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DEPARTMENT OF TRANSPORTATION | KA 'OIHANA ALAKAU
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HONOLULU, HAWAII 96813-5097

IN REPLY REFER TO:

HWY-DD 2.20381

July 16, 2024

TO: JAMES KUNANE TOKIOKA, DIRECTOR
DEPARTMENT OF BUSINESS ECONOMIC DEVELOPMENT AND TOURISM

THROUGH: MARY ALICE EVANS, DIRECTOR
ENVIRONMENTAL REVIEW PROGRAM
OFFICE OF PLANNING AND SUSTAINABLE DEVELOPMENT

FROM: EDWIN H. SNIFFEN
DIRECTOR OF TRANSPORTATION

SUBJECT: FINAL ENVIRONMENTAL ASSESSMENT (EA) AND FINDING OF NO SIGNIFICANT IMPACT FOR NANUE STREAM BRIDGE REHABILITATION PROJECT
NINOLE, HILO MOKU, ISLAND OF HAWAII
FEDERAL-AID PROJECT NO. BR-019-2(077)

With this letter, the State of Hawaii Department of Transportation (HDOT) transmits the Final EA for the Nanue Stream Bridge Rehabilitation Project for publication in the next available edition of the Environmental Notice.

We have determined that preparation of an Environmental Impact Statement is not required for the Nanue Stream Bridge Rehabilitation project, pursuant to the significance criteria specified in the Hawaii Administrative Rules § 11-20.1-13. We hereby issue a Finding of No Significant Impact, as documented in the enclosed Final EA.

Should you have any questions, please contact our HDOT Project Manager, Ms. Amy Sunahara, at (808) 692-8431, of our Design Branch, Highway Design Section or by email at amy.my.sunahara@hawaii.gov.

Enclosure

From: webmaster@hawaii.gov
To: DBEDT OPSD Environmental Review Program
Subject: New online submission for The Environmental Notice
Date: Thursday, August 1, 2024 2:40:56 PM

Action Name

Nanue Stream Bridge Rehabilitation

Type of Document/Determination

Final environmental assessment and finding of no significant impact (FEA-FONSI)

HRS §343-5(a) Trigger(s)

- (1) Propose the use of state or county lands or the use of state or county funds
- (4) Propose any use within any historic site as designated in the National Register or Hawai‘i Register

Judicial district

North Hilo, Hawai‘i

Tax Map Key(s) (TMK(s))

(3) 3-2-001-008 and right-of-way (ROW)

Action type

Agency

Other required permits and approvals

NEPA Categorical Exclusion; DA Permit pursuant to Clean Water Act (CWA) Section 404 or Rivers and Harbors Act, Section 10; Endangered Species Act (ESA) Section 7 consultation; Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) Essential Fish Habitat coordination; ESA Section 7 consultation; National Historic Preservation Act (NHPA) Section 106 consultation; Coast Guard Bridge Permit Exception; Coastal Zone Management (CZM) Federal Consistency Review coordination; Remedial Alternatives Analysis (RAA); National Pollutant Discharge Elimination System (NPDES) Permit for storm water discharges related to construction activities; CWA Section 401 Water Quality Certification (WQC) blanket certification (pending DA permit); Community Noise Permit; Community Noise Variance; HRS Chapter 6E-8 Review; HRS Chapter 195D Conservation of Aquatic Life, Wildlife, and Land Plants Review; Conservation District Use Permit; Stream Channel Alteration Permit (SCAP);

Proposing/determining agency

State of Hawaii, Department of Transportation

Agency contact name

Amy Sunahara

Agency contact email (for info about the action)

amy.my.sunahara@hawaii.gov

Email address for receiving comments

HonoluluPlanning@wsp.com

Agency contact phone

(808) 692-8431

Agency address

601 Kamokila Boulevard
Kapolei, Hawaii 96707
United States
Map It

Is there a consultant for this action?

Yes

Consultant

WSP USA

Consultant contact name

Dennis Silva Jr

Consultant contact email

Dennis.SilvaJr@wsp.com

Consultant contact phone

(808) 566-2274

Consultant address

1001 Bishop Street
Suite 2400
Honolulu, HI 96813
United States
Map It

Action summary

The proposed action rehabilitates the Nanue Stream Bridge to address deterioration of the structure by (1) replacing in-kind
steel truss members, bearings, gusset plates, etc. that have corrosion and section loss; (2) addressing spalls and delamination in the concrete deck, abutments, bridge railings and column pedestals; (3) cleaning and painting the steel members following the repairs; and (4) addressing scour deficiencies for the bridge foundations.

Reasons supporting determination

See Chapter 1.

Attached documents (signed agency letter & EA/EIS)

- 001_NanueStreamBridgeRehabilitationProject-FinalEA_2024-08-01.pdf

Shapefile

- The location map for this Final EA is the same as the location map for the associated Draft EA.

Action location map

- PLACEHOLDER.zip

Authorized individual

Ethan Lau

Authorization

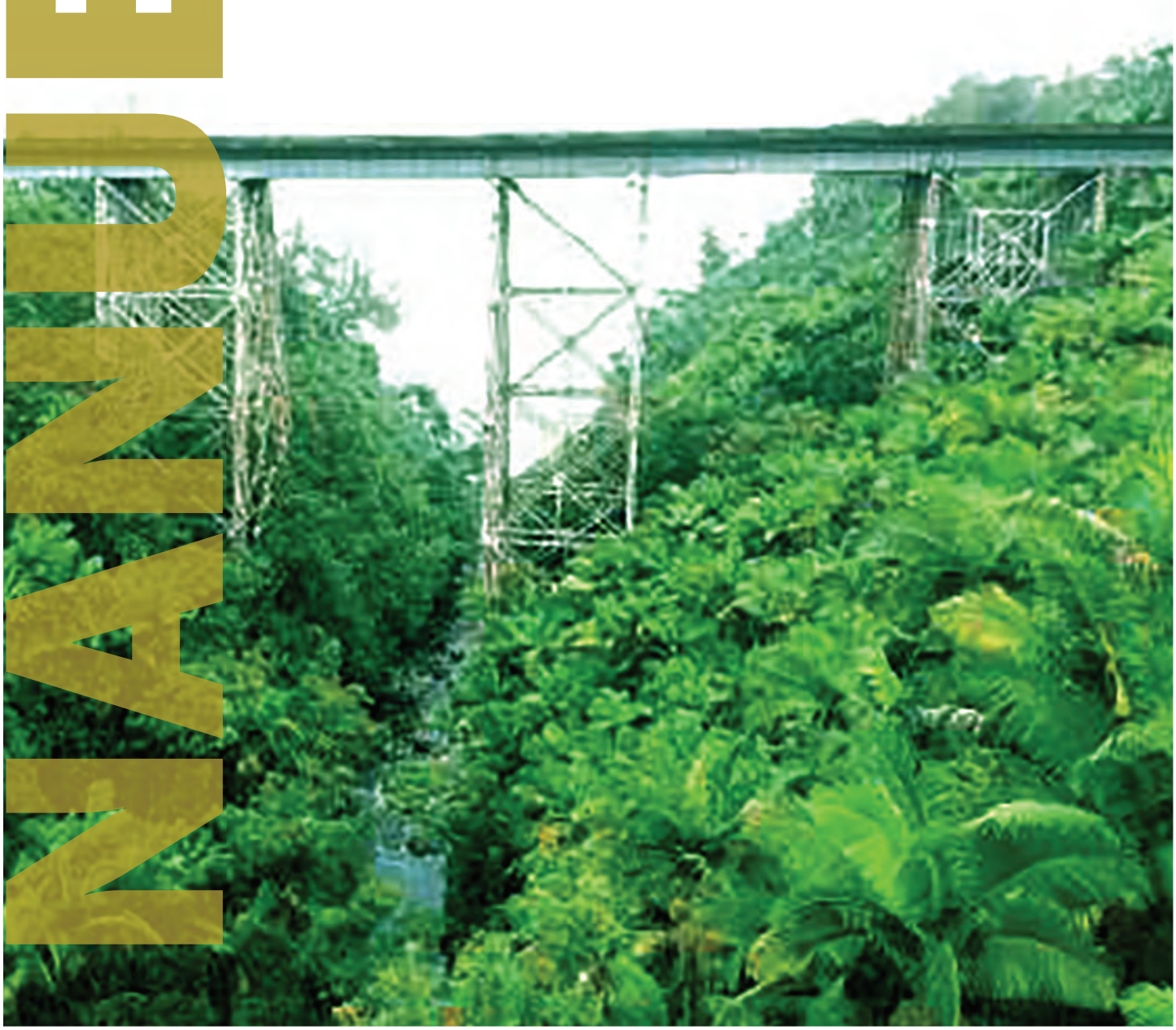
- The above named authorized individual hereby certifies that he/she has the authority to make this submission.

Nanue Stream Bridge Rehabilitation

Bridge ID: 001000190308146
Hawaii County, Hawaii

FINAL ENVIRONMENTAL ASSESSMENT

NANUE



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
DISTRICT OF HAWAII

August 2024

FINAL ENVIRONMENTAL ASSESSMENT

HAWAII BELT ROAD NANUE STREAM BRIDGE REHABILITATION

FEDERAL AID PROJECT NO. BR-019-2(077)

HILO, HAWAII ISLAND

August 2024

FINAL ENVIRONMENTAL ASSESSMENT
Nanue Stream Bridge Rehabilitation
Federal-Aid Project No. BR-019-2(077)
Hawaii Belt Road, Hilo, Hawaii Island

Submitted Pursuant to the

Hawaii Environmental Policy Act,
Chapter 343, Hawaii Revised Statutes, and
Title 11, Chapter 200.1, Hawaii Department of Health Administrative Rules by the:

Department of Transportation, State of Hawaii

The following person may be contacted for additional information concerning this document:

Ms. Amy Sunahara, Project Manager
Department of Transportation, Highways Division
601 Kamokila Boulevard, #688
Kapolei, HI 96707
(808) 692-7548

This Final Environmental Assessment (Final EA) discloses the foreseeable primary, secondary, and cumulative environmental impacts that could result from the proposed project's implementation and commits to specific measures to avoid, minimize, or mitigate adverse impacts to the environment. Additionally, this Final EA contains a record of consultation activities that have been conducted to date as part of project planning. The Build Alternative or proposed action consists of two primary actions: 1) rehabilitate the bridge's deteriorating substructure; and 2) upgrade bridge railings. The upgrade of bridge railings and soil remediation will be part of a future construction phase.

The proposed rehabilitation of the Nanue Stream Bridge is intended to: 1) Allow continued unrestricted use by rehabilitating the bridge's deteriorating substructure; and 2) Meet current bridge railing safety standards. Nanue Stream Bridge will not be widened, and its traffic capacity will not increase.

HDOT has determined that the proposed project is not likely to have a "significant" effect in accordance with HRS Chapter 343 and HAR 11-200.1-13. Therefore, an EA process was selected for the environmental review. If, during the consideration of comments received on this Final EA, HDOT determines that a "significant" impact would occur, HDOT will either revise the proposed project to avoid or mitigate the impact's severity and/or start preparing an Environmental Impact Statement (EIS).

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APPENDICES

LIST OF FIGURES

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ABBREVIATIONS AND ACRONYMS

AAQS	Ambient Air Quality Standards
AASHTO	American Association of State Highway and Transportation Officials
AIS	Archaeological Inventory Survey
ALISH	Agricultural Lands of Importance to the State of Hawaii
APE	Area of Potential Effects
BMP	Best management practices
BSR	Biological Survey Report
CatEx	Categorical Exclusion
C-EHMP	Construction Environmental Hazard Management Plan
CFR	Code of Federal Regulations
CIA	Cultural impact assessment
County	County of Hawaii
CRC	Cultural Resources Commission
CWA	Clean Water Act
CWRM	Commission on Water Resource Management
CY	Cubic yard
CZM	Coastal Zone Management
CZMA	Coastal Zone Management Act
DA	Department of Army
DAR	Division of Aquatic Resources
dBA	A-weighted decibels
DEM	Department of Environmental Management
DLNR	Department of Land and Natural Resources
DOFAW	Division of Forestry and Wildlife
DPS	Distinct Population Segment
EA	Environmental Assessment
EFH	Essential Fish Habitat
EHMP	Environmental hazard management plan
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FDA	Food and Drug Administration
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FONSI	Finding of No Significant Impact
General Plan	County General Plan
HAER	Historic American Engineering Record
HAR	Hawaii Administrative Rules
HDOH	Hawaii Department of Health
HDOT	Hawaii Department of Transportation
HEER	Hazard Evaluation and Emergency Response
HHF	Historic Hawaii Foundation
HRS	Hawaii Revised Statutes
HSTP	Hawaii Statewide Transportation Plan

IPaC	Information for Planning and Consultation
MBTA	Migratory Bird Treaty Act
mg/kg	milligrams of lead per kilogram
MOA	Memorandum of Agreement
MUS	Management unit species
NAC	Noise Abatement Criteria
NEPA	National Environmental Policy Act
NHO	Native Hawaiian Organization(s)
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanographic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NWI	National Wetland Inventory
NWP	Nationwide Permit
OPSD	Office of Planning and Sustainable Development
PIFWO	Pacific Islands Fish and Wildlife Office of the USFWS
PIRO	Pacific Islands Regional Office of the NMFS
ppb	parts per billion
The project	Nanue Stream Bridge Rehabilitation project
RAA	Remedial Alternatives Analysis
RFD	Request for Determination
RHA	Rivers Harbors Act
SCAP	Stream Channel Alteration Permit
Section 106	Section 106 of the National Historic Preservation Act
sf	square feet
SHPD	State Historic Preservation Division
SHPO	State Historic Preservation Officer
SIHP	State Inventory of Historic Places
SLR	Sea-level rise
SLR-XA	Sea-level rise exposure area
SMA	Special Management Area
SSV	Shoreline setback variance
State	State of Hawaii
TMK	Tax Map Key
USACE	U.S. Army Corps of Engineers
USDOT	U.S. Department of Transportation
USDOT Act	1966 U.S. Department of Transportation Act
USFWS	U.S. Fish and Wildlife Service
WQC	Water Quality Certification

EXECUTIVE SUMMARY

Project Name	Nanue Stream Bridge Rehabilitation
Proposing Agency	State of Hawaii Department of Transportation (HDOT)
Determining Agency	HDOT
Landowner	State of Hawaii
General Location	The Nanue Stream Bridge (1000190308146) is oriented from south (to Hilo) to north (to Honokaa) and carries Hawaii Belt Road over Nanue Stream in Ninole, North Hilo, Hawaii Island Nanue Stream Bridge is located at Milepost 18.5 of Hawaii Belt Road (Route 19) at roughly 19°55'38.56"N, 155° 9'23.47"W
Tax Map Keys	(3) 3-2-001-008 and (3) 3-2-001: right-of-way (ROW).
Project Area	The proposed project is in the Hilo District on the island of Hawaii, approximately 16 miles north of Hilo at Milepost 18.5 of Hawaii Belt Road (Rt 19). The Project Area is approximately 100 feet wide by 1,200 feet long along the roadway in the State Right of Way, and 300 feet by 1,000 feet makai of the highway at TMK: (3) 3-2-001-008 and (3) 3-2-001: ROW. The total project acreage is 10.7 acres.
Existing Uses of the Project Area	The project area lies within the Ninole area, and the uses surrounding the project area consists of large parcel agricultural zoned properties.
Proposed Project	The bridge rehabilitation consists of two primary actions: 1) rehabilitate the bridge's deteriorating substructure, and 2) upgrade bridge railings. The upgrade of bridge railings and soil remediation will be part of a future construction phase. Based on conceptual engineering, the total cost of the Proposed Action is estimated at approximately $75 Million (in 2023 dollars). This cost will be refined as engineering details are developed.
State Land Use Designation	Conservation and Agricultural
County Zoning	A-20a: Agricultural District
Special Management Area	The Nanue Stream bridge and most of the project area is within the Special Management Area (SMA).
Anticipated Determination	Finding of No Significant Impact pursuant to Chapter 343, Hawaii Revised Statutes (HRS)
Anticipated Impacts	• Land Use No changes to existing land use are anticipated. The proposed Project is consistent with future land use proposals listed in the Hamakua Community Development Plan. Implementation of the identified mitigation measures and compliance with regulations will ensure that impacts will be less than significant. • Hazardous Materials A Construction – Environmental Hazard Management Plan (C-EHMP) will be implemented to protect human health and the environment from lead

	exposure. Additional construction BMPs shall be implemented in accordance with the following: (1) *Integrated Storm Water Management Approach and a Summary of Clear Water Diversion and Isolation Best Management Practices for Use in the State of Hawaii* (FHWA and HDOT Practitioners Guide, 2016); (2) the *Construction Best Management Practices Field Manual* (HDOT, 2021), and (3) *Standard Specification for Road and Bridge Construction Section 209 Temporary Water Pollution, Dust, and Erosion Control* (HDOT, 2005). • Historic Resources The Section 106 process was initiated with the State of Hawaii Department of Land and Natural Resources State Historic Preservation Division (SHPD) in November 2023. The Hawaii Revised Statutes (HRS) HRS § 6E process the SHPD is expected to conduct its HRS § 6E review responsibilities in conjunction with their Section 106 responsibilities. • Hazardous Materials and Solid Waste Management A remedial alternatives analysis (RAA) was completed to address the most appropriate remedy for the lead-impacted soil. The preferred alternatives include encapsulating the lead-impacted soil with a mesh system, implementing a construction environmental hazard management plan (C-EHMP), and installing fencing and signage, all of which would reduce direct exposure to potential human and ecological receptors. Upon review and approval of the RAA, HDOT will defer to any recommendations agreed upon by the Hawaii Department of Health (HDOH). • Historic, Archaeological, and Cultural Resources Based on the information provided, SHPD has reviewed the proposed project, pursuant to HRS §6E-8, and the SHPD concurs with the State of Hawai‘i Department of Transportation’s determination of “No historic properties affected.” Based on previous and current documentation of the historic and archaeological resources and the impacts to Nanue Stream Bridge, the proposed project has a “no adverse effect” as defined in 36 CFR §800.16(y) and subject to compliance with the Section 106 process. • Biological Resources Although temporary construction duration impacts to flora are unavoidable with the proposed vegetation clearing and earthwork, no significant permanent adverse impacts to biological resources are anticipated with the Proposed Action. No botanical resources of concern were identified in the project area, and to the extent feasible the project will use native plants for restoring vegetation and landscaping, increasing the presence of native species. Although construction activities have the potential to impact various protected wildlife that may be present in the area, HDOT is consulting with multiple natural resource agencies and will incorporate measures mandated by federal and state agencies into the project to avoid and minimize impacts to protected species. The contractor may request the option to work at night to expedite the construction schedule. Construction mitigation measures include ceasing construction if waterbirds are present and avoiding nighttime

	construction activities during the seabird fledging season (September 15 to December 15). The selected contractor will incorporate best management practices (BMPs) to minimize the introduction and spread of invasive species during construction. BMPs for work in aquatic environments will also be incorporated into the project design to minimize the degradation of water quality and minimize the potential for impacts to fish and wildlife resources. HDOT will also obtain a Department of Army (DA) permit from the U.S. Army Corps of Engineers (USACE) for the proposed in-water work, which will call for aquatic BMPs. With these mandated mitigation measures, BMPs, and regulatory controls in place, no significant impacts on biological resources are anticipated during construction. • Visual and Aesthetic Resources During construction, views upstream will be temporarily altered by soil remediation and vegetation clearing. These impacts, however, are only temporary as HDOT and its contractor will restore the soil and vegetation in the project area to its pre-construction state. No significant impacts are anticipated. • Traffic Mitigation measures relating to the maintenance of traffic during construction will be implemented as appropriate. • Noise Construction activities would involve heavy machinery and vehicles that at times may exceed the maximum levels allowed by community noise control regulations. The contractor will obtain a Community Noise Permit and will be required to comply with its terms and conditions. A Community Noise Variance will also be obtained if night, weekend, or holiday construction is needed. No significant impacts are anticipated with adherence to the restrictions in the Community Noise Permit and Community Noise Variance. • Air Quality Air quality impacts during construction generally consist of fugitive dust (airborne particulate matter) and mobile source emissions from construction equipment. Airborne, visible fugitive dust generated during construction would be controlled at the project site by the contractor in accordance with the provisions of HAR Chapter 11-60.1-33, Fugitive Dust.
HAR 11-200.1-18(d) EA Content Requirements	1) Identification of the applicant or proposing agency. See Section 1.1, Introduction. 2) For applicant actions, identification of the approving agency. This project is an agency action. See “Determining Agency” in this Executive Summary and Section 1.1, Introduction. 3) List of all required permit sand approvals (state, federal, and county) and, for applicants, identification of which approval necessitates chapter 343, HRS, environmental review. See Section 1.8, Permits and Approvals, and Chapter 4, Comments and Coordination. 4) Identification of agencies, citizen groups, and individuals consulted in preparing the EA. See Chapter 4, Comments and Coordination, and Appendix A.

	5) General description of the action's technical, economic, social, cultural, historical, and environmental characteristics. See Chapter 2, Affected Environment, Potential Impacts, and Proposed Mitigation. 6) Summary description of the affected environment, including suitable and adequate regional, location, and site maps such as Flood Insurance Rate Maps, Floodway Boundary Maps, U.S. Geological Survey topographic maps, or state sea level rise exposure area maps. See Chapter 2, Affected Environment, Potential Impacts, and Proposed Mitigation. 7) Identification and analysis of impacts and alternatives considered. See Chapter 2, Affected Environment, Potential Impacts, and Proposed Mitigation. 8) Proposed mitigation measures. See Chapter 2, Affected Environment, Potential Impacts, and Proposed Mitigation. 9) Proposing agency or approving agency anticipated determination, including findings and reasons supporting the FONSI, if applicable. See Chapter 5, Finding of No Significant Impact. 10) Written comments and responses to comments received, if any. See Chapter 4, Comments and Coordination, and Appendix A.

CHAPTER 1. DESCRIPTION OF THE PROPOSED ACTION

1.1 Introduction

The State of Hawaii Department of Transportation, Highways Division (HDOT), in cooperation with the Federal Highway Administration (FHWA) is proposing the Nanue Stream Bridge Rehabilitation project (1000190308146). The project is located at Milepost 15.3 of Hawaii Belt Road (Route 19) on the Island of Hawaii at roughly 19°55'38.56"N, 155° 9'23.47"W. See Project Location Map in Figure 1-1.

The purpose of this project is to allow continued unrestricted operation of Nanue Stream Bridge, and to meet current bridge railing safety standards.

To meet the project's objectives, HDOT proposes to rehabilitate the steel bridge's deteriorating substructure, repave the travel way surface and upgrade the bridge railings. The bridge railings will be upgraded in a later construction phase. Soil remediation is also a future phase of the project.

The proposed action rehabilitates the Nanue Stream Bridge to address deterioration of the structure by (1) replacing in-kind steel truss members, bearings, gusset plates, etc. that have corrosion and section loss; (2) addressing spalls and delamination in the concrete deck, abutments, bridge railings and column pedestals; (3) cleaning and painting the steel members following the repairs; and (4) addressing scour deficiencies for the bridge foundations. The following Figures are excerpts from KSF's structural engineering plans addressing the proposed actions. The entire set of KSF Structural Drawings are enclosed as Appendix B.

The proposed project is listed as a system preservation project (HS 4) in the "Statewide Transportation Improvement Program" (STIP) (Federal Fiscal Year 2022-2025), which programs federal funds for transportation improvements.

1.2 Purpose of this Document

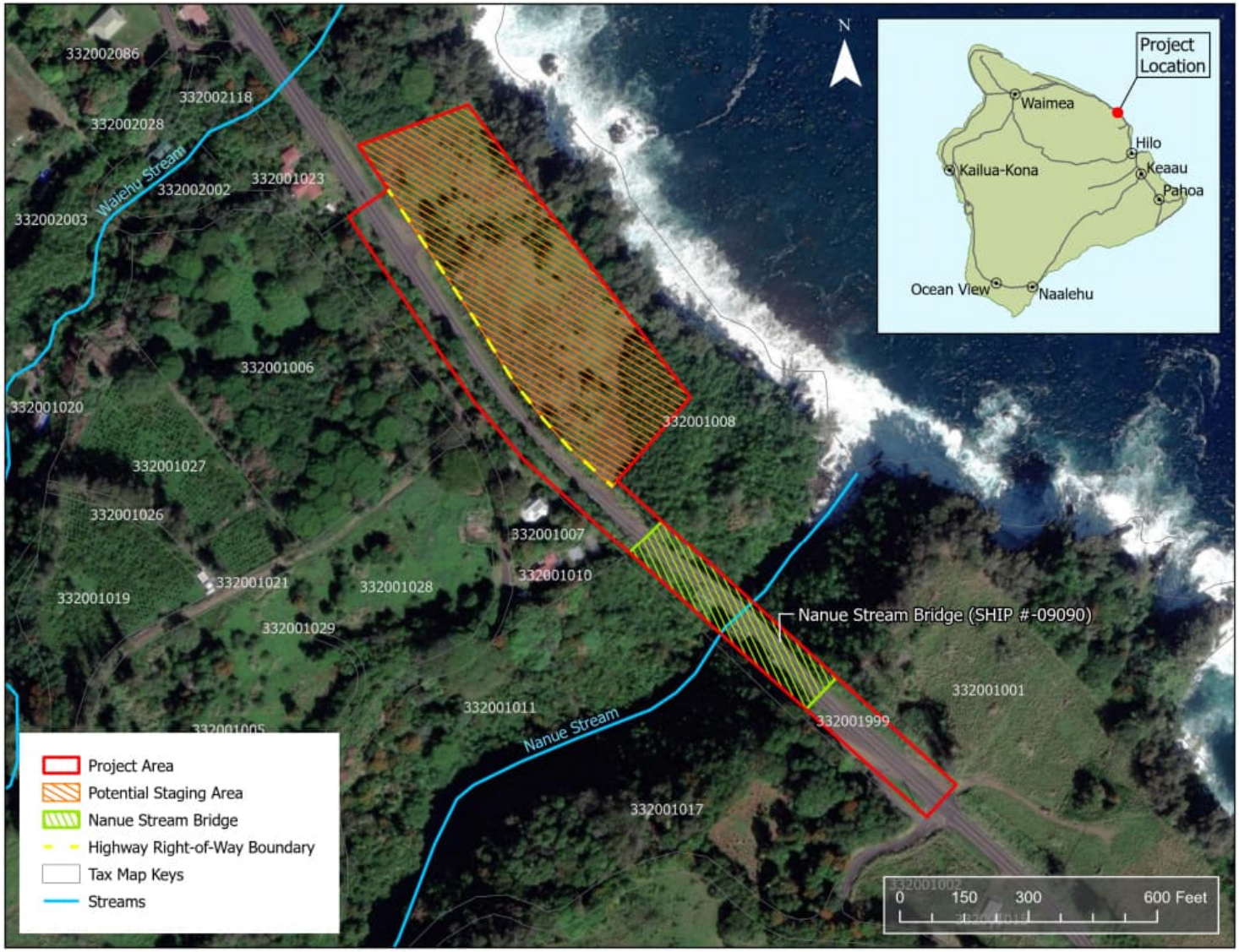
The proposed project requires an environmental review in accordance with Hawaii Revised Statutes (HRS) Chapter 343 because it would use State or County lands and use State funds. HDOT is responsible for preparing this document which must comply with Hawaii Administrative Rules (HAR) Title 11, Chapter 200.1.

This Final Environmental Assessment (Final EA) discloses the foreseeable primary, secondary, and cumulative environmental impacts that could result from the proposed project's implementation and commits to specific measures to avoid, minimize, or mitigate adverse impacts to the environment. Additionally, this Final EA contains a record of consultation activities that have been conducted to date as part of project planning.

HDOT determines that the proposed project is not likely to have a "significant" effect in accordance with HRS Chapter 343 and HAR 11-200.1-13. Therefore, an EA process was selected for the environmental review. If, during the consideration of comments received on this Final EA, HDOT determines that a "significant" impact would occur, HDOT will either revise the proposed project to avoid or mitigate the impact's severity and/or start preparing an Environmental Impact Statement (EIS).

Because federal funds administered by the Federal Highway Administration (FHWA) will be used to construct this project, the project is considered a federal action and must also comply with the National Environmental Policy Act (NEPA), a federally-mandated environmental review process.

Figure 1-1. Project Location Map



To comply with NEPA, a Categorical Exclusion (CatEx) is proposed for this project and will be documented separately. In addition to NEPA, other federal laws that apply to the proposed project include, but are not limited to Section 7 of the Endangered Species Act, Magnuson-Stevens Fishery Conservation and Management Act, Section 106 of the National Historic Preservation Act, and Section 4(f) of the 1966 U.S. Department of Transportation Act. These regulations have potential to affect decision-making, including requiring avoidance and mitigation measures, as they are applied to specific resources. For this reason, they are identified and addressed when relevant throughout the document. This Final EA provides supporting documentation for compliance with NEPA and other federal environmental regulations, the coordination for which is ongoing.

1.3 Project Purpose and Need

The purposes of the project are the following:

- Allow the continued unrestricted operation of the Nanue Stream Bridge.
- Meet the current bridge railing safety standards.

The proposed action is a bridge rehabilitation project to address deterioration of the structure by:

- Replacing in-kind streel truss members, bearings, gusset plates, etc. that have corrosion and section loss;
- Addressing spalls and delamination in the concrete deck, abutments, bridge railings and column pedestals;
- Cleaning and painting the steel members following the repairs;
- Addressing scour deficiencies for the bridge foundations.

The remainder of this section describes the need associated with each project purpose.

Redo the Purpose and Need from the BIR Report Executive Summary.

NBIS Rating:

Overall, this structure is in 4 – Poor Condition:

- Item 58 – Deck: 6 - Satisfactory Condition
- Item 59 – Superstructure: 5 - Fair Condition
- Item 60 – Substructure: 4 - Poor Condition
- Item 61 – Channel and Channel Protection: 7 - Minor Damage
- Item 71 – Waterway Adequacy: 9 - Above Desirable
- Item 113 – Scour Critical: 3 - Scour Critical – Unstable

Overall Observed Condition:

The bridge is in overall 4 - Poor condition.

- On 4/2/2021 a High Priority Repair Recommendation was made to replace in-kind 4 substructure members. Members are listed in CAD sheets in Appendix C.
- All trestle towers have advanced deterioration in Levels 1 and 2.
- Trestle towers 2 through 4 have advanced deterioration and moderate active vegetation growth throughout the bottom levels. The steel braces at the towers have up to 90% section loss.
- The Bent 6 footings have voids and the downstream foundations are undermined.
- Multiple superstructure members have missing/corroded rivets or anchor bolts.
- The steel girders typically have peeling paint and corrosion along the bottom flanges.
- The exterior girders are typically more heavily deteriorated.
- The rock formation under the upstream north corner of the Bent 5 Column 4 foundation has a void.
- The overhangs and deck soffit have cracking with efflorescence throughout.
- The Bent 5 footings have areas of spalling and abrasion.
- All bearings have peeling paint and minor corrosion throughout.
- The deck overlay has full-length longitudinal cracks with map cracking and rutting in all wheel lines.
- All underdeck bays have missing or loose access planks.
- All deck joints are paved over with potholes and patches typically throughout.
- The approaches have transverse cracks with associated alligator cracking in both lanes with active vegetation growth.
- The railings and sidewalks have scale and moss growth throughout.
- The northeast and northwest guardrails have areas of impact damage.
- The PVC utility conduit is broken with corroded and/or loose brackets.
- Several bridge rail delineators are broken or missing.

High Priority Repair Recommendations

- Repair/replace detached substructure members shown on the CAD Sheets. These members were previously mentioned in 4/2/2021 “High Priority Repair Recommendations.
- Replace/repair all CS 4 trestle tower members.

Moderate Priority Repair Recommendations

- Conduct a seismic load rating analysis on the steel tower to determine the susceptibility of the bridge under earthquake conditions.
- Repair deck joints.
- Repaint/repair steel girders and bearings.

- Replace the missing bolts and rivets at the steel girders.
- Replace the rusted out vertical bracing.
- Fill voids and undermined areas at the Bent 5 and Bent 6 foundations.
- Repair broken utility conduit and loose brackets.

Routine Maintenance Recommendation

Per the Routine Bridge Inspection Report for Nanue Stream Bridge (March 19, 2021):

- Replace bridge railing delineators.
- Replace missing access planks.
- Recommend an increased 12-month inspection cycle.

Upgrade Bridge Railings to Current Safety Standards

The bridge's railings need to be updated to meet safety standards as to comply with FHWA height requirements and guarantee safe bridge use:

- To allow continued unrestricted operation of the bridge by rehabilitating the bridge's deteriorating substructure.
- To upgrade the bridge railings to meet current safety standards, and to increase resilience of the bridge to extreme natural events.

1.5 Alternatives Addressed in this Environmental Assessment

Four alternatives are evaluated in this environmental assessment (EA): the No Build Alternative, New Bridge Alternative, the Rehabilitation with New Hybrid Trestle Alternative, and the Historic Rehabilitation Alternative, also known as the proposed action. Other alternatives that were considered but eliminated are described below.

No Build Alternative

The No Build Alternative would leave the site "as is" with no improvements to the bridge substructure. The No Build Alternative is not feasible since the existing condition of the bridge is in dire need of improvements to ensure structural integrity. Due to the advanced state of corrosion of Nanue Stream Bridge, this alternative is not viable as the bridge will not be safe for use under the No Build Alternative. Nanue Stream Bridge facilitates Hawaii Belt Road which is the primary arterial facilitating travel along the Hamakua Coast, connecting Hilo to Kona. The No Build Alternative would result in the further corrosion of Nanue Stream Bridge and will discontinue Hawaii Belt Road as a primary arterial facilitating travel along the Hamakua Coast.

Future roadway improvement assumptions affect forecasts of travel patterns and traffic volumes and are consistent with those included in the current Statewide Transportation Improvements Program for Federal Fiscal Years 2022-2025 (STIP). The STIP indicates that no major roadway improvements will be constructed in the vicinity of the project site.

New Bridge Alternative

The New Bridge Alternative would involve constructing a two-lane bridge adjacent to the existing bridge. Note that a new bridge crossing Nanue Valley at a completely different location was not considered because of the overwhelming impacts of acquiring and building a bridge through a completely new roadway alignment. The new bridge would be approximately the same span (roughly 531 feet) and width (roughly 28 feet) to match the existing bridge. The bridge would be supported on tower bents up to roughly 286 feet high and could be placed either mauka or makai of the existing bridge. The support towers for the new bridge could be either concrete or steel or a combination of materials.

The existing highway right-of-way would not accommodate the relocated bridge, and considerable right-of-way would need to be acquired for the roadway transitions, bridge, and foundations. The alignment of the roadway approaches along Hawaii Belt Road would need to be modified to transition to the new bridge, which would likely involve significant cuts into the hillside above both sides of Nanue Stream as well as acquisition of private property for additional roadway right-of-way. The new bridge would be designed in full compliance with current design codes, and it would meet the project's purpose and need of increasing the bridge's resilience to extreme natural events. In addition, enhancements such as pedestrian or bicycle paths could be easily incorporated in the new bridge design. On the other hand, this alternative would not meet the U.S. Secretary of Interior Standards for the Treatment of Historic Properties, particularly the Standards for Rehabilitation of historic structures.

This alternative would retain the existing bridge in its current configuration until completion of construction of the new bridge, at which point the existing bridge would be disassembled and removed from the site. The viability of this alternative depends on the existing bridge continuing to be deemed satisfactory to support the anticipated traffic loads until construction of the new bridge is complete. Because of the continuing degradation of the existing bridge, as well as the significant environmental and real property impacts of constructing a new relocated bridge, this alternative is not considered a viable alternative and is not considered further in this EA.

Rehabilitation with New Hybrid Trestle

The Hybrid Trestle Alternative would construct the two main full-height trestle towers that would be situated in the main valley (channel and floodplain) as hybrid towers—with concrete on the lower portions and steel on the upper 60 feet of each tower. The quarter-height trestle towers closest to the abutments at each end of the bridge would be constructed entirely of steel. The lower portion of the towers would consist of approximately 5-foot square concrete columns with 5-foot-thick concrete tie beams at roughly 35- to 40-foot spacing. Note that this lower portion of the hybrid tower would not have a traditional trestle look. In profile, the concrete columns would be tapered similar to the shape of the existing steel towers.

Similar to other alternatives, the footprint of these new hybrid trestle towers would also be offset from and extend beyond the footprint of the existing towers. This larger trestle footprint would allow the existing towers to remain in place during construction of the new towers. The existing highway right-of-way is sufficient to accommodate the new trestle towers and foundations.

This alternative would allow the bridge foundation to be designed to withstand tsunami loads and other extreme natural hazards. Regular inspections for in-stream scour conditions would also be

needed. Maintenance activities—including cleaning, sandblasting, and painting the entire structure—would need to be done approximately every 25 years.

The steel-trestle portion of each hybrid tower would be fastened by using bolted technology to emulate the look of rivets, similar to the Historic Rehabilitation and Steel Trestle Alternatives. The Hybrid Trestle Alternative would also retain the existing bridge in its current configuration until completion of construction, at which point the existing bridge trestles would be disassembled and removed from the site. The structural integrity of the existing bridge would not affect construction of the new hybrid towers, because they would be independent structures. As long as the existing bridge is deemed satisfactory to support the anticipated traffic loads until rehabilitation of the bridge is complete, the degree of steel corrosion on the existing bridge is not critical. For this alternative, both the initial costs of construction and the long-term maintenance costs would be substantial. Furthermore, the concrete trestles would not preserve the historic integrity of the bridge. Therefore, this alternative is not considered viable and is not evaluated further in this EA.

Rehabilitation (Preferred Alternative)

The Rehabilitation Alternative would replace the existing steel-trestle bridge members one for one with similar materials (i.e., steel) of approximately the same dimensions. The existing highway right-of-way is sufficient to accommodate the new trestle towers and foundations. This alternative would be designed following the Secretary of the Interior's Standards for the Treatment of Historic Properties, particularly the Standards for Rehabilitation, which would likely result in a finding of "No Adverse Effect" for federal and state historic reviews. SHPD made the Section 106 "No Adverse Effect" determination concurrence on May 28, 2024. The replacement of individual steel members is extremely time consuming and costly, because the structural integrity of the bridge must be maintained during the removal and replacement process and only a limited number of beams can be removed at any one time. Each steel member would be custom designed and placed for each bent, such that the order in which work progresses is critical. Furthermore, the bolted technology used to emulate the look of the original riveted steel trestles is a slow construction process that would require proprietary equipment to manufacture and install. Only a few qualified contractors can perform such work.

The rehabilitation alternative addresses the improvements referenced in Section 1.4 - Purpose and Need. The improvements strengthen the structural stability of the bridge while maintaining the historical preservation of the steel trestle bridges in this region of the island.

Rehabilitating the Nanue Stream Bridge would ensure that its structural integrity can withstand the increasing threat of natural disasters. Should the Nanue Stream Bridge fail, the transit system would be affected island-wide as Hawaii Belt Road is the only road that provides uninterrupted access along the Hamakua Coast. The following site photographs illustrate the existing condition of the Nanue Stream Bridge and Hawaii Belt Road.

Figure 1-2. View of the Existing Nanue Stream Bridge North Approach (Looking South)

Source: Routine Bridge Inspection Report: Nanue Stream Bridge, March 19, 2021Figure 1-3. Profile View of the Existing, Upstream (West) Elevation

Source: Routine Bridge Inspection Report, Nanue Stream Bridge, March 19, 2021

Figure 1-4. Looking Downstream (East)

Source: Routine Bridge Inspection Report, Nanue Stream Bridge, March 19, 2021

Figure 1-5. South Approach (Looking North)

Source: Routine Bridge Inspection Report, Nanue Stream Bridge, March 19, 2021

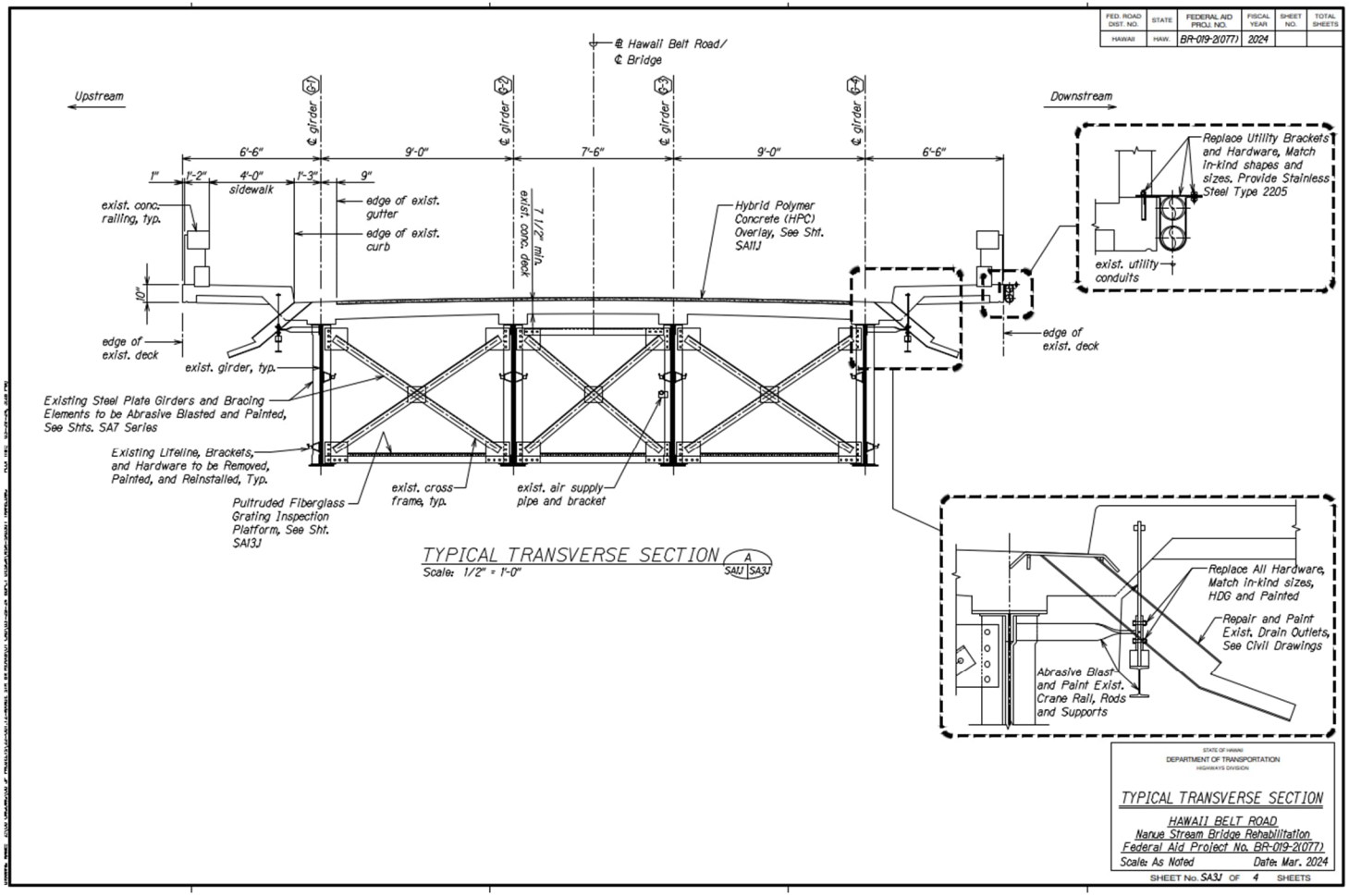
Rehabilitation – Proposed Action

The Rehabilitation Alternative or proposed action consists of two primary actions: 1) rehabilitate the bridge's deteriorating substructure, and 2) upgrade bridge railings.

The Historic Rehabilitation alternative would replace the existing steel trestle bridge members with similar materials of approximately the same dimensions. This alternative would be designed following the Secretary of the Interior's Standards for the Treatment of Historic Properties, particularly the Standards for Rehabilitation. The existing bridge members would be replaced one for one with similar materials. The replacement of individual steel members is extremely time consuming, as the structural integrity of the bridge must be maintained during the removal and replacement process. To maintain structural integrity during bridge rehabilitation, only a limited number of beams can be removed at any one time. Each steel member is custom designed and placed for each bent, so the order in which work progresses would be critical. Rehabilitation of one tower at a time will be the approach for repairs. Refer to the following figures illustrating the structural engineering plans.

The proposed action rehabilitates the Nanue Stream Bridge to address deterioration of the structure by (1) replacing in-kind steel truss members, bearings, gusset plates, etc. that have corrosion and section loss; (2) addressing spalls and delamination in the concrete deck, abutments, bridge railings and column pedestals; (3) cleaning and painting the steel members following the repairs; and (4) addressing scour deficiencies for the bridge foundations. The following figures are excerpts from KSF's structural engineering plans addressing the proposed actions. The entire set of KSF Structural Drawings are enclosed as Appendix B.

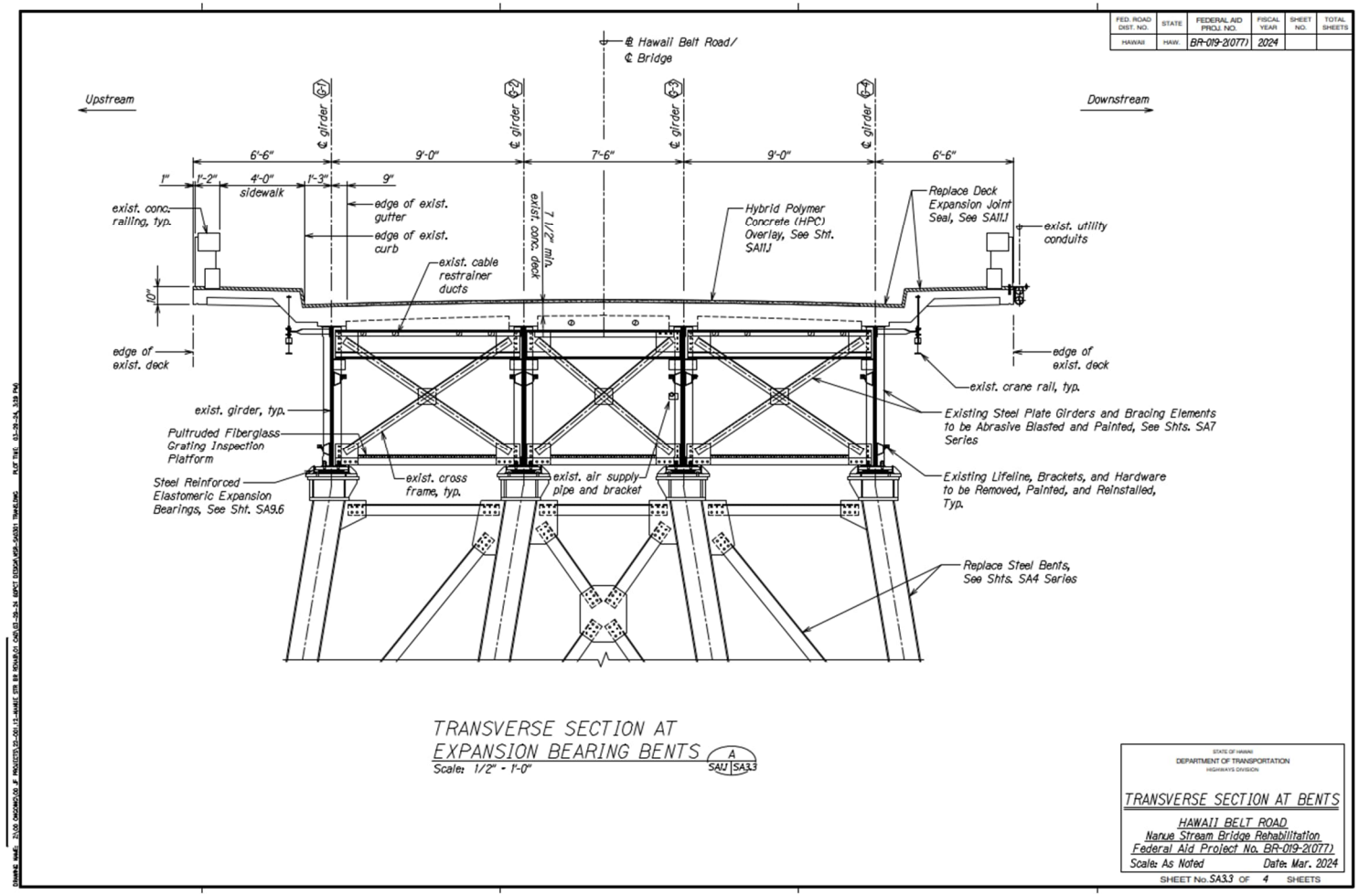
Figure 1-6. Typical Transverse Section



Source: Appendix B – KSF Structural Drawings

Discussion: The typical transverse section rehabilitation elements are: 1) replacing all hardware, match in-kind sizes, hot-dipped galvanized (HDG) and painted; and 2) repair and paint existing drain outlets.

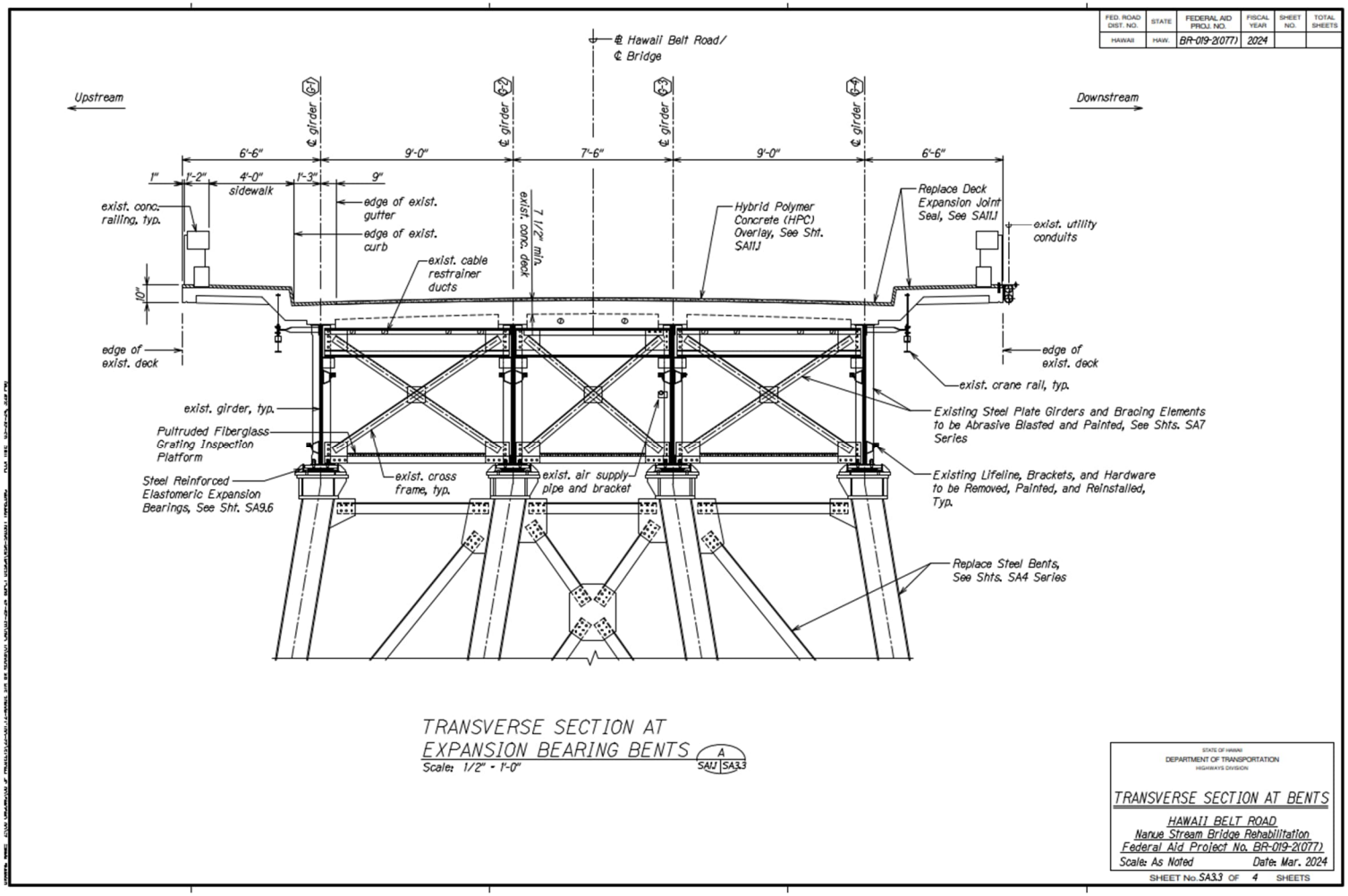
Figure 1-7. Transverse Section at Bents



Source: Appendix B – KSF Structural Drawings

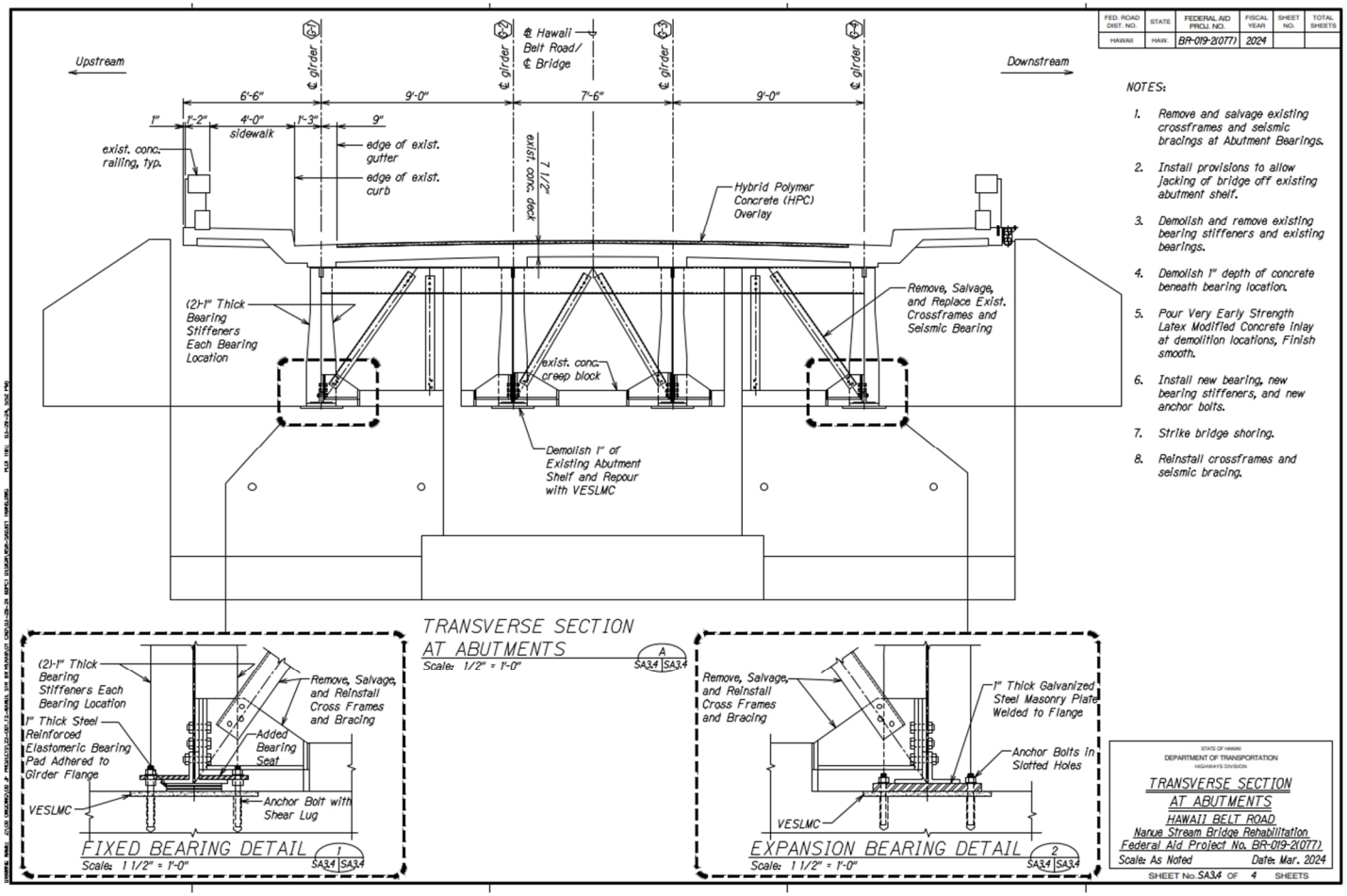
Discussion: The transverse sections at bents plans include 1) replacing the steel bents; and 2) removing, painting, and reinstalling the existing lifeline, brackets, and hardware.

Figure 1-8. Transverse Section at Bents



Source: Appendix B – KSF Structural Drawings

Figure 1-9. Transverse Section at Abutments



Discussion: Transverse Section at Abutments include; 1) remove and salvage existing crossframes and seismic bracings at abutment bearings; 2) install provisions to allow jacking of bridge off existing abutment shelf; 3) demolish and remove existing bearing stiffeners and existing bearings; 4) demolish 1-inch depth of concrete beneath bearing location; 5) pour very early strength latex modified concrete inlay at rehabilitation locations, finish smooth; 6) install new bearing, new bearing stiffeners, and new anchor bolts; 7) strike bridge shoring; and 8) reinstall crossframes and seismic bracing.

1.6 Project Cost

Based on conceptual engineering, costs for the Rehabilitation Alternative are estimated at $75 million (2023 US Dollars). These costs will be refined as engineering details are developed.

1.7 Project Schedule and Phasing

The proposed project's milestones are:

- Finish Planning and Design Concepts: Summer 2022
- Begin Final Design: Mid- Summer 2024
- Initiate Construction: Spring 2025
- Construction Completion: Spring 2028

The work to be performed is to replace the bridge bearings and steel members (trestles, girders, etc.) with in kind materials. Work is anticipated to be done top down by staging on the bridge and lowering materials into position to replace members. The superstructure will be temporarily supported at each frame with temporary diagonal and horizontal bracing. The existing frame member will be removed and the new member will be installed. Each member will be replaced one by one until the trestle is completed. The contractor will move to the next trestle until all of the trestles are completed. Construction is intended to be completed while the bridge is open to public traffic. Contraflow traffic is required while construction is ongoing. Intermittent full bridge closures may be required at times during equipment and material placement. Discussions regarding lead remediation of the soil beneath the bridge structure is ongoing with the Department of Health. If soil lead remediation is required, an additional $10 million dollars would be required.

- Work to be completed include.
    - Possible lead remediation
    - Replace trestles with in-kind materials
    - Repair bridge bearings
    - Repair girders

Work is anticipated to be completed top down. A stage on the bridge is necessary to lower materials into position to replace members.

1.8 Permits and Approvals

Below, Table 1-1 lists approvals and permits that would be required prior to construction of the proposed project. Permits or approvals that may not be required due to construction means and methods selected by the contractor are indicated with an asterisk (*). Coordination and approvals are ongoing.

Table 1-1: List of Permits and Approvals by Agency

Agency	Permit or Approval
County of Hawaii	Grading, Grubbing, and Stockpiling Permit
County of Hawaii – Department of Public Works	Floodplain Management
Department of the Army (DA); (U.S. Army Corps of Engineers, Regulatory Branch)	CWA Section 404 DA Permit
Department of Business, Economic Development & Tourism, Office of Planning and Sustainable Development	Coastal Zone Management (CZM) Federal Consistency Review: Federal Permit Required
Department of Health (HDOH), Clean Water Branch (CWB)	National Pollutant Discharge Elimination System (NPDES) Permit for storm water discharges related to construction activities;
	*NPDES for project discharges related to dewatering activities;
	CWA Section 401 WQC
Department of Land and Natural Resources (DLNR), State Historic Preservation Division	Hawaii Revised Statutes (HRS) Chapter 6E-8 Review
	Section 106 of the National Historic Preservation Act (NHPA)
DLNR, Division of Aquatic Resources (DAR)	Chapter 195D Conservation of Aquatic Life, Wildlife, and Land Plants
DLNR, Division of Forestry and Wildlife (DOFAW)	Chapter 195D Conservation of Aquatic Life, Wildlife, and Land Plants
DLNR, Commission on Water Resource Management (CWRM)	*Stream Channel Alteration Permit (SCAP)
Department of Health (DOH), Indoor Air and Radiological Branch	Community Noise Permit
	*Community Noise Variance (if weekend or holiday construction is needed, the project has committed to no night work)
FHWA	NEPA CatEx, Section 4(f) of the U.S. Department of Transportation Act
National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS)	Section 7 of the Endangered Species Act (ESA), Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act)
U.S. Fish and Wildlife Service	Section 7 of the Endangered Species Act (ESA)
DLNR, Office of Conservation and Coastal Lands (OCCL)	Conservation District Use Permit (CDUP) Coordination
U.S. Coast Guard	U.S. Coast Guard Coordination
County of Hawaii, Planning Department	Special Management Area (SMA) Determination

CHAPTER 2. AFFECTED ENVIRONMENT, POTENTIAL IMPACTS, AND PROPOSED MITIGATION

This chapter describes the existing environmental conditions of the project site, potential long-term impacts of the project, and the proposed mitigation measures to avoid, minimize, or mitigate those potential effects. The relative impact that will likely remain after mitigation is also described. Each section within this chapter is dedicated to analyzing a specific environmental or social discipline. Short-term potential construction phase impacts are discussed in a single section, Section 2.15.

Existing conditions, potential impacts, and proposed mitigation measures presented in this chapter have been developed through (a) review of existing information related to the project areas (see references chapter); (b) studies conducted specifically for the project; (c) coordination with regulatory agencies; and (d) consultation with the general public.

2.1 Physical Geography and Soils

2.1.1 Existing Conditions

The project is located in Ninole, a small town along the Hamakua Coast of Hawaii Island.

The underlying geology primarily consists of lava flows originating from Mauna Kea. These lava flows are part of the Hamakua Volcanics. Over thousands of years, steep runoff draining from the mountains to the sea formed Nanue Stream. The Nanue Stream Bridge spans 528 feet across the valley and connect the Hawaii Belt Road over Nanue Stream. The bridge sits above the stream bed. Nanue Stream runs along a steep gulch that drops from 200 feet above mean sea level to 5- to 10-feet above mean sea level at the stream. The stream bed is relatively narrow, and its banks are heavily vegetated. Some rock outcrops are exposed along the bridge footings.

According to the U.S. Department of Agriculture's Natural Resource Conservation Services (NRCS) Soil Survey Map, the soil within the project area is categorized as Hilo-Rock Outcrop Complex with 35 to 100 percent slope, with hydrous silty clay loam of 10 to 20 percent slope present along the banks of Nanue Stream. The Hilo-Rock Outcrop Complex is generally comprised of 35 percent basalt outcrop and 65 percent Hilo and similar soils. Such soils are found at elevations up to 1,000 feet and in lava flow gulches. Soils in the project area are shown in Figure 2-1.

The Hilo-Rock Outcrop Complex runoff is classified as "high," and drainage is classified as "well-drained." Although the Hilo-Rock Outcrop Complex is not considered prime farmland soil, the vast majority of Ninole soil is characterized as Hilo hydrous silty clay loam, which are considered "prime farmlands." Agricultural Lands of Importance to the State of Hawaii are shown in Figure 2-2. See Section 2.2 for more information on land use.

Figure 2-1. Soils in the Project Area

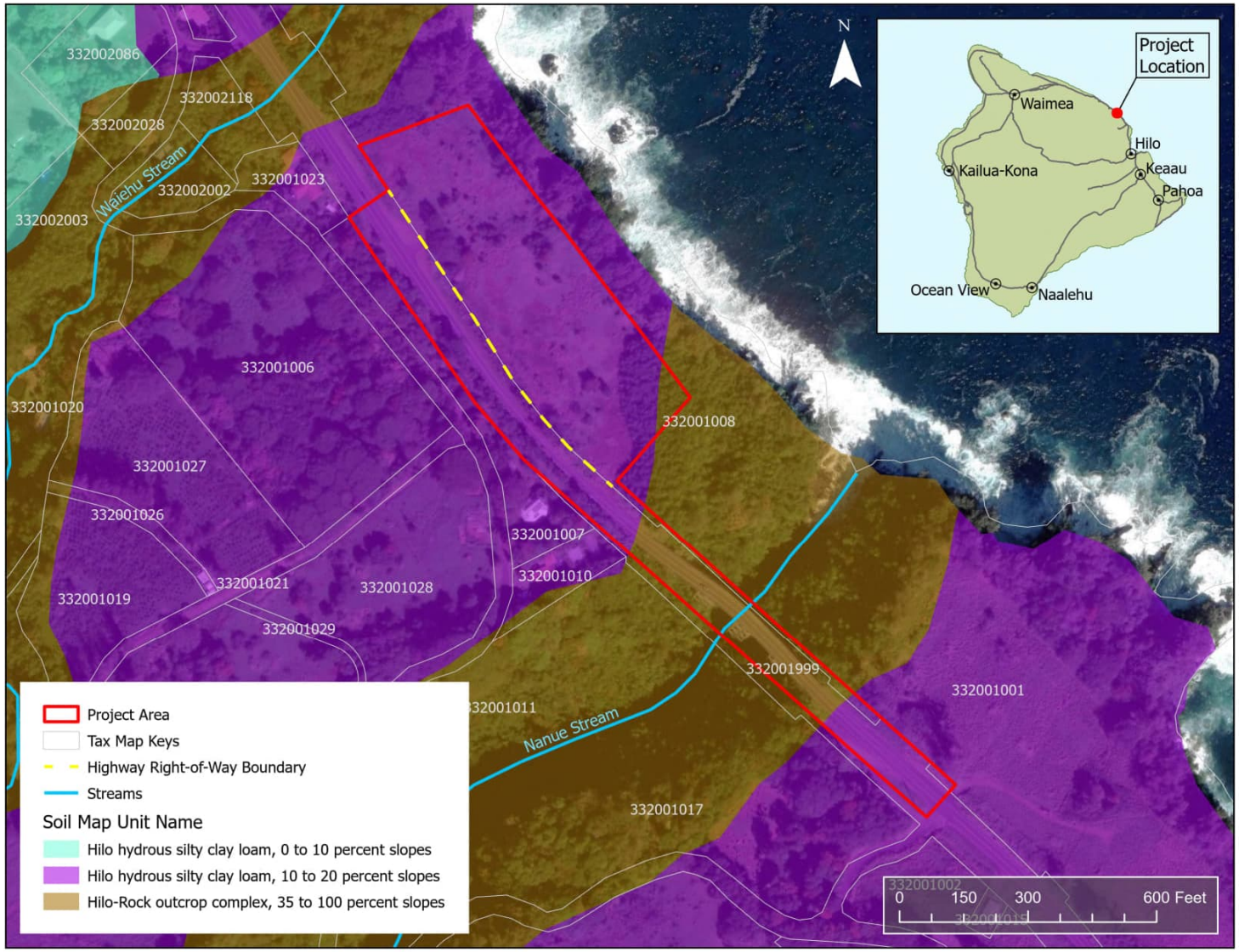
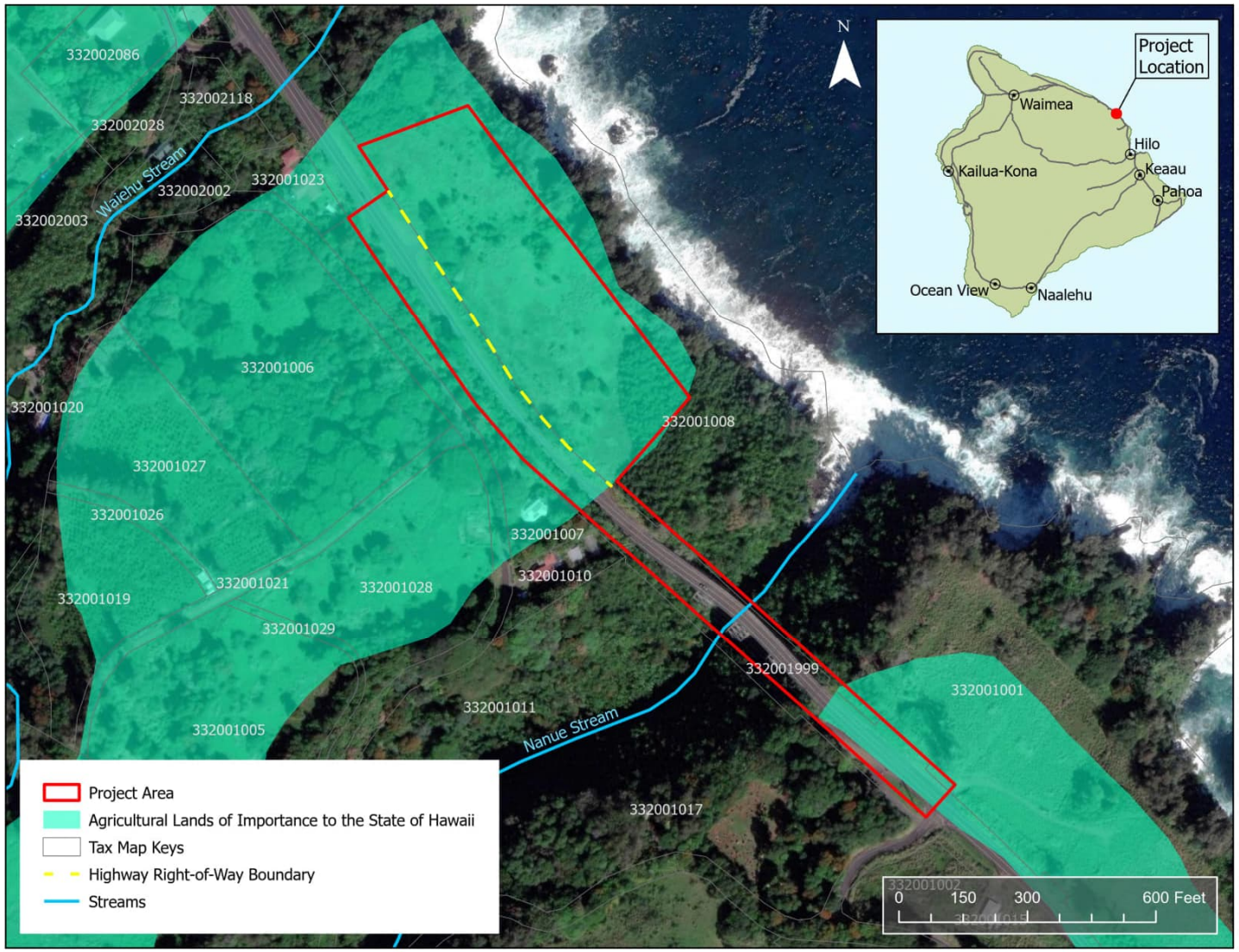


Figure 2-2. Agricultural Lands of Importance to the State of Hawaii



2.1.2 Potential Impacts

The Proposed Action would temporarily alter the topography of the project area. There is existing heavy corrosion in most of the bridge accessories which may likely contribute to elevated lead concentrations. Foundation work and removal of corroded materials are anticipated and will likely exacerbate lead exposure.

In addition, construction of temporary access roads during construction and maintenance work may be necessary during bridge rehabilitation. Because lead-impacted soils are present, a C-EHMP will be necessary prior to and during such work.

No Build

Under the No Build Alternative, the topography and soil that make up the geographic setting, and geologic processes in the project area would not change.

Rehabilitation

Under the Build Alternative, the naturally occurring topography and soils that make up the geographic setting and geologic processes in the project area would not change.

2.1.3 Avoidance, Minimization, and Mitigation Measures

The Proposed Action is not anticipated to result in significant changes to the geography and soils of the area. The bridge rehabilitation would also strengthen the bridge, making this critical component of Hawaii Belt Road more resilient to such hazards.

Due to the extensive ground disturbance and the proximity of Nanue Stream, temporary engineering and/or administrative control measures will be implemented to minimize erosion into Nanue Stream. Post-construction BMPs may include restoring vegetation along the stream banks and erosion control matting. These will ensure that there will not be any significant changes to the geography and soils of the area.

2.2 Land Use

2.2.1 Existing Conditions

The project is located in Ninole, a small unincorporated village community situated along the Hamakua Coast, about eighteen (18) miles north of Hilo on Hawaii Island. With strong sugar cane plantation roots, Ninole is an agricultural community with a population of approximately 210.

According to the State of Hawaii Land Use Commission State Land Use Districts (SLUD), the area surrounding the project location is predominantly part of the Agricultural District. However, most of the project area is classified as 'Conservation,' with surrounding areas of land designated as 'Urban' and 'Agricultural;' see Figure 2-3 for details. The County of Hawaii's State Land Use Pattern Allocation Guide (LUPAG) further defines the immediate area to contain lands with 'Conservation', 'Important Agricultural Land', 'Low Density Urban', and 'Open Area' designations; see Figure 2-4 for details. (County General Plan: Land Use Pattern

Allocation Guide (LUPAG) and Urban, Rural, Industrial & Resort Areas). (County of Hawaii General Plan. February 2005 [As Amended]. Most of the project area is in Agricultural State Land Use. A small portion of the project area is in Conservation State Land Use.

Landowners within the project area are private owners.

The project is also located within the Special Management Area (SMA); see Figure 2-5. Pursuant to HRS § 205A, no development shall be allowed in any county within the SMA without obtaining an SMA permit. No agency authorized to issue other permits pertaining to any development within the SMA shall authorize any development unless approval is first received in accordance with the procedures adopted pursuant to- Part II of HRS Chapter 205A.

An SMA determination was processed with the County of Hawaii Planning Department in January 2024. At that time, the staging area was all within the HDOT ROW. The County made the determination that the HRS Chapter 205-A-22 states that "development" does not include:

Repair or maintenance of roads and highways within existing rights-of-way.

The project area was amended following this determination and another consultation was conducted with the County. The County stated that due to the changes in the project that now includes staging of materials on a private parcel outside the ROW, an SMA Assessment is required. The contractor will make the decision if all staging can occur within the HDOT ROW or on the private property shown on the existing maps. If staging is conducted on the private property, the contractor will process the SMA Assessment to comply with the County requirements and determination.

Figure 2-3. State Land Use Districts

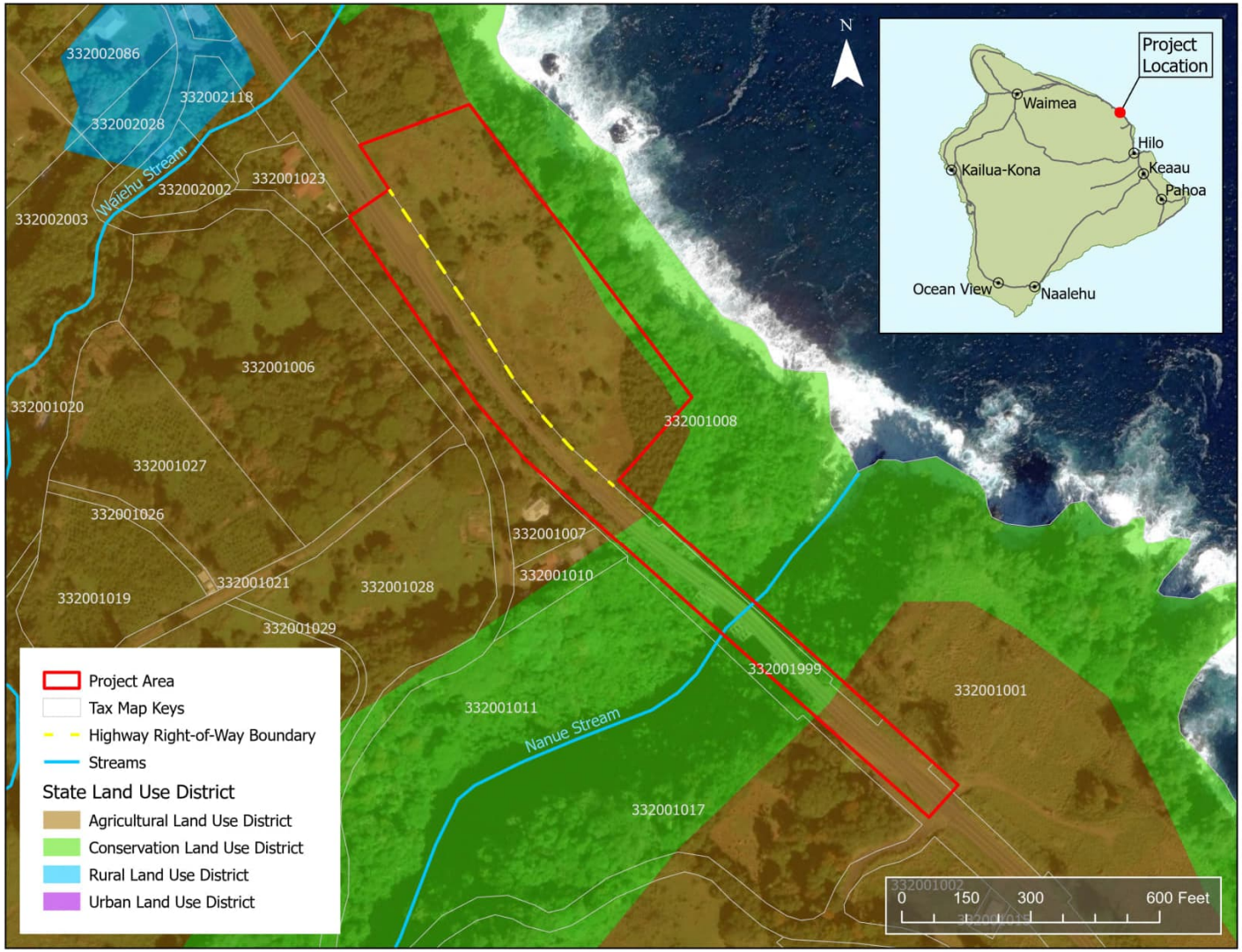


Figure 2-4. County of Hawaii Zoning Map

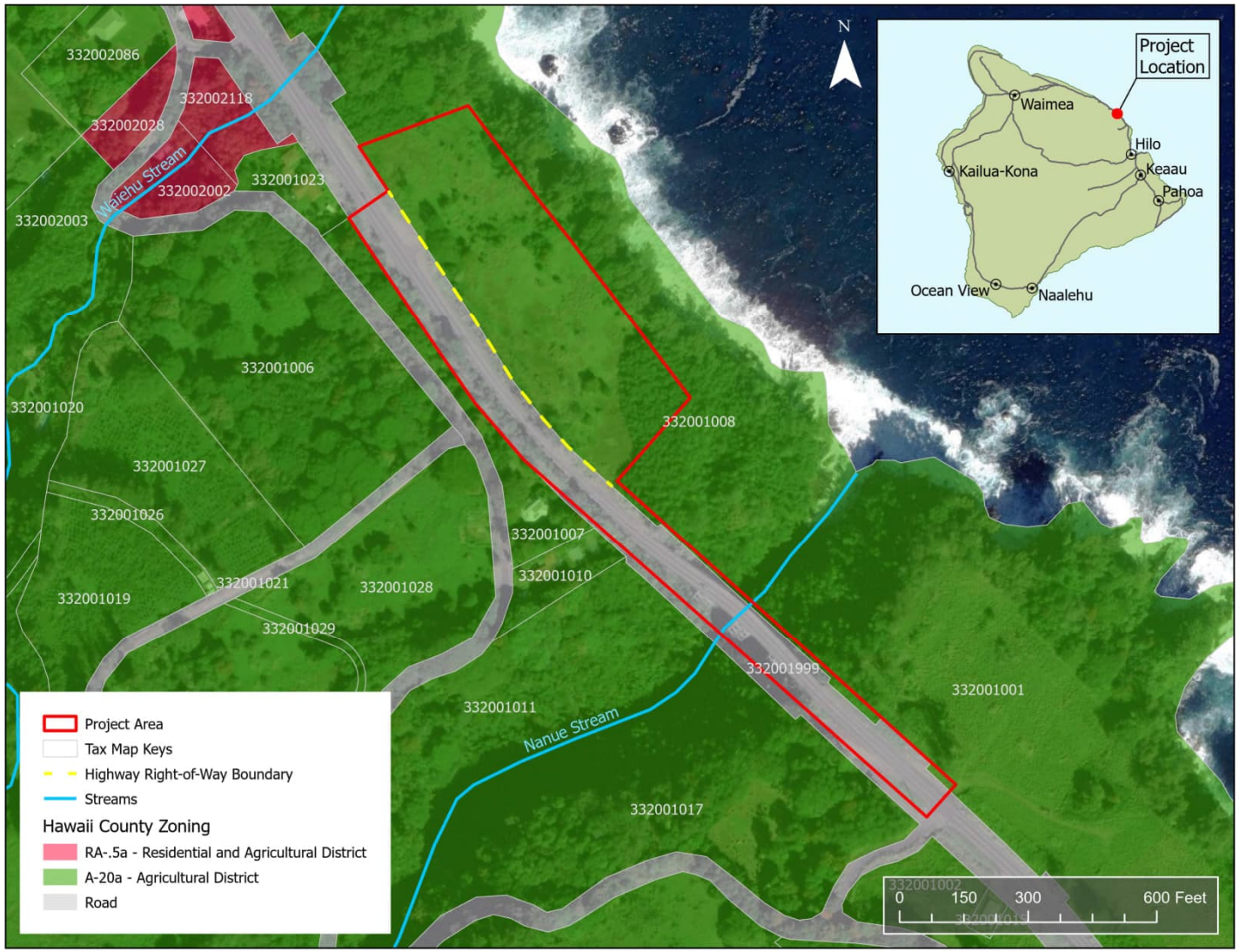
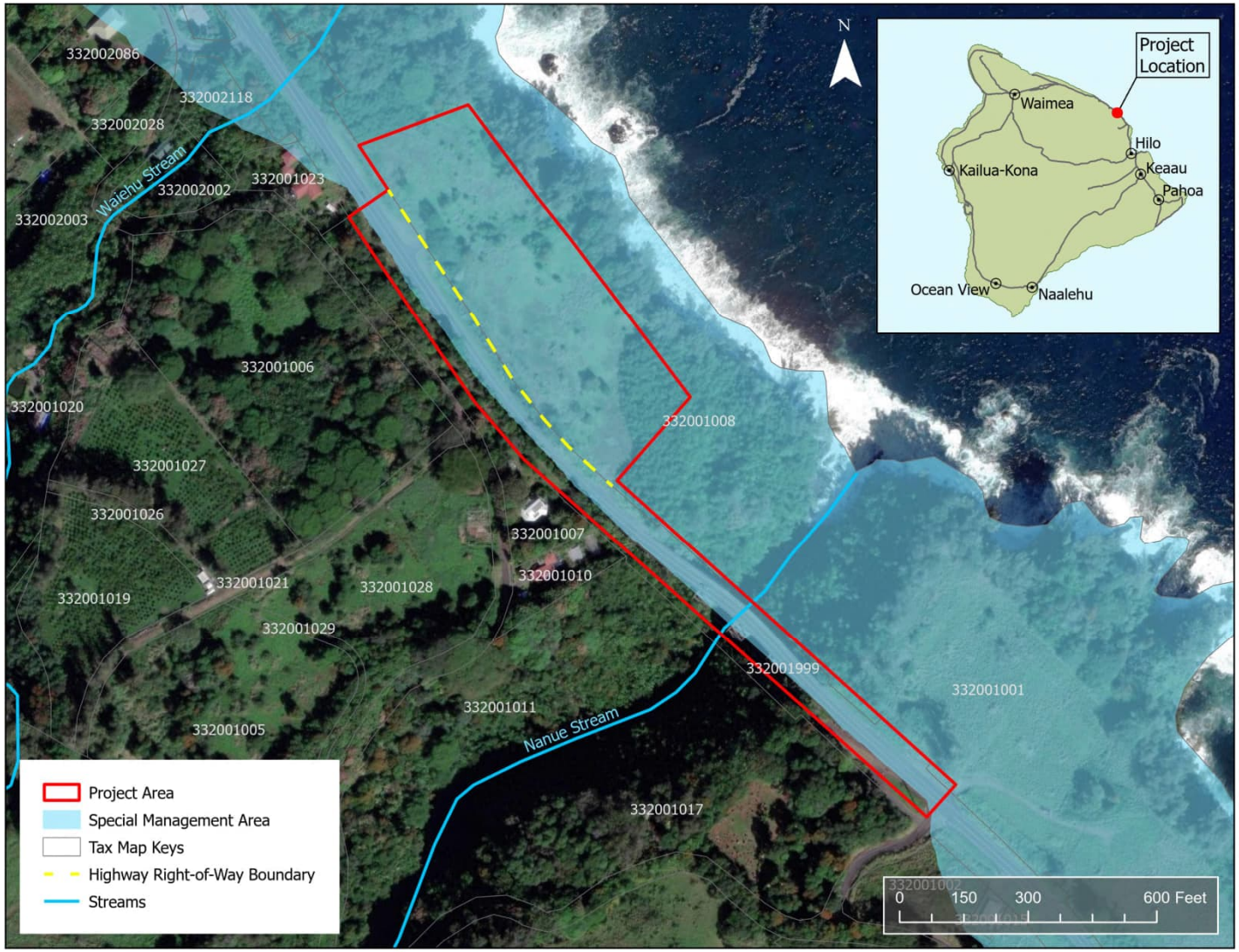


Figure 2-5. Special Management Area Map



2.2.2 Potential Impacts

No Build

Under the No Build Alternative, there would be no changes to existing land use.

Rehabilitation

Under the Rehabilitation Alternative, there would be no changes to existing land use. Furthermore, the proposed actions will be consistent with future land use proposals listed in the Hamakua Community Development Plan. See Chapter 3 (Consistency with Government Plans, Policies and Controls) for more detail.

2.2.3 Avoidance, Minimization, and Mitigation Measures

The proposed project would implement the following measures to avoid, minimize, and mitigate potential impacts to the surrounding area:

- Limit traffic-related impacts to bridge users, by performing bent replacement work incrementally to allow for continued use of the bridge; and
- Limit lane closures required for bridge railing work.

While there may be 24-hour lane closures of the bridge, night work is anticipated.

2.3 Hazardous Materials

A hazardous material is any substance that may be hazardous to humans, animals, or plants. They may include heavy metals, pesticides, herbicides, volatile compounds, explosives, and radioactive wastes. This section discusses the potential for contaminated media and other hazardous materials that are present from previous and existing uses in areas that are anticipated to be disturbed during bridge rehabilitation. The section also summarizes the measures that would be implemented to avoid adverse impacts from exposure of such materials to the workers and the surrounding community. Appendix C includes the Remedial Alternatives Analysis (RAA) Report for Lead-Impacted Soil at Nanue Bridge.

2.3.1 Existing Conditions

The Nanue Bridge was historically coated with lead-based paint and underwent routine maintenance and renovations over the years. Due to the presence of lead-based paint in bridges along the Hamakua Coast, lead-based paint was anticipated. As a result, the DOH required mitigation measures to address the potential lead-based paint hazards for the proposed work. Nanue Bridge is located immediately above Nanue Stream, which discharges directly to the Pacific Ocean located approximately 450 feet away. The gulch of Nanue Stream has steeper slopes compared to the Kolekole and Hakalau gulches, and its stream channel is narrower.

Based on records posted on the Hazard Evaluation and Emergency Response (HEER) website, lead-based paint was used between 1911 and 1946 on the trestles during the time of Hawaii Consolidated Railway Company. After 1946, HDOT took over and routinely maintained and

renovated the bridge for continued highway use even after the 1946 tsunami. It is suspected that the maintenance of the trestles over the decades may have caused a release of lead into Nanue Stream. A Sampling Action Plan (SAP) was developed to investigate the magnitude and extent of lead contamination.

2.3.2 Remedial Alternatives Analysis

Between March 5 and 10, 2023, soil samples were collected from the north and south embankments of Nanue Stream at depths of 0 to 3 inches, 3 to 6 inches, and 6 to 9 inches. The samples were analyzed for contaminants of potential concern (COPCs). In all the soil samples, lead was detected at concentrations exceeding the environmental action levels for unrestricted land use. One soil sample, in particular, contained a lead concentration exceeding the action levels for construction/trench workers, thus requiring the implementation of a construction environmental hazard management plan (C-EHMP). The highest lead concentrations were detected at 9,700 milligrams per kilogram (mg/kg) in the soils collected from the southern embankment, i.e., DU-10. See Figures 2-6, 2-7, and 2-8 below (EnviroQuest 2024). Refer to Appendix C.

On July 2024, a remedial alternatives analysis (RAA) was completed to address the most appropriate remedy for the lead-impacted soil (EnviroQuest 2024). Based on the soil sampling event and the evaluated environmental hazards, the preferred alternatives are:

- Installation of a soil cover using a Tecco Mesh System over the entire lead-impacted area (Alternative 6a);
- Installation of a wire mesh and soil nails, and applying shotcrete slope armor (Alternative 6b);
- Excavation of lead-impacted soil for off-site disposal (Alternative 6c);
- Implementation of the C-EHMP (Alternative 7a) and;
- Installation of fencing and signage (Alternative 7b).

In the project area, the human and ecological receptors most likely to be exposed to the lead hazards would be on-site construction workers, occasional passersby, and a few ecological receptors (e.g., pigs and native birds). With the installation of a soil cover (i.e., Tecco Mesh and wire mesh with soil nails), contaminant mobility would be reduced. With the excavation of lead-impacted soil for off-site disposal, the direct exposure pathway to lead would be removed. In addition, with the implementation of the C-EHMP, the project area would be restricted to on-site construction workers, and appropriate PPE and training in the proper handling and management of hazardous materials would be required. Furthermore, the installation of fencing and signage would restrict access to the project site and thus remove the exposure pathway to occasional passersby and ecological receptors. Upon review and approval of the RAA, HDOT will defer to any recommendations agreed upon by HDOH.

Figure 2-6. Total Lead Results 0 – 3 Inches Bgs

Figure 2-7. Total Lead Results 3 – 6 Inches Bgs

Figure 2-8. Total Lead Results 6 – 9 Inches Bgs

2.3.3 Potential Impacts

The potential impacts of lead-based paint include on-site construction and maintenance workers, trespassers, and ecological receptors.

Project construction workers and all other personnel involved in the construction and related activities of the project will be informed of the possibility of inadvertent cultural finds, including human remains. In the event that any potential historic properties are identified during construction activities, all activities will cease and SHPD will be notified pursuant to HAR §13-280-3. In the event that human remains are encountered, all earth moving activities in the area will stop, the area will be cordoned off, and the SHPD and Police Department will be notified pursuant to HAR §13-300-40. In addition, in the event of an inadvertent discovery of human remains, the completion of a burial treatment plan, in compliance with HAR §13-300 and HRS §6E-43, is recommended.

In the event that iwi kupuna and/or cultural finds are encountered during construction, project proponents will consult with cultural and lineal descendants of the area to develop a reinternment plan and cultural preservation plan for proper cultural protocol, curation, and long-term maintenance.

2.3.4 Avoidance, Minimization, and Mitigation Measures

A C-EHMP will be implemented to protect human health and the environment from lead exposure. Additional construction BMPs shall be implemented in accordance with the following:

(1) *Integrated Storm Water Management Approach and a Summary of Clear Water Diversion and Isolation Best Management Practices for Use in the State of Hawaii* (FHWA and HDOT Practitioners Guide, 2016);

(2) the *Construction Best Management Practices Field Manual* (HDOT, 2021), and

(3) *Standard Specification for Road and Bridge Construction Section 209 Temporary Water Pollution, Dust, and Erosion Control* (HDOT, 2005).

2.4 Historic and Archaeological Resources

2.4.1 Regulatory Context

Section 106 of the NHPA requires actions that are federally funded, authorized, or implemented to consider the effect of such actions on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register of Historic Places (NRHP). Under NHPA Section 106, the federal agency—in this case, FHWA—is responsible for assessing the effects of the project on all significant historic properties within the area of potential effects (APE).

At the State level, Chapter 6E-8 of the HRS places similar responsibilities on State agencies to evaluate their projects. The HRS Chapter 6E-8 review of potential project impacts on historic properties is conducted with the State Historic Preservation Division (SHPD), a division of the DLNR.

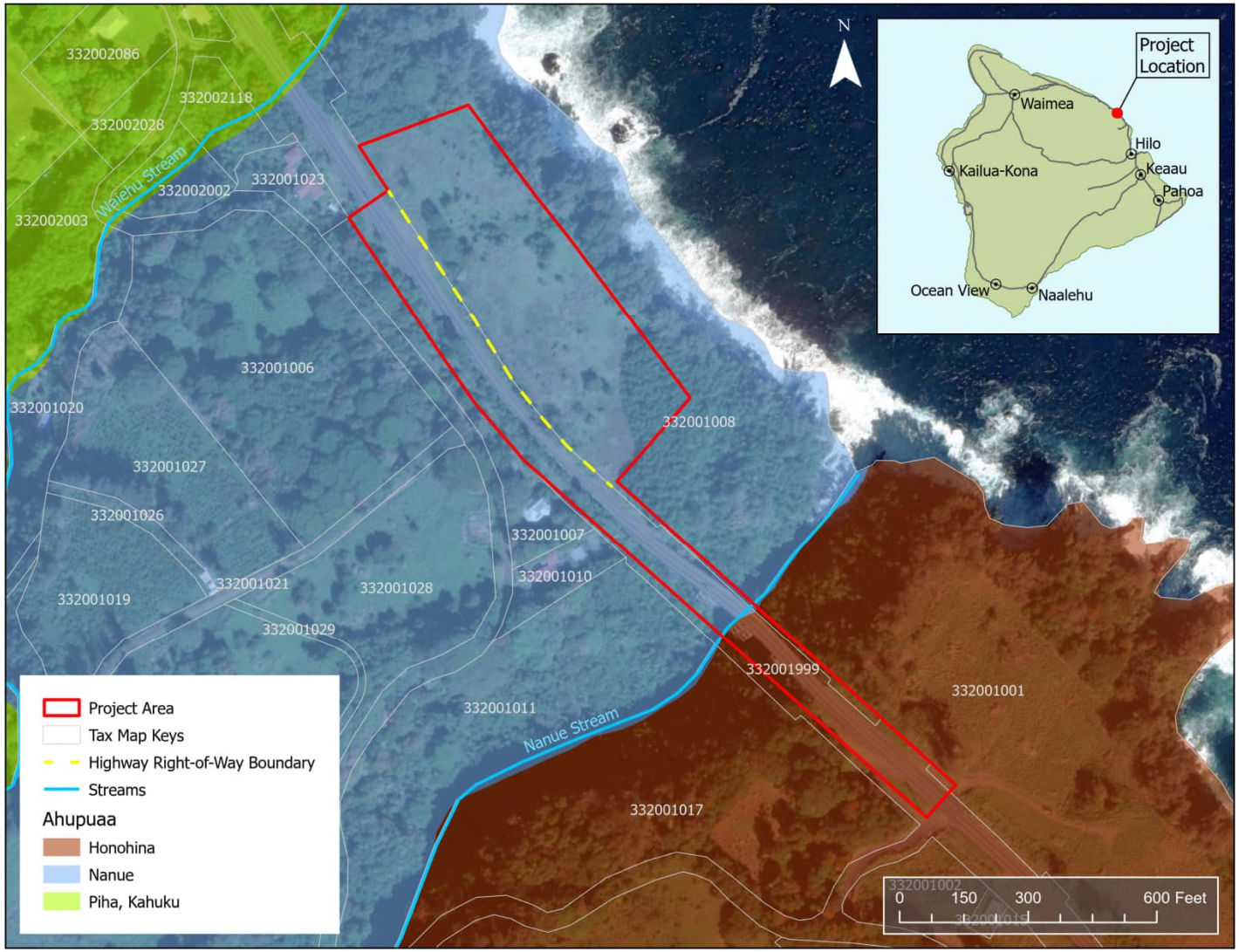
2.4.2 Existing Conditions

The proposed undertaking will rehabilitate Nanue Stream Bridge to address the deterioration in the superstructure by repairing steel truss members, bearings, gusset plates, rivets, etc.; address spalls delamination in the concrete deck, bridge railings, column pedestals and foundations; clean and paint the steel members following the repairs; and address scour deficiencies for the bridge foundations. The rehabilitation proposed is consistent with and will adhere to the Secretary of Interior's Standards for the Treatment of Historic Properties (36 Code of Federal Regulations [CFR] Part 68, 1995) and will be overseen by an architectural historian meeting the Secretary of Interior Professional Qualification Standards (36 CFR Part 61).

The Project occurs in the Nanue and Honohina Ahupuaa, as shown below in Figure 2-9.

Project plans are included as Appendix B in this EA.

Figure 2-9. Ahupuaa Map



2.4.3 Potential Impacts

The Section 106 process was initiated with the State of Hawaii Department of Land and Natural Resources State Historic Preservation Division (SHPD) on November 1, 2023, and the effect determination letter was sent to SHPD on May 14, 2024. The SHPD concurred with the "No Adverse Effect" determination on May 28, 2024.

For the HRS § 6E process, although HDOT has provided preliminary assessments of archaeological historic properties, SHPD is expected to conduct its HRS § 6E review responsibilities in conjunction with their Section 106 responsibilities. The SHPD concurred with the "No historic properties affected" determination on May 28, 2024.

The potential impacts described in this section should be considered cursory as they have not been coordinated with Section 106 consulting parties. Nonetheless, the anticipated impacts described are intended to fulfill the impact disclosure requirements of HRS 343.

No Build

Under the No Build Alternative, no historic properties would be affected.

Rehabilitation

Based on previous and current documentation of the historic and archaeological resources and the impacts to Nanue Stream Bridge, the proposed project is anticipated to have "No adverse effect" under 36 CFR 800.5. The applicant is also processing the HRS Chapter 6E consultation.

2.4.4 Avoidance, Minimization, and Mitigation Measures

Consultation with SHPD for the HRS §6E-8 Historic Preservation Review and Hawaii Administrative Rules (HAR) §13-275 Evaluation of Significance for the project was conducted. Based on the information provided, SHPD has reviewed the proposed project, pursuant to HRS §6E-8, and the SHPD concurs with the State of Hawai‘i Department of Transportation's determination of "No historic properties affected." SHPD's HRS §6E-8 historic preservation review for the subject is now complete (May 28, 2024 letter from SHPD).

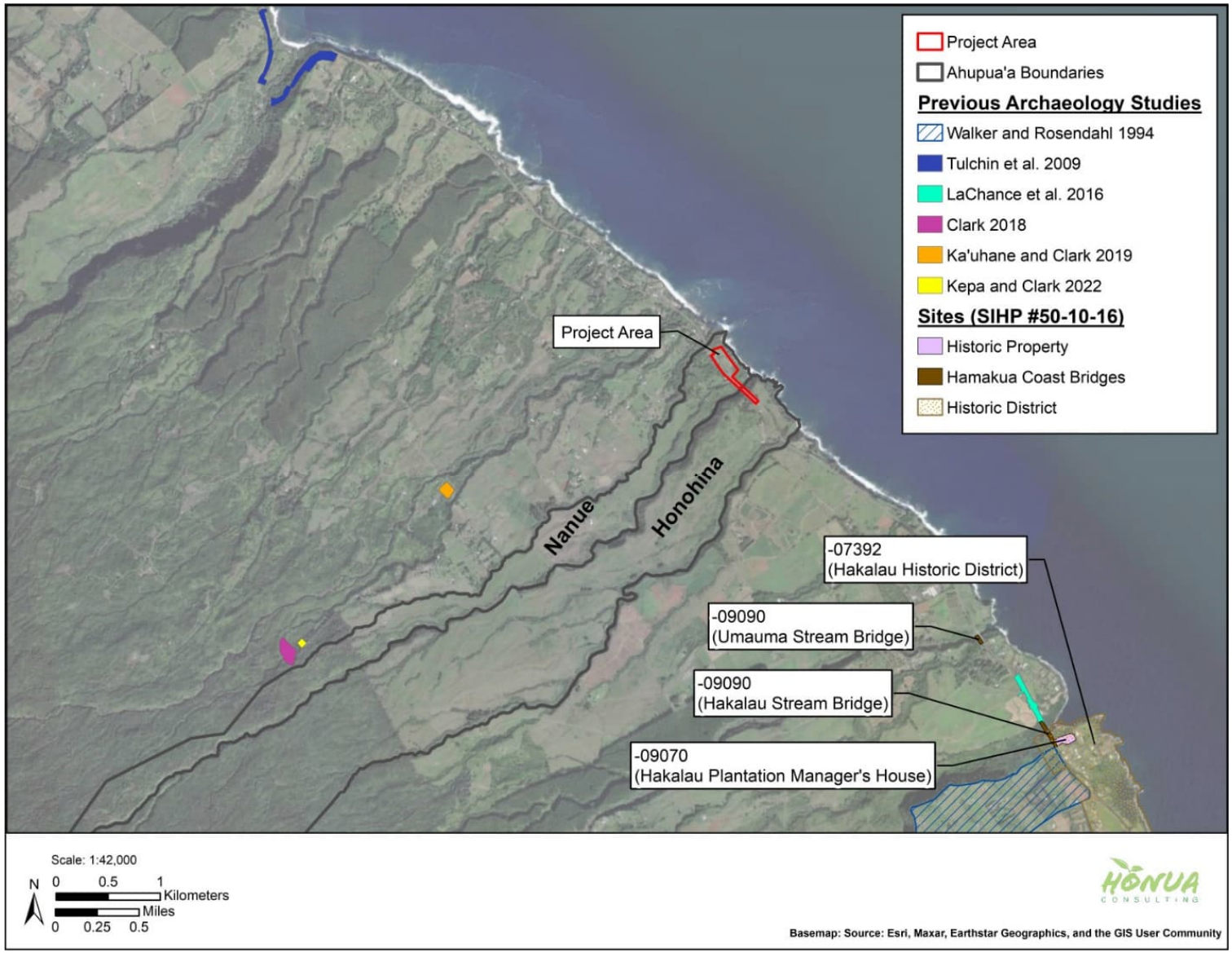
The scope of work includes rehabilitation of Nanue Stream Bridge (Bridge No. 001000190308146) to repair deterioration of the bridge superstructure, spall delamination, scour deficiencies for the bridge foundations, as well as cleaning and repainting the steel members of the bridge. The Nanue Stream Bridge is listed in the Hawai‘i Register of Historic Places (Site 50-10-16-09090) and is eligible for listing in the National Register of Historic Places under Criteria A, B, and C. The proposed project will not remove any character defining features or materials, nor will it alter significant spaces or spatial relationships that contribute to the historical significance of the site. Therefore, the proposed project will not affect the integrity of design, materials, workmanship, location, setting, association, or feeling of Nanue Stream Bridge. The proposed project is in keeping with the Secretary of the Interior's Standards and Guidelines for the Treatment of Historic Properties and best preservation practices.

Completion of project design, consultation, and concurrence by the SHPD will confirm appropriate mitigation commitments.

2.5 Cultural Resources

Because bridge repairs occur in a streambed and in areas previously disturbed by activities associated with bridge construction and bent footing installation, archaeological investigations are not recommended for safety reasons. Nonetheless, Honua Consulting, LLC conducted a literature review of the project area in support of this FEA. The literature review included research at the Department of Land and Natural Resources (DLNR) State Historic Preservation Division (SHPD) library to locate and review previous archaeological studies that may have been conducted in the project area and surrounding region on file with SHPD. This review identified that no previous studies have been conducted for the Nanue or Honohina (Figure 2-10). Based on the literature review, there are no previously identified archaeological sites in the project area, therefore no effect is anticipated. Further review will be conducted through consultation with SHPD during HRS 6E review process.

Figure 2-10. Previous Archaeology Studies

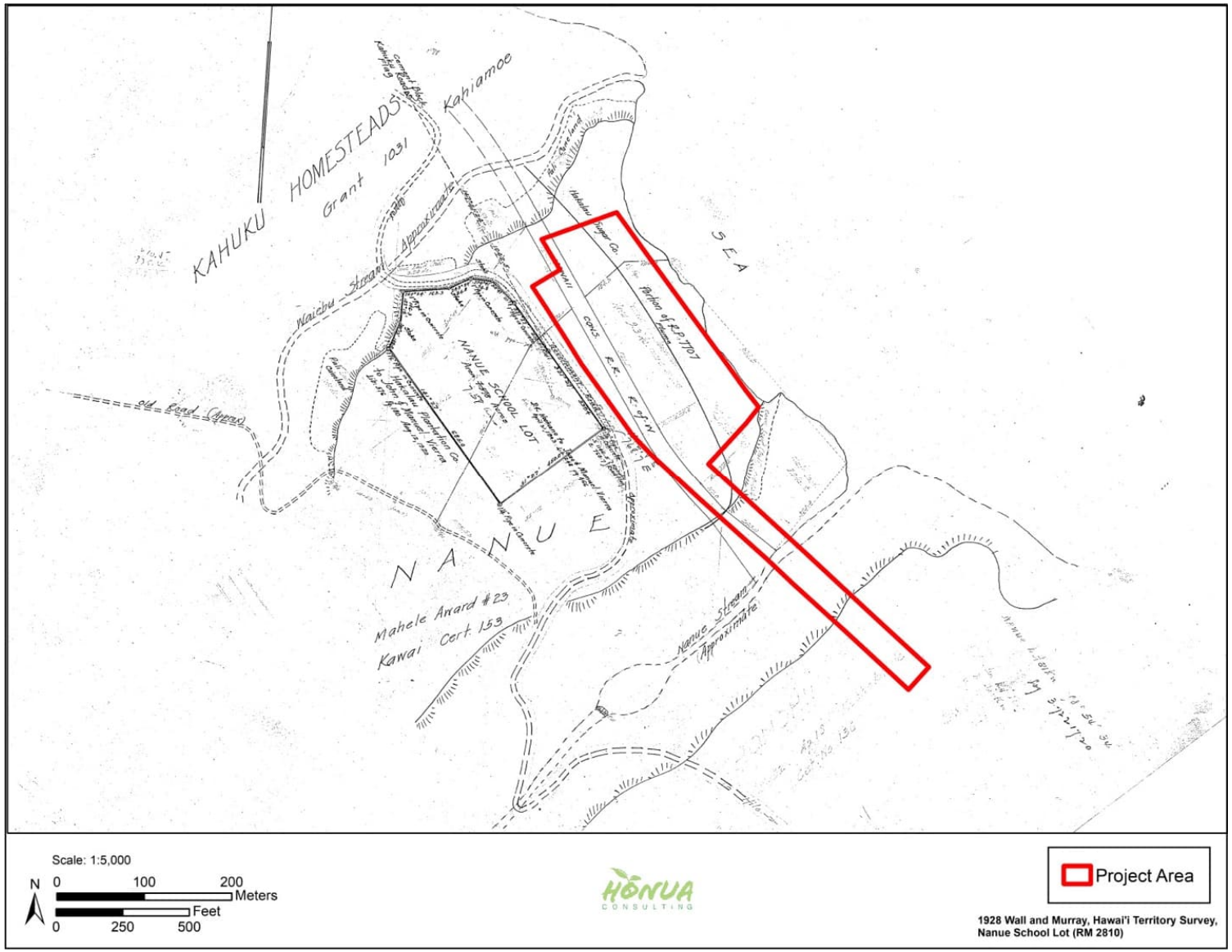


Twenty-eight agencies, organizations, and individuals with an applicable interest to the project letter were contacted by formal letter for their input. See Appendix A for a complete list of consulted parties.

2.5.1 Existing Conditions

Review of historic documents show that Royal Patent No. 7707 was located within the project area. This royal patent was issued by Kalakaua based on an application by Kawai, which was awarded and recorded (Figure 2-11). Other uses within the project area included agriculture, as record of a flume is also identified in historic documents. Neighboring uses included the Nanue School and the Hakalau Plantation Company. Kahuku (Hawaii Island) homesteads were located north of the project area.

Figure 2-11. Project Area Map (Homesteads)



2.5.2 Potential Impacts

No Build

Based on the data gathered, it is likely that the area once enjoyed numerous traditional and customary practices, including homesteading, farming, and fishing. Historic records show a once thriving community in the area. Any of these traditional practices were likely severely impacted by the introduction of industrial agriculture to the area in the early 20th century. It is possible though that some fishing continues along the coast and farming continues mauka of the project area.

The no build option would have no impact on these activities.

Rehabilitation

The rehabilitation would have no impact on any practices that may occur in the area. There will be future collaboration and consultation with the Cultural Resources Commission (CRC).

2.5.3 Avoidance, Minimization, and Mitigation Measures

Although no traditional cultural practices were identified within the project limits, measures to protect the stream environment and associated resources during construction activities will be implemented to avoid potential effects to the cultural practices related to the use of the stream that take place beyond the boundaries of the current project area.

The State and its agencies have an obligation to preserve and protect Native Hawaiians' customarily and traditionally exercised rights to the extent feasible.[1] State law further recognizes that the cultural landscapes provide living and valuable cultural resources where Native Hawaiians have and continue to exercise traditional and customary practices, including hunting, fishing, gathering, and religious practices. In *Ka Paʻakai*, the Hawaiʻi Supreme Court provided government agencies an analytical framework to ensure the protection and preservation of traditional and customary Native Hawaiian rights while reasonably accommodating competing private development interests. This is accomplished through:

1) The identification of valued cultural, historical, or natural resources in the project area, including the extent to which traditional and customary Native Hawaiian rights are exercised in the project area;
2) The extent to which those resources—including traditional and customary Native Hawaiian rights—will be affected or impaired by the proposed action; and
3) The feasible action, if any, to be taken to reasonably protect Native Hawaiian rights if they are found to exist.

The appropriate information concerning Nanue and Honohina was collected, focusing on areas near or adjacent to the project area.

[1] Article XII, Section 7 of the Hawaiʻi State Constitution, *Ka Paʻakai O Ka ʻĀina v. Land Use Commission*, 94 Haw. 31 [2000](Ka Paʻakai), Act 50 HSL 2000.

The identification of valued cultural, historical, or natural resources in the project area, including the extent to which traditional and customary Native Hawaiian rights are exercised in the project area.

Through the research data, numerous cultural resources were identified in the surrounding geographic extent, but none were identified in the project area itself.

There are numerous traditions or customs that potentially, even likely, occur in the surrounding area, including farming, fishing, hunting, kilo (observational practices), and other ocean related practices. It is not anticipated that the project will impact any of these practices.

The potential that the proposed action would affect or impair resources in the surrounding region is negligible. Best management practices should be implemented to ensure that no unanticipated affects to cultural resources occur and that there is a mechanism in place for practitioners to report any such potential occurrences to the project.

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

Of the identified cultural resources and traditional and customary practices that occur in the surrounding project area, the potential that the proposed action would affect or impair these resources in negligible.

The feasible action, if any, to be taken to reasonably protect Native Hawaiian rights if they are found to exist.

As the potential for effect or impairment of cultural resources (including practices) is negligible, no action is required to protect Native Hawaiian rights. Nonetheless, best management practices should be implemented to ensure that no unanticipated affects to cultural resources occur and that there is a mechanism in place for practitioners to report any such potential occurrences to the project.

2.6 Biological Resources

Section 7 of the Endangered Species Act of 1973 requires federal agencies to consider impacts on endangered or threatened species and critical habitat of such species. For terrestrial species and freshwater organisms, it requires that federal agencies consult with the U.S. Fish and Wildlife Service (USFWS) and National Oceanographic and Atmospheric Administration's National Marine Fisheries Service (NMFS) for marine mammals, regarding the effects of any major construction activity on a listed species or species proposed as endangered, or those effects which could result in the destruction or adverse modification of designated critical habitat (50 Code of Federal Regulations 402). In addition, the Magnuson-Stevens Fishery Conservation and Management Act requires federal agencies to consider project impacts to essential fish habitat (EFH) or those waters and substrate needed for fish spawning, breeding or maturing such as coral reefs.

The State's counterpart law is Chapter 195D, Hawaii Revised Statutes (HRS), as amended, under which species are similarly protected. The remainder of this section discusses the impact to biological resources in these regulatory contexts.

2.6.1 Existing Conditions

The Nanue Stream Bridge (1000190308146) is oriented from south (to Hilo) to north (to Honokaa) and carries Hawaii Belt Road over Nanue Stream. The bridge was constructed in 1952 and the coordinates are 19°55'38.56"N, 155° 9'23.47"W and carries Hawaii Belt Road over the Nanue Stream. The bridge is in the State Conservation District and the Special Management Area (SMA). The proposed action is a bridge rehabilitation project.

The project consists of rehabilitating the Nanue Stream Bridge addressing the deterioration in the superstructure by repairing steel truss members, bearings, gusset plates, rivets, etc. that have corrosion and section loss; addressing spalls delamination in the concrete deck, bridge railings, column pedestals and foundations; cleaning and painting the steel members following the repairs; addressing scour deficiencies for the bridge foundations; and addressing other significantly deteriorated bridge elements discovered in the field study and documented in the March 19, 2021 Bridge Inspection Report (BIR). There will be no graded areas, parking areas and related facilities.

The Nanue Stream bridge was originally painted with lead-based paint, which was later removed from the structural members and disposed of. However, prior to that removal, the soil beneath the bridge became contaminated from falling paint chips. Recent soil analysis indicates that lead-levels are above allowable levels and thus HDOT is in discussions with Department of Health regarding possible mitigation measures, if any. The current project phase consists of only work and rehabilitation on the bridge structure. Soil mitigation, if required, will be completed in the second phase of the project.

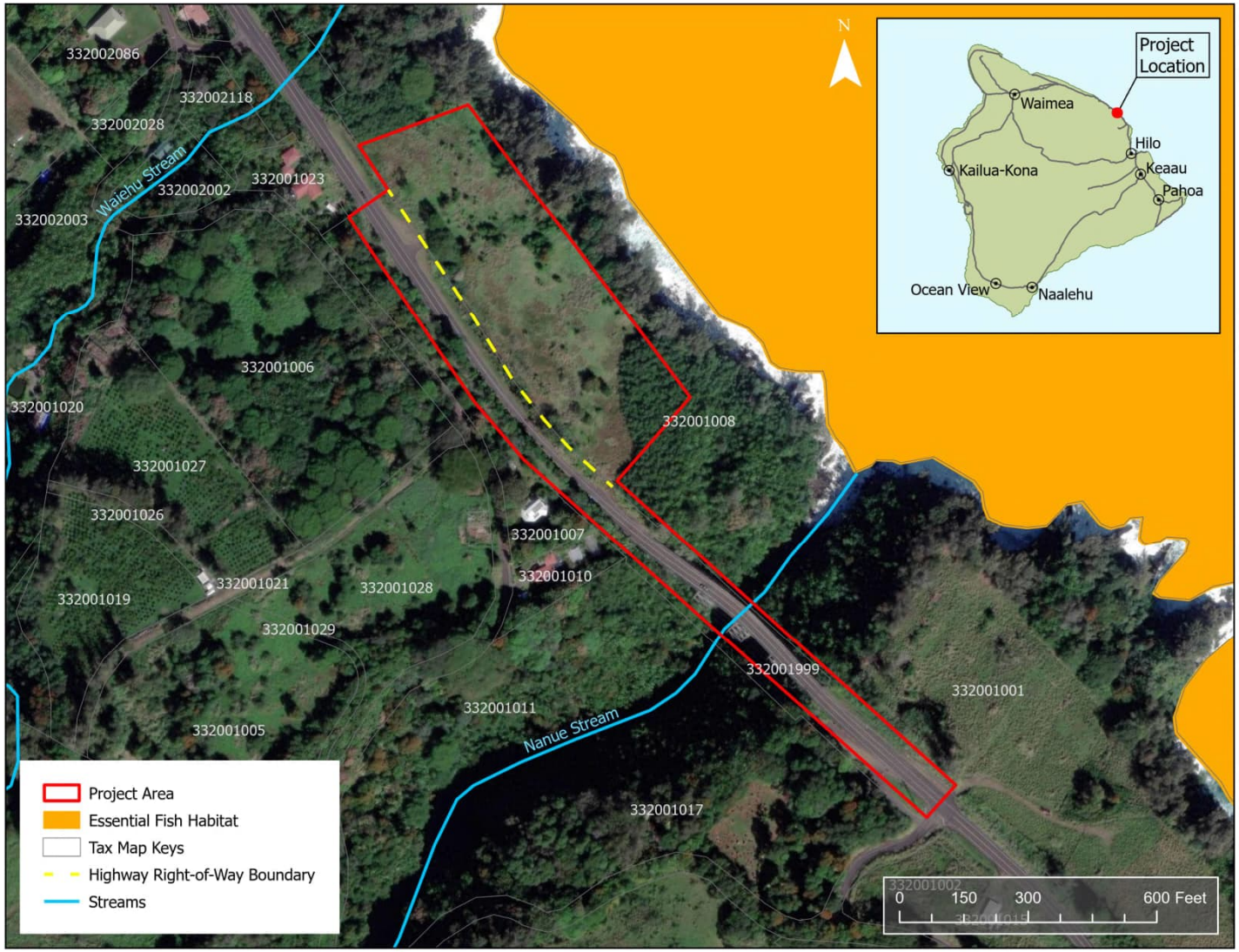
Part of the construction staging areas will be within the HDOT right-of-way (ROW). The staging area will be within a private property, Tax Map Key: (3) 3-2-001: 008. The estimated start of the first construction phase is Spring 2025 for three (3) years. Night work may be anticipated, and appropriate mitigation measures will be in place to prevent potential effects to ESA protected species.

The proposed project is located in Ninole on the island of Hawaii, approximately 16 miles north of Hilo. The Nanue Stream Bridge carries Hawaii Belt Road over Nanue Stream at Milepost 18.5. The proposed action area spans approximately 2,050 feet (0.38 miles) and consists of the bridge footprint, construction staging areas, as well as the highway right-of-way (ROW). The bridge measures 528-feet long with a deck width of 38'-6" and footings about 85-feet wide. Please refer to the attached project location map that delineates the proposed action area.

The marine water column from the surface to a depth of 3,280.8 feet (1,000 meters) from the shoreline to the outer boundary of the exclusive economic zone (EEZ) (200 nautical miles), and the seafloor from the shoreline out to a depth of 2,296.6 feet (700 meters) around each of the Hawaiian Islands, have been designated as essential fish habitat (EFH). As such, the water column and bottom of the Pacific Ocean around the island of Hawai‘i are designated as EFH and support various life stages for the management unit species (MUS) identified under the Western Pacific Fishery Management Council's Pelagic and Hawaii Archipelago Fishery Ecosystem Plans. Figure 2-12 below illustrates the EFH in the Project Area. The MUS and life stages found in these waters

include eggs, larvae, juveniles, and adults of Bottomfish, Crustacean, and Pelagic MUS. Specific types of habitats considered as EFH include coral reef, patch reefs, hard substrates, artificial substrates, seagrass beds, soft substrates, lagoons, estuaries, surge zones, deep-slope terraces, and pelagic/open oceans. (Source: NOAA, September 2023)

Figure 2-12. Essential Fish Habitat in the Project Area



2.6.2 Potential Impacts

No Build

Under the No Build Alternative, there would be no ground-disturbing activities and no disruption to the existing environment. Existing biological resources would not be affected.

Rehabilitation

The rehabilitation alternative will have short-term impacts and avoidance, minimization, and mitigation measures are listed in the following subsections.

Baseline Environment

In referencing the National Oceanic Atmospheric Administration (NOAA) National Centers for Coastal Ocean Science benthic habitat mapping surveys (Battista et al. 2007; see https://www.pacioos.hawaii.edu/voyager/), shows that the marine environment near the Nanue Stream consists of rock and boulder.

Stressors

The potential environmental stressors of concern related to this project include sedimentation and turbidity, and introduction of chemical contaminants. The broad potential adverse effects to essential fish habitat (EFH) for the proposed action are described in the subsections below.

Sedimentation and Turbidity

Increased sedimentation and turbidity can cause smothering of benthic species and block sunlight necessary for species that rely on photosynthesis. For corals, sedimentation has been shown to reduce species diversity, change patterns, and reduce growth and survival (Rogers 1990). Coral reef organisms are easily smothered by sediment (Golbuu et al. 2003), and minimal rates of sediment can affect multiple life stages of coral. For fish, sedimentation is less likely to cause significant impacts because of their mobility, but some effects are still possible. Fish may be displaced from their normal home range which could result in negative intra- and interspecies interactions and impact fitness, leading to lower reproductive success and a lower ability to find prey or avoid predators (Kjelland et al. 2015).

Introduction of Nutrients and Chemical Contaminants

In general, the impacts from contaminants in the marine environment is dependent on how long the chemical components persist and their tendency to bio-accumulate in the food web (van Dam et al. 2011). Some pollutants are environmentally persistent and can take years or even decades to biodegrade (Minton 2017). Increases in nutrients, pollutants and contaminants to the marine environment can reduce fitness and cause mortality of exposed organisms. Increase of land-based runoffs and discharges can subject benthic communities to adverse exposures and potential degradation of condition. Heavy metals, which is the contaminant of concern for this project (lead), are known to bioaccumulate and can undergo food chain magnification and cause trophic effects (Baby et al. 2010). When they are present in the substrate they can spread in dissolved and particulate form and made bio-available by activities such as dredging, excavation, and stirring

soft sediment (Goossens and Zwolsman 1996). When not properly maintained, equipment could also release contaminants (oil, fuel, etc.) into the marine environment.

Flora

Pursuant to Section 7 of the Endangered Species Act (ESA), the FHWA is requesting concurrence from the U.S. Fish and Wildlife Service (USFWS) that the proposed project may affect, but is not likely to adversely affect the following federally listed species: the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*), the endangered Band-rumped Storm-petrel (*Oceanodroma castro*), the endangered Hawaiian Duck (*Anas wyvilliana*), the endangered Hawaiian Coot (*Fulica americana alai*), the threatened Hawaiian Goose (*Branta sandvicensis*), the endangered Hawaiian petrel (*Pterodroma sandwichensis*), the endangered Hawaiian Stilt (*Himatopus mexicanus knudensi*), the threatened Newell's Townsend's Shearwater (*Puffinus auricularis newelli*), the threatened Green Sea Turtle (*Chelonia mydas*), the endangered Alani (Melicope zahlbruckneri), the endangered Nanu (*Gardenia remyi*), the endangered *Deparia kaalaana, and the endangered Microlepia strigose var. mauiensis.* No critical habitat is located within the immediate vicinity of the proposed project.

Fauna

Consultation under the authority of, and in accordance with, section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.) as amended with the United States Fish and Wildlife Service found the following species that may occur in the area.

- Opeaopea or Hawaiian hoary bat (Lasiurus cinereus semotus)
- Nene or Hawaiian goose (Branta sandvicensis)
- Hawaiian waterbirds, including aeo or Hawaiian stilt (Himantopus mexicanus knudseni), alae keokeo or Hawaiian coot (Fulica alai), and koloa maoli or Hawaiian duck (Anas wyvilliana)
- Hawaiian seabirds, including uau or Hawaiian petrel (Pterodroma sandwichensis), akeake or Hawaii Distinct Population Segment of the band-rumped storm petrel (*Hydrobates castro*), and ao or Newell's shearwater (*Puffinus newelli*)
- Honu or green sea turtle (*Chelonia mydas*)
- Federally listed plants, including:
    - alani (*Melicope zahlbruckneri*),
    - nanu (*Gardenia remyi*),
    - *Deparia kaalaana*, and
    - *Microlepia strigosa var. Mauiensis.*

2.6.3 Avoidance, Minimization, and Mitigation Measures

The following avoidance, minimization, or mitigation measures are being proposed for the project.

Green sea turtles

Green sea turtles may nest on any sandy beach in the Pacific Islands. Hawksbill sea turtles exhibit a wide tolerance for nesting substrate (ranging from sandy beach to crushed coral) with nests typically placed under vegetation. Both species exhibit strong nesting site fidelity, Nesting occurs on beaches from May through September, peaking in June and July, with hatchlings emerging through November and December.

Construction on, or in the vicinity of, beaches can result in sand and sediment compaction, sea turtle nest destruction, beach erosion, contaminant and nutrient runoff, and an increase in direct and ambient light pollution which may disorient hatchlings or deter nesting females. Off-road vehicle traffic may result in direct impacts to sea turtles or nests, and also contributes to habitat degradation through erosion and compaction.

To avoid and minimize project impacts to sea turtles and their nests we recommend you incorporate the following measures into your project description:

- No vehicle use on or modification of the beach/dune environment during the sea turtle nesting or hatching season (May to December).
- Do not remove native dune vegetation.
- Incorporate applicable best management practices regarding Work in Aquatic Environments (see enclosed) into the project design.
- Have a biologist familiar with sea turtles conduct a visual survey of the project site to ensure no basking sea turtles are present.
- If a basking sea turtle is found within the project area, cease all mechanical or construction activities within 100 feet until the animal voluntarily leaves the area.
- Cease all activities between the basking turtle and the ocean.
- Remove any project-related debris, trash, or equipment from the beach or dune if not actively being used.
- Do not stockpile project-related materials in the intertidal zone, reef flats, sandy beach and adjacent vegetated areas, or stream channels.

Optimal sea turtle nesting habitat is a dark beach free of barriers that restrict sea turtle movement. Nesting turtles may be deterred from approaching or laying successful nests on lighted or disturbed beaches. They may become disoriented by artificial lighting, leading to exhaustion and placement of a nest in an inappropriate location (such as at or below the high tide line). Hatchlings that emerge from nests may also be disoriented by artificial lighting. Inland areas visible from the beach should be sufficiently dark to allow for successful navigation by hatchlings to the ocean.

To avoid and minimize project impacts to sea turtles from lighting we recommend incorporating the following applicable measures into your project description:

- Avoid nighttime work during the nesting and hatching season (May to December).
- Minimize the use of lighting on or near beaches and shield all project-related lights so the light is not visible from any beach.

  - If lights can't be fully shielded or if headlights must be used, fully enclose the
  - light source with light filtering tape or filters.
- Incorporate design measures into the construction or operation of buildings adjacent to the beach to reduce ambient outdoor lighting such as:
  - Tinting or using automatic window shades for exterior windows that face the beach;
  - Reducing the height of exterior lighting to below 3 feet and pointed downward or away from the beach; and
  - Minimize light intensity to the lowest level feasible and, when possible, include timers and motion sensors.

Opeapea

- No barbed wire shall be used for fencing.
- Woody vegetation taller than 4.6 m (15 ft) shall not be cleared between June 1 and September 15, the period in which bats may have pups.

Hawaiian seabirds

- Fully shield all outdoor lights so the bulb can only be seen from below.
- Install automatic motion sensor switches and controls on all outdoor lights or turn off lights when human activity is not occurring in the lighted area.
- Avoid nighttime construction during the seabird fledging period, September 15 through December 15. To avoid and minimize the likelihood that towers would result in collisions:
- The profile of the tower should be as small as possible, minimize the extent of the tower that protrudes above the surrounding vegetation layer and avoid the use of guywires.
- If the top of the tower must be lit to comply with Federal Aviation Administration regulations, use a flashing red light verses a steady-beam red or white light.
- If possible, co-locate with existing towers or facilities.
- To avoid and minimize the likelihood of collision:
- Where fences extend above vegetation, integrate three strands of polytape into the fence to increase visibility.
- For powerlines, guywires and other cables, minimize exposure above vegetation height and vertical profile.

Hawaiian waterbirds

- In areas where Hawaiian waterbirds are present, inform project personnel and contractors about the presence of endangered species on-site.
- Incorporate applicable best management practices regarding work in aquatic environments into the project design.

- Have a biological monitor that is familiar with the species' biology conduct Hawaiian waterbird nest surveys, where appropriate habitat occurs within the vicinity of the proposed project site, prior to project initiation. Repeat surveys again within 3 days of project initiation and after any subsequent delay of work of 3 or more days (during which the birds may attempt to nest). If a nest or active brood is found:
    - Contact the Service within 48 hours for further guidance.
    - Establish and maintain a 100-foot buffer around all active nests and/or broods until the chicks/ducklings have fledged. Do not conduct potentially disruptive activities or habitat alteration within this buffer.
    - Have a biological monitor that is familiar with the species' biology present on the project site during all construction or earth moving activities until the chicks/ducklings fledge to ensure that Hawaiian Waterbirds and nests are not adversely impacted.

Hawaiian goose (nene)

- Do not approach, feed, or disturb nene.
- If nene are observed loafing or foraging within the action area during the breeding season (September through April), have a biologist familiar with nene nesting behavior survey for nests in and around the action area prior to the resumption of any work. Repeat surveys after any subsequent delay of work of 3 or more days (during which the birds may attempt to nest).
- Cease all work immediately and contact the Service for further guidance if a nest is discovered within a radius of 150 feet of proposed project, or a previously undiscovered nest is found within the 150-foot radius after work begins.
- In areas where nēnē are known to be present, post and implement reduced speed limits, and inform project personnel and contractors about the presence of endangered species on-site.
- Alani, Nanu, Deparia kaalaana, and Microlepia strigosa var. mauiensis
- To avoid and minimize potential project impacts to flowering plans and ferns and allies, the Service recommended Avoidance and Minimization Measures for federally listed plant species (Attachment B) will be followed.

Flora

Alani, Nanu and Microlepia strigose var. mauiensis

To avoid and minimize potential project impacts to flowering plants and ferns the measures included in Table 2-1 below would be followed:

Table 2-1. Recommended Buffer Distances Based on Activities

Action		Buffer Distance (feet (meters)) – Keep Project Activity This Far Away from Listed Plant	
		Grasses / Herbs / Shrubs and Terrestrial Orchids	**Trees and Arboreal Orchids**
Walking, hiking, surveys		3 feet (1 meter)	3 feet (1 meter)
Cutting and Removing Vegetation by Hand or Hand Tools (e.g., weeding)		3 feet (1 meter)	3 feet (1 meter)
Mechanical Removal of Individual Plants or Woody Vegetation (e.g., chainsaw, weed eater)		3 feet up to height of removed vegetation (whichever greater)	3 feet up to height of removed vegetation (whichever greater)
Removal of Vegetation with Heavy Equipment (e.g., bulldozer, tractor, "bush hog")		2 times the width of the equipment plus the height of the vegetation	820 feet (250 meters)
Use of Approved Herbicides (following label)	Ground-based Spray Application; hand application (no wand applicator; spot treatment)	10 feet (3 meters)	Crown diameter
	Ground-based Spray Application; manual pump with wand, backpack	50 feet (15 meters)	Crown diameter
	Ground-based Spray Application; vehicle-mounted tank sprayer	50 feet (15 meters)	Crown diameter
	Aerial Spray (ball applicator)	250 feet (76 meters)	250 feet (76 meters)
	Aerial Application – herbicide ballistic technology (individual plant treatment)	100 feet (30 meters)	Crown diameter
	Aerial Spray (boom)	Further consultation required	Further consultation required
Use of Insecticides (pollinators, seed dispersers)		Further consultation required	Further consultation required
Ground / Soil Disturbance / Outplanting / Fencing (Hand tools, e.g., shovel, oo, Small mechanized tools, e.g., auger)		20 feet (6 meters)	2 times the crown diameter
Ground / Soil Disturbance (Heavy Equipment)		328 feet (100 meters)	820 feet (250 meters)

Surface Hardening / Soil compaction	Trails (e.g., human, ungulates)	20 feet (6 meters)	2 times the crown diameter
	Roads / Utility Corridors, Buildings / Structures	328 feet (100 meters)	820 feet (250 meters)
Prescribed Burns		Further consultation required	Further consultation required
Farming / Ranching / Silviculture		820 feet (250 meters)	820 feet (250 meters)

Additional Best Management Practices

The following measures will be implemented, which include applicable measures from the USFWS list on "Standard Best Management Practices in Aquatic Areas":

- Construction staff will be informed of the potential presence of threatened and endangered species, including being provided materials to assist in species identification and appropriate actions if a species enters the work area.
- Good housekeeping practices and erosion-control device(s) shall be employed at the job site to prevent debris and soil from leaving the site.
- Turbidity and siltation from project-related work shall be minimized and contained within the action area by silt containment devices and curtailing work during flooding or adverse tidal and weather conditions. BMPS shall be maintained for the life of the construction period until turbidity and siltation within the action area is stabilized. All project construction-related debris and sediment containment devices shall be removed and disposed of at an approved site.
- A litter-control plan shall be developed and implemented to prevent attraction and introduction of non-native species.
- Invasive species controls shall be maintained to ensure that all materials transported from off-site are free of such species.
- Project construction-related materials shall not be stockpiled in, or in close proximity to aquatic habitats and shall be protected from erosion (e.g., with filter fabric, etc.) to prevent materials from being carried into waters by wind, rain, or high surf.
- Fueling of project-related vehicles and equipment shall take place away from the aquatic environment. A contingency plan to control petroleum products accidentally spilled during the project shall be developed. The plan shall be retained on site with the person responsible for compliance with the plan. Absorbent pads and containment booms shall be stored on-site to facilitate the clean-up of accidental petroleum releases.
- All deliberately exposed soil or under-layer materials used in the project near water shall be protected from erosion and stabilized as soon as possible with geotextile, filter fabric or native or non-invasive vegetation matting, hydro-seeding, etc.

FHWA-proposed Best Management Practices (BMPs)

The following measures have been incorporated into the overall design and construction methods for the proposed action to minimize and reduce impacts to water quality under NMFS jurisdiction:

For all project related construction, BMPs shall be implemented in accordance with the documented approach, "An Integrated Storm Water Management Approach and a Summary of Clear Water Diversion and Isolation Best Management Practices for Use in the State of Hawaii", by the Federal Highway Administration and Hawaii Department of Transportation Practitioners Guide (2016) or the Construction Best Management Practices Field Manual by the State of Hawaii Department of Transportation (2008). In addition, the HDOT Standard Specification for Road and Bridge Construction Section 209 Temporary Water Pollution, Dust, and Erosion Control will be followed.

In addition, in the documents submitted for the consultation, the FHWA provided a thorough list of BMPs which will be incorporated into the overall design and construction methods for the proposed action to minimize and reduce impacts to water quality under NMFS jurisdiction. Adherence to those BMPs during the proposed activities will be effective in addressing many of NMFS concerns about potential adverse effects.

Fauna

The following species are included in the USFWS's Information for Planning and Consultation (IPaC) official species list downloaded on August 29, 2023 (see Enclosure 2).

- the endangered Hawaiian hoary bat or opeapea (Lasiurus cinereus semotus)
- the threatened Hawaiian goose or nene (Branta sandvicensis);
- Hawaiian waterbirds, including the endangered Hawaiian coot or alae keokeo (Fulica americana alai), the endangered Hawaiian stilt or aeo (Himantopus mexicanus knudseni), and endangered Hawaiian (koloa) duck (Anas wyvilliana);
- Hawaiian seabirds, including the endangered Hawaiian petrel or uau (Pterodroma sandwichensis), the endangered Hawaii Distinct Population Segment (DPS) of the band-rumped storm-petrel or akeake (Oceanodroma castro), and threatened Newell's Townsend's shearwater or ao (Puffinus auricularis newelli);
- the threatened Green Sea Turtle or Honu (Chelonia mydas);
- Flowering plants including the endangered Alani (Melicope zahlbruckneri) and the endangered Nanu (Gardenia remyi); and
- Ferns and allies including the endangered Deparia kaalaana, and the endangered Microlepia strigosa var. mauiensis

According to IPaC, USFWS identified no critical habitat for listed species in the action area.

2.6.4 Potential Impacts to ESA Protected Species

Based on the recommendations provided in the IPaC, the following measures will be implemented to avoid and minimize potential Project impacts to federally-listed species.

Hawaiian Hoary Bat

The Hawaiian hoary bat roosts in both exotic and native woody vegetation across all islands and will leave young unattended in trees and shrubs when they forage. If trees or shrubs 15 feet or

taller are cleared during the pupping season (June 1 through September 15), there is a risk that young bats could inadvertently be harmed or killed since they are too young to fly or may not move away. Most work is expected to occur within the ROW and on the deck of the bridge, however soil remediation on the valley floor below the bridge may be necessary.

Hawaiian seabirds

To avoid and minimize potential project impacts to Hawaiian seabirds, the following measures would also be incorporated into the project:

- Fully shield all outdoor lights so the bulb can only be seen from below.
- Install automatic motion sensor switches and controls on all outdoor lights or turn off lights when human activity is not occurring in the lighted area.
- Avoid nighttime construction during the seabird fledging period, September 15 through December 15.

To avoid and minimize the likelihood that towers would result in collisions:

- The profile of the tower should be as small as possible, minimize the extent of the tower that protrudes above the surrounding vegetation layer, and avoid the use of guywires.
- If the top of the tower must be lit to comply with Federal Aviation Administration regulations, use a flashing red light versus a steady-beam red or white light.
- If possible, co-locate with existing towers or facilities.

To avoid and minimize the likelihood of collision:

- Where fences extend above vegetation, integrate three strands of polytape into the fence to increase visibility.
- For powerlines, guywires and other cables, minimize exposure above vegetation height and vertical profile.

Hawaiian Waterbirds

To avoid and minimize potential project impacts to Hawaiian Waterbirds, the following measures would also be incorporated into the project:

- In areas where Hawaiian Waterbirds are present, inform project personnel and contractors about the presence of endangered species on-site.
- Incorporate applicable best management practices regarding work in aquatic environments into the project design.
- Have a biological monitor that is familiar with the species' biology conduct Hawaiian waterbird nest surveys, where appropriate habitat occurs within the vicinity of the proposed project site, prior to project initiation. Repeat surveys again within 3 days of project initiation and after any subsequent delay of work of 3 or more days (during which the birds may attempt to nest). If a nest or active brood is found:
    - Contact the USFWS within 48 hours for further guidance.

- Establish and maintain a 100-foot buffer around all active nests and/or broods until the chicks/ducklings have fledged. Do not conduct potentially disruptive activities or habitat alteration within this buffer.
- Have a biological monitor that is familiar with the species' biology present on the project site during all construction or earth moving activities until the chicks/ducklings fledge to ensure that Hawaiian Waterbirds and nests are not adversely impacted.

Hawaiian goose (nene)

To avoid and minimize potential project impacts to nene, the following measures would be incorporated into the project:

- Do not approach, feed, or disturb nene.
- If nene are observed loafing or foraging within the action area during the breeding season (September through April), have a biologist familiar with nene nesting behavior survey for nests in and around the action area prior to the resumption of any work. Repeat surveys after any subsequent delay of work of 3 or more days (during which the birds may attempt to nest).
- Cease all work immediately and contact the USFWS for further guidance if a nest is discovered within a radius of 150 feet of proposed project, or a previously undiscovered nest is found within the 150-foot radius after work begins.
- In areas where nene are known to be present, post and implement reduced speed limits, and inform project personnel and contractors about the presence of endangered species on-site.

Green Sea Turtle

Green sea turtles nest on sandy beach areas from May through September, peaking in June and July. Turtle hatchlings emerge from their nests in November and December. Construction on, or in the vicinity of beaches can result in sand and sediment compaction, sea turtle nest destruction, beach erosion, contaminant and nutrient runoff. An increase in direct and ambient light pollution can also disorient hatchlings or deter nesting females. An increase in direct and ambient light pollution can also disorient hatchlings or deter nesting females. All construction would occur within the ROW, bridge deck, and valley floor beneath the structure. No sandy beach area is located at or adjacent to the Project site.

2.7 Surface Water Resources and Wetlands

2.7.1 Existing Conditions

The project area is situated at the border of the Nanue and Opea watersheds (see Figure 2-13). The Nanue watershed encompasses an area of approximately 3,502 acres, stretching about 9 miles inland from the coast. The Opea watershed encompasses an area of approximately 1,463 acres, stretching about 4 miles inland.

The National Wetland Inventory (NWI) map identified Riverine habitat associated with Nanue Stream in the project area. A "freshwater pond" is also determined to exist 200 feet downstream of the bridge (Figure 2-14), outside of the project area. Given our understanding of site conditions,

we assume that the stream in this reach is tidal. See Section 0 for a description of biological resources.

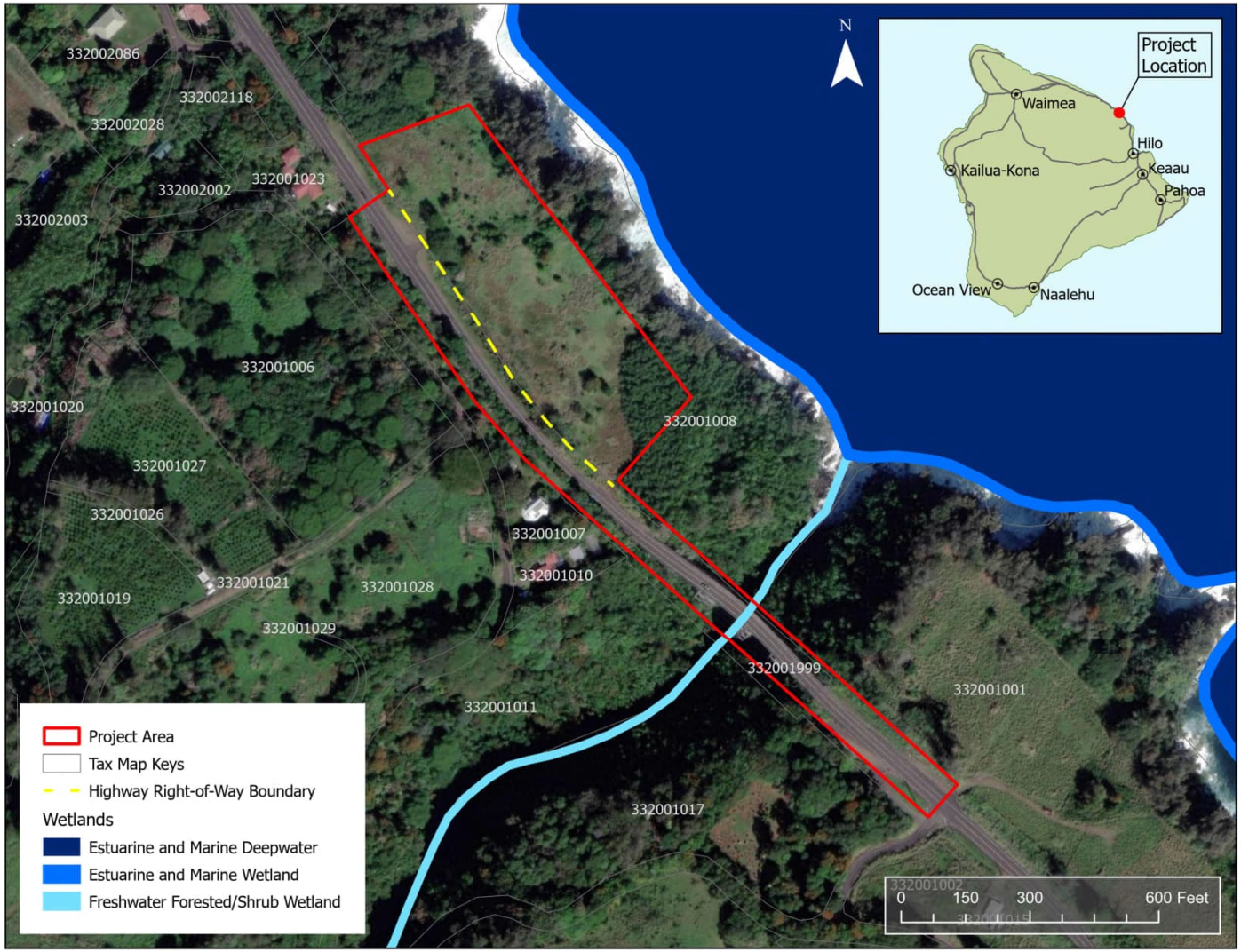
The State of Hawaii Department of Land and Natural Resources Division of Forestry and Wildlife (DOFAW) is also responsible for managing wetlands in Hawaii. According to DOFAW, there are three wetland types in the vicinity of the project area. The wetlands codes and descriptions below are those provided by the U.S. Fish and Wildlife Service, National Wetlands Inventory (NWI) wetlands data, as defined by the Federal Wetland Mapping Standard, to the complete wetland definitions, as defined by the Federal Wetlands Classification Standard.

- Wetland Type: M1UBL:
    - System: Marine. The Marine System consists of the open ocean overlying the continental shelf and its associated high-energy coastline. Marine habitats are exposed to the waves and currents of the open ocean and the Water Regimes are determined primarily by the ebb and flow of oceanic tides. Salinities exceed 30 parts per thousand (ppt), with little or no dilution except outside the mouths of estuaries. Shallow coastal indentations or bays without appreciable freshwater inflow, and coasts with exposed rocky islands that provide the mainland with little or no shelter from wind and waves, are also considered part of the Marine System because they generally support typical marine biota.
    - Subsystem: Subtidal. The substrate in these habitats is continuously covered with tidal water (i.e., located below extreme low water).
    - Class: Unconsolidated Bottom. Includes all wetlands and deepwater habitats with at least 25% cover of particles smaller than stones (less than 6-7 centimeters [cm]), and a vegetative cover less than 30%.
    - Water Regime: Subtidal. Tidal salt water continuously covers the substrate.
- Wetland Type M2RS1N:
    - System: Marine. The Marine System consists of the open ocean overlying the continental shelf and its associated high-energy coastline. Marine habitats are exposed to the waves and currents of the open ocean and the Water Regimes are determined primarily by the ebb and flow of oceanic tides. Salinities exceed 30 parts per thousand (ppt), with little or no dilution except outside the mouths of estuaries. Shallow coastal indentations or bays without appreciable freshwater inflow, and coasts with exposed rocky islands that provide the mainland with little or no shelter from wind and waves, are also considered part of the Marine System because they generally support typical marine biota.
    - Subsystem: Intertidal. The substrate in these habitats is flooded and exposed by tides; includes the associated splash zone.
    - Class: Rocky Shore. High energy shoreline environments characterized by bedrock, stones, or boulders which singly or in combination have an areal cover 75% percent or more and less than 30% vegetative cover by area.
        - Subclass Bedrock: Bottoms in which bedrock covers 75% or more of the surface.

- Water Regime: Regularly Flooded. Tides alternately flood and expose the substrate at least once daily.

Figure 2-13. Overview of Streams in the Nanue Watershed

Figure 2-14. Overview of National Wetland Inventory (NWI) Wetland Types Associated with the Nanue Stream



2.7.2 Potential Impacts

No Build Alternative

Under the No Build Alternative, there would be no ground-disturbing activities and no disruption to the existing environment. Existing wetlands and surface water resources would not be affected.

Rehabilitation Alternative

Under the Rehabilitation Alternative, potential short-term impacts to surface water quality during rehabilitation of the existing bridge and construction of the replacement bridge could occur; however, minimization and mitigation measures will be implemented. During design, Best Management Practices or BMPs may be incorporated to lessen impacts to water quality caused by stormwater discharged from roadway operations.

2.7.3 Avoidance, Minimization, and Mitigation Measures

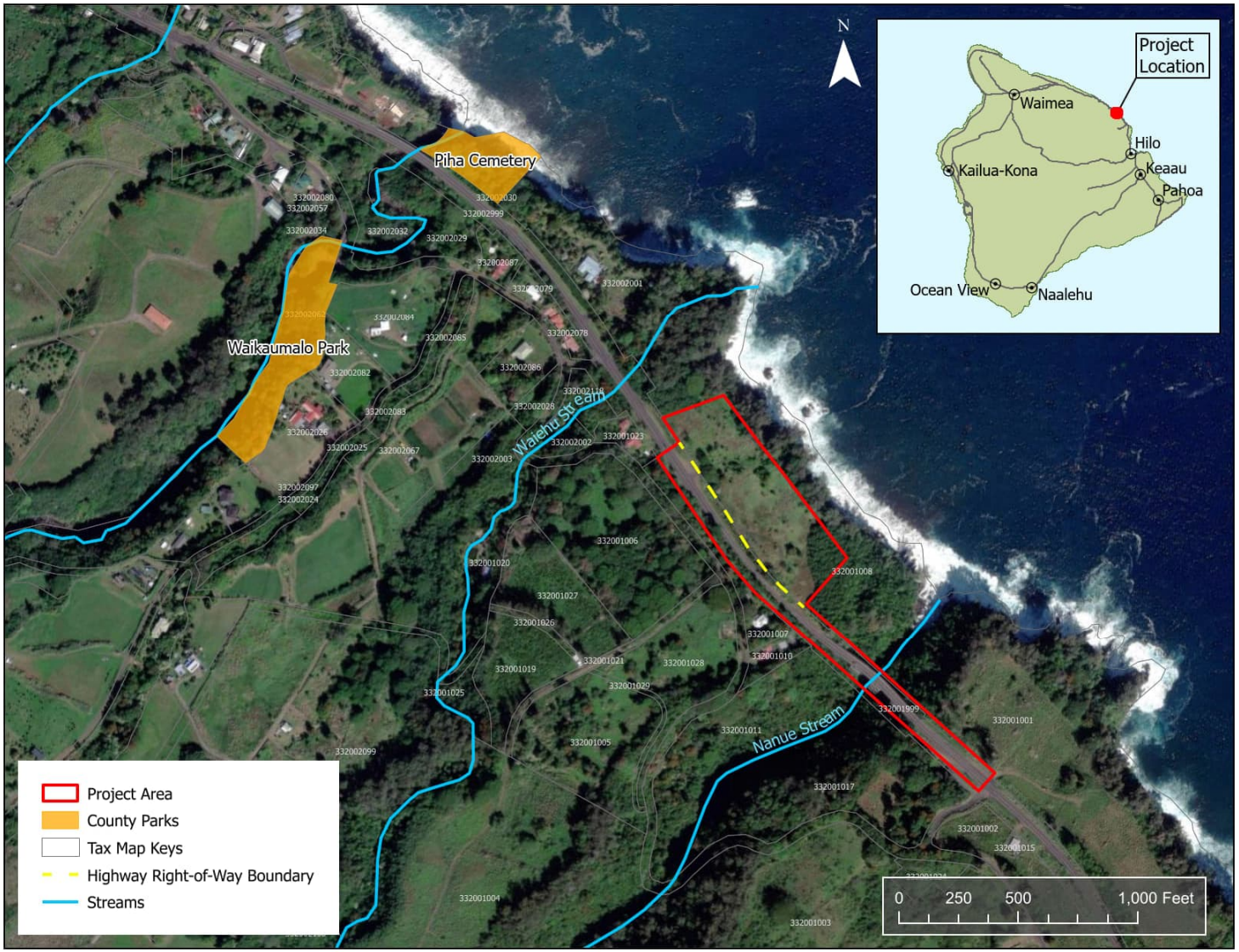
No avoidance, minimization, and mitigation measures are proposed since the project has no anticipated impacts on surface water resources. Section 2.15 describes the short-term impacts to water quality from construction activities. The applicant is coordinating with the U.S. Army Corps of Engineers (USACE) and these permits will be completed during the PE2 phase of the project.

2.8 Parks and Recreational Resources

2.8.1 Existing Conditions

The Kolekole Beach Park is approximately 5.2 miles from the Nanue Stream Bridge project area. The Waikaumalo Park is 0.6 miles from the Nanue Stream Bridge project area (see Figure 2-15).

Figure 2-15. Parks



2.8.2 Potential Impacts

No Build

Access to parks and recreational facilities may be limited if the Nanue Bridge continues to deteriorate and is unable to accommodate Hawaii Belt Road (Route 19).

Rehabilitation

There should be only limited traffic impacts to bridge users, as bent replacements can occur incrementally to allow for continued use of the bridge. It is anticipated that the project will not impact parks or recreational areas in which case there will be no requirement for a Section 4(f) consultation.

2.8.3 Avoidance, Minimization, and Mitigation Measures

Since there are no parks in the immediate vicinity of the project area, no mitigation measures are warranted.

2.9 Visual and Aesthetic Resources

2.9.1 Existing Conditions

Overlooking the Pacific Ocean, Nanue is a community that is situated on the sea cliffs of the Hamakua Coast. Commuting along Hawaii Belt Road, drivers experience breathtaking views of Nanue Valley and the ocean while crossing the Nanue Stream Bridge. Inland, a vast blanket of agricultural pastureland ascends a looming Mauna Kea summit.

Nanue can be described as rural. As one travels along Hawaii Belt Road, minimal development is observed both while approaching and leaving the small community, preserving the natural beauty of the surrounding area.

Human-made features, other than the development of the existing roads, are uncommon. Overhead utility powerlines adjacent to the Hawaii Belt Road corridor are commonly observed.

2.9.2 Potential Impacts

No Build

Under the No Build Alternative, there will be no impact to the visual and aesthetic setting of the project area.

Rehabilitation

Potential impacts to the visual and aesthetic setting of Nanue are limited to the historically listed Nanue Stream Bridge, located within the project area. The replacement of century-old steel bents with the steel to match the existing aesthetic of the Nanue Stream Bridge. There is no park in the vicinity of the Nanue Stream Bridge that would have viewshed impacts.

The Nanue Stream Bridge greatly contributes to the town's sense of place because of its historic value, and familiarity by generations of longtime Nanue residents and families. The steel bents, originally constructed in the early 1900s, are an example of early 20th century engineering and a reminder of Nanue's plantation era history. The Nanue Stream Bridge has previously been reconstructed due to damage caused by the 1946 tsunami. Thus, replacing the historic steel bents will greatly impact the sense of place, and visual plane of the project area, and the Nanue Community as a whole.

2.9.3 Avoidance, Minimization, and Mitigation Measures

No avoidance, minimization, and mitigation measures are proposed. The steel trestle bridge technology used to construct the Nanue Stream Bridge during the early 20th century no longer exists.

2.10 Transportation Infrastructure

2.10.1 Existing Conditions

The Nanue Stream Bridge (1000190308146) is oriented from south (to Hilo) to north (to Honokaa) and carries Hawaii Belt Road over Nanue Stream. The bridge was constructed in 1952 and the coordinates are 19°55'38.56"N, 155° 9'23.47"W and carries Hawaii Belt Road over the Nanue Stream. Hawaii Belt Road in this location consists of one existing travel lane in each direction. Nanue Stream Bridge provides a raised grade-separated 3-foot-wide pedestrian sidewalk / walkway along either side of the bridge. There are no designated bicycle facilities at this location.

Hawaii Belt Road is a two-lane, undivided principal arterial within the project area with a speed limit of 55 miles per hour (mph). Hawaii Belt Road provides primary regional and sub-regional access within the project area.

According to the 2022 Bike Plan Hawaii, the Proposed Bicycle Facilities Priority III near the project area include the Hawaii Belt Road – Honokaa to Hilo bike route.

2.10.2 Potential Impacts

No Build

Under the No Build Alternative, none of the project's purposes and needs would be met. The Nanue Stream Bridge would face potential operational changes, including limited use of the area surrounding the bridge and restricted operation of Nanue Stream Bridge.

Rehabilitation

Under the Rehabilitation Alternative, the deteriorating substructure of the Nanue Stream Bridge would be rehabilitated.

The proposed project is not anticipated to result in a change to the overall operations of Hawaii Belt Road at and along this stretch of the roadway. The bridge will not be widened, but the bridge railings will be upgraded to meet current safety standards.

During construction of the proposed action, traffic would be managed to allow for continued safe operation of Nanue Stream Bridge. The proposed project may cause disruptions in normal traffic patterns. Temporary changes to traffic patterns and travel times would be expected. Temporary movement of construction equipment on the road and bridge may cause delays on the traffic travel time.

Because the proposed project would not disproportionately affect a "minority" community, and would provide a pedestrian/bicycle facility that would be accessible to all for non-motorized users, there are no proposed avoidance, minimization, or mitigation measures for the Rehabilitation Alternative.

2.10.3 Avoidance, Minimization, and Mitigation Measures

Because the proposed project involves the rehabilitation of Nanue Stream Bridge, no avoidance, minimization, and mitigation are required for this alternative; however, traffic control plans and construction phasing plans would be implemented to minimize traffic delays and avoid hazards from construction activities. See Section 2.16 for construction impacts discussion.

2.11 Natural Hazards and Sea-Level Rise

2.11.1 Existing Conditions

Natural hazards common to Hawaii include earthquakes, flooding, hurricanes, landslides, climate change, and tsunamis. The project area generally experiences earthquakes at the same rate and proportion as the rest of the island and is not more or less prone to their effect. Annually, the State of Hawaii averages about 100 earthquakes of magnitude 3 or greater, ten of magnitude 4 or greater, and one of magnitude 5 or greater. Typically, people report feeling earthquakes larger than magnitude 3.

Based on the tsunami evacuation zone data prepared by the County and Hawaii Emergency Management Agency, most of the project area falls within the current tsunami evacuation zone. See Figure 2-16: Tsunami Evacuation Zone Map. Nanue Stream Bridge is elevated well above Nanue Stream, so vehicular traffic on Hawaii Belt Road and the bridge itself would not be affected in the event of a tsunami, unless the bridge foundations and trestles were undermined. The project area is not within the Tsunami Evacuation Zone.

Hurricanes and severe storms, resulting in intense rainfall events and high winds, would have the potential to affect this area similarly to the rest of the county. Similar to other streams in Hawaii, in the event of heavy rainfall, the water level at Nanue Stream may rise rapidly. However, Nanue Stream is not located in a regulatory floodway or Special Flood Hazard Area. According to the Flood Insurance Rate Map, the entire project area lies within Zone X, which indicates that the area is outside the 500-year floodplain as currently defined and is of minimal flood hazard. See Figure 2-17: Flood Zone Map.

Extreme storm events also contribute to the likelihood of landslides and road closures. In accordance with the findings of the HDOT Asset and Hazard Assessment tool, the entire project area is designated as having a "very high" susceptibility to rockfall and landslides. The contractor would be responsible for determining and implementing mitigation measures to reduce construction risks and enhance safety.

Global climate change and sea-level rise (SLR) can exacerbate impacts of these natural hazards on all infrastructure in the state, particularly in coastal areas and areas prone to flooding. Coastal areas are expected to experience more frequent and severe flooding episodes, which can exacerbate the impacts of natural hazard events such as tsunami and hurricanes or other high wind events. Storm surges can penetrate further inland, increasing the area and population that is vulnerable to hurricane and tsunami hazards. Effective July 2019, the State required all new projects undergoing environmental review under the Hawaii Environmental Policy Act (also known as HRS, Chapter 343) to consider whether the project is likely to have an adverse effect or be vulnerable to SLR.

To help identify potential coastal flooding extents for events under projected future sea level rise conditions, in 2018, the State developed the web-based State of Hawaii Sea Level Rise Viewer (SLR Viewer) to show sea-level rise exposure areas (SLR-XA) in Hawaii with varying assumed depths of SLR. The SLR Viewer was prepared as a companion tool to the 2017 Hawaii Sea Level Rise Vulnerability and Adaptation Report (Hawaii Climate Change Mitigation and Adaptation Commission 2021). The SLR Viewer provides map data illustrating future projections of hazard exposure and evaluate vulnerabilities stemming from sea level rise. While other SLR scenarios are presented in the SLR Viewer, any references to the SLR-XA in this EA assumes the 3.2-foot SLR scenario unless otherwise noted. In Hawaii, there is accepted guidance to use 3.2 feet of global mean SLR as a planning target for 2100.

Climate change, while a consideration for the entire State of Hawaii, is not anticipated to be a particular concern in this location. Nanue Stream Bridge sits approximately 300 feet inland from the coastline and 261 feet above Nanue Stream. Some portions of the project area do fall within the identified sea level exposure areas, 3.2-feet SLR scenario (Figure 2-18).

Figure 2-16. Tsunami Evacuation Zone Map

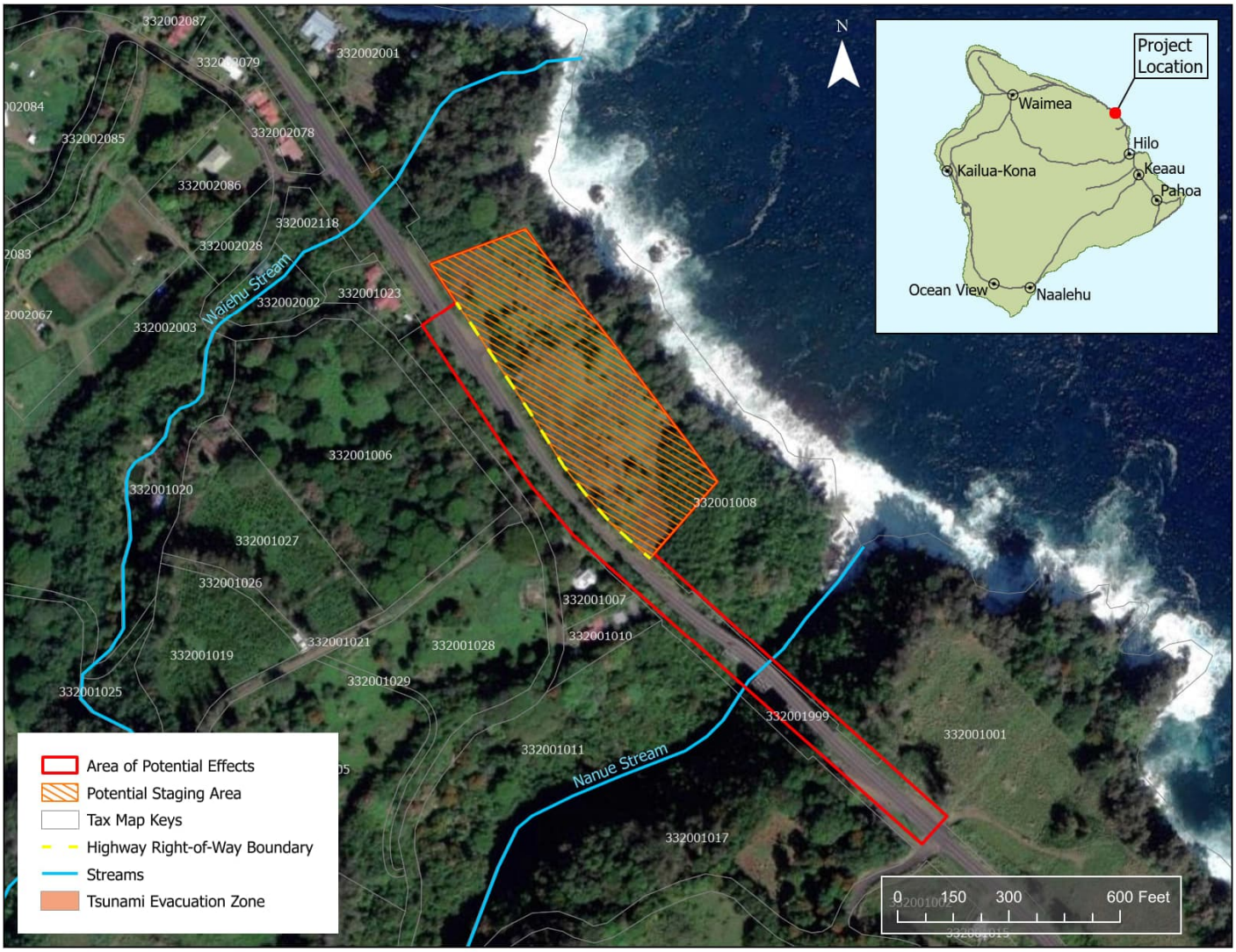


Figure 2-17. Flood Zone Map

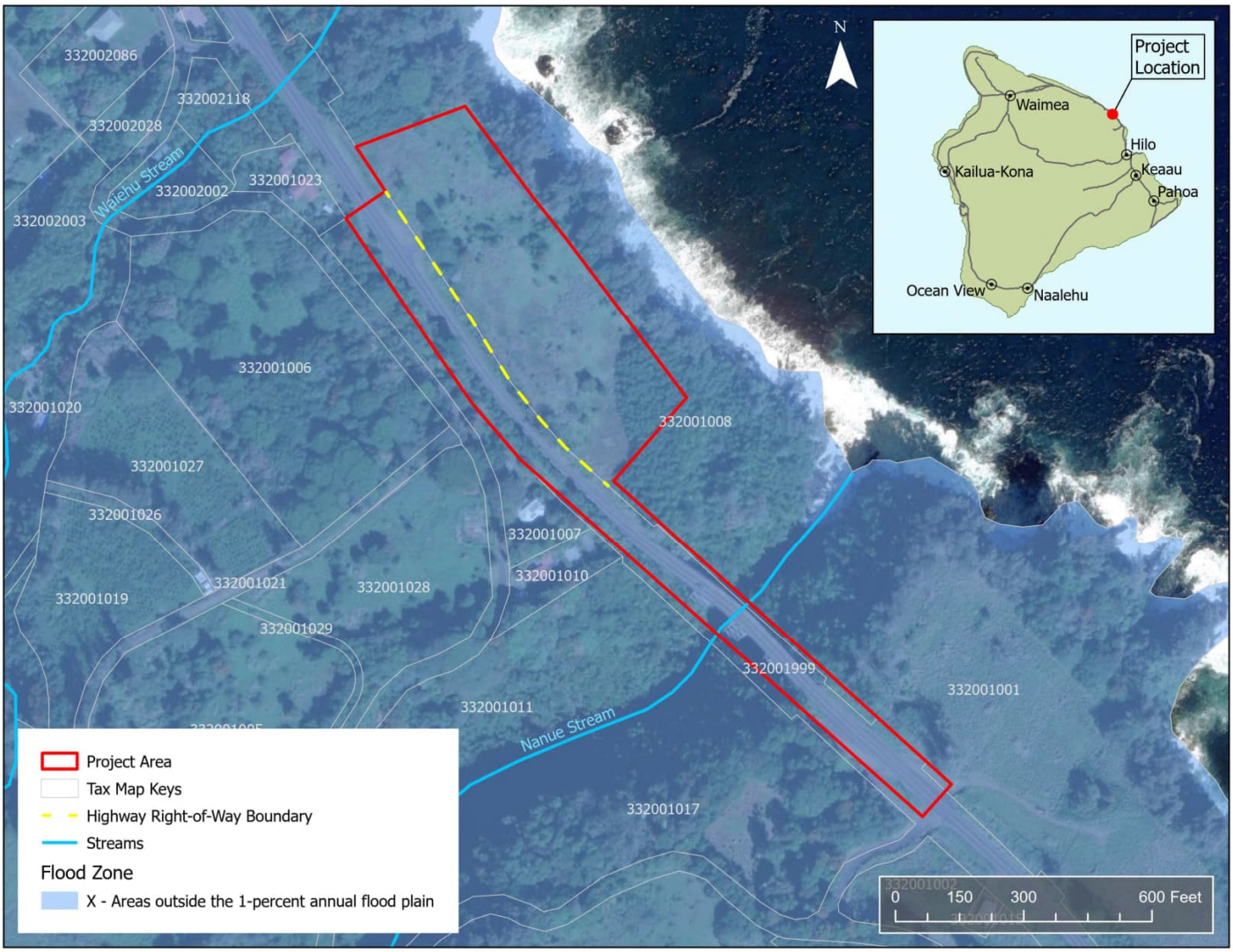
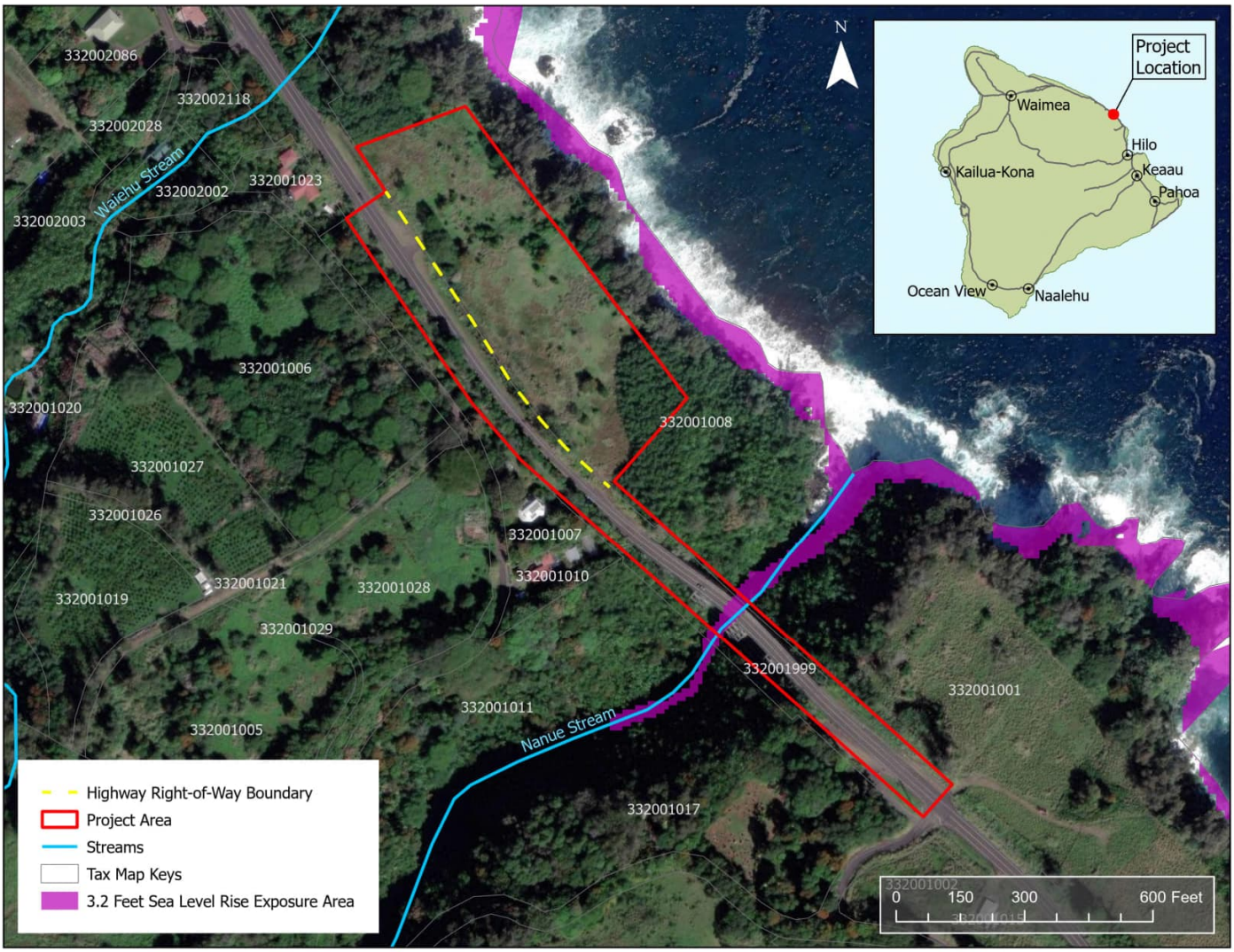


Figure 2-18. Sea Level Rise



2.11.2 Potential Impacts

No Build Alternative

Under the No Build Alternative, there would be no changes to vulnerability to natural hazards in the project area. Nanue Stream Bridge's deteriorating substructure would continue to become increasingly more of a potential safety risk, especially during flooding and large storm events when stream velocity significantly increases. Climate change, such as change in precipitation patterns and the frequency and degree of heavy rains may affect conditions long-term in and around nearby streams.

Rehabilitation Alternative

The proposed project would not increase the project area's vulnerability to earthquakes, landslides, flooding, tsunami or sea level rise. Neither would it have any bearing on the change in precipitation patterns or frequency and degree of heavy rains anticipated with climate change.

In the event of flooding or a tsunami, the rehabilitated bridge would provide a safer and more reliable evacuation route for the surrounding areas than the No Build Alternative. This is because the work would rehabilitate the bridge's deteriorating substructure and ensure that it meets current safety standards, as to allow for continued safe bridge operation.

2.11.3 Avoidance, Minimization, and Mitigation Measures

No Avoidance, Minimization, and Mitigation Measures are proposed for any of the alternatives, is anticipated. The project area is not within the tsunami evacuation zone.

2.12 Public Services, Utilities and Infrastructure

2.12.1 Existing Conditions

While Nanue has access to public facilities and services, including potable water, fire, police, and healthcare services, its location is somewhat isolated. Residents of Nanue travel to nearby towns for healthcare needs. The U.S. Postal Service provides delivery to this area and maintains a Post Office in Nanue. The North Hilo Police Station is located in Laupahoehoe, roughly ten miles from Nanue. The main Hawaii County Fire Department is located in Hilo, approximately 13 miles away. The County of Hawaii does not provide solid waste collection services in Nanue; there is a solid waste transfer station in Honomu, approximately two miles away.

2.12.2 Potential Impacts

No Build

Under the No Build Alternative, public facilities and services will remain the same in Nanue.

Rehabilitation

The Rehabilitation Alternative would not have long-term negative effects on access to public facilities and services.

There should be limited traffic-related impacts to bridge users, as bent replacement could occur incrementally to allow for continued use of the bridge. Lane closures will be required for work on the bridge railings and may result in disruptions to traffic flow. However, as previously discussed, full bridge closure is not anticipated at any time during the proposed project.

The proposed bridge rehabilitation efforts will facilitate permanent safe access to public services, utilities, and infrastructure.

2.12.3 Avoidance, Minimization, and Mitigation Measures

The proposed project will perform the rehabilitation work on Nanue Stream Bridge incrementally as discussed above. This will minimize the potential for disruption to access to public services, utilities, and infrastructure. Overall, public services, utilities, and infrastructure will not be significantly impacted by the proposed project.

2.13 Noise

2.13.1 Existing Conditions

Noise is defined as any sound that is undesirable or interferes with normal human activities. Energy level equivalent (Leq) is the constant noise level over a specified period of time that is equivalent in energy to a fluctuating (or brief) noise "averaged" over that period of time. Leq is also a function of time and is expressed as Leq (time period). Under HDOT policy, a noise impact occurs when the predicted traffic noise levels approach or exceed the NAC, or when the predicted traffic noise levels substantially exceed the existing noise levels. "Approach" means within 1 dBA less than the NAC, and "substantially exceed the existing noise levels" means an increase of at least 15 dBA.

Based on the roadway's posted speed limit in the project area, the off-peak free-flow traffic conditions, and proximity of noise-sensitive land uses, it is reasonable to assume that the existing worst-hour traffic noise levels for noise-sensitive areas near the project are below the HDOT NAC.

Existing and future noise sensitive land uses and activities located in the vicinity of the project area include residences and Nanue Beach Park, which is located below and adjacent to the Nanue Stream Bridge. No other noise-sensitive land uses are located within the project area. All residences along the project area are Category B (residential) and the outdoor uses at the beach park are Category C (parks). All residences in the vicinity of the proposed project are at least 500 feet away from Nanue Stream Bridge. Category B and Category C activities have an exterior NAC of Leq(h) 67 dBA. The existing and future posted speed limit is 55 miles per hour (mph) on Hawaii Belt Road at Nanue Stream Bridge.

Taking into consideration the roadway speed limit at this location and general roadway traffic flows of free-flow during non-peak operation periods, it is reasonable to assume that the worst-hour traffic noise levels for residential areas ranges from 57dBA to 68dBA depending on the proximity of the receiver to the roadway traffic and the presence of buildings and topography providing noise attenuation between the receiver and the roadway.

2.13.2 Potential Impacts

No Build Alternative

According to the predicted traffic noise levels without the project range from 57dBA to 68dBA. The future worst-hour traffic noise levels without the proposed project are not anticipated to substantially increase.

Rehabilitation Alternative

No significant impacts to noise levels are anticipated as a result of this project. Consistent with the existing conditions, the Proposed Action would maintain the existing roadway alignment, capacity, and 55-mile-per-hour posted speed limit on Hawaii Belt Road. The project would not result in any change in traffic volumes, directional split, or vehicle composition on Hawaii Belt Road compared to existing conditions. The primary noise source in the area, traffic from Hawaii Belt Road, would remain similar to existing traffic noise levels with future worst-hour traffic noise levels without the project similar to existing conditions and below the HDOT NAC. The Rehabilitation Alternative would not have long-term negative effects on noise levels.

The contractor will obtain a Community Noise Permit and will be required to comply with its terms and conditions. A Community Noise Variance will also be obtained if night, weekend, or holiday construction is needed. No significant impacts are anticipated with adherence to the restrictions in the Community Noise Permit and Community Noise Variance. No significant impacts are anticipated with adherence to the restrictions in the Community Noise Permit and Community Noise Variance.

2.13.3 Avoidance, Minimization, and Mitigation Measures

Overall, the existing noise environment would not be significantly impacted by the project. Furthermore, the bridge rehabilitation work would be conducted incrementally, as described in Chapter 1. This construction method would minimize the potential for noise disruptions from roadway traffic to the surrounding environment and community. Therefore, no long-term noise mitigation measures are necessary.

Construction activities would involve heavy machinery and vehicles that at times may exceed the maximum levels allowed by community noise control regulations. The proposed project will perform the rehabilitation work on Nanue Stream Bridge incrementally as discussed above. This will minimize the potential for noise disruptions to the surrounding environment and community. Overall, the existing noise environment will not be significantly impacted by the proposed project.

Construction of the Rehabilitation Alternative would involve the use of heavy machinery that may cause temporary noise impacts to adjacent noise sensitive land uses. Table 2-1 presents a range of noise levels for various construction equipment anticipated to be used during construction of the proposed project. Equipment noise levels vary depending on the make and model of the equipment, the operation being performed, the condition of the equipment, and other variables. The noise levels listed are based on published measurement taken at a distance of 50 feet from the equipment.

Table 2-1: Construction Equipment Noise Levels

Equipment	Decibels	Equipment	Decibels (dBA)
Standard Construction Equipment		Light Impact Equipment	
Truck	75 - 90	Jack Hammer	81 - 98
Saw	72 - 81	Jumping Jack	81 - 97
Light Tower	62 - 72		
Cold Planer	79 - 88	Heavy Impact Equipment	
Paving Machine	86 - 88	Hoe rams	95 - 106
Roller	63 - 70	Vibratory Sheet pile driver	90 - 100
Striping machine	75 - 86		
Concrete Truck	75 - 88		
Backhoe/Loader	72 - 83		
Compressor	74 - 87		
Generator	71 - 82		
Crane	75 - 87		

Since HDOH maintains community noise control standards (HAR Section 1146) that apply to construction noise, these specifications would be followed. A Community Noise Permit and Noise Variance would be obtained for construction activities performed during standard work hours (Monday through Friday 7:00 a.m. through 6:00 p.m. and Saturday 9:00 a.m. through 6:00 p.m., and holidays).

General abatement measures, including design considerations, source control, and community relations, are recommended as guidelines in developing construction plans that consider the adverse impacts of construction noise for this project. The aforementioned measures can be incorporated into site-specific construction plans to minimize noise impacts to sensitive receivers along the project corridor, and additional noise emission limits could be developed as well. Construction hours would be set in the Community Noise Permit and Community Noise Variance, and noise level criteria could be decided upon and adhered to during construction.

2.14 Air Quality

As required by the 1977 Clean Air Act and subsequent amendments, the U.S. Environmental Protection Agency (EPA) established National Ambient Air Quality Standards (AAQS) for seven major air pollutants: carbon monoxide, nitrogen dioxide, ozone, particulate matter smaller than 10 microns (PM10), particulate matter smaller than 2.5 microns (PM2.5), sulfur dioxide, and lead. The State has also established its own standards for these pollutants and hydrogen sulfide. The National and State AAQS are periodically reviewed and revised. See Table 2-6: National and State Ambient Air Quality Standards.

Based on the latest year of available ambient air monitoring data (2022), the State is in attainment of all National and State AAQS. The HDOH Clean Air Branch has 10 air monitoring stations on the Island of Hawaii, though it does not operate any stationary air monitoring sites near the project location. The closest station to the project area is located in Hilo, approximately 13.5 miles away from the project area. The pollutants/parameters monitored at this location are PM2.5 and sulfur dioxide. No exceedances of the national or state AAQS were recorded during 2020, 2021, or 2022, the most recent three years of available data (HDOH 2021, 2022, 2023).

Air quality impacts during construction generally consist of fugitive dust and mobile source emissions from construction equipment.

Fugitive dust is airborne particulate matter, of usually large particle size, generated by construction vehicles operating around construction sites and from material blown from uncovered haul trucks, stockpiles, and exposed areas. The emission rate for fugitive dust emissions from construction activities is difficult to estimate accurately because its generation varies greatly depending upon the type of soil, the amount and type of dirt-disturbing activity, the moisture content of exposed soil, and wind speed. Frequent watering would control fugitive dust at construction sites. In addition, wind screens may be used in areas near residences and commercial districts, as well as limiting the areas of disturbance at any given time. Landscaping would be re-established as early as possible to limit fugitive dust. To prevent haul trucks from tracking dirt onto paved streets, tire washing, or road cleaning may be appropriate. State regulations further stipulate that open-bodied trucks be covered at all times when in motion if they are transporting wind-erodible materials.

2.14.1 Existing Conditions

As required by the 1977 Clean Air Act (CAA), National Ambient Air Quality Standards (AAQS) were established by the U.S. Environmental Protection Agency (USEPA) for seven major air pollutants: carbon monoxide (CO), nitrogen oxides (NOx), ozone (O3), particulate matter smaller than 10 microns (PM10), particulate matter smaller than 2.5 microns (PM2.5), sulfur oxides (SOx), and lead. Current standards for ozone and PM2.5 were established in September 1997. The State of Hawaii has also established its own standards for these pollutants. Both the National and State AAQS are listed in Table 2-2.

The State of Hawaii is designated as an attainment area for CO, ozone (O3), PM10, and PM2.5. The Hawaii Department of Health's (DOH) Clean Air Branch has twelve air monitoring stations on the Island of Hawaii, though it does not operate any stationary air monitoring sites near the project location. The closest station to the project area is located at Waikoloa Elementary School, approximately 8.25 miles away from the project area. The pollutants / parameters monitored at this location are PM2.5 . No exceedances have been recorded for the 2021 and 2022 calendar years.

Table 2-2. National and State Ambient Air Quality Standards

Pollutant	Standards		
	Hawaii State	Federal Primary[a] (Health)	Federal Secondary[b] (Welfare)
Carbon Monoxide (CO)			
1 Hour[1]	9 ppm	35 ppm	----
8 Hour[1]	4.4 ppm	9 ppm	----
Nitrogen Dioxide (NO_2)			
1 Hour	----	100 ppb	----
Annual Mean	0.04 ppm	53 ppb	0.053 ppm
PM10[c]			
24 Hour[3]	150 µg /m^3	150 µg /m^3	----
Annual (Arithmetic)[2]	50 µg /m^3	----	----
PM2.5[d]			
24 Hour[5]	----	35 µg /m3	35 µg /m^3
Annual (Arithmetic)[4]	----	12 µg /m3	15 µg /m^3
Ozone (O_3)			
8 Hour Rolling Average	157 µg /m^3 (0.08 ppm)	0.070 ppm	0.070 ppm
Sulfur Dioxide (SO_2)			
1 Hour	----	75 ppb	----
3 Hour[1]	0.5 ppm	----	1,300 µg /m^3 (0.5 ppm)
24 Hour Block Average	0.14 ppm	----	----
Annual Average	80 µg /m^3 (0.03 ppm)	----	----
Lead (Pb)			
3 Months (Arithmetic)	1.5 µg /m^3	0.15 µg /m^3	0.15 µg /m^3
Hydrogen Sulfide			
1 Hour	25 ppb	----	----

Source: State of Hawaii, Department of Health, Clean Air Branch – Hawaii Administrative Rules, Chapter 59. Code of Federal Regulations, Title 40, Part 50, January 2007 and EPA. http://epa.gov/air/criteria.html

Notes:
[a] Designated to prevent against adverse effects on public health
[b] Designated to prevent against adverse effects on public welfare, including effects on comfort, visibility, vegetation, animals, aesthetic values, and soiling and deterioration of materials.
[c] Particulate matter 10 microns or less in diameter
[d] Particulate matter 2.5 microns or less in diameter.
(1) Not to be exceeded more than once per year.
(2) Due to a lack of evidence linking health problems to long-term exposure to coarse particle pollution, the agency revoked the annual PM_{10} standard in 2006 (effective December 17, 2006).
(3) Not to be exceeded more than once per year on average over 3 years.
(4) To attain this standard, the 3-year average of the weighted annual mean $PM_{2.5}$ concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m^3.
(5) To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m^3 (effective December 17, 2006).

Key:
µg/m3 = micrograms per cubic meter
ppm = parts per million
ppb = parts per billion
PM2.5 = particulate matter smaller than 2.5 microns
PM10 = particulate matter smaller than 10 microns

2.14.2 Potential Impacts

No Build Alternative

Under the No Build Alternative, there would be no change in air quality.

Rehabilitation Alternative

Because the Rehabilitation Alternative would not result in any meaningful changes in traffic volumes, vehicle mix or any other factor that would cause an increase in emissions, the project is not anticipated to generate any notable air quality impacts or contribute to any air quality concerns during its use. Additionally, the proposed project would not cause or exacerbate a violation of the State or National AAQS.

2.14.3 Avoidance, Minimization, and Mitigation Measures

No Avoidance, Minimization, and Mitigation Measures are proposed for any of the alternatives, because no violation of the State or National AAQS is anticipated.

2.15 Social and Economic Conditions

2.15.1 Existing Conditions

General Socio-Economic Conditions

HDOT's Title VI Plan (2019) is designed to fulfill its responsibilities under Title VI of the Civil Rights Act of 1964, as amended, Executive Order (EO) 12898, called "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," was signed by the President of the United States on February 11, 1994. It is intended to address issues regarding Environmental Justice and other related non-discrimination regulations and directives. It directs federal agencies to take appropriate and necessary steps to identify and address disproportionately high and adverse effects of federal projects on the health or environment of minority or low-income populations.

If minority or low-income populations are found in the project vicinity, good faith effort must be made to ensure that disproportionate and adverse impacts on low-income and minority populations are prevented, minimized, or mitigated. An example of good faith effort is additional public notification or outreach to these groups.

The federal definition of "minority" includes the following groups:

- Black: a person having origins in any of the black racial groups of Africa.
- Hispanic: a person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race.
- Asian: a person having origins in any of the original peoples of the Far East, Southeast Asia or the Indian subcontinent or the Pacific Islands.
- American Indian or Alaskan Native (AIAN): a person having origins in any of the original people of North America and who maintains cultural identification through tribal affiliation or community recognition.
- Native Hawaiian or Other Pacific Islander (NHOPI): a person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands.

Pursuant to EO 12898, "low-income" is defined as households with incomes at or below the U.S. Department of Health and Human Services (DHHS) poverty guidelines. The 2021 poverty

guidelines for the State of Hawaii are at or below $30,480 for a family/household of four2. There are '2023 Poverty Guidelines: 48 Contiguous States (all states except Alaska and Hawaii)' available, but as the name notes they do not apply to the State of Hawaii.

The following discussion is based on selected census data, summarized in Table 2-3 and Table 2-4.

Population and Ethnicity

The State of Hawaii is an unusual, but increasingly common case, where traditionally-defined "minority" populations make up the majority of the population.

The largest ethnic group in Hawaii is Asian. This group makes up 36.8% of the overall State population. Those who classify themselves as "Two or More Races" make up 19.2% of the population.

Table 2-3 presents the ethnic characteristics for the State of Hawaii, County of Hawaii (Island of Hawaii), and the community of Nanue. Ethnic characteristics for Nanue is summarized from census tract 221.02.

Table 2-3. Ethnic Characteristics

	Hawaii State	Hawaii County	Nanue (Census Tract 221.02)
Population	1,420,074	201,350	Census Tract (CT) 221.02: 1,650
Ethnicity			
White	342,923 (24.1%)	65,831 (32.7%)	CT 221.02: 660 (40%)
Black or African American	26,717 (1.9%)	1,301 (0.6%)	CT 221.02: 29 (1.8%)
American Indian/Alaska Native	3,508 (0.2%)	809 (0.4%)	CT 221.02: 30 (1.8%)
Asian	534,519 (37.6%)	45,650 (22.7%)	CT 221.02: 389 (23.6%)
Hispanic or Latino	152,566 (10.7%)	26,579 (13.2%)	CT 221.02: 126 (7.6%)
Native Hawaiian and Other Pacific Islander	147,698 (10.4)%	24,173 (12.0%)	CT 221.02: 74 (4.5%)
Other	19,791 (1.4%)	4,152 (2.1%)	CT 221.02: 0 (0%)
Two or More Races	344,918 (24.3%)	59,434 (29.5%)	CT 221.02: 468 (28.4%)

Source: U.S. Census Bureau, 2016-2020 American Community Survey 5-Year Estimates
https://data.census.gov/cedsci/table?q=demographics%20in%20hawaii&g=0500000US15001_1400000US15001020100,15001022102&tid=ACSDP5Y2020.DP05
Survey/Program Decennial Census, Universe: Total Population, Year: 2020, Table ID: DP05.

As indicated in Table 2-3, the ethnic characteristics of the residents of Nanue are similar to that of the general population of Hawaii County and the State, except for a few variations. A slightly higher portion (40%) of the population in Nanue is White than that of the State. The other difference is a slightly higher (29.5%) group reporting as 'Two or More Races' population in Hawaii County in comparison to the State.

[2] Office of the Assistant Secretary for Planning and Evaluation (ASPE). 2021 Poverty Guidelines. https://aspe.hhs.gov/2021-poverty-guidelines

Income and Employment

In terms of income, the proportion of persons living below the poverty line in Nanue is greater than the State and the County, as shown in Table 2-4. In Nanue, 30.4% of households earn incomes that may be considered below the poverty line, while in comparison, the State was at 19.4% and the island is at 28.4%[3].

Table 2-4 shows the median household incomes and other general income characteristics. Mean household incomes in Nanue were lower than the mean incomes for the island and the State. Generally, the household incomes in Nanue are more consistent with the County trends than with the State trends.

Table 2-4: Income in the Past 12-Months (In 2020 Inflation-Adjusted Dollars)

	Hawaii State	Hawaii County	Nanue (Zip Code Tabulation Area 96710)
Number of Households	490,080	72,194	102
Earn Less than $34,999	19.4%	28.4%	30.4%
$35,000 to $74,999	25.8%	27.7%	15.7%
$75,000 to $99,999	13.7%	14%	0%
$100,000 to $200,000	30%	23.6%	53.9%
$200,000 or more	11.3%	6.3%	0%
Median Income (dollars)	$83,173	$65,401	-
Mean Income (dollars)	$107,348	$86,367	$84,545

Source: U.S. Census Bureau (2016-2020). American Community Survey 1-year estimates. Table ID: S1901.
https://data.census.gov/cedsci/table?q=demographics%20in%20hawaii&t=Income%20%28Households,%20Families,%20Individuals%29%3AIncome%20and%20Earnings&g=0500000US15001_860XX00US96710&tid=ACSST5Y2020.S1901

2.15.2 Potential Impacts

No Build Alternative

Under the No Build Alternative, there would be no changes or impacts experienced by the surrounding community.

Rehabilitation Alternative

In accordance with the federal definition of "minority" as presented earlier, which includes those of Asian and Native Hawaiian/Pacific Island ancestry, the proposed project improvements would affect minority populations. Additionally, socio-economic trends illustrate that there are populations where the household income is lower than the DHHS poverty guidelines for Hawaii.

However, the project would not disproportionately affect the community in an adverse manner. Impacts such as noise and air will not worsen as a result of the Rehabilitation Alternative, and will be temporary in relation to construction activities. Benefits include a more efficient (less delay) and safer transportation system.

[3] Statement assumes the Health and Human Services Poverty Guidelines of $29,620 for a household/family of four.

2.15.3 Avoidance, Minimization, and Mitigation Measures

Because the proposed project would not disproportionately affect a "minority" community, and would provide a pedestrian/bicycle facility that would be accessible to all for non-motorized users, there are no proposed avoidance, minimization, or mitigation measures for the Rehabilitation Alternative.

2.16 Solid Waste Management and Hazardous Waste and Materials

A hazardous material is any substance that may be hazardous to humans, animals, or plants. They may include pesticides, herbicides, toxic metals and chemicals, volatile chemicals, explosives, and nuclear fuels or low-level radioactive wastes. This section discusses the potential for the presence of contaminated soils or groundwater and other hazardous materials resulting from previous and existing uses in areas where new project construction may disturb such materials. The section also summarizes the measures that would be implemented to avoid adverse impacts from exposure of such materials to the workers and the surrounding community.

EnviroQuest, Inc. on behalf of HDOT, completed a Remedial Alternatives Analysis Report (RAA) in cooperation with HDOH, which is currently under review. The RAA will go through a public review process. Due to lead contamination exceeding EPA regulatory limits (5 milligrams per liter (mg/L)), any excavated lead-impacted soil would be characterized as hazardous waste and must be properly disposed of to the appropriate landfills. All other soil that passes the TCLP criteria will be profiled for disposal to the appropriate landfill and replaced with clean fill. The remedial actions include restricted access, engineering and institutional controls, and removing the source of contamination.

2.16.1 Existing Conditions

According to the State of Hawaii, "Hazardous Substances" include materials and wastes that are considered severely harmful to human health and the environment, as defined by the United States Environmental Protection Agency (EPA) Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (also commonly known as "Superfund")[4].

Areas near Nanue Stream Bridge have been involved in agricultural activities, therefore it is possible that fertilizer and fuel from farm equipment or abandoned vehicles may be encountered in the soils during ground disturbing activities. It is also known that soils surrounding the footings of the bridge have been contaminated by lead based paint which was previously used on the bridge.

2.16.2 Potential Impacts

During construction, the Contractor will watch for key signs of soil pollution (e.g., smell, sight – sheen on soil, etc.). If hazardous materials are identified, the Contractor would be required to consolidate such soils immediately and independently of other excavated materials for individual testing and appropriate disposal upon testing results.

[4] State of Hawaii. Hazard Mitigation Plan. 2018

2.16.3 Avoidance, Minimization, and Mitigation Measures

HDOT will work with the Contractor to ensure that all excess material from the site will be handled and disposed of properly at a solid waste permitted facility. If the project material is deemed hazardous, the Contractor will take necessary measures to dispose of the material according to federal, State and County statutes.

Good housekeeping and BMPs would be required of the contractor, such as ensuring that:

- All waste materials be collected and stored in securely lidded dumpsters that are emptied before becoming overly full and not buried on site;
- Materials stored on-site be stored in a neat, orderly manner in appropriate containers (i.e., per manufacturer recommendations);
- All on-site vehicles be monitored for leaks and receive regular preventive maintenance to reduce the chance of leakage;
- A spill cleanup kit be located on-site where petroleum products, paints, or other hazardous materials are stored; and
- All sanitary waste generated during the construction phase be collected from portable units as required and directed to a HDOH-permitted treatment facility.

The Project will be responsible for preparing and implementing a 'Construction – Environmental Hazard Management Plan' (C-EHMP). This plan will be prepared per the guidelines established by the Hawaii State Department of Health (HDOH) – Hazard Evaluation and Emergency Response Office (HEER). The Project will follow the template that has been created by the HDOH -HEER Office. Information regarding the C-EHMP, as included in the template provided by HDOH-HEER is provided below.

A C-EHMP documents the presence of a contaminated environmental medium (e.g., soil, soil vapor, sediment, surface water, and/or groundwater) on a site and describes how the contamination must be managed during planned construction activities. C-EHMPs are typically for handling contamination during surface or subsurface construction activities that could expose construction workers, nearby people, or ecological receptors. The purpose of an EHMP is for long-term management of identified environmental hazards posed by known or suspected environmental contaminants at your site, and to provide clear procedures for how to safely manage these environmental hazards.

The C-EHMP will contain information regarding the area's background and site description, site closure plan, long-term monitoring requirements (if any), and site management and notification requirements to be implemented during construction.

2.17 Secondary and Cumulative Impacts

2.17.1 Secondary Impacts

Secondary impacts, or indirect effects, are effects that are caused by an action and are later in time or farther removed from distance but are still reasonably foreseeable. Such efforts may include

growth-inducing impacts and other effects related to changes in land use patterns, population density, or growth rate, and related effects on air, water, and other natural systems.

Construction of the project is expected to generate short-term construction employment for a limited number of workers. It is anticipated that local contractors on Hawaii Island or within the state of Hawaii would likely be used for construction of the project, with some of the soil disposal potentially conducted on the mainland instead of on Hawaii Island. Thus, construction workers would have minimal, if any, effect on the island's residential population or housing demand.

The bridge rehabilitation would not result in any change in use of roadway facilities or traffic volume increases. Therefore, no secondary effects of increasing infrastructure demands are anticipated, which may necessitate other off-site improvements and additional use of public funds and resources.

2.17.2 Cumulative Impacts

Cumulative impacts are effects on the environment that result from the incremental impact of a project when added to past, present, and reasonably near future actions. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time.

The Proposed Action is a complete, independent project that would not result in commitments for other projects, nor would it result in cumulative, considerable impacts on the environment. While multiple bridges along the Hamakua Coast would be rehabilitated in the foreseeable future, the Nanue Stream Bridge Rehabilitation would not result in adverse cumulative impacts on the combination of historic properties on Hawaii Belt Road.

No cumulative impacts that result in significant impacts of public utilities and services such as water and electricity or emergency services are anticipated. No long-term or cumulative adverse impacts on water quality, biological resources, cultural resources, or park resources are anticipated other than what is previously disclosed above.

Chapter 3. CONSISTENCY WITH GOVERNMENT PLANS AND POLICIES

This section describes the project's consistency with state and local government plans, policies, and controls.

3.1 State of Hawaii Plans and Controls

3.1.1 Hawaii State Plan

The Hawaii State Plan, HRS §226: Hawaii State Planning Act is a long-range comprehensive plan that includes an overall theme, goals, objectives, policies, priority guidelines, and implementation mechanisms. The Hawaii State Plan acts as a roadmap for long-term state development, setting goals, policies, and priorities. Aids in resource allocation, enhances coordination among federal, state, and county plans and programs, and establishes a systematic approach to integrate major state and county activities.

Relevant Hawaii State Plan goals, objectives, and policy are listed below with discussion and analysis.

§226-9 Objective and policies for the economy -- federal expenditures

- Policy 3 – Promote the development of federally supported activities in Hawaii that respect statewide economic concerns, are sensitive to community needs, and minimize adverse impacts on Hawaii's environment.
- Policy 6 – Strengthen federal-state-county communication and coordination in all federal activities that affect Hawaii.

Discussion: The proposed project is a State-lead initiative, in cooperation with the Federal Highway Administration. HDOT is also seeking federal agency input via the required consultations, including Section 106 of the National Historic Preservation Act, Section 7 of the Endangered Species Act and compliance with the National Environmental Policy Act. The Section 106 SHPD Concurrence letter of "no adverse effect" is enclosed in Appendix A. The ESA Section 7 is also enclosed in Appendix A.

§226-11 Objectives and policies for the physical environment--land-based, shoreline, and marine resources

- *Policy 3 – Take into account the physical attributes of areas when planning and designing activities and facilities.*

§226-13 Objectives and policies for the physical environment--land, air, and water quality

- *Policy 2 – Promote the proper management of Hawaii's land and water resources.*
- *Policy 3 – Promote effective measures to achieve desired quality in Hawaii's surface, ground, and coastal waters.*

- *Policy 5 – Reduce the threat to life and property from erosion, flooding, tsunamis, hurricanes, earthquakes, volcanic eruptions, and other natural or man-induced hazards and disasters.*

Discussion: The Nanue Stream Bridge rehabilitation would increase the resiliency of the bridge, while maintaining a similar aesthetic to the old structure. The U.S. Army Corp of Engineers (USACE) is being consulted to ensure proper Best Management Practices (BMPs) are in place to mitigate potential impacts, if any, to Nanue Stream's water quality.

§226-14 Objective and policies for facility systems--in general

- Policy 1 – Accommodate the needs of Hawaii's people through coordination of facility systems and capital improvement priorities in consonance with state and county plans.
- Policy 5 – Identify existing and planned state facilities that are vulnerable to sea level rise, flooding impacts, and natural hazards.
- Policy 6 – Assess a range of options to mitigate the impacts of sea level rise to existing and planned state facilities.

Discussion: Rehabilitating the Nanue Stream Bridge would ensure that its structural integrity can withstand the increasing threat of natural disasters. Should the Nanue Stream Bridge fail, the transit system would be affected island-wide as Hawaii Belt Road is the only road that provides uninterrupted access along the Hamakua Coast.

§226-17 Objectives and policies for facility systems—transportation

- Policy 6 – Encourage transportation systems that serve to accommodate present and future development needs of communities.
- Policy 9 – Encourage the development of transportation systems and programs which would assist statewide economic growth and diversification.
- Policy 12 – Coordinate intergovernmental land use and transportation planning activities to ensure the timely delivery of supporting transportation infrastructure in order to accommodate planned growth objectives.

Discussion: As stated above, the proposed project would ensure that Nanue Stream Bridge's structural integrity can withstand the increasing threat of natural disasters, which is a part of Hawaii Belt Road, a vital transportation corridor. Should the Nanue Stream Bridge fail, impacts to bridge operations would disrupt the efficient, economical, safe, and convenient movement of people and goods.

§226-109 Climate change adaptation priority guidelines

- Guideline 5 – Encourage the preservation and restoration of natural landscape features, such as coral reefs, beaches and dunes, forests, streams, floodplains, and wetlands, that have the inherent capacity to avoid, minimize, or mitigate the impacts of climate change.
- Guideline 7 – Promote sector resilience in areas such as water, roads, airports, and public health, by encouraging the identification of climate change threats, assessment of potential consequences, and evaluation of adaptation options.

- Guideline 8 – Foster cross-jurisdictional collaboration between county, state, and federal agencies and partnerships between government and private entities and other nongovernmental entities, including nonprofit entities.
- Guideline 10 – Encourage planning and management of the natural and built environments that effectively integrate climate change policy.

Discussion: Rehabilitating the Nanue Stream Bridge would ensure that its structural integrity can withstand the increasing threat of natural disasters due to climate change.

3.1.2 Hawaii 2050 Sustainability Plan

The *Hawaii 2050 Sustainability Plan: Charting a Course for the Decade of Action (2020-2030)* (Sustainability Plan), revised June 2021, serves as a guide for the future long-range development of the state (State of Hawaii 2021). The Sustainability Plan promotes the growth and diversification of the state's economy, the protection of the physical environment, the provision of public facilities, and the promotion of and assistance to socio-cultural advancement. Relevant Hawaii 2050 Sustainability Plan goals, objectives, and policy are listed below with discussion and analysis.

Sustainable Development Goal 9 – Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation.

Discussion: The project includes the rehabilitation of Nanue Stream Bridge to ensure that this bridge infrastructure can be sustained into the future. The Proposed Action would fortify the bridge supports due to wear and ensure its structural integrity in an earthquake, tsunami, or flood.

3.1.3 Coastal Zone Management Consistency Review

The Office of Planning and Sustainable Development (OPSD) administers Hawaii Revised Statutes (HRS) Chapter 205A, the state's Coastal Zone Management (CZM) law, pursuant to the federal Coastal Zone Management Act (CZMA) of 1972. Hawaii's coastal zone includes the waters from the shoreline to the makai limit of the State's jurisdiction and all lands excluding those lands designated as forest reserves. As a result, the project is within the CZM area and is subject to consistency with the objectives and policies of the Hawaii CZM Program. The purpose of HRS Chapter 205A is to "provide for the effective management, beneficial use, protection, and development of the Coastal Zone."

1. Recreational Resources

Objective: Provide coastal recreational opportunities accessible to the public.

Policies:

a. Improve coordination and funding of coastal recreational planning and management.

b. Provide adequate, accessible, and diverse recreational opportunities in the coastal zone management area by:

i. Protecting coastal resources uniquely suited for recreational activities that cannot be provided in other areas.

ii. Requiring restoration of coastal resources that have recreational and ecosystem value including, but not limited to coral reefs, surfing sites, fishponds, sand beaches, and coastal dunes when these resources will be unavoidably damaged by development; or requiring monetary compensation to the State for recreation when restoration is not feasible or desirable.

iii. Providing and managing adequate public access, consistent with conservation of natural resources, to and along shorelines with recreational value.

iv. Providing an adequate supply of shoreline parks and other recreational facilities suitable for public recreation.

v. Ensuring public recreational uses of county, state, and federally owned or controlled shoreline lands and waters having recreational value consistent with public safety standards and conservation of natural resources.

vi. Adopting water quality standards and regulating point and nonpoint sources of pollution to protect, and where feasible, restore the recreational value of coastal waters.

vii. Developing new shoreline recreational opportunities, where appropriate, such as artificial lagoons, artificial beaches, and artificial reefs for surfing and fishing.

viii. Encouraging reasonable dedication of shoreline areas with recreational value for public use as part of discretionary approvals or permits by the land use commission (LUC), board of land and natural resources, and county authorities; and crediting such dedication against the requirements of Section 46-6.

Discussion: The proposed project is not anticipated to adversely impact these recreational activities.

2. Historic Resources

Objective: Protect, preserve, and, where desirable, restore those natural and manmade historic and prehistoric resources in the CZM area that are significant in Hawaiian and American history and culture.

Policies:

a. Identify and analyze significant archaeological resources.

b. Maximize information retention through preservation of remains and artifacts or salvage operations.

c. Support state goals for protection, restoration, interpretation, and display of historic resources.

Discussion: Archaeological and cultural analysis have been completed as part of project planning and is included in Sections 2.4: Historic and Archaeological Resources and 2.5: Cultural Resources of this EA. The proposed project is not anticipated to adversely impact historic or cultural resources.

3. Scenic and Open Space Resources

Objective: Protect, preserve, and, where desirable, restore or improve the quality of coastal scenic and open space resources.

Policies:

a. Identify valued scenic resources in the CZM area.

b. Ensure that new developments are compatible with their visual environment by designing and locating those developments to minimize the alteration of natural landforms and existing public views to and along the shoreline.

c. Preserve, maintain, and, where desirable, improve and restore shoreline open space and scenic resources.

d. Encourage those developments that are not coastal dependent to locate in inland areas.

Discussion: The proposed project is not anticipated to adversely impact scenic and open space resources.

4. Coastal Ecosystems

Objective: Protect valuable coastal ecosystems, including reefs, beaches, and coastal dunes, from disruption and minimize adverse impacts on all coastal ecosystems.

Policies:

a. Exercise an overall conservation ethic, and practice stewardship in the protection, use, and development of marine and coastal resources.

b. Improve the technical basis for natural resource management.

c. Preserve valuable coastal ecosystems of significant biological or economic importance, including reefs, beaches, and dunes.

d. Minimize disruption or degradation of coastal water ecosystems by effective regulation of stream diversions, channelization, and similar land and water uses, recognizing competing water needs; and

e. Promote water quantity and quality planning and management practices that reflect the tolerance of fresh water and marine ecosystems and maintain and enhance water quality through the development and implementation of point and nonpoint source water pollution control measures.

Discussion: The project area is near the coastline, but the bridge crosses a steep ridge which will not have significant impacts to coastal ecosystems.

5. Economic Uses

Objective: Provide public or private facilities and improvements important to the State's economy in suitable locations.

Policies:

a. Concentrate coastal dependent development in appropriate areas.

b. Ensure that coastal dependent development and coastal related development are located, designed, and constructed to minimize exposure to coastal hazards and adverse social, visual, and environmental impacts in the CZM area.

c. Direct the location and expansion of coastal development to areas designated and used for that development and permit reasonable long-term growth at those areas, and permit coastal development outside of designated areas when:

i. Use of designated locations is not feasible.

ii. Adverse environmental effects and risks from coastal hazards are minimized.

iii. The development is important to the State's economy.

Discussion: The proposed project supports the objective above by providing additional and improved public facilities; a rehabilitated bridge. The project area is not coastal dependent and will have no adverse impacts on coastal ecosystems.

6. Coastal Hazards

Objective: Reduce hazard to life and property from coastal hazards.

Policies:

a. Develop and communicate adequate information about the risk of coastal hazards.

b. Control development, including planning and zoning control, in areas subject to coastal hazards.

c. Ensure that developments comply with requirements of the NFIP.

d. Prevent coastal flooding from inland projects.

Discussion: The project will not have immediate impacts on shorelines, reefs, and nearshore waters. The elevated bridge is not coastal dependent and will have no adverse impacts to coastal hazards.

7. Managing Development

Objective: Improve the development review process, communication, and public participation in the management of coastal resources and hazards.

Policies:

a. Use, implement, and enforce existing law effectively to the maximum extent possible in managing present and future coastal zone development.

b. Facilitate timely processing of applications for development permits and resolve overlapping or conflicting permit requirements.

c. Communicate the potential short and long-term impacts of proposed significant coastal developments early in their life cycle and in terms understandable to the public to facilitate public participation in the planning and review process.

Discussion: The proposed project will be reviewed and processed pursuant to Chapter 343, HRS and the Title 11, HAR, EIS Rules. As such, the proposed project will undergo public review during the EA preparation process.

8. Public Participation

Objective: Stimulate public awareness, education, and participation in coastal management.

Policies:

a. Promote public involvement in CZM processes.

b. Disseminate information on coastal management issues by means of educational materials, published reports, staff contact, and public workshops for persons and organizations concerned with coastal issues, developments, and government activities.

c. Organize workshops, policy dialogues, and site-specific mediations to respond to coastal issues and conflicts.

Discussion: Public review of the proposed project will be coordinated through the EA process.

9. Beach Protection

Objective:

a. Protect beaches and coastal dunes for:

i. Public use and recreation.

ii. The benefit of coastal ecosystem.

iii. Use as natural buffers against coastal hazards.

b. Coordinate and fund beach management and protection.

Policies:

a. Locate new structures inland from the shoreline setback to conserve open space, minimize interference with natural shoreline processes, and minimize loss of improvements due to erosion.

b. Prohibit construction of private shoreline hardening structures, including seawalls and revetments, at sites having sand beaches and at sites where shoreline hardening structures interfere with existing recreational and waterline activities.

c. Minimize the construction of public shoreline hardening structures, including seawalls and revetments at sites having sand beaches and at sites where shoreline hardening structures interfere with existing recreational and waterline activities.

d. Minimize grading of and damage to coastal dunes.

e. Prohibit private property owners from creating a public nuisance by inducing or cultivating the private property owner's vegetation in a beach transit corridor.

f. Prohibit private property owners from creating a public nuisance by allowing the private property owner's unmaintained vegetation to interfere or encroach upon a beach transit corridor.

Discussion: The proposed project will not adversely impact beach processes or recreational activities. BMPs will be carried out during construction. The project will not have immediate impacts on Shorelines, Reefs, and Nearshore Waters.

10. Marine Resources

Objective: Promote the protection, use, and development of marine and coastal resources to assure their sustainability.

Policies:

a. Ensure that the use and development of marine and coastal resources are ecologically and environmentally sound and economically beneficial.

b. Coordinate the management of marine and coastal resources and activities to improve effectiveness and efficiency.

c. Assert and articulate the interests of the State as a partner with federal agencies in the sound management of ocean resources within the U.S. exclusive economic zone.

d. Promote research, study, and understanding of ocean and coastal processes, impacts of climate change and sea level rise, marine life, and other ocean resources to acquire and inventory information necessary to understand how coastal development activities relate to and impact ocean and coastal resources.

e. Encourage research and development of new, innovative technologies for exploring, using, or protecting marine and coastal resources.

Discussion: Implementation of appropriate BMP's will occur during project implementation, which will minimize stormwater runoff impacts and protect marine resources.

In addition to the foregoing objectives and policies and pursuant to Act 224 (2005), permits will not be granted for projects that have artificial light from floodlights, uplights, or spotlights used for decorative or aesthetic purposes when the light:

Article I. Directly illuminates the shoreline and ocean waters, or

Article II. Is directed to travel across property boundaries toward the shoreline and ocean waters.

Further, this prohibition shall not apply to authorized users for government operations, security, public safety, or navigational needs, provided that a government agency or its authorized users shall make reasonable efforts to properly position or shield lights to minimize adverse impacts.

Discussion: The preliminary plans for the project will be designed to ensure that light fixtures, if needed, are shielded to comply with the dark sky lighting requirements and are not directed across property boundaries.

3.1.4 Hawaii Statewide Federal-Aid Highways 2035 Transportation Plan

In conjunction with the development of the HSTP 2035, the HDOT updated the Regional Long-Range Land Transportation Plans for the District of Hawaii using a future horizon year of 2035 and retitled it as the Federal-Aid Highways 2035 Transportation Plans for the District of Hawaii (HDOT 2014a, 2014b). While the HSTP discussed above has since been updated to reflect a 2045 horizon, the district plans have not yet been updated from the 2035 horizon. Nevertheless, the 2035 Hawaii District report found that Hawaii County prioritized the following transportation goals, such as:

- Improve capacity and system efficiency by addressing congestion;
- Maintain and improve safety for all modes;
- Expand and increase Hawaii's economic vitality through the efficient movement of people, goods, and services;
- Preserve and maintain the existing transportation system;
- Provide modal integration (complete streets) and improve transit service; and
- Support evacuation and emergency access/egress during incidents.

The report then identified system preservation and maintenance projects as one of the solutions to the County's transportation meeting the above goals, stating:

> *"Bridges are also important assets and can be critical infrastructures on the island. Multiple subprograms are in place to manage and maintain the island's bridge inventory. Bridge needs can arise when a specific facility is found to be structurally deficient, or when a bridge requires attention through its regular maintenance cycle. When bridge needs are identified, system preservation solutions are addressed through one of the specific subprograms that manage:*
>
> - *Bridge replacement*
> - *Rehabilitation*
> - *Preventative maintenance*
> - *Seismic retrofit*"

Discussion: The Proposed Action would ensure the continued safe, reliable operation of the transportation system. Additionally, the project would also serve as preventive measures to ensure the bridge's structural integrity in the event of an earthquake or tsunami.

3.2 County of Hawaii Plans

3.2.1 County of Hawaii General Plan 2005

The County General Plan (General Plan) is the policy document for Hawaii Island that guides long-range comprehensive development in a way that fosters healthy community vison and values.

The plan examines numerous study areas (economic, energy, environmental quality, flooding and natural hazards, historic sites, natural beauty, natural resources and shoreline, housing, public facilities, public utilities, recreation, transportation, and land use) and sets forth goals, policies, and specific actions within each study area. The General Plan was published in February 2005, and is currently being updated.

Relevant Hawaii County General Plan policies are listed below along with discussion and analysis.

TRANSPORTATION

GOALS

(a) Provide a system of roadways for the safe, efficient, and comfortable movement of people and goods.
(b) Provide an integrated State and County transportation system so that new major routes will complement and encourage proposed land policies.

POLICIES

(a) Encourage the programmed improvement of existing roadways by both public and private sectors.
(d) Support the development of programs to identify and improve hazardous and substandard sections of roadway and drainage problems.
(c) There shall be coordinated planning of federal, state, and county street systems to meet program goals of the other elements such as historic, recreational, environmental quality, and land use.

Discussion: The Proposed Action would rehabilitate Nanue Stream Bridge, which carries Hawaii Belt Road, a primary transportation arterial, and would allow the continued safe, efficient, and comfortable movement of people and goods. Additionally, HDOT is coordinating with the FHWA to ensure that its Proposed Action is aligned with other historic, environmental quality, and land use considerations at this site.

3.2.2 Hamakua Community Development Plan

The Hamakua Community Development Plan (County of Hawaii 2018) highlights the values, vision, and community objectives of the Hamakua Community using preliminary policy and recommended actions. Relevant Hamakua Community Development Plan policies and objectives are listed below along with discussion and analysis.

SECTION 5: STRENGTHEN INFRASTRUCTURE, FACILITIES, AND SERVICES

Community Objective 6: Develop and improve critical community infrastructure, including utilities, healthcare, emergency services, affordable housing, educational opportunities, and recreational facilities to keep our ohana safe, strong, and healthy.

Section 5.3, Policy 67 – Improve / replace substandard bridges in the Hamakua Planning Area

Discussion: The project would rehabilitate Nanue Stream Bridge, which is nearing the end of its useful life because of steel corrosion and scour conditions undermining its foundations.

Rehabilitating Nanue Stream Bridge to address these conditions would continue to provide a safe, reliable, transportation corridor for Hawaii County roadway users. The Nanue Stream Bridge carries Hawaii Belt Road, which is a primary arterial in the Hawaii County transportation network.

CHAPTER 4. COMMENTS AND COORDINATION

This chapter summarizes public and agency consultation and coordination activities associated with this project that have been conducted to date. Project pre-assessment consultation and coordination activities included meetings and correspondence with government agencies, and the affected communities.

4.1 Early Consultation

The following public outreach activities were conducted in support of the project's environmental review process.

Pre-Assessment and Early Consultation

Prior to initiation of the Draft EA in December 2023, scoping letters were sent to community stakeholders to request input on environmental concerns, solicit input on designs and alternatives, community outreach, and identify studies or issues for further study. A list of recipients is provided below and an asterisk appears next to those entities that responded to the letter. A copy of the responses is provided in Appendix A.

Letters:

- County of Hawaii Planning Department
- County of Hawaii Civil Defense Agency
- County of Hawaii Fire Department
- County of Hawaii Department of Environmental Management
- County of Hawaii Department of Parks and Recreation
- County of Hawaii Police Department*
- County of Hawaii Department of Research and Development
- County of Hawaii Department of Water Works / Water Supply
- County of Hawaii Department of Public Works
- County of Hawaii Department of Planning, Hawaii County Cultural Resources Commission
- Hawaiian Electric Company
- Hawaiian Telcom
- Spectrum
- Hawaii State Legislature, House District 1 – Representative Mark M. Nakashima
- Hawaii State Legislature, Senate District 4 – Senator Herbert M. Richards III
- Hawaii County Council, District 1 – Councilmember Heather L. Kimball
- Hakalau Neighborhood Watch

- National Trust for Historic Preservation
- Hamakua Community Development Plan Action Committee – Committee Member Desiree Moana Cruz
- Historic Hawaii Foundation
- Hamakua Community Development Plan Action Committee – Committee Member Nicolette Hubbard
- Hamakua Community Development Plan Action Committee – Committee Member Crystal Kua
- Hamakua Community Development Plan Action Committee – Committee Member Robert Nishimoto
- Hamakua Community Development Plan Action Committee – Committee Member Dr. Tawn Keeney
- Conservation of Biodiversity Program, Pacific Southwest Research Station – Richard Mackenzie – Research Ecologist,
- University of Hawaii at Hilo Tropical Conservation of Biology and Environmental Sciences Program – James Akau
- U.S. Army Corps of Engineers, Honolulu District, District Commander Lt. Col. Christopher (Ryan) Prevey
- United States Geological Survey (U.S.G.S.) Pacific Island Ecosystems Research Center, Kilauea Field Station, Center Director Gordon Tribble
- United States Coast Guard, Commander Fourteenth Coast Guard District, District Commander Rear Admiral Michael H. Day

Memos:

- Department of Land and Natural Resources
- Department of Land and Natural Resources, Commission on Water Resource Management*
- Department of Land and Natural Resources, State Historic Preservation Division
- Department of Land and Natural Resources, Hawaii Island Burial Council
- Department of Land and Natural Resources, Land Division – Hawaii District*
- Department of Land and Natural Resources, Aha Moku Advisory Committee
- Department of Land and Natural Resources, Division of Aquatic Resources
- Department of Land and Natural Resources, Division of Forestry and Wildlife
- Department of Hawaiian Homelands
- Office of Hawaiian Affairs
- Department of Health
- Department of Health, Clean Water Branch*

- Department of Health, Clean Air Branch
- Department of Health, Environmental Health Administration
- Department of Health, Hazard Evaluation and Emergency Response Office
- Department of Health, Safety Drinking Water Branch
- Department of Health, Solid and Hazardous Waste Branch*
- Department of Agriculture
- Department of Business, Economic Development, and Tourism
- Office of Planning and Sustainable Development*
- University of Hawaii, Environmental Center and Water Resources Research Center

Eight (8) responses were received in response to the request for pre-assessment consultation. A summary of the responses are provided in Appendix A.

4.2 Draft Environmental Assessment

The proposed project's Draft EA was published in the June 8, 2024 edition of The Environmental Notice, initiating the 30-day public comment period that concluded on July 7, 2024. A complete mailing list for the notice of availability of the Draft EA is presented in Appendix A-1, Environmental Assessment Coordination and Consultation. By the response deadline, HDOT received seven comment letters. See Appendix A-1, Draft Environmental Assessment Coordination and Consultation. HDOT summarized these comments and indicated where the comment was addressed in this EA. See Table 4-1: Summary of Draft Environmental Assessment Comments and Responses.

Public Meeting

No public meeting is scheduled or required as part of this project. The Draft EA was published in the Environmental Notice and had a 30-day public comment period complying with the public notification requirements.

Table 4-1: Summary of Draft Environmental Assessment Comments and Responses

Commentor	Comment	Response
Hawaiian Electric Company	Provided no objections to the project.	N/A
State of Hawaii DOH – Clean Air Branch	Thank you for addressing our comments regarding the fugitive dust in the DEA-AFNSI for Nanue Stream Bridge Rehabilitation Project. The Department of Health Clean Air Branch has no further comments on the subject DEA.	N/A
State of Hawaii DLNR – Land Division – Hawaii District	No comments or concerns expressed	N/A
State of Hawaii DLNR – Land Division	No comments or concerns expressed	N/A
State of Hawaii DLNR – Engineering Division	No comments or concerns expressed	N/A
State of Hawaii DLNR – Office of Conservation and Coastal Lands	At this time, it appears a CDUA is not required for the project. If the scope of the project changes, please consult with the OCCL.	N/A
State of Hawaii Office of Planning and Sustainable Development (OPSD)	1. The Draft EA adequately examined concerns related to climate change and sea level rise. 2. Please contact our office regarding the applicable rules, policies and procedures for CZMA federal consistency. 3. Include a complete evaluation of § 205A-2, the objectives and supporting policies of the Hawaii CZM Program.	Listing and discussion of the Hawaii CZM included in Section 3.1.3

4.3 Final Environmental Assessment

This Final EA will be announced in The Environmental Notice. A copy of the Final EA will also be sent to the State Documents Center.

4.4 Regulatory Coordination

Because the project would involve the use of federal funds through FHWA, the project must comply with certain federal environmental laws and regulations, as well as state regulatory requirements. The following coordination and consultation activities are being conducted to coordinate these compliance efforts. Appendix A includes documentation of the regulatory coordination.

4.4.1 Federal Coordination

The following federal permits and approvals have been or are being obtained to support the Proposed Action.

4.4.1.1 National Environmental Policy Act Categorical Exclusion

The NEPA process is required when a federal agency proposes to take a major federal action. These federal actions, which are defined at 40 CFR 1508.1, may be "categorically excluded" (CatEx) from a detailed environmental analysis when the federal action normally does not have a

significant effect on the human environment. FHWA has determined that a NEPA CatEx is appropriate for this Proposed Action under 23 CFR 771.117. The CatEx documentation for this project will be completed separately from this HRS Chapter 343 EA and will cite to the additional federal permits and approvals in progress for this Proposed Action.

4.4.1.2 Section 106 of the National Historic Preservation Act

The National Historic Preservation Act (NHPA) requires that actions that are federally funded, authorized, or implemented take into account the effect of such actions on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register of Historic Places (NRHP). Such resources are called historic properties. The Section 106 process involves coordination and consultation with the State Historic Preservation Officer (SHPO), and other agencies and organizations that have an interest in or is mandated to protect historic properties. In addition, the Advisory Council on Historic Preservation (ACHP) is afforded the opportunity to comment on actions that may adversely affect historic properties. At the State level, Hawaii Revised Statutes (HRS) Chapter 6E-8 (HRS 6E-8) places similar responsibilities on State agencies to evaluate their projects. Since the project is both a federal and State action, both regulations apply to the project.

The following consultation and coordination activities were conducted in fulfillment of Section 106. See Appendix A-2, Regulatory Coordination and Correspondence.

Letter dated December 20, 2023, from HDOT to SHPD to initiate Section 106 consultation, consult on the area of potential effects (APE), and request information on properties eligible for the NRHP from SHPO.

Letter dated March 13, 2024, from HDOT to Native Hawaiian Organizations (NHO), individuals and families with cultural and lineal ties to the project area, and knowledgeable stakeholders inviting them to participate in Section 106 consultation for the project. A list of recipients is noted in Appendix A.

Letter dated March 18, 2024, from HDOT to SHPD with the revised APE letter (via HICRIS).

Letter dated April 18, 2024, from SHPD to HDOT. SHPO has no objections to the revised APE.

Due to the sensitivity of information contained in some of the letters, these correspondences are not included in the Appendix.

It is anticipated that the project will result in a "No Adverse Effect" since the proposed action is Historic Rehabilitation as described in this EA.

4.4.1.3 Section 7 of the Endangered Species Act

Section 7 of the ESA requires that federally funded actions not jeopardize any species listed as threatened or endangered, or adversely modify designated critical habitat. The following consultation and coordination activities have been conducted to date with the USFWS and NOAA NMFS pursuant to Section 7. See Appendix A-2, Regulatory Coordination and Correspondence.

- USFWS Section 7 Correspondence
    - August 29, 2023USFWS letter generated by the online Information for Planning and Consultation (IPaC) system, which provided a list of threatened and

endangered species that may occur in the project area or may be affected by the Proposed Action (Project Code: 2023-0123168).

- August 29, 2023: FHWA effect determination letter to USFWS Pacific Islands Fish and Wildlife Office (PIFWO) requesting concurrence that the project "may affect, but is not likely to adversely affect" federally listed species in the project area.
- December 15, 2023: USFWS concurred that the Proposed Action "may affect but are not likely to adversely affect" the Hawaiian hoary bat, Hawaiian goose, Hawaiian stilt, Hawaiian coot, Hawaiian gallinule, Hawaiian duck, Hawaiian petrel, Hawaii DPS of the band-rumped storm petrel, Newell's shearwater, green sea turtle, and four federally listed plant species. The USFWS also requested to be informed of the type of Army Corps permit that the project would be obtaining to comply with CWA, Section 404

- NMFS Section 7 Correspondence
  - July 21, 2023: Letter from HDOT to NOAA NMFS Pacific Island Regional Office (PIRO) requesting a list of threatened and endangered species and critical habitats within the vicinity of the project to enable an appropriate determination for this project under Section 7 of the ESA.
  - September 21, 2023: FHWA determined that the proposed project meets all requirements of the HI-waySLOPES and that the proposed ion is not likely to adversely affect species listed under the ESA or their designated critical habitat administered by the NMFS. The FHWA requested concurrence from NMFS with this determination.
  - September 29, 2023: NMFS concurred with the FHWA determination that the proposed project is consistent with HI-waySLOPES, as described. The project may affect but is not likely to affect the Central North Pacific green sea turtle, hawksbill sea turtle, and the Hawaiian monk seal, and that there would be no destruction or adverse modification to Hawaiian monk seal critical habitat.

4.4.1.4 Migratory Bird Treaty Act

The MBTA implements four international conservation treaties that the U.S. entered into with Canada, Mexico, Japan, and Russia. It is intended to ensure the sustainability of populations of all protected migratory bird species. The MBTA prohibits the take (including killing, capturing, selling, trading, and transport) of protected migratory bird species without prior authorization by the USFWS.

As stated in the FHWA effect determination letter to USFWS (dated September 25, 2023), the IPaC list dated September 21, 2023, did not identify any migratory birds of conservation concern pursuant to the MBTA.

4.4.1.5 Magnuson-Stevens Fishery Conservation and Management Act (Essential Fish Habitat)

The Magnuson-Stevens Fishery Conservation and Management Act (16 United States Code [USC] 1801), as amended, requires agencies which fund, permit, or undertake activities that may

adversely affect EFH to consult with NMFS/PIRO regarding the potential effects of their actions on EFH and respond to NMFS recommendations. EFH are defined as "those waters and substrate necessary to fish for spawning breeding, feeding, and/or growth to maturity," including open water, wetlands, coral reefs, and submerged structures associated with federally managed fish species. Actions outside EFH, such as upstream/upslope activities, must also be reviewed. An adverse effect is defined as any impact that reduces quality or quantity of EFH, including direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, species and their habitat, and other ecosystem components.

Coastal waters including the water column and the bottom of the Pacific Ocean around all islands of Hawaii are designated as EFH that support various life stages for MUS identified under the Western Pacific Fishery Management Council's Pelagic and Hawaii Archipelago Fishery Ecosystem Plans. According to NMFS, the MUS and life stages found in these waters include eggs, larvae, juveniles, and adults of Bottomfish, Crustacean, and Pelagic MUS. Specific types of habitats considered as EFH include coral reef, patch reefs, hard substrates, artificial substrates, seagrass beds, soft substrates, lagoons, estuaries, surge zones, deep-slope terraces, and pelagic/open oceans. The potential environmental stressors of concern related to this project include sedimentation and turbidity, and the introduction of chemical contaminants and nutrients. Increased sedimentation and turbidity can cause smothering of benthic species and block sunlight necessary for species that rely on photosynthesis. Heavy metals, which is the main contaminant of concern for this project (lead), are known to bioaccumulate.

The following coordination activities were conducted with the NMFS/PIRO regarding EFH consultation:

- September 5, 2023: FHWA, on behalf of HDOT, requested EFH consultation with NMFS.
- September 11, 2023: NMFS responded in an email suggesting incorporating certain BMPs for the work and stated that NMFS will not provide additional conservation recommendations for this project, thus satisfying the requirements of Section 305(b)(D)(2) of the Magnuson-Stevens Act.

4.4.1.6 U.S. Army Corps of Engineers, Department of Army Permit

The USACE Regulatory Program regulates discharges of dredged or fill material into waters of the United States and structures or work in navigable waters of the United States, under Section 404 of the CWA and Section 10 of the Rivers and Harbors Act of 1899. Such in-water activities require a DA permit from the USACE.

Section 404 of the CWA regulates discharge of dredge and fill material in the waters of the U.S., including wetlands. Because the project requires in-water work resulting in discharges regulated under Section 404, it requires an NWP that authorizes categories of activities meeting certain permit conditions. Section 401 of the CWA separately directs states to establish WQC programs. In Hawaii, the Section 401 WQC is administered by the HDOH Clean Water Branch. A blanket Section 401 WQC coverage is anticipated with the NWP.

RHA requires the Secretary of the Army (via the USACE) to administer a regulatory permit program to protect navigable and tidally influenced waters in the development of harbors and other construction and excavation. Section 10 of the RHA (33 USC Sec. 403) requires authorization

from the USACE prior to construction of any structure in or over any navigable water of the U.S. Even if a structure or work on the structure is outside the limits defined for navigable waters of the U.S., a Section 10 permit may still be required if the structure or work affects the course, location, or condition of the water body. It is anticipated that this project will require a Section 10 permit from the USACE.

HDOT will coordinate with the USACE to confirm the proposed in-water work is covered by one or more NWPs. Upon review of a project, the USACE issues a verification letter pursuant to the applicable NWP(s). Some activities authorized by NWPs require preparation of a preconstruction notification to the District Engineer to ensure that activities authorized by these NWPs have minimal individual and cumulative adverse impacts on the aquatic environment.
The following consultation and coordination activities were conducted with the U.S. Fish and Wildlife Service (USFWS) pursuant to Section 7 and to support compliance with HRS Chapter 195D.

4.4.1.7 U.S. Coast Guard Bridge Permit Exception

The U.S. Coast Guard regulates the construction, reconstruction, rehabilitation, or replacement of bridges over navigable waterways in the United States. The U.S. Coast Guard regulates work on bridges to ensure waterways remain navigable within reason. Projects intending to modify or construct a bridge over a navigable waterway must apply for a U.S. Coast Guard bridge permit. Any work on a bridge over a tidal waterway in which the waterway is not used or susceptible to use for interstate or foreign commerce and the boats using the waterway are less than 21 feet in length may be subject to exception under 23 USC § 144(c)(2).

The project bridge is over a tidal waterway used only by recreational vessels. FHWA, on behalf of HDOT, is consulting with the U.S. Coast Guard regarding permit exception.

4.4.2 State and Local Coordination

In addition to the requirements of HRS Chapter 343 which are fulfilled by this current EA, the following State and local permits and approvals will be obtained for the Proposed Action.

4.4.2.1 Hawaii Revised Statutes Chapter 6E-8

Similar to NHPA Section 106 described above, HRS Chapter 6E-8 requires State and local agencies to evaluate the impact of their projects on historic properties. The AIS prepared to support the NHPA Section 106 consultation will also be used to support the HRS 6E-8 review. See Appendix C, Archaeological Study.

Pursuant to HRS Chapter 6E-8, HDOT will provide its preliminary assessments of potential impacts to archaeological historic properties to SHPD. The anticipated impacts on historic properties described in this EA are preliminary findings intended to fulfill the impact disclosure requirements of HRS Chapter 343. SHPD is expected to conduct its HRS Chapter 6E-8 review responsibilities separate from the requirements of HRS Chapter 343.

The HRS Chapter 6E-8 review process with the SHPD has not yet been completed. Therefore, the significance evaluations, potential impacts, and treatment recommendations presented below should be considered as preliminary findings only. SHPD is expected to conduct its HRS Chapter 6E-8 review responsibilities in conjunction with their Section 106 responsibilities, separate from

the requirements of HRS Chapter 343. Nonetheless, the anticipated impacts described in this EA are intended to fulfill the impact disclosure requirements of HRS Chapter 343.

4.4.2.2 Hawaii Revised Statutes Chapter 195D

HRS Chapter 195D, the State counterpart law to the federal ESA, provides for the protection of aquatic life, wildlife, or land plant species that are indigenous to Hawaii. The following coordination was conducted with the DLNR in accordance with HRS Chapter 195D:

- HDOT sent a consultation letter to the Department of Land and Natural Resources (DLNR) Division of Aquatic Resources (DAR) requesting information on a) threatened and endangered species that may be present in or pass through the project area, b) the presence of identified critical habitat, and c) any other input or concerns regarding the project.
- HDOT sent a consultation letter to DLNR's Division of Forestry and Wildlife (DOFAW) requesting information on a) threatened and endangered species that may be present in or pass through the project area, b) the presence of identified critical habitat, and c) any other input or concerns regarding the project.
- Letter dated November 6, 2023, from DLNR's DOFAW to HDOT identifying protected species (Hawaiian hoary bat, Hawaiian hawk, and Blackburn's sphinx moth as potentially occurring in the project vicinity, as well as potential impacts to seabirds from artificial lighting. DOFAW's consultation also stated that the endemic pueo or Hawaiian Short-Eared Owl (*Asio flammeus sandwichensis)* could potentially nest in the project area.

4.4.2.3 Conservation District

The use of Conservation District lands is regulated by HAR Title 13 Chapter 5 and HRS Chapter 183C. These rules and regulations identify land uses that may be allowed by discretionary permit as well as impose fines for violations. The Conservation District has five subzones: Protective, Limited, Resource, General, and Special. The first four subzones are arranged in a hierarchy of environmental sensitivity, ranging from the most environmentally sensitive (Protective) to least sensitive (General). The Special subzones defines a unique land use on a specific site.

The project area is in the Conservation District, Limited Subzone. CDUA coordination is in process and will be completed before the EA FONSI acceptance.

4.4.2.4 Coastal Zone Management Act

In 1972, the U.S. Congress enacted the federal Coastal Zone Management Act (CZMA) to ensure that federal actions (including activities performed by a nonfederal entity requiring federal permits, licenses, or other form of federal authorization) within or outside the coastal zone that affects any land or water use or natural resource of the coastal zone are carried out in a manner that is consistent, to the maximum extent practicable, with the enforceable policies of approved state management programs. Each federal agency carrying out or permitting an activity subject to the Act will provide a consistency determination to the relevant state agency designated under Section 1455(d)(6) of this title at the earliest practicable time.

OPSD administers HRS Chapter 205A, the state's CZM law, pursuant to the federal CZMA. Hawaii's coastal zone includes the waters from the shoreline to the makai limit of the State's

jurisdiction and all lands excluding those lands designated as forest reserves. As a result, the project is within the CZM area and is subject to consistency with the objectives and policies of the Hawaii CZM Program. The purpose of HRS Chapter 205A is to "provide for the effective management, beneficial use, protection, and development of the Coastal Zone." In addition, in-water work is anticipated for this project. As a result, the USACE is being consulted for an NWP.

4.4.2.5 Special Management Area

In establishing the SMA in 1975, the Hawaii state legislature found that:

"it is the state policy to preserve, protect, and where possible, to restore the natural resources of the coastal zone of Hawaii,"

and, therefore, that

"special controls on developments within an area along the shoreline are necessary to avoid permanent losses of valuable resources and the foreclosure of management options, and to ensure that adequate access, by dedication or other means, to public owned or used beaches, recreation areas, and natural reserves is provided." (Hawaii Revised Statutes, Chapter 205A, Part II)

County authorities administer SMA permits and related shoreline setback provisions. The authority in Hawaii County is the County Planning Department.

An SMA determination was processed with the County of Hawaii Planning Department in January 2024. At that time, the staging area was all within the HDOT ROW. The County made the determination that the HRS Chapter 205-A-22 states that "development" does not include:

Repair or maintenance of roads and highways within existing rights-of-way.

The project area was amended following this determination and a 2nd consultation was conducted with the County. The County stated that due to the changes in the project that now includes staging of materials on a private parcel outside the ROW, an SMA Assessment is required. The contractor will make the decision if all staging can occur within the HDOT ROW or on the private property shown on the existing maps. If staging is conducted on the private property, the contractor will process the SMA Assessment to comply with the County requirements and determination.

4.4.2.6 Hawaii Act 50, Cultural Practices

Hawaii Act 50 (approved in 2000) sought to "promote and protect cultural beliefs, practices, and resources of Native Hawaiians and other ethnic groups" and requires the proposing agency/applicant under Chapter 343 HRS to consider cultural practices in a CIA. HDOT completed a CIA in compliance with this Act. See Appendix D, Cultural Impact Assessment.

4.4.2.7 National Pollutant Discharge Elimination System Permit

Section 402 of the CWA requires an NPDES permit for point source discharges, including storm water discharges associated with construction activities. The permit is mandatory for construction activities that disturb one or more acres and discharge storm water from the project site to waters of the U.S. The project is expected to require an NPDES permit from HDOH.

4.4.2.8 Stream Channel Alteration Permit

The Hawaii CWRM requires a SCAP for any work within a stream that may "obstruct, diminish, destroy, modify, or relocate a stream channel; change the direction of flow of water in a stream channel; place any materials or structures in a stream channel; or remove any material or structure from a stream channel." The project is anticipated to require a SCAP because of the proposed in-stream work. HDOT will submit an RFD to CWRM upon completion of this HRS Chapter 343 EA process to initiate the SCAP review.

4.4.2.9 Solid Waste Management Plan

The County DEM requires a solid waste management plan be completed for any project that requires the preparation of an EA. A solid waste management plan should describe any waste that may be generated by a project, how waste will be organized on site, means and location of disposal, and any impacts on County-operated waste management facilities. As stated in Chapter 1, HDOT will prepare and submit a solid waste management plan for this project to the County DEM prior to disposal of any soil or vegetation.

CHAPTER 5. FINDING OF NO SIGNIFICANT IMPACT

In accordance with HRS Chapter 343 and Hawaii Administrative Rules (HAR), Section 11-200.1-19, HDOT is issuing a Finding of No Significant Impact (FONSI) for the proposed project. This assessment is based on an evaluation of project impacts in relation to the "Significance Criteria" specified in HAR 11-200.1-13. The Significance Criteria appear below in italics, followed by a discussion of the project in relation to the specific criterion. The nature of the project's potential impacts, and committed mitigation measures is discussed in detail in Chapter 2.

1. *Irrevocably commit a natural, cultural, or historic resource* – The proposed project involves rehabilitation of the existing Nanue Stream Bridge which is eligible for the NRHP. The Section 106 consultation is completed and a "No adverse effect" determination was granted for the proposed action. The proposed project would not cause any loss or destruction of natural or cultural resources. HRS Chapter 6E consultation is also completed. Appendix A includes the effect determination concurrence letters from SHPD dated May 28, 2024 for both consultations. See Sections 2.4 Historic and Archaeological Resources, 2.5 Cultural Resources, and 2.6 Biological Resources for details. As the potential for effect or impairment of cultural resources (including practices) is negligible, no action is required to protect Native Hawaiian rights. Nonetheless, best management practices should be implemented to ensure that no unanticipated affects to cultural resources occur and that there is a mechanism in place for practitioners to report any such potential occurrences to the project. There will be future collaboration and consultation with the CRC.

   HDOT has consulted with the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, and State of Hawaii Department of Land and Natural Resources, among other interested parties, to identify avoidance, minimization, and mitigation measures to protect species of concern. See Section 2.6 Biological Resources for details.

2. *Curtails the range of beneficial uses of the environment* – The proposed project will not curtail beneficial uses of the environment. On the contrary, the project would enhance the existing transportation environment for all users in the area. The bridge rehabilitation and repairs would provide a safer experience for all users.

3. *Conflicts with the State's environmental policies or long-term environmental goals established by law* – The proposed project is consistent with the environmental goals and objectives of the State of Hawaii, as demonstrated in this EA.

4. *Have a substantial adverse effect on the economic welfare, social welfare, and cultural practices of the community or State* – The proposed project would not have an adverse effect on the economic or social welfare nor the cultural practices of the community or State. Rather, the project would support the social welfare of the community by providing a safer transportation system through bridge rehabilitation.

5. *Have a substantial adverse effect on public health* – The proposed project would not adversely affect public health.

6. *Involve adverse secondary impacts, such as population changes or effects on public facilities* – The proposed project is not expected to cause secondary impacts as it does not increase any roadway capacity. The project is not anticipated to induce development of the area or lead to population growth as a direct result of its construction.

7. *Involve a substantial degradation of environmental quality* – The proposed project would not result in a substantial degradation of environmental quality. The project will not result in adverse environmental conditions, as demonstrated in Chapter 2.

8. *Be individually limited but cumulatively have substantial adverse effect upon the environment or involves a commitment for larger actions* –The proposed project is a complete, independent project and would not result in commitments to other projects, nor would it result in cumulative, considerable impacts on the environment.

9. *Have a substantial adverse effect on a rare, threatened, or endangered species or its habitat* –The project would not adversely affect any species of concern or associated habitat; see Section 2.6. General mitigation measures will be implemented during construction so as to not cause any adverse impacts to the area.

10. *Have a substantial adverse effect on air or water quality or ambient noise levels* – The proposed project would not lead to any violations of State or National Ambient Air Quality Standards. The project would comply with State of Hawaii environmental regulations and standards. For in-water work, BMPs that have been either pre-approved or coordinated with regulatory agencies, as described in An Integrated Storm Water Management Approach and a Summary of Clear Water Diversion and Isolation Best Management Practices for Use in the State of Hawaii, will be utilized to minimize the potential for water quality impacts to the stream. The Construction BMP Manual will also be utilized and implemented. While there would be short-term construction noise impacts, overall no long-term adverse noise impacts are anticipated due to the proposed project. Prior to commencement of the detailed engineering design, the design consultant or HDOT project manager shall complete and submit to HWY-DH the Permanent BMP Checklist and Project Record (Checklist). The Checklist shall be submitted for all contract projects regardless of whether or not the project is exempt.

11. *Have a substantial adverse effect on or be likely to suffer damage by being located in an environmentally sensitive area such as a floodplain, tsunami zone, sea level rise exposure area, beach, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters* – The proposed project is not located in an environmentally-sensitive area. The project will be designed considering the impacts to Nanue Stream due to the rehabilitation of Nanue Stream Bridge.

12. *Have a substantial adverse effect on scenic vistas and viewplanes, during day or night, identified in county or state plans or studies* – The proposed project is the rehabilitation of an existing bridge and the removal of lead contaminated soil near the bridge that would not affect any identified views / vistas. Input from the community will continue to inform the project's final design to ensure that the bridge fits within the geographical context.

13. *Require substantial energy consumption or emit substantial greenhouse gases* – The proposed project would not result in substantial energy consumption. There may be a short-term increase in energy consumption during the project's construction; however, it could be offset by the project's long-term benefits as the rehabilitated bridge benefits are anticipated to help traffic flow more efficiently.

CHAPTER 6. REFERENCES

County of Hawaii. *Hāmākua Community Development Plan (Ordinance No. 2018-78).* August 2018.

County of Hawaii, Planning Department. *General Plan*. Accessed August 2022. https://www.planning.hawaiicounty.gov/general-plan-community-planning/gp

County of Hawaii, Planning Department. *General Plan 2040: August 2019 Draft*. August 2019.

EnviroQuest Inc. 2024. Remedial Alternatives Analysis Report for Lead-Impacted Soil at Nanue Bridge, Ninole, Hawaii. Prepared for Hawaii Department of Transportation and KSF Inc. June 2024.

Hawaii Life: Real Estate Brokers. *When Sugar Was King – The Heyday of the Hamakua Coast*. January 1, 2020. https://www.hawaiilife.com/blog/sugar-king-heyday-hamakua-coast/

Hawaii Statewide GIS Program. *Ahupuaa (shapefile*). November 2021.

Hawaii Statewide GIS Program. *ALISH Map.*

Hawaii Stream Assessment. *A Preliminary Appraisal of Hawaii's Stream Resources. A Cooperative Project*. The State of Hawaii Commission on Water Resource Management and the National Park Service Rivers and Trails Conservation Assistance Program. Prepared for the State of Hawaii Commission on Water Resource Management. Prepared by the Hawaii Cooperative Park Service Unit; the Western Region Natural Resources and Research Division and the National Park Service. December 1990.

Hawaii Tourism Authority. The Hawaiian Islands. Hamakua Coast. Accessed August 2022. https://www.gohawaii.com/islands/hawaii-big-island/regions/hamakua-coast

National Park Service, Western Region Natural Resources and Research Division, Hawaii Cooperative Park Service Unit. *Hawaii Stream Assessment*. December 1990.

State of Hawaii, Department of Health, Clean Water Branch. *2018 State of Hawaii Water Quality Monitoring and Assessment Report: Integrated Report to the U.S. Environmental Protection Agency and the U.S. Congress; Pursuant to Chapter 303(d) and Chapter 305(d), Clean Water Act (P.L. 97-117)*. July 11, 2018.

State of Hawaii, Department of Health, Hazard Evaluation and Emergency Response Office (HEER Office). *Lead in Hawaiian Soils: Questions and Answers*. January 2017.

State of Hawaii, Department of Transportation. *Hakalau Stream Bridge Rehabilitation, Draft Environmental Assessment.* April 2024.

State of Hawaii, Department of Transportation, Highways Division. *Statewide Federal-Aid Highways 2035 Transportation Plan*. July 2014.

State of Hawaii, Office of Planning. *Hawaii 2050 Sustainability Plan: Charting a Course for the Decade of Action (2020 – 2030).*

State of Hawaii, Office of Planning and Sustainable Development. *Various Maps*. Accessed August 2022. https://planning.hawaii.gov/gis/various-maps/

United States Census Bureau. *DP05: ACS Demographic and Housing Estimates*. Accessed August 2022. https://data.census.gov/cedsci/

United States Census Bureau. *P1: Total Population*. Accessed August 2022. https://data.census.gov/cedsci/

United States Census Bureau. *S1901: Income in the Past 12 Months (In 202 Inflation-Adjusted Dollars)*. Accessed August 2022. https://data.census.gov/cedsci/

United States Geological Survey, Hawaii Volcano Observatory. *About Earthquakes in Hawaii*. 2017. https://volcanoes.usgs.gov/observatories/hvo/about_earthquakes.html

United States Geological Survey. *National Water Information System: Web Interface*. Hydrological Unit 20010000. Accessed August 2022. https://waterdata.usgs.gov/nwis/inventory/

University of California, Agriculture and Natural Resources. *SoilWeb*. Accessed August 2020. https://casoilresource.lawr.ucdavis.edu/gmap/

APPENDIX A
PRE-DRAFT ENVIRONMENTAL ASSESSMENT COORDINATION AND CONSULTATION, REGULATORY COORDINATION AND CORRESPONDENCE

Appendix A-1
Pre-Draft Environmental Assessment Coordination and Consultation

JOSH GREEN, M.D.
GOVERNOR
KE KIAʻĀINA

DESIGN BRANCH, ROOM 688A
BRIDGE DESIGN SECTION, ROOM 611
CADASTRAL DESIGN SECTION, ROOM 600
ENVIRONMENTAL DESIGN SECTION, ROOM 688A
HIGHWAY DESIGN SECTION, ROOM 609
HYDRAULIC DESIGN SECTION, ROOM 636
TECHNICAL DESIGN SECTION, ROOM 688

EDWIN H. SNIFFEN
DIRECTOR
KA LUNA HOʻOKELE

Deputy Directors
Nā Hope Luna Hoʻokele
DREANALEE K. KALILI
TAMMY L. LEE
ROBIN K. SHISHIDO

STATE OF HAWAIʻI | KA MOKUʻĀINA ʻO HAWAIʻI
DEPARTMENT OF TRANSPORTATION | KA ʻOIHANA ALAKAU
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

IN REPLY REFER TO:

HWY-DD 2.2318

December 13, 2023

Addressee
Address 1
Address 2
City, State Zip

Subject: Pre-Consultation for Draft Environmental Assessment (EA)
Hawaii Belt Road, Nanue Stream Bridge Rehabilitation Project
District of North Hilo, Island of Hawaii
Road Right-of-Way: (3) 3-2-001
Federal-Aid Project No. BR-019-2(077)

Dear Addressee:

The State of Hawaii Department of Transportation (HDOT) is conducting an environmental review to examine the impacts of the project to improve the Nanue Stream Bridge on the island of Hawaii. HDOT is preparing an EA in compliance with the Hawaii Revised Statutes Chapter 343, Hawaii's environmental impact statement law, to evaluate and disclose the project's potential environmental impacts and identify any potential permitting requirements. At this time, HDOT is seeking input on the project information provided below, as well as information related to any environmental, social, or economic concerns related to the project or project area.

The Federal Highway Administration intends to fund the bridge project and therefore is considered a federal action, triggering federal requirements including the National Environmental Policy Act (NEPA), 42 United States Code 4332(2)(c). To comply with NEPA, preparation for environmental documentation to be consistent with the findings of this EA is being done.

Existing Condition Information:

The bridge was constructed in 1952 and carries Hawaii Belt Road over the Nanue Stream at milepost 18.5. The bridge's coordinates are 19°55'38.56"N, 155° 9'23.47"W. The project area is bordered by: Tax Map Keys 3-2-1:008; 3-2-1:001 (makai) and 3-2-1:007; 3-2-1:010; 3-2-1:011; 3-2-1:017 (mauka). Refer to the attached project location map.

Overview

The proposed action is to rehabilitate the bridge to allow continued unrestricted operation of the bridge and provide resilience to extreme natural events as the bridge does not meet the current American Association of State Highway and Transportation Officials' standards. Work includes repairing corroded and section loss areas of the superstructure and replacement of the substructure using bolted in-kind materials, addressing scour deficiencies for the bridge foundations, upgrading bridge railings, and addressing other significantly deteriorated bridge elements.

There will be no bypass road planned for this project as the bridge construction will be completed in phases to maintain traffic flow. Temporary work and permanent improvements are all within HDOT right-of-way. Nightwork is not anticipated for this project.

Request for Input

HDOT is reaching out to you as well as other City, State, Federal agencies, and the surrounding community to gather project input. We request comments and input regarding environmental concerns in all resources areas as well as design concerns that might help us to evaluate the project. Also, if relevant, we would like to know if you have any recent or upcoming projects planned in the area, or if there are any specific permitting issues or considerations that you would like to bring to our attention.

You may email or mail any additional comments to:

Ms. Amy Sunahara, HDOT Project Manager
State of Hawaii, Department of Transportation
601 Kamokila Boulevard, Room 609
Kapolei, Hawaii 96707
amy.my.sunahara@hawaii.gov

If you have any questions or concerns, please contact our Project Manager, Ms. Amy Sunahara, at (808) 692-8431, from our Design Branch, Highways Design Section or by email at amy.my.sunahara@hawaii.gov.

Sincerely,

Henry Kennedy

HENRY KENNEDY
Engineering Program Manager
Design Branch

Enclosure

STATE OF HAWAIʻI
OFFICE OF PLANNING
& SUSTAINABLE DEVELOPMENT

JOSH GREEN, M.D.
GOVERNOR

SYLVIA LUKE
LT. GOVERNOR

MARY ALICE EVANS
INTERIM DIRECTOR

235 South Beretania Street, 6th Floor, Honolulu, Hawaiʻi 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaiʻi 96804

Telephone: (808) 587-2846
Fax: (808) 587-2824
Web: https://planning.hawaii.gov/

DTS202312261024NA

Coastal Zone Management Program

Environmental Review Program

Land Use Commission

Land Use Division

Special Plans Branch

State Transit-Oriented Development

Statewide Geographic Information System

Statewide Sustainability Program

January 30, 2024

To: Edwin Sniffin, Director
State of Hawaiʻi Department of Transportation

From: Mary Alice Evans, Interim Director
Office of Planning and Sustainable Development

Attention: Amy Sunahara, Project Manager
Design Branch, Highways Design Section

Subject: Pre-Consultation for Draft Environmental Assessment Hawaiʻi Belt Road, Nanue Stream Bridge Rehabilitation Project, District of North Hilo, Island of Hawaiʻi, Federal-Aid Project No. BR-019-2(077)
Tax Map Key: (3) 3-2-001

Thank you for the opportunity to provide comments on your pre-consultation request for the proposed Hawaiʻi Belt Road, Nanue Stream Bridge Rehabilitation, Project. The review material was received by our office via memo dated December 13, 2023.

It is our understanding that the State of Hawaiʻi Department of Transportation (HDOT) proposes to rehabilitate the Nanue Stream bridge to allow continued unrestricted operation of the bridge and provide resilience to extreme natural events. The bridge does not meet the current American Association of State Highway and Transportation Officials' standards. The proposed action includes repairing corroded and section loss areas of the superstructure and replacement of the substructure using bolted in-kind materials. The action also calls for addressing scour deficiencies for the bridge foundations, upgrading bridge railings, and other deteriorated bridge areas.

There will be no bypass road planned for this project as the bridge construction will be completed in phases to maintain traffic flow. Temporary work and permanent improvements are all within a HDOT right-of-way.

The Office of Planning and Sustainable Development (OPSD) has reviewed the submitted material and has the following comments to offer:

1. Coastal Zone Management Act (CZMA), Federal Consistency
We note that the review material states that the U.S. Department of Transportation, Federal Highway Administration (FHWA) intends to fund

this bridge improvement project. Therefore, this project may be subject to CZMA federal consistency. Additionally, due to the project area's proximity to Nanue Stream, the project may be subject to federal permits or approvals such as a Department of the Army (DA) permit. The DA permit may also trigger CZMA federal consistency.

OPSD is the lead state agency with the authority to conduct CZMA federal consistency determinations. We recommend that HDOT consult with our office on the applicability of CZMA federal consistency.

2. Hawai‘i Coastal Zone Management (CZM) Program

The CZM area is defined as "all lands of the State and the area extending seaward from the shoreline to the limit of the State's police power and management authority, including the U.S. territorial sea" under Hawai‘i Revised Statutes (HRS) § 205A-1.

Pursuant to HRS § 205A-4, in implementing the objectives of the CZM program, agencies shall consider ecological, cultural, historic, esthetic, recreational, scenic, open space values, coastal hazards, and economic development. As the proposed action is being submitted by HDOT, the Draft Environmental Assessment (Draft EA) should include a discussion on the project's consistency with the policies of the Hawai‘i CZM Program, HRS § 205A-2, as amended.

Furthermore, the objectives and supporting policies of the Hawai‘i CZM Program serve as the foundation of the enforceable policies of the State of Hawai‘i. Analysis within the Draft EA can be used as support material for a CZMA federal consistency submittal. Furthermore, disclosure of impacts on CZM objectives and supporting policies as it relates to HRS Chapter 343 requirements, will aid the State in determining impacts to the resources of the coastal zone, and mitigation measures on lands involved for this proposed action.

3. Special Management Area (SMA) Use Permitting

We note sections of the Hawai‘i Belt Road, along the north shore of Hawaii Island, frequently constitutes the outermost boundary of the SMA as delineated by the County of Hawaii (CoH). We recommend that the CoH, Planning Department be consulted on the applicability of SMA Use permitting.

4. Stormwater Runoff, Erosion, and Water Resources

Pursuant to Hawaii Administrative Rules (HAR) § 11-200.1-18(d)(7) – identification and analysis of impacts and alternatives considered; to ensure that nearshore marine resources along the coastal areas of the Hamakua coastline of Hawai‘i Island remain protected, the negative effects of stormwater inundation and sediment loading surrounding the proposed project site, ensuing from bridge and roadway improvements during the construction and operational phase should be evaluated.

Issues that may be examined include, but are not limited to, project site characteristics in relation to flood and erosion prone areas, vulnerability of the nearshore environment any increase in volume or flow rate of stormwater runoff. Developing mitigation measures for the protection for surface water resources and the coastal ecosystem should take this into account, pursuant to HAR § 11-200.1-18(d)(8).

5. Climate Change Adaptation/Sea Level Rise (SLR)

Pursuant to HAR § 11-200.1-13(11) – Significance Criteria on SLR exposure areas; the bridge location is located within close proximity to the Hamakua coastline of Hawai‘i Island. We acknowledge that the project area is situated in higher elevation and likely outside of this exposure risk area. Nonetheless, the roadway approaches connecting the bridge to roadway network of Hawai‘i Island may still be vulnerable to the effects of SLR. These threats include coastal erosion, storm surge, and flooding. To assess the vulnerability of the project to SLR, the Draft EA would benefit from evaluating the susceptibility of connecting roadways. We suggest the Draft EA refer to the findings of the Hawai‘i Sea Level Rise Vulnerability and Adaptation Report 2017, accepted by the Hawai‘i Climate Change Mitigation and Adaptation Commission.

The Report, and Hawaii Sea Level Rise Viewer at https://www.pacioos.hawaii.edu/shoreline/slr-hawaii/ identifies a 3.2-foot SLR exposure area across the main Hawaiian Islands, as a starting evaluation point. The Draft EA should provide a map of 3.2-foot SLR exposure area in relation to the project area, and consider site-specific mitigation measures, setbacks from the shoreline or relocation options further inland or various climate change adaptation strategies that respond to impacts of 3.2-foot SLR or greater.

If you wish to respond to this comment letter, please include DTS202312261024NA in the subject line. Any questions regarding this on EA concerns, please contact Joshua Hekekia on at (808) 587-2845 or by email to Joshua.K.Hekeia@hawaii.gov; or Debra Mendes on federal consistency matters at (808) 587-2840 or by email to Debra.L.Mendes@hawaii.gov.

JOSH GREEN, M.D.
GOVERNOR
KE KIA'ĀINA

DESIGN BRANCH, ROOM 688A
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STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF TRANSPORTATION | KA 'OIHANA ALAKAU
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

IN REPLY REFER TO:

HWY-DD 2.20359

June 3, 2024

TO: MARY ALICE EVANS
INTERIM DIRECTOR
OFFICE OF PLANNING AND SUSTAINABLE DEVELOPMENT

FROM: HENRY KENNEDY *Henry Kennedy*
ENGINEERING PROGRAM MANAGER
DESIGN BRANCH

SUBJECT: PRE-CONSULTATION FOR DRAFT ENVIRONMENTAL ASSESSMENT
HAWAII BELT ROAD, NANUE STREAM BRIDGE REHABILITATION PROJECT
DISTRICT OF NORTH HILO, ISLAND OF HAWAII
TAX MAP KEY: (3) 3-2-001
FEDERAL-AID PROJECT NO. BR-019-2(077)

The State of Hawaii Department of Transportation (HDOT) is in receipt of your pre-consultation comments regarding the proposed Nanue Stream Bridge Rehabilitation Project (the Project) on the Island of Hawaii, dated January 30, 2024.

Your comments as received are provided below in *italics*.

Comment 1.

> *We note that the review material states that the U.S. Department of Transportation, Federal Highway Administration (FHWA) intends to fund this bridge improvement project. Therefore, this project may be subject to CZMA federal consistency. Additionally, due to the project area's proximity to Nanue Stream, the project may be subject to federal permits or approvals such as a Department of the Army (DA) permit. The DA permit may also trigger CZMA federal consistency.*
>
> *OPSD is the lead state agency with the authority to conduct CZMA federal consistency determinations. We recommend that HDOT consult with our office on the applicability of CZMA federal consistency.*

Project Response 1.

> The Project Team thanks your office for the information and direction regarding the CZMA federal consistency review and also the potential requirement of a Department of the Army (DA) permit.
>
> From Draft EA, Section *4.3.1.6 U.S. Army Corps of Engineers, Department of Army Permit:*

HDOT will coordinate with the USACE to confirm the proposed in-water work is covered by one or more NWPs. Upon review of a project, the USACE issues a verification letter pursuant to the applicable NWP(s). Some activities authorized by NWPs require preparation of a preconstruction notification to the District Engineer to ensure that activities authorized by these NWPs have minimal individual and cumulative adverse impacts on the aquatic environment.

Comment 2.

The CZM area is defined as "all lands of the State and the area extending seaward from the shoreline to the limit of the State's police power and management authority, including the U.S. territorial sea" under Hawai'i Revised Statutes (HRS) § 205A-1.

Pursuant to HRS § 205A-4, in implementing the objectives of the CZM program, agencies shall consider ecological, cultural, historic, esthetic, recreational, scenic, open space values, coastal hazards, and economic development. As the proposed action is being submitted by HDOT, the Draft Environmental Assessment (Draft EA) should include a discussion on the project's consistency with the policies of the Hawai'i CZM Program, HRS § 205A-2, as amended.

Furthermore, the objectives and supporting policies of the Hawai'i CZM Program serve as the foundation of the enforceable policies of the State of Hawai'i. Analysis within the Draft EA can be used as support material for a CZMA federal consistency submittal. Furthermore, disclosure of impacts on CZM objectives and supporting policies as it relates to HRS Chapter 343 requirements, will aid the State in determining impacts to the resources of the coastal zone, and mitigation measures on lands involved for this proposed action.

Project Response 2.

The Project Team thanks your office for this information regarding the CZM Program. The Project Team looks forward to coordinating further with your office as the Project progresses.

Comment 3.

We note sections of the Hawai'i Belt Road, along the north shore of Hawaii Island, frequently constitutes the outermost boundary of the SMA as delineated by the County of Hawaii (CoH). We recommend that the CoH, Planning Department be consulted on the applicability of SMA Use permitting.

Project Response 3.

The Project Team is consulting with the County of Hawaii Planning Department to determine the appropriate permits, clearances, and other requirements that may apply.

Comment 4.

Pursuant to Hawaii Administrative Rules (HAR) § 11-200.1-18(d)(7) – identification and analysis of impacts and alternatives considered; to ensure that nearshore marine resources along the coastal areas of the Hamakua coastline of Hawai'i Island remain protected, the negative effects of stormwater inundation and sediment loading surrounding the proposed project site, ensuing from bridge and roadway improvements during the construction and operational phase should be evaluated.

Issues that may be examined include, but are not limited to, project site characteristics in relation to flood and erosion prone areas, vulnerability of the nearshore environment any increase in volume or flow rate of stormwater runoff. Developing mitigation measures for the protection for surface water resources and the coastal ecosystem should take this into account, pursuant to HAR § 11-200.1-18(d)(8).

Project Response 4.

The Project as proposed is not anticipated to Increase the amount of non-permeable surface, or otherwise affect the surface water in the area. It is not anticipated that the Project will have any impact to surface waters. There will be no significant grading that may affect drainage patterns.

Comment 5.

Pursuant to HAR § 11-200.1-13(11) – Significance Criteria on SLR exposure areas; the bridge location is located within close proximity to the Hamakua coastline of Hawai'i Island. We acknowledge that the project area is situated in higher elevation and likely outside of this exposure risk area. Nonetheless, the roadway approaches connecting the bridge to roadway network of Hawai'i Island may still be vulnerable to the effects of SLR. These threats include coastal erosion, storm surge, and flooding. To assess the vulnerability of the project to SLR, the Draft EA would benefit from evaluating the susceptibility of connecting roadways. We suggest the Draft EA refer to the findings of the Hawai'i Sea Level Rise Vulnerability and Adaptation Report 2017, accepted by the Hawai'i Climate Change Mitigation and Adaptation Commission.

The Report, and Hawaii Sea Level Rise Viewer at https://www.pacioos.hawaii.edu/shoreline/slr-hawaii/ identifies a 3.2-foot SLR exposure area across the main Hawaiian Islands, as a starting evaluation point. The Draft EA should provide a map of 3.2-foot SLR exposure area in relation to the project area, and consider site-specific mitigation measures, setbacks from the shoreline or relocation options further inland or various climate change adaptation strategies that respond to impacts of 3.2-foot SLR or greater.

Project Response 5.

The Project, as noted by your office, is situated in higher elevation and likely outside of the Sea Level Rise (SLR) exposure risk area.

We will include you in future correspondence as we seek further input on the proposed improvements to the intersection throughout the environmental review process in compliance with Hawaii Revised Statutes Chapter 343.

We value your participation in the environmental review process. Your letter and this response will be reproduced in the forthcoming Draft Environmental Assessment.

If you have any questions or concerns, please contact the HDOT Project Manager, Ms. Amy Sunahara of our Highways Design Branch, Highway Design Section at (808) 692-8431 or by email at amy.my.sunahara@hawaii.gov.

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

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIA'ĀINA

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

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA 'OIHANA KUMUWAIWAI 'ĀINA
LAND DIVISION

P.O. BOX 621
HONOLULU, HAWAII 96809

December 27, 2023

MEMORANDUM

TO: **DLNR Agencies:**
X Div. of Aquatic Resources (kendall.l.tucker@hawaii.gov)
__Div. of Boating & Ocean Recreation
X Engineering Division (DLNR.ENGR@hawaii.gov)
X Div. of Forestry & Wildlife (rubyrosa.t.terrago@hawaii.gov)
__Div. of State Parks
X Commission on Water Resource Management (DLNR.CWRM@hawaii.gov)
X Office of Conservation & Coastal Lands (sharleen.k.kuba@hawaii.gov)
X Land Division – Hawaii District (gordon.c.heit@hawaii.gov)
X Land Division – Planner (lauren.e.yasaka@hawaii.gov)
X Land Division – Planner (dayna.k.vierra@hawaii.gov)
__Aha Moku Advisory Committee

FROM: Russell Y. Tsuji, Land Administrator *Russell Tsuji*
SUBJECT: Pre-Consultation for DEA for Hawaii Belt Road, **Nanue Stream Bridge Rehabilitation Project**
LOCATION: North Hilo, Island of Hawaii; TMK2: (3) 3-2-001:Various
APPLICANT: State of Hawaii Department of Transportation

Transmitted for your review and comment is information on the above-referenced subject matter. Please submit comments by **January 17, 2024.**

If no response is received by the above date, we will assume your agency has no comments. Should you have any questions about this request, please contact Darlene Nakamura at darlene.k.nakamura@hawaii.gov. Thank you.

BRIEF COMMENTS:

A Stream Channel Alteration Permit (SCAP) may be required should any work impact the bed and/or banks of Nanue Stream. CWRM needs more project details to make a full determination.

( ) We have no objections.
( ) We have no comments.
( ) We have no additional comments.
(XX) Comments are included/attached.

Signed: *Dean Uyeno*
Print Name: Dean D. Uyeno
Division: CWRM
Date: 01/12/2024

Attachments

JOSH GREEN, M.D.
GOVERNOR
KE KIA'ĀINA

DESIGN BRANCH, ROOM 688A
BRIDGE DESIGN SECTION, ROOM 611
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EDWIN H. SNIFFEN
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STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF TRANSPORTATION | KA 'OIHANA ALAKAU
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

IN REPLY REFER TO:

HWY-DD 2.20359

June 3, 2024

TO: DAWN N. S. CHANG, CHAIRPERSON
DEPARTMENT OF LAND AND NATURAL RESOURCES

ATTENTION: DEAN UYENO, ACTING DEPUTY DIRECTOR
COMMISSION ON WATER RESOURCE MANAGEMENT

FROM: HENRY KENNEDY Henry Kennedy
ENGINEERING PROGRAM MANAGER
DESIGN BRANCH

SUBJECT: PRE-CONSULTATION FOR DRAFT ENVIRONMENTAL ASSESSMENT
HAWAII BELT ROAD, NANUE STREAM BRIDGE REHABILITATION
PROJECT, DISTRICT OF NORTH HILO, ISLAND OF HAWAII,
TAX MAP KEY: (3) 3-2-001
FEDERAL-AID PROJECT NO. BR-019-2(077)

The State of Hawaii Department of Transportation (HDOT) is in receipt of your comment regarding the subject Nanue Stream Bridge Rehabilitation Project.

We acknowledge that your response provided the following:

> *A Stream Channel Alteration Permit (SCAP) may be required should any work impact the bed and / or banks of Nanue Stream. CWRM needs more project details to make a full determination.*

Project Response:

> The HDOT looks forward to further coordination with your office, and the Project will provide more details to the CWRM as the design progresses. A SCAP will be completed for this project.

We will include you in future correspondence as we seek further input on the proposed improvements to the intersection throughout the environmental review process in compliance with Hawaii Revised Statutes Chapter 343.

We value your participation in the environmental review process. Your letter and this response will be reproduced in the forthcoming Draft Environmental Assessment.

If you have any questions or concerns, please contact the Project Manager, Ms. Amy Sunahara, of our Highways Design Branch, Highway Design Section at (808) 692-8431 or by email at amy.my.sunahara@hawaii.gov.

JOSH GREEN, M.D.
GOVERNOR | KE KIAʻĀINA

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIAʻĀINA

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

STATE OF HAWAIʻI | KA MOKUʻĀINA ʻO HAWAIʻI
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA ʻOIHANA KUMUWAIWAI ʻĀINA
LAND DIVISION

P.O. BOX 621
HONOLULU, HAWAII 96809

December 27, 2023

MEMORANDUM

FROM: ~~TO:~~

DLNR Agencies:
_X_ Div. of Aquatic Resources (kendall.l.tucker@hawaii.gov)
___ Div. of Boating & Ocean Recreation
_X_ Engineering Division (DLNR.ENGR@hawaii.gov)
_X_ Div. of Forestry & Wildlife (rubyrosa.t.terrago@hawaii.gov)
___ Div. of State Parks
_X_ Commission on Water Resource Management (DLNR.CWRM@hawaii.gov)
_X_ Office of Conservation & Coastal Lands (sharleen.k.kuba@hawaii.gov)
_X_ Land Division – Hawaii District (gordon.c.heit@hawaii.gov)
_X_ Land Division – Planner (lauren.e.yasaka@hawaii.gov)
_X_ Land Division – Planner (dayna.k.vierra@hawaii.gov)
___ Aha Moku Advisory Committee

TO: ~~FROM:~~ Russell Y. Tsuji, Land Administrator *Russell Tsuji*
SUBJECT: Pre-Consultation for DEA for Hawaii Belt Road, **Nanue Stream Bridge Rehabilitation Project**
LOCATION: North Hilo, Island of Hawaii; TMK2: (3) 3-2-001:Various
APPLICANT: State of Hawaii Department of Transportation

Transmitted for your review and comment is information on the above-referenced subject matter. Please submit comments by **January 17, 2024.**

If no response is received by the above date, we will assume your agency has no comments. Should you have any questions about this request, please contact Darlene Nakamura at darlene.k.nakamura@hawaii.gov. Thank you.

BRIEF COMMENTS:

( ) We have no objections.
( ) We have no comments.
( ) We have no additional comments.
(✓) Comments are included/attached.

Signed: *Carty S. Chang*
Print Name: Carty S. Chang, Chief Engineer
Division: Engineering Division
Date: Jan 4, 2024

Attachments

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LD/Russell Tsuji

Ref: Pre-Consultation for DEA for Hawaii Belt Road, Nanue Stream Bridge Rehabilitation Project
Location: North Hilo, Island of Hawaii
TMK(s): (3) 3-2-001:Various
Applicant: State of Hawaii Department of Transportation

COMMENTS

The rules and regulations of the National Flood Insurance Program (NFIP), Title 44 of the Code of Federal Regulations (44CFR), are in effect when development falls within a Special Flood Hazard Area (high-risk areas). State projects are required to comply with 44CFR regulations as stipulated in Section 60.12. Be advised that 44CFR, Chapter 1, Subchapter B, part 60 reflects the minimum standards as set forth by the NFIP. Local community flood ordinances may stipulate higher standards that can be more restrictive and would take precedence over the minimum NFIP standards.

The owner of the project property and/or their representative is responsible to research the Flood Hazard Zone designation for the project. Flood Hazard Zones are designated on FEMA's Flood Insurance Rate Maps (FIRM). The official FIRMs can be accessed through FEMA's Map Service Center (msc.fema.gov). Our Flood Hazard Assessment Tool (FHAT) (fhat.hawaii.gov) could also be used to research flood hazard information.

If there are questions regarding the local flood ordinances, please contact the applicable County NFIP coordinating agency below:

- Oahu: City and County of Honolulu, Department of Planning and Permitting (808) 768-8098.
- Hawaii Island: County of Hawaii, Department of Public Works (808) 961-8327.
- Maui/Molokai/Lanai County of Maui, Department of Planning (808) 270-7139.
- Kauai: County of Kauai, Department of Public Works (808) 241-4896.

Signed: _____
CARTY S. CHANG, CHIEF ENGINEER

Date: Jan 4, 2024

JOSH GREEN, M.D.
GOVERNOR | KE KIAʻĀINA

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIAʻĀINA

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

STATE OF HAWAIʻI | KA MOKUʻĀINA ʻO HAWAIʻI
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA ʻOIHANA KUMUWAIWAI ʻĀINA
LAND DIVISION

P.O. BOX 621
HONOLULU, HAWAII 96809

January 17, 2024

Mr. Henry Kennedy, Engineering Program Manager
Design Branch
State of Hawaiʻi
Department of Transportation
601 Kamokila Blvd.
Kapolei, HI 96707

SUBJECT: Request for Comments on the Pre-Consultation for the Draft Environmental Assessment for the Nanue Stream Bridge Rehabilitation Project Located in the District of North Hilo, Island of Hawaiʻi
Tax Map Key(s): (3) 3-2-001

Dear Mr. Kennedy:

The Land Division was forwarded your request by the Department. Based on the information provided, it would appear that the entire project is located within the right-of-way of Hawaiʻi Belt Road and therefore, the Land Division has no comments at this time. However, Staff notes that the information provided is relatively generic and more details will need to be provided for us to properly determine if there are any impacts to State-owned lands. Therefore, we reserve the right to provide additional comments based on information presented in the forthcoming Draft Environmental Assessment.

Should you have any questions regarding this correspondence, please contact Ms. Lauren Yasaka of our office at 808-587-0431 or at lauren.e.yasaka@hawaii.gov.

Sincerely,

Russell Tsuji

Russell Y. Tsuji,
Land Division Administrator

JOSH GREEN, M.D.
GOVERNOR
KE KIA'ĀINA

DESIGN BRANCH, ROOM 688A
BRIDGE DESIGN SECTION, ROOM 611
CADASTRAL DESIGN SECTION, ROOM 600
ENVIRONMENTAL DESIGN SECTION, ROOM 688A
HIGHWAY DESIGN SECTION, ROOM 609
HYDRAULIC DESIGN SECTION, ROOM 636
TECHNICAL DESIGN SECTION, ROOM 688

EDWIN H. SNIFFEN
DIRECTOR
KA LUNA HO'OKELE

Deputy Directors
Nā Hope Luna Ho'okele
DREANALEE K. KALILI
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ROBIN K. SHISHIDO

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF TRANSPORTATION | KA 'OIHANA ALAKAU
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

IN REPLY REFER TO:

HWY-DD 2.20359

June 3, 2024

TO: DAWN N. S. CHANG, CHAIRPERSON
DEPARTMENT OF LAND AND NATURAL RESOURCES

ATTENTION: RUSSELL TSUJI, ADMINISTRATOR
LAND DIVISION

FROM: HENRY KENNEDY Henry Kennedy
ENGINEERING PROGRAM MANAGER
DESIGN BRANCH

SUBJECT: PRE-CONSULTATION FOR DRAFT ENVIRONMENTAL ASSESSMENT
HAWAII BELT ROAD, NANUE STREAM BRIDGE REHABILITATION
PROJECT, DISTRICT OF NORTH HILO, ISLAND OF HAWAII,
TAX MAP KEYS: (3) 3-2-001
FEDERAL-AID PROJECT NO. BR-019-2(077)

Thank you for your response dated January 12, 2024 (provided through Department of Land and Natural Resources Memorandum dated December 27, 2023).

We acknowledge that your response provided the following (from Carty S. Chang, Chief Engineer, Engineering Division, dated January 4, 2024):

> *The rules and regulations of the National Flood Insurance Program (NFIP), Title 44 of the Code of Federal Regulations (44CFR), are in effect when development falls within a Special Flood Hazard Area (high-risk areas). State projects are required to comply with 44CFR regulations as stipulated in Section 60.12. Be advised that 44CFR, Chapter 1, Subchapter B, part 60 reflects the minimum standards as set forth by the NFIP. Local community flood ordinances may stipulate higher standards that can be more restrictive and would take precedence over the minimum NFIP standards.*
>
> *The owner of the project property and/or their representative is responsible to research the Flood Hazard Zone designation for the project. Flood Hazard Zones are designated on FEMA's Flood Insurance Rate Maps (FIRM). The official FIRMs can be accessed through FEMA's Map Service Center (msc.fema.gov). Our Flood Hazard Assessment Tool (FHAT) (fhat.hawaii.gov) could also be used to research flood hazard information.*

If there are questions regarding the local flood ordinances, please contact the applicable County NFIP coordinating agency below:

- Oahu: City and County of Honolulu, Department of Planning and Permitting (808) 768-8098.
- Hawaii Island: County of Hawaii, Department of Public Works (808) 961-8327.
- Maui/Molokai/Lanai County of Maui, Department of Planning (808) 270-7139.
- Kauai: County of Kauai, Department of Public Works (808) 241-4896.

Project Response:

The HDOT thanks you for the information provided and looks forward to further coordination with your office, and the Project will provide more details to the DLNR-Engineering Division as the design progresses.

We value your participation in the environmental review process. Your letter and this response will be reproduced in the forthcoming Draft Environmental Assessment.

If you have any questions or concerns, please contact the Project Manager, Ms. Amy Sunahara, of our Highways Design Branch, Highway Design Section at (808) 692-8431 or by email at amy.my.sunahara@hawaii.gov.

DAVID Y. IGE
GOVERNOR OF HAWAII

VIRGINIA PRESSLER, M.D.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HI 96801-3378

In reply, please refer to:
EMD/CWB

05023PDCL.18

May 10, 2018

MEMORANDUM

SUBJECT: Clean Water Branch Standard Project Comments

TO: Agencies and Project Owners

FROM: ALEC WONG, P.E., CHIEF
Clean Water Branch

This memo is provided for your information and sharing. You are encouraged to share this memo with your project partners, team members, and appropriate personnel.

The Department of Health (DOH), Clean Water Branch (CWB) will no longer be responding directly to requests for comments on the following documents (Pre-consultation, Early Consultation, Preparation Notice, Draft, Final, Addendums, and/or Supplements):

- Environmental Impact Statements (EIS)
- Environmental Assessments (EA)
- Stream Channel Alteration Permits (SCAP)
- Stream Diversion Works Permits (SDWP)
- Well Construction/Pump Installation Permits
- Conservation District Use Applications (CDUA)
- Special Management Area Permits (SMAP)
- Shoreline Setback Areas (SSA)

For agencies or project owners requiring DOH-CWB comments for one or more of these documents, please utilize the DOH-CWB Standard Comments below regarding your project's responsibilities to maintain water quality and any necessary permitting. DOH-CWB Standard Comments are also available on the DOH-CWB website located at: http://health.hawaii.gov/cwb/.

DOH-CWB Standard Comments

The following information is for agencies and/or project owners who are seeking comments regarding environmental compliance for their projects with the Hawaii Administrative Rules (HAR), Chapters 11-54 and 11-55. You may be responsible for fulfilling additional requirements related to our program.

1. Any project and its potential impacts to State waters must meet the following criteria:

    a. Antidegradation policy (HAR, Section 11-54-1.1), which requires that the existing uses and the level of water quality necessary to protect the existing uses of the receiving State water be maintained and protected.

    b. Designated uses (HAR, Section 11-54-3), as determined by the classification of the receiving State waters.

    c. Water quality criteria (HAR, Sections 11-54-4 through 11-54-8).

2. You may be required to obtain National Pollutant Discharge Elimination System (NPDES) permit coverage for point source water pollutant discharges into State surface waters (HAR, Chapter 11-55). Point source means any discernible, confined, and discrete conveyance from which pollutants are or may be discharged.

    For NPDES general permit coverage, a Notice of Intent (NOI) form must be submitted at least 30 calendar days before the commencement of the discharge. An application for a NPDES individual permit must be submitted at least 180 calendar days before the commencement of the discharge. To request NPDES permit coverage, you must submit the applicable form ("CWB Individual NPDES Form" or "CWB NOI Form") through the e-Permitting Portal and the hard copy certification statement with the respective filing fee ($1,000 for an individual NPDES permit or $500 for a Notice of General Permit Coverage). Please open the e-Permitting Portal website located at: https://eha-cloud.doh.hawaii.gov/epermit/. You will be asked to do a one-time registration to obtain your login and password. After you register, click on the Application Finder tool and locate the appropriate form. Follow the instructions to complete and submit the form.

Some of the activities requiring NPDES permit coverage include, but, are not limited to:

a. Discharges of Storm Water

   i. For Construction Activities Disturbing One (1) or More Acres of Total Land Area.

      By HAR Chapter 11-55, an NPDES permit is required before the start of the construction activities that result in the disturbance of one (1) or more acres of total land area, including clearing, grading, and excavation. The total land area includes a contiguous area where multiple separate and distinct construction activities may be taking place at different times on different schedules under a larger common plan of development or sale.

   ii. For Industrial Activities for facilities with primary Standard Industrial Classification (SIC) Codes regulated in the Code of Federal Regulations (CFR) at 40 CFR 122.26(b)(14)(i) through (ix) and (xi). If a facility has more than one SIC code, the activity that generates the greatest revenue is the primary SIC code. If revenue information is unavailable, use the SIC code for the activity with the most employees. If employee information is also unavailable, use the SIC code for the activity with the greatest production.

   iii. From a small Municipal Separate Storm Sewer System (along with certain non-storm water discharges).

b. Discharges to State surface waters from construction activity hydrotesting or dewatering

c. Discharges to State surface waters from cooling water applications

d. Discharges to State surface waters from the application of pesticides (including insecticides, herbicides, fungicides, rodenticides, and various other substances to control pest) to State waters

e. Well-Drilling Activities

   Any discharge to State surface waters of treated process wastewater effluent associated with well drilling activities is regulated by HAR Chapter 11-55. Discharges of treated process wastewater effluent (including well drilling slurries,

lubricating fluids wastewater, and well purge wastewater) to State surface waters requires NPDES permit coverage.

NPDES permit coverage is not required for well pump testing. For well pump testing, the discharger shall take all measures necessary to prevent the discharge of pollutants from entering State waters. Such measures shall include, if necessary, containment of initial discharge until the discharge is essentially free of pollutants. If the discharge is entering a stream or river bed, best management practices (BMPs) shall be implemented to prevent the discharge from disturbing the clarity of the receiving water. If the discharge is entering a storm drain, the discharger must obtain written permission from the owner of the storm drain prior to discharge. Furthermore, BMPs shall be implemented to prevent the discharge from collecting sediments and other pollutants prior to entering the storm drain.

3. A Section 401 Water Quality Certification (WQC) is required if your project/activity:

   a. Requires a federal permit, license, certificate, approval, registration, or statutory exemption; and

   b. May result in a discharge into State waters. The term “discharge” is defined in Clean Water Act, Subsections 502(16), 502(12), and 502(6).

   Examples of “discharge” include, but are not limited to, allowing the following pollutants to enter State waters from the surface or in-water: solid waste, rock/sand/dirt, heat, sewage, construction debris, any underwater work, chemicals, fugitive dust/spray paint, agricultural wastes, biological materials, industrial wastes, concrete/sealant/epoxy, and washing/cleaning effluent.

   Determine if your project/activity requires a federal permit, license, certificate, approval, registration, or statutory exemption by contacting the appropriate federal agencies (e.g. Department of the Army (DA), U.S. Army Corps of Engineers (COE), Pacific Ocean Division Honolulu District Office (POH) Tel: (808) 835-4303; U.S. Environmental Protection Agency, Region 9 Tel: (415) 947-8021; Federal Energy Regulatory Commission Tel: (866) 208-3372; U.S. Coast Guard Office of Bridge Programs Tel: (202) 372-1511). If your project involves work in, over, or under waters of the United States, it is highly recommended that you contact the Army Corp of Engineers, Regulatory Branch regarding their permitting requirements.

   To request a Section 401 WQC, you must complete and submit the Section 401 WQC application. This application is available on the e-Permitting Portal website located at: https://eha-cloud.doh.hawaii.gov/epermit/.

Please see HAR, Chapter 11-54 for the State's Water Quality Standards and for more information on the Section 401 WQC. HAR, Chapter 11-54 is available on the CWB website at: http://health.hawaii.gov/cwb/.

4. Please note that all discharges related to the project construction or operation activities, whether or not NPDES permit coverage and/or Section 401 WQC are required, must comply with the State's Water Quality Standards. Noncompliance with water quality requirements contained in HAR, Chapter 11-54, and/or permitting requirements, specified in HAR, Chapter 11-55, may be subject to penalties of $25,000 per day per violation and up to two (2) years in jail.

5. It is the State's position that all projects must reduce, reuse, and recycle to protect, restore, and sustain water quality and beneficial uses of State waters. Project planning should:

   a. Treat storm water as a resource to be protected by integrating it into project planning and permitting. Storm water has long been recognized as a source of irrigation that will not deplete potable water resources. What is often overlooked is that storm water recharges ground water supplies and feeds streams and estuaries; to ensure that these water cycles are not disrupted, storm water cannot be relegated as a waste product of impervious surfaces. Any project planning must recognize storm water as an asset that sustains and protects natural ecosystems and traditional beneficial uses of State waters, like community beautification, beach going, swimming, and fishing. The approaches necessary to do so, including low impact development methods or ecological bio-engineering of drainage ways must be identified in the planning stages to allow designers opportunity to include those approaches up front, prior to seeking zoning, construction, or building permits.

   b. Clearly articulate the State's position on water quality and the beneficial uses of State waters. The plan should include statements regarding the implementation of methods to conserve natural resources (e.g. minimizing potable water for irrigation, gray water re-use options, energy conservation through smart design) and improve water quality.

   c. Consider storm water Best Management Practice (BMP) approaches that minimize the use of potable water for irrigation through storm water storage and reuse, percolate storm water to recharge groundwater to revitalize natural hydrology, and treat storm water which is to be discharged.

d. Consider the use of green building practices, such as pervious pavement and landscaping with native vegetation, to improve water quality by reducing excessive runoff and the need for excessive fertilization, respectively.

e. Identify opportunities for retrofitting or bio-engineering existing storm water infrastructure to restore ecological function while maintaining, or even enhancing, hydraulic capacity. Consideration should be given to areas prone to flooding, or where the infrastructure is aged and will need to be rehabilitated.

JOSH GREEN, M.D.
GOVERNOR
KE KIA'ĀINA

DESIGN BRANCH, ROOM 688A
BRIDGE DESIGN SECTION, ROOM 611
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EDWIN H. SNIFFEN
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STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF TRANSPORTATION | KA 'OIHANA ALAKAU
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

IN REPLY REFER TO:

HWY-DD 2.20359

June 3, 2024

TO: KENNETH S. FINK, MD, MGA, MPH, DIRECTOR
DEPARTMENT OF HEALTH

ATTENTION: DARRYL LUM, P.E., CHIEF
CLEAN WATER BRANCH

FROM: HENRY KENNEDY *Henry Kennedy*
ENGINEERING PROGRAM MANAGER
DESIGN BRANCH

SUBJECT: PRE-CONSULTATION FOR DRAFT ENVIRONMENTAL ASSESSMENT
HAWAII BELT ROAD, NANUE STREAM BRIDGE REHABILITATION
PROJECT, DISTRICT OF NORTH HILO, ISLAND OF HAWAII,
TAX MAP KEY: (3) 3-2-001
FEDERAL-AID PROJECT NO. BR-019-2(077)

Thank you for your response dated December 26, 2023 (State of Hawaii Department of Health Clean Water Branch [DOH-CWB], email from Colin T. Maruoka at 10:28 a.m. to Ms. Amy Sunahara, State of Hawaii Department of Transportation Project Manager).

We acknowledge your response that the DOH-CWB no longer provides comments for pre-consultation on EA/EIS documents.

We acknowledge that your response provided the following:

> *For agencies and projects owners requiring DOH-CWB comments, please utilize the DOH-CWB standard comments accessible on our website or the following link: https://health.hawaii.gov/cwb/files/2018/05/Memo-CWB-Standard-Comments.pdf.*
>
> If you have any questions, please email cleanwaterbranch@doh.hawaii.gov.

Project Response:

> The HDOT will include the State of Hawaii Department of Health Clean Water Branch Standard Comments as part of the Bid Package for the Project.

We will include you in future correspondence as we seek further input on the proposed improvements to the intersection throughout the environmental review process in compliance with Hawaii Revised Statutes Chapter 343.

We value your participation in the environmental review process. Your letter and this response will be reproduced in the forthcoming Draft Environmental Assessment.

If you have any questions or concerns, please contact the Project Manager, Ms. Amy Sunahara, of our Highways Design Branch, Highway Design Section at (808) 692-8431 or by email at amy.my.sunahara@hawaii.gov.

Solid and Hazardous Waste Branch
Standard Comments

November 26, 2018

The Solid and Hazardous Waste Branch administers programs in the areas of:

1) Management of hazardous waste;
2) Management of solid waste; and
3) Regulation of underground storage tanks.

Our general comments on projects are below. For further information about these programs, please contact the Solid and Hazardous Waste Branch at (808) 586-4226. All chapters of the Hawaii Revised Statutes (HRS) are at https://www.capitol.hawaii.gov/hrscurrent/.

Hazardous Waste Program

- The state regulations for hazardous waste and used oil are in chapters 11-260.1 to 11-279.1, Hawaii Administrative Rules (HAR) [http://health.hawaii.gov/shwb/hwrules/]. These rules apply to the identification, handling, transportation, storage and disposal of regulated hazardous waste and used oil. Generators, transporters and treatment, storage, and disposal facilities of hazardous waste and used oil must adhere to these requirements. Violations are subject to penalties under chapter 342J, HRS.

Solid Waste Section

- The Solid Waste Section (SWS) enforces laws and regulations contained in chapters 342H and 342I, HRS, and chapter 11-58.1, HAR, "Solid Waste Management Control" [http://health.hawaii.gov/shwb/solid-waste/].

- The purpose of the rules is to establish minimum standards governing the design, construction, installation, operation, and maintenance of solid waste disposal, recycling, reclamation and transfer systems.

- All facilities that accept solid wastes are required to obtain a solid waste management permit from the SWS. Examples of the types of facilities governed by these regulations include landfills, transfer stations and convenience centers, recycling facilities, composting facilities, and salvage facilities. Medical waste, infectious waste, and foreign waste treatment facilities are also included.

- Generators of solid waste are required to ensure that their wastes are properly delivered to permitted solid waste management facilities. Managers of construction and demolition projects should require their waste contractors to submit disposal receipts and invoices to ensure proper disposal of wastes.

Solid and Hazardous Waste Branch Standard Comments

Office of Solid Waste Management

- The Office of Solid Waste Management (OSWM) administers statewide integrated solid waste management planning activities, which apply to the counties, as well as various recycling programs, e.g. the Glass Advance Disposal Fee (ADF) and Deposit Beverage Container (DBC) Programs. Management of the DBC Program is conducted pursuant to chapter 342G, HRS, which contains compliance and enforcement provisions, and chapter 11-282, HAR, "Deposit Beverage Recycling" [http://health.hawaii.gov/hi5/rules-regulations-additional-links/]. OSWM is also responsible for limited enforcement and compliance of solid waste management facilities that operate primarily as certified DBC redemption centers pursuant to chapter 342H, HRS, and chapter 11-58.1, HAR, "Solid Waste Management Control" [http://health.hawaii.gov/shwb/solid-waste/]. Authority for the integrated solid waste management planning and ADF programs is contained in chapter 342G, HRS.

- Glass Advance Disposal Fee Program: Businesses that import glass containers into Hawaii are required to register with the Department of Health and pay a 1.5 cent per container fee. Fee revenue is distributed to the counties for the operation of glass recycling programs.

- Deposit Beverage Container Program: Business that manufacture or import deposit beverage containers into Hawaii are required to register with the Department of Health and pay the five cent deposit and one cent container fee on each deposit container. Deposits and fees are deposited into a special fund and are used to reimburse DBC redemption center refunds paid to consumers; and to pay handling fees to redemption/recycling companies to process and recycle collected deposit beverage containers; and to pay program administrative costs.

- The Department of Health reimburses and pays an associated handling fee for the redemption of deposit beverage containers (DBC). These transactions are conducted only with certified redemption centers. Certification requires obtaining a solid waste management permit from the SWS (which addresses environmental issues) and a certification from the DBC program (which standardizes the redemption process).

- Chapter 342G, HRS, encourages the reduction of waste generation, reuse of discarded materials, and the recycling of solid waste. Businesses, property managers and developers, and government entities are highly encouraged to develop solid waste management plans to ensure proper handling of wastes and divert recyclables from being landfilled.

- Solid waste management plans seek to maximize waste diversion and minimize disposal. Such plans should include designated areas to promote the collection of reusable and recyclable materials.

Underground Storage Tank Program

- The state's underground storage tank (UST) regulations, found in chapter 11-280.1, HAR [http://health.hawaii.gov/shwb/underground-storage-tanks/], include specific requirements that UST owners and operators must meet when installing, operating, and permanently closing their UST systems and addressing releases from USTs. Violations are subject to penalties under chapter 11-280.1, HAR, and chapter 342L, HRS.

- A permit is required prior to the installation and operation of a UST. Any new UST system that will be installed must have secondary containment with interstitial monitoring. Refer to subchapters 2, 3, 4, and 12 of chapter 11-280.1, HAR. The installation permit expires 1 year from the date of issuance. The operation permit expires 5 years from the date of issuance.

- §11-280.1-50, HAR, requires owners and operators of USTs or tank systems to notify DOH within twenty-four (24) hours and follow the procedures in §11-280.1-52, HAR, if any of the following occur, with specific exceptions found in the rules:
  1) The discovery by any person of evidence of regulated substances which may have been released at the UST site or in the surrounding area (such as the presence of free product or vapors in soils, basements, sewer and utility lines, or nearby surface water);
  2) Unusual UST system operating conditions observed or experienced (such as the erratic behavior of product dispensing equipment, the sudden loss of product from the UST, or an unexplained presence of water in the tank); or
  3) Monitoring results from a release detection method required under §§11-280.1-41 or 11-280.1-42 indicate a release may have occurred.

- For release response actions, responsible parties and their consultants and contractors should follow the applicable guidance in the Department of Health Hazard Evaluation Emergency (HEER) Office Technical Guidance Manual, HEER Environmental Action Level (EAL) guidance, and other guidance documents on the DOH HEER Office website [http://eha-web.doh.hawaii.gov/eha-cma/Org/HEER/], including those pertaining to Multi-Increment Sampling of soil, low flow groundwater sampling, soil vapor sampling, and Environmental Hazard Evaluations (EHE)/Environmental Hazard Management Plans (EHMP).

JOSH GREEN, M.D.
GOVERNOR
KE KIAʻĀINA

DESIGN BRANCH, ROOM 688A
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STATE OF HAWAIʻI | KA MOKUʻĀINA ʻO HAWAIʻI
DEPARTMENT OF TRANSPORTATION | KA ʻOIHANA ALAKAU
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

IN REPLY REFER TO:

HWY-DD 2.20359

June 3, 2024

TO: KENNETH S. FINK, MD, MGA, MPH, DIRECTOR
DEPARTMENT OF HEALTH

ATTENTION: LENE ICHINOTSUBO, ACTING CHIEF
SOLID AND HAZARDOUS WASTE BRANCH

FROM: HENRY KENNEDY Henry Kennedy
ENGINEERING PROGRAM MANAGER
DESIGN BRANCH

SUBJECT: PRE-CONSULTATION FOR DRAFT ENVIRONMENTAL ASSESSMENT (DEA)
HAWAII BELT ROAD, NANUE STREAM BRIDGE REHABILITATION PROJECT,
DISTRICT OF NORTH HILO, ISLAND OF HAWAII,
TAX MAP KEY NO. (3) 3-2-001
FEDERAL-AID PROJECT NO. BR-019-2(077)

The State of Hawaii Department of Transportation (HDOT) is in receipt of your comment regarding the subject listed above, Nanue Stream Bridge Rehabilitation Project.

We acknowledge that your response provided the following:

> *Standard Comments, Use the following link: https://health.hawaii.gov/epo/files/2018/11/SHWB-standard-comments-v3-Nov-2018-update.pdf*

Project Response:

> The HDOT will include the State of Hawaii Department of Health, Solid and Hazardous Waste Branch Standard Comments as part of the Bid Package for the Project.

We will include you in future correspondence as we seek further input on the proposed improvements to the intersection throughout the environmental review process in compliance with Hawaii Revised Statutes Chapter 343.

We value your participation in the environmental review process. Your letter and this response will be reproduced in the forthcoming DEA.

If you have any questions or concerns, please contact the HDOT Project Manager, Ms. Amy Sunahara, of our Highways Design Branch, Highway Design Section at (808) 692-7578, or by email at amy.my.sunahara@hawaii.gov.

Appendix A-2
Regulatory Coordination and Correspondence

National Historic Preservation Act (NHPA) Section 106

JOSH GREEN, M.D.
GOVERNOR
KE KIA'ĀINA

DESIGN BRANCH, ROOM 688A
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EDWIN H. SNIFFEN
DIRECTOR
KA LUNA HO'OKELE

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STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF TRANSPORTATION | KA 'OIHANA ALAKAU
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

IN REPLY REFER TO:

HWY-DD 2.25320

December 15, 2023

TO: DAWN N. S. CHANG, CHAIRPERSON AND STATE HISTORIC PRESERVATION OFFICER
DEPARTMENT OF LAND AND NATURAL RESOURCES

ATTN: ALAN S. DOWNER, Ph.D., ADMINISTRATOR AND DEPUTY STATE HISTORIC PRESERVATION OFFICER
STATE HISTORIC PRESERVATION DIVISION

FROM: HENRY KENNEDY Henry Kennedy
ENGINEERING PROGRAM MANAGER, DESIGN BRANCH

SUBJECT: NATIONAL HISTORIC PRESERVATION ACT SECTION 106 INITIATION, REQUEST FOR CONTACT INFORMATION AND AREA OF POTENTIAL EFFECTS CONCURRENCE
HAWAII BELT ROAD, NANUE STREAM BRIDGE REHABILITATION
HONOHINA AHUPUAA, HILO MOKU, HAWAII ISLAND
FEDERAL AID PROJECT NO. BR-019-2(077)
TAX MAP KEY: (3) 3-2-001

On behalf of the Federal Highway Administration (FHWA), the State of Hawaii, Department of Transportation (HDOT) is initiating consultation with the State Historic Preservation Officer (SHPO) under Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended (2006), for the subject bridge rehabilitation project. HDOT requests contact information that SHPO may have on Native Hawaiian organizations (NHO) and potential consulting parties. Lastly, HDOT requests SHPO's concurrence on the proposed area of potential effects (APE), pursuant to Section 106 of the NHPA and Title 36 of the Code of Federal Regulations (CFR), Part 800.4(a)(1).

This proposed federally funded State project is considered a federal action and undertaking, as defined by 36 CFR Part 800.16(y). Effective May 1, 2016, FHWA issued a Delegation of Authority authorizing the HDOT and local public agencies to conduct NHPA Section 106 consultations with SHPO, NHO, and qualified consulting parties per 36 CFR Part 800.2(c)(4). The FHWA will remain responsible for all findings and determinations charged to the agency during the Section 106 process.

Consultations

The Section 106 notice/advertisement will also be included in the Hawaii Tribune Herald and The Star Advertiser. NHO's and Native Hawaiian descendants with ancestral, lineal, or cultural ties to cultural and/or historical property knowledge of and/or concerns for, and cultural or religious attachment to the proposed APE will be asked to provide a response within 30 days of notification. In addition, other

individuals, and organizations with demonstrated legal, economic, or historic preservation interest will also be asked to respond to the Section 106 notice/advertisement.

Upon receipt of responses to the initial consultation, additional efforts such as meetings, site visits and conference calls will be conducted as necessary to address the Section 106 requirements.

In addition to consulting with SHPO, consultations with NHO's currently listed on the U.S. Department of Interior, Office of Native Hawaiian Relations' NHO List, with an applicable interest in the APE, has been undertaken at the same time as our consultation with your agency. The following agencies, organizations, individuals are being contacted by formal letter:

- State of Hawaii, DLNR, Aha Moku Advisory Committee
- State of Hawaii, Department of Hawaiian Home Lands
- State of Hawaii, Office of Hawaiian Affairs
- Hawaii County Cultural Resources Commission
- Association of Hawaiian Civic Clubs
- Association of Hawaiian Homestead Lands
- Au Puni O Hawaii
- Council for Native Hawaiian Advancement
- Friends of Iolani Palace
- George K. Cypher Ohana
- Hawaiian Civic Club of Hilo
- Hawaiian Community Assets, Inc.
- Historic Hawaii Foundation
- Hui Huliau, Inc.
- Kamehameha Schools
- Kanu O Ka Aina Learning Ohana
- Koolau Foundation
- Kuaaina Ulu Auamo
- Kuloloia Lineage – I Ke Kaio Kuloloia
- Na Koa Ikaika Ka Lahui Hawaii
- Na Kuauhau o Kahiwakaneikapolei
- Na Kupuna Moku O Keawe
- Nanakuli Housing Corporation
- Nekaifes Ohana
- Ohana Keaweamahi
- Order of Kamehameha I
- Partners in Development Foundation
- Paukukalo Hawaiian Homes Community Association
- Royal Hawaiian Academy of Traditional Arts
- The I Mua Group
- The Makua Group
- The Mary Kawena Pukui Cultural Preservation Society
- Azhar Q. Mustafa
- Penny L. Mustafa
- Liliuokalani Trust
- George Hitowari
- Sterling Niles Schuetz
- Soon Ae, Schuetz
- Agee, Inc

Request for Information

Pursuant to 36 CFR Part 800.3(f), we are interested if your agency is acquainted with any NHO's or Native Hawaiian descendants with ancestral, lineal, or cultural ties to cultural and/or historic properties or knowledge of and/or concerns for cultural or religious attachments to the proposed project area. If so, we would appreciate receiving their names and contact information within the 30 days of notification.

Per 36 CFR Part 800.2(a)(4)(c)(5) we also request the names of individuals and organizations who have contacted your office on the proposed undertaking and who have demonstrated their legal, economic, or historic preservation interests to you. Please provide us with a copy of your correspondence for our records.

Area of Potential Effects (APE)

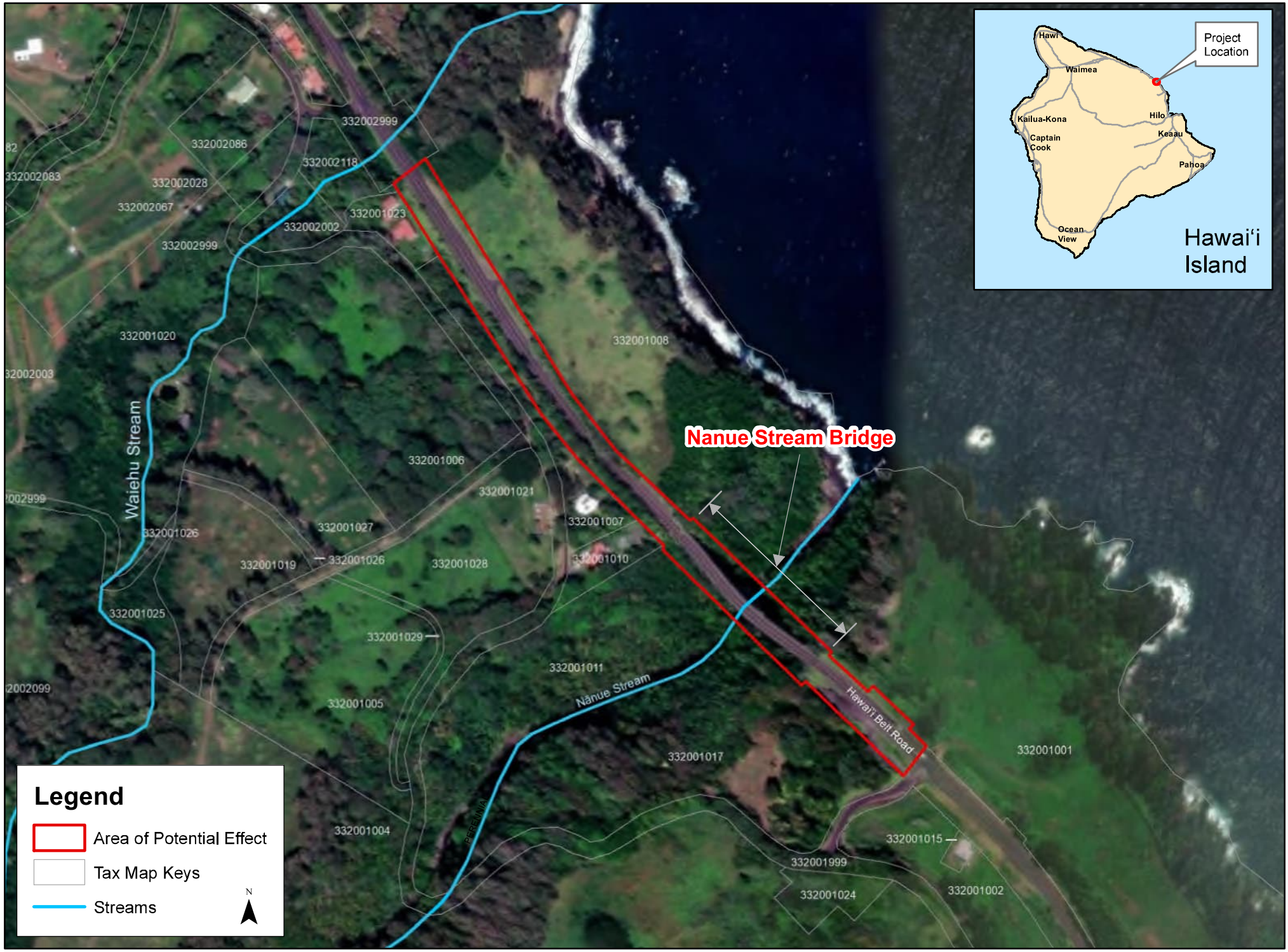
The proposed project is in Honohina on the island of Hawaii, approximately 16 miles north of Hilo at Milepost 18.5 of the Hawaii Belt Road (Route 19). The rectangular shaped Area of Potential Effects (APE) extends 1,121 feet to the north from the northern terminus of Nanue bridge and 401 feet south from the southern terminus of the bridge. The bridge itself measures 528-feet long. The total length of project area is 2,050 feet and width is 110 feet. The project area includes the bridge footprint, construction and staging areas and the highway right of way. The total project acreage is 5.5 acres.

In addition to providing us with information on NHO, we ask for your concurrence on the proposed APE.

We would appreciate all responses in writing within 30 days from the date of receipt to our Project Manager, Amy Sunahara from the Highway Design Section, Design Branch, at (808) 692-8431 or by email at amy.my.sunahara@hawaii.gov and reference letter number HWY-DD 2.25320 as noted above.

c:

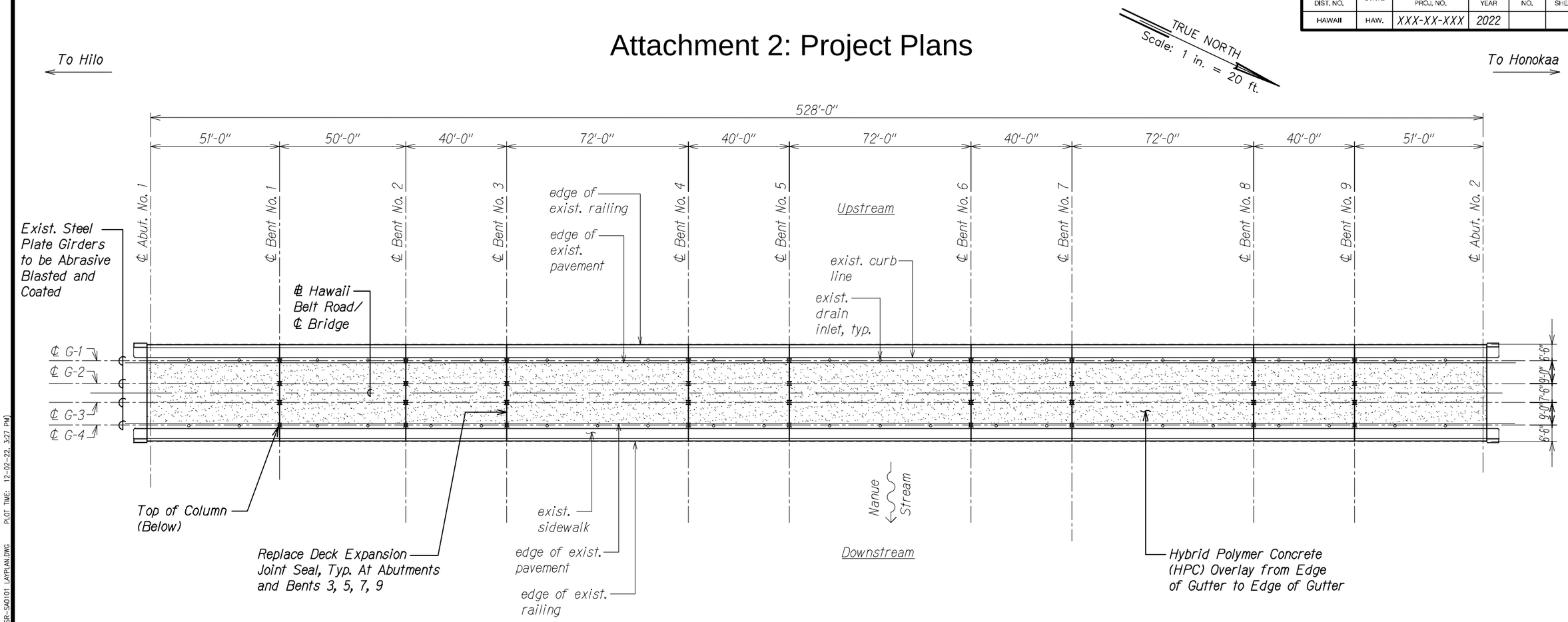
Enclosures
Attachment 1: Area of Potential Effects
Attachment 2: Project Plans
Attachment 3: Site Photos



Nānue Stream Bridge Rehabilitation
Area of Potential Effect Map

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	XXX-XX-XXX	2022		

Attachment 2: Project Plans



LAYOUT PLAN

Scale: 1" = 20'-0"

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
No.	TRACED BY	
	DESIGNED BY	
	QUANTITIES BY	
	CHECKED BY	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

LAYOUT PLAN

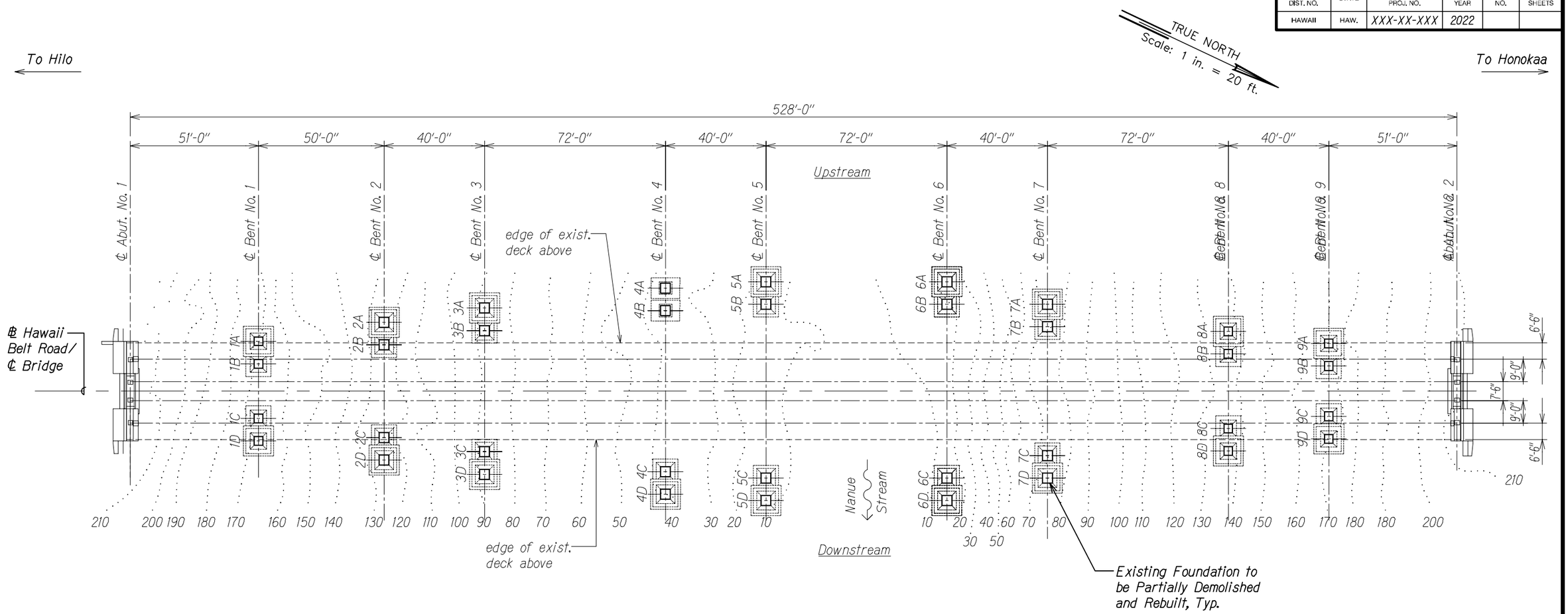
HAWAII BELT ROAD
NANUE STREAM BRIDGE REHABILITATION
Federal-Aid Proj. No. XXX-XX-XXX

Scale: As Noted Date: Dec. 2022

SHEET No. SA1.1 OF 3 SHEETS

DRAWING NAME: Z:\00 ONGOING\00 uF PROJECTS\22-001.12-NANUE STR BR REHAB\01 CAD\12-02-22 PE1 SUBMITTAL\NSR-SA0101 LAYPLAN.DWG PLOT TIME: 12-02-22, 3:27 PM)

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	XXX-XX-XXX	2022		



FOUNDATION PLAN

Scale: 1" = 20'-0"

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

FOUNDATION PLAN

HAWAII BELT ROAD
NANUE STREAM BRIDGE REHABILITATION
Federal-Aid Proj. No. XXX-XX-XXX

Scale: As Noted Date: Dec. 2022

SHEET No. SA1.2 OF 3 SHEETS

ORIGINAL PLAN
NOTE BOOK No.
SURVEY PLOTTED BY DATE
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY

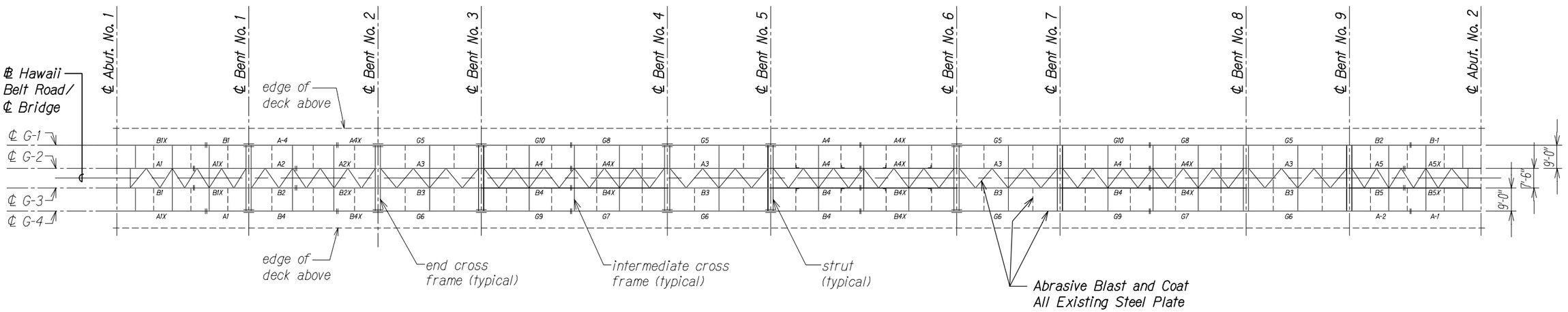
DRAWING NAME: Z:\00 ONGOING\00 JF PROJECTS\22-001.12-NANUE STR BR REHAB\01 CAD\12-02-22 PE1 SUBMITTAL\NSR-SA0102 FDN PLAN.DWG PLOT TIME: 12-02-22, 3:28 PM)

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	XXX-XX-XXX	2022		

To Hilo

To Honokaa

TRUE NORTH
Scale: 1 in. = 20 ft.



Abrasive Blast and Coat All Existing Steel Plate Girders, Cross Bracings, Lateral Bracing, and Struts

FRAMING PLAN

Scale: 1" = 20'-0"

ORIGINAL PLAN

NOTE BOOK
No.

SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE

DRAWING NAME: Z:\00 ONGOING\00 JF PROJECTS\22-001.12-NANUE STR BR REHAB\01 CAD\12-02-22 PE1 SUBMITTAL\NSR-SA0103 FRAM PLAN.DWG PLOT TIME: 12-02-22, 3:28 PM)

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

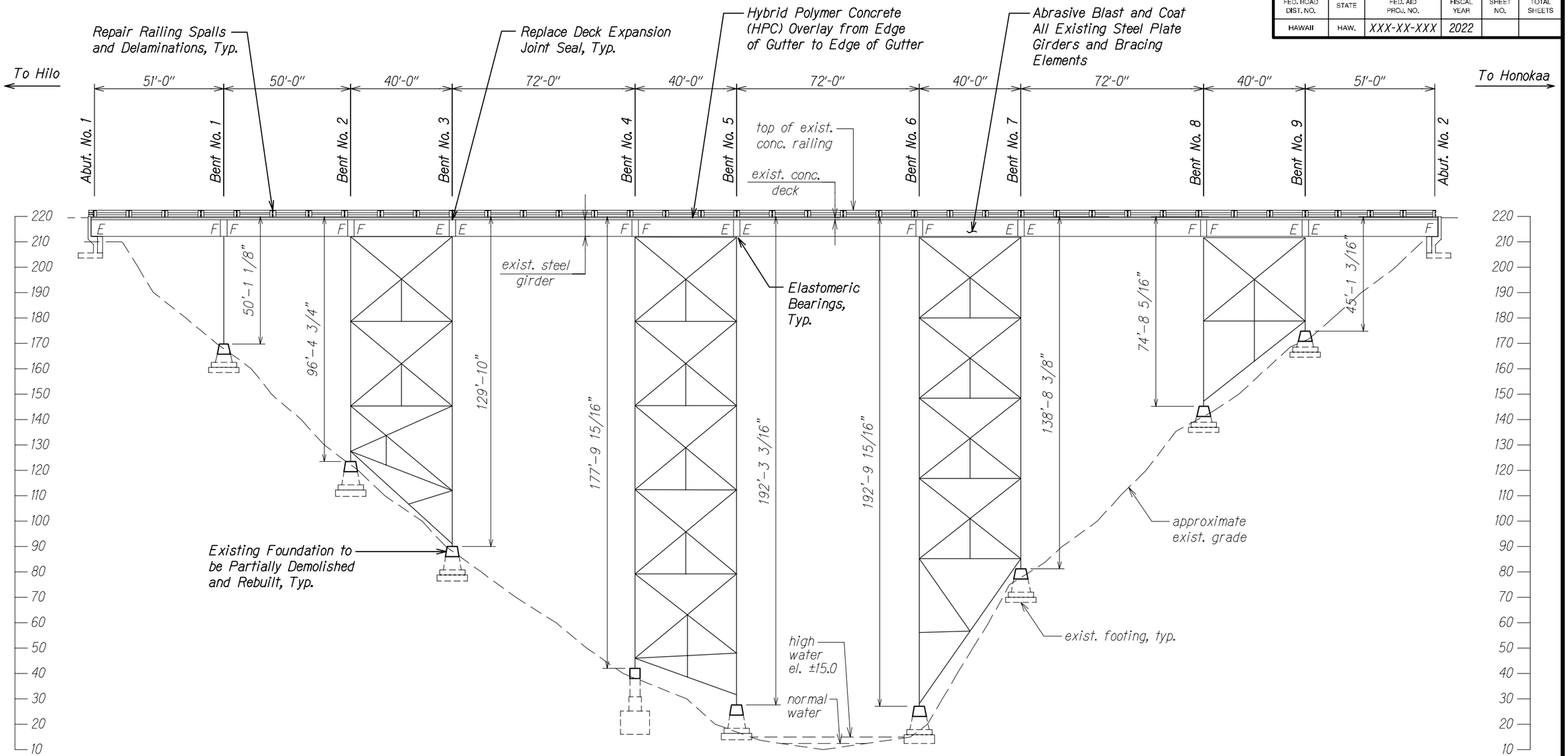
FRAMING PLAN

HAWAII BELT ROAD
NANUE STREAM BRIDGE REHABILITATION
Federal-Aid Proj. No. XXX-XX-XXX

Scale: As Noted Date: Dec. 2022

SHEET No. SA1.3 OF 3 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	XXX-XX-XXX	2022		



Legend:

F Fixed Bearing

E Expansion Bearing

DOWNSTREAM ELEVATION

Scale: 1" = 20'-0"

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BRIDGE ELEVATION

HAWAII BELT ROAD
NANUE STREAM BRIDGE REHABILITATION
Federal-Aid Proj. No. XXX-XX-XXX

Scale: As Noted Date: Dec. 2022

SHEET No. SA2.1 OF 1 SHEETS

ORIGINAL PLAN | NOTE BOOK No. | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE

DRAWING NAME: Z:\00 ONGOING\00 JF PROJECTS\22-001.12-NANUE STR BR REHAB\01 CAD\12-02-22 PE1 SUBMITTAL\NSR-SA0201 ELEV.DWG PLOT TIME: 12-02-22, 3:29 PM)

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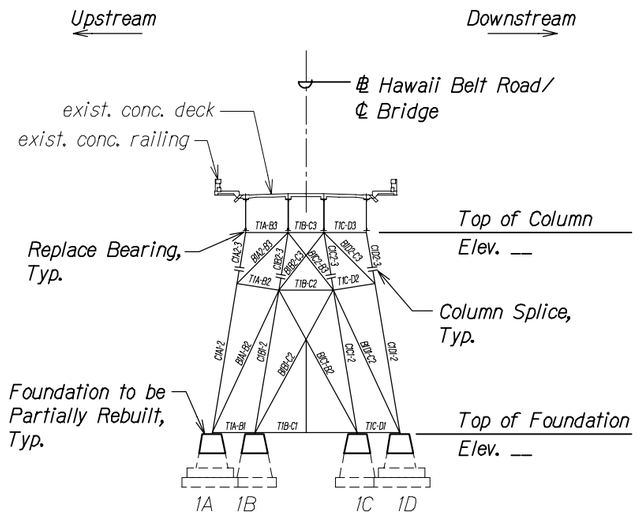
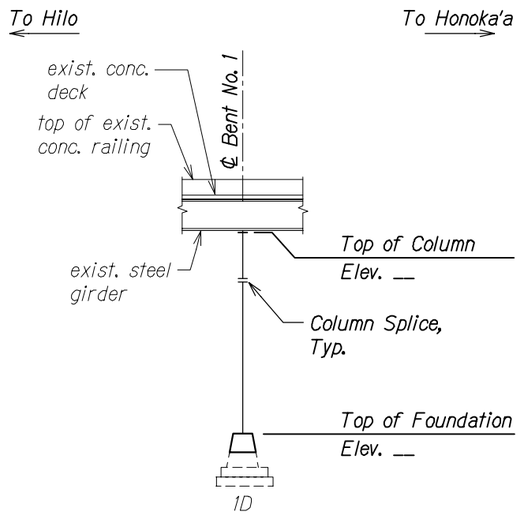
HAWAII	HAW.	XXX-XX-XXX	2022		



BENT NO. 1 ELEVATION (A)

Scale: 1/16" = 1'-0"

SA3.1 | SA3.1



BENT NO. 1 ELEVATION EXTERIOR DOWNSTREAM FACE (B)

Scale: 1/16" = 1'-0"

SA3.1 | SA3.1

NOTE:

Elevations shall be determined after land survey information has been obtained

ORIGINAL PLAN	SURVEY PLOTTED BY
NOTE BOOK	DRAWN BY
No.	TRACED BY
	DESIGNED BY
	QUANTITIES BY
	CHECKED BY
	DATE

DRAWING NAME: Z:\00 ONGOING\00 JF PROJECTS\22-001.12-NANUE STR BR REHAB\01 CAD\12-02-22 PE1 SUBMITTAL\NSR-SA0301 BENTS.DWG PLOT TIME: 12-02-22, 3:56 PM)

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

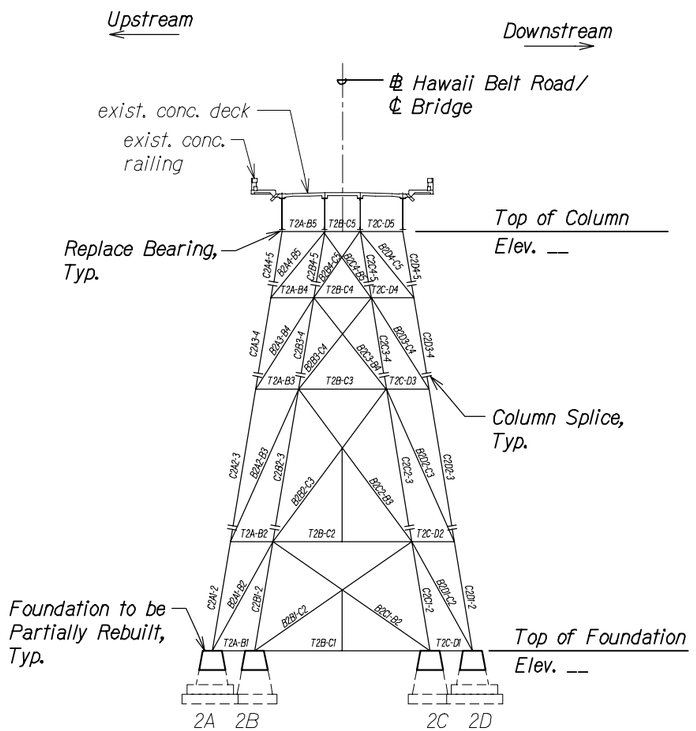
BENT NO. 1 ELEVATIONS

HAWAII BELT ROAD
NANUE STREAM BRIDGE REHABILITATION
Federal-Aid Proj. No. XXX-XX-XXX

Scale: As Noted Date: Dec. 2022

SHEET No. SA3.1 OF 5 SHEETS

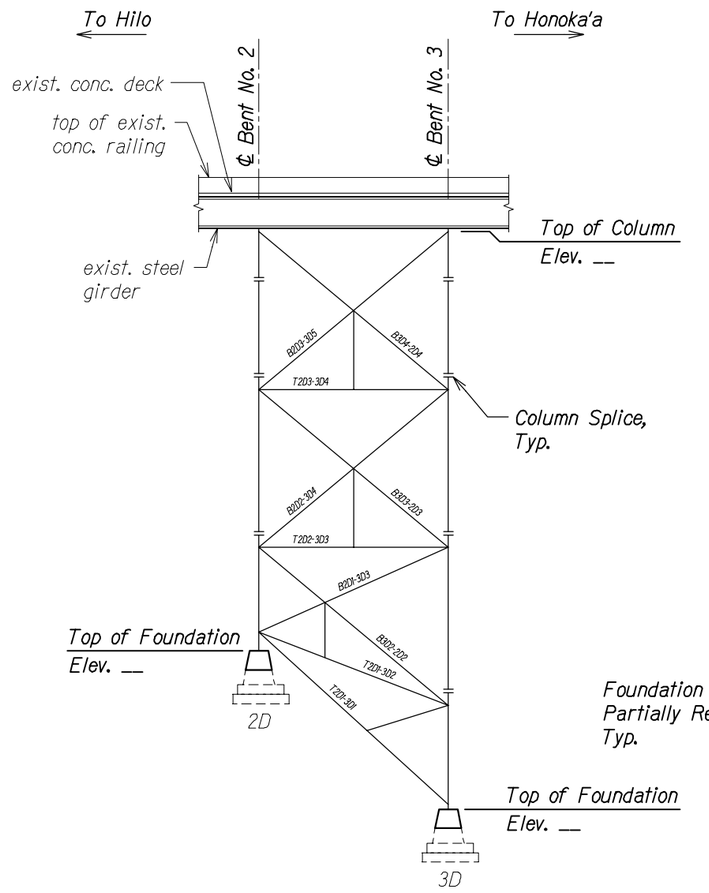
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	XXX-XX-XXX	2022		



BENT NO. 2 ELEVATION (A)

Scale: 1/16" = 1'-0"

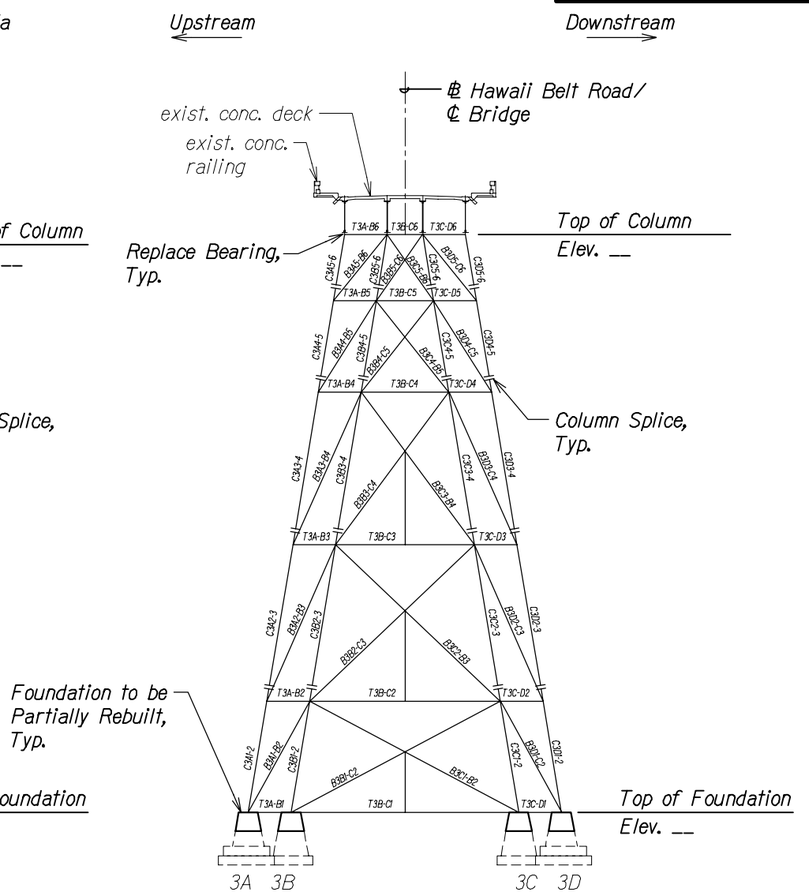
SA3.2 | SA3.2



BENT NOS. 2 AND 3 ELEVATION EXTERIOR DOWNSTREAM FACE (B)

Scale: 1/16" = 1'-0"

SA3.2 | SA3.2



BENT NO. 3 ELEVATION (C)

Scale: 1/16" = 1'-0"

SA3.2 | SA3.2

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BENT NOS. 2 AND 3 ELEVATIONS

HAWAII BELT ROAD
NANUE STREAM BRIDGE REHABILITATION
Federal-Aid Proj. No. XXX-XX-XXX

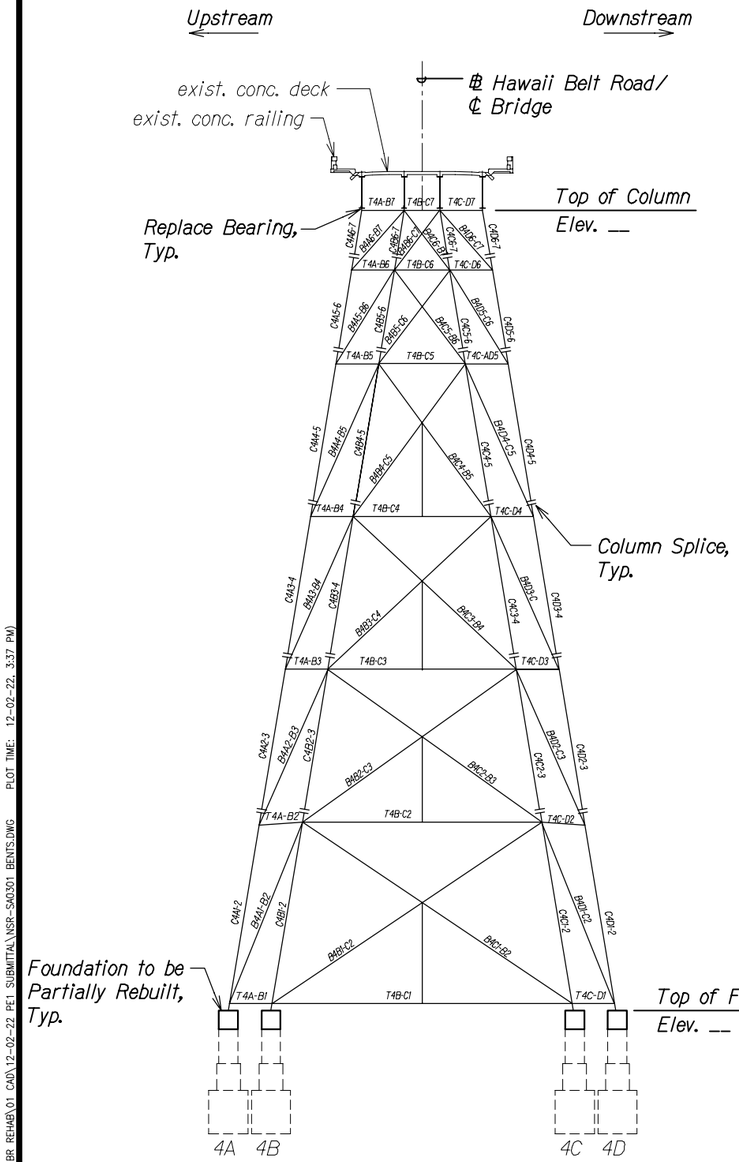
Scale: As Noted Date: Dec. 2022

SHEET No. SA3.2 OF 5 SHEETS

ORIGINAL PLAN | NOTE BOOK | No.
SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE

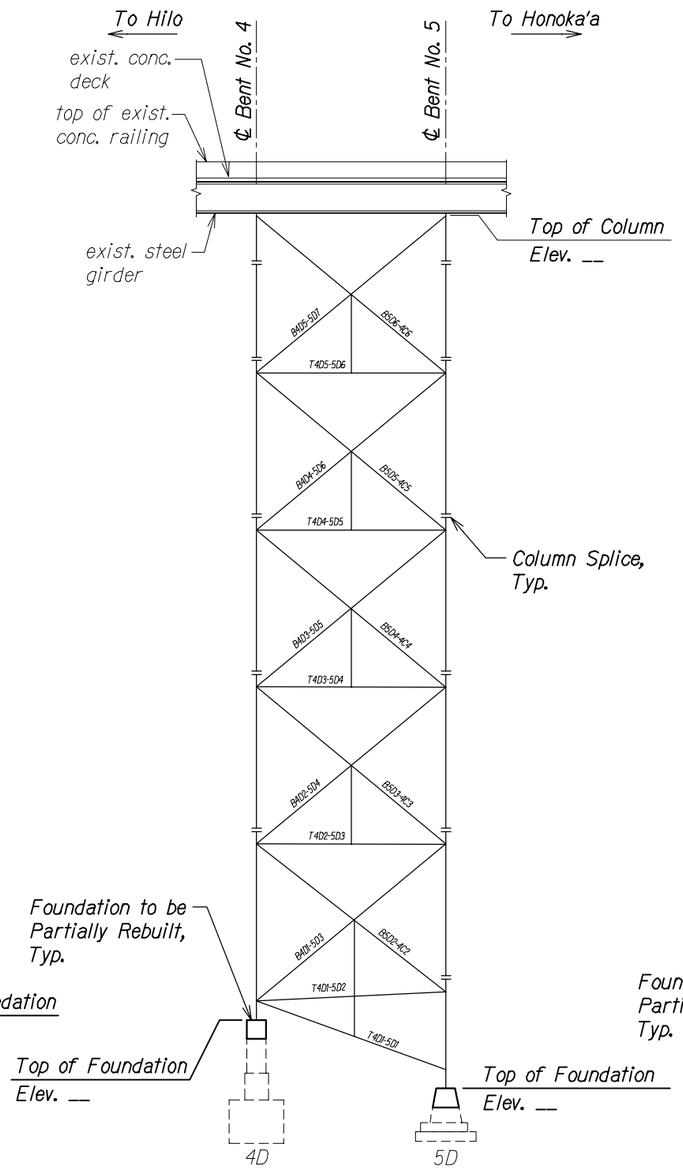
DRAWING NAME: Z:\00 ONGOING\00 JF PROJECTS\22-001.12-NANUE STR BR REHAB\01 CAD\12-02-22 PE1 SUBMITTAL\NSR-SA0301 BENTS.DWG PLOT TIME: 12-02-22, 3:37 PM)

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	XXX-XX-XXX	2022		



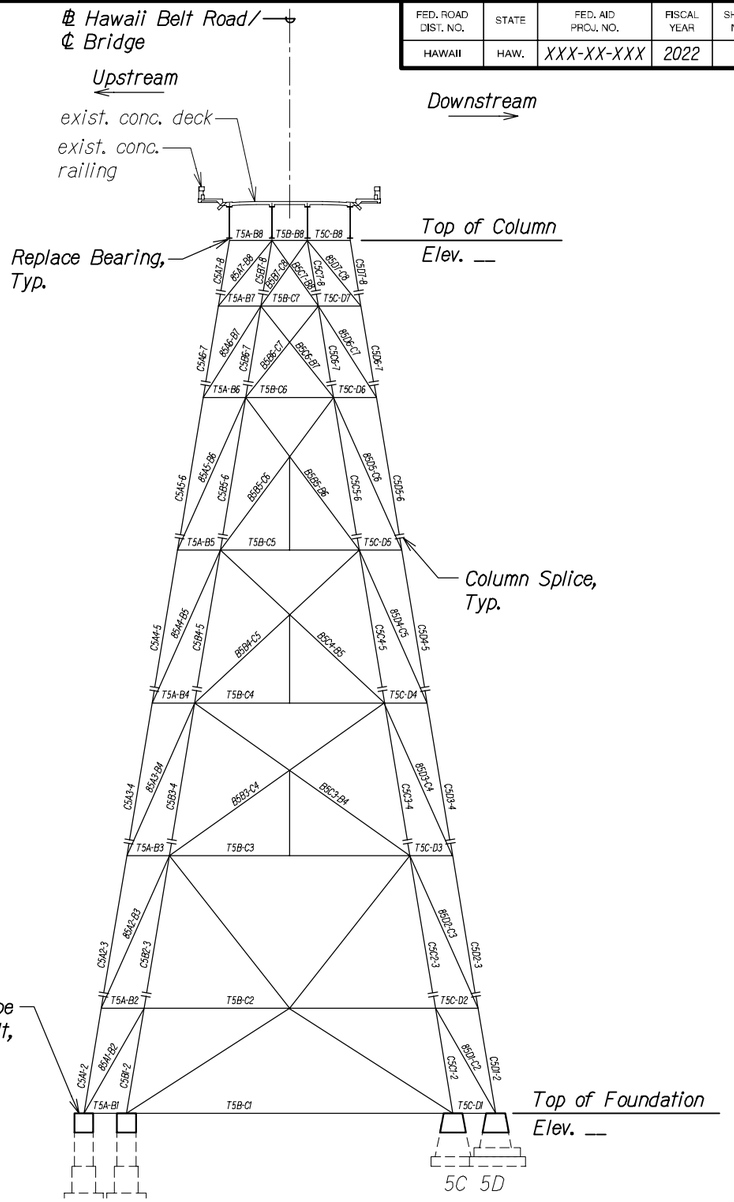
BENT NO. 4 ELEVATION (A)

Scale: 1/16" = 1'-0"



BENT NOS. 4 AND 5 ELEVATION EXTERIOR DOWNSTREAM FACE (B)

Scale: 1/16" = 1'-0"



BENT NO. 5 ELEVATION (C)

Scale: 1/16" = 1'-0"

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BENT NOS. 4 AND 5 ELEVATIONS

HAWAII BELT ROAD
NANUE STREAM BRIDGE REHABILITATION
Federal-Aid Proj. No. XXX-XX-XXX

Scale: As Noted Date: Dec. 2022

SHEET No. SA3.3 OF 5 SHEETS

ORIGINAL PLAN | NOTE BOOK No. | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE

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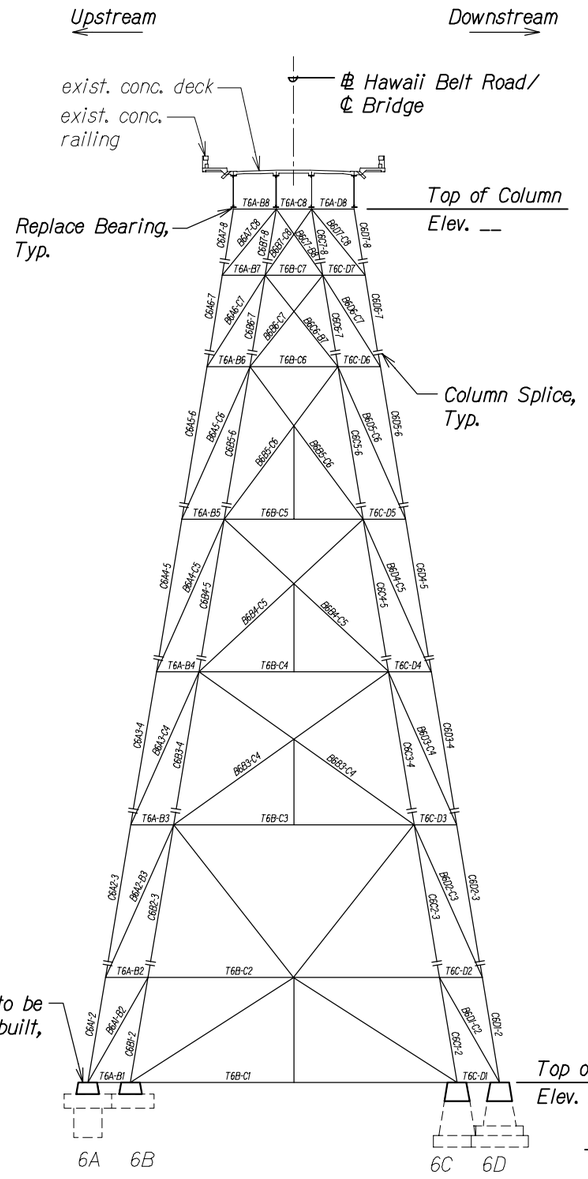
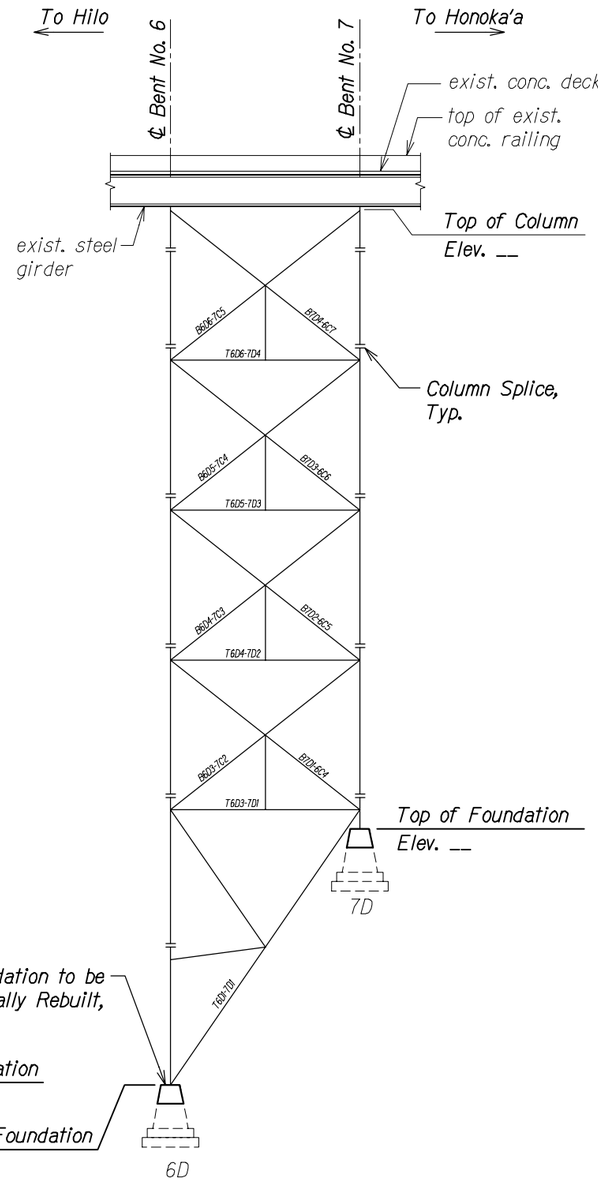
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	XXX-XX-XXX	2022		



BENT NO. 6 ELEVATION

Scale: 1/16" = 1'-0"

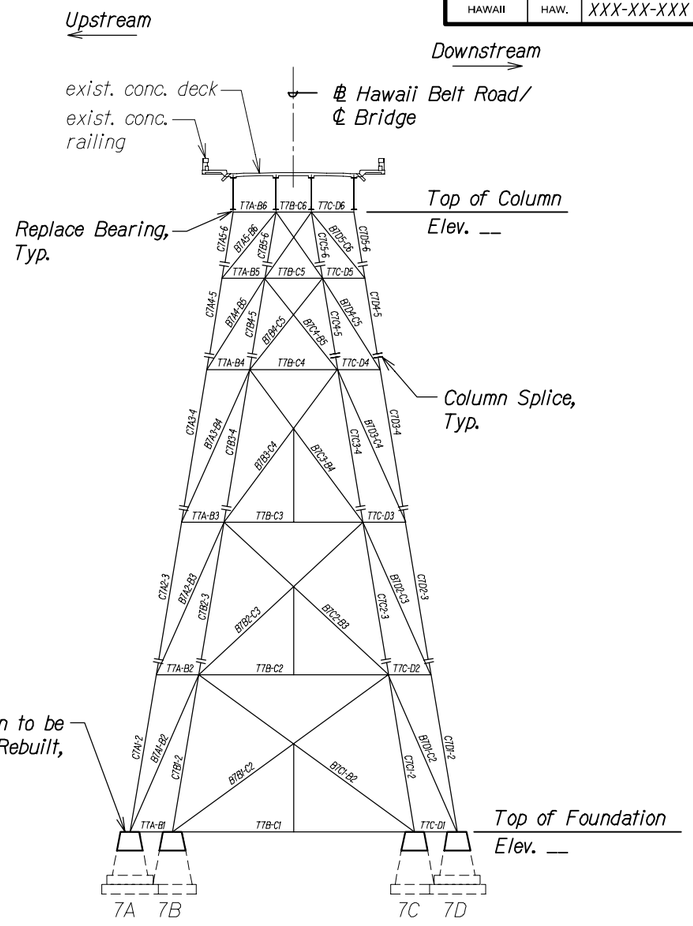
SA3.4 | SA3.4 (A)



BENT NOS. 6 AND 7 ELEVATION EXTERIOR DOWNSTREAM FACE

Scale: 1/16" = 1'-0"

SA3.4 | SA3.4 (B)



BENT NO. 7 ELEVATION

Scale: 1/16" = 1'-0"

SA3.4 | SA3.4 (C)

ORIGINAL PLAN	SURVEY PLOTTED BY
NOTE BOOK	DRAWN BY
	TRACED BY
	DESIGNED BY
	QUANTITIES BY
No.	CHECKED BY
	DATE

DRAWING NAME: Z:\00 ONGOING\00 JF PROJECTS\22-001.12-NANUE STR BR REHAB\01 CAD\12-02-22 PE1 SUBMITTAL\NSR-SA0301 BENTS.DWG PLOT TIME: 12-02-22, 3:37 PM)

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BENT NOS. 6 AND 7 ELEVATIONS

HAWAII BELT ROAD
NANUE STREAM BRIDGE REHABILITATION
Federal-Aid Proj. No. XXX-XX-XXX

Scale: As Noted Date: Dec. 2022

SHEET No. SA3.4 OF 5 SHEETS

Photograph 1. Upstream (West) Elevation

Photograph 2. Looking Upstream (West)

Photograph 3. Looking Downstream (East)

Photograph 4. South Approach (Looking North)

Photograph 43. Bent 3 Level 5, Column A just above bearing, gusset plates - Damage, plates are bowed to the South up to 1/8" for the horizontal bracing member (CS 4)

Photograph 44. Bent 3 Level 1, Column D Vertical near top - Corrosion, typical laminar at upper levels (CS 3)

JOSH GREEN, M.D.
GOVERNOR
KE KIA'ĀINA

DESIGN BRANCH, ROOM 688A
BRIDGE DESIGN SECTION, ROOM 611
CADASTRAL DESIGN SECTION, ROOM 600
ENVIRONMENTAL DESIGN SECTION, ROOM 688A
HIGHWAY DESIGN SECTION, ROOM 609
HYDRAULIC DESIGN SECTION, ROOM 636
TECHNICAL DESIGN SECTION, ROOM 688

EDWIN H. SNIFFEN
DIRECTOR
KA LUNA HO'OKELE

Deputy Directors
Nā Hope Luna Ho'okele
DREANALEE K. KALILI
TAMMY L. LEE
ROBIN K. SHISHIDO

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF TRANSPORTATION | KA 'OIHANA ALAKAU
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

IN REPLY REFER TO:

HWY-DD 2.25444

March 8, 2024

TO: DAWN N. S. CHANG, CHAIRPERSON
AND STATE HISTORIC PRESERVATION OFFICER
DEPARTMENT OF LAND AND NATURAL RESOURCES

ATTENTION: ALAN S. DOWNER, Ph.D.
ADMINISTRATOR AND DEPUTY STATE HISTORIC PRESERVATION OFFICER
STATE HISTORIC PRESERVATION DIVISION

FROM: HENRY KENNEDY Henry Kennedy
ENGINEERING PROGRAM MANAGER
HIGHWAYS DESIGN BRANCH

SUBJECT: NATIONAL HISTORIC PRESERVATION ACT (NHPA) SECTION 106
REQUEST FOR REVISED AREA OF POTENTIAL EFFECTS (APE)
CONCURRENCE
HAWAII BELT ROAD, NANUE STREAM BRIDGE
REHABILITATION
HONOHINA AHUPUAA, HILO MOKU, HAWAII ISLAND
FEDERAL-AID PROJECT NO. BR-019-2(077)
TAX MAP KEY (TMK): (3) 3-2-001

The Hawaii Department of Transportation (HDOT) requests the State Historic Preservation Officer's (SHPO) concurrence on the proposed revised APE pursuant to Section 106 of the NHPA and Title 36 of the Code of Federal Regulations, Section 800.4(a)(1).

Revised APE

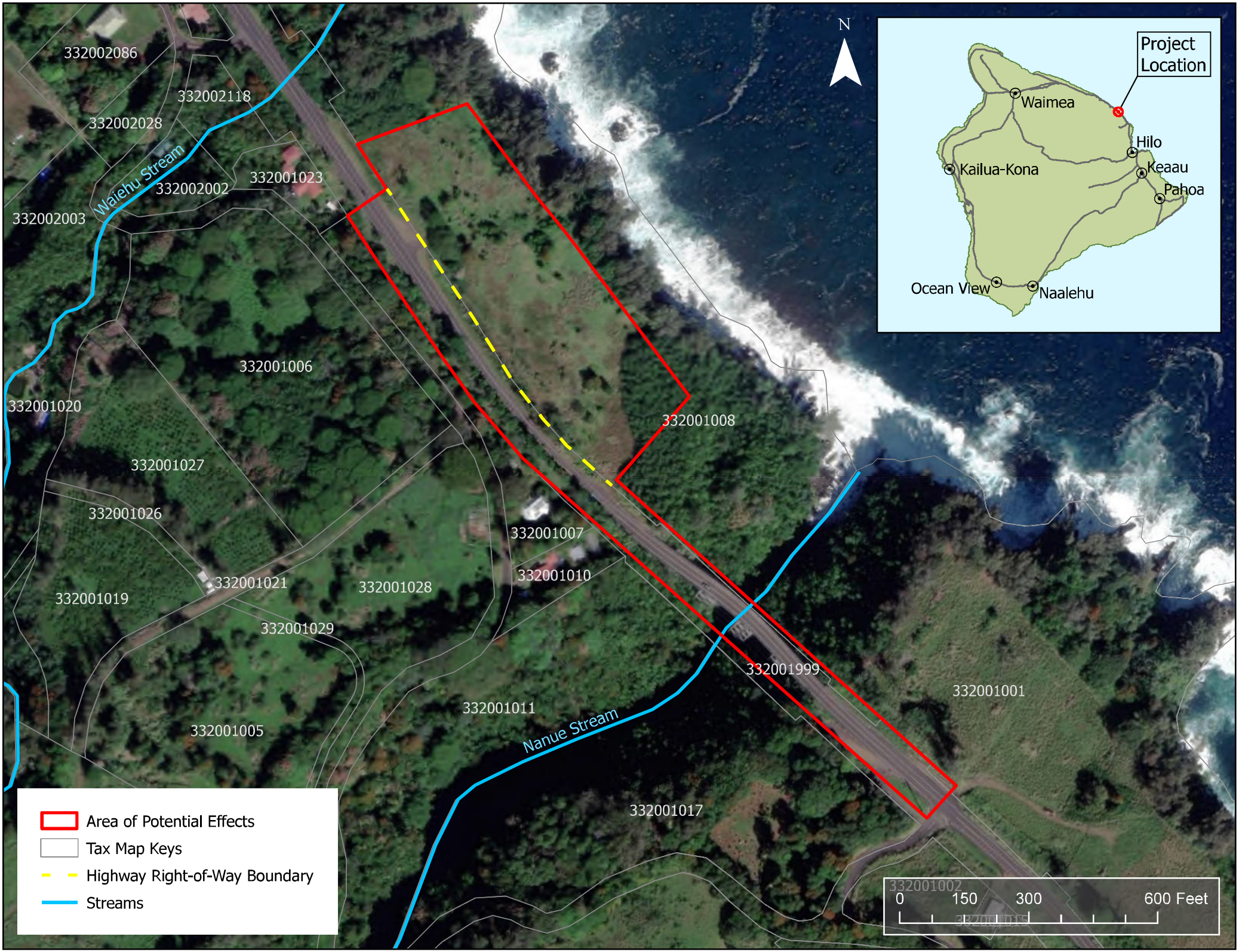
In the State Historic Preservation Division's letter dated January 22, 2024, Docket No. 2401SH04, the SHPO had no objections to the APE that extends 1,100 feet to the north from the northern terminus of Nanue Stream Bridge and 400 feet from the southern terminus of the bridge with a total acreage of 5.5 acres.

HDOT is expanding the APE to include 6 acres owned by Azhar Mustafa located on the makai side of Hawaii Belt Road at TMK: (3) 3-2-001-008. This portion of land has been previously graded and will be used specially for staging and stockpiling purposes.

HDOT requests concurrence to the addition. The APE is now defined as approximately 100 feet wide by 1,200 feet along Hawaii Belt Road in the State of Hawaii Right of Way and 300 feet by 1,000 feet makai of the highway on private property. The total acreage is 10.7 acres and is located 16 miles north of Hilo at Milepost 18.5. See enclosed for the revised APE Map.

We would appreciate all responses in writing within 30 days from the date of receipt to our Project Manager, Amy Sunahara from the Highway Design Section, Design Branch, at (808) 692-8431 or by email at amy.my.sunahara@hawaii.gov and reference letter number HWY-DD 2.25444 as noted above.

Enclosure


N
Project Location
Waimea
Hilo
Kailua-Kona
Keaau
Pahoa
Ocean View
Naalehu
332002086
332002118
332002028
Waiehu Stream
332002002
332001023
332002003
332001006
332001020
332001008
332001027
332001026
332001007
332001010
332001021
332001028
332001019
332001029
332001999
332001001
332001011
Nanue Stream
332001005
332001017
Area of Potential Effects
Tax Map Keys
Highway Right-of-Way Boundary
Streams
0
150
300
600 Feet

From: Sullivan, Kevin <Kevin.Sullivan@hawaiicounty.gov>
Sent: Friday, May 17, 2024 10:47 AM
To: Sunahara, Amy <amy.my.sunahara@hawaii.gov>; Trisha Kehaulani Watson <watson@honuaconsulting.com>
Cc: Kennedy, Henry <henry.kennedy@hawaii.gov>; Yuen, Holly <holly.yuen@hawaii.gov>; Tanaka, Kim <Kim.Tanaka@hawaiicounty.gov>; Laus, Lawrence M <lawrence.m.laus@hawaii.gov>; Surprenant, April <April.Surprenant@hawaiicounty.gov>; Naleimaile, Sean P <sean.p.naleimaile@hawaii.gov>; Hacker, Stephanie <stephanie.hacker@hawaii.gov>; Tanaka, Kim <Kim.Tanaka@hawaiicounty.gov>
Subject: [EXTERNAL] RE: Nanue Stream Bridge Rehabilitation (PL-CRC- 2024-000017)

Mahalo Amy,
Just wondering if you, and/or consultants have anything line itemed as to how the project addresses the SOI standards for Rehab?
Let me know please if we already have such a document? Makes it easier for CRC

1. A property shall be used for its historic purpose or be placed in a new use that requires minimal change to the defining characteristics of the building and its site and environment.
    1. Still a bridge

2. The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided.
    1. Extent of avoidance?

3. Each property shall be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or architectural elements from other buildings, shall not be undertaken.

4. Most properties change over time; those changes that have acquired historic significance in their own right shall be retained and preserved.

5. Distinctive features, finishes, and construction techniques or examples of craftsmanship that characterize a historic property shall be preserved.

6. Deteriorated historic features shall be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature shall match the old in design, color, texture, and other visual qualities and, where possible, materials. Replacement of missing features shall be substantiated by documentary, physical, or pictorial evidence.

7. Chemical or physical treatments, such as sandblasting, that cause damage to historic materials shall not be used. The surface cleaning of structures, if appropriate, shall be undertaken using the gentlest means possible.

8. Significant archeological resources affected by a project shall be protected and preserved. If such resources must be disturbed, mitigation measures shall be undertaken.

9. New additions, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment.

10. New additions and adjacent or related new construction shall be undertaken in such a manner that if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

Mahalo
Kevin Sullivan
808-961-8135

From: Sullivan, Kevin <Kevin.Sullivan@hawaiicounty.gov>
Sent: Tuesday, May 28, 2024 10:57 AM
To: Sunahara, Amy <amy.my.sunahara@hawaii.gov>; Trisha Kehaulani Watson <watson@honuaconsulting.com>
Cc: Kennedy, Henry <henry.kennedy@hawaii.gov>; Yuen, Holly <holly.yuen@hawaii.gov>; Tanaka, Kim <Kim.Tanaka@hawaiicounty.gov>; Laus, Lawrence M <lawrence.m.laus@hawaii.gov>; Surprenant, April <April.Surprenant@hawaiicounty.gov>; Naleimaile, Sean P <sean.p.naleimaile@hawaii.gov>; Hacker, Stephanie <stephanie.hacker@hawaii.gov>; Tanaka, Kim <Kim.Tanaka@hawaiicounty.gov>
Subject: [EXTERNAL] RE: Nanue Stream Bridge Rehabilitation (PL-CRC- 2024-000017)

Thank You Amy,
This is very helpful!
Staff is preparing a positive presentation for CRC comment/recommendations.
If you, or other(s) on the project team would like to present, please let me know; while not required, having someone in attendance/available for questions is always wise. Is a hybrid meeting so Zoom or in-person (Hilo)

Mahalo
Kevin Sullivan
808-961-8135

From: Sunahara, Amy <amy.my.sunahara@hawaii.gov>
Sent: Tuesday, May 28, 2024 8:46 AM
To: Sullivan, Kevin <Kevin.Sullivan@hawaiicounty.gov>; Trisha Kehaulani Watson <watson@honuaconsulting.com>
Cc: Kennedy, Henry <henry.kennedy@hawaii.gov>; Yuen, Holly <holly.yuen@hawaii.gov>; Tanaka, Kim <Kim.Tanaka@hawaiicounty.gov>; Laus, Lawrence M <lawrence.m.laus@hawaii.gov>; Surprenant, April <April.Surprenant@hawaiicounty.gov>; Naleimaile, Sean P <sean.p.naleimaile@hawaii.gov>; Hacker, Stephanie <stephanie.hacker@hawaii.gov>; Tanaka, Kim <Kim.Tanaka@hawaiicounty.gov>
Subject: RE: Nanue Stream Bridge Rehabilitation (PL-CRC- 2024-000017)

Kevin,

Please see our responses in blue below.

Thanks,

Amy Sunahara (nee Yagi), P.E.
Hawaii Department of Transportation
Highways, Design Branch (HWY-DD)
(808) 692-8431

From: Sullivan, Kevin <Kevin.Sullivan@hawaiicounty.gov>
Sent: Friday, May 17, 2024 10:47 AM
To: Sunahara, Amy <amy.my.sunahara@hawaii.gov>; Trisha Kehaulani Watson <watson@honuaconsulting.com>
Cc: Kennedy, Henry <henry.kennedy@hawaii.gov>; Yuen, Holly <holly.yuen@hawaii.gov>; Tanaka, Kim <Kim.Tanaka@hawaiicounty.gov>; Laus, Lawrence M <lawrence.m.laus@hawaii.gov>; Surprenant, April <April.Surprenant@hawaiicounty.gov>; Naleimaile, Sean P <sean.p.naleimaile@hawaii.gov>; Hacker, Stephanie <stephanie.hacker@hawaii.gov>; Tanaka, Kim <Kim.Tanaka@hawaiicounty.gov>
Subject: [EXTERNAL] RE: Nanue Stream Bridge Rehabilitation (PL-CRC- 2024-000017)

Mahalo Amy,
Just wondering if you, and/or consultants have anything line itemed as to how the project addresses the SOI standards for Rehab?
Let me know please if we already have such a document? Makes it easier for CRC

1. A property shall be used for its historic purpose or be placed in a new use that requires minimal change to the defining characteristics of the building and its site and environment.
    1. Still a bridge

    The existing land use is the Nanue Stream Bridge. The project is to rehabilitate the bridge and will continue in its existing use.

2. The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided.
    1. Extent of avoidance?

    The existing bridge structure is in a deteriorated state and rehabilitation will consist of replacement with in-kind materials.

3. Each property shall be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or architectural elements from other buildings, shall not be undertaken.

    In a letter dated May 14, 2024 from FHWA to SHPD, the FHWA states: “Typically, bridge rehabilitation results in an effect in historic properties. However, we are implementing the following as mitigation to retain the original appearance and integrity of Nanue Stream Bridge.

    Replacing in-kind steel truss members, bearings, gusset plates, nearly identical components to the original rivets, etc. that have corrosion and section loss;

Addressing spalls delamination in the concrete deck, bridge railings, column pedestals and foundations, such that the original characteristics are retained;

Cleaning and painting the steel members following the repairs to a near resemblance of the original bridge; and

Addressing scour deficiencies for the bridge foundations to maintain the original substructure.

Based on the mitigation efforts described above for the rehabilitation, FHWA has determined in accordance with 36 CFR § 800.5(b) that the Project will have No Adverse Effect on historic properties, as the project is rehabilitating the historic property in a manner consistent with the Secretary's Standards for the Treatment of Historic Properties (36 CFR part 68) and applicable guidelines to avoid adverse effects.

4. Most properties change over time; those changes that have acquired historic significance in their own right shall be retained and preserved.

   Same response as #3.

5. Distinctive features, finishes, and construction techniques or examples of craftsmanship that characterize a historic property shall be preserved.

   Same response as #3.

6. Deteriorated historic features shall be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature shall match the old in design, color, texture, and other visual qualities and, where possible, materials. Replacement of missing features shall be substantiated by documentary, physical, or pictorial evidence.

   Same response as #3.

7. Chemical or physical treatments, such as sandblasting, that cause damage to historic materials shall not be used. The surface cleaning of structures, if appropriate, shall be undertaken using the gentlest means possible.

N/A to this project. As previously stated, the existing steel members will be replaced with in-kind materials.

8. Significant archeological resources affected by a project shall be protected and preserved. If such resources must be disturbed, mitigation measures shall be undertaken.

   Page 3/19 of the FHWA letter to SHPD:

   Archaeological resources:

   Individuals meeting the Secretary of the Interior's (SOI) Professional Qualifications Standards reviewed available information, including National Register of Historic Places (NRHP) listings, information derived from online research and other sources to identify historic properties in the

APE. In SHPD's April 15, 2024 correspondence was a recommendation for HDOT and FHWA to research the SHPD Library to determine whether any archaeological identification efforts have taken place in or around the APE. Our SHPD Library research found no record of archaeological studies completed near the project area and APE. FHWA identified one historic property in the APE through research and consultation. Nanue Stream Bridge is listed on the State of Hawaii Department of Transportation State Historic Bridge Inventory and Evaluation (SHBIE) (2013).

9. New additions, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment.

   Same response as #3.

10. New additions and adjacent or related new construction shall be undertaken in such a manner that if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

    Same response as #3.

Mahalo
Kevin Sullivan
808-961-8135

From: Sunahara, Amy <amy.my.sunahara@hawaii.gov>
Sent: Thursday, May 16, 2024 2:20 PM
To: Sullivan, Kevin <Kevin.Sullivan@hawaiicounty.gov>; Trisha Kehaulani Watson <watson@honuaconsulting.com>
Cc: Kennedy, Henry <henry.kennedy@hawaii.gov>; Yuen, Holly <holly.yuen@hawaii.gov>; Tanaka, Kim <Kim.Tanaka@hawaiicounty.gov>; Laus, Lawrence M <lawrence.m.laus@hawaii.gov>; Surprenant, April <April.Surprenant@hawaiicounty.gov>; Naleimaile, Sean P <sean.p.naleimaile@hawaii.gov>; Hacker, Stephanie <stephanie.hacker@hawaii.gov>
Subject: RE: Nanue Stream Bridge Rehabilitation (PL-CRC- 2024-000017)

Kevin,

As mentioned earlier, SHPD is currently reviewing our Section 106 Determination. We are currently waiting on their response.

We look forward to moving forward based on your comments.

Thanks,

Amy Sunahara (nee Yagi), P.E.
Hawaii Department of Transportation
Highways, Design Branch (HWY-DD)
(808) 692-8431

From: Sullivan, Kevin <Kevin.Sullivan@hawaiicounty.gov>
Sent: Wednesday, May 15, 2024 1:47 PM

To: Sunahara, Amy <amy.my.sunahara@hawaii.gov>; Trisha Kehaulani Watson <watson@honuaconsulting.com>
Cc: Kennedy, Henry <henry.kennedy@hawaii.gov>; Yuen, Holly <holly.yuen@hawaii.gov>; Tanaka, Kim <Kim.Tanaka@hawaiicounty.gov>; Laus, Lawrence M <lawrence.m.laus@hawaii.gov>; Surprenant, April <April.Surprenant@hawaiicounty.gov>; Naleimaile, Sean P <sean.p.naleimaile@hawaii.gov>; Hacker, Stephanie <stephanie.hacker@hawaii.gov>
Subject: [EXTERNAL] RE: Nanue Stream Bridge Rehabilitation (PL-CRC- 2024-000017)

Thank You Amy!

I think I am (finally) 'current'?
I'm cc'ing SHPD so we can ALL be on same page forward. (Sec.106, HRS 6E, et al)

Your letter went out yesterday 5/14/24 to SHPD, I'm assuming in response to SHPD's most recent (attached) correspondence for the proposed project; that SHPD letter indicated that more archaeological identification efforts should be undertaken...any update on that?

Otherwise, my recommendation is to gear your presentation to CRC around their SOI kuleana: "The Commission shall review the proposed action against the criteria set forth by the Secretary of the Interior' s Standards for the Treatment of Historic Properties."

For your info: After the CRC has reviewed all materials and public testimony pertaining to the project, the Commission may:
A) Request further information regarding the project, including but not limited to an opinion from the State Historic Preservation Division.
B) Vote on a recommendation for consideration by the (Planning) Director and the State Historic Preservation Officer, which may include an opinion as to whether the project is not likely to impact a historic property, will likely have a limited but acceptable impact on a historic property, or will likely have a severe impact on a historic property.
The Commission shall forward their recommendation to the (Planning) Director and the State Historic Preservation Officer, for their consideration in any approvals, permits, or determinations issued.

Let me know if you have any questions

Mahalo
Kevin Sullivan
808-961-8135

From: Sunahara, Amy <amy.my.sunahara@hawaii.gov>
Sent: Wednesday, May 15, 2024 9:48 AM
To: Sullivan, Kevin <Kevin.Sullivan@hawaiicounty.gov>; Trisha Kehaulani Watson <watson@honuaconsulting.com>
Cc: Roy, Alex <Alex.Roy@hawaiicounty.gov>; Planning Cultural Resources Commission <CRC@hawaiicounty.gov>; Kennedy, Henry <henry.kennedy@hawaii.gov>; Yuen, Holly <holly.yuen@hawaii.gov>; Tanaka, Kim <Kim.Tanaka@hawaiicounty.gov>; Laus, Lawrence M <lawrence.m.laus@hawaii.gov>
Subject: RE: Nanue Stream Bridge Rehabilitation (PL-CRC- 2024-000017)

Kevin,

Our Section 106 Determination was signed by FHWA and is currently being reviewed by SHPD. Please see attached for the Section 106 Determination Letter.

Thanks,

Amy Sunahara (nee Yagi), P.E.
Hawaii Department of Transportation
Highways, Design Branch (HWY-DD)
(808) 692-8431

From: Sullivan, Kevin <Kevin.Sullivan@hawaiicounty.gov>
Sent: Monday, May 13, 2024 10:38 AM
To: Sunahara, Amy <amy.my.sunahara@hawaii.gov>; Trisha Kehaulani Watson <watson@honuaconsulting.com>
Cc: Roy, Alex <Alex.Roy@hawaiicounty.gov>; Planning Cultural Resources Commission <CRC@hawaiicounty.gov>; Kennedy, Henry <henry.kennedy@hawaii.gov>; Yuen, Holly <holly.yuen@hawaii.gov>; Tanaka, Kim <Kim.Tanaka@hawaiicounty.gov>
Subject: [EXTERNAL] RE: Nanue Stream Bridge Rehabilitation (PL-CRC- 2024-000017)

Mahalo for sending these prelim plans over.

What documentation can you please share (from SHPD or otherwise?) that may elaborate on "full rehabilitation is accordance with SOI treatment standards, which is why the no adverse effect determination per Section 106 Part 800.5(b).".

Mahalo
Kevin Sullivan
808-961-8135

From: Sunahara, Amy <amy.my.sunahara@hawaii.gov>
Sent: Monday, May 13, 2024 9:43 AM
To: Tanaka, Kim <Kim.Tanaka@hawaiicounty.gov>
Cc: Roy, Alex <Alex.Roy@hawaiicounty.gov>; Sullivan, Kevin <Kevin.Sullivan@hawaiicounty.gov>; Planning Cultural Resources Commission <CRC@hawaiicounty.gov>; Kennedy, Henry <henry.kennedy@hawaii.gov>; Yuen, Holly <holly.yuen@hawaii.gov>; Trisha Kehaulani Watson <watson@honuaconsulting.com>
Subject: RE: Nanue Stream Bridge Rehabilitation (PL-CRC- 2024-000017)

Hi Kim,

Per your conversation with Trisha, please see attached for the Nanue Stream Bridge Rehabilitation Preliminary Plans as requested.

Thanks,

Amy Sunahara (nee Yagi), P.E.
Hawaii Department of Transportation
Highways, Design Branch (HWY-DD)
(808) 692-8431

From: Trisha Kehaulani Watson <watson@honuaconsulting.com>
Sent: Monday, May 6, 2024 3:04 PM
To: Tanaka, Kim <Kim.Tanaka@hawaiicounty.gov>
Cc: Sunahara, Amy <amy.my.sunahara@hawaii.gov>; Roy, Alex <Alex.Roy@hawaiicounty.gov>; Sullivan, Kevin

JOSH GREEN, M.D.
GOVERNOR
KE KIAʻĀINA

DESIGN BRANCH, ROOM 688A
BRIDGE DESIGN SECTION, ROOM 611
CADASTRAL DESIGN SECTION, ROOM 600
ENVIRONMENTAL DESIGN SECTION, ROOM 688A
HIGHWAY DESIGN SECTION, ROOM 609
HYDRAULIC DESIGN SECTION, ROOM 636
TECHNICAL DESIGN SECTION, ROOM 688

EDWIN H. SNIFFEN
DIRECTOR
KA LUNA HOʻOKELE

Deputy Directors
Nā Hope Luna Hoʻokele
DREANALEE K. KALILI
TAMMY L. LEE
ROBIN K. SHISHIDO

STATE OF HAWAIʻI | KA MOKUʻĀINA ʻO HAWAIʻI
DEPARTMENT OF TRANSPORTATION | KA ʻOIHANA ALAKAU
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

IN REPLY REFER TO:

HWY-DD 2.25446

March 13, 2024

Ms. Kiersten Faulkner
Executive Director
Historic Hawaii Foundation
680 Iwilei Road, Dole Office Building Tower, Suite 690
Honolulu, Hawaii 96817

Dear Ms. Faulkner:

Subject: National Historic Preservation Act (NHPA), Section 106: Consultation with Native Hawaiian Organizations (NHO) and Potential Consulting Parties
Hawaii Belt Road Nanue Stream Bridge Rehabilitation
Honohina Ahupuaa, Hilo Moku, Hawaii Island
Federal-Aid Project No. BR-019-2(077)
Tax Map Key (TMK): (3) 3-2-001-008

On behalf of the Federal Highway Administration (FHWA), the State of Hawaii Department of Transportation (HDOT) is notifying you that on December 19, 2023, Section 106 of the NHPA of 1966 (amended, 2006), was initiated with the State Historic Preservation Officer (SHPO) for the subject bridge rehabilitation project.

The proposed federally funded HDOT project is considered a federal action and undertaking as defined in Title 36 *Code of Federal Regulations* (CFR), § 800.16(y). Effective May 1, 2016, FHWA has issued a Delegation of Authority allowing the HDOT and local public agencies to conduct NHPA Section 106 consultations with the SHPO, NHO, and other consulting parties per 36 CFR, § 800.2 (c) (4). The FHWA will remain responsible for all findings and determinations charged to the agency during the Section 106 process.

Overview of the Undertaking
HDOT proposes to rehabilitate the Nanue Stream Bridge at Milepost 18.5 on Hawaii Belt Road in the Honohina ahupuaa, Hawaii Island to address the deterioration in the superstructure by repairing steel truss members, bearings, gusset plates, rivets, etc. that have corrosion and section

loss; address spalls delamination in the concrete deck, bridge railings, column pedestals and foundations; clean and paint the steel members following the repairs; and address scour deficiencies for the bridge foundations.

Consultations
Entitled consulting parties during the Section 106 process include the Advisory Council on Historic Preservation, SHPO, NHO, and if applicable, local governments and applicants for federal assistance, permits, licenses and other approvals.

NHO and/or Hawaiian Descendants
NHO and native Hawaiian descendants with ancestral, lineal, or cultural ties to, cultural and/or historical property knowledge of and/or concerns for, and cultural or religious attachment to the proposed Area of Potential Effects (APE) are asked to provide a response to this letter within 30 days of notification.

Other Individuals and Organizations
Individuals and organizations with legal, economic, or historic preservation interest are requested to respond within 30 days of notification and demonstrate your interest in the proposed undertaking and provide intent to participate in the Section 106 process. Your participation is subject to FHWA approval.

The APE
The APE is as described below: approximately 16 miles north of Hilo at Milepost 18.5 of the Hawaii Belt Road (Route 19); the APE is approximately 100 feet wide by 1,200 feet long along the roadway in the State Right of Way, and 300 feet by 1,000 feet makai of the highway at TMK: (3) 3-2-001-008. The total project acreage is 10.7 acres. See attachment for a revised APE map with the Request for Revised APE Concurrence letter sent to the SHPO on March 11, 2024.

Identification of Historic Properties within the APE
We welcome any information you may have on historical and cultural sites that have been recorded in or which you may have knowledge of within the proposed APE. In addition, if you are acquainted with any persons or organization that is knowledgeable about the proposed APE, or any descendants with ancestral, lineal or cultural ties to or cultural knowledge and/or historical properties information of or concerns for, and cultural or religious attachment to the proposed project area, we would appreciate receiving their names and contact information within 30 days of notice.

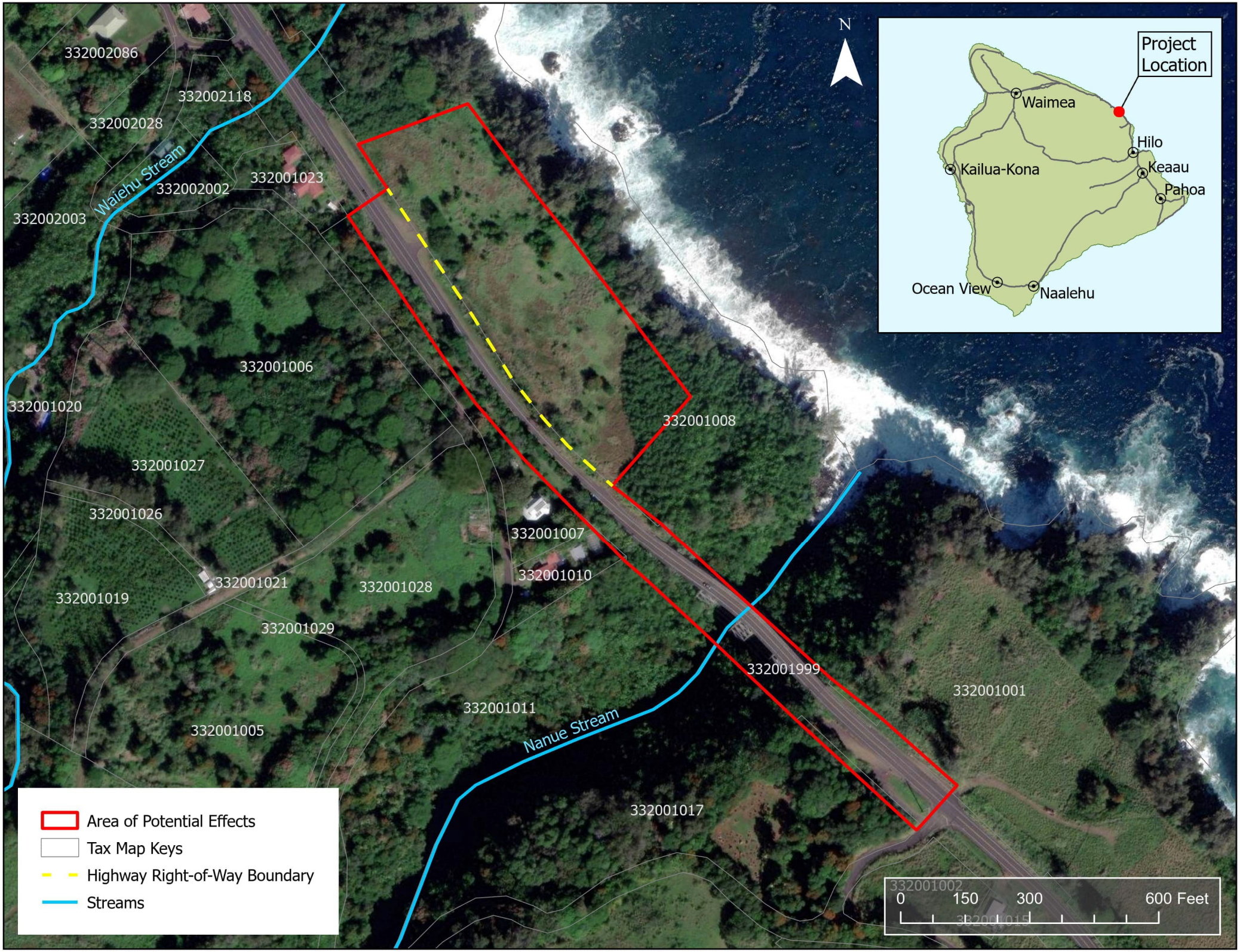
Please send all responses to our Project Manager, Amy Sunahara, via email at amy.my.sunahara@hawaii.gov, or by U.S. Postal Service to Department of Transportation, Highways Design Branch, 601 Kamokila Boulevard, Room 609, Kapolei, Hawaii, 96707.

Sincerely,

Henry Kennedy

HENRY KENNEDY
Engineering Program Manager
Design Branch

Attachment


N
Project Location
Waimea
Hilo
Kailua-Kona
Keaau
Pahoa
Ocean View
Naalehu
332002086
332002118
332002028
Waiehu Stream
332001023
332002002
332002003
332001006
332001020
332001008
332001027
332001026
332001007
332001010
332001021
332001028
332001019
332001029
332001999
332001001
332001011
332001005
Nanue Stream
332001017
Area of Potential Effects
Tax Map Keys
Highway Right-of-Way Boundary
Streams
0
150
300
600 Feet

Hi All,

Please see below for OHA's comments to the Section 106.

Thanks,

Amy Sunahara (nee Yagi), P.E.
Hawaii Department of Transportation
Highways, Design Branch (HWY-DD)
(808) 692-8431

From: Kamakana Ferreira <kamakanaf@oha.org>
Sent: Friday, April 12, 2024 9:25 AM
To: Sunahara, Amy <amy.my.sunahara@hawaii.gov>
Cc: Kennedy, Henry <henry.kennedy@hawaii.gov>
Subject: [EXTERNAL] OHA Comment Re: NHPA Sec 106 for Nanue Bridge Rehab Project

Aloha,

The Office of Hawaiian Affairs (OHA) is in receipt of your letter dated March 13, 2024, initiating National Historic Preservation Act (NHPA) Section 106 consultation for the Hawaii Belt Road Nanue Stream Bridge Rehabilitation project in Hilo, Hawaii Island, TMK (3) 3-2-001:008. HDOT is carrying out this consultation on behalf of the Federal Highway Administration (FHWA). HDOT proposes to rehab the Nanue Stream Bridge at Milepost 18.5 on Hawaii Belt Road to address deterioration in the superstructure by repairing steel truss members, bearings, gusset plates, rivets. Further work will include addressing spall delamination on the concrete deck, bridge railings, column pedestals and foundations; and, cleaning and painting steel members following repairs.

At this time, OHA would like to participate as a consulting party. However, we would like to request further detail on ground disturbing work. If the State Historic Preservation Division (SHPD) has submitted comments on this project, we respectfully request those as well.

OHA has no comment on the area of potential effect (APE) at this time.

Mahalo for the opportunity to comment. We look forward to continued consultation and receiving the requested information. Please let me know if you have any questions at this time.

Going forward, please address all letters OHA's new Chief Executive Officer, Stacy Ferreira, as Sylvia Hussey is no longer with the agency.

Mahalo,

Kamakana C. Ferreira, M.A.
Lead Compliance Specialist
Office of Hawaiian Affairs
560 N. Nimitz Hwy
Honolulu, Hi. 96817

(808)594-0227

JOSH GREEN, M.D.
GOVERNOR | KE KIAʻĀINA

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIAʻĀINA

STATE OF HAWAIʻI | KA MOKUʻĀINA ʻO HAWAIʻI
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA ʻOIHANA KUMUWAIWAI ʻĀINA

STATE HISTORIC PRESERVATION DIVISION
KAKUHIHEWA BUILDING
601 KAMOKILA BLVD, STE 555
KAPOLEI, HAWAIl 96707

May 28, 2023

IN REPLY REFER TO:
Project No.: 2023PR01507
Doc. No.: 2405JLP03
Architecture, Archaeology

Richelle M. Takara, P.E.
Division Administrator
Federal Highway Administration
Hawaii Federal-Aid Division
U.S. Department of Transportation
300 Ala Moana Blvd., Rm 3-306
Box 50206
Honolulu, HI 96850

Dear Richelle M. Takara,

RE: National Historic Preservation Act (NHPA) Section 106 Consultation
Hawaii Belt Road, Nanue Stream Bridge Rehabilitation
Federal-Aid Project No. BR-019-2(077)
Honohina Ahupuaʻa, Hilo District, Island of Hawaiʻi
TMK: (3) 3-2-001:008

Thank you for the opportunity to comment on this request from the Federal Highway Administration (FHWA) for consultation and concurrence with the determination of ***no adverse effect*** for the proposed Hawaii Belt Road, Nanue Stream Bridge Rehabilitation project. FHWA has determined that this project is an undertaking, as defined in 36 CFR §800.16(y) and subject to compliance with the Section 106 process. The State Historic Preservation Division (SHPD) received this submittal on May 20, 2024.

The area of potential effects (APE) includes a 100-foot-wide by 1,200-foot-long area along the Hawaii Belt Road, as well as a 300-foot by 1,000-foot area makai of the highway for staging materials and equipment. SHPD responded with no objections to the APE on April 15, 2024 (Project No. 2023PR01507, Doc. No. 2404SH05). The APE totals 11.5 acres.

The proposed State of Hawaiʻi Department of Transportation project includes rehabilitation of Nanue Stream bridge to repair its deteriorated superstructure and spalling as well as to clean and paint steel members and address scour deficiencies at the bridge foundations. The Nanue Stream Bridge is listed in the Hawaii Register of Historic Places (Site 50-10-16-09090) and is eligible for listing in the National Register of Historic Places under Criteria A, B, and C. The work will be overseen by architectural historians who meet SOI professional qualification standards and will follow the Secretary of the Interior's Standards for the Treatment of Historic Properties (pursuant to 36 CFR Part 68).

Based on the information provided, the Hawaii State Historic Preservation Officer (SHPO) has reviewed the undertaking, pursuant to 36 CFR § 800.5(c), and the **SHPO concurs** with the FHWA's determination that the proposed undertaking will have ***no adverse effect.*** The proposed project meets the Secretary of the Interior's Standards for the Treatment of Historic Properties and best preservation practices.

FHWA is the office of record for this undertaking. Please maintain a copy of this letter with your environmental review record. If you have any questions about this undertaking or if there is a change to the scope of work, please contact Jessica Puff, Architecture Branch Chief, at (808) 692-8022 or by email at Jessica.Puff@hawaii.gov. If you have any questions regarding archaeological resources, please contact Stephanie Hacker, Archaeologist IV, at Stephanie.Hacker@hawaii.gov.

Sincerely,

Dawn Chang
State Historic Preservation Officer
Chairperson, Department of Land and Natural Resources

CC:

Hansen Ho, hansen.ho@hawaii.gov
Amy Sunahara, amy.my.sunahara@hawaii.gov
Meesa Otani, meesa.otani@dot.gov
Holly Yuen, holly.yuen@hawaii.gov
Lawrence Laus, lawrence.m.laus@hawaii.gov

Hawaii Revised Statutes Chapter 6E-8

JOSH GREEN, M.D.
GOVERNOR | KE KIAʻĀINA

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIAʻĀINA

STATE OF HAWAIʻI | KA MOKUʻĀINA ʻO HAWAIʻI
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA ʻOIHANA KUMUWAIWAI ʻĀINA

STATE HISTORIC PRESERVATION DIVISION
KAKUHIHEWA BUILDING
601 KAMOKILA BLVD, STE 555
KAPOLEI, HAWAII 96707

May 28, 2024

IN REPLY REFER TO:
Project No.: 2023PR01507
Doc. No.: 2405JLP04
Architecture, Archaeology

Henry Kennedy
Engineering Program Manager
Design Branch
State of Hawai‘i Department of Transportation
601 Kamokila Blvd.
Kapolei, HI 96707

Dear Henry Kennedy:

RE: Hawaii Revised Statues (HRS) §6E-8 Historic Preservation Review and Hawaii Administrative Rules (HAR) §13-275 Evaluation of Significance for the Hawaii Belt Road, Nanue Stream Bridge Rehabilitation Project
Federal-Aid Project No. BR-019-2(077)
Honohina Ahupua‘a, Hilo District, Island of Hawai‘i
Fronting TMK: (3) 3-2-001:008 (Hawaii Belt Road [Route 19] Right-of-Way [ROW])

Thank you for the opportunity to comment on the Hawaii Belt Road, Nanue Stream Bridge Rehabilitation project, pursuant to HRS §6E-8. The State Historic Preservation Division (SHPD) received a letter dated May 6, 2024 (Ref. HWY-DD 2.20336) from the State of Hawai‘i Department of Transportation on May 14, 2024, initiating HRS 6E-8 review and requesting the SHPD’s concurrence with a determination of “No historic properties affected.”

The proposed project is located at milepost 18.5 along the Hawaii Belt Road (Route 19) ROW. The project area includes a 100-foot-wide by 1,200-foot-long area along the ROW and a potential 300-foot-wide by 1,000-foot-long staging area makai of the highway at TMK: (3) 3-2-001:008. The project area totals 11.5 acres.

The scope of work includes rehabilitation of Nanue Stream Bridge (Bridge No. 001000190308146) to repair deterioration of the bridge superstructure, spall delamination, scour deficiencies for the bridge foundations, as well as cleaning and repainting the steel members of the bridge. The Nanue Stream Bridge is listed in the Hawai‘i Register of Historic Places (Site 50-10-16-09090) and is eligible for listing in the National Register of Historic Places under Criteria A, B, and C. The proposed project will not remove any character defining features or materials, nor will it alter significant spaces or spatial relationships that contribute to the historical significance of the site. Therefore, the proposed project will not affect the integrity of design, materials, workmanship, location, setting, association, or feeling of Nanue Stream Bridge. The proposed project is in keeping with the Secretary of the Interior’s Standards and Guidelines for the Treatment of Historic Properties and best preservation practices.

Based on the information provided, SHPD has reviewed the proposed project, pursuant to HRS §6E-8, and **the SHPD concurs** with the State of Hawai‘i Department of Transportation’s determination of “**No historic properties affected.”** SHPD’s HRS §6E -8 historic preservation review for the subject is now complete.

Please annotate permits and construction plans to include the following: In the unlikely event that subsurface historic resources, including human skeletal remains, structural remains, cultural deposits, artifacts, sand deposits, or sink holes are identified during the demolition and/or construction work, cease work in the immediate vicinity of the find, protect the find from additional disturbance, and contact the State Historic Preservation Division, at (808) 933-7651.

If you have any questions about this project review or if there is a change to the scope of work, please contact Jessica Puff, Architecture Branch Chief, at (808) 692-8015 or at Jessica.Puff@hawaii.gov. If you have any questions regarding archaeological resources, please contact Stephanie Hacker, Archaeologist IV, at stephanie.hacker@hawaii.gov.

Sincerely,
Susan A. Lebo

Susan A. Lebo, PhD
Archaeology Branch Chief
Acting Administrator, State Historic Preservation Division

cc:

Hansen Ho, hansen.ho@hawaii.gov
Amy Sunahara, amy.my.sunahara@hawaii.gov
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U.S. Fish and Wildlife Service Endangered Species Act Section 7

U.S. Department of Transportation
Federal Highway Administration

Hawaii Federal-Aid Division

300 Ala Moana Blvd, Rm 3-229
Box 50206
Honolulu, Hawaii 96850
Phone: (808) 541-2700
FHWA-Hawaii.Intake@dot.gov

August 29, 2023

In Reply Refer To:
HDA-HI

Earl Campbell, Ph.D.
Field Supervisor, Pacific Islands Fish and Wildlife Office
U.S Fish and Wildlife Service
300 Ala Moana Boulevard, Rm 3-122, Box 50088
Honolulu, HI 96850

Subject: Endangered Species Act Section 7 Consultation
Nanue Stream Bridge Rehabilitation
Island of Hawaii, Hawaii
Federal-aid Project No. BR-019-2(077)

Dear Dr. Campbell,

The Federal Highway Administration (FHWA), in cooperation with the State of Hawai'i Department of Transportation (HDOT), is planning the Nanue Stream Bridge Rehabilitation project. Pursuant to Section 7 of the Endangered Species Act (ESA), the FHWA is requesting concurrence from the U.S. Fish and Wildlife Service (USFWS) that the proposed project may affect, but is not likely to adversely affect the following federally listed species: the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*), the endangered Band-rumped Storm-petrel (*Oceanodroma castro*), the endangered Hawaiian Duck (*Anas wyvilliana*), the endangered Hawaiian Coot (*Fulica americana alai*), the threatened Hawaiian Goose (*Branta sandvicensis*), the endangered Hawaiian petrel (*Pterodroma sandwichensis*), the endangered Hawaiian Stilt (*Himatopus mexicanus knudensi*), the threatened Newell's Townsend's Shearwater (*Puffinus auricularis newelli*), the threatened Green Sea Turtle (*Chelonia mydas*), the endangered Alani (*Melicope zahlbruckneri*), the endangered Nanu (*Gardenia remyi*), the endangered *Deparia kaalaana*, and the endangered *Microlepia strigose var. mauiensis*. No critical habitat is located within the immediate vicinity of the proposed project.

Description of the Proposed Action

The Nanue Stream Bridge (1000190308146) is oriented from south (to Hilo) to north (to Honokaa) and carries Hawaii Belt Road over Nanue Stream. The bridge was constructed in 1952 and the coordinates are 19°55'38.56"N, 155° 9'23.47"W and carries Hawaii Belt Road over the Nanue Stream. The bridge is in the State Conservation District and the Special Management Area (SMA). The proposed action is a bridge rehabilitation project.
The proposed project is located in Ninole on the island of Hawaii, approximately 16 miles north of Hilo. The Nanue Stream Bridge carries Hawaii Belt Road over Nanue Stream at Milepost

18.5. The proposed action area spans approximately 2,050 feet (0.38 miles) and consists of the bridge footprint, construction staging areas, and the highway right-of-way (ROW). The bridge measures 528-feet long with a deck width of 38'-6" and footings about 85 feet wide. Please refer to the attached project location map that delineates the proposed action area.

The project consists of rehabilitating the Nanue Stream Bridge; addressing the deterioration in the superstructure by repairing steel truss members, bearings, gusset plates, rivets, etc. that have corrosion and section loss; addressing spalls delamination in the concrete deck, bridge railings, column pedestals and foundations; cleaning and painting the steel members following the repairs; addressing scour deficiencies for the bridge foundations; and addressing other significantly deteriorated bridge elements discovered in the field study and documented in the March 19, 2021 Bridge Inspection Report (BIR).

There would be no graded areas, parking areas and related facilities.

The Nanue Stream Bridge was painted with lead-based paint. HDOT is in discussions with the Department of Health regarding mitigation measures required for contaminated soil beneath the bridge.

All construction staging areas would be within the HDOT ROW. The estimated start of construction is September 2024 for two (2) years. Night work may be anticipated, and appropriate mitigation measures would be in place to prevent potential effects to ESA protected species. Prior to construction, a flora/fauna survey would be conducted.

Coordination with USFWS

The following species are included in the USFWS's Information for Planning and Consultation (IPaC) official species list downloaded on August 29, 2023 (see Enclosure 2).

- the endangered Hawaiian hoary bat or ʻōpeʻapeʻa (*Lasiurus cinereus semotus*)
- the threatened Hawaiian goose or nēnē (*Branta sandvicensis*);
- Hawaiian waterbirds, including the endangered Hawaiian coot or ʻalae keʻokeʻo (*Fulica americana alai*), the endangered Hawaiian stilt or aeʻo (*Himantopus mexicanus knudseni*), and endangered Hawaiian (=koloa) duck (*Anas wyvilliana*);
- Hawaiian seabirds, including the endangered Hawaiian petrel or ʻuaʻu (*Pterodroma sandwichensis*), the endangered Hawaiʻi Distinct Population Segment (DPS) of the band-rumped storm-petrel or ʻakeʻake (*Oceanodroma castro*), and threatened Newell's Townsend's shearwater or ʻaʻo (*Puffinus auricularis newelli*);
- the threatened Green Sea Turtle or Honu (*Chelonia mydas*);
- Flowering plants including the endangered Alani (*Melicope zahlbruckneri*) and the endangered Nanu (*Gardenia remyi*); and
- Ferns and allies including the endangered *Deparia kaalaana*, and the endangered *Microlepia strigosa var. mauiensis*

According to IPaC, USFWS identified no critical habitat for listed species in the action area.

Potential Impacts to ESA Protected Species

Hawaiian Hoary Bat
The Hawaiian hoary bat roosts in both exotic and native woody vegetation across all islands and will leave young unattended in trees and shrubs when they forage. If trees or shrubs 15 feet or taller are cleared during the pupping season (June 1 through September 15), there is a risk that young bats could inadvertently be harmed or killed since they are too young to fly or may not move away. Most work is expected to occur within the ROW and on the deck of the bridge, however soil remediation on the valley floor below the bridge may be necessary.

Hawaiian Seabirds
Hawaiian seabirds may transit the action area at night during the breeding, nesting and fledging seasons (March 1 through December 15). Nighttime outdoor lighting could result in seabird disorientation, fallout, and injury or mortality. Hawaiian seabirds can be attracted to artificial lighting which could result in disorientation and subsequent fallout due to exhaustion. Seabirds are vulnerable to collision with nearby wires, buildings, or other structures. Once grounded, the seabirds may fall victim to automobiles, starvation, dogs, cats, and other predators.

Hawaiian Waterbirds
Hawaiian Waterbirds are currently found in a variety of wetland habitats including freshwater marshes and ponds, coastal estuaries and ponds, artificial reservoirs, kalo and taro (*Colocasia esculenta*) loʻi or patches, irrigation ditches, sewage treatment ponds, and in the case of the Hawaiian duck, montane streams and marshlands. Hawaiian stilts may also be found wherever ephemeral or persistent standing water may occur. Threats to these species include non-native predators, habitat loss, and habitat degradation. Hawaiian ducks are also subject to threats from hybridization with introduced mallards.

Hawaiian Goose (nēnē)
Nēnē are observed in a variety of habitats, but prefer open areas, such as pastures, golf courses, wetlands, natural grasslands and shrublands, and lava flows. Threats to the species include introduced mammalian and avian predators, wind facilities, and vehicle strikes.

Green Sea Turtle
Green sea turtles nest on sandy beach areas from May through September, peaking in June and July. Turtle hatchlings emerge from their nests in November and December. Construction on, or in the vicinity of beaches can result in sand and sediment compaction, sea turtle nest destruction, beach erosion, contaminant and nutrient runoff. An increase in direct and ambient light pollution can also disorient hatchlings or deter nesting females. An increase in direct and ambient light pollution can also disorient hatchlings or deter nesting females. All construction would occur within the ROW, bridge deck, and valley floor beneath the structure. No sandy beach area is located at or adjacent to the Project site. It is anticipated that the Project would have no effect on the Green Sea Turtle due to the lack of sandy beach areas within the action area.

Avoidance and Minimization Measures for ESA-Listed Species

Based on the recommendations provided in the IPaC, the following measures will be implemented to avoid and minimize potential Project impacts to federally-listed species.

Hawaiian hoary bat

To avoid and minimize potential project impacts to the Hawaiian hoary bat, the following measures would be incorporated into the project:

- No barbed wire shall be used for fencing.
- Woody vegetation taller than 4.6 m (15 ft) shall not be cleared between June 1 and September 15, the period in which bats may have pups.

Hawaiian seabirds

To avoid and minimize potential project impacts to Hawaiian seabirds, the following measures would also be incorporated into the project:

- Fully shield all outdoor lights so the bulb can only be seen from below.
- Install automatic motion sensor switches and controls on all outdoor lights or turn off lights when human activity is not occurring in the lighted area.
- Avoid nighttime construction during the seabird fledging period, September 15 through December 15.

To avoid and minimize the likelihood that towers would result in collisions:

- The profile of the tower should be as small as possible, minimize the extent of the tower that protrudes above the surrounding vegetation layer, and avoid the use of guywires.
- If the top of the tower must be lit to comply with Federal Aviation Administration regulations, use a flashing red light verses a steady-beam red or white light.
- If possible, co-locate with existing towers or facilities.

To avoid and minimize the likelihood of collision:

- Where fences extend above vegetation, integrate three strands of polytape into the fence to increase visibility.
- For powerlines, guywires and other cables, minimize exposure above vegetation height and vertical profile.

Hawaiian Waterbirds

To avoid and minimize potential project impacts to Hawaiian Waterbirds, the following measures would also be incorporated into the project:

- In areas where Hawaiian Waterbirds are present, inform project personnel and contractors about the presence of endangered species on-site.
- Incorporate applicable best management practices regarding work in aquatic environments into the project design.
- Have a biological monitor that is familiar with the species' biology conduct Hawaiian waterbird nest surveys, where appropriate habitat occurs within the vicinity of the proposed project site, prior to project initiation. Repeat surveys again within 3 days of project initiation and after any subsequent delay of work of 3 or more days (during which the birds may attempt to nest). If a nest or active brood is found:
    - Contact the USFWS within 48 hours for further guidance.
    - Establish and maintain a 100-foot buffer around all active nests and/or broods until the chicks/ducklings have fledged. Do not conduct potentially disruptive activities or habitat alteration within this buffer.

- Have a biological monitor that is familiar with the species' biology present on the project site during all construction or earth moving activities until the chicks/ducklings fledge to ensure that Hawaiian Waterbirds and nests are not adversely impacted.

Hawaiian goose (nēnē)

To avoid and minimize potential project impacts to nēnē, the following measures would be incorporated into the project:

- Do not approach, feed, or disturb nēnē.
- If nēnē are observed loafing or foraging within the action area during the breeding season (September through April), have a biologist familiar with nēnē nesting behavior survey for nests in and around the action area prior to the resumption of any work. Repeat surveys after any subsequent delay of work of 3 or more days (during which the birds may attempt to nest).
- Cease all work immediately and contact the USFWS for further guidance if a nest is discovered within a radius of 150 feet of proposed project, or a previously undiscovered nest is found within the 150-foot radius after work begins.
- In areas where nēnē are known to be present, post and implement reduced speed limits, and inform project personnel and contractors about the presence of endangered species on-site.

Alani, Nanu and Microlepia strigose var. mauiensis

To avoid and minimize potential project impacts to flowering plans and ferns and allies, the table below would be followed:

Action	Buffer Distance (feet (meters)) - Keep Project Activity This Far Away from Listed Plant	
	Grasses/Herbs/Shrubs and Terrestrial Orchids	Trees and Arboreal Orchids
Walking, hiking, surveys	3 ft (1 m)	3 ft (1 m)
Cutting and Removing Vegetation By Hand or Hand Tools (e.g., weeding)	3 ft (1 m)	3 ft (1 m)
Mechanical Removal of Individual Plants or Woody Vegetation (e.g., chainsaw, weed eater)	3 ft up to height of removed vegetation (whichever greater)	3 ft up to height of removed vegetation (whichever greater)
Removal of Vegetation with Heavy Equipment (e.g., bulldozer, tractor, "bush hog")	2x width equipment + height of vegetation	820 ft (250 m)

Use of Approved Herbicides (following label)	**Ground-based Spray Application; hand application (no wand applicator; spot treatment)**	10 ft (3 m)	Crown diameter
	Ground-based Spray Application; manual pump with wand, backpack	50 ft (15 m)	Crown diameter
	Ground-based Spray Application; vehicle-mounted tank sprayer	50 ft (15 m)	Crown diameter
	Aerial Spray (ball applicator)	250 ft (76 m)	250 ft (76 m)
	Aerial Application – herbicide ballistic technology (individual plant treatment)	100 ft (30 m)	Crown diameter
	Aerial Spray (boom)	Further consultation required	Further consultation required
Use of Insecticides (pollinators, seed dispersers)		Further consultation required	Further consultation required
Ground/Soil Disturbance/Outplanting/Fencing (Hand tools, e.g. shovel, `ô`ô; Small mechanized tools, e.g., auger)		20 ft (6 m)	2x crown diameter
Ground/Soil Disturbance (Heavy Equipment)		328 ft (100 m)	820 ft (250 m)
Surface Hardening/Soil compaction	**Trails (e.g., human, ungulates)**	20 ft (6 m)	2x crown diameter
	Roads/Utility Corridors, Buildings/Structures	328 ft (100 m)	820 ft (250 m)
Prescribed Burns		Further consultation required	Further consultation required
Farming/Ranching/Silviculture		820 ft (250 m)	820 ft (250 m)

Additional Best Management Practices

The following measures will be implemented, which include applicable measures from the USFWS list on "Standard Best Management Practices in Aquatic Areas":

- Construction staff will be informed of the potential presence of threatened and endangered species, including being provided materials to assist in species identification and appropriate actions if a species enters the work area.
- Good housekeeping practices and erosion-control device(s) shall be employed at the job site to prevent debris and soil from leaving the site.
- Turbidity and siltation from project-related work shall be minimized and contained within the action area by silt containment devices and curtailing work during flooding or adverse tidal and weather conditions. BMPS shall be maintained for the life of the construction period until turbidity and siltation within the action area is stabilized. All project construction-related debris and sediment containment devices shall be removed and disposed of at an approved site.
- A litter-control plan shall be developed and implemented to prevent attraction and introduction of non-native species.
- Invasive species controls shall be maintained to ensure that all materials transported from off-site are free of such species.
- Project construction-related materials shall not be stockpiled in, or in close proximity to aquatic habitats and shall be protected from erosion (*e.g.*, with filter fabric, etc.) to prevent materials from being carried into waters by wind, rain, or high surf.

- Fueling of project-related vehicles and equipment shall take place away from the aquatic environment. A contingency plan to control petroleum products accidentally spilled during the project shall be developed. The plan shall be retained on site with the person responsible for compliance with the plan. Absorbent pads and containment booms shall be stored on-site to facilitate the clean-up of accidental petroleum releases.
- All deliberately exposed soil or under-layer materials used in the project near water shall be protected from erosion and stabilized as soon as possible with geotextile, filter fabric or native or non-invasive vegetation matting, hydro-seeding, etc.

Request for Concurrence

With the implementation of the avoidance and minimization measures described above, the FHWA has determined that the Nanue Stream Bridge Rehabilitation project may affect, but is not likely to adversely affect the the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*), the endangered band-rumped storm-petrel (*Oceanodroma castro*), the endangered Hawaiian duck (*Anas wyvilliana*), the endangered Hawaiian coot (*Fulica americana alai*), the threatened Hawaiian goose (*Branta sandvicensis*), the endangered Hawaiian petrel (*Pterodroma sandwichensis*), the endangered Hawaiian stilt (*Himatopus mexicanus knudensi*), the threatened Newell's Townsend's Shearwater (*Puffinus auricularis newelli*), the threatened Green Sea Turtle (*Chelonia mydas*), the endangered Alani (*Melicope zahlbruckneri*), the endangered Nanu (*Gardenia remyi*), the endangered *Deparia kaalaana*, and the endangered *Microlepia strigose var. mauiensis*.

We request your concurrence with our may affect, but not likely to adversely affect determination. We respectfully request your response within 60 days of receipt of this letter.

If you have any questions, please feel free to contact Meesa Otani, Environmental Engineer, at (808) 541-2316 or by email at meesa.otani@dot.gov. Thank you for your assistance.

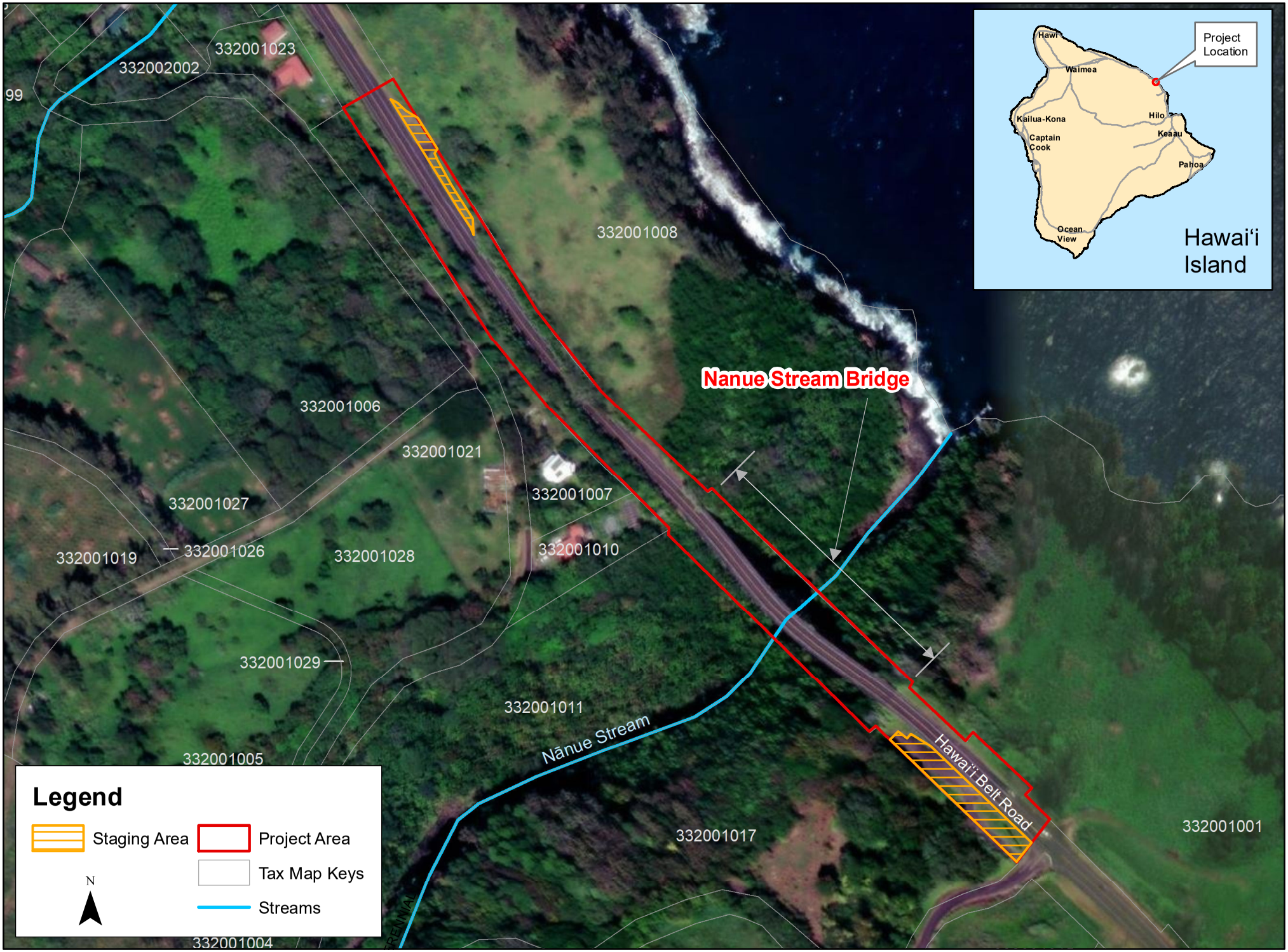
Sincerely yours,

Digitally signed by MEESA T. OTANI
Date: 2023.08.29 16:55:47 -10'00'

for Richelle M. Takara, P.E.
Division Administrator

Enclosures

cc: Amy Yagi, HDOT, HWY-DD
Randall Urasaki, WSP



Nānue Stream Bridge Rehabilitation
Project Area Map

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Islands Fish And Wildlife Office
300 Ala Moana Boulevard, Box 50088
Honolulu, HI 96850-5000
Phone: (808) 792-9400 Fax: (808) 792-9580

In Reply Refer To: August 29, 2023
Project Code: 2023-0123168
Project Name: Nanue Stream Bridge Rehabilitation

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened and endangered species, as well as designated critical habitat that may occur within the boundary of your proposed project and that may be affected by project related actions. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*). Please contact the Service's Pacific Islands Fish and Wildlife Office (PIFWO) at 808-792-9400 if you have any questions regarding your IPaC species list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may adversely affect threatened and endangered species and/or designated critical habitat.

Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a Biological

Evaluation, similar to a Biological Assessment, be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment or Biological Evaluation are described at 50 CFR 402.12.

Due to the significant number of listed species found on each island within PIFWO's regulatory jurisdiction, and the difficulty in accurately mapping ranges for species that we have limited information about, your species list may include more species than if you obtained the list directly from a Service biologist. We recommend you use the species links in IPaC to view the life history, habitat descriptions, and recommended avoidance and minimization measures to assist with your initial determination of whether the species or its habitat may occur within your project area. If appropriate habitat is present for a listed species, we recommend surveys be conducted to determine whether the species is also present. If no surveys are conducted, we err on the side of the species, by regulation, and assume the habitat is occupied. Updated avoidance and minimization measures for plants and animals, best management practices for work in or near aquatic environments, and invasive species biosecurity protocols can be found on the PIFWO website at: https://www.fws.gov/office/pacific-islands-fish-and-wildlife/library.

If a Federal agency determines, based on the Biological Assessment or Biological Evaluation, that a listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at: http://www.fws.gov/endangered/esa-library/index.

Non-federal entities can also use the IPaC generated species list to develop Habitat Conservation Plans (HCP) in accordance with section 10(a)(1)(B) of the Act. We recommend HCP applicants coordinate with the Service early during the HCP development process. For additional information on HCPs, the Habitat Conservation Planning handbook can be found at https://www.fws.gov/sites/default/files/documents/habitat-conservation-planning-handbook-entire.pdf.

Please be aware that wind energy projects should follow the Service’s wind energy guidelines (http://www.fws.gov/windenergy) for minimizing impacts to migratory birds. Listed birds and the Hawaiian hoary bat may also be affected by wind energy development and we recommend development of a Habitat Conservation Plan for those species, as described above. Guidance for minimizing impacts to migratory birds for projects including communications towers can be found at:

- http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers
- http://www.towerkill.com
- http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation actions that benefit threatened and endangered species into their project planning to further the purposes of the Act in accordance with section 7(a)(1). Please include the Consultation Tracking Number associated with your IPaC species list in any

request for consultation or correspondence about your project that you submit to our office. Please feel free to contact us at PIFWO_admin@fws.gov or 808-792-9400 if you need more current information or assistance regarding the potential impacts to federally listed species and federally designated critical habitat.

Attachment(s):

- Official Species List

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Pacific Islands Fish And Wildlife Office
300 Ala Moana Boulevard, Box 50088
Honolulu, HI 96850-5000
(808) 792-9400

PROJECT SUMMARY

Project Code: 2023-0123168
Project Name: Nanue Stream Bridge Rehabilitation
Project Type: Bridge - Maintenance
Project Description: The Nanue Stream Bridge (Bridge No. 1000190308146) is oriented from south (to Hilo) to north (to Honokaa) and carries Hawaii Belt Road over Nanue Stream. The bridge was constructed in 1952 and the coordinates are 19°55'38.56"N, 155° 9'23.47"W and carries Hawaii Belt Road over the Nanue Stream. The bridge is in the State Conservation District and the Special Management Area (SMA). The proposed action area spans approximately 2,050 feet (0.38 miles) and consists of the bridge footprint, construction staging areas, and the highway right-of-way (ROW). The bridge measures 528-feet long with a deck width of 38’-6” and footings about 85 feet wide. Please refer to the attached project location map that delineates the proposed action area.

The proposed action is a bridge rehabilitation project to address the deterioration in the superstructure by repairing steel truss members, bearings, gusset plates, rivets, etc. that have corrosion and section loss; addressing spalls delamination in the concrete deck, bridge railings, column pedestals and foundations; cleaning and painting the steel members following the repairs; addressing scour deficiencies for the bridge foundations; and addressing other significantly deteriorated bridge elements. There will be no graded areas, parking areas and related facilities. Work may occur within the ordinary high-water mark (OHWM). The Hawaii Department of Transportation (HDOT) will coordinate with the U.S. Army Corp of Engineers (USACE). A National Pollutant Discharge Elimination System (NPDES) permit will be obtained, proper stormwater BMPs will be implemented.

Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@19.92839335,-155.15745627083564,14z

Counties: Hawaii County, Hawaii

ENDANGERED SPECIES ACT SPECIES

There is a total of 13 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Hawaiian Hoary Bat *Lasiurus cinereus semotus*	Endangered

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/770
General project design guidelines:
https://ipac.ecosphere.fws.gov/project/MVLXWXUVKRH65BJ72TFHPQTHYU/documents/generated/6477.pdf

BIRDS

NAME	STATUS
Band-rumped Storm-petrel *Oceanodroma castro*	Endangered
Hawaiian (=koloa) Duck *Anas wyvilliana*	Endangered
Hawaiian Coot *Fulica alai*	Endangered
Hawaiian Goose *Branta (=Nesochen) sandvicensis*	Threatened
Hawaiian Petrel *Pterodroma sandwichensis*	Endangered
Hawaiian Stilt *Himantopus mexicanus knudseni*	Endangered
Newell's Townsend's Shearwater *Puffinus auricularis newelli*	Threatened

Band-rumped Storm-petrel *Oceanodroma castro*
- Population: USA (HI)
- No critical habitat has been designated for this species.
- Species profile: https://ecos.fws.gov/ecp/species/1226
- General project design guidelines: https://ipac.ecosphere.fws.gov/project/MVLXWXUVKRH65BJ72TFHPQTHYU/documents/generated/6939.pdf

Hawaiian (=koloa) Duck *Anas wyvilliana*
- No critical habitat has been designated for this species.
- Species profile: https://ecos.fws.gov/ecp/species/7712
- General project design guidelines: https://ipac.ecosphere.fws.gov/project/MVLXWXUVKRH65BJ72TFHPQTHYU/documents/generated/6934.pdf

Hawaiian Coot *Fulica alai*
- No critical habitat has been designated for this species.
- Species profile: https://ecos.fws.gov/ecp/species/7233
- General project design guidelines: https://ipac.ecosphere.fws.gov/project/MVLXWXUVKRH65BJ72TFHPQTHYU/documents/generated/6934.pdf

Hawaiian Goose *Branta (=Nesochen) sandvicensis*
- No critical habitat has been designated for this species.
- Species profile: https://ecos.fws.gov/ecp/species/1627
- General project design guidelines: https://ipac.ecosphere.fws.gov/project/MVLXWXUVKRH65BJ72TFHPQTHYU/documents/generated/6925.pdf

Hawaiian Petrel *Pterodroma sandwichensis*
- No critical habitat has been designated for this species.
- Species profile: https://ecos.fws.gov/ecp/species/6746
- General project design guidelines: https://ipac.ecosphere.fws.gov/project/MVLXWXUVKRH65BJ72TFHPQTHYU/documents/generated/6939.pdf

Hawaiian Stilt *Himantopus mexicanus knudseni*
- No critical habitat has been designated for this species.
- Species profile: https://ecos.fws.gov/ecp/species/2082
- General project design guidelines: https://ipac.ecosphere.fws.gov/project/MVLXWXUVKRH65BJ72TFHPQTHYU/documents/generated/6934.pdf

Newell's Townsend's Shearwater *Puffinus auricularis newelli*
- No critical habitat has been designated for this species.
- Species profile: https://ecos.fws.gov/ecp/species/2048
- General project design guidelines: https://ipac.ecosphere.fws.gov/project/MVLXWXUVKRH65BJ72TFHPQTHYU/documents/generated/6939.pdf

REPTILES

NAME STATUS

Green Sea Turtle *Chelonia mydas* Threatened

Population: Central North Pacific DPS
There is **proposed** critical habitat for this species.
Species profile: https://ecos.fws.gov/ecp/species/6199
General project design guidelines:
https://ipac.ecosphere.fws.gov/project/MVLXWXUVKRH65BJ72TFHPQTHYU/documents/generated/6929.pdf

FLOWERING PLANTS

NAME STATUS

Alani *Melicope zahlbruckneri* Endangered

There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/7338
General project design guidelines:
https://ipac.ecosphere.fws.gov/project/MVLXWXUVKRH65BJ72TFHPQTHYU/documents/generated/7060.pdf

Nanu *Gardenia remyi* Endangered

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/5835
General project design guidelines:
https://ipac.ecosphere.fws.gov/project/MVLXWXUVKRH65BJ72TFHPQTHYU/documents/generated/7051.pdf

FERNS AND ALLIES

NAME STATUS

Deparia kaalaana Endangered

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/9612

Microlepia strigosa var. mauiensis Endangered

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/4737
General project design guidelines:
https://ipac.ecosphere.fws.gov/project/MVLXWXUVKRH65BJ72TFHPQTHYU/documents/generated/7051.pdf

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

IPAC USER CONTACT INFORMATION

Agency:	Hawaii Department of Transportation
Name:	Ethan Lau
Address:	1001 Bishop Street
Address Line 2:	Suite 2400
City:	Honolulu
State:	HI
Zip:	96813
Email	ethan.lau@wsp.com
Phone:	8085993430

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122
Honolulu, Hawai‘i 96850

In Reply Refer To:
2023-0123168-S7-001

December 15, 2023

Meesa Otani
U.S. Department of Transportation
Federal Highway Administration
Hawai‘i Federal-Aid Division
300 Ala Moana Blvd., Rm 3-229
Honolulu, HI 96850

Subject: Informal Consultation for the Nanue Stream Bridge Rehabilitation Project, Nīnole, Island of Hawai‘i [Federal-aid Project No. BR-019-2(077)]

Dear Meesa Otani:

Thank you for your letter of August 29, 2023, requesting our concurrence with your determination that the Federal Highway Administration's (FHWA) proposed Nanue Stream Bridge Rehabilitation Project, at Hawai‘i Belt Road, Route 19, Milepost 18.5 near Nīnole on the Island of Hawai‘i, may affect, but is not likely to adversely affect federally listed species. We appreciated your patience while we prepared our response. Specifically, you requested informal consultation pursuant to section 7(a)(2) of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.) (ESA) for the following federally listed species and designated critical habitat:

- ‘Ōpe‘ape‘a or Hawaiian hoary bat (*Lasiurus cinereus semotus*)
- Nēnē or Hawaiian goose (*Branta sandvicensis*)
- Hawaiian waterbirds, including ae‘o or Hawaiian stilt (*Himantopus mexicanus knudseni*), ‘alae ke‘oke‘o or Hawaiian coot (*Fulica alai*), and koloa maoli or Hawaiian duck (*Anas wyvilliana*)
- Hawaiian seabirds, including ‘ua‘u or Hawaiian petrel (*Pterodroma sandwichensis*), ‘akē‘akē or Hawai‘i Distinct Population Segment of the band-rumped storm petrel (*Hydrobates castro*), and ‘a‘o or Newell's shearwater (*Puffinus newelli*)
- Honu or green sea turtle (*Chelonia mydas*)
- Federally listed plants, including alani (*Melicope zahlbruckneri*), nānū (*Gardenia remyi*), *Deparia kaalaana*, and *Microlepia strigosa* var. *mauiensis.*

The State of Hawai‘i Department of Transportation is being provided Federal funding to rehabilitate the Nanue Stream Bridge near Nīnole on the Island of Hawai‘i (Figure 1). There is no designated critical habitat within the project area.

This letter has been prepared under the authority of, and in accordance with, section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531 *et seq*.) as amended.

Project Description

The FHWA, in cooperation with the State of Hawai‘i Department of Transportation (HDOT), proposes to rehabilitate the Nanue Stream Bridge (Figure 1) by repairing steel truss members, bearings, gusset plates, rivets, etc. that have corrosion and section loss; addressing spalls delamination in the concrete deck, bridge railings, column pedestals and foundations; cleaning and painting the steel members following the repairs; addressing scour deficiencies for the bridge foundations; and, addressing other significantly deteriorated bridge elements discovered in the field study and documented in the March 19, 2021 Bridge Inspection Report.

There would be no graded areas, parking areas, and related facilities. The Nanue Stream Bridge was painted with lead-based paint. The HDOT is in discussions with the Department of Health regarding mitigation measures required for contaminated soil beneath the bridge. All construction staging areas would be within the HDOT Right of Way. Construction is estimated to begin in September 2024 and continue for two (2) years during daytime and nighttime hours. Prior to construction, a biological survey will be conducted.

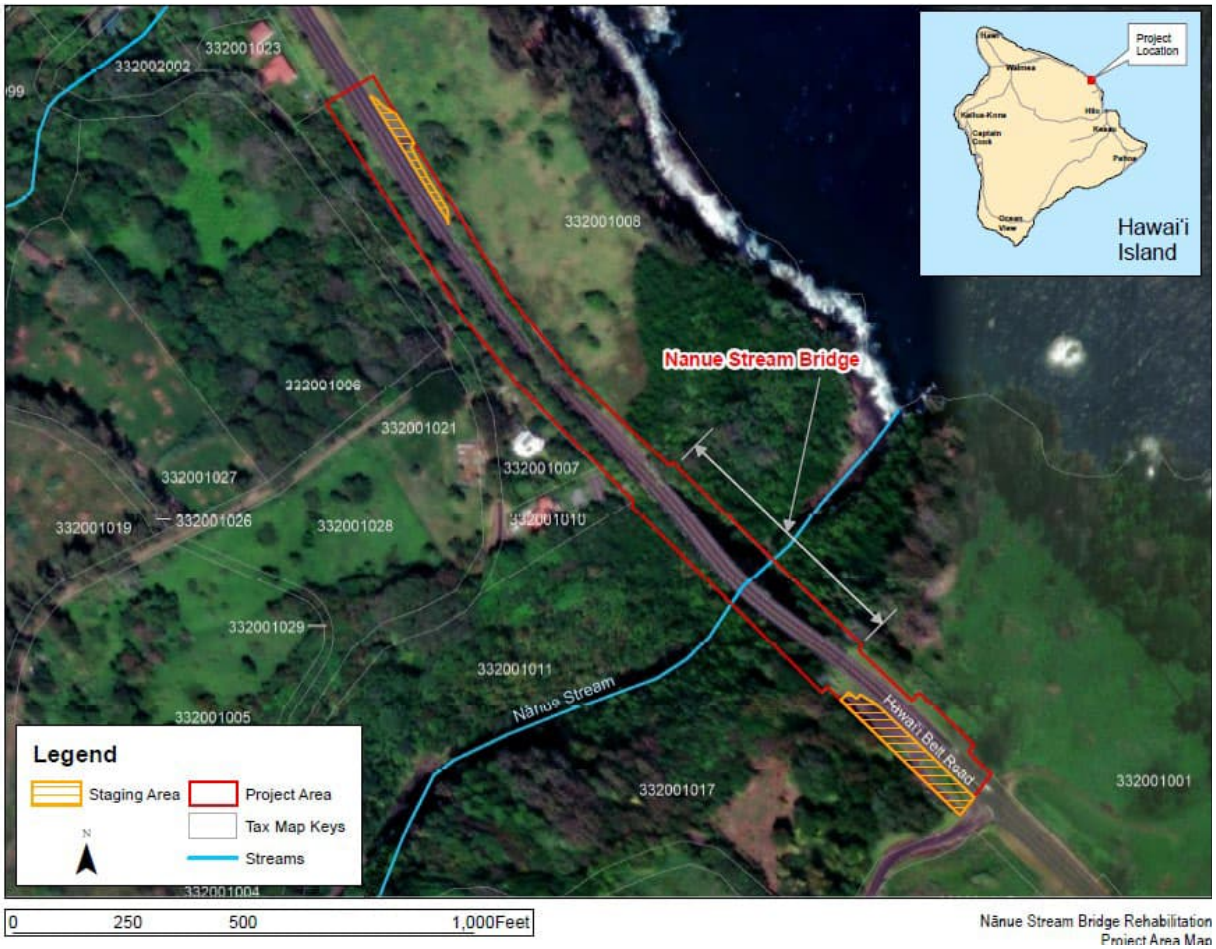


Figure 1. Nanue Stream Bridge Rehabilitation Project Map.

Conservation Measures

The project will implement the following Service recommended Avoidance and Minimization Measures for federally listed wildlife species (Attachment A), Avoidance and Minimization Measures for federally listed plant species (Attachment B), and Best Management Practices For Work In or Around Aquatic Environments (Attachment C) to avoid and minimize impacts to listed species.

ʻŌpeʻapeʻa

- No barbed wire shall be used for fencing.
- Woody vegetation taller than 4.6 m (15 ft) shall not be cleared between June 1 and September 15, the period in which bats may have pups.

Hawaiian seabirds

- Fully shield all outdoor lights so the bulb can only be seen from below.
- Install automatic motion sensor switches and controls on all outdoor lights or turn off lights when human activity is not occurring in the lighted area.

- Avoid nighttime construction during the seabird fledging period, September 15 through December 15.

To avoid and minimize the likelihood that towers would result in collisions:

- The profile of the tower should be as small as possible, minimize the extent of the tower that protrudes above the surrounding vegetation layer and avoid the use of guywires.
- If the top of the tower must be lit to comply with Federal Aviation Administration regulations, use a flashing red light verses a steady-beam red or white light.
- If possible, co-locate with existing towers or facilities.

To avoid and minimize the likelihood of collision:

- Where fences extend above vegetation, integrate three strands of polytape into the fence to increase visibility.
- For powerlines, guywires and other cables, minimize exposure above vegetation height and vertical profile.

Hawaiian waterbirds

- In areas where Hawaiian waterbirds are present, inform project personnel and contractors about the presence of endangered species on-site.
- Incorporate applicable best management practices regarding work in aquatic environments into the project design.
- Have a biological monitor that is familiar with the species' biology conduct Hawaiian waterbird nest surveys, where appropriate habitat occurs within the vicinity of the proposed project site, prior to project initiation. Repeat surveys again within 3 days of project initiation and after any subsequent delay of work of 3 or more days (during which the birds may attempt to nest). If a nest or active brood is found:
    - Contact the Service within 48 hours for further guidance.
    - Establish and maintain a 100-foot buffer around all active nests and/or broods until the chicks/ducklings have fledged. Do not conduct potentially disruptive activities or habitat alteration within this buffer.
    - Have a biological monitor that is familiar with the species' biology present on the project site during all construction or earth moving activities until the chicks/ducklings fledge to ensure that Hawaiian Waterbirds and nests are not adversely impacted.

Hawaiian goose (nēnē)

- Do not approach, feed, or disturb nēnē.
- If nēnē are observed loafing or foraging within the action area during the breeding season (September through April), have a biologist familiar with nēnē nesting behavior survey for nests in and around the action area prior to the resumption of any work. Repeat surveys after any subsequent delay of work of 3 or more days (during which the birds may attempt to nest).
- Cease all work immediately and contact the Service for further guidance if a nest is discovered within a radius of 150 feet of proposed project, or a previously undiscovered nest is found within the 150-foot radius after work begins.

- In areas where nēnē are known to be present, post and implement reduced speed limits, and inform project personnel and contractors about the presence of endangered species on-site.

Alani, *Nānū*, *Deparia kaalaana*, *and Microlepia strigosa* var. *mauiensis*
To avoid and minimize potential project impacts to flowering plans and ferns and allies, the Service recommended Avoidance and Minimization Measures for federally listed plant species (Attachment B) will be followed.

Effects to Listed Species

ʻŌpeʻapeʻa
Woody vegetation may be used by ʻōpeʻapeʻa for roosting, potentially year around. The ʻōpeʻapeʻa roosts in woody vegetation across all islands and will leave their young unattended in trees and shrubs when they forage. If trees or shrubs 15 ft or taller are cleared during the pupping season, June 1 through September 15, there is a risk that young bats could inadvertently be harmed or killed, since they are too young to fly or move away from disturbance. However, removing woody vegetation 15 ft or taller at the project areas will be avoided during the ʻōpeʻapeʻa pupping season (June 1 through September 15) and no barbed wire will be used.

Human presence and project activities may cause temporary disruptions to the normal behaviors of ʻōpeʻapeʻa nearby the project area. If bats are present during the construction, we expect the disturbance may cause them to leave the site. We expect that these disturbances will be short term and intermittent and will not result in measurable disruptions of their normal behaviors, nor will there be reductions in the reproductive success or fitness of the bats. The high mobility of adult bats enables them to relocate to suitable vegetation nearby. No nonvolant young would be injured or killed because trees and vegetation taller than 15 ft will not be removed during the pupping season when the young cannot fly.

Avoidance and minimization measures will be implemented to avoid adverse effects to ʻōpeʻapeʻa. ʻŌpeʻapeʻa are not expected to be injured, killed, or to experience a measurable disruption to their normal behaviors. Therefore, effects to the ʻōpeʻapeʻa are insignificant.

Hawaiian Seabirds
Hawaiian seabirds may traverse the project area at night during the breeding, nesting, and fledging seasons (March 1 to December 15). The FHWA anticipates some night construction to occur and in that event, all outdoor lighting will be fully shielded, directed towards the ground, and equipped with automatic sensors. Night construction will be avoided during the seabird fledging period, September 15 through December 15. No new permanent outdoor lighting will be installed. Additionally, any construction fencing extending above vegetation or roof lines will be equipped with polytape of other measures to increase visibility.

When outdoor lighting is used seabird disorientation, fallout, and injury or mortality may occur because seabirds are attracted to lights and after circling the lights, they may become exhausted and collide with nearby wires, buildings, or other structures or they may land on the ground. Fledglings are particularly vulnerable to light attraction when they are traversing the project area

between September 15 and December 15, as they are making their first flights from their mountain nests to the sea. Downed seabirds are subject to increased mortality due to collision with automobiles, starvation, and predation by dogs, cats, and other predators.

No night construction or night lighting will be used during the seabird fledging season from September 15 through December 15. All night construction lighting used outside of the fledging season will be fully shielded, directed towards the ground, and equipped with automatic sensors. Any seabirds traversing the area at night are unlikely to be exposed to any project-related activities because it is not probable that Hawaiian seabirds would be attracted to project lighting and possibly become disoriented. We do not expect injury, mortality, or measurable disruptions to the normal behaviors of Hawaiian seabirds. Therefore, effects to Hawaiian seabirds are considered insignificant.

Hawaiian waterbirds
Hawaiian waterbirds are found in a variety of wetland habitats including freshwater marshes and ponds, coastal estuaries and ponds, artificial reservoirs, *Colocasia esculenta* (kalo or taro) loʻi or patches, irrigation ditches, and sewage treatment ponds. Aeʻo may also be found wherever ephemeral or persistent standing water may occur, such as sediment basins. The project area contains suitable waterbird habitat, such as open water bodies (e.g., Nanue Stream, ditch) and Hawaiian waterbirds may occur in the project area. Additionally, Hawaiian waterbirds may be attracted to areas of standing water that are inadvertently created during construction activities. Hawaiian waterbirds are vulnerable to vehicular strikes, human presence, and construction activities because the birds enter roadways, and foot traffic and equipment can crush nests hidden in vegetation. Human presence and disturbance can keep adults from protecting and provisioning vulnerable young in nests.

Because project personnel will be informed about the presence of endangered species on site and a biologist will be on site where appropriate Hawaiian waterbird habitat occurs, project personnel are unlikely to step on or crush nests. Additionally, because reduced speed limit signs will be used, Hawaiian waterbirds and their nests are unlikely to be run over and killed by vehicles. Therefore, effects to the Hawaiian waterbirds are considered discountable.

If Hawaiian waterbirds are present during construction, we expect human presence and disturbance may cause them to leave the site before nesting can occur. Hawaiian waterbirds that are displaced are expected to relocate to other areas of suitable habitat. We do not expect any nesting Hawaiian waterbirds will be affected by this project.

We expect that project-related disturbances will be short term and intermittent and would not result in measurable disruptions to their normal behaviors or a measurable reduction in their reproductive success and fitness. Therefore, effects to Hawaiian waterbirds are insignificant.

Nēnē
Nēnē may be observed in a variety of habitats, but prefer open areas, such as pastures, golf courses, wetlands, natural grasslands and shrublands, and lava flows. Nēnē are unlikely to occur within the project area prior to construction because the area currently does not provide suitable habitat. However, nēnē may occasionally loaf or be attracted to the site when it is cleared for

construction or if suitable habitats area created, especially if clearings are made or standing water is created. Nēnē are vulnerable to vehicular strikes, human presence, and construction activities because nēnē enter roadways, and foot traffic and equipment can crush nests hidden in vegetation. Human presence and disturbance can keep adults from protecting and provisioning vulnerable young in nests.

If nēnē are present during construction, we expect human presence and disturbance may cause them to leave the site before nesting can occur. Nesting nēnē may be temporarily disturbed by human presence but are expected to resume their normal behaviors because protective buffers will be maintained that will minimize any temporary disturbances. Nēnē that are displaced from loafing and foraging areas are expected to relocate to other areas of suitable habitat. We do not expect any nesting nēnē will be affected by this project.

We expect that project-related disturbances will be short term and intermittent and would not result in measurable disruptions to their normal behaviors or a measurable reduction in their reproductive success and fitness. Therefore, effects to nēnē are insignificant.

Honu
Honu may nest or be present on any sandy beach in the Pacific Islands. Nesting occurs on beaches from May through September, peaking in June and July, with hatchlings emerging through November and December. Because no sandy beach areas are located in or near the project area, honu are unlikely to be present in the project area; therefore, it is not likely that the project would impact honu. Therefore, effects to honu are considered discountable.

Plant Species
Service records indicate that the project location occurs within the historic range of the following federally listed plants: alani, nānū, *D. kaalaana*, and *M. strigosa* var. *mauiensis.* A biological survey will be conducted prior to construction in order to determine if any listed plants are located in the project area. Monitoring and survey protocols (Attachment B) will be fully implemented by personnel trained to identify the four plant species and avoid impacts to the listed plant species should they occur at the site. Because the project will implement the avoidance, minimization, and conservation measures for the listed plants, and the project area is likely dominated by non-native species, we do not expect these plants would be present or exposed to project-related activities. Therefore, effects to federally listed plants are discountable.

Effects to Designated Critical Habitat

No Critical Habitat is located on or near the proposed project location.

Summary

Based on the project description, conservation measures incorporated (attachments A–C), and supporting biological rationale provided above, we expect effects to federally listed species are discountable (extremely unlikely to occur) and insignificant (undetectable). Therefore, the Service concurs with the determination that the proposed project may affect but is not likely to adversely federally listed species and designated critical habitat.

Please inform us of the type of Army Corps permit you are obtaining in order to comply with Clean Water Act, Section 404, under the authorities of which the Service has additional oversight responsibilities.

This concludes section 7 consultation for the proposed Project. Reinitiation of this consultation is required by the Service, where discretionary Federal involvement or control over the proposed actions has been retained or is authorized by law and:

1) If new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered;
2) If the identified action is subsequently modified in a manner that causes an effect to listed species or critical habitat that was not considered herein; or
3) If a new species is listed or critical habitat designated that may be affected by the proposed actions.

Thank you for participating with us in the protection of our endangered species. If you have any questions, please contact Colleen Cole, at colleen_cole@fws.gov or by telephone at 808-859-1002 or pifwo_admin@fws.gov. When referring to this project, please include this reference number: 2023-0123168-S7-001.

Sincerely,

CHELSIE JAVAR-SALAS

Digitally signed by CHELSIE JAVAR-SALAS
Date: 2023.12.15 10:09:00 -10'00'

Acting Island Team Manager for Maui Nui and Hawai‘i Island
Pacific Islands Fish and Wildlife Office

Attachments: A: U.S. Fish and Wildlife Service Avoidance and Minimization Measures (Animals)
B: Avoidance and Minimization Measures (Plants)
C: Best Management Practices For Work In or Around Aquatic Environments

Attachment A: U.S. Fish and Wildlife Service Avoidance and Minimization Measures Final revised May 2023

ESA Listed Species

Endangered ʻōpeʻapeʻa (Hawaiian hoary bat, *Lasiurus cinereus semotus*): The Hawaiian hoary bat roosts in woody vegetation across all islands and will leave their young unattended in trees and shrubs when they forage. If trees or shrubs 15 feet or taller are cleared during the pupping season, June 1 through September 15, there is a risk that young bats could inadvertently be harmed or killed, since they are too young to fly or move away from disturbance. Hawaiian hoary bats forage for insects from as low as 3 feet to higher than 500 feet above the ground and can become entangled in barbed wire used for fencing.

To avoid and minimize impacts to the endangered Hawaiian hoary bat we recommend you incorporate the following applicable measures into your project description:

- Do not disturb, remove, or trim woody plants greater than 15 feet tall during the bat birthing and pup rearing season (June 1 through September 15).
- Do not use barbed wire for fencing.

Endangered ʻuaʻu (Hawaiian petrel, *Pterodroma sandwichensis*), Threatened ʻaʻo, (Newell's shearwater, *Puffinus newelli*), and Endangered Hawaiʻi Distinct Population Segment of the ʻakēʻakē (band-rumped storm-petrel, *Hydrobates castro*
Hawaiian seabirds may traverse the project area at night during the breeding, nesting and fledging seasons (March 1 to December 15). Outdoor lighting could result in seabird disorientation, fallout, and injury or mortality. Seabirds are attracted to lights and after circling the lights they may become exhausted and collide with nearby wires, buildings, or other structures or they may land on the ground. Downed seabirds are subject to increased mortality due to collision with automobiles, starvation, and predation by dogs, cats, and other predators. Young birds (fledglings) traversing the project area between September 15 and December 15, in their first flights from their mountain nests to the sea, are particularly vulnerable to light attraction.

To avoid and minimize potential project impacts to seabirds we recommend you incorporate the following measures into your project description:

- Fully shield all outdoor lights so the bulb can only be seen from below.
- Install automatic motion sensor switches and controls on all outdoor lights or turn off lights when human activity is not occurring in the lighted area.
- Avoid nighttime construction during the seabird fledging period, September 15 through December 15.

Listed seabirds have been documented colliding with communication towers, particularly in areas of high seabird passage rate. In general, self-supporting monopoles are the least likely to result in collisions, whereas lattice towers, particularly those that rely on guy-wires, have a greater risk.

To avoid and minimize the likelihood that towers will result in collisions by listed seabirds we recommend you incorporate the following measures into your project description:

- The profile of the tower should be as small as possible, minimize the extent of the tower that protrudes above the surrounding vegetation layer, and avoid the use of guywires.
- If the top of the tower must be lit to comply with Federal Aviation Administration regulations, use a flashing red light verses a steady-beam red or white light.
- If possible, co-locate with existing towers or facilities.

Seabirds have been known to collide with fences, powerlines, and other structures near nesting colonies. To avoid and minimize the likelihood of collision we recommend you incorporate the following measures into your project description:

- Where fences extend above vegetation, integrate three strands of polytape into the fence to increase visibility.
- For powerlines, guy-wires and other cables, minimize exposure above vegetation height and vertical profile.

We recommend further coordination with our office to address specific project details and potential seabird interactions.

Threatened nēnē (Hawaiian goose, *Branta (Nesochen) sandvicensis*): Nēnē are found on the islands of Hawai‘i, Maui, Moloka‘i, and Kaua‘i. They are observed in a variety of habitats, but prefer open areas, such as pastures, golf courses, wetlands, natural grasslands and shrublands, and lava flows. Threats to the species include introduced mammalian and avian predators, wind facilities, and vehicle strikes.

To avoid and minimize potential project impacts to nēnē we recommend you incorporate the following measures into your project description:

- Do not approach, feed, or disturb nēnē.
- If nēnē are observed loafing or foraging within the project area during the breeding season (September through April), have a biologist familiar with nēnē nesting behavior survey for nests in and around the project area prior to the resumption of any work. Repeat surveys after any subsequent delay of work of 3 or more days (during which the birds may attempt to nest).
- Cease all work immediately and contact the Service for further guidance if a nest is discovered within a radius of 150 feet of proposed project, or a previously undiscovered nest is found within the 150-foot radius after work begins.
    - In areas where nēnē are known to be present, post and implement reduced speed limits, and inform project personnel and contractors about the presence of endangered species on-site.

Endangered Hawaiian waterbirds (ae‘o, Hawaiian stilt, *Himantopus mexicanus knudseni*; ‘alae ke‘oke‘o, Hawaiian coot, *Fulica alai*; ‘alae ‘ula, Hawaiian common gallinule, *Gallinula galeata sandvicensis*; koloa maoli, Hawaiian duck, *Anas wyvilliana*): Hawaiian waterbirds are currently found in a variety of wetland habitats including freshwater marshes and ponds, coastal estuaries and ponds, artificial reservoirs, kalo or taro (*Colocasia esculenta*) lo‘i or patches, irrigation ditches, sewage treatment ponds, and in the case of the Hawaiian duck,

montane streams and marshlands. Hawaiian stilts may also be found wherever ephemeral or persistent standing water may occur. Threats to these species include non-native predators, habitat loss, and habitat degradation. Hawaiian ducks are also subject to threats from hybridization with introduced mallards.

Based on the project details provided, your project may result in the creation of standing water or open water that could attract Hawaiian waterbirds to the project site. In particular, the Hawaiian stilt is known to nest in sub-optimal locations (e.g., any ponding water), if water is present. Hawaiian waterbirds attracted to sub-optimal habitat may suffer adverse impacts, such as predation and reduced reproductive success, and thus the project may create an attractive nuisance. Therefore, we recommend you work with our office during project planning so that we may assist you in developing measures to avoid impacts to listed species (e.g., fencing, vegetation control, predator management).

To avoid and minimize potential project impacts to Hawaiian waterbirds we recommend you incorporate the following measures into your project description:

- In areas where waterbirds are known to be present, post and implement reduced speed limits, and inform project personnel and contractors about the presence of endangered species on-site.
- If water resources are located within or adjacent to the project site, incorporate applicable best management practices regarding work in aquatic environments into the project design (see enclosure).
- Have a biological monitor that is familiar with the species' biology conduct Hawaiian waterbird nest surveys where appropriate habitat occurs within the vicinity of the proposed project site prior to project initiation. Repeat surveys again within 3 days of project initiation and after any subsequent delay of work of 3 or more days (during which the birds may attempt to nest). If a nest or active brood is found:
    - Contact the Service within 48 hours for further guidance.
    - Establish and maintain a 100-foot buffer around all active nests and/or broods until the chicks/ducklings have fledged. Do not conduct potentially disruptive activities or habitat alteration within this buffer.
    - Have a biological monitor that is familiar with the species' biology present on the project site during all construction or earth moving activities until the chicks/ducklings fledge to ensure that Hawaiian waterbirds and nests are not adversely impacted.

Threatened (Central North Pacific DPS) Green sea turtles (*Chelonia mydas*) and Endangered Hawksbill sea turtle (*Eretmochelys imbricata*) (collectively referred to as sea turtles): The Service consults on sea turtles and their use of terrestrial habitats (beaches where nesting and/or basking is known to occur), whereas the National Oceanic and Atmospheric Administration (NOAA) Fisheries consults on sea turtles in aquatic habitats. We recommend that you consult with NOAA Fisheries regarding the potential impacts from the proposed project if it may affect off-shore or open ocean habitats.

Green sea turtles may nest on any sandy beach area in the Pacific Islands. Hawksbill sea turtles exhibit a wide tolerance for nesting substrate (ranging from sandy beach to crushed coral) with

nests typically placed under vegetation. Both species exhibit strong nesting site fidelity. Nesting occurs on beaches from May through September, peaking in June and July, with hatchlings emerging through November and December.

Construction on, or in the vicinity of, beaches can result in sand and sediment compaction, sea turtle nest destruction, beach erosion, contaminant and nutrient runoff, and an increase in direct and ambient light pollution which may disorient hatchlings or deter nesting females. Off-road vehicle traffic may result in direct impacts to sea turtles or nests, and also contributes to habitat degradation through erosion and compaction.

To avoid and minimize project impacts to sea turtles and their nests we recommend you incorporate the following measures into your project description:

- No vehicle use on or modification of the beach/dune environment during the sea turtle nesting or hatching season (May to December).
- Do not remove native dune vegetation.
- Incorporate applicable best management practices regarding Work in Aquatic Environments (see enclosed) into the project design.
- Have a biologist familiar with sea turtles conduct a visual survey of the project site to ensure no basking sea turtles are present.
    - If a basking sea turtle is found within the project area, cease all mechanical or construction activities within 100 feet until the animal voluntarily leaves the area.
    - Cease all activities between the basking turtle and the ocean.
- Remove any project-related debris, trash, or equipment from the beach or dune if not actively being used.
- Do not stockpile project-related materials in the intertidal zone, reef flats, sandy beach and adjacent vegetated areas, or stream channels.

Optimal sea turtle nesting habitat is a dark beach free of barriers that restrict sea turtle movement. Nesting turtles may be deterred from approaching or laying successful nests on lighted or disturbed beaches. They may become disoriented by artificial lighting, leading to exhaustion and placement of a nest in an inappropriate location (such as at or below the high tide line). Hatchlings that emerge from nests may also be disoriented by artificial lighting. Inland areas visible from the beach should be sufficiently dark to allow for successful navigation by hatchlings to the ocean.

To avoid and minimize project impacts to sea turtles from lighting we recommend incorporating the following applicable measures into your project description:

- Avoid nighttime work during the nesting and hatching season (May to December).
- Minimize the use of lighting on or near beaches and shield all project-related lights so the light is not visible from any beach.
    - If lights can’t be fully shielded or if headlights must be used, fully enclose the light source with light filtering tape or filters.
- Incorporate design measures into the construction or operation of buildings adjacent to the beach to reduce ambient outdoor lighting such as:
    - tinting or using automatic window shades for exterior windows that face the beach;

- reducing the height of exterior lighting to below 3 feet and pointed downward or away from the beach; and
- minimize light intensity to the lowest level feasible and, when possible, include timers and motion sensors.

Attachment B: Avoidance and Minimization Measures (Plants)

Avoidance, Minimization, and Conservation Measures for listed plants in the Pacific Islands

Project activities may affect listed plant species by causing physical damage to plant parts (roots, stems, flowers, fruits, seeds, etc.) as well as impacts to other life requisite features of their habitat, which may result in reduction of germination, growth and/or reproduction. Cutting and removal of vegetation surrounding listed plants has the potential to alter microsite conditions (e.g., light, moisture, temperature), damaging or destroying the listed plants and also increasing the risk of invasion by nonnative plants, which can result in higher incidence or intensity of fire. Activities such as grazing, use of construction equipment and vehicles, and increased human traffic (i.e., trails, visitation, monitoring), can cause ground disturbance, erosion, and/or soil compaction, which decrease absorption of water and nutrients and damage plant root systems and may result in reduced growth and/or mortality of listed plants. Soil disturbance or removal has the potential to negatively impact the soil seed bank of listed plant species if such species are present or historically occurred in the project area.

In order to avoid or minimize potential adverse effects to listed plants that may occur on the proposed project site, we recommend minimizing disturbance outside of existing developed or otherwise modified areas. When disturbance outside existing developed or modified sites is proposed, conduct a botanical survey for listed plant species within the project action area, defined as the area where direct and indirect effects are likely to occur. Surveys should be conducted by a knowledgeable botanist with documented experience in identifying native Hawaiian and Pacific Islands plants, including listed plant species. Botanical surveys should optimally be conducted during the wettest part of the year (typically October to April) when plants and identifying features are more likely to be visible, especially in drier areas. If surveys are conducted outside of the wet season, the Service may assume plant presence.

The boundary of the area occupied by listed plants should be marked with flagging by the surveyor. To avoid or minimize potential adverse effects to listed plants, we recommend adherence to buffer distances for the activities in the **Table below**. Where disturbed areas do not need to be maintained as an open area, restore disturbed areas using native plants as appropriate for the location. Whenever possible we recommend using native plants for landscaping purposes. The following websites are good resources to use when choosing landscaping plants: Landscape Industry Council of Hawai‘i Native Plant Poster (https://hawaiiscape.com/Publications), Native Hawaiian Plants for Landscaping, Conservation, and Reforestation (https://www.ctahr.hawaii.edu/oc/freepubs/pdf/of-30.pdf), and Best Native Plants for Landscapes (https://www.ctahr.hawaii.edu/oc/freepubs/pdf/OF-40.pdf).

If listed plants occur in a project area, the avoidance buffers are recommended to reduce direct and indirect impacts to listed plants from project activities. However, where project activities will occur within the recommended buffer distances, additional consultation is required. The impacts to the plants of concern within the buffer area may be reduced by placing temporary fencing or other barriers at the boundary of the disturbance, as far from the affected plants as practicable.

The above guidelines apply to areas outside of designated critical habitat. If project activities occur within designated critical habitat unit boundaries, additional consultation is required.

All activities, including site surveys, risk introducing nonnative species into project areas. Specific attention needs to be made to ensure that all equipment, personnel, and supplies are properly checked and are free of contamination (weed seeds, organic matter, or other contaminants) before entering project areas. Quarantines and or management activities occurring on specific priority invasive species proximal to project areas need to be considered or adequately addressed. This information can be acquired by contacting local experts such as those on local invasive species committees (Kauaʻi: https://www.kauaiisc.org/; Oʻahu: https://www.oahuisc.org/; Maui Nui: https://mauiinvasive.org/; and Hawaiʻi: https://www.biisc.org/

Table 1. Recommended buffer distances to minimize and avoid potential adverse impacts to listed plants from activities listed below.

Action		**Buffer Distance (feet (meters)) – Keep Project Activity This Far Away from Listed Plant**	
		Grasses/Herbs/Shrubs and Terrestrial Orchids	**Trees and Arboreal Orchids**
Walking, hiking, surveys		3 ft (1 m)	3 ft (1 m)
Cutting and Removing Vegetation By Hand or Hand Tools (e.g., weeding)		3 ft (1 m)	3 ft (1 m)
Mechanical Removal of Individual Plants or Woody Vegetation (e.g., chainsaw, weed eater)		3 ft up to height of removed vegetation (whichever greater)	3 ft up to height of removed vegetation (whichever greater)
Removal of Vegetation with Heavy Equipment (e.g., bulldozer, tractor, "bush hog")		2x width equipment + height of vegetation	820 ft (250 m)
Use of Approved Herbicides (following label)	**Ground-based Spray Application; hand application (no wand applicator; spot treatment)**	10 ft (3 m)	Crown diameter
	Ground-based Spray Application; manual pump with wand, backpack	50 ft (15 m)	Crown diameter
	Ground-based Spray Application; vehicle-mounted tank sprayer	50 ft (15 m)	Crown diameter
	Aerial Spray (ball applicator)	250 ft (76 m)	250 ft (76 m)

Action		Buffer Distance (feet (meters)) – Keep Project Activity This Far Away from Listed Plant	
		Grasses/Herbs/Shrubs and Terrestrial Orchids	**Trees and Arboreal Orchids**
	Aerial Application – herbicide ballistic technology (individual plant treatment)	100 ft (30 m)	Crown diameter
	Aerial Spray (boom)	Further consultation required	Further consultation required
Use of Insecticides (pollinators, seed dispersers)		Further consultation required	Further consultation required
Ground/Soil Disturbance/Outplanting/Fencing (Hand tools, e.g., shovel, ʻōʻō; Small mechanized tools, e.g., auger)		20 ft (6 m)	2x crown diameter
Ground/Soil Disturbance (Heavy Equipment)		328 ft (100 m)	820 ft (250 m)
Surface Hardening/Soil compaction	**Trails (e.g., human, ungulates)**	20 ft (6 m)	2x crown diameter
	Roads/Utility Corridors, Buildings/Structures	328 ft (100 m)	820 ft (250 m)
Prescribed Burns		Further consultation required	Further consultation required
Farming/Ranching/Silviculture		820 ft (250 m)	820 ft (250 m)

Definitions (Wagner *et al*. 1999)
Crown: The leafy top of a tree.
Herb: A plant, either annual, biennial, or perennial, with the non-woody stems dying back to the ground at the end of the growing season.
Shrub: A perennial woody plant with usually several to numerous primary stems arising from or relatively near the ground.
Tree: A woody perennial that usually has a single trunk

References Cited

USFWS. 2010. Endangered and threatened wildlife and plants; determination of endangered status for 48 species on Kauai and designation of critical habitat. Federal Register 75: 18960–19165.

. 2012. Endangered and threatened wildlife and plants; endangered status for 23 species on Oahu and designation of critical habitat for 124 species; final rule. Federal Register 77: 57648–57862.

. 2013a Endangered and threatened wildlife and plants; determination of endangered status for 38 species from Molokai, Lanai, and Maui. Federal Register 78: 32014–32065.

. 2013b. Endangered and threatened wildlife and plants; determination of endangered species status for 15 species on Hawaii Island. Federal Register 78: 64638–64690.

. 2016. Endangered and threatened wildlife and plants; determination of endangered status for 49 species from the Hawaiian Islands. Federal Register 81: 67786–67860.

. 2016. USFWS Rare plant database. Unpublished.

Wagner, W.L., Sohmer, S., and D.R. Herbst. 1999. Manual of the flowering plants of Hawaii, revised edition. Honolulu, Hawaii. University of Hawaii and Bishop Museum Press. 1,919 pp.

Attachment C: BMPs For Work In or Around Aquatic Environment
U.S. Fish and Wildlife Service
Recommended Standard Best Management Practices (BMPs)

The U.S. Fish and Wildlife Service (Service) recommends the following measures are incorporated into project planning to avoid or minimize impacts to fish and wildlife resources. Incorporation of these BMPs may reduce negative impacts to aquatic habitats from project construction-related activities. These BMPs are recommended in addition to, and do not over-ride any terms, conditions, or other recommendations prepared by the Service, other Federal, state, or local agencies. Please contact the Service Aquatic Ecosystems Conservation Program at 808-792-9400 with any questions.

1. Authorized dredging and filling-related activities that may result in the temporary or permanent loss of aquatic habitats should be designed to avoid indirect, negative impacts to aquatic habitats that extend beyond the planned project area.
2. Dredging/filling in the marine environment should be scheduled to avoid coral spawning and recruitment periods, and sea turtle nesting and hatching periods. Because these periods vary throughout the Pacific islands, we recommend contacting the relevant local, state, or Federal fish and wildlife resource agency for site specific guidance.
3. Turbidity and siltation from project-related work should be minimized and contained within the project area by silt containment devices and curtailing work during flooding or adverse tidal and weather conditions. The BMPs should occur for the life of the construction period until turbidity and siltation within the project area is stabilized. All project construction-related debris and sediment containment devices should be removed and disposed of at an approved site.
4. All project construction-related materials and equipment (i.e., dredges, vessels, backhoes, silt curtains, etc.) to be placed in an aquatic environment should be inspected for pollutants including, but not limited to; marine fouling organisms, grease, oil, etc., and cleaned to remove pollutants prior to use. Project related activities should not result in any debris disposal, non-native species introductions, or attraction of non-native pests to the affected or adjacent aquatic or terrestrial habitats. Implementing both a litter-control plan and a Hazard Analysis and Critical Control Point plan (HACCP – see https://www.fws.gov/policy/A1750fw1.html) can prevent attraction and introduction of non-native species.
5. Project construction-related materials (i.e., fill, revetment rock, pipe, etc.) should not be stockpiled in, or in close proximity to aquatic habitats and should be protected from erosion (e.g., with filter fabric, etc.), to prevent materials from being carried into waters by wind, rain, or high surf.
6. Fueling of project-related vehicles and equipment should occur away from the aquatic environment and a contingency plan to control petroleum products accidentally spilled during the project should be developed. The plan should be retained on site with the person responsible for compliance with the plan. Absorbent pads and containment booms should be stored on-site to facilitate the clean-up of accidental petroleum releases.
7. All deliberately exposed soil or under-layer materials used in the project near water should be protected from erosion and stabilized as soon as possible with geotextile, filter fabric or native or non-invasive vegetation matting, hydro-seeding, etc.

U.S. Department of Transportation
Federal Highway Administration

Federal Highway Administration
Hawaii Division
&
National Oceanic and Atmospheric Administration
Pacific Islands Regional Office Protected Resources Division

ENDANGERED SPECIES ACT SECTION 7 PROGRAMMATIC CONSULTATION
HI-WAYSLOPES NOTIFICATION AND VERIFICATION FORM

This form constitutes informal consultation and a request for concurrence under the Standard Local Operating Procedures for Endangered Species in Hawaii (HI-waySLOPES). The Federal Highway Administration (FHWA) is requesting verification from the National Oceanic and Atmospheric Administration (NOAA) that the above referenced project meets all requirements of the Standard Local Operating Procedures for Endangered Species in Hawaii Programmatic Consultation (HI-waySLOPES). The FHWA determined the proposed action is not likely to adversely affect species listed under the Endangered Species Act or their designated critical habitat administered by the National Marine Fisheries Service (NMFS). The project sponsor will be required to comply with the HI-waySLOPES conservation measures and activity-specific best management practices (BMPs) to avoid effects to threatened and endangered marine species.

Date of Request: 7/21/2023
Date of Requested NMFS Response:
Federal-aid Project No.: BR-019-2(077)
NOAA PIRO Reference No.: TBD
Project Sponsor (HDOT or LPA): HDOT
Project Manager Name, Phone, & Email: Amy Yagi, (808) 692-8431, amy.m.yagi.@hawaii.gov
Project Title: Nanue Stream Bridge Rehabilitation
Project Location (attach a map): Hawaii Belt Road Milepost 18.5
Project Latitude and Longitude (approximate): 19°55'38.56"N, 155° 9'23.47"W
Water Body Adjacent or Above: Nanue Stream
Project Description (Scope of Work, if more space is needed, please attach description to form.): The Nanue Stream Bridge (1000190308146) is oriented from south (to Hilo) to north (to Honokaa) and carries Hawaii Belt Road over Nanue Stream. The bridge was constructed in 1952 and the coordinates are 19°55'38.56"N, 155° 9'23.47"W and carries Hawaii Belt Road over the Nanue Stream. The bridge is in the State Conservation District and the Special Management Area (SMA). The proposed action is a bridge rehabilitation project. The project consists of rehabilitating the Nanue Stream Bridge addressing the deterioration in the superstructure by repairing steel truss members, bearings, gusset plates, rivets, etc. that have corrosion and section loss; addressing spalls delamination in the concrete deck, bridge railings, column pedestals and foundations; cleaning and painting the steel members following the repairs; addressing scour deficiencies for the bridge foundations; and addressing other significantly deteriorated bridge elements discovered in the field study and documented in the March 19, 2021 Bridge Inspection Report (BIR). There will be no graded areas, parking areas and related facilities. The Nanue Stream bridge was painted with lead-based paint. HDOT is in discussions with Department of Health regarding mitigation measures required for contaminated soil beneath the bridge. The project consists of only work and rehabilitation on the bridge structure. There is testing on the structure and soil to determine level of contamination, if any. All construction staging areas will be within the HDOT right-of-way (ROW). The estimated start of construction is September 2024 for two (2) years. Night work may be anticipated, and appropriate mitigation measures will be in place to prevent potential effects to ESA protected species. The proposed project is located in Ninole on the island of Hawaii, approximately 16 miles north of Hilo. The Nanue Stream Bridge carries Hawaii Belt Road over Nanue Stream at Milepost 18.5. The proposed action area spans approximately 2,050 feet (0.38 miles) and consists of the bridge footprint, construction staging areas, as well as the highway right-of-way (ROW). The bridge measures 528-feet long with a deck width of 38'-6" and footings about 85 feet wide. Please refer to the attached project location map that delineates the proposed action area.

COVERED ACTIVITIES:
Please select the activities included in the scope of work for the project. More detailed information about the activities is included in the Biological Evaluation.

- ☐ Road repair, resurfacing, and/or reconstruction
- ☑ Bridge repair, rehabilitation, and/or replacement
- ☑ Grading and establishment of staging and storage areas
- ☐ Geotechnical Drilling
- ☐ Grading of access roads and traffic detours

NOAA SPECIES/CRITICAL HABITAT IN ACTION AREA:
Please select the species and/or designated critical habitat that occurs in the action area.

- ☑ Green sea turtle (*Chelonia mydas*), Central North Pacific DPS – threatened
- ☑ Hawksbill sea turtle (*Eretmochelys imbricate*) – endangered
- ☑ Hawaiian monk seal (*Monachus schauinslandi*) – endangered
- ☑ Hawaiian monk seal (*Monachus schauinslandi*) – critical habitat

Please provide justification, description of marine environment to be impacted, additional BMPs, special conditions and/or additional avoidance and minimization measures the applicant has proposed in order to comply with the HI-waySLOPES programmatic consultation and to ensure the proposed project is not likely to adversely affect endangered or threatened species under NMFS jurisdiction or to destroy or adversely modify critical habitat. Attach map and drawings.

The Nanue Stream Bridge is approximately 450 feet from the shoreline. There may be in-water work for this project. HDOT is coordinating with the U.S. Army Corps of Engineers (USACE) and anticipates obtaining a Nationwide Permit (NWP) from USACE. Appropriate stormwater best management practices (BMPs) will be implemented and maintained throughout construction to minimize potential effects, if any, to NMFS protected species.

The Contractor will be required to prevent any debris from falling into the water. Access to the bridge under-deck would be from scaffolding hung from the sides of the bridge or built adjacent to the stream.

The project is not likely to adversely affect threatened or endangered species under NMFS jurisdiction, such as green sea turtles or monk seals, as they are unlikely to travel up stream to the project site. It is anticipated that the project will have no effect on the Green Sea Turtle due to the lack of sandy beach habitats within the action area. The Action Area is approximately 450 feet from the marine critical habitat for the Hawaiian Monk Seal.

CONSERVATION MEASURES:
All applicable conservation measures shall be included in the Plans or Specifications.

All projects covered under HI-waySLOPES shall implement the following conservation measures:

1. Constant vigilance shall be kept for the presence of ESA-listed marine species (sea turtles and Hawaiian monk seals) during all aspects of the action.
2. A responsible party (i.e., permittee/site manager/project supervisor) shall designate a competent observer to search/monitor work sites and the areas adjacent to the authorized work area for ESA-listed marine species.
3. Work shall be postponed or halted when ESA-listed marine species are within 50 yards.
4. A pollution and erosion control plan for the project site and adjacent areas must be prepared and carried out. As a minimum, this plan shall include:
    a. Proper installation and maintenance of silt fences/curtains, sausages, equipment diapers, or drip pans.
    b. A contingency plan to control and clean spilled petroleum products and other toxic materials.
    c. Appropriate materials to contain and clean potential spills will be stored at the work site, and be readily available.
    d. All project-related materials and equipment placed in the water will be free of pollutants.
    e. Daily pre-work inspections of heavy equipment for cleanliness and leaks, with all heavy equipment operations postponed or halted until leaks are repaired and equipment is cleaned.
    f. Fueling of project-related vehicles and equipment will take place at least 50 feet away from the water and within a containment area, preferably over an impervious surface.
5. BMPs shall be implemented in accordance with An Integrated Storm Water Management Approach and a Summary of Clear Water Diversion and Isolation Best Management Practices for Use in the State of Hawaii, by the Federal Highway Administration and Hawaii Department of Transportation Practitioners Guide (2016) or the Construction Best Management Practices Field Manual by the State of Hawaii Department of Transportation (2008).

Does the project have in-water work?

☑ Yes
☐ No

If yes, then the following conservation measures shall be implemented:

1. All objects will be lowered to the bottom in a controlled manner. This can include the use of buoyancy controls such as lift bags, or the use of cranes, winches, or other equipment that affect positive control over the rate of descent.
2. Special attention shall be given to ensure that no ESA-listed marine species are within 50 yards of maintenance dredging, in-water excavation and movement of large armor stones, and benthic core sampling, and that those operations will immediately shut-down should any ESA-listed species enter within that range.
3. Full-depth silt curtains (or alternative as described in justification) shall be installed around all work sites with the potential to disturb and mobilize sediments. This will contain mobilized sediments in the marine environment and reduce the potential for elevated turbidity.

RECOMMENDATION BY PROJECT SPONSOR:

The Project Sponsor recommends to FHWA that the proposed project be considered consistent with HI-waySLOPES **programmatic consultation.** Additionally, the Project Sponsor agrees to implement the applicable conservation measures and agrees to re-consult if there is any change in the description of the project or new information reveals that the effects of the proposed action may affect ESA-listed species in a manner or extent not previously considered, or a new species or critical habitat is designated that may be affected by the proposed action.

Recommended by HDOT and/or LPA Project Manager:

Signature: Tracy M Yagi	Date: 7/21/2023

FHWA DETERMINATION:

FHWA has determined that the proposed project meets all requirements of the HI-waySLOPES and that the proposed action is not likely to adversely affect species listed under the Endangered Species Act or their designated critical habitat administered by the NMFS. The FHWA requests concurrence from NMFS with this determination.

FHWA Signature: Digitally signed by MEESA T. OTANI Date: 2023.09.21 08:17:52 -10'00'	Date: September 21, 2023

NMFS CONCURRENCE:

[X] NMFS concurs with the FHWA determination that the proposed project is consistent with HI-waySLOPES, as described and checked above.

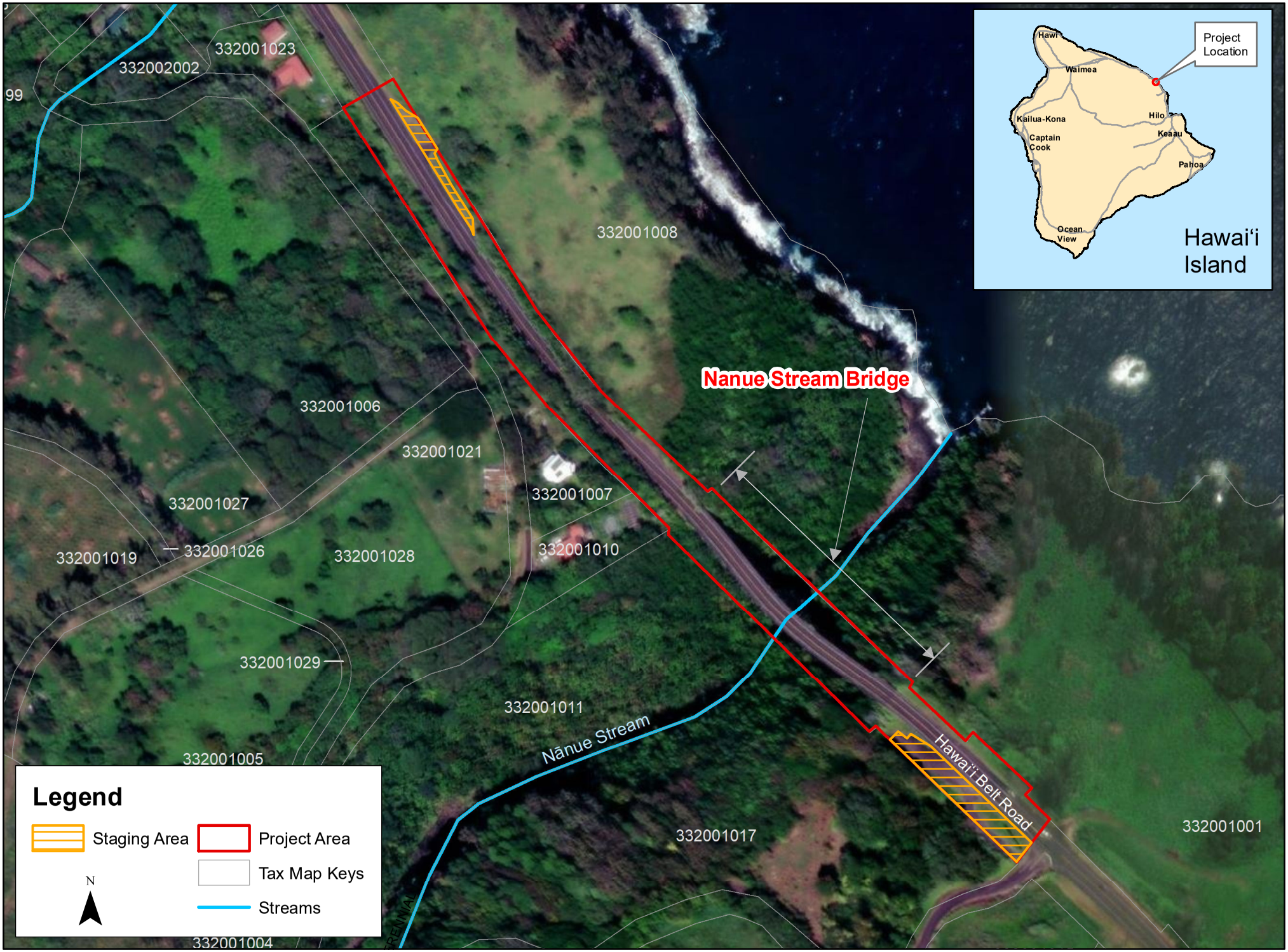
[ ] NMFS does not concur with the FHWA determination that the project is consistent with HI-waySLOPES, as described and checked above, and requests an individual Section 7 consultation.

NMFS Signature: Jamie Marchetti	Date: 09/29/2023

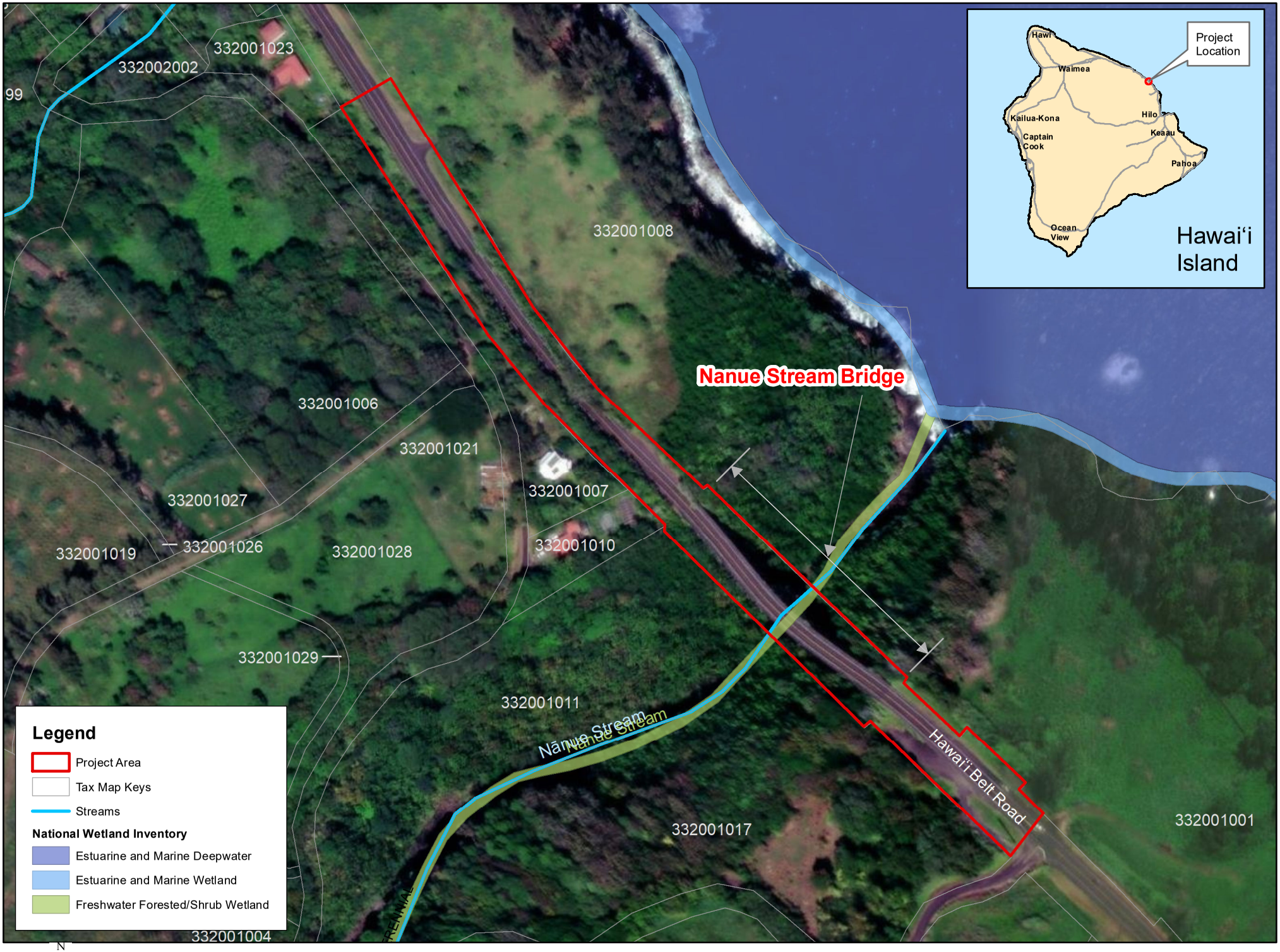
ATTACHMENTS:

Please select documents attached to form.

- [x] Project Location Map
- [ ] Project Description
- [x] Drawings
- [x] Photos
- [ ] Other



Nānue Stream Bridge Rehabilitation
Project Area Map



Nānue Stream Bridge Rehabilitation
Project Area Map

Figure 2a. Upstream (West) Elevation

Figure 2b. Looking Downstream (East)

Figure 2c. South Approach (Looking North)

Figure 2d. North Approach (Looking South)

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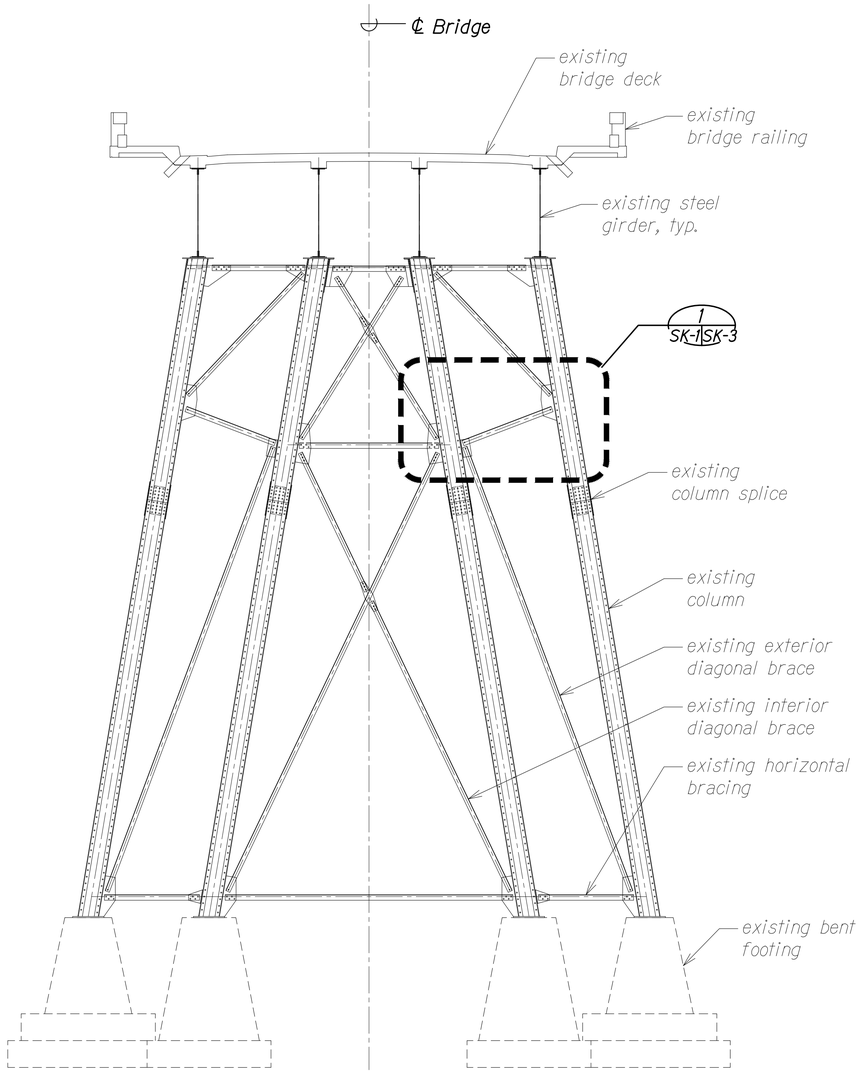

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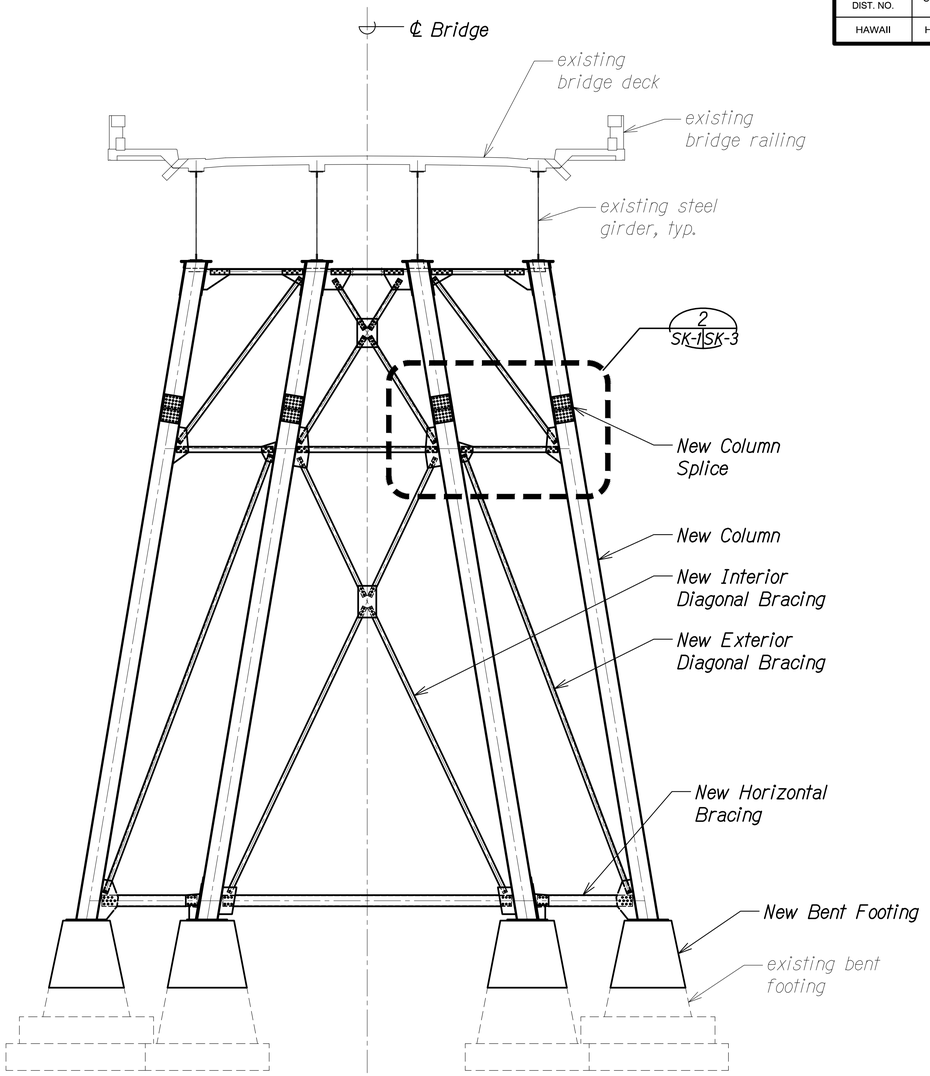

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Scale: 3/16" = 1'-0"

FOR REFERENCE

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BENT NO. 9
ELEVATIONS

HAWAII BELT ROAD
NANUE STREAM BRIDGE REHABILITATION
Federal-Aid Proj. No. XXX-XX-XXX

Scale: As Noted Date: Jan. 2023

SHEET No. SK-1 OF 6 SHEETS

ORIGINAL PLAN
NOTE BOOK No.
SURVEY PLOTTED BY DATE
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY

DRAWING NAME: 2A\00 ONGOING\00 dF PROJECTS\22-001 12-NANUE STR BR REHAB\01 CAD\01-XX-23\NSR-ELEV.DWG PLOT TIME: 01-16-23, 2:46 PM

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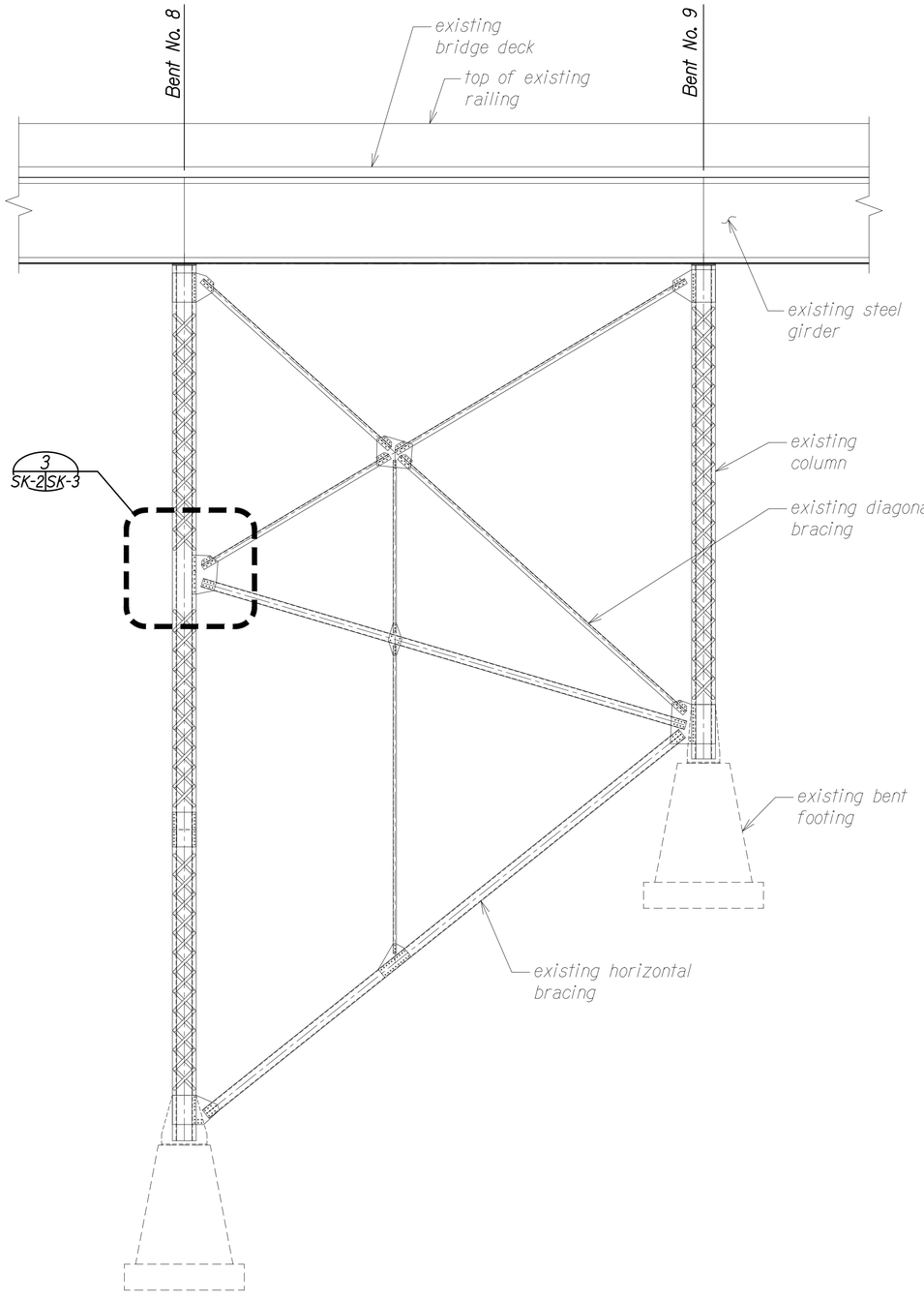

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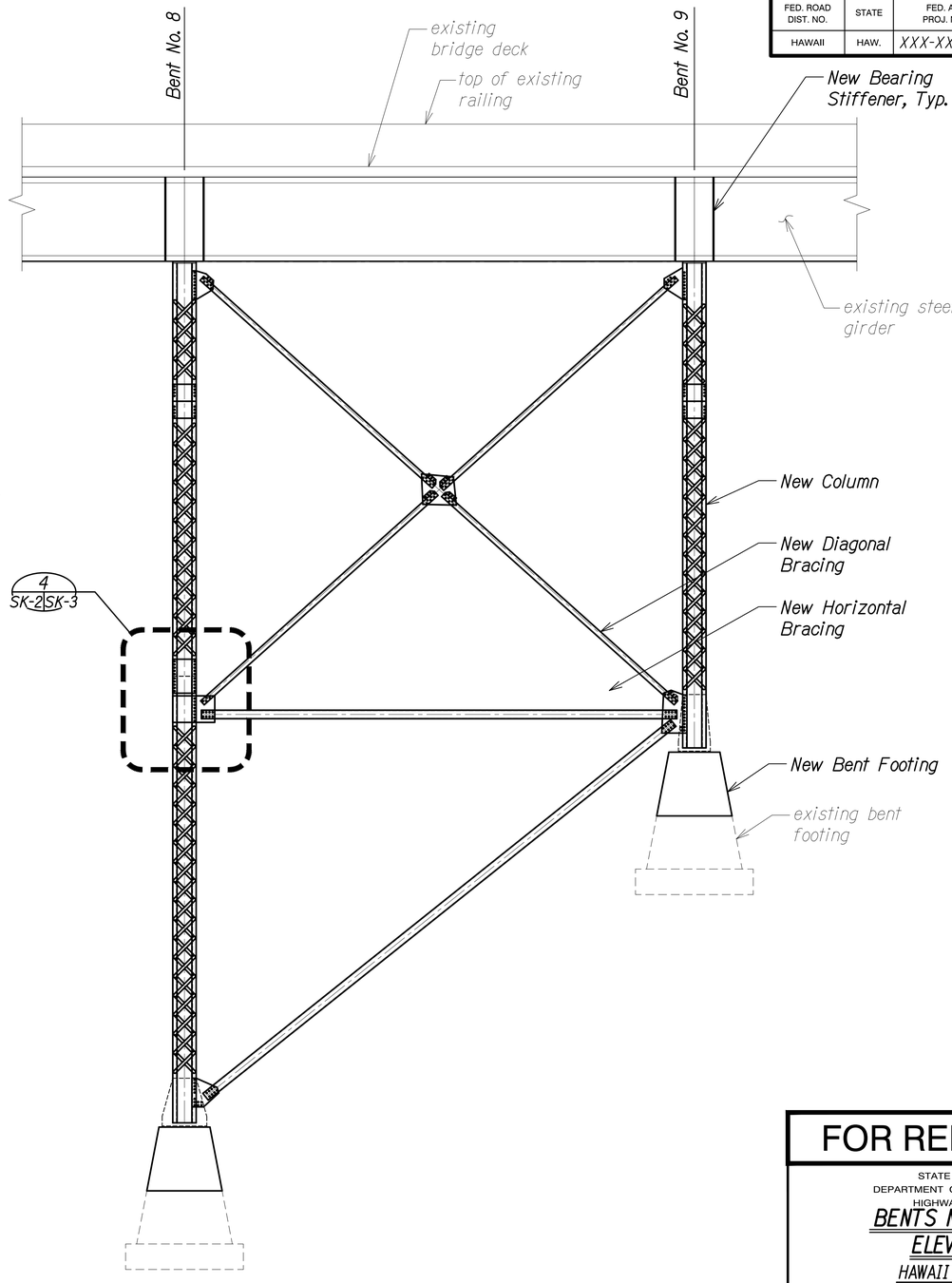

NEW BENTS NO. 8 AND 9
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NOTE BOOK	TRACED BY	
	DESIGNED BY	
No.	QUANTITIES BY	
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FOR REFERENCE

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BENTS NO. 8 AND 9
ELEVATIONS

HAWAII BELT ROAD
NANUE STREAM BRIDGE REHABILITATION
Federal-Aid Proj. No. XXX-XX-XXX

Scale: As Noted Date: Jan. 2023

SHEET No. SK-2 OF 6 SHEETS

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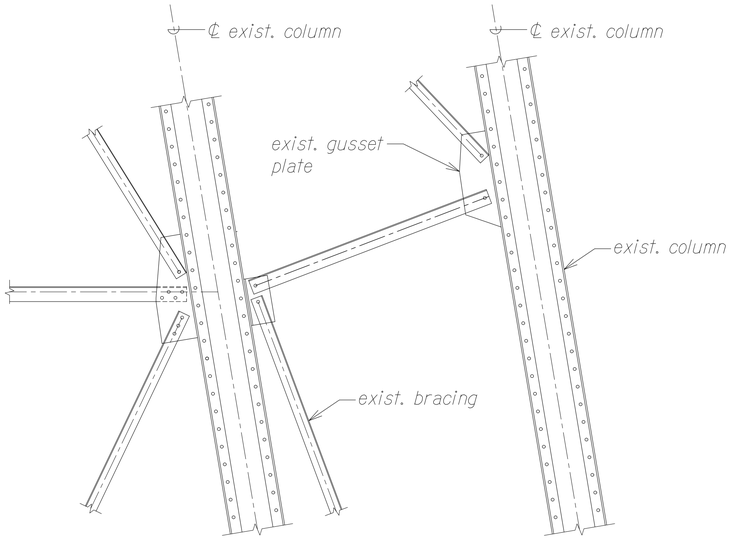

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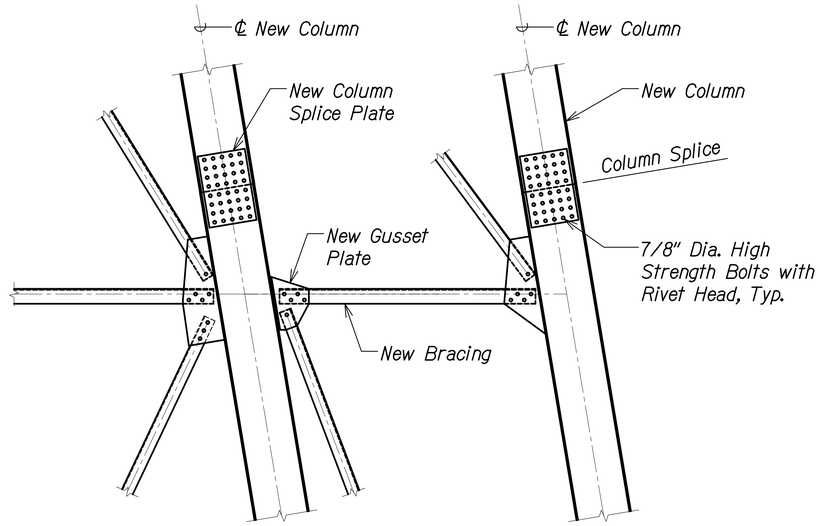

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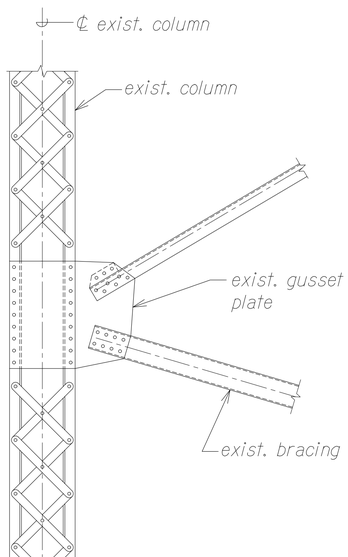

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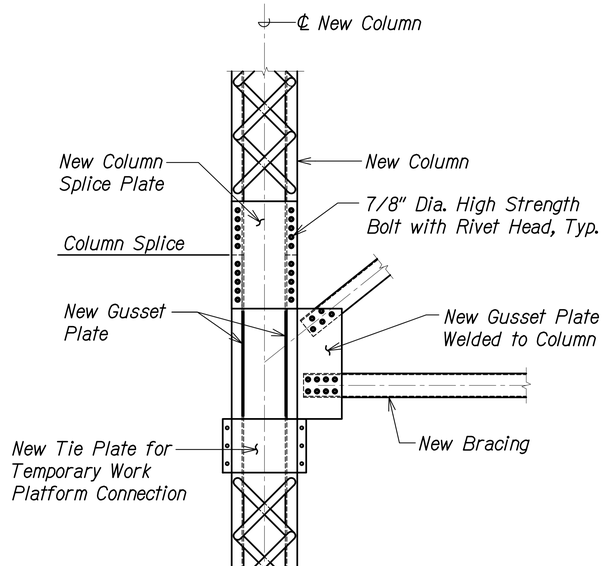

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FOR REFERENCE

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BENTS NO. 8 AND 9
DETAILS

HAWAII BELT ROAD
NANUE STREAM BRIDGE REHABILITATION
Federal-Aid Proj. No. XXX-XX-XXX

Scale: As Noted Date: Jan. 2023

SHEET No. SK-3 OF 6 SHEETS

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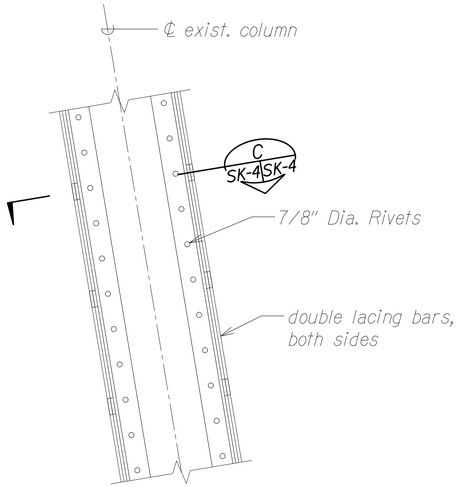

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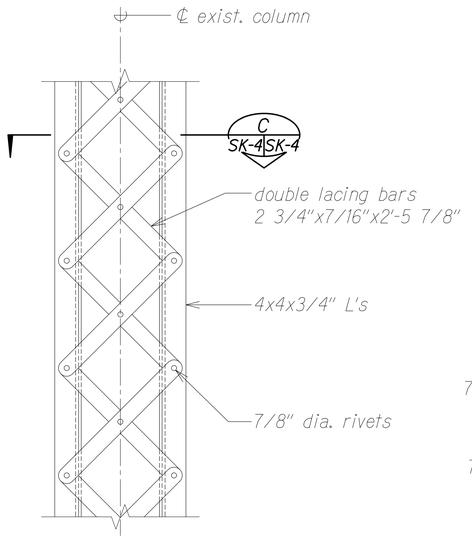

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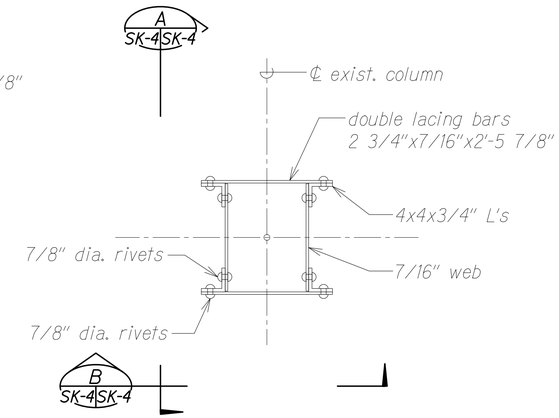

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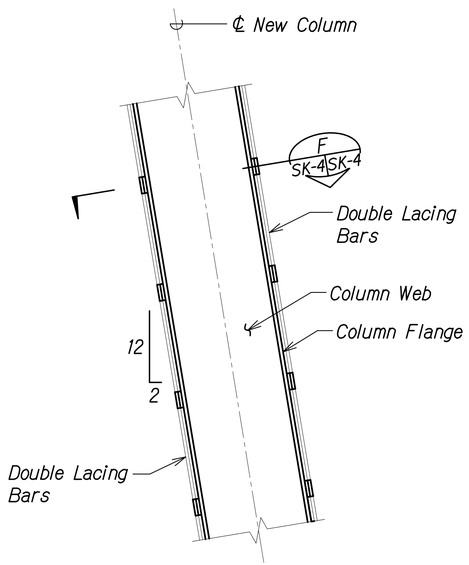

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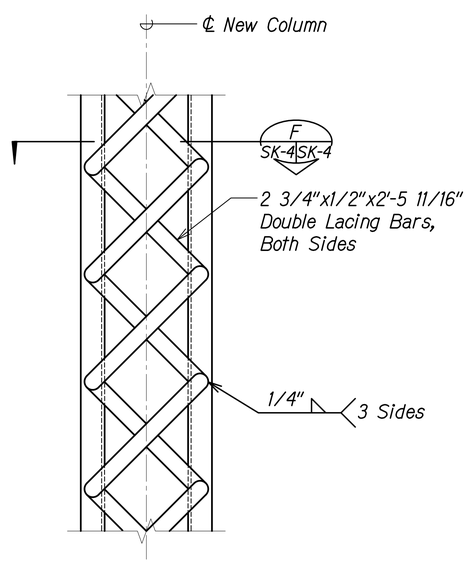

NEW COLUMN
UPSTREAM-DOWNSTREAM ELEVATION (E SK-4 | SK-4)
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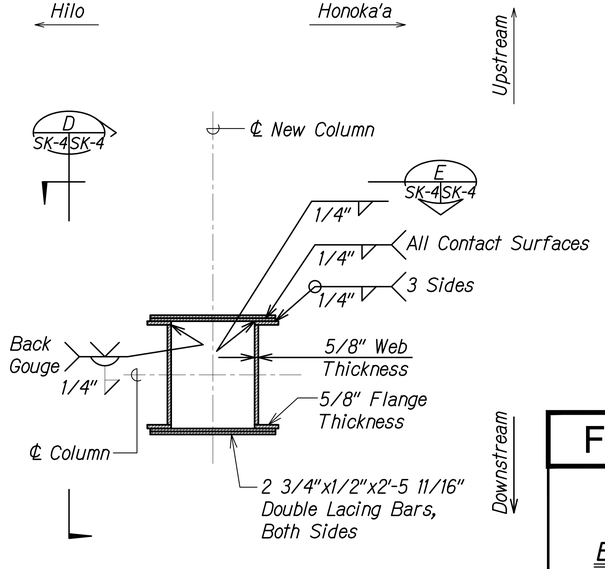

NEW COLUMN SECTION (F SK-4 | SK-4)
Scale: 1" = 1'-0"

NOTE:

Member sizes and dimensions may change slightly.

FOR REFERENCE

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BENTS NO. 8 AND 9
ELEVATIONS AND SECTIONS

HAWAII BELT ROAD
NANUE STREAM BRIDGE REHABILITATION
Federal-Aid Proj. No. XXX-XX-XXX

Scale: As Noted Date: Jan. 2023

SHEET No. SK-4 OF 6 SHEETS

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
No.	TRACED BY	
	DESIGNED BY	
	QUANTITIES BY	
	CHECKED BY	

DRAWING NAME: Z:\OD ONGONO\OD JF PROJECTS\22-601\12-NANUE STR BR REHAB\01 CAD\01-XX-23\NSR-ELEV.DWG PLOT TIME: 01-16-23, 2:47 PM

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
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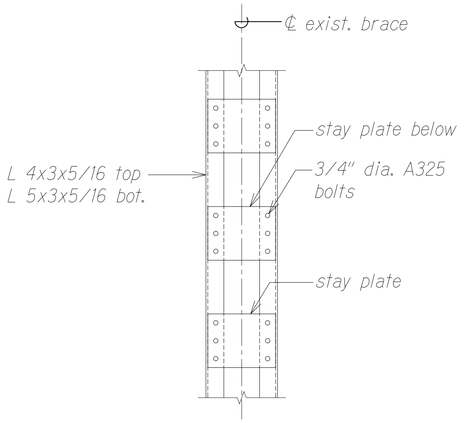
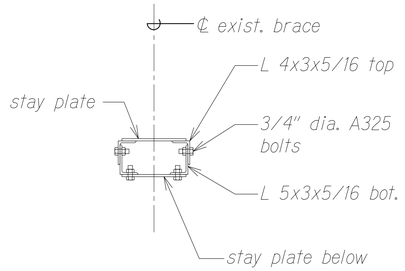


PLAN



SECTION

EXISTING EXTERIOR DIAGONAL BRACING DETAILS

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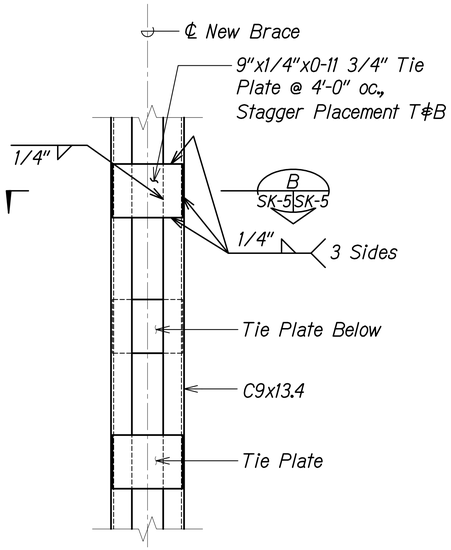
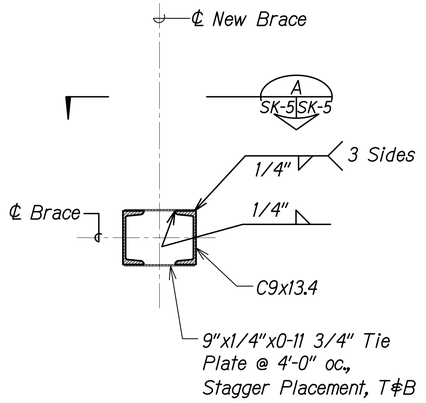


PLAN A SK-5 SK-5



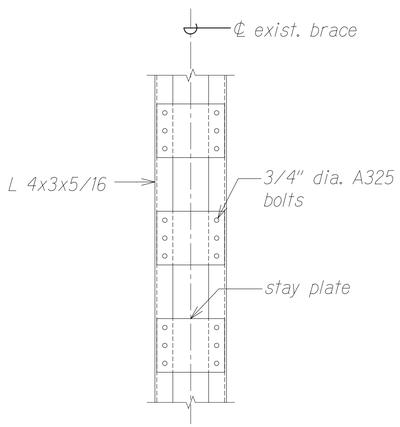
SECTION B SK-5 SK-5

NEW EXTERIOR DIAGONAL BRACING DETAILS

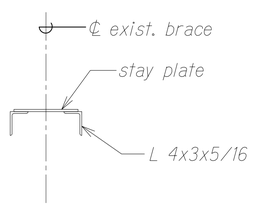
Scale: 1" = 1'-0"

NOTE:

Member sizes and dimensions may change slightly.



PLAN



SECTION

EXISTING INTERIOR DIAGONAL BRACING DETAILS

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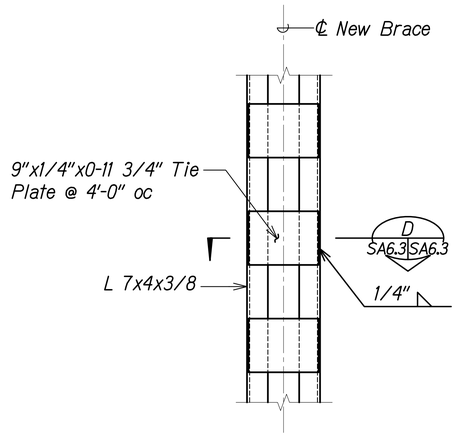
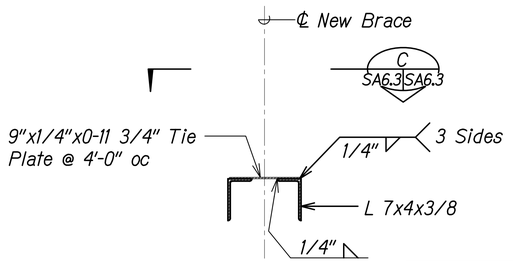


PLAN C SK-5 SK-5



SECTION D SK-5 SK-5

NEW INTERIOR DIAGONAL BRACING DETAILS

Scale: 1" = 1'-0"

FOR REFERENCE

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BENTS NO. 8 AND 9 DETAILS

HAWAII BELT ROAD
NANUE STREAM BRIDGE REHABILITATION
Federal-Aid Proj. No. XXX-XX-XXX

Scale: As Noted Date: Jan. 2023

SHEET No. SK-5 OF 6 SHEETS

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
NOTE BOOK	TRACED BY	
	DESIGNED BY	
No.	QUANTITIES BY	
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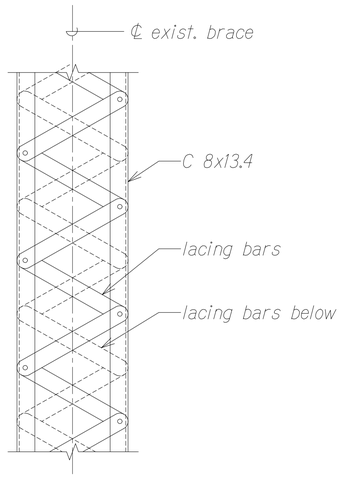
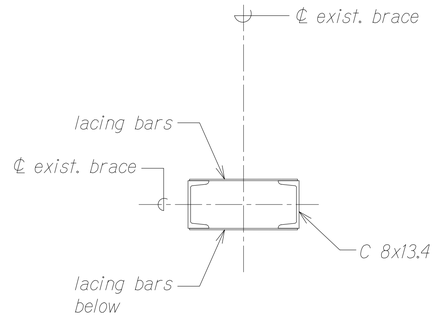
DRAWING NAME: Z:\OD ONGINO\OD // PROJECTS\22-601\12-NANUE STR BR REHAB\01 CAD\01-XX-23\NSR-ELEV.DWG PLOT TIME: 01-16-23, 2:58 PM

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	XXX-XX-XXX	2022		



PLAN A SK-6 | SK-6



SECTION B SK-6 | SK-6

EXISTING HORIZONTAL BRACING DETAILS

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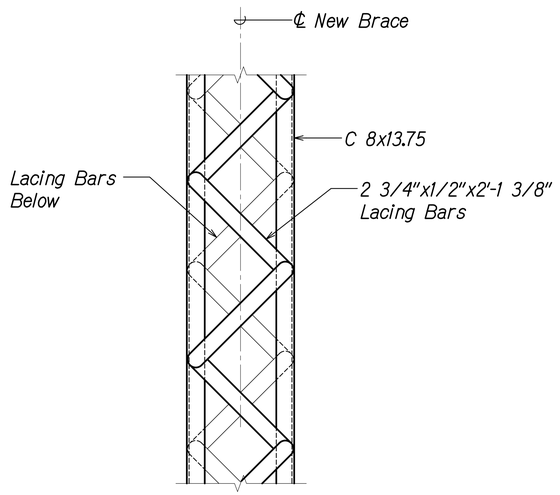
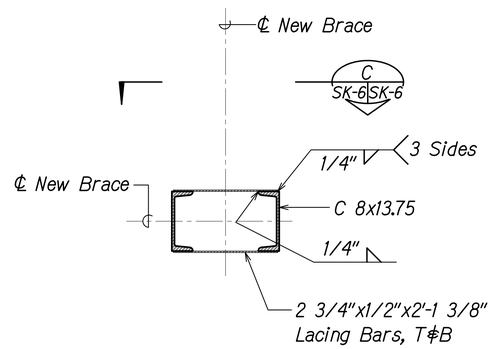


PLAN C SK-6 | SK-6



SECTION D SK-6 | SK-6

NEW HORIZONTAL BRACING DETAILS

Scale: 1" = 1'-0"

NOTE:

Member sizes and dimensions may change slightly.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
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DRAWING NAME: Z:\OD ONGOING\OD JF PROJECTS\22-601\12-NANUE STR BR REHAB\01 CAD\01-XX-23\NSR-ELEV.DWG PLOT TIME: 01-16-23, 2:48 PM

FOR REFERENCE

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BENTS NO. 8 AND 9 DETAILS

HAWAII BELT ROAD
NANUE STREAM BRIDGE REHABILITATION
Federal-Aid Proj. No. XXX-XX-XXX

Scale: As Noted Date: Jan. 2023

SHEET No. SK-6 OF 6 SHEETS

National Marine Fisheries Service (NMFS) Essential Fish Habitat

U.S. Department of Transportation
Federal Highway Administration

Hawaii Federal-Aid Division

September 5, 2023

300 Ala Moana Blvd, Rm 3-229
Box 50206
Honolulu, Hawaii 96850
Phone: (808) 541-2700
FHWA-Hawaii.Intake@dot.gov

In Reply Refer To:
HDA-HI

Ms. Sarah Malloy
Acting Regional Administrator, Pacific Islands Regional Office
National Oceanic and Atmospheric Administration
NOAA Inouye Regional Center, NMFS/PIRO
1845 Wasp Boulevard, Building 176
Honolulu, HI 96818

Subject: Magnuson-Stevens Fishery Conservation and Management Act
Essential Fish Habitat Consultation
Nanue Stream Bridge Rehabilitation
North Hilo District, Island of Hawaii
Federal-aid Project No. BR-019-2(077)

Dear Ms. Malloy:

The Federal Highway Administration (FHWA), in cooperation with the State of Hawaii Department of Transportation (HDOT), is planning the Nanue Stream Bridge Rehabilitation project. Pursuant to Section 305(b)(2)(4) of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), the FHWA is requesting Essential Fish Habitat (EFH) consultation with the National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS) for the proposed project. With the implementation of best management practices (BMPs), the FHWA proposes that the project is not likely to adversely any EFH and managed species.

Description of the Proposed Action

The Nanue Stream Bridge (1000190308146) is oriented from south (to Hilo) to north (to Honokaa) and carries Hawaii Belt Road over Nanue Stream. The bridge was constructed in 1952 and the coordinates are 19°55'38.56"N, 155° 9'23.47"W and carries Hawaii Belt Road over the Nanue Stream. The bridge is in the State Conservation District and the Special Management Area (SMA). The proposed action area spans approximately 2,050 feet (0.38 miles) and consists of the bridge footprint, construction staging areas, and the highway right-of-way (ROW). The bridge measures 528-feet long with a deck width of 38'-6" and footings about 85 feet wide. Please refer to the enclosed project location map that delineates the proposed action area.

The proposed action is a bridge rehabilitation project to address the deterioration in the superstructure by repairing steel truss members, bearings, gusset plates, rivets, etc. that have

corrosion and section loss; addressing spalls delamination in the concrete deck, bridge railings, column pedestals and foundations; cleaning and painting the steel members following the repairs; addressing scour deficiencies for the bridge foundations; and addressing other deteriorated bridge elements. There would be no graded areas, parking areas and related facilities.

The Nanue Stream bridge was painted with lead-based paint. HDOT is in discussions with the State of Hawaii Department of Health regarding mitigation measures required for contaminated soil beneath the bridge. The project consists of only work and rehabilitation on the bridge structure. There is testing on the structure and soil to determine level of contamination, if any.

All construction staging areas would be within the HDOT right-of-way (ROW). The estimated start of construction is September 2024 for two (2) years. Night work may be anticipated.

Analysis of Potential Adverse Effects on EFH and Managed Species

The proposed project location is approximately 450 feet inland from the nearest EFH. Please see enclosed figure for the project location in relation to EFH. The Western Pacific Regional Fishery Management Council (Council) has established EFH for Bottomfish and Seamount Groundfish, as well as Crustaceans, and Coral Reef Ecosystems as generally beginning in the marine water column at the shoreline, including tidally influenced stream areas surrounding all islands of Hawaii. Other Management Unit Species (MUS) include Precious Coral and Pelagic species; however, these specific EFH are too geographically distant to experience potential effects from the proposed action.

The 2009 Hawaii Fishery Ecosystem Plan (FEP) describes the physical limits of EFH for each MUS and possible sources of adverse impacts to the EFH from non-fishing activities. These possible sources identified in the FEP which may be relevant to this project include coastal construction and nutrient loading. Potential adverse impacts of these activities include biological availability of toxic substances, contaminant runoff, and sediment runoff. However, given the project location's distance to the EFH and presence of a roadway partition makai (seaward) of Hawaii Belt Road, potential effects (direct and indirect), if any, to Essential Fish Habitat are unlikely. Specifically, water quality impacts are not anticipated.

The construction site's primary potential sources of nutrient loading include sediment runoff and ground disturbance, deriving from the storage and use of construction equipment. Contaminant runoff could be generated from storage and use of construction equipment that is leaking fuel or oil, and/or improperly stored construction materials being exposed to storm water runoff. Storm water BMPs will be utilized to mitigate these potential effects.

Project Best Management Practices and Avoidance and Minimization Measures

To minimize any potential effects to EFH managed species, the following BMPs and minimization measures will be implemented:

1. Waste Management – Concrete wastes solid wastes, and any sanitary/septic wastes will be located away from and managed to assure no contamination.

2. Vehicle and Equipment Management – All vehicles and equipment cleaning, maintenance, and refueling will be located away from and managed to assure no contamination. Invasive species controls shall be maintained to ensure that all materials transported from off-site are free of such species.

3. Storm Water Management and Erosion Control – Site-specific storm water BMPs will be implemented and/or installed at the road staging and work areas to prevent water quality degradation associated with storm water runoff. The Contractor will be required to install and maintain BMPs as part of the proposed project. The Contractor will be required to prevent any debris from falling into the water.

4. The HDOT Standard Specification for Road and Bridge Construction Section 209 Temporary Water Pollution, Dust, and Erosion Control will be followed.

5. Reduce the generation and runoff of pollutants during bridge repair operations by decreasing the use of hazardous materials and incorporating practices to prevent spillage into sensitive areas.

Conclusion

Based on the nature of the proposed work and implementation of the proposed BMPs, the FHWA believes there will be no more than minimal adverse effects to EFH and managed species. We are seeking concurrence that the proposed action will have no more than minimal adverse effects to EFH and managed species. We respectfully request your response within 30 days of receipt of this letter.

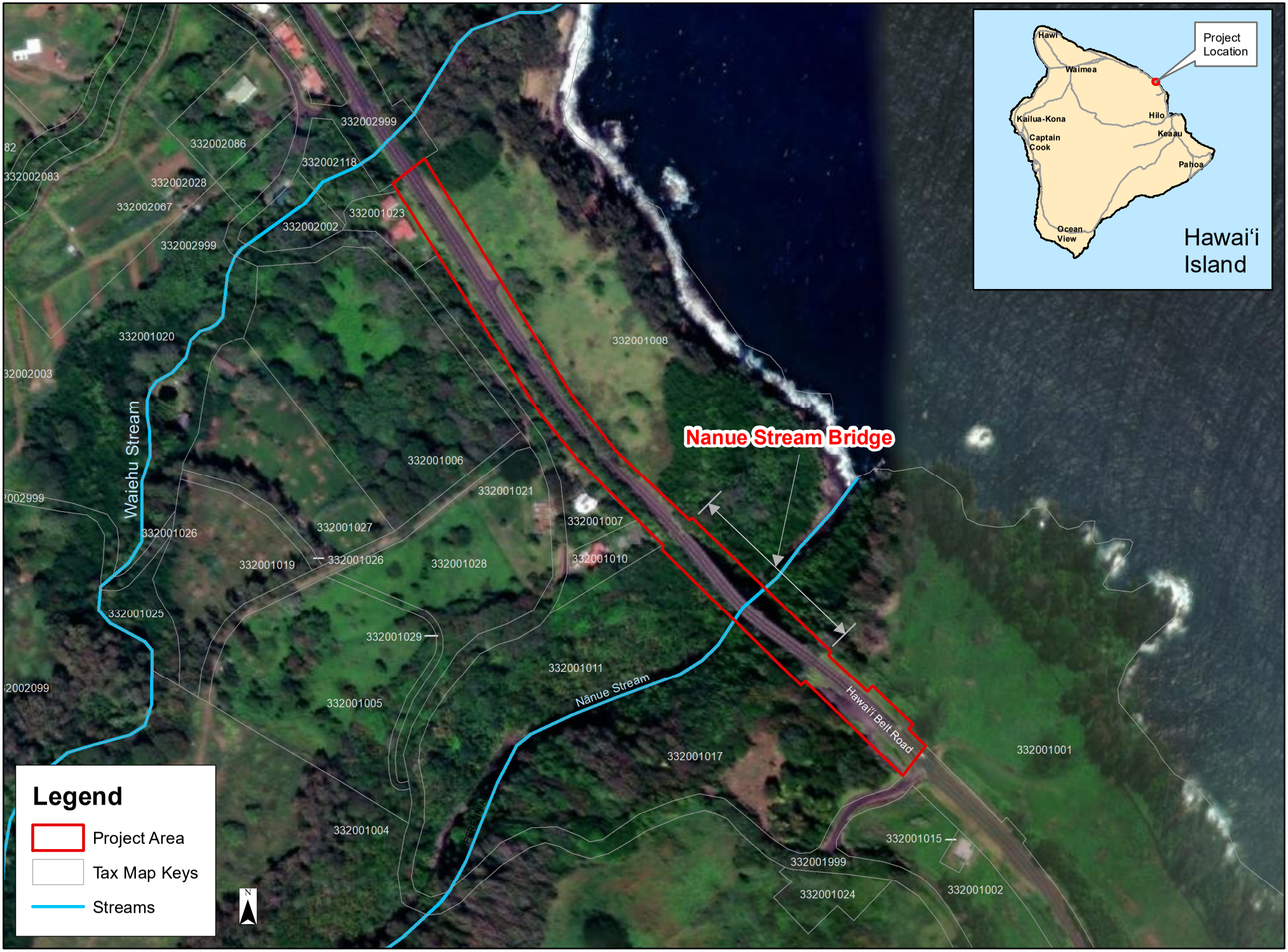
If you have any questions, please feel free to contact Meesa Otani, Environmental Engineer, at (808) 541-2316 or by email at meesa.otani@dot.gov. Thank you for your assistance.

Sincerely yours,

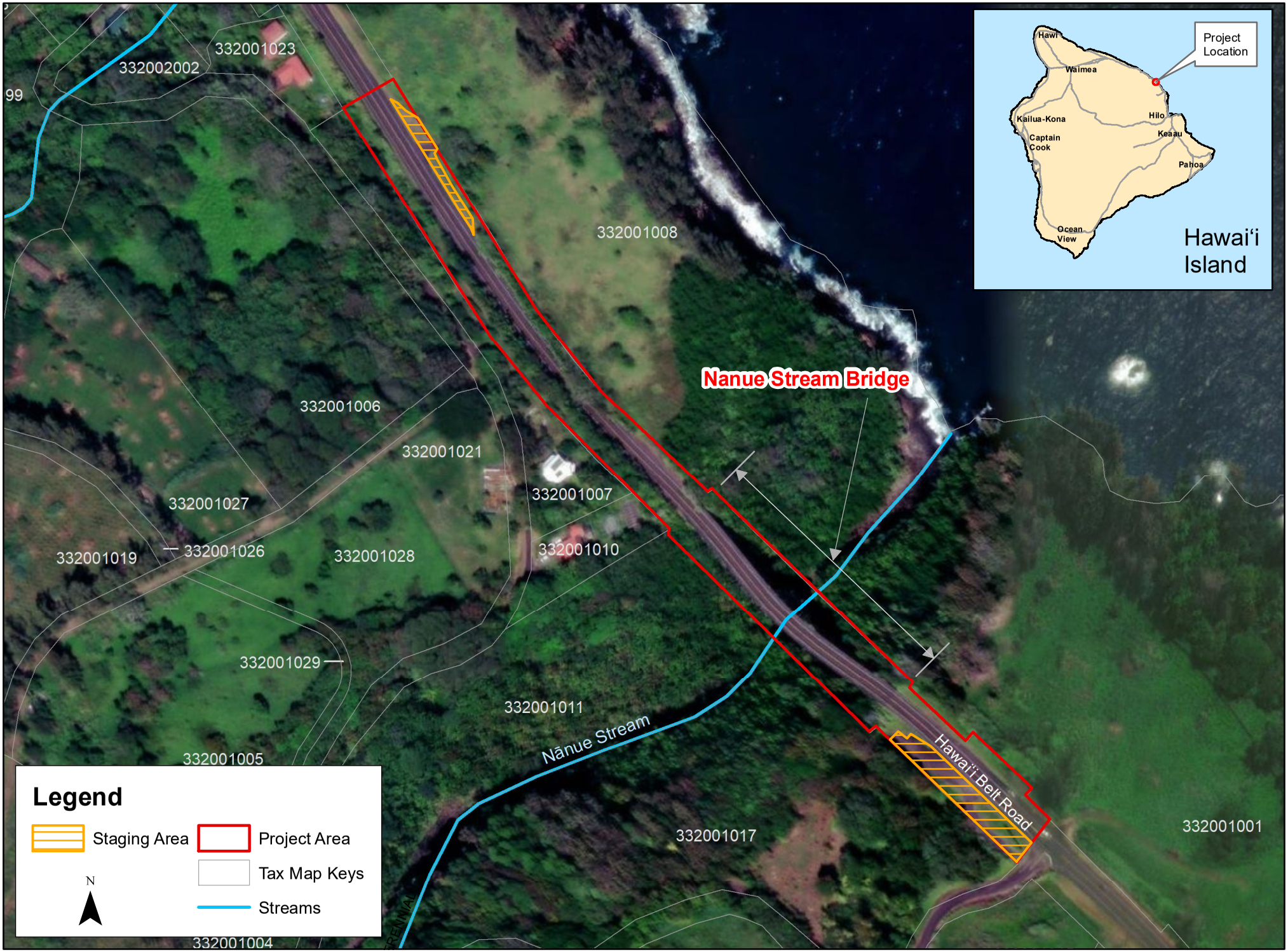
for Richelle M. Takara, P.E.
Division Administrator

Enclosures

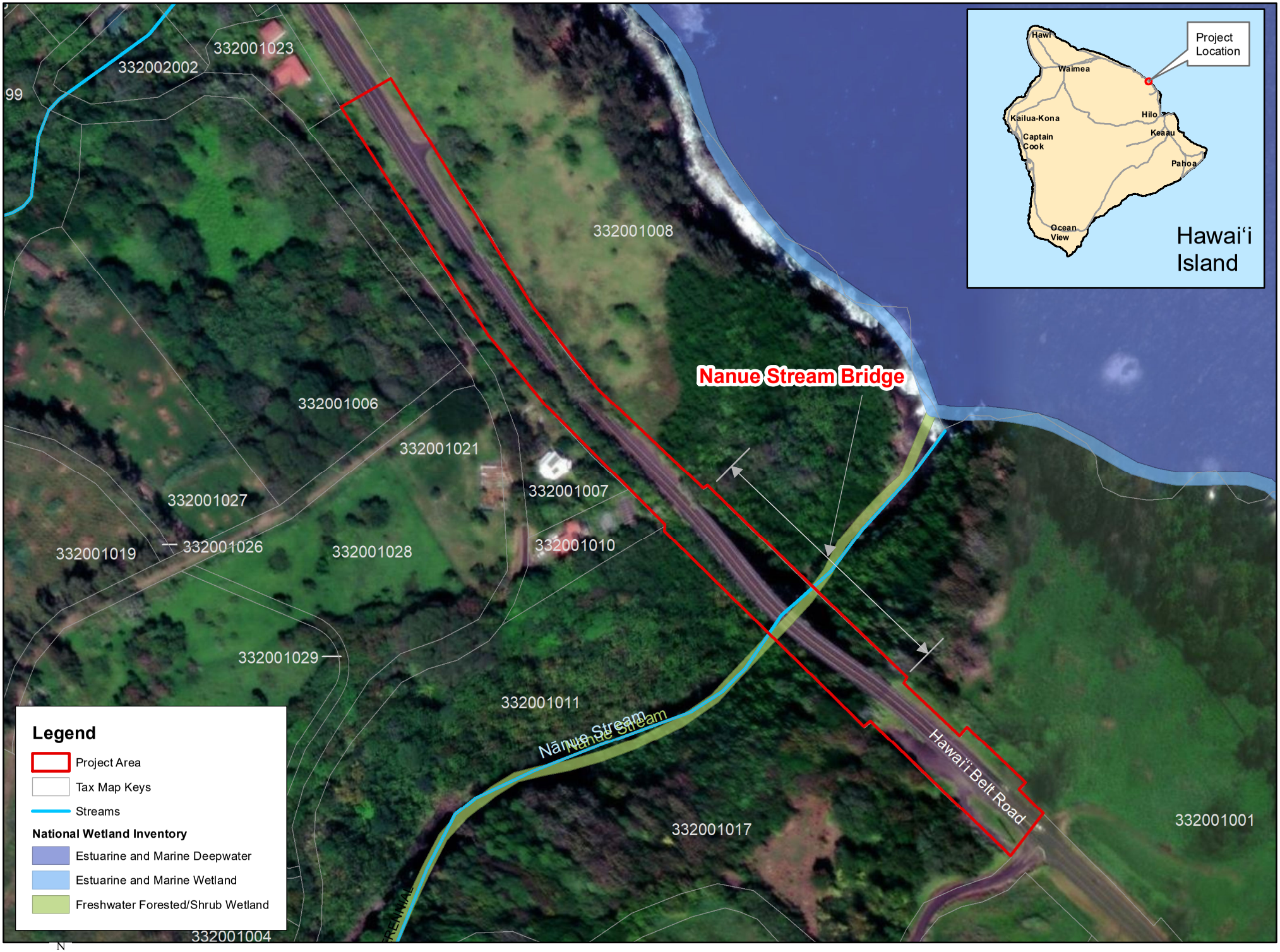
cc: Amy Yagi, HDOT, HWY-DD
Randall Urasaki, WSP



Nānue Stream Bridge Rehabilitation
Project Area Map



Nānue Stream Bridge Rehabilitation
Project Area Map



Nānue Stream Bridge Rehabilitation
Project Area Map

From: Richard Hall - NOAA Federal <richard.hall@noaa.gov>
Sent: Monday, September 11, 2023 10:57 AM
To: Otani, Meesa (FHWA) <meesa.otani@dot.gov>
Cc: Yagi, Amy M <amy.m.yagi@hawaii.gov>; Ho, Hansen <hansen.ho@hawaii.gov>; Urasaki, Randall M. <randall.urasaki@wsp.com>; Gerry Davis <gerry.davis@noaa.gov>; Malia Chow - NOAA Federal <malia.chow@noaa.gov>; Sean Hanser - NOAA Federal <sean.hanser@noaa.gov>; David Delaney - NOAA Federal <david.delaney@noaa.gov>
Subject: [EXTERNAL] Re: BR-019-2(077) Nanue Stream Bridge Rehabilitation EFH Consultation

Ms. Otani,

On September 5, 2023, the National Marine Fisheries Service (NMFS), Pacific Islands Regional Office (PIRO) received a request for an essential fish habitat consultation (EFH) from the Federal Highway Administration (FHWA) for the proposed Nanue Stream Bridge Rehabilitation (19.55'38.56"N, 155° 9'23.47"W) project on the island of Hawai'i, which will be conducted in cooperation with the Hawaii Department of Transportation (HDOT). The FHWA has proposed to include and adhere to best management practices (BMPs) and minimization measures that, when implemented, will be suitable to ensure that adverse effects to EFH will be no more than minimal. Additional conservation recommendations are unnecessary, thus satisfying the requirements of Section 305(b)(D)(2) of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act).

Project Description

The proposed action is a bridge rehabilitation project to address the deterioration in the superstructure of the Nanue Stream Bridge by repairing steel truss members, bearings, gusset plates, and rivets that have corrosion and section loss; addressing spalls delamination in the concrete deck, bridge railings, column pedestals and foundations; cleaning and painting the steel members following the repairs; addressing scour deficiencies for the bridge foundations; and addressing other deteriorated bridge elements.

At some point during its lifetime, Nanue Bridge was painted with a lead-based paint that may have contaminated the soil beneath the structure. Remediation of the lead may involve removal or encapsulation of contaminated soils or implementation of controls to prevent access to lead contaminated areas. HDOT is currently discussing the situation with the State of Hawaii Department of Health and will work to identify mitigation measures of contaminated soil beneath the bridge. HDOT will test the structure and the soil to determine the level of contamination, if any.

The construction is expected to take up to two years. Due to the extent of the repairs, night work may be required.

Essential Fish Habitat

The marine water column from the surface to a depth of 3,280.8 feet (1,000 meters) from the shoreline to the outer boundary of the EEZ (200 nautical miles), and the seafloor from the shoreline out to a depth of 2,296.6 feet (700 meters) around each of the Hawaiian Islands, have been designated as EFH. As such, the water column and bottom of the Pacific Ocean around the island of Hawai'i are designated as EFH, and support various life stages for the management unit species (MUS) identified under the Western Pacific Fishery Management Council's Pelagic and Hawaii Archipelago Fishery Ecosystem Plans. The MUS and life stages found in these waters include eggs, larvae, juveniles, and adults of Bottomfish, Crustacean, and Pelagic MUS. Specific types of habitats considered as EFH include coral reef, patch reefs, hard substrates, artificial substrates, seagrass beds, soft substrates, lagoons, estuaries, surge zones, deep-slope terraces, and pelagic/open oceans.

Baseline Environment

In referencing the NOAA National Centers for Coastal Ocean Science benthic habitat mapping surveys (Battista et al. 2007; see https://www.pacioos.hawaii.edu/voyager/), shows that the marine environment near the stream consists of rock and boulder.

Stressors

The potential environmental stressors of concern related to this project include sedimentation and turbidity, and introduction of chemical contaminants. The broad potential adverse effects to EFH due to the proposed activities are described below.

Sedimentation and Turbidity

Increased sedimentation and turbidity can cause smothering of benthic species and block sunlight necessary for species that rely on photosynthesis. For corals, sedimentation has been shown to reduce species diversity, change growth patterns, and reduce growth and survival (Rogers 1990). Coral reef organisms are easily smothered by sediment (Golbuu et al. 2003), and minimal rates of sediment can affect multiple life stages of coral. For fish, sedimentation is less likely to cause significant impacts because of their mobility, but some effects are still possible. Fish may be displaced from their normal home range which could result in negative intra- and interspecies interactions and impact fitness, leading to lower reproductive success and a lower ability to find prey or avoid predators (Kjelland et al. 2015).

Introduction of Nutrients and Chemical Contaminants

In general, the impacts from contaminants in the marine environment is dependent on how long the chemical components persist and their tendency to bio-accumulate in the food web (van Dam et al. 2011). Some pollutants are environmentally persistent and can take years or even decades to biodegrade (Minton 2017). Increases in nutrients, pollutants and contaminants to the marine environment can reduce fitness and cause mortality of exposed organisms. Increase of land-based runoffs and discharges can subject benthic communities to adverse exposures and potential degradation of condition. Heavy metals, which is the contaminant of concern for this project (lead), are known to bioaccumulate and can undergo food chain magnification and cause trophic effects (Baby et al. 2010). When they are present in the substrate they can be spread in dissolved and particulate form and made bio-available by activities such as dredging, excavation,

and stirring soft sediment (Goossens and Zwolsman 1996). When not properly maintained, equipment could also release contaminants (oil, fuel, etc.) into the marine environment.

FHWA-proposed Best Management Practices (BMPs)

The following measures have been incorporated into the overall design and construction methods for the proposed action to minimize and reduce impacts to water quality under NMFS jurisdiction:

For all project related construction, BMPs shall be implemented in accordance to the documented approach, "An Integrated Storm Water Management Approach and a Summary of Clear Water Diversion and Isolation Best Management Practices for Use in the State of Hawaii", by the Federal Highway Administration and Hawaii Department of Transportation Practitioners Guide (2016) or the Construction Best Management Practices Field Manual by the State of Hawaii Department of Transportation (2008). In addition, the HDOT Standard Specification for Road and Bridge Construction Section 209 Temporary Water Pollution, Dust, and Erosion Control will be followed.

In addition, in the documents submitted for the consultation, the FHWA provided a thorough list of BMPs which will be incorporated into the overall design and construction methods for the proposed action to minimize and reduce impacts to water quality under NMFS jurisdiction. Adherence to those BMPs during the proposed activities will be effective in addressing many of NMFS concerns about potential adverse effects.

Conclusion

The FHWA has determined that proposed project activities will have minimal adverse effects to EFH given incorporation of all proposed BMPs. NMFS finds that the FHWA- and HDOT-proposed BMPs for the Nanue Stream Bridge Rehabilitation project are suitable to ensure that adverse effects to EFH will be no more than minimal. Therefore, NMFS will not provide additional conservation recommendations for this project, thus satisfying the requirements of Section 305(b)(D)(2) of the Magnuson-Stevens Act.

Thank you for coordinating on this proposed project. Feel free to contact me 808-725-5018 or at richard.hall@noaa.gov with any questions or comments.

References

Baby, J., J. S. Raj, E. T. Biby, P. Sankarganesh, M. V. Jeevitha, S. U. Ajisha, S. S. Rajan. 2010. Toxic effect of heavy metals on aquatic environment. *International Journal of Biological and Chemical Sciences*, *4*(4):939-952.

Battista, T., B. Costa, and S. Anderson. 2007. Shallow-water benthic habitats of the main eight Hawaiian Islands. NOAA Technical Memorandum NOS NCCOS 61, Biogeography Branch. Silver Spring, MD.

Golbuu Y, S. Victor, E. Wolanski, and R. H. Richmond. 2003. Trapping of fine sediment in a semi-enclosed bay, Palau, Micronesia. Estuarine, Coastal and Shelf Science. 57(5):941-949.

Goossens, H. and J. J. Zwolsman. 1996. An evaluation of the behaviour of pollutants during dredging activities. *Terra et aqua*, 62:20-28.

Kjelland, M. E., C. M. Woodley, T. M. Swannack, and D. L. Smith. 2015. A review of the potential effects of suspended sediment on fishes: potential dredging-related physiological, behavioral, and transgenerational implications. *Environ. Syst. Decis.* 35:334-50.

Minton, D. 2017. Non-fishing effects that may adversely affect essential fish habitat in the Pacific Islands Region. National Oceanic and Atmospheric Administration Final Report for contract AB-133F-15-CQ-0014.

Rogers, C. S. 1990. Responses of coral reefs and reef organisms to sedimentation. *Mar. Ecol. Prog. Ser.* 62: 185–202.

van Dam J. W., Negri A. P., Uthicke S., and Mueller J. F. 2011. Chemical pollution on coral reefs. Ecological impacts of toxic chemicals. p. 187-211.

On Tue, Sep 5, 2023 at 4:38 PM 'Otani, Meesa (FHWA)' via _NMFS PIR ESHESA <efhesaconsult@noaa.gov> wrote:

> Good afternoon,
>
> Attached is the Essential Fish Habitat consultation for the Nanue Stream Bridge Rehabilitation project on the Big Island.
>
> Please let me know if you have any questions.
>
> Thank you!
>
> *Meesa Otani*
>
> Environmental Engineer
>
> Federal Highway Administration, Hawaii Division
>
> 300 Ala Moana Blvd., Room 3-229
>
> Honolulu, Hawaii 96850
>
> (808) 541-2316
>
> meesa.otani@dot.gov
>
> **Think before you print**

--
Richard Hall
Fishery Policy Analyst, Pacific Islands Regional Office
NOAA Fisheries | U.S. Department of Commerce
Office: (808) 725-5018
www.fisheries.noaa.gov

Hawaii Revised Statutes Chapter 195D

JOSH GREEN, M.D.
GOVERNOR

DESIGN BRANCH, ROOM 688A
BRIDGE DESIGN SECTION, ROOM 611
CADASTRAL DESIGN SECTION, ROOM 600
ENVIRONMENTAL DESIGN SECTION, ROOM 688A
HIGHWAY DESIGN SECTION, ROOM 609
HYDRAULIC DESIGN SECTION, ROOM 636
TECHNICAL DESIGN SECTION, ROOM 688

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

EDWIN H. SNIFFEN
DIRECTOR

Deputy Directors
FORD N. FUCHIGAMI
DREANALEE K. KALILI
TAMMY L. LEE
ROBIN K. SHISHIDO

IN REPLY REFER TO:

HWY-DD 2.2316

October 3, 2023

TO: DAWN N. S. CHANG, CHAIRPERSON
DEPARTMENT OF LAND AND NATURAL RESOURCES

ATTENTION: BRIAN NEILSON
ADMINISTRATOR
DIVISION OF AQUATIC RESOURCES

FROM: HENRY KENNEDY Henry Kennedy
ENGINEERING PROGRAM MANAGER
DESIGN BRANCH

SUBJECT: HAWAII REVISED STATUTES (HRS) CHAPTER 195D CONSULTATION
HRS CHAPTER 343 ENVIRONMENTAL ASSESSMENT CONSULTATION
NANUE STREAM BRIDGE REHABILITATION
DISTRICT OF HILO, ISLAND OF HAWAII
ROAD RIGHT-OF-WAY (ROW) (3) 3-2-001

The State of Hawaii Department of Transportation (HDOT) is planning to repair the Nanue Stream Bridge, located in North Hilo near the Ninole area. In accordance with State guidelines for preparing environmental review documents, HDOT is consulting with the Department of Aquatic Resources (DAR) under HRS Chapter 195D to determine if any threatened and endangered aquatic species or critical habitats within the vicinity of the project would be affected by the proposed project actions.

HDOT is preparing an Environmental Assessment (EA) in compliance with HRS Chapter 343, Hawaii's environmental impact statement law, to evaluate and disclose the project's potential environmental impacts and identify any potential permitting requirements. At this time, HDOT is seeking input on the project information provided below, as well as information related to any environmental, social, or economic concerns related to the project or project area.

The Federal Highway Administration intends to fund the bridge project and therefore is considered a federal action triggering federal requirements including the National Environmental Policy Act (NEPA) and Section 7 of the Endangered Species Act. To comply with NEPA, preparation for environmental documentation to be consistent with the findings of this EA is being done. The United States Fish and Wildlife Service and the National Marine Fisheries Service are also currently being consulted.

The Draft EA is organized as follows:

- Chapter 1 provides an introduction and discusses the purpose as well as the need for the proposed project. It presents the alternatives that were considered, the proposed project's anticipated schedule, and its cost. It also lists permits and approvals that may be required.
- Chapter 2 describes existing environmental conditions, potential environmental impacts, and the mitigation measures that are supposed to reduce the level of potential effect.
- Chapter 3 documents agency and public coordination conducted to date related to the proposed project.
- Chapter 4 documents the Anticipated Finding of No Significant Impact statement in accordance with Hawaii Administrative Rules Section 11-200.1-18 (d)(9).
- Chapter 5 consists of a list of references used in the preparation of this Draft EA.
- Appendices contain records of comments and coordination conducted for the project, as well as various technical reports prepared by specialists.

Project Purpose and Need

The proposed purposes of the Nanue Stream Bridge rehabilitation are the following:

- Rehabilitate the steel bridge's deteriorating substructure to allow continued unrestricted operation of the bridge and resilience to extreme natural events; and
- Upgrade bridge railings to meet current safety standards.

Overview of the Proposed Project

The Nanue Stream Bridge (Bridge No. 1000190308146) is oriented from south (to Hilo) to north (to Honokaa) and carries Hawaii Belt Road over Nanue Stream. The bridge was constructed in 1952; the coordinates are 19°55'38.56"N, 155° 9'23.47"W, and carries Hawaii Belt Road over the Nanue Stream. The bridge is in the State Conservation District and the Special Management Area. The proposed action area spans approximately 2,050 feet (0.38 miles) and consists of the bridge footprint, construction staging areas, and the highway ROW. The bridge measures 528 feet long with a deck width of 38 feet and 6 inches and footings about 85 feet wide. Please refer to the attached project location map that delineates the proposed action area.

The proposed action is a bridge rehabilitation project to address the deterioration in the superstructure by repairing steel truss members, bearings, gusset plates, rivets, etc. that have corrosion and section loss; addressing spalls delamination in the concrete deck, bridge railings, column pedestals and foundations; cleaning and painting the steel members following the repairs; addressing scour deficiencies for the bridge foundations; and addressing other significantly deteriorated bridge elements. There will be no graded areas, parking areas and related facilities. Work may occur within the ordinary high-water mark. HDOT will coordinate

with the United States Army Corp of Engineers. A National Pollutant Discharge Elimination System permit will be obtained, proper stormwater Best Management Practices will be implemented.

The Nanue Stream Bridge was painted with lead-based paint. HDOT is in discussions with the Department of Health regarding mitigation measures required for contaminated soil beneath the bridge. The project consists of only work and rehabilitation on the bridge structure. There is testing on the structure and soil to determine the level of contamination, if any.

All construction staging areas will be within the HDOT ROW. The estimated start of construction is September 2024 for two (2) years. Night work may be anticipated.

Existing Environment in the Action Area

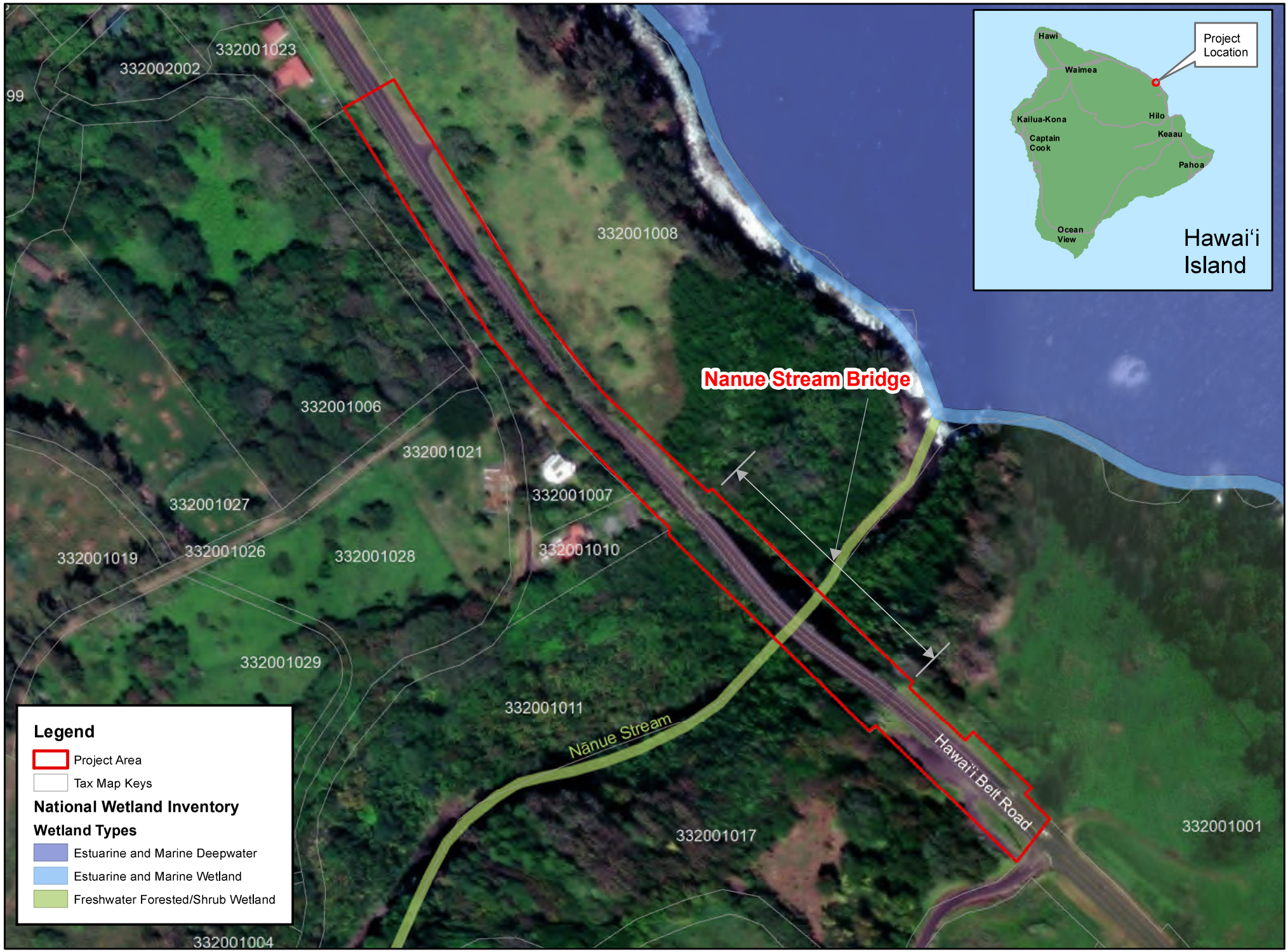
The surrounding land uses include prime agricultural lands, open space, and residential. The attached Wetlands map designates Nanue Stream as a Freshwater Forested/Shrub Wetland. The downstream portion of Nanue Stream at the coastline is designated Estuarine and Marine Wetland and the ocean is designated at Estuarine and Marine deepwater.

Your Request Input

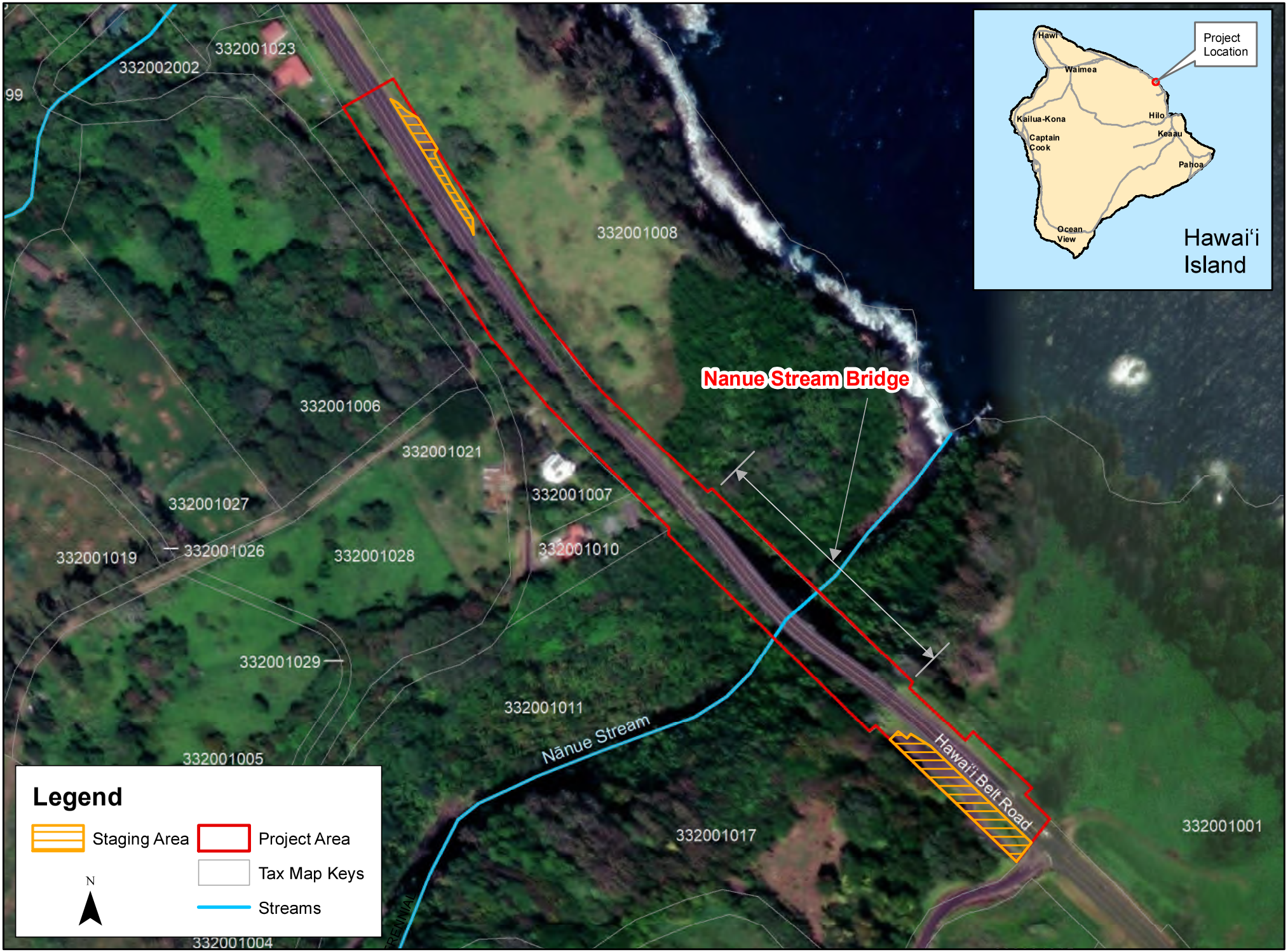
The attached Wetlands map designates Nanue Stream as Freshwater Forested/Shrub Wetland. The downstream portion of Nanue Stream at the coastline is designated Estuarine and Marine Wetland and the ocean is designated at Estuarine and Marine Deepwater. We request your consultation on the threatened and endangered marine species within the vicinity of the project that would be affected by this project. To assist in our assessment for the EA, we also respectfully ask for DAR's opinion on the likely impact of the project based on the potential issues of the locations considering the proposed construction activities and schedule.

Please contact our Project Manager, Amy Yagi, Design Section, Design Branch, at (808) 692-8431, or by email at amy.m.yagi@hawaii.gov should you have any questions. We would appreciate a written response within 30 days of receipt of this letter. We look forward to working with you on these needed improvements.

Attachments



Nānue Stream Bridge Rehabilitation
Wetlands Map



Nānue Stream Bridge Rehabilitation
Project Area Map

JOSH GREEN, M.D.
GOVERNOR

DESIGN BRANCH, ROOM 688A
BRIDGE DESIGN SECTION, ROOM 611
CADASTRAL DESIGN SECTION, ROOM 600
ENVIRONMENTAL DESIGN SECTION, ROOM 688A
HIGHWAY DESIGN SECTION, ROOM 609
HYDRAULIC DESIGN SECTION, ROOM 636
TECHNICAL DESIGN SECTION, ROOM 688

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

EDWIN H. SNIFFEN
DIRECTOR

Deputy Directors
FORD N. FUCHIGAMI
DREANALEE K. KALILI
TAMMY L. LEE
ROBIN K. SHISHIDO

IN REPLY REFER TO:

HWY-DD 2.2317

October 3, 2023

TO: DAWN N. S. CHANG, CHAIRPERSON
DEPARTMENT OF LAND AND NATURAL RESOURCES

ATTENTION: DAVID SMITH
ADMINISTRATOR
DIVISION OF FORESTRY AND WILDLIFE

FROM: HENRY KENNEDY Henry Kennedy
ENGINEERING PROGRAM MANAGER
DESIGN BRANCH

SUBJECT: HAWAII REVISED STATUTES (HRS) CHAPTER 195D CONSULTATION
HRS CHAPTER 343 ENVIRONMENTAL ASSESSMENT CONSULTATION
NANUE STREAM BRIDGE REHABILITATION
DISTRICT OF HILO, ISLAND OF HAWAII
ROAD RIGHT-OF-WAY (3) 3-2-001

The State of Hawaii Department of Transportation (HDOT) is planning to repair the Nanue Stream Bridge, located in North Hilo near the Ninole area. In accordance with State guidelines for preparing environmental review documents, HDOT is consulting with the Division of Forestry and Wildlife (DOFAW) under HRS Chapter 195D to determine if any threatened and endangered aquatic species or critical habitats within the vicinity of the project would be affected by the proposed project actions.

HDOT is preparing an Environmental Assessment (EA) in compliance with HRS Chapter 343, Hawaii's environmental impact statement law, to evaluate and disclose the project's potential environmental impacts and identify any potential permitting requirements. At this time, HDOT is seeking input on the project information provided below, as well as information related to any environmental, social, or economic concerns related to the project or project area.

The Federal Highway Administration intends to fund the bridge project and therefore is considered a federal action triggering federal requirements including the National Environmental Policy Act (NEPA) and Section 7 of the Endangered Species Act. To comply with NEPA, preparation for environmental documentation to be consistent with the findings of this EA is being done. The United States Fish and Wildlife Service and the National Marine Fisheries Service are also currently being consulted.

The Draft EA is organized as follows:

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with the United States Army Corp of Engineers. A National Pollutant Discharge Elimination System permit will be obtained, proper stormwater Best Management Practices will be implemented.

The Nanue Stream Bridge was painted with lead-based paint. HDOT is in discussions with the Department of Health regarding mitigation measures required for contaminated soil beneath the bridge. The project consists of only work and rehabilitation on the bridge structure. There is testing on the structure and soil to determine the level of contamination, if any.

All construction staging areas will be within the HDOT ROW. The estimated start of construction is September 2024 for two (2) years. Night work may be anticipated.

Existing Environment in the Action Area

The surrounding land uses include prime agricultural lands, open space, and residential. The attached Wetlands map designates Nanue Stream as a Freshwater Forested/Shrub Wetland. The downstream portion of Nanue Stream at the coastline is designated Estuarine and Marine Wetland and the ocean is designated at Estuarine and Marine deepwater.

Your Request Input

To assist us in our assessment, we also respectfully ask for DOFAW's opinion on the likely impact of the project based on the potential issues of the locations considering the proposed construction activities and schedule. We request your consultation on threatened and endangered plant and animal species and critical habitats within the vicinity of the project would be affected by this project.

Please contact our Project Manager, Amy Yagi, Design Section, Design Branch, at (808) 692-8431, or by email at amy.m.yagi@hawaii.gov should you have any questions. We would appreciate a written response within 30 days of receipt of this letter. We look forward to working with you on these needed improvements.

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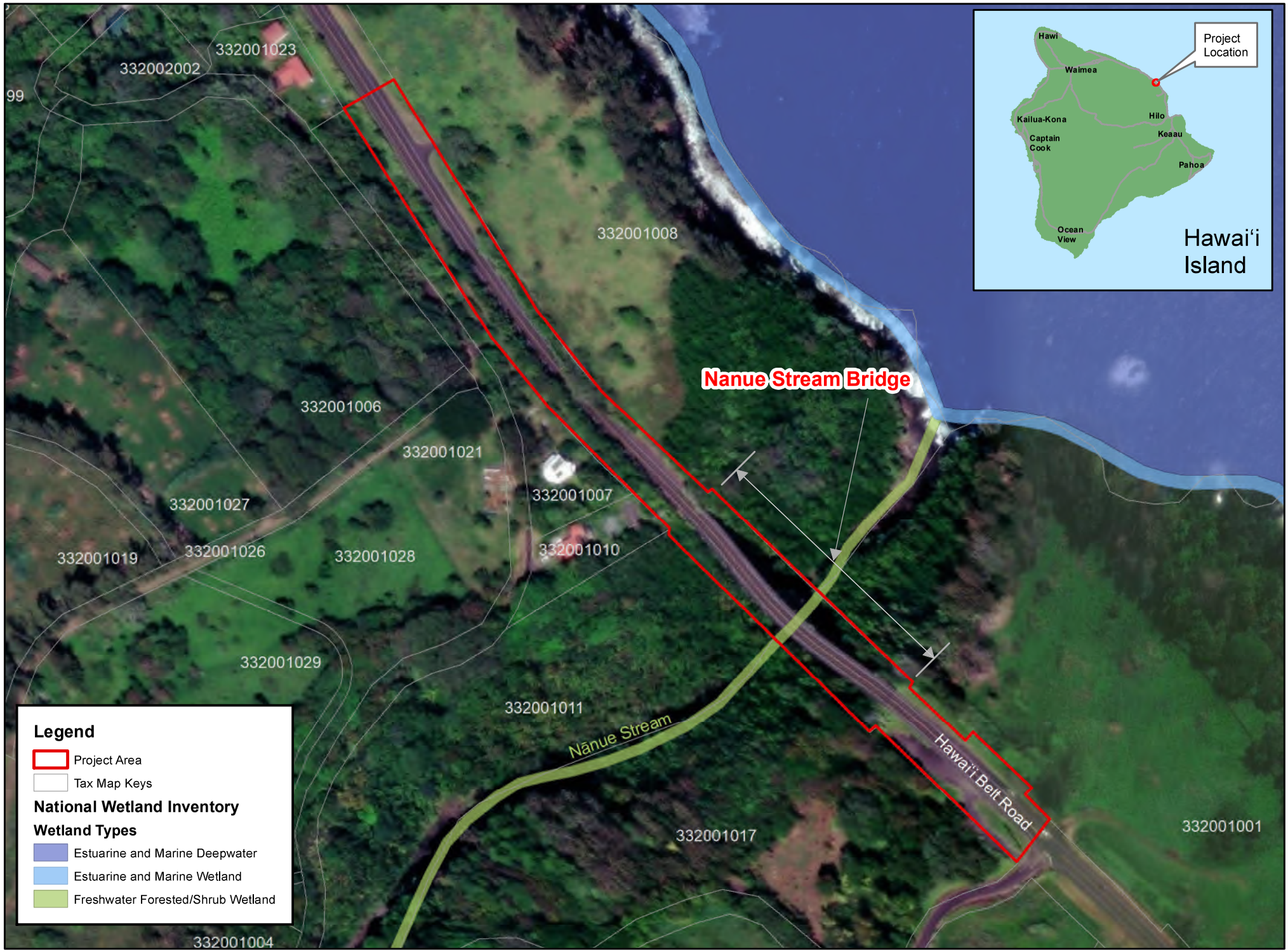
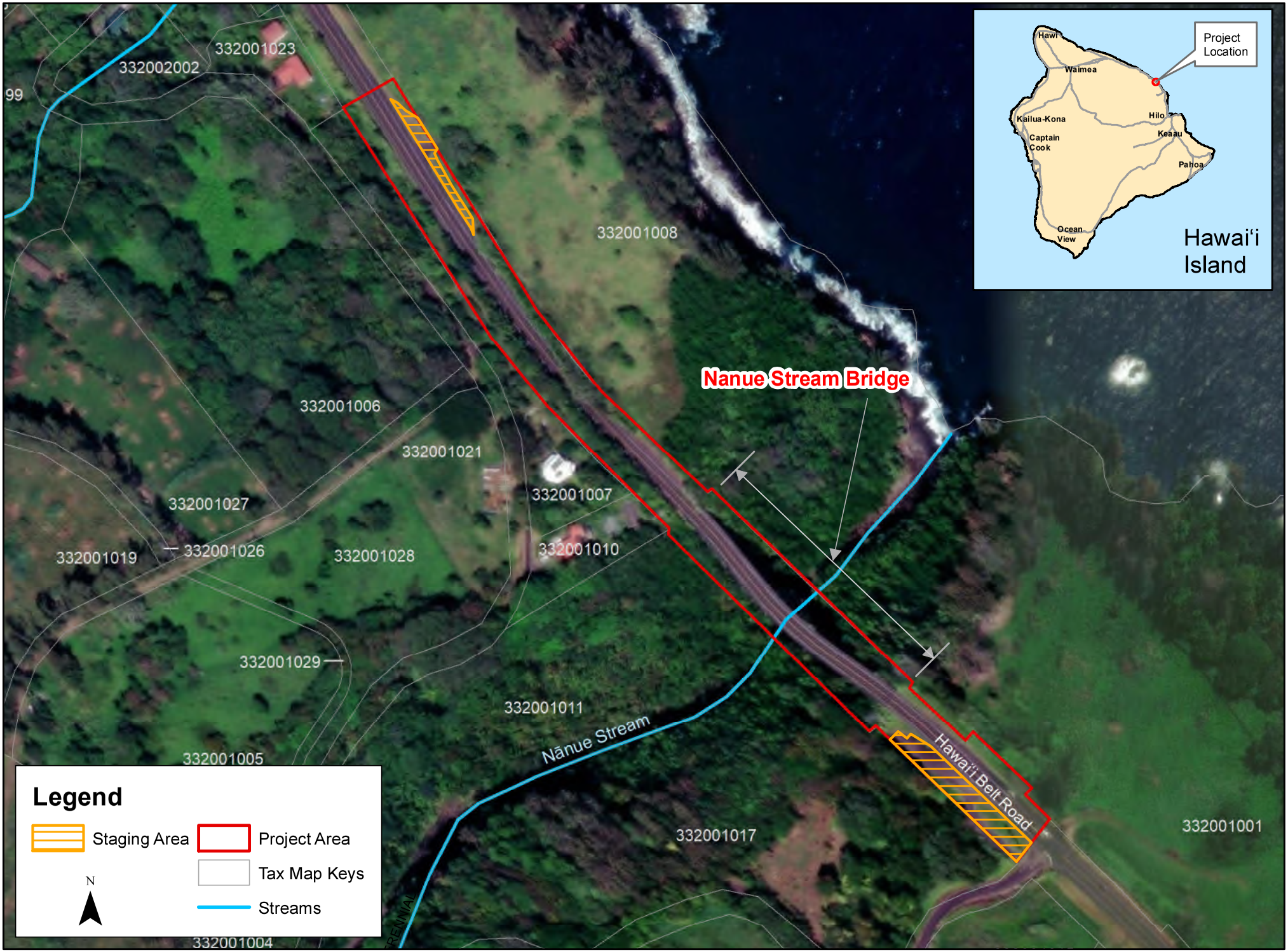


Nānue Stream Bridge Rehabilitation
Wetlands Map



Nānue Stream Bridge Rehabilitation
Project Area Map

JOSH GREEN, M.D.
GOVERNOR | KE KIAʻĀINA

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIAʻĀINA

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

STATE OF HAWAIʻI | KA MOKUʻĀINA ʻO HAWAIʻI
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA ʻOIHANA KUMUWAIWAI ʻĀINA

DIVISION OF FORESTRY AND WILDLIFE
1151 PUNCHBOWL STREET, ROOM 325
HONOLULU, HAWAII 96813

November 6, 2023

Log no. 4293
Reference No. HWY-DD.2.2317

MEMORANDUM

TO: HENRY KENNEDY, Engineering Program Manager
Department of Transportation - Design Branch

FROM: JASON C. MISAKI, Acting Wildlife Program Manager
Division of Forestry and Wildlife

SUBJECT: Division of Forestry and Wildlife Comments for the Draft Environmental Assessment on the Nanue Stream Bridge Rehabilitation, Hawai'i Island

The Department of Land and Natural Resources, Division of Forestry and Wildlife (DOFAW) has received your request for comments regarding the rehabilitation of the Nanue Stream bridge, located on the island of Hawai'i; TMK: (3)3-2-001. The proposed action is a bridge rehabilitation project to address the deterioration in the superstructure by repairing steel truss members, bearings, gusset plates, rivets, etc. that have corrosion and section loss; addressing spalls delamination in the concrete deck, bridge railings, column pedestals and foundations; cleaning and painting the steel members following the repairs; addressing scour deficiencies for the bridge foundations; and addressing other significantly deteriorated bridge elements. Work may occur within the ordinary high-water mark. The Nanue Stream Bridge was painted with lead-based paint. HDOT is in discussions with the Department of Health regarding mitigation measures required for contaminated soil beneath the bridge. The project area encompasses 2,050 feet, and consists of the bridge footprint, construction staging areas, and the highway ROW. There will be no graded areas, parking areas and related facilities. The bridge measures 528 feet long with a deck width of 38 feet and 6 inches, and footings about 85 feet wide. All construction areas will be within the HDOT ROW, with an estimated start date of September 2024, for two years. Night work may be anticipated. Nanue Stream is designated as a Freshwater Forested/Shrub Wetland. The downstream portion of Nanue Stream at the coastline is designated Estuarine and Marine Wetland and the ocean is designated as Estuarine and Marine deepwater.

Thank you for the opportunity to review and comment on the subject matter. DOFAW provides the following comments regarding the potential for the proposed work to the affected listed species in the vicinity of the project area described in the letter (HWY-DD 2.2317).

The State listed ʻōpeʻapeʻa or Hawaiian Hoary Bat (*Lasiurus cinereus semotus*) could potentially occur at or in the vicinity of the project and may roost in nearby trees. Any required site clearing should be timed to avoid disturbance to bats during their birthing and pup rearing season (June 1 through September 15). During this period woody plants greater than 15 feet (4.6 meters) tall should not be disturbed, removed, or trimmed. Barbed wire should also be avoided for any construction because bats can become ensnared and killed by such fencing material during flight.

Artificial lighting can adversely impact seabirds that may pass through the area at night by causing them to become disoriented. This disorientation can result in their collision with manmade structures or the grounding of birds. It is DOFAW's stance that **permanent lighting would pose a very high risk of seabird attraction on the proposed stretch of road.** New highway lights, therefore, should not be installed in this area to protect seabird flyways and preserve the night sky. For nighttime work that might be required, DOFAW recommends that all lights used be fully shielded to minimize the attraction of seabirds. Nighttime work that requires outdoor lighting should be avoided during the seabird fledging season from September 15 through December 15, the period when young seabirds make their maiden voyage to sea. For illustrations and guidance related to seabird-friendly light styles that also protect seabirds and the dark starry skies of Hawaiʻi please visit https://dlnr.hawaii.gov/wildlife/files/2016/03/DOC439.pdf.

State-listed waterbirds such as aeʻo or Hawaiian stilt (*Himantopus mexicanus knudseni*), ʻalae keʻokeʻo or Hawaiian coot (*Fulica alai*), and nēnē or Hawaiian Goose (*Branta sandvicensis*) could potentially occur in the vicinity of the proposed project site. It is against State law to harm or harass these species. If any are present during construction, all activities within 100 feet (30 meters) should cease and the bird or birds should not be approached. Work may continue after the bird or birds leave the area of their own accord. If a nest is discovered at any point, please contact the Hawaiʻi Island Branch DOFAW Office at (808) 974-4221 and establish a buffer zone around the nest.

The endemic pueo or Hawaiian Short-Eared Owl (*Asio flammeus sandwichensis*) could potentially nest in the project area. Before any potential vegetative alteration, especially ground-based disturbance, we recommend that line transect surveys are conducted during crepuscular hours through the project area. If a pueo nest is discovered, a minimum buffer distance of 100 meters from the nest should be established until chicks are capable of flight.

The State listed ʻio or Hawaiian Hawk (*Buteo solitarius*) may occur in the project vicinity. Prior to undertaking vegetation clearing, DOFAW recommends that pre-construction surveys of the area be conducted by a qualified biologist following appropriate survey methods[1] (Gorressen et al., 2008) to ensure no Hawaiian Hawk nests are present, which may occur during the breeding season from March to September. The survey should be conducted at least 10 days prior to the start of construction. If an ʻio nest is detected, a buffer zone of 100 meters (330 feet) should be established around it where no construction shall occur until the chick or chicks have fledged, or the nest is abandoned and. DOFAW staff should be immediately notified. If adult individuals are detected in the area during construction, all activities within 30 meters (100 feet) of the bird should cease. Work may continue when the bird has left the area on its own.

[1]Gorresen, P. M., R. J. Camp, J. L. Klavitter, and T. K. Pratt. 2008. Abundance, distribution and population trend of the Hawaiian Hawk: 1998-2007. Hawai`i Cooperative Studies Unit Technical Report HCSU-009. University of Hawai`i at Hilo. 53 pp., incl. 8 figures, 3 tables & 1 appendix.

DOFAW recommends using native plant species for landscaping that are appropriate for the area; i.e., plants for which climate conditions are suitable for them to thrive, plants that historically occurred there, etc. Please do not plant invasive species. DOFAW also recommends referring to www.plantpono.org for guidance on the selection and evaluation of landscaping plants and to determine the potential invasiveness of plants proposed for use in the project.

DOFAW recommends minimizing the movement of plant or soil material between worksites. Soil and plant material may contain detrimental fungal pathogens (e.g., Rapid ʻŌhiʻa Death), vertebrate and invertebrate pests (e.g., Little Fire Ants, Coqui Frogs, etc.), or invasive plant parts (e.g., African Tulip, Octopus Tree, Trumpet Tree, etc.) that could harm our native species and ecosystems. We recommend consulting the Big Island Invasive Species Committee (BIISC) at (808) 933-3340 to help plan, design, and construct the project, learn of any high-risk invasive species in the area, and ways to mitigate their spread. All equipment, materials, and personnel should be cleaned of excess soil and debris to minimize the risk of spreading invasive species.

To prevent the spread of Rapid ʻŌhiʻa Death (ROD), DOFAW requests that the information and guidance at the following website be reviewed and followed if ʻōhiʻa trees are present at the project site that will be removed, trimmed, or potentially injured: https://cms.ctahr.hawaii.edu/rod.

We recommend that Best Management Practices are employed during and after construction to contain any soils and sediment with the purpose of preventing damage to near-shore waters and marine ecosystems.

DOFAW is concerned about impacts to vulnerable birds from nonnative predators such as cats, rodents, and mongooses. We recommend taking action to minimize predator presence; remove cats, place bait stations for rodents and mongoose, and provide covered trash receptacles.

We appreciate your efforts to work with our office for the conservation of our native species. These comments are general guidelines and should not be considered comprehensive for this site or project. It is the responsibility of the applicant to do their own due diligence to avoid any negative environmental impacts. Should the scope of the project change significantly, or should it become apparent that threatened or endangered species may be impacted, please contact our staff as soon as possible. If you have any questions, please contact Myrna N. Girald Pérez, Protected Species Habitat Conservation Planning Coordinator, at (808) 265-3276 or myrna.girald-perez@hawaii.gov.

Sincerely,

JASON C. MISAKI
Acting Wildlife Program Manager

U.S. Coast Guard

U.S. Department of Homeland Security
United States Coast Guard

Commander
Fourteenth Coast Guard District

300 Ala Moana Blvd.
Honolulu, HI 96850-4982
Staff Symbol: dpw
Phone: (808) 535-3407
Fax: (808) 535-3414

20 May 2024

Federal Highways Administration
Hawaii Division Office
ATTN: Mr. Matthew Walker
300 Ala Moana Blvd., Room 3-229
Honolulu, HI 96850

Dear Mr. Walker.:

In accordance with the provisions of 23 U.S.C. 144(c)(2), we have evaluated your completed checklist pertaining to the proposed rehabilitation of the Nanue Stream bridge across Nanue Stream at milepoint 0.1 and concur with the finding that a Coast Guard permit is not required.

Although this project will not require a bridge permit, we do require certain information to ensure we have accurate records for all bridges across this waterway. The applicant shall submit to the Coast Guard photographs and as-built drawings of both plan and elevation views of the bridge upon completion of the project. Plans should be in the standard 8 ½ x 11 inch format. The drawings, along with the enclosed Completion Report Form, must indicate the vertical clearance from ordinary high water to the lowest portion of the bridge and horizontal clearance, pier face to pier face, or bank to bank, in the main navigation span.

In addition, the requirement to display navigational lighting at the aforementioned bridge is hereby waived, as per Title 33 Code of Federal Regulations, Part 118.40(b). This waiver may be rescinded at any time in the future should nighttime navigation through the proposed bridge be increased to a level determined by the District Commander to warrant lighting.

If you have any further questions, please contact this office at the number above.

Sincerely,

MOORE.JAMES.M.1016368365

Digitally signed by MOORE.JAMES.M.1016368365
Date: 2024.05.20 10:04:15 -04'00'

Jim Moore
U.S. Coast Guard 14th District Bridge Manager
(Acting)

Enclosure List: (a) Blank CG-4599 (Completion report)

Appendix A-3
Draft Environmental Assessment Comments and Responses

From: Nagata, Sarah
Sent: Tuesday, June 25, 2024 7:43 AM
To: Sunahara, Amy
Cc: Liu, Rouen
Subject: [EXTERNAL] Environmental Notice - Draft Environmental Assessment: Nanue Stream Bridge Rehabilitation, Federal-Aid Project No. BR-019-2(077)

Aloha Ms. Sunahara,

Thank you for the opportunity to comment on the subject project. Hawaiian Electric Company has no objection to the project Environmental Notice - Draft Environmental Assessment. Should Hawaiian Electric have existing easements and facilities in the project area, we will need continued access for maintenance of our facilities. We appreciate your efforts to keep us apprised of the subject project in the planning process. As the proposed project comes to fruition, please continue to keep us informed.

Mahalo,
Sarah

Sarah Nagata
Permits Engineer, Transmission & Distribution
Hawaiian Electric
PO Box 2750 / Honolulu, HI 96840

O: 808.543.7046
M: 808.772.3281
E: sarah.nagata@hawaiianelectric.com

From: DOH.CABPDTSS <DOH.CABPDTSS@doh.hawaii.gov>
Sent: Wednesday, June 26, 2024 9:31 AM
To: Honolulu Planning
Subject: DOH-CAB comments on the DEA-AFNSI for Nanue Stream Bridge Rehabilitation Project

Subject: The Draft Environmental Assessment and Anticipated Finding of No Significant Impact (DEA-AFNSI) for Nanue Stream Bridge Rehabilitation Project

Agency: Hawaii Department of Transportation
Amy Sunahara
amy.my.sunahara@hawaii.gov
(808)692-8431
601 Kamokila Boulevard
Kapolei, HI 96707
United States

Consultant: WSP USA
Dennis Silva Jr
Dennis.SilvaJr@wsp.com
(808)566-2274
1001 Bishop Street Suite 2400
Honolulu, HI 96813
United States

Aloha,

Thank you for addressing our comments regarding the fugitive dust in the DEA-AFNSI for Nanue Stream Bridge Rehabilitation Project. The Department of Health Clean Air Branch has no further comments on the subject DEA.

Thanks,
Anna

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

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIA'ĀINA

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

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA 'OIHANA KUMUWAIWAI 'ĀINA
LAND DIVISION

P.O. BOX 621
HONOLULU, HAWAII 96809

July 5, 2024

Ms. Amy Sunahara, HDOT Project Manager
State of Hawaii, Department of Transportation
Design Branch, Highways Design Section
601 Kamokila Boulevard, Room 688A
Kapolei , Hawaii 96707

via email: amy.my.sunahara@hawaii.gov

WSP USA, LLC
Attn: Mr. Dennis Silva, Jr.
1001 Bishop Street, Suite 2400
Honolulu, Hawaii 96813

via email: Dennis.SilvaJr@wsp.com
and via email: HonoluluPlanning@wsp.com

Dear Ms. Sunahara and Mr. Silva, Jr.:

SUBJECT: Draft Environmental Assessment for Hawaii Belt Road **Nanue Stream Bridge Rehabilitation** Project located at North Hilo, Island of Hawaii; TMKs: (3) 3-2-001:008 and (3) 3-2-001: ROW

Thank you for the opportunity to review and comment on the subject matter. The Land Division of the Department of Land and Natural Resources (DLNR) distributed or made available a copy of your request pertaining to the subject matter to DLNR's Divisions for their review and comments.

At this time, enclosed are comments from the (a) Engineering Division and (b) Land Division–Hawaii District on the subject matter. Should you have any questions, please feel free to contact Darlene Nakamura at (808) 587-0417 or email: darlene.k.nakamura@hawaii.gov. Thank you.

Sincerely,

Russell Tsuji

Russell Y. Tsuji
Land Administrator

Enclosures
cc: Central Files

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

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIA'ĀINA

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

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA 'OIHANA KUMUWAIWAI 'ĀINA
LAND DIVISION

P.O. BOX 621
HONOLULU, HAWAII 96809

June 26, 2024

MEMORANDUM

FROM: ~~TO:~~ **DLNR Agencies:**

- X Div. of Aquatic Resources (Kendall.l.tucker@hawaii.gov)
- ___Div. of Boating & Ocean Recreation
- X Engineering Division (DLNR.ENGR@hawaii.gov)
- X Div. of Forestry & Wildlife (rubyrosa.t.terrago@hawaii.gov)
- ___Div. of State Parks
- X Commission on Water Resource Management (DLNR.CWRM@hawaii.gov)
- X Office of Conservation & Coastal Lands (sharleen.k.kuba@hawaii.gov)
- X Land Division – Hawaii District (gordon.c.heit@hawaii.gov)
- ___Aha Moku Advisory Committee

TO: ~~FROM:~~ Russell Y. Tsuji, Land Administrator *Russell Tsuji*

SUBJECT: Draft Environmental Assessment for Hawaii Belt Road **Nanue Stream Bridge Rehabilitation** Project

LOCATION: North Hilo, Island of Hawaii; TMKs: (3) 3-2-001:008 and (3) 3-2-001: ROW

APPLICANT: State of Hawaii Department of Transportation

Transmitted for your review and comment is information on the above-referenced subject matter. The DEA was published on June 8, 2024, by the State Environmental Review Program (formerly the Office of Environmental Quality Control) at the Office of Planning and Sustainable Development in the periodic bulletin, The Environmental Notice, available at the following link:

https://files.hawaii.gov/dbedt/erp/The_Environmental_Notice/2024-06-08-TEN.pdf

Please submit any comments by **July 5, 2024**. If no response is received by this date, we will assume your agency has no comments. Should you have any questions, please contact Darlene Nakamura directly via email at darlene.k.nakamura@hawaii.gov. Thank you.

BRIEF COMMENTS:

( ) We have no objections.
( ) We have no comments.
(✓) We have no additional comments.
( ) Comments are included/attached.

Signed: *CSC*

Print Name: Carty S. Chang, Chief Engineer

Division: Engineering Division

Date: Jul 1, 2024

Attachments

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

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIA'ĀINA

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

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA 'OIHANA KUMUWAIWAI 'ĀINA
LAND DIVISION

P.O. BOX 621
HONOLULU, HAWAII 96809

June 26, 2024

MEMORANDUM

TO: **DLNR Agencies:**
_X_ Div. of Aquatic Resources (Kendall.I.tucker@hawaii.gov)
___ Div. of Boating & Ocean Recreation
_X_ Engineering Division (DLNR.ENGR@hawaii.gov)
_X_ Div. of Forestry & Wildlife (rubyrosa.t.terrago@hawaii.gov)
___ Div. of State Parks
_X_ Commission on Water Resource Management (DLNR.CWRM@hawaii.gov)
_X_ Office of Conservation & Coastal Lands (sharleen.k.kuba@hawaii.gov)
_X_ Land Division – Hawaii District (gordon.c.heit@hawaii.gov)
___ Aha Moku Advisory Committee

FROM: Russell Y. Tsuji, Land Administrator *Russell Tsuji*
SUBJECT: Draft Environmental Assessment for Hawaii Belt Road **Nanue Stream Bridge Rehabilitation** Project
LOCATION: North Hilo, Island of Hawaii; TMKs: (3) 3-2-001:008 and (3) 3-2-001: ROW
APPLICANT: State of Hawaii Department of Transportation

Transmitted for your review and comment is information on the above-referenced subject matter. The DEA was published on June 8, 2024, by the State Environmental Review Program (formerly the Office of Environmental Quality Control) at the Office of Planning and Sustainable Development in the periodic bulletin, The Environmental Notice, available at the following link:

https://files.hawaii.gov/dbedt/erp/The_Environmental_Notice/2024-06-08-TEN.pdf

Please submit any comments by **July 5, 2024**. If no response is received by this date, we will assume your agency has no comments. Should you have any questions, please contact Darlene Nakamura directly via email at darlene.k.nakamura@hawaii.gov. Thank you.

BRIEF COMMENTS:

( ) We have no objections.
(✓) We have no comments.
( ) We have no additional comments.
( ) Comments are included/attached.

Signed: *Gordon Heit*
Print Name: Gordon Heit
Division: Land Division
Date: June 28, 2024

Attachments

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

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIA'AINA

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

STATE OF HAWAI'11KA MOKLTAINA 'O HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA 'OIHANA KUMUWAIWAI 'AINA
LAND DIVISION

P.O. BOX 621
HONOLULU, HAWAII 96809

July 9, 2024

Ms. Amy Sunahara, HDOT Project Manager
State of Hawaii, Department of Transportation
Design Branch, Highways Design Section
601 Kamokila Boulevard, Room 688A
Kapolei , Hawaii 96707

via email: amy.my.sunahara@hawaii.gov

WSP USA, LLC
Attn: Mr. Dennis Silva, Jr.
1001 Bishop Street, Suite 2400
Honolulu, Hawaii 96813

via email: Dennis.SilvaJr@wsp.com
and via email: HonoluluPlanning@wsp.com

Dear Ms. Sunahara and Mr. Silva, Jr.:

SUBJECT: Draft Environmental Assessment for Hawaii Belt Road **Nanue Stream Bridge Rehabilitation** Project located at North Hilo, Island of Hawaii; TMKs: (3) 3-2-001:008 and (3) 3-2-001: ROW

Thank you for the opportunity to review and comment on the subject matter. In addition to our previous comments dated July 5, 2024, enclosed are comments from the Office of Conservation and Coastal Lands on the subject matter. Should you have any questions, please feel free to contact Darlene Nakamura at (808) 587-0417 or email: darlene.k.nakamura@hawaii.gov. Thank you.

Sincerely,

Ru&s&tt- Tsty'i/

Russell Y. Tsuji
Land Administrator

Enclosure
cc: Central Files

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

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIA'ANA

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

RYAN K.P. KANAKA OLE
FIRST DEPUTY

DEAN D. UYENO
ACTING 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

KA MOKU'AINA 'O HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA 'OIHANA KUMUWAIWAI 'AINA
OFFICE OF CONSERVATION AND COASTAL LANDS
P.O. BOX 621
HONOLULU, HAWAII 96809

JUL 5 ftM10:33

DEPT. OF LAND
NATURAL RESOURCES
STATE OF HAWAII

REF:OCCL:AA

Correspondence: HA 24-205

JUL -3 2024

MEMORANDUM

To: Russell Y. Tsuji, Administrator
Land Division

FROM: S. Michael Cain, Administrator
Office of Conservation and Coastal Lands

SUBJECT: Draft Environmental Assessment (DEA) for Hawaii Belt Road Nanue Stream Bridge Rehabilitation Project, Nanue & Honohina, North Hilo, Hawaii, TMK(s): (3) 3-2-001:008 & (3) 3-2-001

The Office of Conservation and Coastal Lands (OCCL) has reviewed the DEA regarding the subject matter. According to the information, the State of Hawaii Department of Transportation (HDOT) plans to rehabilitate the Nanue Stream Bridge and are seeking comments on the DEA. The project areas lie within the Limited and Resource subzone of the State Land Use Conservation District.

The proposed project is located at milepost 18.5 along the Hawaii Belt Road (Route 19) right-of-way. The project area includes a 10O-ft wide by 1,200 ft long area along the right-of-way and a potential 300 ft-wide by 1,000 ft long staging area makai of the highway at TMK (3) 3-2-001:008. The project area totals 11.5 acres.

The OCCL notes that the DEA is being prepared pursuant to HRS 343 and the National Environmental Policy Act (NEPA).

The Nanue Stream Bridge was constructed in 1952, prior to the Conservation District (1964), therefore, the bridge appears to be a nonconforming use. Further, most of the temporary work and permanent improvements are proposed within the HDOT right-of-way. The DEA notes that a staging area may be done outside the right-of-way and on parcel TMK (3) 3-2-001:008. The DEA states that the contractor will make the decision if all staging can occur within the HDOT right-of-way or if further staging is necessary on the private parcel. A small portion of the private parcel within the project area is located within the Resource subzone of the Conservation District. However, it does not appear that the proposed staging area will be located within the

Conservation District. Should plans change and any proposed land uses fall within the Conservation District, please consult with the OCCL.

Further, section 4.3.2.3 Conservation District of the DEA states that Conservation District Use Application (CDUA) coordination is in process and will be completed before the EA FONSI acceptance. At this time, it appears a CDUA is not required for the project. If the scope of the project changes, please consult with the OCCL.

Should you have any questions regarding this correspondence, contact Alyssa Accardo of our Office at (808) 587-0048 or at alyssa.m.accardo@hawaii.gov.

C: Hawaii Division Land Office
County of Hawaii, Department of Planning and Permitting

STATE OF HAWAIʻI
OFFICE OF PLANNING
& SUSTAINABLE DEVELOPMENT

235 South Beretania Street, 6th Floor, Honolulu, Hawaiʻi 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaiʻi 96804

Telephone: (808) 587-2846
Fax: (808) 587-2824
Web: https://planning.hawaii.gov/

JOSH GREEN, M.D.
GOVERNOR

SYLVIA LUKE
LT. GOVERNOR

MARY ALICE EVANS
DIRECTOR

DTS 202406210837DO

July 9, 2024

To: Edwin Sniffen, Director
State of Hawaiʻi Department of Transportation

From: Mary Alice Evans, Director
Office of Planning and Sustainable Development

Attention: Amy Sunahara, Project Manager
Design Branch, Highway Design Section

Subject: Draft Environmental Assessment for the Nanue Stream Bridge Rehabilitation, Federal-Aid Project No. BR-019-2(077)
Ninole, North Hilo, Island of Hawaiʻi

Thank you for the opportunity to provide comments on the Draft Environmental Assessment (Draft EA) for the Nanue Stream Bridge Rehabilitation Improvements. Our office was notified of the availability of the Draft EA on this bridge rehabilitation project via memo dated June 8, 2024.

The Office of Planning and Sustainable Development (OPSD) has reviewed the Draft EA and has the following comments to offer:

1. Previous Comments
We note that our office provided comments on this project in a Pre-Assessment Consultation comment request, DTS202312261024NA, dated January 30, 2024. Our response letter stated that the Draft EA should address consult with the County of Hawaiʻi regarding Special Management Are Use permitting, evaluate stormwater runoff impacts, and potential impacts to the project area resulting from Climate Change/Sea Level Rise. The Draft EA has adequately examined these concerns.

2. Coastal Zone Management Act (CZMA) Federal Consistency
We note that Draft EA does list the need for a CZMA federal consistency review. Our office is the lead state agency with the authority to conduct CZMA federal consistency reviews. Please contact our office regarding the applicable rules, policies and procedures for CZMA federal consistency.

3. Hawai‘i Coastal Zone Management (CZM) Program
   We note that Section 3.1.3, page 3-3 provides a brief discussion on Coastal Zone Management and Consistency Review. The Draft EA does not include a complete evaluation of Hawai‘i Revised Statutes (HRS) § 205A-2, the objectives and supporting policies of the Hawai‘i CZM Program. The provisions of HRS § 205A-2 include Recreational Resources, Historic Resources, Scenic and Open Space Resources, Coastal Ecosystems, Economic Uses, Coastal Hazards, Managing Development, Public Participation, Beach Protection, and Marine Resources.

   Furthermore, HRS § 205A-2 serves as the foundation of the enforceable policies of the State of Hawai‘i of which the CZMA federal consistency review is based upon. The Final Environmental Assessment should include a complete evaluation of this statute and its provisions. This assessment can be used as support material for the federal consistency review. Additionally, disclosure of impacts on CZM objectives and supporting policies will aid the State in determining impacts to the project area and to the Hamakua Coastal region of the island of Hawai‘i.

If you wish to respond to this comment letter, please include 202406210837DO in the subject line. For any questions regarding this comment letter, please contact Joshua Hekekia at (808) 587-2845 or by email to joshua.k.hekeia@hawaii.gov.

Sincerely,

Mary Alice Evans

Mary Alice Evans
Director

JOSH GREEN, M.D.
GOVERNOR
KE KIA'ĀINA

DESIGN BRANCH, ROOM 688A
BRIDGE DESIGN SECTION, ROOM 611
CADASTRAL DESIGN SECTION, ROOM 600
ENVIRONMENTAL DESIGN SECTION, ROOM 688A
HIGHWAY DESIGN SECTION, ROOM 609
HYDRAULIC DESIGN SECTION, ROOM 636
TECHNICAL DESIGN SECTION, ROOM 688

EDWIN H. SNIFFEN
DIRECTOR
KA LUNA HO'OKELE

Deputy Directors
Nā Hope Luna Ho'okele
DREANALEE K. KALILI
TAMMY L. LEE
ROBIN K. SHISHIDO

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF TRANSPORTATION | KA 'OIHANA ALAKAU
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

IN REPLY REFER TO:

HWY-DD 2.20866

July 17, 2024

TO: JAMES KUNANE TOKIOKA, DIRECTOR
DEPARTMENT OF BUSINESS ECONOMIC DEVELOPMENT AND TOURISM

THROUGH: MARY ALICE EVANS, DIRECTOR
ENVIRONMENTAL REVIEW PROGRAM
OFFICE OF PLANNING AND SUSTAINABLE DEVELOPMENT

FROM: For HENRY KENNEDY
ENGINEERING PROGRAM MANAGER
DESIGN BRANCH

SUBJECT: RESPONSE TO COMMENT RECEIVED – 202406210837DO
PRE-CONSULTATION FOR DRAFT ENVIRONMENTAL ASSESSMENT (EA)
HAWAII BELT ROAD, NANUE STREAM BRIDGE REHABILITATION
PROJECT, DISTRICT OF NORTH HILO, ISLAND OF HAWAII
TAX MAP KEY NO. (3) 3-2-001
FEDERAL-AID PROJECT NO. BR-019-2(077)

The State of Hawaii Department of Transportation (HDOT) is in receipt of your comments to our Pre-Consultation Letter for the Draft EA for the Nanue Stream Bridge Rehabilitation Project. Please see below for our responses to your comments received.

Comment Received:
1. Previous Comments.
We note that our office provided comments on this project in a Pre-Assessment Consultation comment request, DTS202312261024NA, dated January 30, 2024. Our response letter stated that the Draft EA should address consult with the County of regarding Special Management Area Use permitting, evaluate stormwater runoff impacts, and potential impacts to the project area resulting from Climate Change/Sea Level Rise. The Draft EA has adequately examined these concerns.

Response: It is noted that the Draft EA adequately addressed this comment.

Comment Received:
2. Hawaii Coastal Zone Management (CZM) Program
We note that Section 3.1.3, page 3-3 provides a brief discussion on Coastal Zone Management and Consistency Review The Draft EA does not include a complete evaluation of HRS) § 205A-2, the objectives and supporting policies of the Hawaii CZM Program. The provisions of HRS § 205A-2 include Recreational Resources, Historic Resources, Scenic and Open Space Resources, Coastal Ecosystems, Economic Uses, Coastal Hazards, Managing Development, Public Participation, Beach Protection, and Marine Resources.

Response: The Final EA will include a complete evaluation of the Hawaii Revised Statutes (HRS) § 205A-2, the objectives and supporting policies of the Hawaii CZM Program, as noted in your comment.

Comment Received:
3. Furthermore, HRS § 205A-2 serves as the foundation of the enforceable policies of the State of Hawaii of which the CZMA federal consistency review is based upon. The Final Environmental Assessment should include a complete evaluation of this statute and its provisions. This assessment can be used as support material for the federal consistency review. Additionally, disclosure of impacts on CZM objectives and supporting policies will aid the State in determining impacts to the project area and to the Hamakua Coastal region of the island of Hawaii.

Response: The Final EA will include a complete evaluation of HRS § 205A-2, the objectives and supporting policies of the Hawaii CZM Program, as noted in your comment.

Should you have any questions, please contact our HDOT Project Manager, Ms. Amy Sunahara, at (808) 692-8431, of our Design Branch, Highway Design Section or by email at amy.my.sunahara@hawaii.gov.

Enclosure

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

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIA'ĀINA

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

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA 'OIHANA KUMUWAIWAI 'ĀINA
LAND DIVISION

P.O. BOX 621
HONOLULU, HAWAII 96809

July 15, 2024

Ms. Amy Sunahara, HDOT Project Manager
State of Hawaii, Department of Transportation
Design Branch, Highways Design Section
601 Kamokila Boulevard, Room 688A
Kapolei , Hawaii 96707

via email: amy.my.sunahara@hawaii.gov

WSP USA, LLC
Attn: Mr. Dennis Silva, Jr.
1001 Bishop Street, Suite 2400
Honolulu, Hawaii 96813

via email: Dennis.SilvaJr@wsp.com
and via email: HonoluluPlanning@wsp.com

Dear Ms. Sunahara and Mr. Silva, Jr.:

SUBJECT: Draft Environmental Assessment for Hawaii Belt Road **Nanue Stream Bridge Rehabilitation** Project located at North Hilo, Island of Hawaii; TMKs: (3) 3-2-001:008 and (3) 3-2-001: ROW

Thank you for the opportunity to review and comment on the subject matter. In addition to our previous comments dated July 5 and 9, 2024, enclosed are comments from the Division of Forestry & Wildlife on the subject matter. Should you have any questions, please feel free to contact Darlene Nakamura at (808) 587-0417 or email: darlene.k.nakamura@hawaii.gov. Thank you.

Sincerely,

Russell Tsuji

Russell Y. Tsuji
Land Administrator

Enclosure
cc: Central Files

JOSH GREEN, M.D.
GOVERNOR | KE KIAʻĀINA

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIAʻĀINA

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

STATE OF HAWAIʻI | KA MOKUʻĀINA ʻO HAWAIʻI
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA ʻOIHANA KUMUWAIWAI ʻĀINA
LAND DIVISION

P.O. BOX 621
HONOLULU, HAWAII 96809

June 26, 2024

MEMORANDUM

FROM: **DLNR Agencies:**
X Div. of Aquatic Resources (Kendall.I.tucker@hawaii.gov)
___Div. of Boating & Ocean Recreation
X Engineering Division (DLNR.ENGR@hawaii.gov)
X Div. of Forestry & Wildlife (rubyrosa.t.terrago@hawaii.gov)
___Div. of State Parks
X Commission on Water Resource Management (DLNR.CWRM@hawaii.gov)
X Office of Conservation & Coastal Lands (sharleen.k.kuba@hawaii.gov)
X Land Division – Hawaii District (gordon.c.heit@hawaii.gov)
___Aha Moku Advisory Committee

TO: Russell Y. Tsuji, Land Administrator *Russell Tsuji*
SUBJECT: Draft Environmental Assessment for Hawaii Belt Road **Nanue Stream Bridge Rehabilitation** Project
LOCATION: North Hilo, Island of Hawaii; TMKs: (3) 3-2-001:008 and (3) 3-2-001: ROW
APPLICANT: State of Hawaii Department of Transportation

Transmitted for your review and comment is information on the above-referenced subject matter. The DEA was published on June 8, 2024, by the State Environmental Review Program (formerly the Office of Environmental Quality Control) at the Office of Planning and Sustainable Development in the periodic bulletin, The Environmental Notice, available at the following link:

https://files.hawaii.gov/dbedt/erp/The_Environmental_Notice/2024-06-08-TEN.pdf

Please submit any comments by **July 5, 2024**. If no response is received by this date, we will assume your agency has no comments. Should you have any questions, please contact Darlene Nakamura directly via email at darlene.k.nakamura@hawaii.gov. Thank you.

BRIEF COMMENTS:

( ) We have no objections.
( ) We have no comments.
( ) We have no additional comments.
(☑) Comments are included/attached.

Signed: *Afsheen Siddiqi*
Print Name: AFSHEEN A. SIDDIQI, Acting Wildlife Prog. Mgr.
Division: Forestry and Wildlife
Date: Jul 12, 2024

Attachments

JOSH GREEN, M.D.
GOVERNOR | KE KIAʻĀINA

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIAʻĀINA

STATE OF HAWAIʻI | KA MOKUʻĀINA ʻO HAWAIʻI
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA ʻOIHANA KUMUWAIWAI ʻĀINA

DIVISION OF FORESTRY AND WILDLIFE
1151 PUNCHBOWL STREET, ROOM 325
HONOLULU, HAWAII 96813

July 12, 2024

Log no. 4624

MEMORANDUM

TO: Russel Y. Tsuji, Administrator
Land Division

FROM: AFSHEEN A. SIDDIQI, Acting Wildlife Program Manager
Division of Forestry and Wildlife

SUBJECT: Request for Comments on the Draft Environmental Assessment for Hawaii Belt Road, Nanue Stream Bridge Rehabilitation Project, Hawai'i Island

The Department of Land and Natural Resources, Division of Forestry and Wildlife (DOFAW) has received your request for comments on the Draft Environmental Assessment (DEA) for Hawaii Belt Road and the Nanue Stream Bridge rehabilitation project (Federal-aid project NO. BR-019-2(077)), on the island of Hawai'i; TMK: (3) 3-2-001:various. The proposed action is a bridge rehabilitation project to ensure unrestricted operation of the bridge and to provide resilience to extreme natural events. The bridge currently does not meet the current American Association of State Highway and Transportation Officials' standards. The proposed work would include repairing corroded and section loss areas of the superstructure, replacing the substructure using bolted in-kind materials, addressing scour deficiencies for the bridge foundations, upgrading bridge railings, and addressing other significantly deteriorated bridge elements. The bridge construction will be completed in phases to maintain traffic flow, no bypass road is planned. Temporary work and permanent improvements will occur in the HDOT right-of-way. Nightwork is currently not anticipated.

DOFAW concurs with the measures included in the DEA intended to avoid construction and operational impacts to State-listed species including the ʻōpeʻapeʻa or Hawaiian Hoary bat (*Lasiurus cinereus semotus*), koloa maoli or Hawaiian Duck (*Anas wyvilliana*), aeʻo or Hawaiian Stilt (*Himantopus mexicanus knudseni*), ʻalae keʻokeʻo or Hawaiian Coot (*Fulica alai*), nēnē or Hawaiian Goose (*Branta sandvicensis*), and seabirds. For illustrations and guidance related to seabird-friendly light styles that also protect the dark, starry skies of Hawaiʻi please visit https://dlnr.hawaii.gov/wildlife/files/2016/03/DOC439.pdf. We also appreciate the measures outlined to minimize the movement of plant and soil material to prevent the spread of invasive species and for the use of native plant species. DOFAW

provides the following additional comments regarding the potential for the proposed work to affect listed species in the vicinity of the project area.

The endemic pueo or Hawaiian Short-Eared Owl (*Asio flammeus sandwichensis*) could potentially nest in the project area. Before any potential vegetative alteration, especially ground-based disturbance, we recommend that line transect surveys are conducted during crepuscular hours through the project area. If a pueo nest is discovered, a minimum buffer distance of 100 meters from the nest should be established until chicks are capable of flight.

The State listed ʻio or Hawaiian Hawk (*Buteo solitarius*) may occur in the project vicinity. Prior to undertaking vegetation clearing, DOFAW recommends that pre-construction surveys of the area be conducted by a qualified biologist following appropriate survey methods[1] (Gorressen et al., 2008) to ensure no Hawaiian Hawk nests are present, which may occur during the breeding season from March to September. The survey should be conducted at least 10 days prior to the start of construction. If an ʻio nest is detected, a buffer zone of 100 meters (330 feet) should be established around it where no construction shall occur until the chick or chicks have fledged, or the nest is abandoned and. DOFAW staff should be immediately notified. If adult individuals are detected in the area during construction, all activities within 30 meters (100 feet) of the bird should cease. Work may continue when the bird has left the area on its own.

The invasive Coconut Rhinoceros Beetle (CRB) or Oryctes rhinoceros is found on the islands of O'ahu, Hawai'i Island, Maui and Kaua'i. On July 1, 2022, the Hawai'i Department of Agriculture (HDOA) approved Plant Quarantine Interim Rule 22-1. This rule restricts the movement of CRB-host material within or to and from the island of Oʻahu, which is defined as the Quarantine Area. Regulated material (host material or host plants) is considered a risk for potential CRB infestation. Host material for the beetle specifically includes a) entire dead trees, b) mulch, compost, trimmings, fruit and vegetative scraps, and c) decaying stumps. CRB host plants include the live palm plants in the following genera: Washingtonia, Livistona, and Pritchardia (all commonly known as fan palms), Cocos (coconut palms), Phoenix (date palms), and Roystonea (royal palms). When such material or these specific plants are moved there is a risk of spreading CRB because they may contain CRB in any life stage. For more information regarding CRB, please visit https://dlnr.hawaii.gov/hisc/info/invasive-species-profiles/coconut-rhinoceros-beetle/.

To prevent the spread of Rapid ʻŌhiʻa Death (ROD), DOFAW requests that the information and guidance at the following website be reviewed and followed if ʻōhiʻa trees are present at the project site that will be removed, trimmed, or potentially injured: https://cms.ctahr.hawaii.edu/rod.

DOFAW is concerned about impacts to vulnerable birds from nonnative predators such as cats, rodents, and mongooses. We recommend taking action to minimize predator presence; remove cats, place bait stations for rodents and mongoose, and provide covered trash receptacles.

We appreciate your efforts to work with our office for the conservation of our native species. These comments are general guidelines and should not be considered comprehensive for this site or project. It is the responsibility of the applicant to do their own due diligence to avoid any

[1]Gorresen, P. M., R. J. Camp, J. L. Klavitter, and T. K. Pratt. 2008. Abundance, distribution and population trend of the Hawaiian Hawk: 1998-2007. Hawai`i Cooperative Studies Unit Technical Report HCSU-009. University of Hawai`i at Hilo. 53 pp., incl. 8 figures, 3 tables & 1 appendix.

negative environmental impacts. Should the scope of the project change significantly, or should it become apparent that threatened or endangered species may be impacted, please contact our staff as soon as possible. If you have any questions, please contact Kate Cullison, Protected Species Habitat Conservation Planning Coordinator, Katherine.cullison@hawaii.gov.

Sincerely,

Afsheen Siddiqi

AFSHEEN A. SIDDIQI
Acting Wildlife Program Manager

www.hawaii.gov/dlnr/

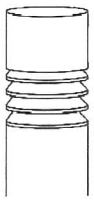
WILDLIFE LIGHTING

PROTECTING WILDLIFE THROUGH RESPONSIBLE LIGHTING PRACTICES

www.dofaw.net

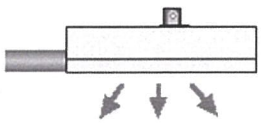
ACCEPTABLE
ONLY WITH PROPER BULB(S)

WALKWAY/PATH LIGHTING



Low Profile Bollards with Louvers

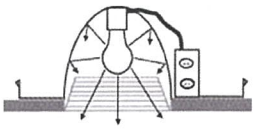
STREET/PARKING LIGHTING



Full Cutoff Low Pressure Sodium Streetlight

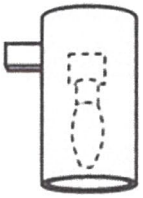
Fully Shieded NEMA Light

ARCHITECTURAL LIGHTING

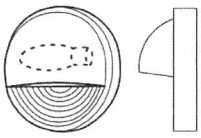


Recessed Can w/ baffles

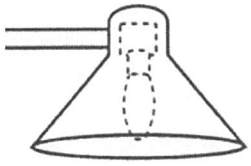
Glare Buster



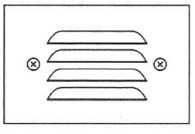
Canister Downlight



'Eyelid' Step Light



Downlight

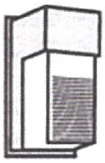


Louvered Step Light

UNACCEPTABLE

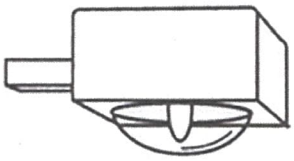
Globe Fixture

Unshielded Carriage



Wallpack

Acorn Fixture

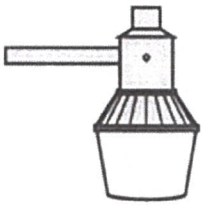


Drop-Lens/Sag-Lens w/ exposed bulb

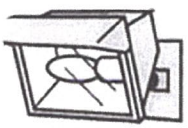
Unshielded Streetlight

Nautical Wall Sconce

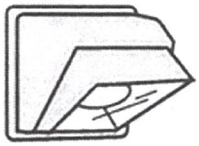
Floodlight



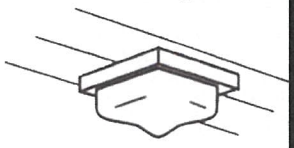
NEMA Security Light



Partially Shielded Floodlight



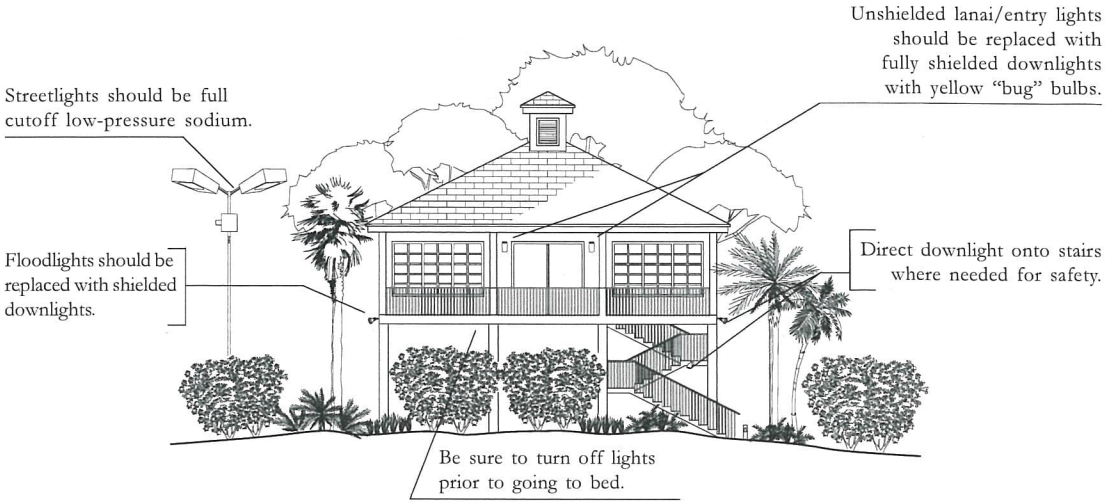
Shielded Security Light



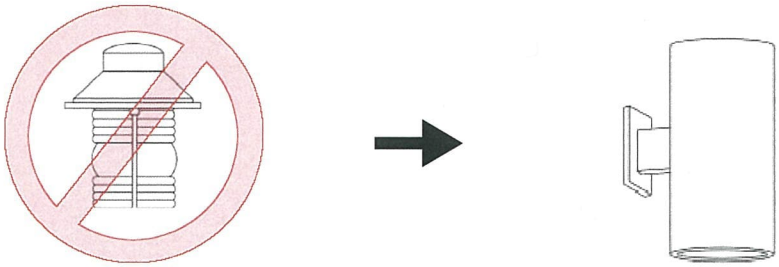
Drop-Lens Canopy Light

Bulbs for all fixtures should be of the Yellow 'Bug' Light variety incandescent or compact fluorescent.

Replacing Bad Light Fixtures



This diagram depicts a typical house with several styles of exterior light fixtures. These fixtures are inappropriate for use and should be replaced with shielded, downward directed lights. When correcting problem light fixtures, don't forget about your interior lights. Try to make it a habit to keep your window blinds closed at night, especially Sept 15-Dec15 when young Newell's shearwater and Hawaiian petrel fly to the ocean for the first time.

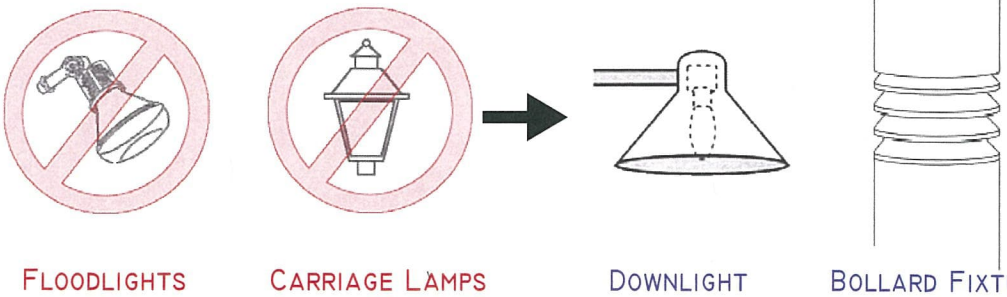


"Jelly-Jar" Lights

Lights like the one shown above waste 40% to 60% of the light produced in the form of glare. It is not uncommon to see these poorly designed $3 and $4 fixtures on homes costing $500,000 and up.

Canister Downlights

The best light fixture for wildlife is the canister downlight using a 25watt to 40watt yellow bug lamp. Excellent for human safety, minimum glare, almost no light trespass occurs into the night sky or onto your neighbor's property.



Floodlights

Carriage Lamps

These unshielded exterior lights are poorly suited for use in Hawaii. These light fixtures contribute to light trespass onto neighbor's property as well as up into the night sky.

Downlight

Bollard Fixture

Downlights and bollards are excellent fixtures for providing safety, illuminating pathways and landscaping. Specified with long wavelength "yellow" lamps, these lights actually improve our night vision by reducing glare.

Source for Good Light Fixtures: www.darksky.org/fixtures

A Typical Home in Hawaii

Replace Poorly Shielded Lights to Reduce Light Pollution

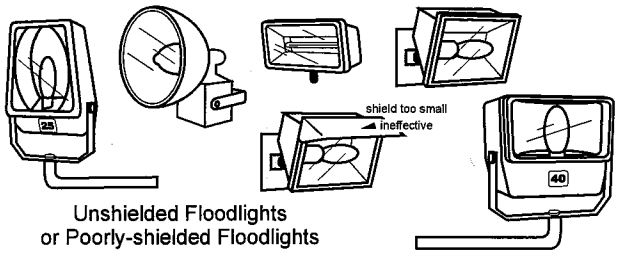
Replace Floodlights and Unshielded Fixtures with Walkway and Path Lighting

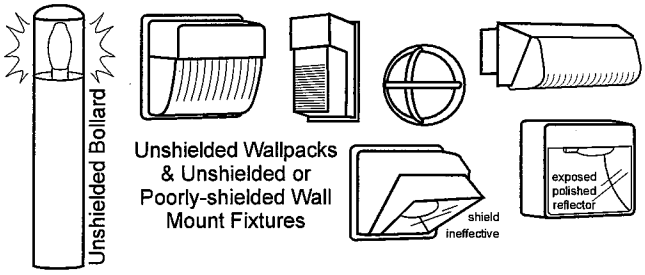
SEABIRD FRIENDLY LIGHTING SOLUTIONS

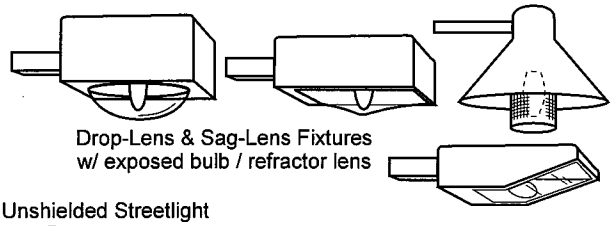
Help eliminate seabird light attraction. Select the best fixture for your application using this guide. Avoid uplighting, always shield floodlights, and aim downlights carefully to avoid light trespass. For more information go to www.kauai-seabirdhcp.info.

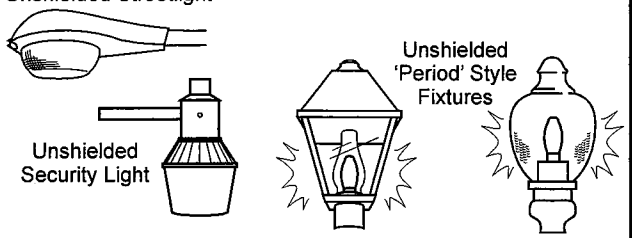
Unacceptable / Discouraged

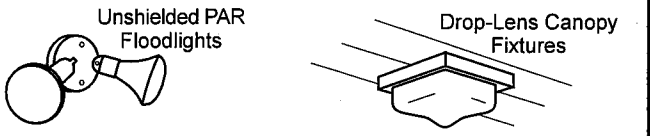
Fixtures that produce glare and light trespass



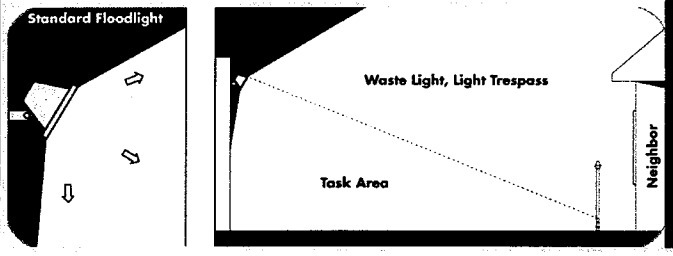






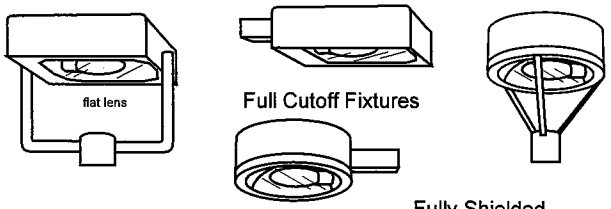


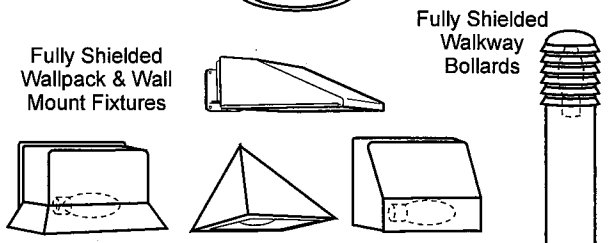
Unshielded floodlight that is angled incorrectly

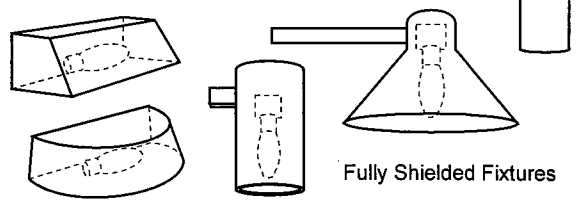


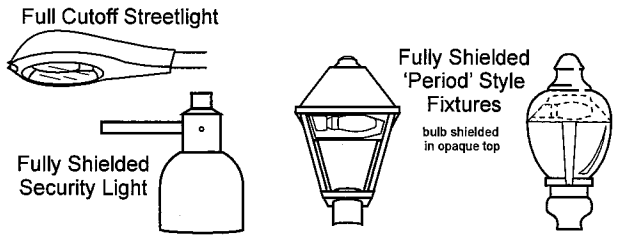
Acceptable

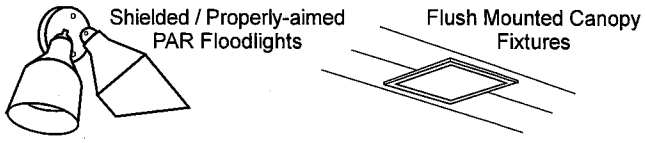
Fixtures that shield the light source to minimize glare and light trespass and to facilitate better vision at night



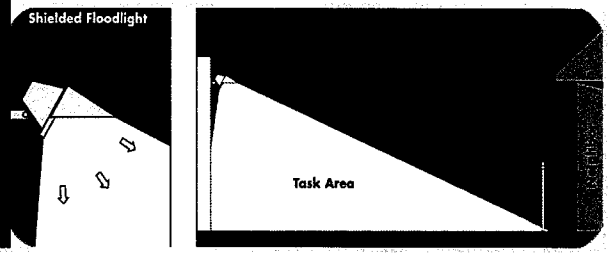








Shielded floodlight that is angled correctly



Illustrations from www.darksky.org and www.darkskysociety.org

JOSH GREEN, M.D.
GOVERNOR
KE KIA'ĀINA

DESIGN BRANCH, ROOM 688A
BRIDGE DESIGN SECTION, ROOM 611
CADASTRAL DESIGN SECTION, ROOM 600
ENVIRONMENTAL DESIGN SECTION, ROOM 688A
HIGHWAY DESIGN SECTION, ROOM 636
HYDRAULIC DESIGN SECTION, ROOM 636
TECHNICAL DESIGN SECTION, ROOM 688

EDWIN H. SNIFFEN
DIRECTOR
KA LUNA HO'OKELE

Deputy Directors
Nā Hope Luna Ho'okele
DREANALEE K. KALILI
TAMMY L. LEE
CURT T. OTAGURO
ROBIN K. SHISHIDO

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF TRANSPORTATION | KA 'OIHANA ALAKAU
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

IN REPLY REFER TO:

HWY-DD 2.20396

August 1, 2024

TO: DAWN N. S. CHANG, CHAIRPERSON
DEPARTMENT OF LAND AND NATURAL RESOURCES

ATTENTION: AFSHEEN A. SIDDIQI, ACTING WILDLIFE PROGRAM MANAGER
DIVISION OF FORESTRY AND WILDLIFE

FROM: HENRY KENNEDY Henry Kennedy
ENGINEERING PROGRAM MANAGER
DESIGN BRANCH

SUBJECT: RESPONSE TO COMMENT RECEIVED – LOG NO. 4624
PRE-CONSULTATION FOR
DRAFT ENVIRONMENTAL ASSESSMENT (EA)
HAWAII BELT ROAD, NANUE STREAM BRIDGE REHABILITATION PROJECT, DISTRICT OF NORTH HILO, ISLAND OF HAWAII
FEDERAL-AID PROJECT NO. BR-019-2(077)
TAX MAP KEY NO. (3) 3-2-001

The State of Hawaii Department of Transportation (HDOT) is in receipt of your comments to our Pre-Consultation Letter for Draft EA for the Nanue Stream Bridge Rehabilitation project, letter dated July 12, 2024, Log No. 4624. Please see below for our responses to your comments received.

Comment Received:
1. Division of Forestry and Wildlife (DOFAW) concurs with the measures included in the Draft EA intended to avoid construction and operational impacts to State-listed species including the ʻōpeʻapeʻa or Hawaiian Hoary bat (Lasiurus cinereus semotus), koloa maoli or Hawaiian Duck (Anas wyvilliana), aeʻo or Hawaiian Stilt (Himantopus mexicanus knudseni), ʻalae keʻokeʻo or Hawaiian Coot (Fulica alai), nēnē or Hawaiian Goose (Branta sandvicensis), and seabirds.

Response: The project team thanks your office for your review and concurrence with the measures included in the Draft EA to avoid construction and operational impacts to State-listed species and seabirds.

Comment Received:
2. For illustrations and guidance related to seabird-friendly light styles that also protect the dark, starry skies of Hawai'i please visit https://dlnr.hawaii.gov/wildlife/files/2016/03/DOC439.pdf.

Response: The project team has downloaded the guidance items provided as links in your office's letter and will ensure that the Contractor is aware of these guidance measures.

Comment Received:
3. We also appreciate the measures outlined to minimize the movement of plant and soil material to prevent the spread of invasive species and for the use of native plant species.

Response: The project team thanks you for your acknowledgement of and comment regarding the measures to minimize the movement of plant and soil material to prevent the spread of invasive species and for the use of native plant species.

Comment Received:
4. DOFAW provides the following additional comments regarding the potential for the proposed work to affect listed species in the vicinity of the project area.

The endemic pueo or Hawaiian Short-Eared Owl (Asio flammeus sandwichensis) could potentially nest in the project area. Before any potential vegetative alteration, especially ground-based disturbance, we recommend that line transect surveys are conducted during crepuscular hours through the project area. If a pueo nest is discovered, a minimum buffer distance of 100 meters from the nest should be established until chicks are capable of flight.

Response: The project team will ensure that a line transect survey will be conducted during crepuscular (i.e., twilight) hours through the project area. If a pueo nest is discovered, a minimum buffer distance of 100 meters from the nest should be established until chicks are capable of flight.

Comment Received:
5. The State listed 'io or Hawaiian Hawk (Buteo solitarius) may occur in the project vicinity. Prior to undertaking vegetation clearing, DOFAW recommends that pre-construction surveys of the area be conducted by a qualified biologist following appropriate survey methods1 (Gorressen et al., 2008) to ensure no Hawaiian Hawk nests are present, which may occur during the breeding season from March to September. The survey should be conducted at least 10 days prior to the start of construction. If an 'io nest is detected, a buffer zone of 100 meters (330 feet) should be established around it where no construction shall occur until the chick or chicks have fledged, or the nest is abandoned and. DOFAW staff should be immediately

notified. If adult individuals are detected in the area during construction, all activities done within 30 meters (100 feet) of the bird should cease. Work may continue when the bird has left the area on its own.

Response: The project team will ensure that a pre-construction survey of the area be conducted by a qualified biologist following appropriate survey methods and all direction as provided in your comment here.

Comment Received:
6. The invasive Coconut Rhinoceros Beetle (CRB) or Oryctes rhinoceros is found on the islands of O'ahu, Hawai'i Island, Maui and Kaua'i. On July 1, 2022, the Hawai'i Department of Agriculture (HDOA) approved Plant Quarantine Interim Rule 22-1. This rule restricts the movement of CRB-host material within or to and from the island of O'ahu, which is defined as the Quarantine Area. Regulated material (host material or host plants) is considered a risk for potential CRB infestation. Host material for the beetle specifically includes a) entire dead trees, b) mulch, compost, trimmings, fruit and vegetative scraps, and c) decaying stumps. CRB-host plants include the live palm plants in the following genera: Washingtonia, Livistona, and Pritchardia (all commonly known as fan palms), Cocos (coconut palms), Phoenix (date palms), and Roystonea (royal palms). When such material or these specific plants are moved there is a risk of spreading CRB because they may contain CRB in any life stage. For more information regarding CRB, please visit https://dlnr.hawaii.gov/hisc/info/invasive-species-profiles/coconut-rhinoceros-beetle/.

Response: The project team appreciates your office's notes and directions regarding the CRB and appropriate restrictions and will ensure these are followed as applicable and appropriate.

Comment Received:
7. To prevent the spread of Rapid 'Ōhi'a Death (ROD), DOFAW requests that the information and guidance at the following website be reviewed and followed if 'ōhi'a trees are present at the project site that will be removed, trimmed, or potentially injured: https://cms.ctahr.hawaii.edu/rod.

Response: The project team appreciates your office's guidance regarding the prevention of the spread of ROD and will ensure these are followed as applicable and appropriate.

Comment Received:
8. DOFAW is concerned about impacts to vulnerable birds from nonnative predators such as cats, rodents, and mongooses. We recommend taking action to minimize predator presence; remove cats, place bait stations for rodents and mongoose, and provide covered trash receptacles.

Response: The project team appreciates your office's guidance regarding the potential impacts to vulnerable birds.

The project team will provide covered trash receptables.

The project team believes that the guidance provided regarding the removal of cats and placing bait stations for rodents and mongoose extends beyond the scope of this project and the contractor(s).

The project team will ensure that the project area is kept clean and organized.

Comment Received:
9. We appreciate your efforts to work with our office for the conservation of our native species. These comments are general guidelines and should not be considered comprehensive for this site or project. It is the responsibility of the applicant to do their own due diligence to avoid any negative environmental impacts.

Response: The project team understands that these guidance measures are not to be considered comprehensive and will work with the selected Contractor to ensure that measures are implemented as needed to address the potential impacts identified by your Office.

Comment Received:
10. Should the scope of the project change significantly, or should it become apparent that threatened or endangered species may be impacted, please contact our staff as soon as possible. If you have any questions, please contact Kate Cullison, Protected Species Habitat Conservation Planning Coordinator, Katherine.cullison@hawaii.gov.

Response: If there is a significant change to the scope of the project or it becomes apparent that threatened or endangered species may be impacted, the project team will contact your staff as soon as possible.

The project team appreciates you for the direct contact information provided for your office.

If you have any additional questions or concerns during project construction, please contact our HDOT Project Manager, Ms. Amy Sunahara, via email at amy.my.sunahara@hawaii.gov or via mail U.S. Postal Service to State of Hawaii, Department of Transportation, Design Branch, Highway Design Section, at 601 Kamokila Boulevard, Suite 609, Kapolei, Hawaii, 96707, or by phone at (808) 692-8431.

Enclosure

APPENDIX B
HAWAII BELT ROAD,
NANUE STREAM BRIDGE STRUCTURAL PLANS

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		

INDEX TO STRUCTURAL DRAWINGS

SHEET NO.	DESCRIPTION
S0.1	INDEX TO STRUCTURAL DRAWINGS
S0.2	INDEX TO STRUCTURAL DRAWINGS
S0.3	STRUCTURAL GENERAL NOTES
S0.4	STRUCTURAL GENERAL NOTES
S0.5	STRUCTURAL GENERAL NOTES
S0.6	STRUCTURAL GENERAL NOTES
S0.7	SYMBOLS AND ABBREVIATIONS
SA1.1	LAYOUT PLAN
SA1.2	FOUNDATION PLAN
SA2.1	BRIDGE ELEVATION
SA3.1	TYPICAL TRANSVERSE SECTION
SA3.2	TRANSVERSE SECTION AT BENTS
SA3.3	TRANSVERSE SECTION AT BENTS
SA3.4	TRANSVERSE SECTION AT ABUTMENTS
SA4.1	MEMBER ID LEGEND AT BENTS
SA4.2	BENT NO. 1 MEMBER ELEVATIONS
SA4.3	BENT NOS. 2 AND 3 MEMBER ELEVATIONS
SA4.4	BENT NOS. 2 AND 3 MEMBER ELEVATIONS
SA4.5	BENT NOS. 4 AND 5 MEMBER ELEVATIONS
SA4.6	BENT NOS. 4 AND 5 MEMBER ELEVATIONS
SA4.7	BENT NOS. 6 AND 7 MEMBER ELEVATIONS
SA4.8	BENT NOS. 6 AND 7 MEMBER ELEVATIONS
SA4.9	BENT NOS. 8 AND 9 MEMBER ELEVATIONS
SA4.10	CONNECTION ID LEGEND AT BENTS
SA4.11	BENT NO. 1 CONNECTION ELEVATIONS
SA4.12	BENT NOS. 2 AND 3 CONNECTION ELEVATIONS
SA4.13	BENT NOS. 2 AND 3 CONNECTION ELEVATIONS
SA4.14	BENT NOS. 4 AND 5 CONNECTION ELEVATIONS
SA4.15	BENT NOS. 4 AND 5 CONNECTION ELEVATIONS
SA4.16	BENT NOS. 6 AND 7 CONNECTION ELEVATIONS
SA4.17	BENT NOS. 6 AND 7 CONNECTION ELEVATIONS
SA4.18	BENT NOS. 8 AND 9 CONNECTION ELEVATIONS

SHEET NO.	DESCRIPTION
SA5.1	UPPER COLUMN ELEVATIONS
SA5.2	TYPICAL COLUMN ELEVATIONS
SA5.3	LOWER COLUMN ELEVATIONS
SA5.4	COLUMN SECTIONS AND DETAILS
SA5.5	ALTERNATIVE COLUMN SECTIONS AND DETAILS
SA5.6	DIAGONAL BRACE PLAN, ELEVATION, AND SECTION
SA5.7	DIAGONAL BRACE SCHEDULE
SA5.8	DIAGONAL BRACE SCHEDULE
SA5.9	DIAGONAL BRACE PLAN, ELEVATION, AND SECTION
SA5.10	DIAGONAL BRACE SCHEDULE
SA5.11	HORIZONTAL BRACE PLAN, ELEVATION, AND SECTION
SA5.12	HORIZONTAL BRACE SCHEDULE
SA5.13	HORIZONTAL BRACE PLAN, ELEVATION, AND SECTION
SA5.14	HORIZONTAL BRACE SCHEDULE
SA5.15	DIAGONAL BRACE PLAN, ELEVATION, AND SECTION
SA5.16	DIAGONAL BRACE SCHEDULE
SA5.17	DIAGONAL BRACE SCHEDULE
SA5.18	HORIZONTAL BRACE PLAN, ELEVATION, AND SECTION
SA5.19	HORIZONTAL BRACE SCHEDULE
SA5.20	DIAGONAL BRACE PLAN, ELEVATION, AND SECTION
SA5.21	DIAGONAL BRACE SCHEDULE
SA5.22	DIAGONAL BRACE SCHEDULE
SA6.1	CONNECTION DETAILS
SA6.2	CONNECTION DETAILS
SA6.3	CONNECTION DETAILS
SA6.4	CONNECTION DETAILS
SA6.5	CONNECTION DETAILS
SA6.6	CONNECTION DETAILS
SA6.7	CONNECTION REFERENCE SCHEDULE
SA6.8	CONNECTION REFERENCE SCHEDULE

SHEET NO.	DESCRIPTION
SA7.1	GIRDER FRAMING PLAN - SPANS 1 AND 2
SA7.2	GIRDER FRAMING PLAN - SPANS 3 AND 4
SA7.3	GIRDER FRAMING PLAN - SPANS 5 AND 6
SA7.4	GIRDER FRAMING PLAN - SPANS 7 AND 8
SA7.5	GIRDER FRAMING PLAN - SPANS 9 AND 10
SA7.6	GIRDER 1 DOWNSTREAM ELEVATION
SA7.7	GIRDER 1 DOWNSTREAM ELEVATION
SA7.8	GIRDER 1 DOWNSTREAM ELEVATION
SA7.9	GIRDER 2 DOWNSTREAM ELEVATION
SA7.10	GIRDER 2 DOWNSTREAM ELEVATION
SA7.11	GIRDER 2 DOWNSTREAM ELEVATION
SA7.12	GIRDER 3 DOWNSTREAM ELEVATION
SA7.13	GIRDER 3 DOWNSTREAM ELEVATION
SA7.14	GIRDER 3 DOWNSTREAM ELEVATION
SA7.15	GIRDER 4 DOWNSTREAM ELEVATION
SA7.16	GIRDER 4 DOWNSTREAM ELEVATION
SA7.17	GIRDER 4 DOWNSTREAM ELEVATION
SA8.1	GIRDER BRACING DEMOLITION SECTIONS
SA8.2	GIRDER BRACING DEMOLITION SECTIONS
SA8.3	GIRDER BRACING DEMOLITION SECTIONS
SA8.4	GIRDER BRACING DEMOLITION SECTIONS
SA8.5	GIRDER BRACING SECTIONS
SA8.6	GIRDER BRACING SECTIONS
SA8.7	GIRDER BRACING DETAILS
SA8.8	GIRDER BRACING DETAILS

ORIGINAL PLAN
NOTE BOOK
No.
SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE

DRAWING NAME: Z:\OO ONGOING\OO JF PROJECTS\22-001.12-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\NSR-S0001 INDEX.DWG PLOT TIME: 03-29-24, 7:51 PM)

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

INDEX TO STRUCTURAL DRAWINGS

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: None Date: Mar. 2024

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STRUCTURAL GENERAL NOTES

1. Standard Specifications:

   A. Hawaii Department of Transportation (HDOT), "Hawaii Standard Specifications for Road and Bridge Construction", 2005, together with Special Provisions prepared for this contract.

2. Design Specifications:

   A. American Association of State Highway and Transportation Officials (AASHTO) 2020 "LRFD Bridge Design Specifications", (9th Edition) and its subsequent interim supplements and as amended by the HDOT Highways Division.

   B. HDOT Document dated August 8, 2014 with subject title "Design Criteria for Bridges and Structures" and HDOT memorandum dated January 8, 2018 with subject title "Changes to Design Criteria for Bridges and Structures".

3. General:

   A. The Contractor is required to perform a thorough survey of existing concrete pedestal foundation limits and elevations including the soffit elevations of each girder line at each abutment and bent seat location. An electronic copy of this information shall be submitted to the Engineer for review no later than 45 days prior to initial preparation of the structural steel shop drawings. The Contractor shall anticipate having to perform vegetation removal to obtain survey information.

   B. The SA series constitutes the contract drawings related to the permanent rehabilitation of Nanue Stream Bridge. The SB series constitutes the suggested erection drawings related to how the steel members of the bridge bents will be replaced.

4. Design Loads:

   A. Dead Load: A concrete weight of 160 lbs/cf and steel weight of 490 lbs/cf has been provided for in the design.

   B. Live Load: AASHTO HL-93 Vehicular Live Loading

   C. Seismic Loads:

   Design Earthquake = 7% Probability of Exceedance in 75 years (1,000-Year Return Period)

PGA = 0.471 g	F_{PGA} = 1.00	As = 0.471 g
Ss = 0.913 g	Fa = 1.035	S_{DS} = 0.945 g
S_1 = 0.353 g	Fv = 1.447	S_{D1} = 0.511 g
Site Class = C	Seismic Zone = 4	

   D. Wind Loads:

V = 130 mph	K_z = 1.46
G = 1.00	C_D = 1.6

5. Structural Steel:

   A. All steel as shown on the SA series "Contract Drawings" shall conform to the following requirements:

(1) Channels	ASTM A709,	fy = 36 ksi
(2) Angles	ASTM A709,	fy = 36 ksi
(3) Batten Plates and Lacing Bars	ASTM A709,	fy = 36 ksi
(4) Cross Frames, Gusset Plates, and Girder Stiffeners	ASTM A709,	fy = 36 ksi
(5) Column Seats, Webs Flanges, Base Plates, Splice Plates, and Continuity Plates	ASTM A709, (AASHTO M270)	fy = 50 ksi

   B. All steel as shown on the SB series "Suggested Erection Drawings" shall conform to the following requirements:

(1) Wide Flange Beams	ASTM A992	fy = 50 ksi
(2) HSS Tubes	ASTM A500B	fy = 46 ksi
(3) Channels	ASTM A36	fy = 36 ksi
(4) Angles	ASTM A36	fy = 36 ksi
(5) Plates and All Others	ASTM A36	fy = 36 ksi

   All item listed above may be dual certified with ASTM A709 at Contractor's option.

   C. All new steel structures shall be ASTM A123 hot-dip zinc galvanized after all fabrication is complete. Protect elements against hydrogen embrittlement in conformance with ASTM A143. Post-galvanizing quenching/passivation shall not be utilized for steel going directly to paint. Coordinate with coating Contractor.

   D. Vent holes shall be provided in members for hot-dip zinc galvanized operation. Size and location of holes shall be determined by galvanizing contractor, unless otherwise shown on the drawings. Vent hole sizes and locations shall be included on the structural steel shop drawings. All holes, other than base plates, and where noted shall be filled with zinc plugs following galvanizing operation.

   E. All damage done to galvanized steel surfaces shall be repaired in accordance with ASTM A780 using the zinc solder method. Zinc rich paint shall not be an acceptable repair procedure

5. Structural Steel (Cont.)

   F. Plates for columns, cover plates, base plates, angles, and anchor bolts shall meet the longitudinal Charpy V-Notch requirements for a non-fracture critical member in Zone 1.

   G. Steel plates for columns shall be cut and fabricated so that the primary direction of rolling is parallel to the column length. For splice plates, the direction shall be parallel to the direction of the splice. For base plates, the direction shall be parallel to the centerline of the bent.

   H. All holes in steel members shall be be sub-punched and reamed or full size drilled.

   I. All holes for bolted connections shall be standard size unless otherwise shown on the contract drawings.

   J. Bolts which connect steel to steel shall be high-strength bolts conforming to ASTM F3125, Grade A325, Type 1. Bolts shall be ordered such that threads are excluded from the shear plane. Bolts shall be snug tightened unless otherwise shown on plans. All pretensioned/slip-critical bolts shall utilize Direct Tension Indicating (DTI) washers. Bolts shall be inspected following installation.

   K. Bolt Assemblies shall be supplied with bolt, nut, and washer provided by the same supplier.

   L. Steel-to-steel bolted joints designated as pretensioned shall be installed with a Direct Tension Indicating (DTI) washer to ensure proper bolt tension.

   M. Steel-to-steel bolted joints designated as slip-critical shall be pretensioned bolts with additional paint masking requirements between the faying surfaces. Provide paint masking details as shown in the contract documents.

   N. All other bolted joints shall be classified as snug-tight connections.

   O. Installation of all bolted assemblies shall be in accordance with the latest RCSC Specifications for Structural Joints Using High-Strength Bolts.

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5. Structural Steel (Cont.)

O. Anchor bolts which connect steel to concrete shall be high-strength threaded rods conforming to ASTM F1554, Grade 105 and shall be straight rod with anchor plate details at the end as shown in the contract drawings. Anchor bolts shall be pretensioned by the turn of the nut method. See anchor bolt pretensioning schedule.

P. All nuts shall be ASTM A563 DH heavy-hex and all hardened washers shall be ASTM F436. All hardened washers shall have a hardness of Rc 38-45. DTI Washer shall be ASTM F959 and shall be installed under either the bolt head or a hardened washer.

Q. All hardware, including bolts, anchor bolts, nuts, hardened washers, and DTI washers shall be ASTM A153 hot-dip zinc galvanized. Nut threads may be chased following the galvanizing process.

R. All welding shall conform to the latest ANSI/AASHTO/AWS D1.5 Bridge Welding Code. Welding shall be performed in accordance with a Welding Procedure Specification (WPS) and Procedure Qualification Record (PQR) as required in AWS D1.5 and approved by the Engineer. The WPS variables shall be within the parameters established by the filler-metal manufacturer.

S. All welding, whether shop or field, shall be done by certified welders in conformance with the Bridge Welding Code AWS D1.5 of the American Welding Society.

T. Welding shall be performed in such a manner so as to minimize warping and distortion of steel pieces being joined. Excessive concentrated heat being applied to steel pieces shall be avoided. See Standard Specifications and Special Provision for pre-heat and other requirements.

U. All Welding Procedure Specifications (WPS) and supporting Procedure Qualification Records (PQR) shall be submitted to the Engineer for review and approval prior to any welding being performed.

V. All weld sizes are shown in inches.

W. All welds shall utilize E70XX Electrodes where Shielded Metal Arc Welding is utilized. Where other welding processes are used, filler metal shall have matching strength to base metal.

X. Field welding shall not be permitted unless explicitly shown on the contract drawings.

Y. See Standard Specifications and Special Provisions Section 501 - STEEL STRUCTURES for additional requirements.

6. Concrete:

A. All concrete strengths shall be as noted below:

Item No.	Structural Parts	Compressive Strength, f'c (28 Days)	Maximum Water/ Cementitious (W/C)	Maximum Cementitious Material Content (lbs./cy)	Included Admixtures (See Notes Below in This Section)
(1)	Foundation Pedestals, and Grade Beams	6,000 psi	0.40	670	C, D, E
(2)	Underwater Conc.	(See Special Provisions Section 615)			

B. The use of calcium chloride in any concrete is prohibited.

C. A migrating amine carboxylate water-based corrosion inhibiting admixture such as Cortec MCI 2005 NS or approved equal shall be added to the concrete mix. The dosage requirements shall be 24 fluid ounces per cubic yard of concrete.

D. An alkali-resistant glass macro fiber shall be added to the concrete mix. The fiber shall have an aspect ratio of 67 and a length of 1 1/2". The dosage shall be 13 lbs per cubic yard of concrete.

E. A shrinkage reducing admixture such as Masterlife SRA 35 or approved equal shall be added to the concrete mix. The dosage requirement shall be 128 fluid ounces per cubic yard of concrete or as approved by the Manufacturer.

F. Contractor is not limited to only adding admixtures listed on these notes. Other admixtures may be added upon approval of the Engineer.

G. If formwork is removed/stripped exposing concrete within 7 days of placement then concrete shall be cured. All exposed concrete shall be cured using Sinak Lithium Cure 1000 or approved equal with application rates as per Manufacturer's recommendations.

H. The Contractor has the option to design the concrete for all items to be pumpable and flowable. All concrete shall be designed for minimum segregation and separation.

7. Reinforcement:

A. Reinforcing steel shall be ASTM A 615, Grade 60 deformed bars unless otherwise noted. ASTM A 706, Grade 60 may be used at Contractor's option.

B. Reinforcing bars shall be detailed in accordance with the latest edition of the American Concrete Institute (ACI) Detailing Manual, unless otherwise noted.

C. Reinforcing bars shall be placed and installed in accordance with the CRSI Manual of Standard Practice and CRSI Placing Reinforcing Bars, unless otherwise noted.

7. Reinforcement (Cont.):

D. The covering measured from the surface of the concrete to the face of any reinforcing bars shall be as follows, except as otherwise shown:

(1) Foundation Pedestals and Grade Beams = 2"

(2) All others unless otherwise noted = 2"

E. Minimum lap splice length for steel reinforcing shall be 40 bar diameters or 2'-0", whichever is greater, for #8 bars or smaller. Minimum lap splice length for #9 bars or larger shall be 50 bar diameters. Increase lap length by multiplying the minimum lap splice length by 1.3 for bars having more than 12" of fresh concrete below bars.

F. Unless otherwise noted, reinforcing splices shall be staggered. Minimum distance between staggered lap splice shall be equal to the length required for the lap splice. Number of bars spliced at sections normal to axis of member shall not exceed 50 percent of the total main reinforcing in the member.

G. Minimum clear spacing between parallel bars shall be 1 1/2 times the diameter of bars (for non bundled bars). In no case shall the clear distance between the bars be less than 1 1/2 times the maximum size of the coarse aggregate or 1 1/2".

H. All dimensions relating to reinforcing bars are to centers of bars unless otherwise noted.

I. Reinforcing bars shall be securely tied at all intersections and lap splices except where the spacing of intersections is less than 1 foot in each direction, in which case alternate intersections shall be tied.

J. Dissimilar metals in contact shall be avoided where possible. If unavoidable, wrap contact surface with several layers of a dielectric tape such as Teflon or polypropylene. Any type of reinforcing steel in contact with stainless steel shall be considered a dissimilar metal contact.

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8. Materials:

A. A penetrating sealer shall be used to fill cracks on the existing bridge and shall rapidly cure to allow return to traffic within 3 hours. See Special Provisions Section 683 - PENETRATING SEALER FOR BRIDGE DECKS.

B. Hybrid Polymer Concrete (HPC) shall utilize a rapid setting material capable of achieving a compressive strength of 1,000 psi in 3 hours. See Special Provisions Section 678 - HYBRID POLYMER CONCRETE (HPC).

C. Epoxy grout shall be a high performance, three component, pre-packaged material capable of developing a minimum compressive strength of 9,000 psi in 1 day and 15,000 psi in 7 days in accordance with ASTM C579 at 75° F. Compressive Modulus of Elasticity shall be a minimum 2,100,00 psi in accordance with ASTM C579. Material shall be FasTrac CE815 Epoxy Grout or approved equal.

D. Defective concrete repair mortar shall be a pre-blended, pre-bagged, shrinkage compensated, polymer-modified, fiber-reinforced material with an internal corrosion inhibitor capable of developing 4,500 psi in 24-hrs and 9,000 psi in 28-days such as FasTrac V/O Mortar or approved equal.

E. Injectable Epoxy Resin for Crack Repairs shall conform to ASTM C 881, Type IV, Grade 1 and AASHTO M-235. Epoxy Resin shall be able to achieve a 7-day tensile strength of 8,900 psi in accordance with ASTM D-638 and a 2-day bond strength of 2,800 psi in accordance with ASTM C-882. Material shall be Sika Sikadur 35, Hi-Mod LV or approved equal.

F. For compression joint seal requirements, see Special Provisions Section 515 – DECK EXPANSION JOINTS.

G. Elastomeric Bearing Assemblies shall be a manufactured product consisting of a sole plate and masonry plate bonded to a steel reinforced neoprene bearing pad. The steel assembly shall conform to ASTM A709 Grade 50 and shall be hot-dip zinc galvanized in accordance with ASTM A 153. The neoprene bearing pad shall have a Shore A durometer hardness of 60 in accordance with ASTM D 412, a minimum tensile strength of 2,500 psi in accordance with ASTM D 412, and a minimum shear modulus of 155 psi in accordance with ASTM D 4014. The neoprene bearing pad shall come factory vulcanized to both the sole plate and masonry plate. Adhesive bonding will not be allowed. The bearing assembly shall be supplied complete with all drilled/tapped holes, welds, and mounting hardware as well as painted in accordance with the requirements of Special Provisions Section 698 – PREPARATION AND COATING OF GALVANIZED BRIDGE COMPONENETS. Submit complete shop drawings for every bearing type and assembly for review and approval.

H. Inspection grating shall be a 2-inch deep extruded isophthalic polyester resin product with a bonded and baked on quartz grit anti-skid surface.

9. Coating/Painting:

A. Existing bridge steel members to remain, new non-galvanized steel members (where noted), and ancillary components (as specified) shall receive an abrasive blasted surface preparation in accordance with SSPC-SP10 - Near White Metal. Immediately following blasting, steel surfaces shall be coated with an organic zinc primer, epoxy intermediate, and highly weatherable fluoropolymer top coat. See Special Provisions Section 697 - CLEAN AND PAINT EXISTING BRIDGE STEEL.

B. Field painting shall be conducted by an approved SSPC-QP-1 accredited contractor.

C. Unless as otherwise noted, new steel shall be hot-dip zinc galvanized in accordance with ASTM A 123 prior to being coated with an epoxy intermediate and a highly weatherable fluoropolymer top coat. See Special Provisions Section 698 - PREPARATION AND COATING OF GALVANIZED BRIDGE COMPONENTS.

D. New galvanized steel shall be coated in an approved SSPC-QP-3 accredited shop. Submit written coating procedures to the Engineer for review and approval prior to starting work. Only touch-up coating of new galvanized steel shall be allowed at the construction site.

E. Stripe coat all edges, crevices, nuts, bolts, weld seams and tight metal-to-metal joints.

F. Submit written field and shop coating procedures to the Engineer for review and approval prior to starting work.

G. Top coat color shall be according to Federal Standard 595B "Federal Standard Colors". The formulated color of the top coat shall conform to Federal Standard Color (Determined by HDOT), possessing a minimum 80% gloss finish.

H. The Contractor shall inform the Galvanizer in writing that all structural steel elements will be painted and that no water quenching or use of chromate conversion coating shall be utilized as these processes interfere with paint adhesion and surface preparation.

I. Bolted joints designated as "slip-critical" shall have members masked for paint as designated in the contract documents. Paint masking details shall be shown on the shop drawings and provided to the paint contractor.

J. All bolt assemblies shall be touch-up field painted with the specified paint system after assembly.

K. The Contractor shall incorporate SSPC Guide 6 in the design of the containment system and shall meet the requirements of a Class 2A containment.

10. Construction Notes:

A. Install protective devices to prevent all construction debris and fugitive dust from entering the stream and banks.

B. The Contractor shall be entirely responsible for the stability of the bridge and integrity of the members during construction.

C. The Contractor shall field verify all existing site conditions, dimensions, and member sizes prior to fabrication of any bridge elements. The Engineer shall be notified immediately regarding any change of conditions or discrepancies between the plans and field investigatin.

D. The Contractor shall be solely responsible for the protection of adjacent properties, utilities and existing and new structures from damage due to construction. Repairing any damage shall be at the Contractor's own expense, to the satisfaction of the Engineer.

E. The Contractor shall be aware of the overhead power lines on the mauka side of the bridge running parallel with the roadway.

F. The Contractor shall coordinate all traffic control and lane closure requirements with the State DOT Highways Division. The Contractor shall notify the State a minimum of 11 days prior to any requests for traffic control or lane closures. Lane closures may be scheduled on weekdays from 8:30 AM to 3:00 PM.

G. The Contractor shall be aware that some tree trimming work may be required to perform the necessary bridge work. Cost for tree trimming work shall be considered incidental to the bridge work.

H. The Contractor shall be responsible for the cost of all high strength bolting and welding inspection, including any non-destructive testing. Cost shall be incidental to the associated work. Reports shall be submitted to the Engineer for review and approval. All deficient work shall be corrected with no increase in cost to the State.

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10. Construction Notes (Cont):

I. Except as otherwise noted, all vertical dimensions are measured plumb.

J. For concrete finish see Standard Specifications.

K. Construction joints may be relocated or additional ones added subject to the acceptance of the Engineer.

L. Unless otherwise noted, all exposed concrete edges shall be chamfered 3/4" x 3/4".

M. Prior to performing any drilling or coring operations into existing reinforced concrete, the Contractor shall verify the location of all existing reinforcing steel using an appropriate ground penetrating radar rebar scanner. Inform the Engineer of any conflicts, for review, if the planned drilled/cored hole cannot be moved.

N. Epoxy anchoring material shall be an injectable, two-component adhesive that has a current Evaluation Service Report from ICC-ES (International Code Council Evaluation Service Inc.) and has a characteristic bond strength, $\tau_{k,uncr}$, of at least 1,600 psi for a #5 reinforcing bar at Temperature Range A.

O. All individuals performing drilled reinforcing dowel work shall hold a current ACI/CRSI Adhesive Anchor Installer certification.

P. Drilling procedures, equipment, material and certifications shall be submitted to the Engineer for approval.

Q. All drilled holes shall have dowels installed within same work shift or shall otherwise be completely filled with a patching and repair mortar.

R. Contractor shall follow all epoxy anchoring adhesive Manufacturer's Printed Installation Instructions (MPII).

S. Location of drilled holes in existing concrete for reinforcing steel dowels as shown on the plans are approximate. Prior to placing holes in concrete, the Contractor shall locate all reinforcing steel, anchor bolts, thru bolts holes, etc. and adjust the location of the drilled holes to clear all of them. Final hole locations are subject to the acceptance of the Engineer.

T. Epoxy shall fully cure prior to pouring concrete around reinforcing steel dowels.

U. All holes shall be hammer drilled using a hollow bit connected to a vacuum system in accordance with a current Evaluation Service Report from ICC-ES.

V. When only portions of concrete are to be demolished the intersections between the demolished concrete and the concrete that are to remain shall have a 1-inch deep sawcut around the entire perimeter of the demolished area.

10. Construction Notes (Cont):

W. All existing concrete substrate surfaces which new concrete is poured against shall be roughened to a minimum 1/4" amplitude and Saturated Surface Dry (SSD) prior to the placement of new concrete.

X. X. All existing reinforcing shall remain in place unless otherwise noted. Any existing reinforcing damaged during concrete removal that was not permitted to be removed shall be repaired, with approval from the Engineer, at no cost to the State.

Y. The Contractor may obtain for review available As-Built drawings of the existing structure from the HDOT Highways Division, Design Branch located at Kakuhihewa Building, Room 609, 601 Kamokila Boulevard, Kapolei, HI 96707.

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SYMBOLS AND ABBREVIATIONS

∉	And
@	At
Ø	Diameter
#	Number, Pound
Abut.	Abutment
Abbr.	Abbreviation
Add.	Additional, Added
Alt.	Alternate
AB	Anchor Bolt
AC	Asphaltic Concrete
Approx.	Approximate
Az.	Azimuth
Bk.	Back
Bal.	Balance
℄	Baseline
Bm.	Beam
Brg., Brgs.	Bearing, Bearings
BVC	Beginning of Vertical Curve
BMP	Best Management Practices
Bet.	Between
BF	Both Faces, Back Face
BW	Both Ways
BFE	Bottom of Footing Elevation
Bot., Bott., B	Bottom
Br.	Bridge
Blt.	Bolt
Cant.	Cantilever
C.B.	Catch Basin
CIP	Cast-in-Place
℄	Centerline
CG	Center of Gravity
cgs	Center to Gravity of Strands
cc	Center to Center
Cl.	Class
Clr.	Clearance
Col.	Column
Conc.	Concrete
Conn.	Connection
Const.	Construction
CFCW	Continuous Flashing Compound Waterproofing
CJ	Control Joint
Const. Jt.	Construction Joint
CLSM	Controlled Low Strength Material
Cont.	Continuous
CF	Cubic Feet
CY, Cu. Yd.	Cubic Yard
CSL	Crosshole Sonic Logging
Demo	Demolish, Demolition
Det.	Detail
Diag.	Diagonal
Dia.	Diameter
Dim.	Dimension
Dist.	Distance
DO	Ditto
Dwls.	Dowels
Dn.	Down
Dbl.	Double
DI	Drain Inlet, Ductile Iron
DTI	Direct Tension Indicating
Dwg., Dwgs.	Drawing, Drawings
DS	Drilled Shaft
EA, Ea., ea.	Each
EF	Each Face
EFH	Each Face Horizontal
EFV	Each Face Vertical
EW	Each Way
EP	Edge of Pavement
EPS	Expanded Polystyrene
E	East
Elec.	Electrical
EMH	Electrical Manhole
El., Elev.	Elevation
Emb.	Embankment
Embed.	Embedded, Embedment
EVC	End of Vertical Curve
Eq.	Equal
ES	Each Side
Est.	Estimated
Exc.	Excavation
Excl.	Excluding
Exist., Ex.	Existing
Exp., (E)	Expansion
EJ	Expansion Joint
Ext.	Exterior
FF	Far Face. Front Face
F'c	Specified Strength of Concrete
F'ci	Strength of Concrete at Time of Initial Prestress
Ft.	Feet, Foot
Fig.	Figure
Fin. Gr.	Finish Grade
(F)	Fixed
FB	Flat Bar
Ftg.	Footing
FA	Force Account
Ga.	Gage, Gauge
Galv.	Galvanized
GDI	Grated Drain Inlet
GFRP	Glass Fiber Reinforced Polymer
Gr.	Grade
Grd.	Ground
GRP	Grouted Rubble Pavement
H	Height
(H)	Hinge
Horiz.	Horizontal
HDG	Hot-Dip Galvanized
HS	High strength
HSS	Hollow Structural Section
HECO	Hawaiian Electric Company
HTL	High Tide Line
IB, Inbnd.	Inbound
In.	Inch
ID	Inside Diameter
IF	Inside Face
Int.	Interior
Inv.	Invert
Jt.	Joint
K	Kips
KF	Kip Foot
KSF	Kips Per Square Foot
KSI	Kips Per Square Inch
KLF	Kips Per Linear Foot
L	Length
lb., lbs., LBS.	Pound, Pounds
Ltg. Std.	Lighting Standard
LF	Linear Feet/Foot
LF	Linear Feet/Foot
Lin. Ft.	Linear Feet/Foot
LS	Lump Sum
Longit.	Longitudinal
M	Modified
MH	Manhole
Max.	Maximum
Mech.	Mechanical
Min.	Minimum
Misc.	Miscellaneous
MPH	Miles Per Hour
NF	Near Face
N	North
NIC	Not in Contract
No.	Number
NTS	Not to Scale
O/S	Offset
oc	On Center
Opn'g	Opening
OB, Outbnd.	Outbound
OD	Outside Diameter
OM	Object Marker
P(e)	Effective or Working Prestressing Force
PP	Precast Plank
Perf.	Perforated
PL	Plate
PCC	Portland Cement Concrete
PC	Point of Curvature
PCF	Pounds per Cubic Foot
PSF	Pounds per Square Foot
PSI	Pounds per Square Inch
PLF	Pounds per Linear Foot
PI	Point of Intersection of Tangents
PIVC	Point of Intersection of Vertical Curve
PT	Point of Tangency, Post Tensioned
Pt., Pts.	Point, Points
PRC	Point of Reverse Curvature
PVC	Polyvinyl Chloride
Prestr.	Prestressed
P/S	Prestressed Strands
PB	Pull Box
Q	Flow Rate
Rad., R	Radius
RCSC	Research Council on Structural Connections
RF	Rear Face
Rebar	Reinforcing Bar
Ref.	Reference
Reinf.	Reinforced, Reinforcing, Reinforcement
Req'd.	Required
Ret.	Retaining
ROW	Right of Way
Rdwy.	Roadway
Sch.	Schedule
Sect.	Section
SDMH	Sewer Drain Manhole
Sht.	Sheet
SRA	Shrinkage Reducing Admixture
Sl.	Slope
S	South
Spc	Spacing
Sprd.	Spread
Spec.	Specification
SF	Square Feet
SY	Square Yard
SS. SSTL	Stainless Steel
Std.	Standard
Sta.	Station
Stagg.	Staggered
Stiff.	Stiffener
Stirr.	Stirrup
Str.	Straight
Struct.	Structure
SE	Super Elevation
Symm.	Symmetrical
Tan.	Tangent
Temp.	Temporary
Thk.	Thick
T	Top
T℄B	Top and Bottom
TOD	Top of Deck
TFE	Top of Footing Elevation
TOW	Top of Wall
Tot.	Total
Transv.	Transverse
TS	Structural Tubing
Typ.	Typical
Undergrd.	Underground
UNO	Unless Noted Otherwise
Var.	Varies
Vert., V	Vertical
VC	Vertical Curve
VSM	Variable Message Sign
W/C	Water/Cement Ratio
w/	With
W	West
WWR	Welded Wire Reinforcing
WW	Wing Wall
WP	Work Point, Working Point
WS	Water Surface
Yr.	Year

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
No.	TRACED BY	
	DESIGNED BY	
	QUANTITIES BY	
	CHECKED BY	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

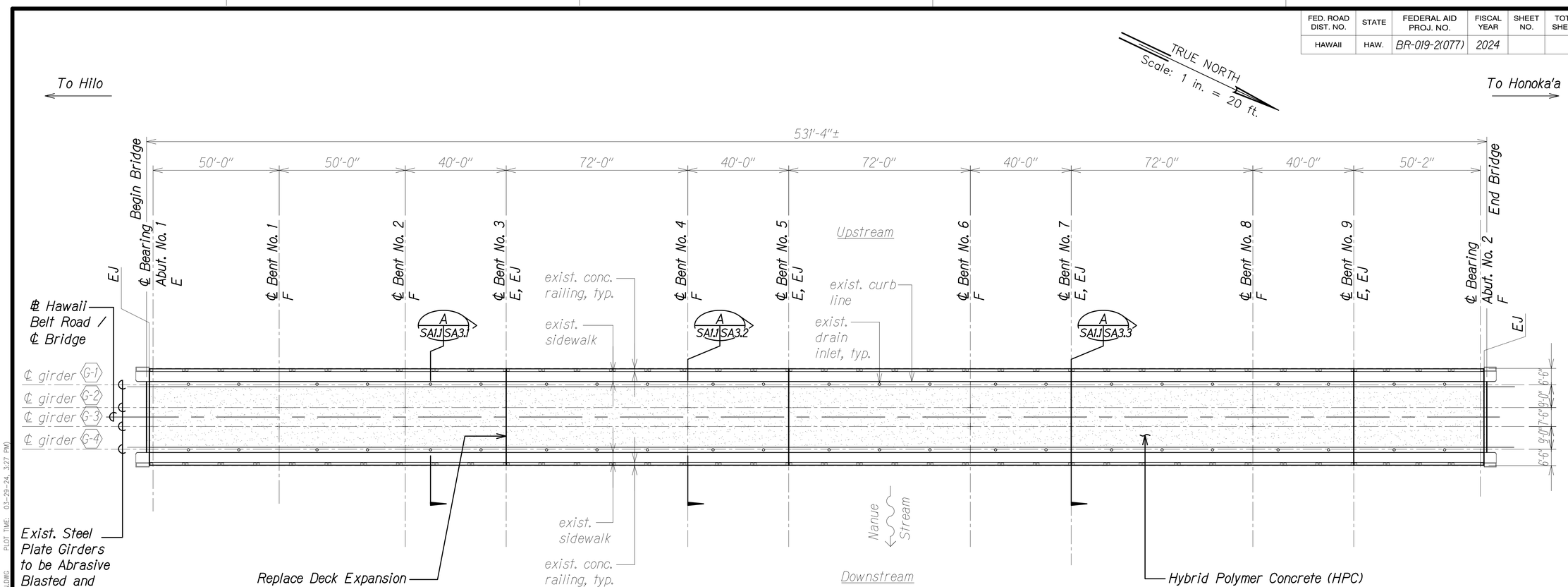
SYMBOLS AND ABBREVIATIONS

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: None Date: Mar. 2024

SHEET No. S0.7 OF 7 SHEETS

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



LAYOUT PLAN

Scale: 1" = 20'-0"

LEGEND:

- G-# Existing Girder Line
- E Expansion Bearing
- F Fixed Bearing
- EJ Expansion Joint in Deck

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

LAYOUT PLAN

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

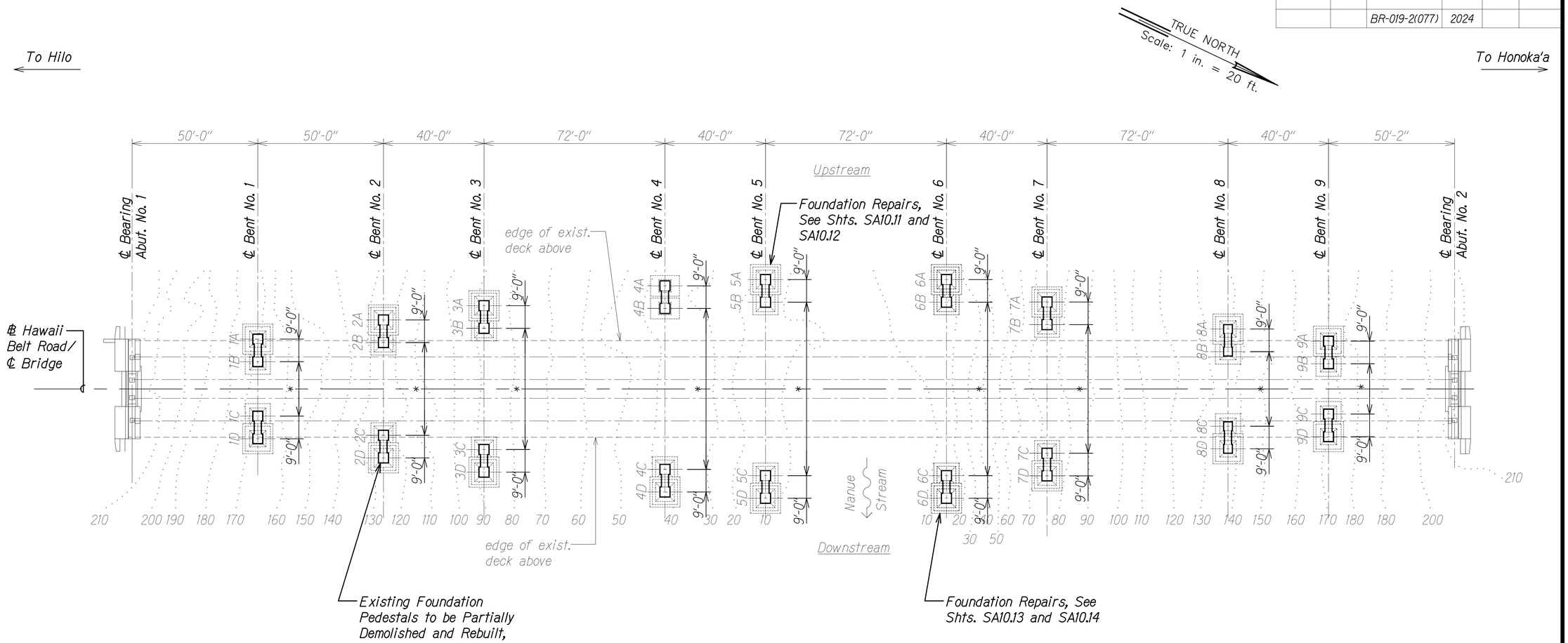
Scale: As Noted Date: Mar. 2024

SHEET No. SA1.1 OF 2 SHEETS

ORIGINAL PLAN | NOTE BOOK No. | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGN BY | PROJECT BY | QUANTITIES BY | CHECKED BY | DATE

DRAWING NAME: Z:\00 ONGOING\00 JF PROJECTS\22-001 12-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\NSR-SA0101 LAYPLAN.DWG PLOT TIME: 03-29-24, 3:27 PM)

		BR-019-2(077)	2024			



FOUNDATION PLAN

Scale: 1" = 20'-0"

NOTE:

* Dimensions will be finalized after in-depth survey information has been obtained at foundation pedestal locations.

ORIGINAL PLAN	SURVEY PLOTTED BY		DATE
NOTE BOOK	DRAWN BY		
No.	TRACED BY		
	DESIGNED BY		
	QUANTITIES BY		
	CHECKED BY		

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

FOUNDATION PLAN

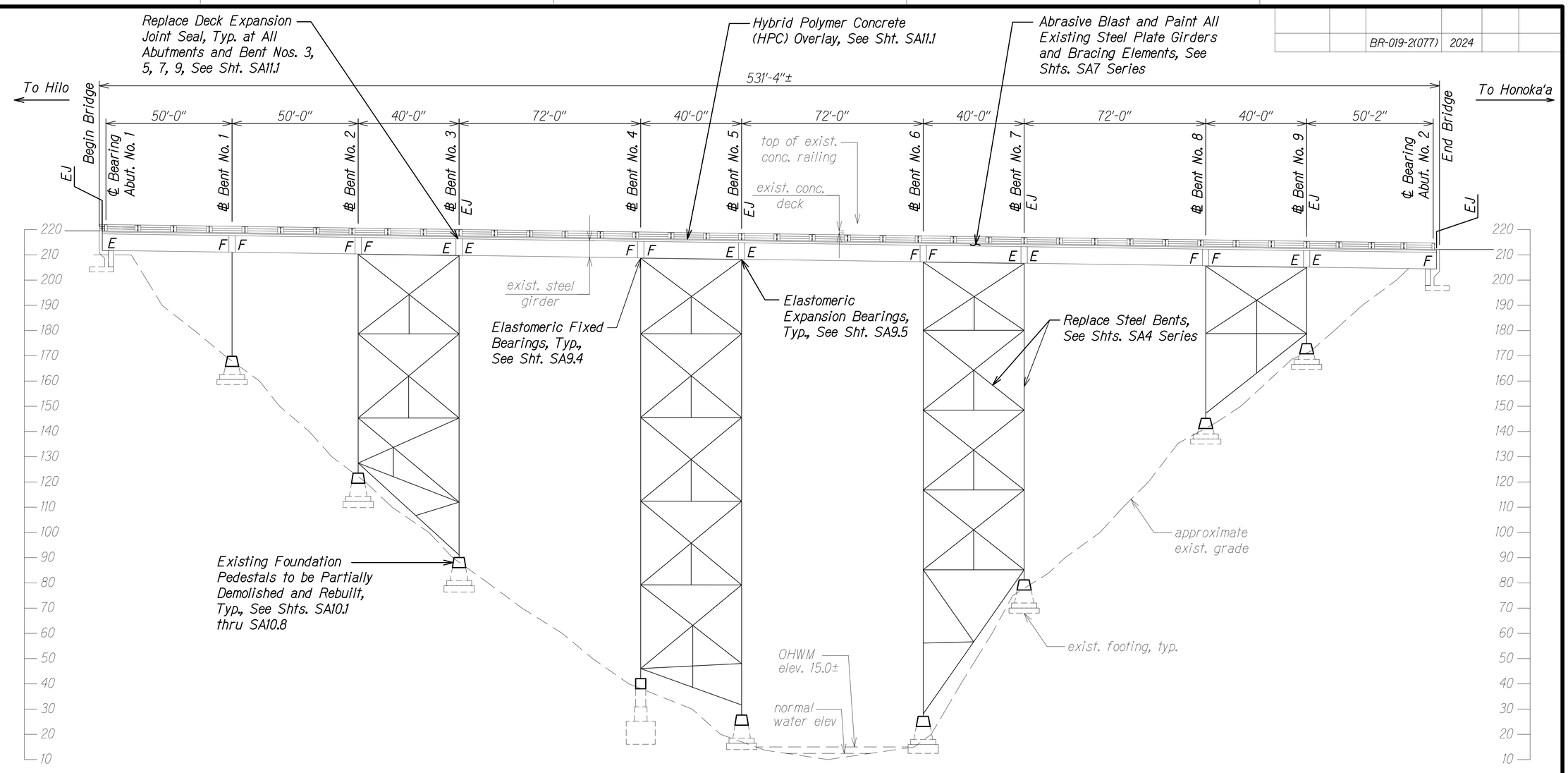
HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA1.2 OF 2 SHEETS

DRAWING NAME: Z:\OD ONGOING\OD_JF_PROJECTS\22-001 12-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\NSR-SA0102 FDN PLAN.DWG PLOT TIME: 03-29-24, 3:28 PM

		BR-019-2(077)	2024		



LEGEND:

E	Expansion Bearing
F	Fixed Bearing
EJ	Expansion Joint in Deck
OHWM	Ordinary High Water Mark

DOWNSTREAM ELEVATION

Scale: 1" = 20'-0"

ORIGINAL PLAN	SURVEY PLOTTED BY
NOTE BOOK	DRAWN BY
No.	TRACED BY
	DESIGNED BY
	QUANTITIES BY
	CHECKED BY
	DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BRIDGE ELEVATION

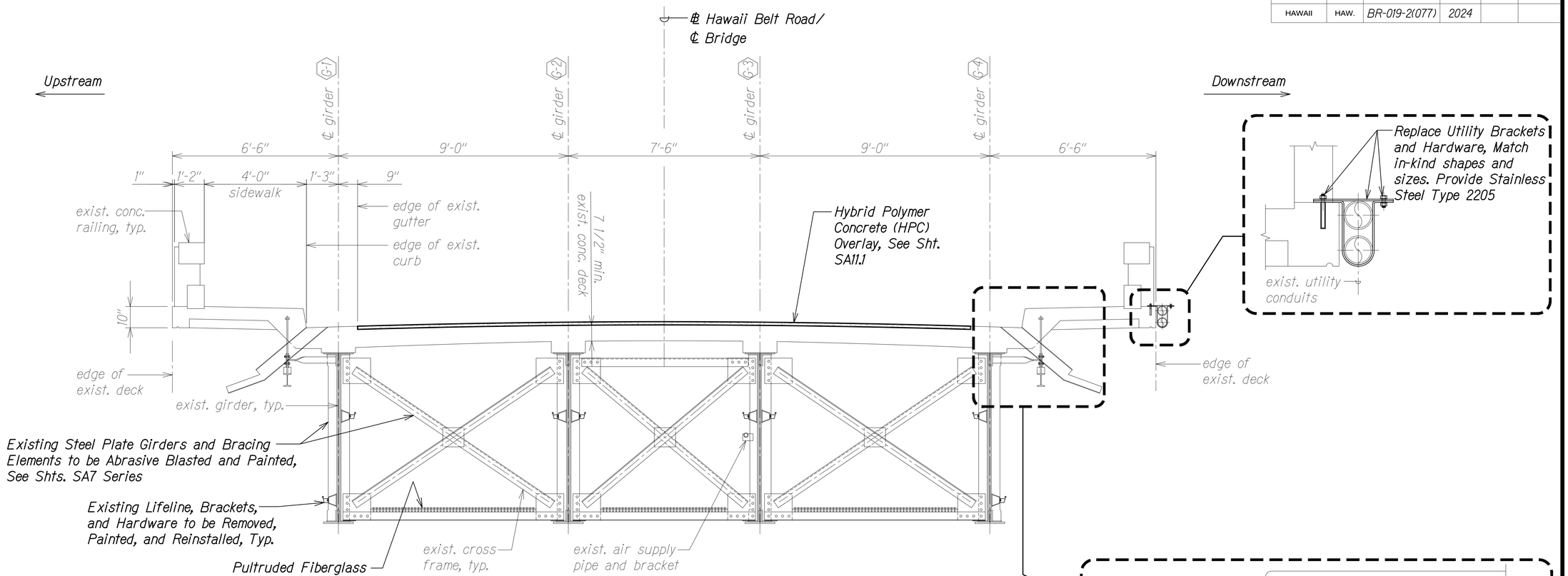
HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA2.1 OF 1 SHEETS

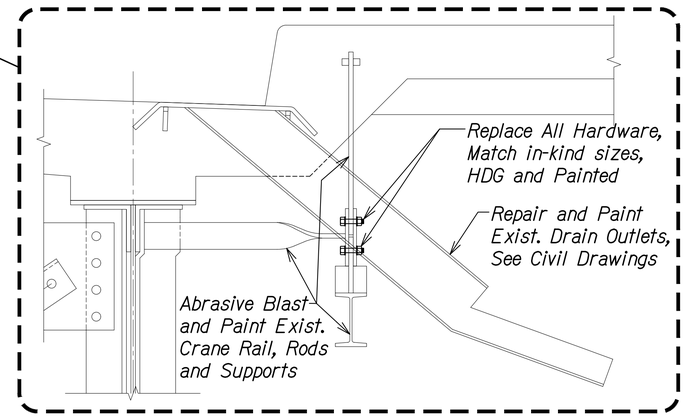
DRAWING NAME: Z:\OD ONCONCO\0 JF PROJECTS\22-601 12-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\NSR-SA0201 ELEV.DWG PLOT TIME: 03-29-24, 3:58 PM

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



TYPICAL TRANSVERSE SECTION (A)

Scale: 1/2" = 1'-0"



ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
NOTE BOOK	TRACED BY	
	DESIGNED BY	
No.	QUANTITIES BY	
	CHECKED BY	

DRAWING NAME: Z:\OD ONGOING\OD JF PROJECTS\22-001.12-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\NSR-SA03D1 TRANS.DWG PLOT TIME: 03-29-24 3:28 PM)

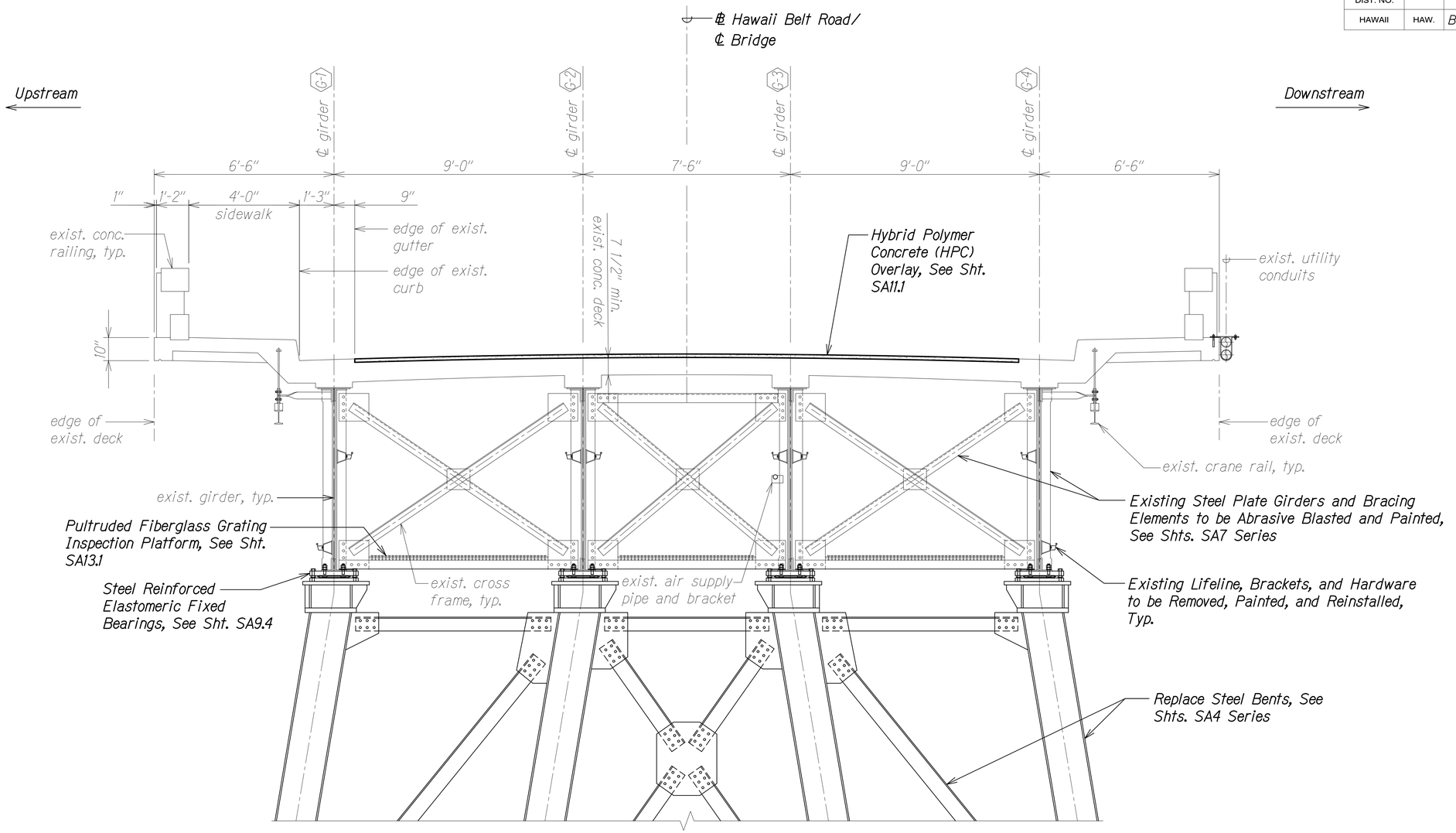
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPICAL TRANSVERSE SECTION

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



TRANSVERSE SECTION AT FIXED BEARING BENTS

A
SA1.1 | SA3.2

Scale: 1/2" = 1'-0"

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRANSVERSE SECTION AT BENTS

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

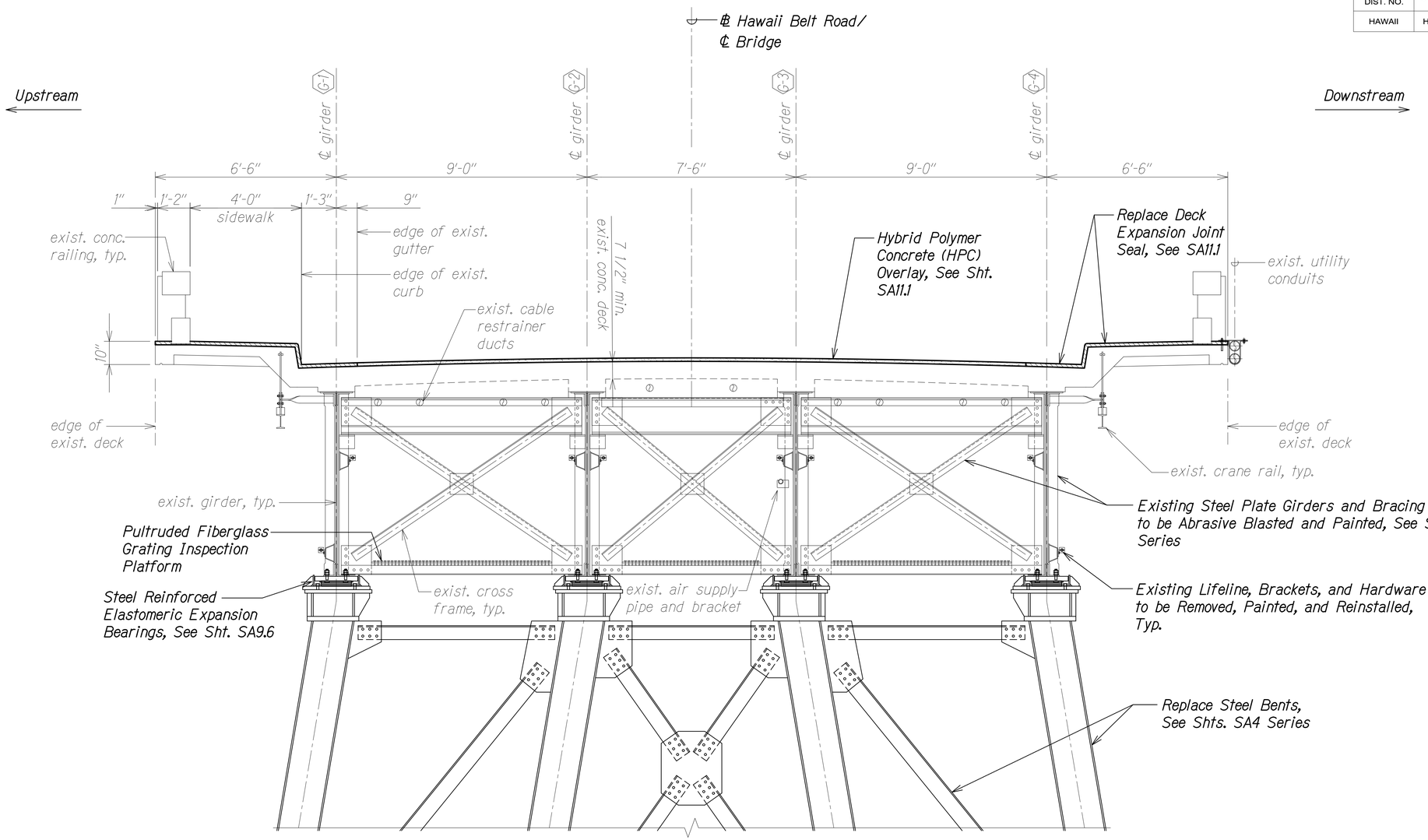
SHEET No. SA3.2 OF 4 SHEETS

ORIGINAL PLAN
NOTE BOOK
No.

SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE

DRAWING NAME: Z:\OD\ ONGOING\OD JF PROJECTS\22-001\12-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\NSR-SA03D1 TRANS.DWG PLOT TIME: 03-29-24, 3:29 PM

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



TRANSVERSE SECTION AT EXPANSION BEARING BENTS

Scale: 1/2" = 1'-0"

A SA1.1 | SA3.3

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRANSVERSE SECTION AT BENTS

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

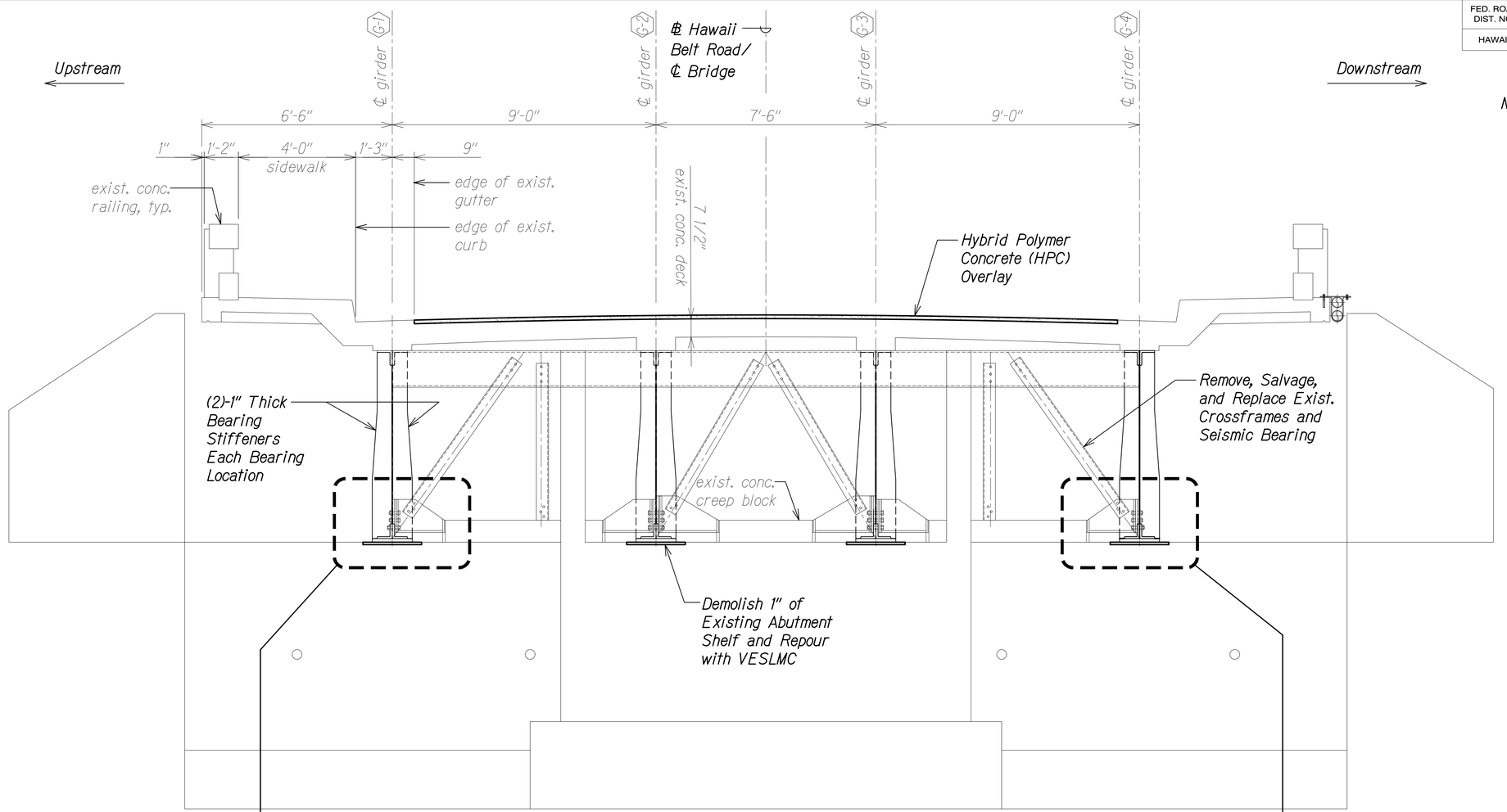
Scale: As Noted Date: Mar. 2024

SHEET No. SA3.3 OF 4 SHEETS

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
NOTE BOOK	TRACED BY	
	DESIGNED BY	
No.	QUANTITIES BY	
	CHECKED BY	

DRAWING NAME: Z:\OD ONGINO\OD JF PROJECTS\22-601 12-NANUE STR BR REHAB\01 CAD\01-29-24 60PCT DESIGN\NSR-SA0301 TRANS.DWG PLOT TIME: 01-29-24, 3:29 PM

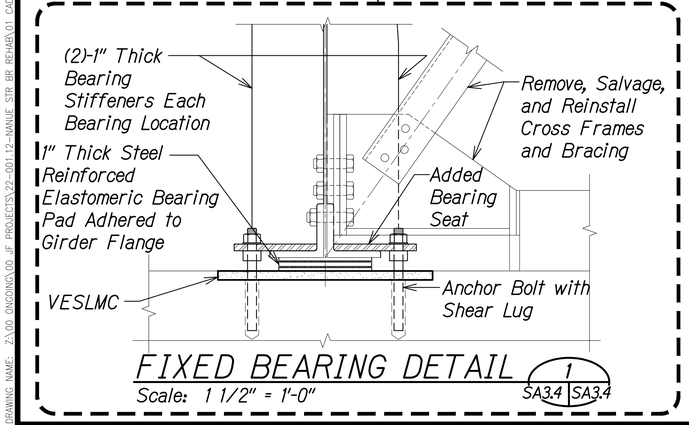
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



TRANSVERSE SECTION AT ABUTMENTS

Scale: 1/2" = 1'-0"

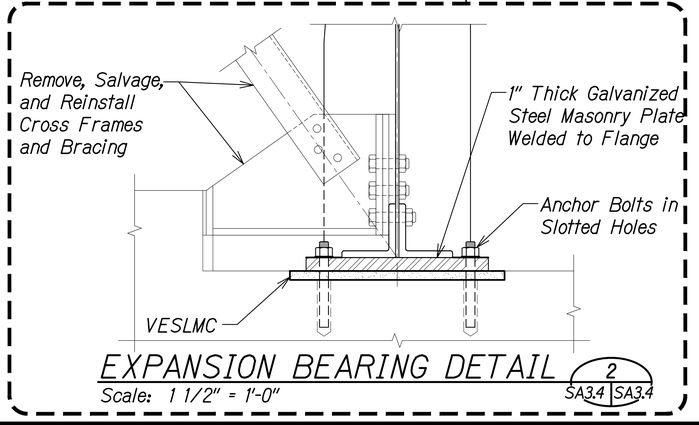
A SA3.4 | SA3.4



FIXED BEARING DETAIL

Scale: 1 1/2" = 1'-0"

1 SA3.4 | SA3.4



EXPANSION BEARING DETAIL

Scale: 1 1/2" = 1'-0"

2 SA3.4 | SA3.4

NOTES:

1. Remove and salvage existing crossframes and seismic bracings at Abutment Bearings.
2. Install provisions to allow jacking of bridge off existing abutment shelf.
3. Demolish and remove existing bearing stiffeners and existing bearings.
4. Demolish 1" depth of concrete beneath bearing location.
5. Pour Very Early Strength Latex Modified Concrete inlay at demolition locations, Finish smooth.
6. Install new bearing, new bearing stiffeners, and new anchor bolts.
7. Strike bridge shoring.
8. Reinstall crossframes and seismic bracing.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
No.	TRACED BY	
	DESIGNED BY	
	QUANTITIES BY	
	CHECKED BY	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

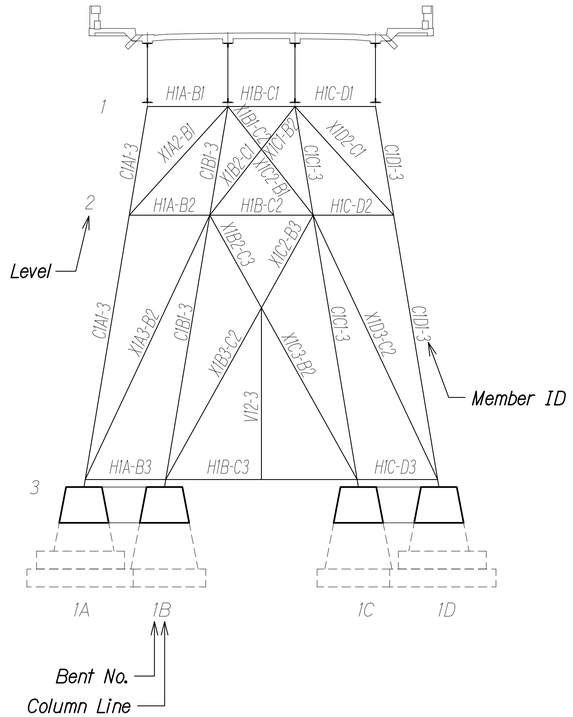
TRANSVERSE SECTION AT ABUTMENTS

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		

MEMBER IDENTIFICATION (ID) LOCATION KEY AT BENTS



MEMBER ID

Member Type
"C" = Column

C 1 D 1 - 2

Bent No.
Column Line
Level at Top
Level at Bottom

Member Type
"V" = Vertical Brace

V 1 2 - 3

Bent No.
Level Above
Level Below

Member Type
"X" = Diagonal Brace

X 1 B 2 - C 3

Bent No.
Column Line
Level Start
Level End
Column Line End

Member Type
"V" = Vertical Brace

V 2 3 A 3 - 4

Bent Nos.
Column Line
Level Above
Level Below

Member Type
"X" = Diagonal Brace

X 4 A 5 - 5 A 6

Bent No. Start
Column Line
Level Start
Level End
Column Line End
Bent No. End

Member Type
"H" = Horizontal Brace

H 1 C - D 2

Bent No.
Column Line at Left
Level
Column Line at Right

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
No.	TRACED BY	
	DESIGNED BY	
	QUANTITIES BY	
	CHECKED BY	

DRAWING NAME: Z:\AOO ONGOING\OO_JF PROJECTS\22-OO112-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\SSR-SA0401-SA409 BENT MEMB.DWG PLOT TIME: 03-29-24, 3:36 PM

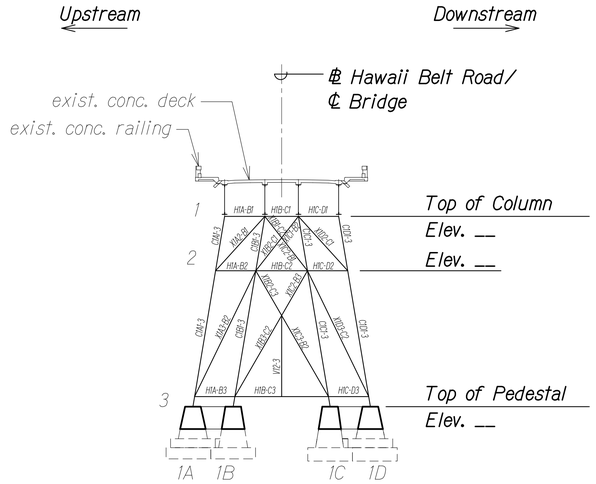
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

MEMBER ID LEGEND AT BENTS

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

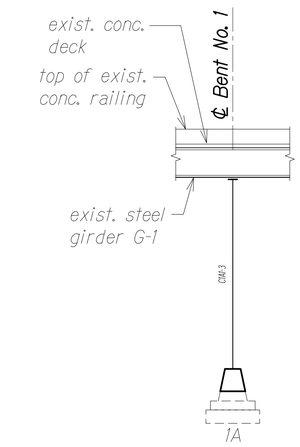
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



BENT NO. 1 ELEVATION

Scale: 1/16" = 1'-0"

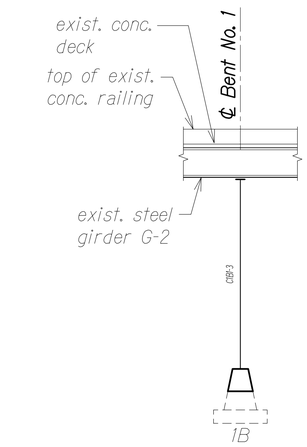
A SA4.2 | SA4.2



BENT NO. 1 ELEVATION - COLUMN LINE "A"

Scale: 1/16" = 1'-0"

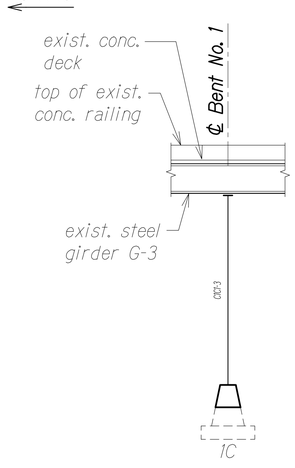
B SA4.2 | SA4.2



BENT NO. 1 ELEVATION - COLUMN LINE "B"

Scale: 1/16" = 1'-0"

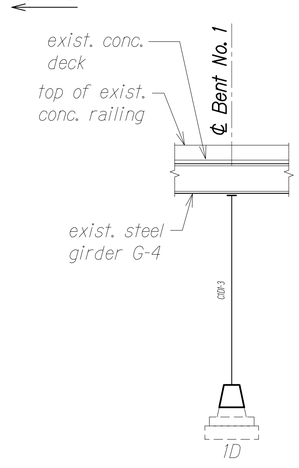
C SA4.2 | SA4.2



BENT NO. 1 ELEVATION - COLUMN LINE "C"

Scale: 1/16" = 1'-0"

D SA4.2 | SA4.2



BENT NO. 1 ELEVATION - COLUMN LINE "D"

Scale: 1/16" = 1'-0"

E SA4.2 | SA4.2

NOTE:

* Elevations will be finalized after in-depth survey information has been obtained at top of bent and at foundation pedestal locations.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
NOTE BOOK	TRACED BY	
No.	DESIGNED BY	
	QUANTITIES BY	
	CHECKED BY	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

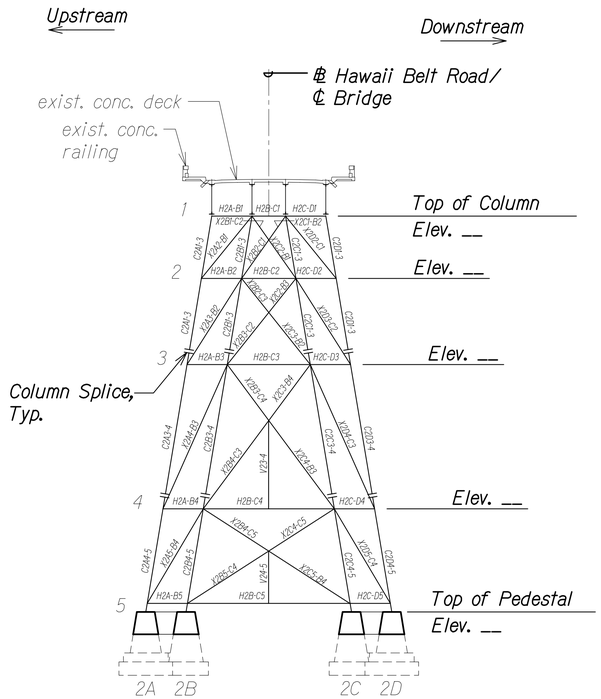
BENT NO. 1 MEMBER ELEVATIONS

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA4.2 OF 18 SHEETS

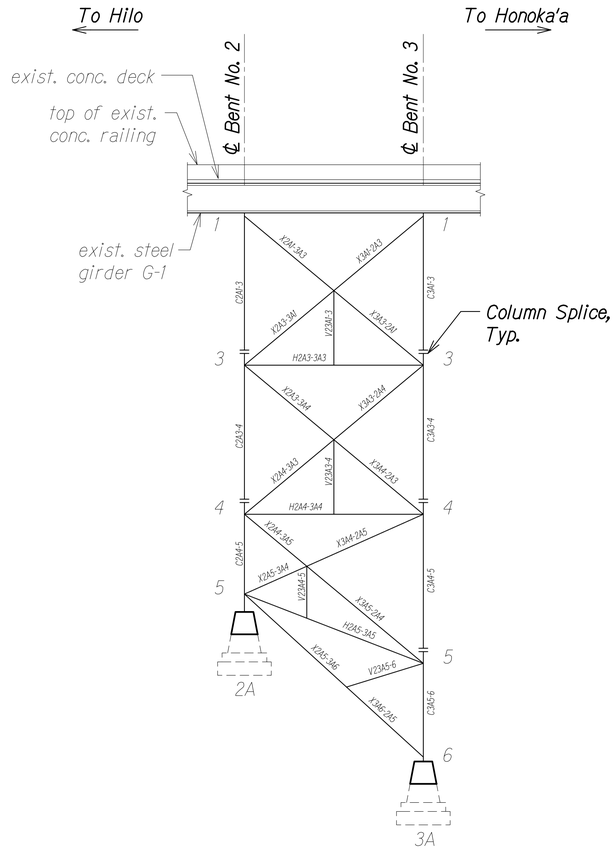
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



BENT NO. 2 ELEVATION

Scale: 1/16" = 1'-0"

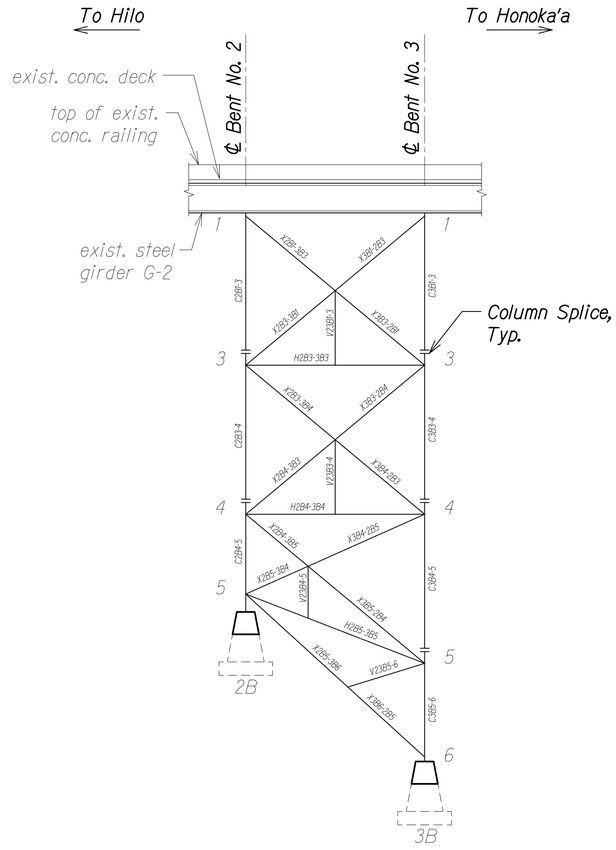
A SA4.3 | SA4.3



BENT NOS. 2 AND 3 ELEVATION - COLUMN LINE "A"

Scale: 1/16" = 1'-0"

B SA4.3 | SA4.3



BENT NOS. 2 AND 3 ELEVATION - COLUMN LINE "B"

Scale: 1/16" = 1'-0"

C SA4.3 | SA4.3

NOTE:

* Elevations will be finalized after in-depth survey information has been obtained at top of bent and at foundation pedestal locations.

ORIGINAL PLAN
NOTE BOOK No. ____

SURVEY PLOTTED BY ____ DATE ____
DRAWN BY ____
TRACED BY ____
DESIGNED BY ____
QUANTITIES BY ____
CHECKED BY ____

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BENT NOS. 2 AND 3 MEMBER ELEVATIONS

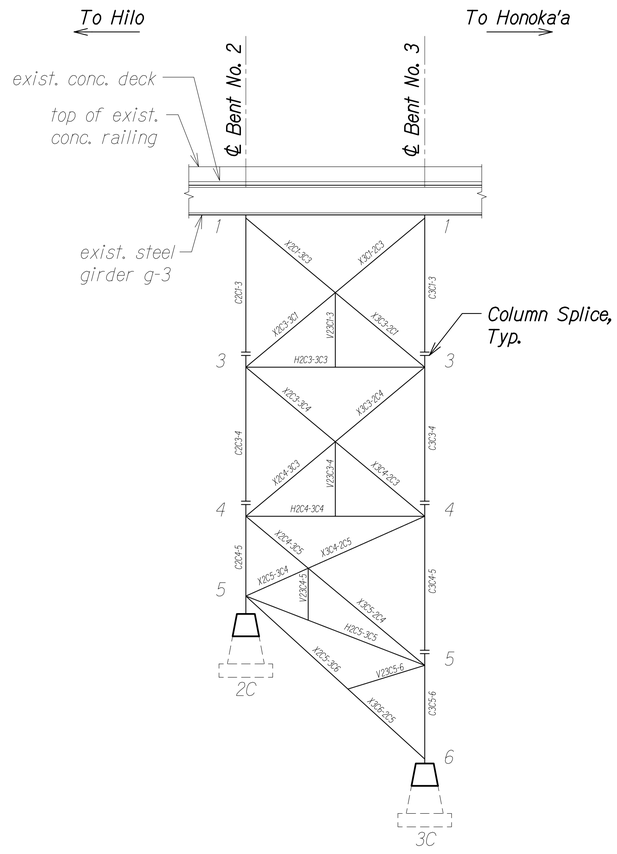
HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA4.3 OF 18 SHEETS

DRAWING NAME: Z:\OD_ONGOING\OD_JF_PROJECTS\22-001_12-NANUE_STR_BR_REHAB\01_CAD\03-29-24_60PCT_DESIGN\NSR-540401-SA409_BENT_MEMB.DWG PLOT TIME: 03-29-24, 3:30 PM

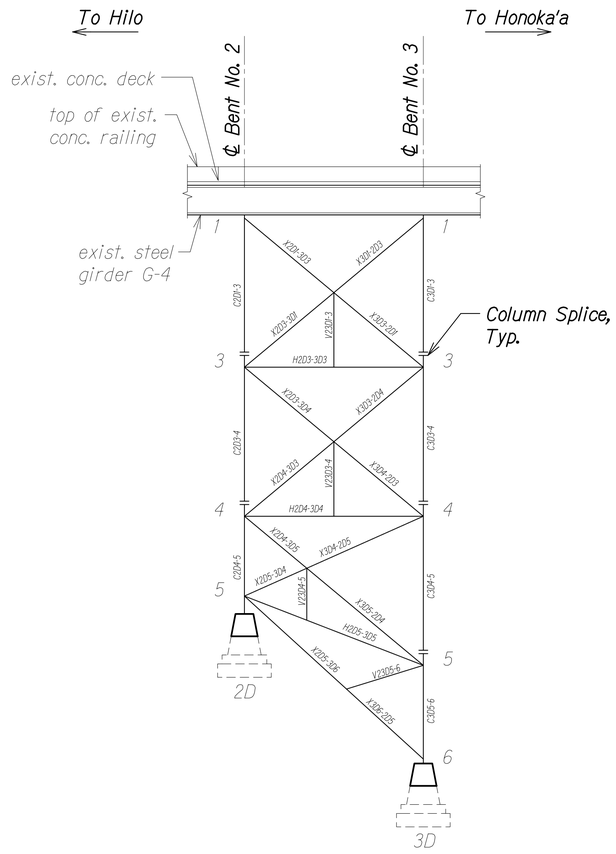
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



BENT NOS. 2 AND 3 ELEVATION - COLUMN LINE "C"

Scale: 1/16" = 1'-0"

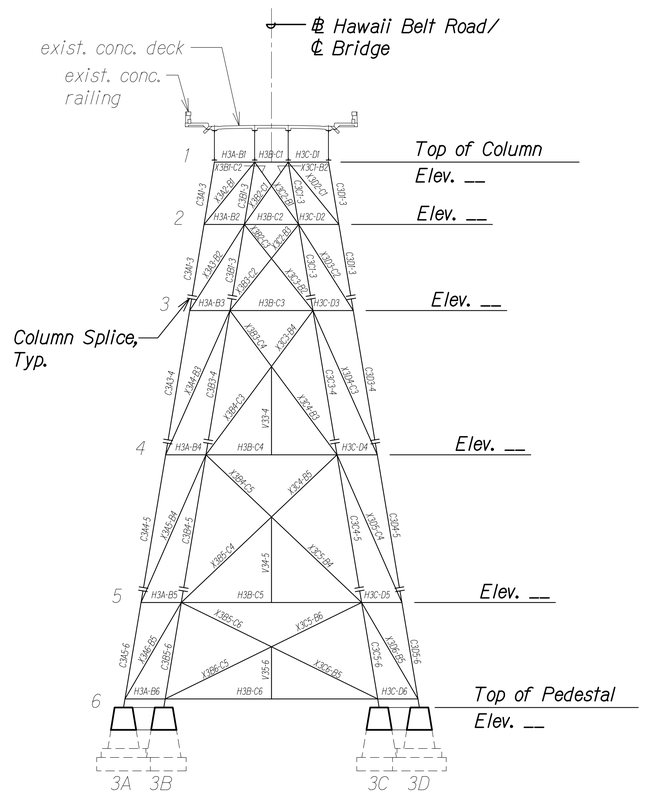
A SA4.4 | SA4.4



BENT NOS. 2 AND 3 ELEVATION - COLUMN LINE "D"

Scale: 1/16" = 1'-0"

B SA4.4 | SA4.4



BENT NO. 3 ELEVATION

Scale: 1/16" = 1'-0"

C SA4.4 | SA4.4

NOTE:

* Elevations will be finalized after in-depth survey information has been obtained at top of bent and at foundation pedestal locations.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BENT NOS. 2 AND 3 MEMBER ELEVATIONS

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

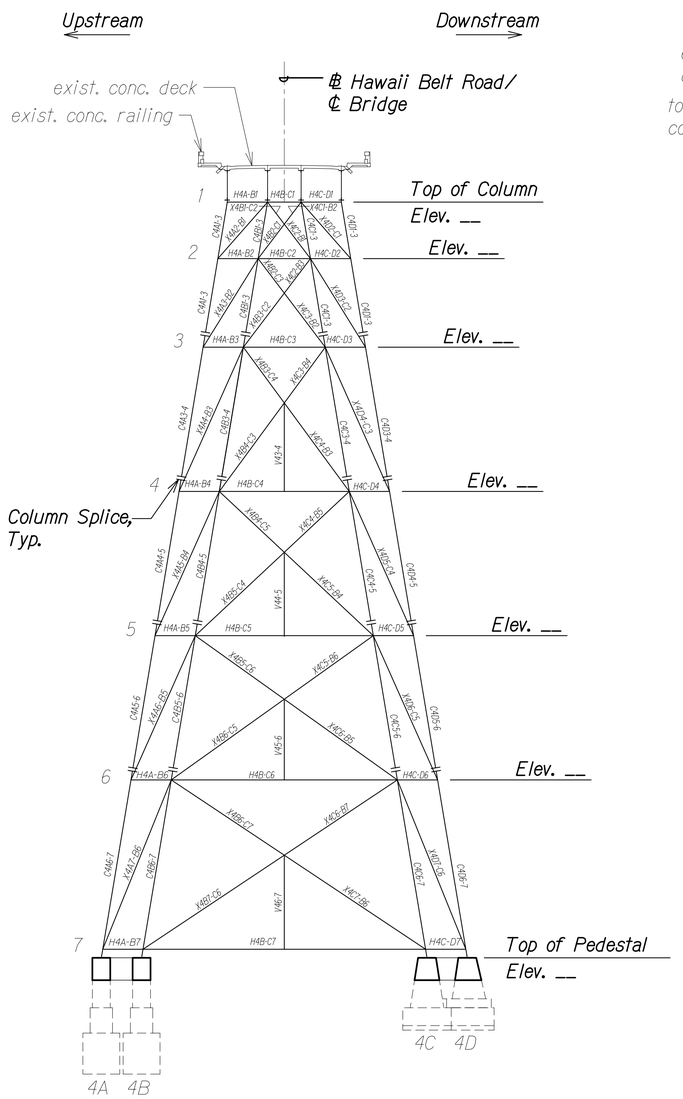
Scale: As Noted Date: Mar. 2024

SHEET No. SA4.4 OF 18 SHEETS

ORIGINAL PLAN | SURVEY PLOTTED BY | DATE
NOTE BOOK | DRAWN BY
No. | TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY

DRAWING NAME: Z:\OD ONDONA\OD JF PROJECTS\22-001\12-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\NSR-SA0401-SA409 BENT MEMB.DWG PLOT TIME: 03-29-24, 3:30 PM

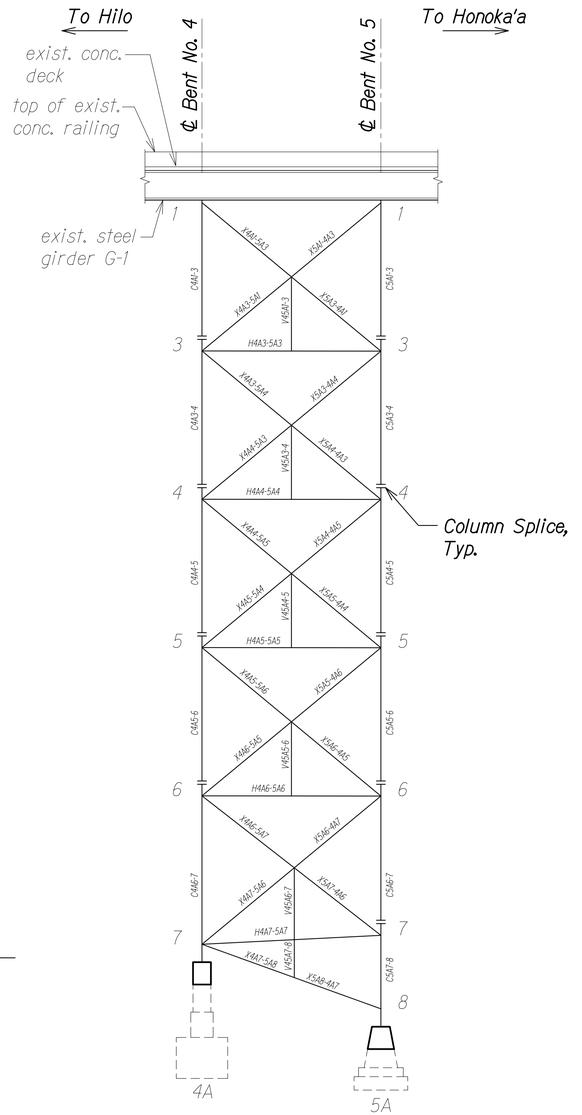
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



BENT NO. 4 ELEVATION

Scale: 1/16" = 1'-0"

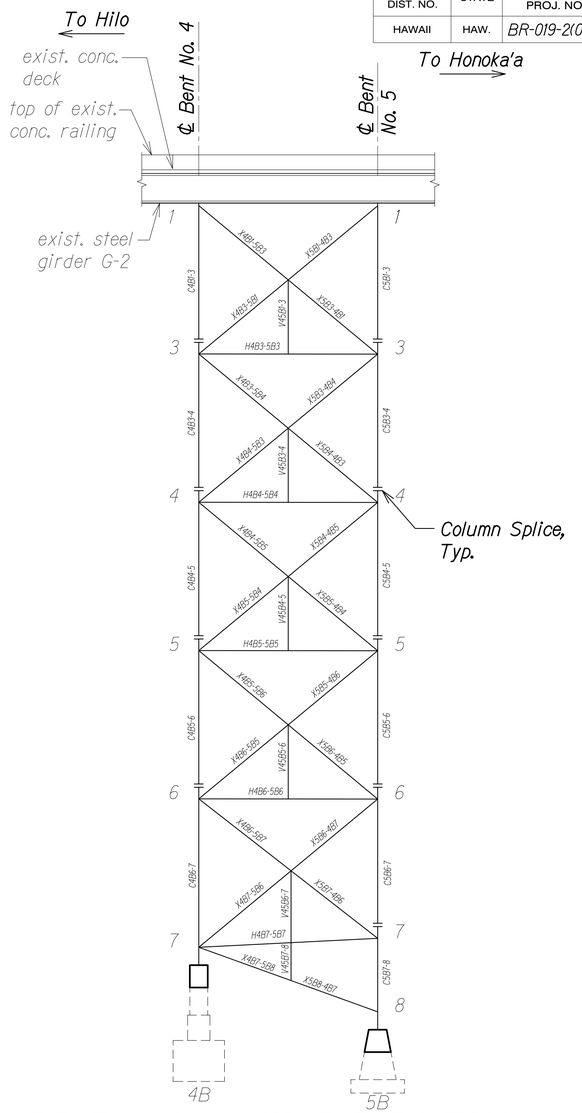
A SA4.5 | SA4.5



BENT NOS. 4 AND 5 ELEVATION - COLUMN LINE "A"

Scale: 1/16" = 1'-0"

B SA4.5 | SA4.5



BENT NOS. 4 AND 5 ELEVATION - COLUMN LINE "B"

Scale: 1/16" = 1'-0"

C SA4.5 | SA4.5

NOTE:

* Elevations will be finalized after in-depth survey information has been obtained at top of bent and at foundation pedestal locations.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
NOTE BOOK	TRACED BY	
	DESIGNED BY	
No.	QUANTITIES BY	
	CHECKED BY	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

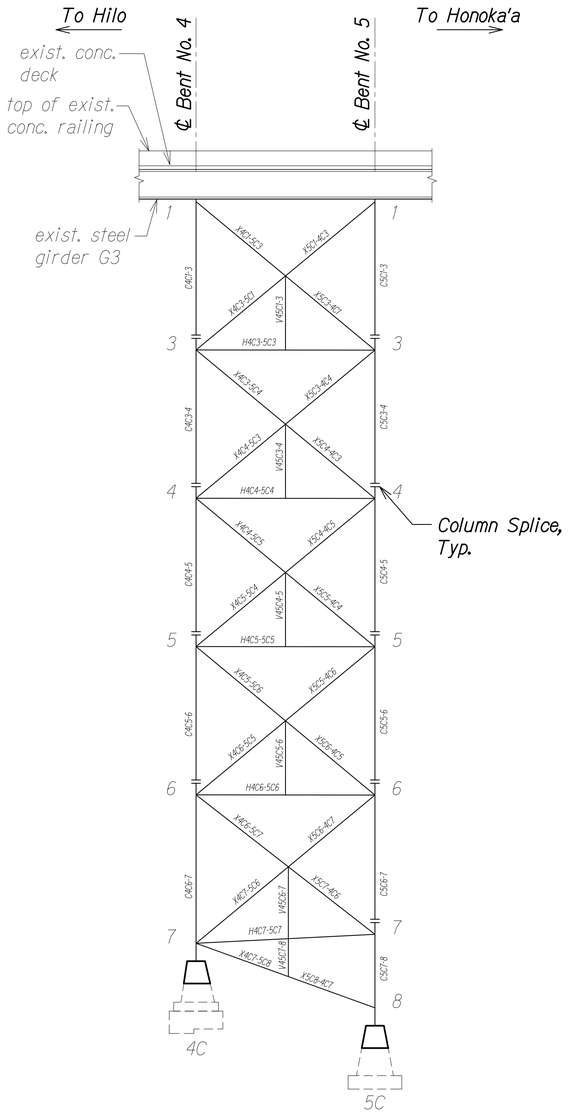
BENT NOS. 4 AND 5 MEMBER ELEVATIONS

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA4.5 OF 18 SHEETS

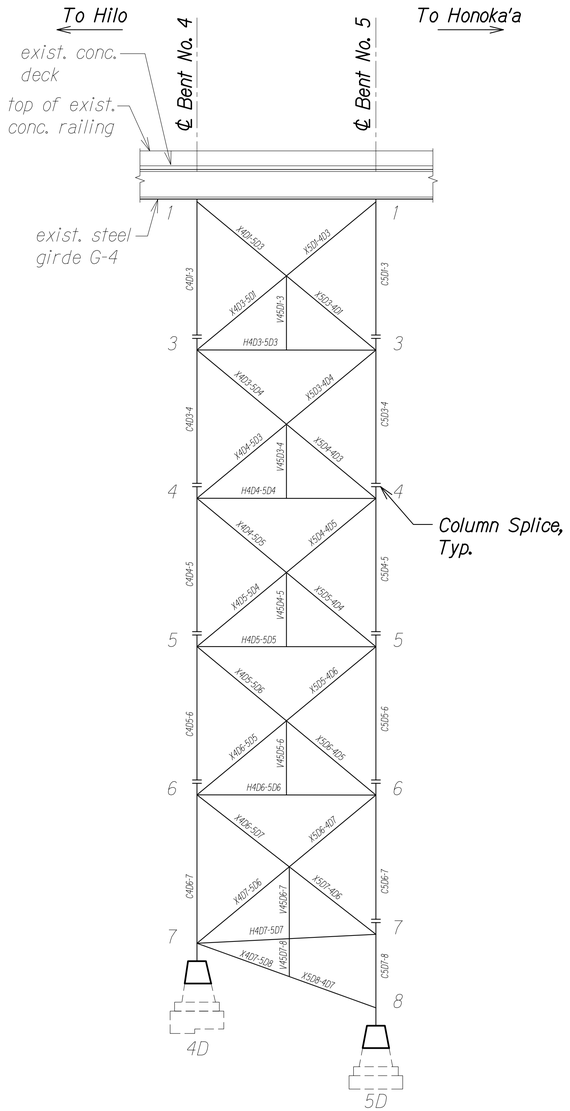
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



BENT NOS. 4 AND 5 ELEVATION - COLUMN LINE "C"

Scale: 1/16" = 1'-0"

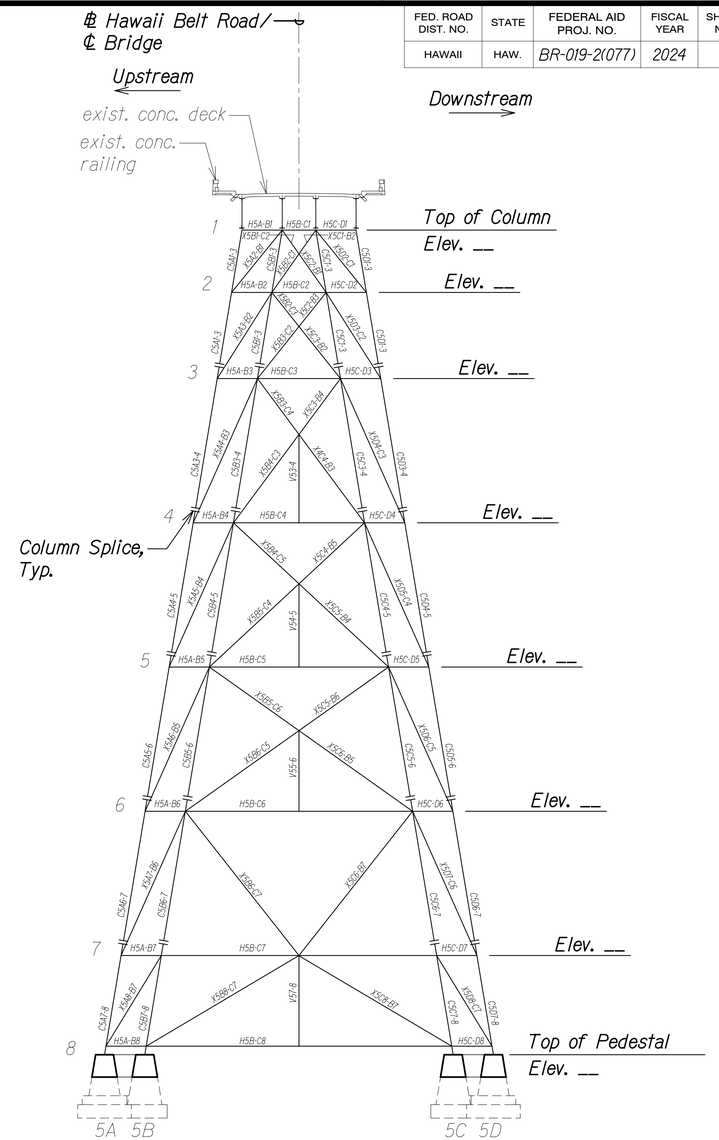
A SA4.6 | SA4.6



BENT NOS. 4 AND 5 ELEVATION - COLUMN LINE "D"

Scale: 1/16" = 1'-0"

B SA4.6 | SA4.6



BENT NO. 5 ELEVATION

Scale: 1/16" = 1'-0"

C SA4.6 | SA4.6

NOTE:

* Elevations will be finalized after in-depth survey information has been obtained at top of bent and at foundation pedestal locations.

ORIGINAL PLAN | NOTE BOOK | No. ____

SURVEY PLOTTED BY ____ DATE
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY

DRAWING NAME: Z:\OD ENGINEERING\00 JF PROJECTS\22-00112-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\STR-SA0401-SA409 BENT MEMB.DWG PLOT TIME: 03-29-24, 3:31 PM

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

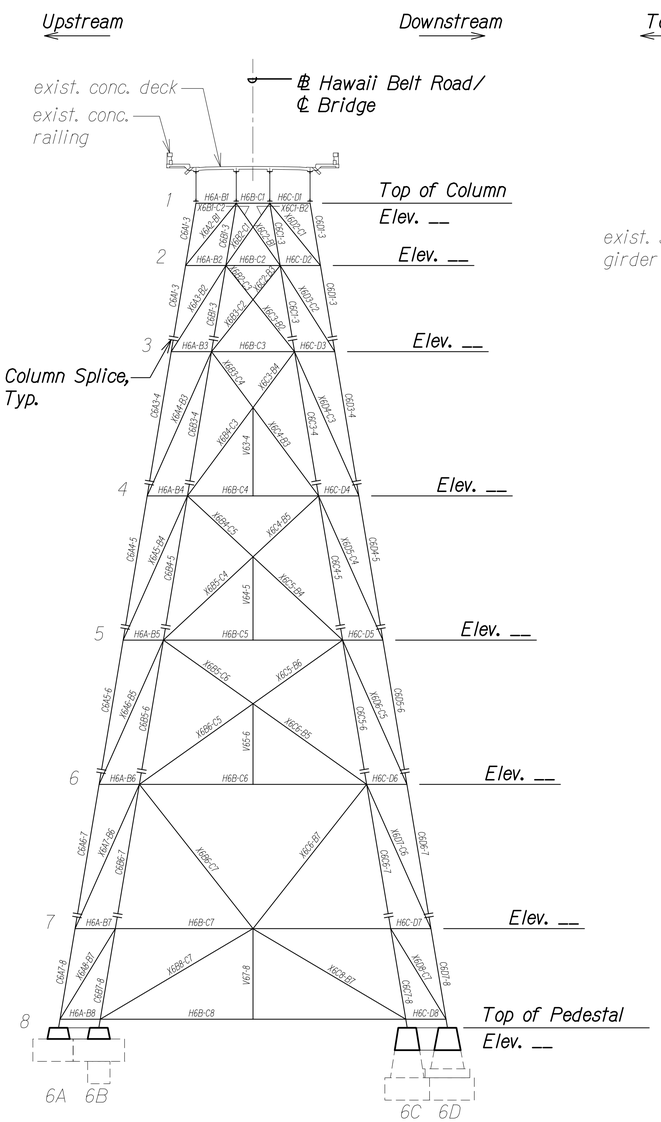
BENT NOS. 4 AND 5 MEMBER ELEVATIONS

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA4.6 OF 18 SHEETS

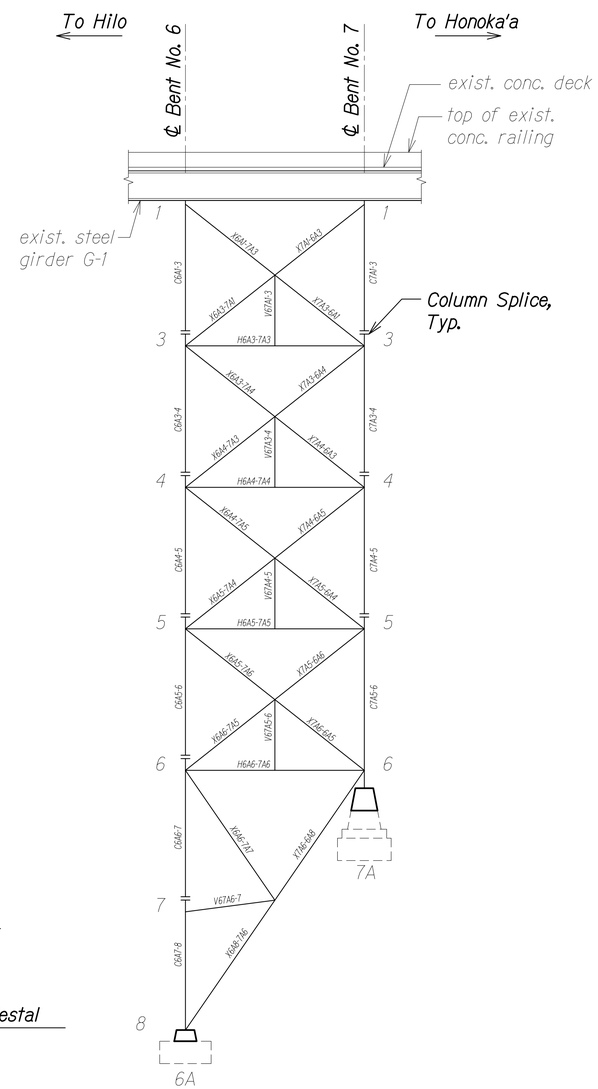
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



BENT NO. 6 ELEVATION

Scale: 1/16" = 1'-0"

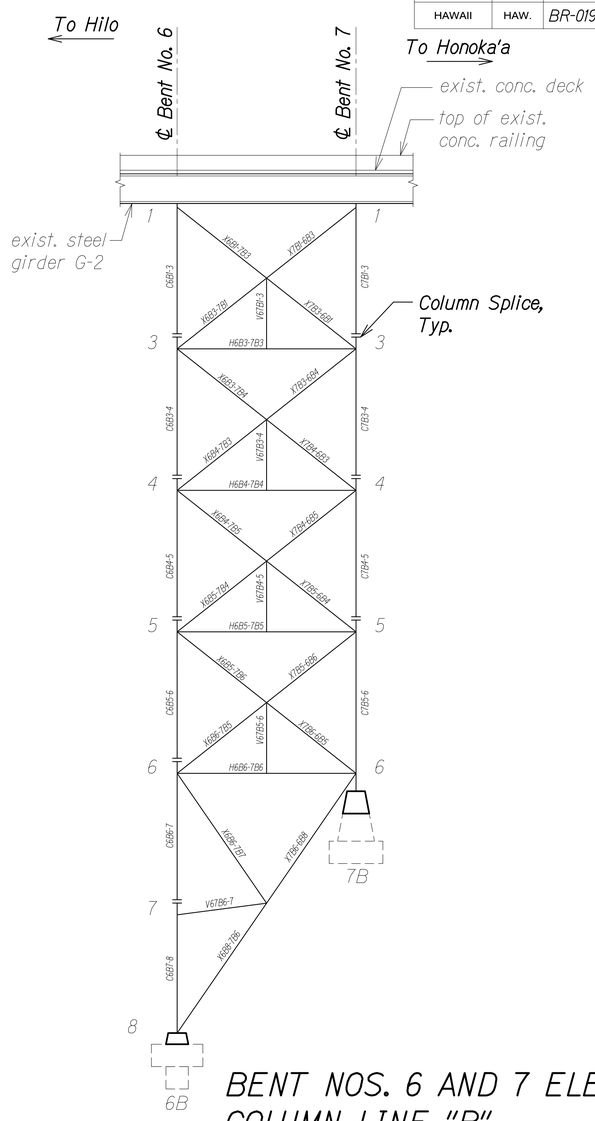
A SA4.7 | SA4.7



BENT NOS. 6 AND 7 ELEVATION - COLUMN LINE "A"

Scale: 1/16" = 1'-0"

B SA4.7 | SA4.7



BENT NOS. 6 AND 7 ELEVATION - COLUMN LINE "B"

Scale: 1/16" = 1'-0"

C SA4.7 | SA4.7

NOTE:

* Elevations will be finalized after in-depth survey information has been obtained at top of bent and at foundation pedestal locations.

ORIGINAL PLAN
NOTE BOOK
No.

SURVEY PLOTTED BY
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DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

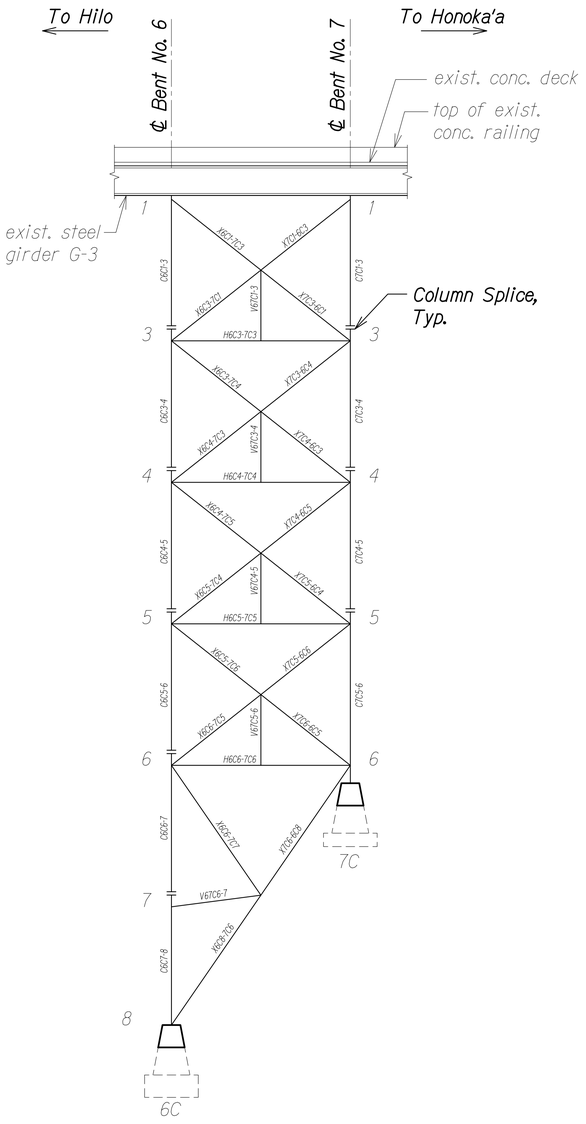
BENT NOS. 6 AND 7 MEMBER ELEVATIONS

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA4.7 OF 18 SHEETS

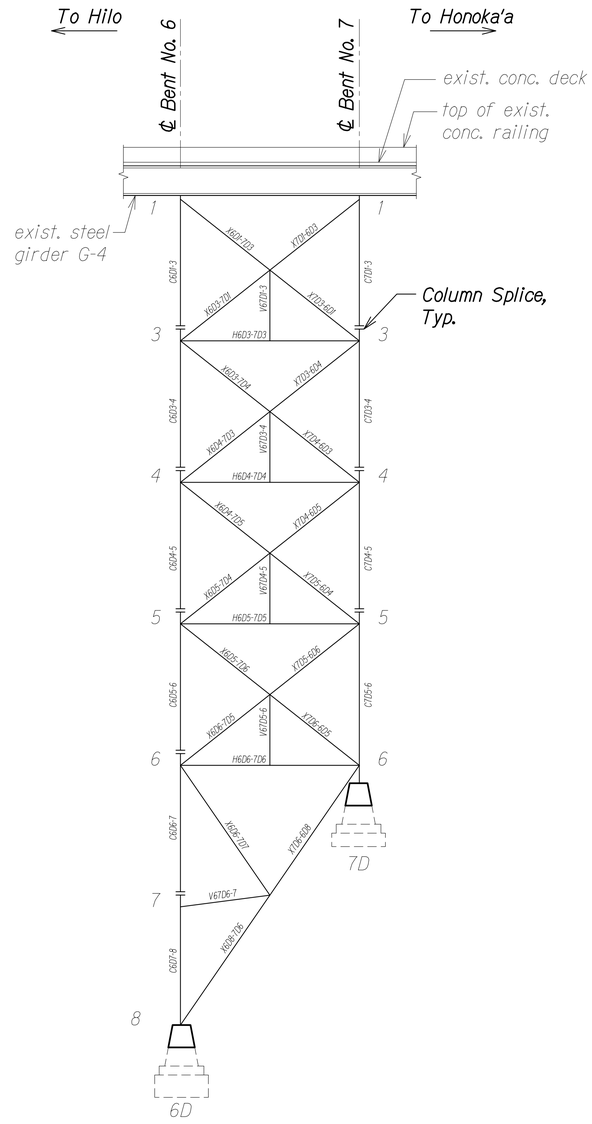
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



BENT NOS. 6 AND 7 ELEVATION - COLUMN LINE "C"

Scale: 1/16" = 1'-0"

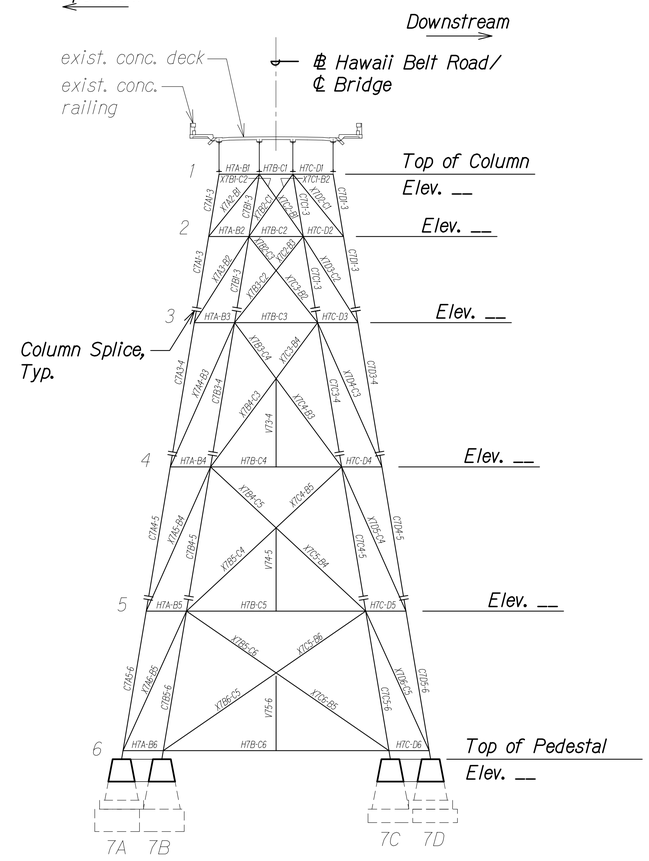
A SA4.8 | SA4.8



BENT NOS. 6 AND 7 ELEVATION - COLUMN LINE "D"

Scale: 1/16" = 1'-0"

B SA4.8 | SA4.8



BENT NO. 7 ELEVATION

Scale: 1/16" = 1'-0"

C SA4.8 | SA4.8

NOTE:

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ORIGINAL PLAN

NOTE BOOK

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DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

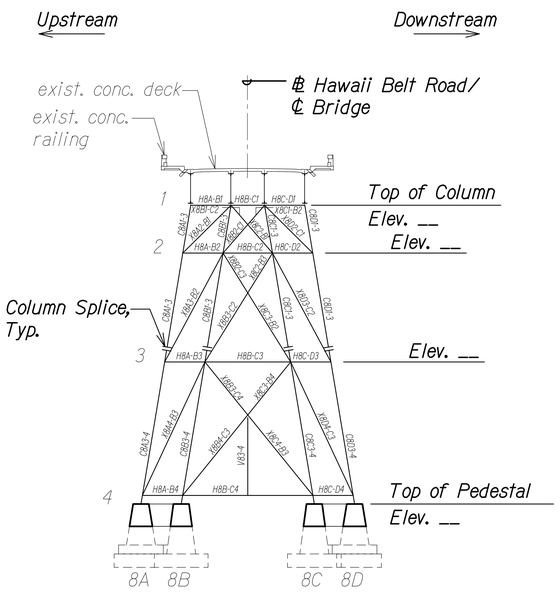
BENT NOS. 6 AND 7 MEMBER ELEVATIONS

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA4.8 OF 18 SHEETS

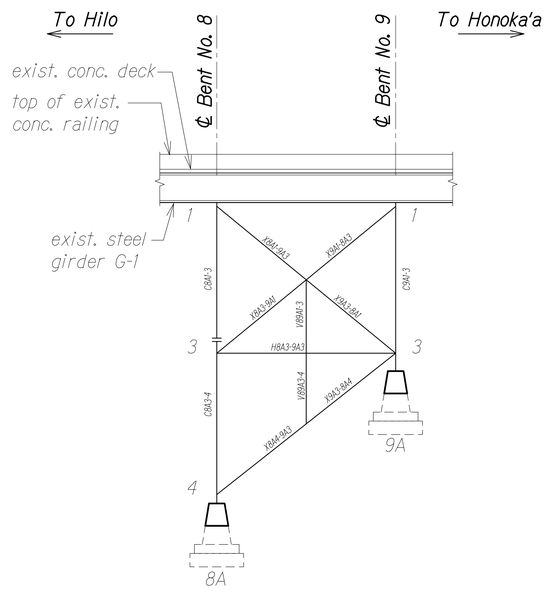
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



BENT NO. 8 ELEVATION

Scale: 1/16" = 1'-0"

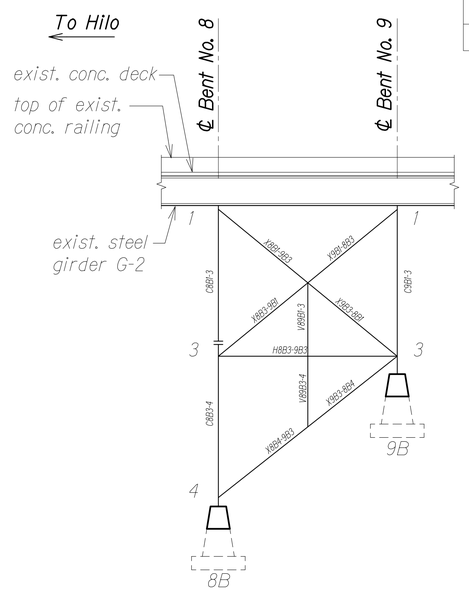
A SA4.9 | SA4.9



BENT NOS. 8 AND 9 ELEVATION COLUMN LINE "A"

Scale: 1/16" = 1'-0"

B SA4.9 | SA4.9



BENT NOS. 8 AND 9 ELEVATION COLUMN LINE "B"

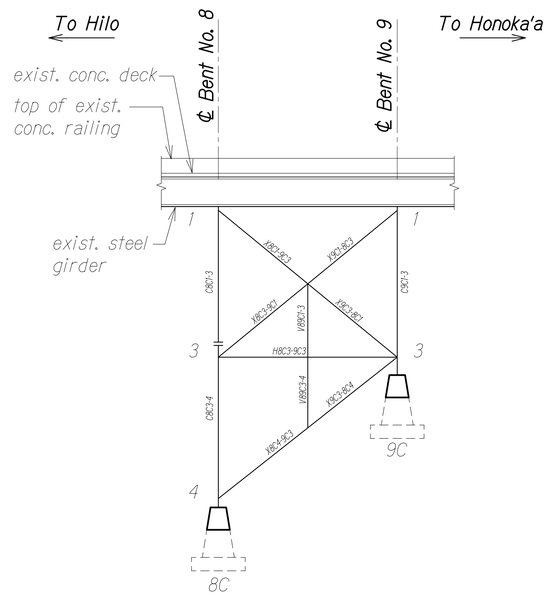
Scale: 1/16" = 1'-0"

C SA4.9 | SA4.9

To Honoka'a

NOTE:

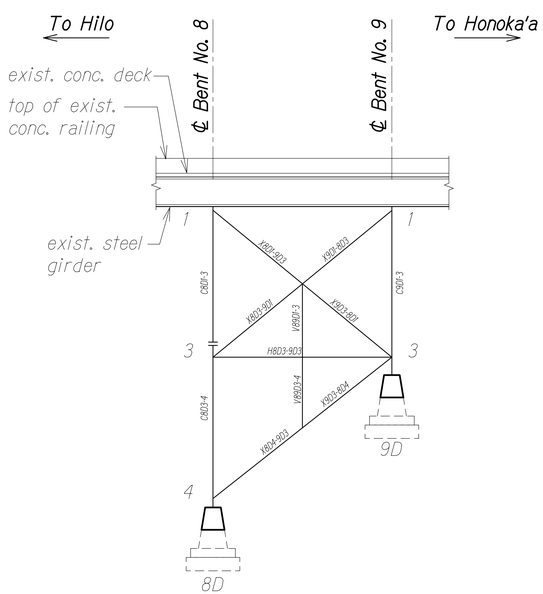
* Elevations will be finalized after in-depth survey information has been obtained at top of bent and at foundation pedestal locations.



BENT NOS. 8 AND 9 ELEVATION - COLUMN LINE "C"

Scale: 1/16" = 1'-0"

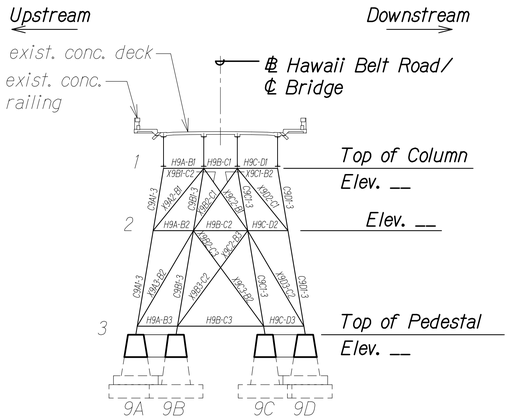
D SA4.9 | SA4.9



BENT NOS. 8 AND 9 ELEVATION - COLUMN LINE "D"

Scale: 1/16" = 1'-0"

E SA4.9 | SA4.9



BENT NO. 9 ELEVATION

Scale: 1/16" = 1'-0"

F SA4.9 | SA4.9

ORIGINAL PLAN
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BENT NOS. 8 AND 9 MEMBER ELEVATIONS

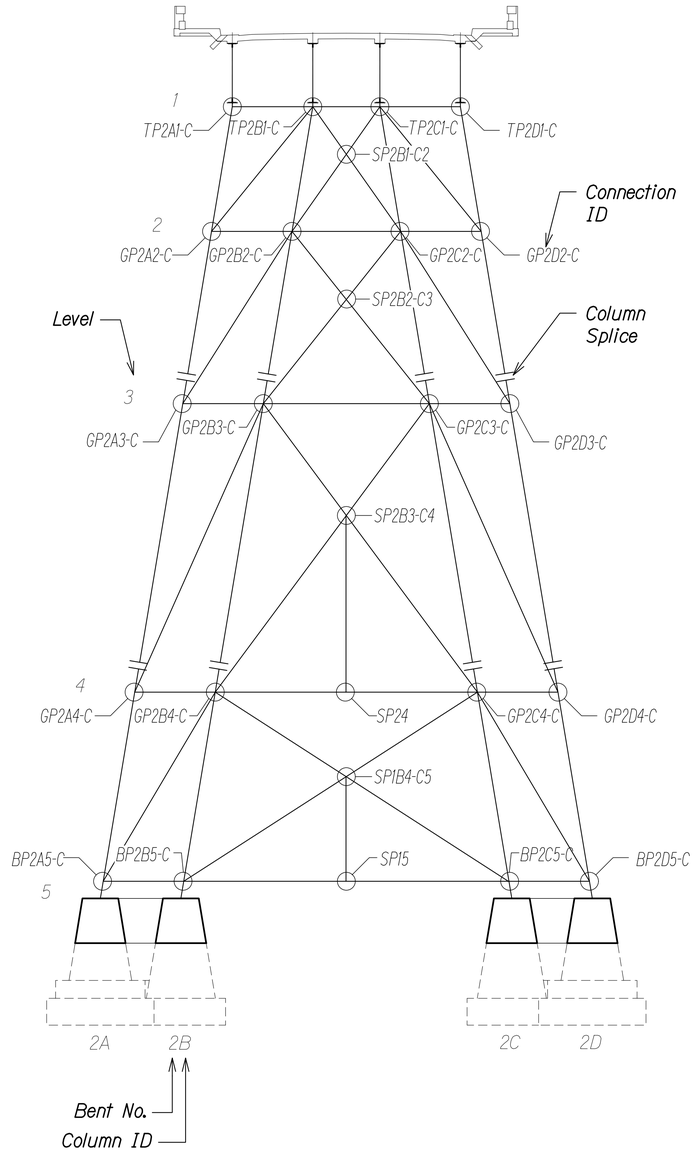
HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA4.9 OF 18 SHEETS

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		

CONNECTION IDENTIFICATION (ID) LOCATION KEY AT BENTS



CONNECTION ID

Connection Type "TP" = Top Plate TP 2 B 1 - C Bent No. Column Line Level at Connection "C" = Column to Column	Connection Type "TP" = Top Plate TP 2 B 1 - B Bent No. Column Line Level at Connection "B" = Bent to Bent
Connection Type "GP" = Gusset Plate GP 2 D 3 - C Bent No. Column Line Level at Connection "C" = Column to Column	Connection Type "GP" = Gusset Plate GP 2 C 2 - B Bent No. Column Line Level at Connection "B" = Bent to Bent
Connection Type "BP" = Base Plate BP 2 B 3 - C Bent No. Column Line Level at Connection "C" = Column to Column	Connection Type "BP" = Base Plate BP 2 D 5 - B Bent No. Column Line Level at Connection "B" = Bent to Bent
Connection Type "SP" = Splice Plate SP 2 B 2 - C 3 Bent No. Column Line at Left Level Above Level Below Column Line at Right	Connection Type "SP" = Splice Plate SP 2 3 B 1 - 3 Bent No. Column Line Level Above Level Below
Connection Type "SP" = Splice Plate SP 2 4 Bent No. Level at Connection	Connection Type "SP" = Splice Plate SP 2 3 A 4 Bent No. Column Line at Left Level at Connection

ORIGINAL PLAN | NOTE BOOK No. | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE

DRAWING NAME: Z:\AOI ONGOING\OD_JF PROJECTS\22-00112-NANUE STR BR REHAB\01 CAD\03-29-24 60FGT DESIGN\SSR-SA0410-SA0418 BEND CONN.DWG PLOT TIME: 03-29-24, 3:32 PM

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CONNECTION ID LEGEND AT BENTS

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

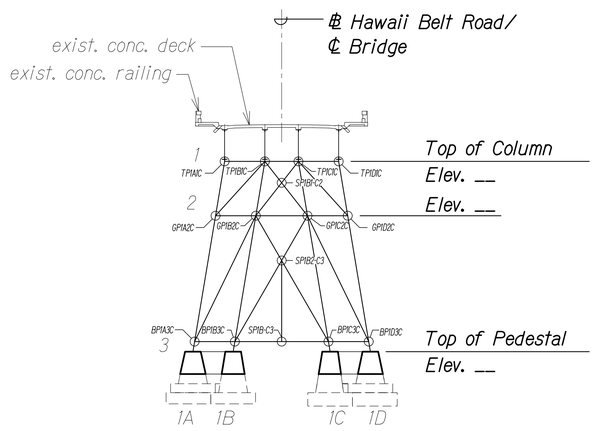
Scale: As Noted Date: Mar. 2024

SHEET No. SA4.10 OF 18 SHEETS

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		

Upstream

Downstream



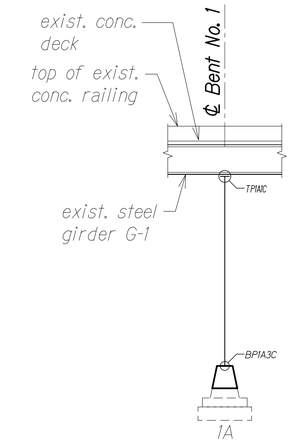
BENT NO. 1 ELEVATION

Scale: 1/16" = 1'-0"

A — SA4.11 | SA4.11

To Hilo

To Honoka'a



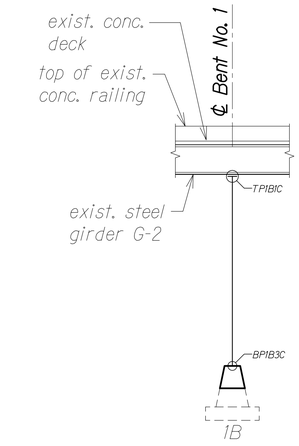
BENT NO. 1 ELEVATION - COLUMN LINE "A"

Scale: 1/16" = 1'-0"

B — SA4.11 | SA4.11

To Hilo

To Honoka'a



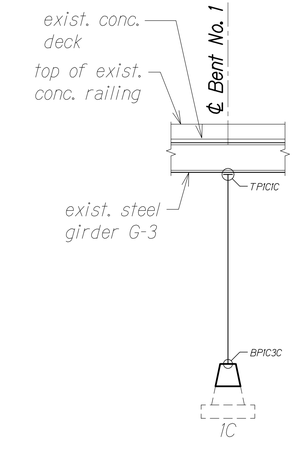
BENT NO. 1 ELEVATION - COLUMN LINE "B"

Scale: 1/16" = 1'-0"

C — SA4.11 | SA4.11

To Hilo

To Honoka'a



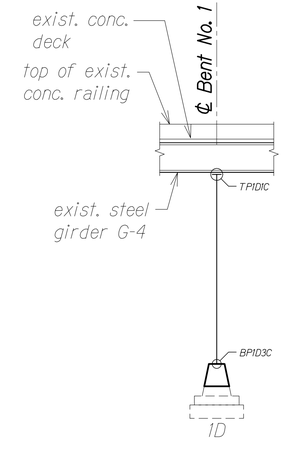
BENT NO. 1 ELEVATION - COLUMN LINE "C"

Scale: 1/16" = 1'-0"

D — SA4.11 | SA4.11

To Hilo

To Honoka'a



BENT NO. 1 ELEVATION - COLUMN LINE "D"

Scale: 1/16" = 1'-0"

E — SA4.11 | SA4.11

NOTE:

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BENT NO. 1 CONNECTION ELEVATIONS

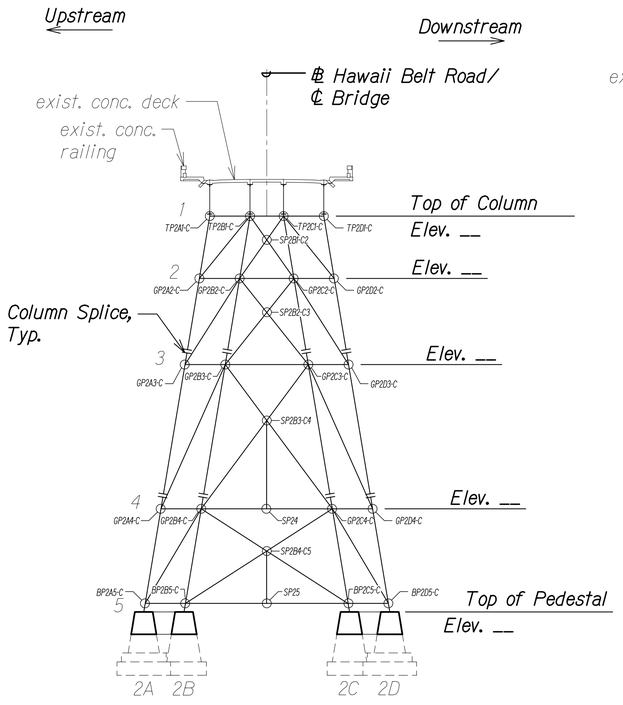
HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA4.11 OF 18 SHEETS

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
NOTE BOOK	TRACED BY	
	DESIGNED BY	
No.	QUANTITIES BY	
	CHECKED BY	

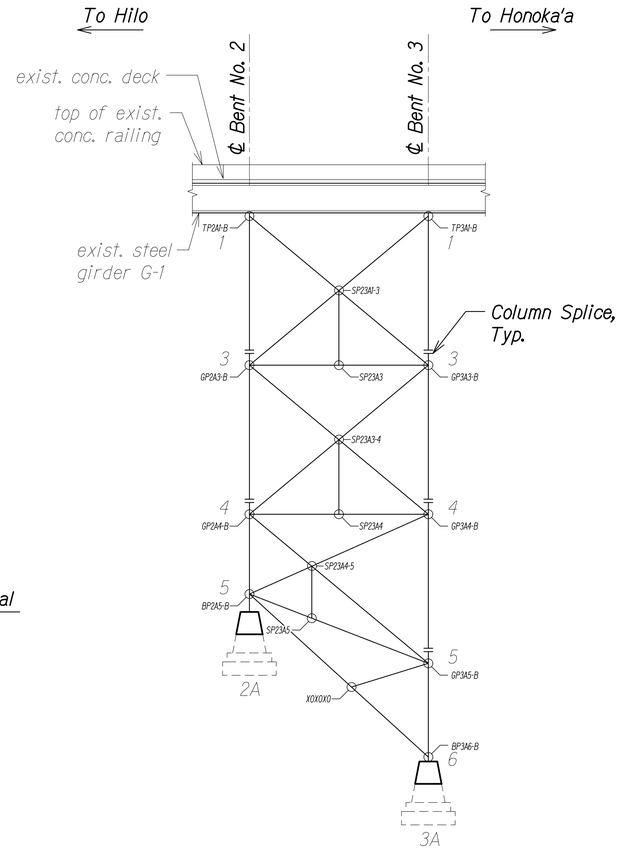
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



BENT NO. 2 ELEVATION

Scale: 1/16" = 1'-0"

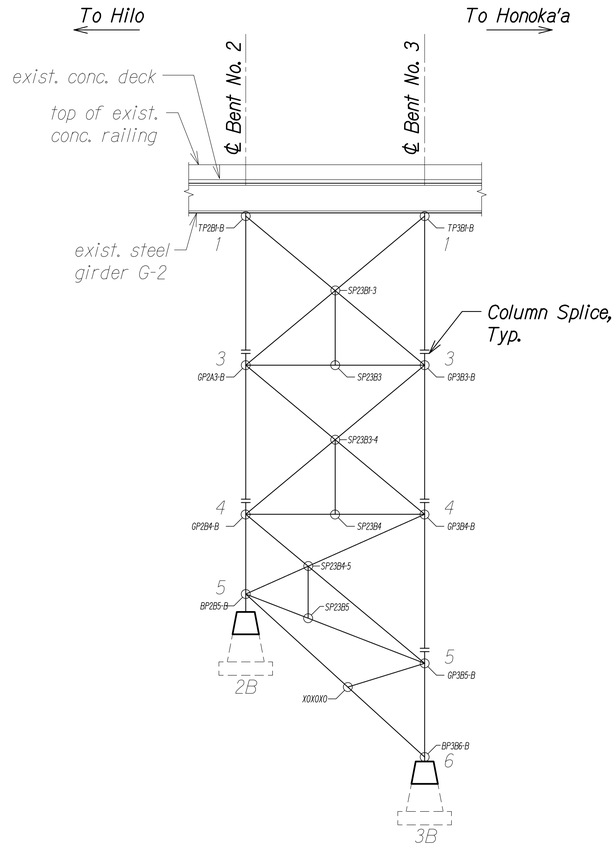
A SA4.12 | SA4.12



BENT NOS. 2 AND 3 ELEVATION - COLUMN LINE "A"

Scale: 1/16" = 1'-0"

B SA4.12 | SA4.12



BENT NOS. 2 AND 3 ELEVATION - COLUMN LINE "B"

Scale: 1/16" = 1'-0"

C SA4.12 | SA4.12

NOTE:

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ORIGINAL PLAN
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BENT NOS. 2 AND 3 CONNECTION ELEVATIONS

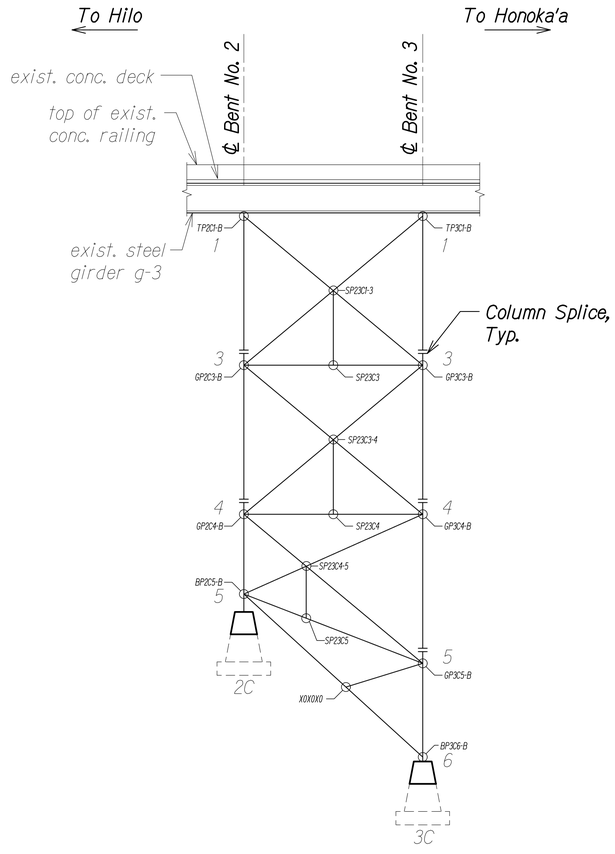
HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA4.12 OF 18 SHEETS

DRAWING NAME: Z:\OD ONGOING\OD_JF PROJECTS\22-001 12-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\NSR-SA6410-SA6418 BEND CONN.DWG PLOT TIME: 03-29-24, 3:33 PM)

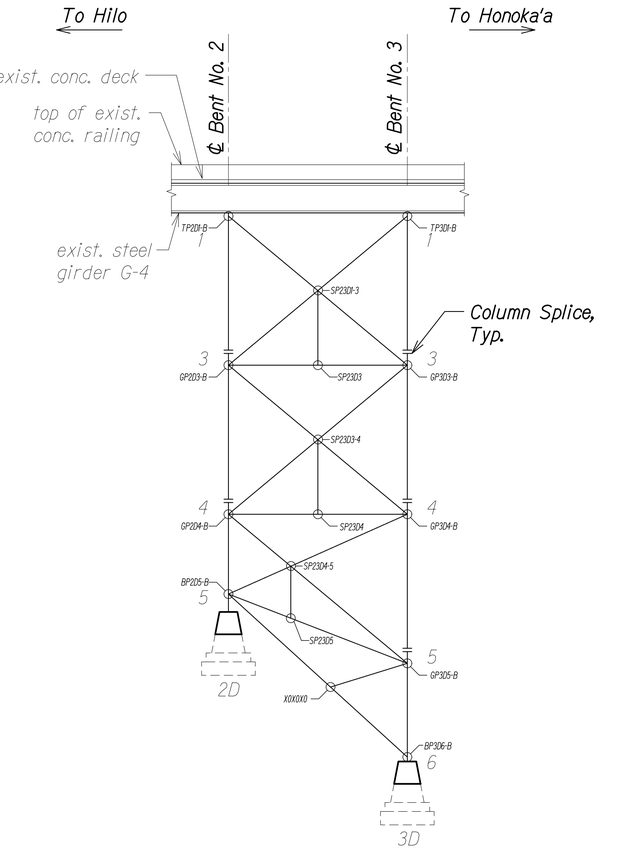
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



BENT NOS. 2 AND 3 ELEVATION - COLUMN LINE "C"

Scale: 1/16" = 1'-0"

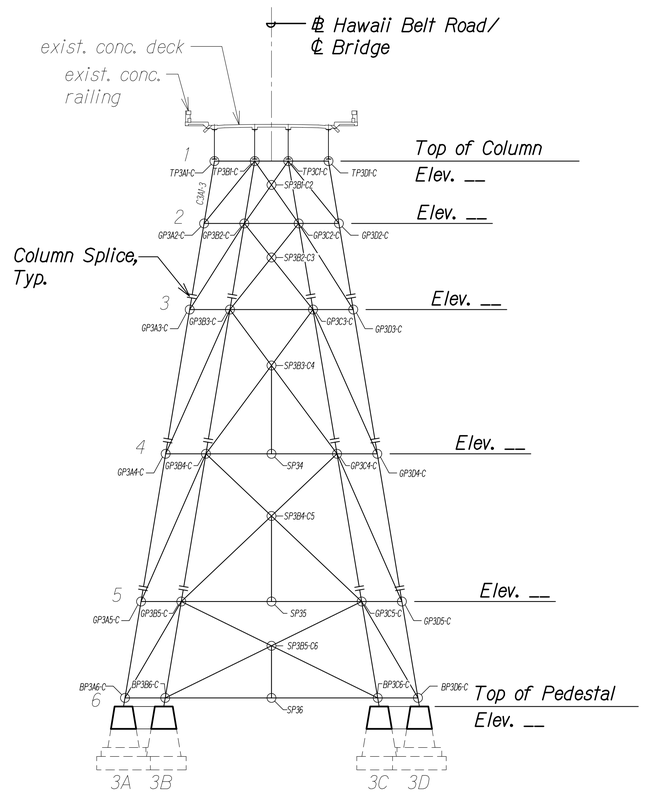
A SA4.13 | SA4.13



BENT NOS. 2 AND 3 ELEVATION - COLUMN LINE "D"

Scale: 1/16" = 1'-0"

B SA4.13 | SA4.13



BENT NO. 3 ELEVATION

Scale: 1/16" = 1'-0"

C SA4.13 | SA4.13

NOTE:

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SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE

ORIGINAL PLAN
NOTE BOOK
No.

DRAWING NAME: Z:\OD ENGINEERING\0_JF PROJECTS\22-001 12-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\SR-340410-340418 BEND CONN.DWG PLOT TIME: 03-29-24, 3:33 PM

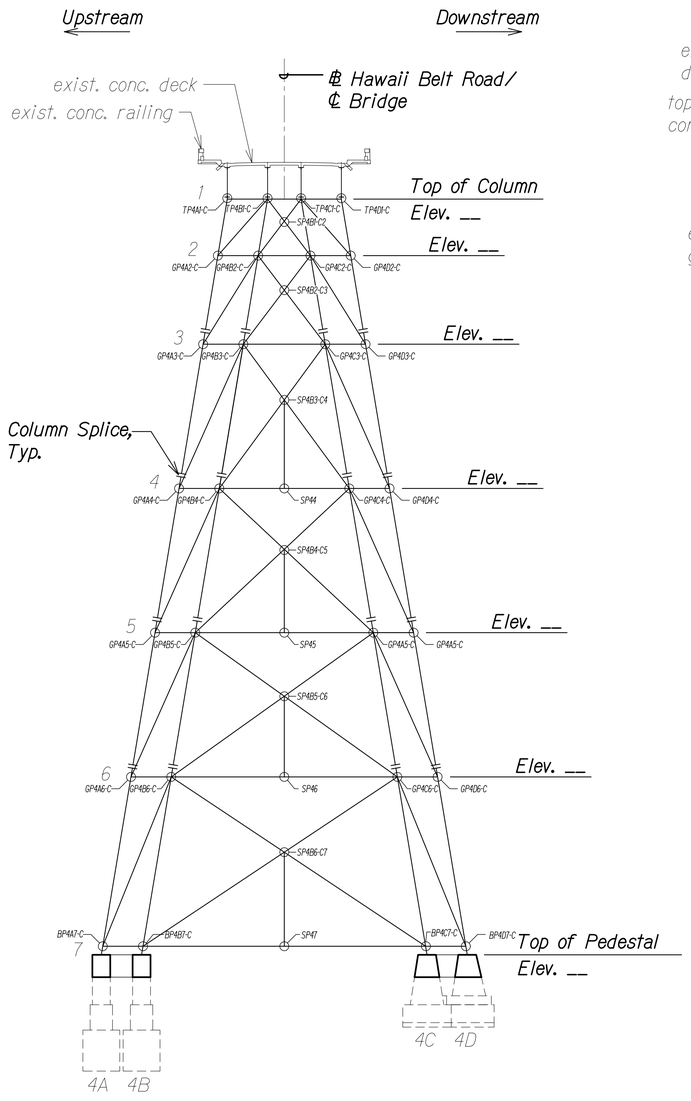
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BENT NOS. 2 AND 3 CONNECTION ELEVATIONS

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

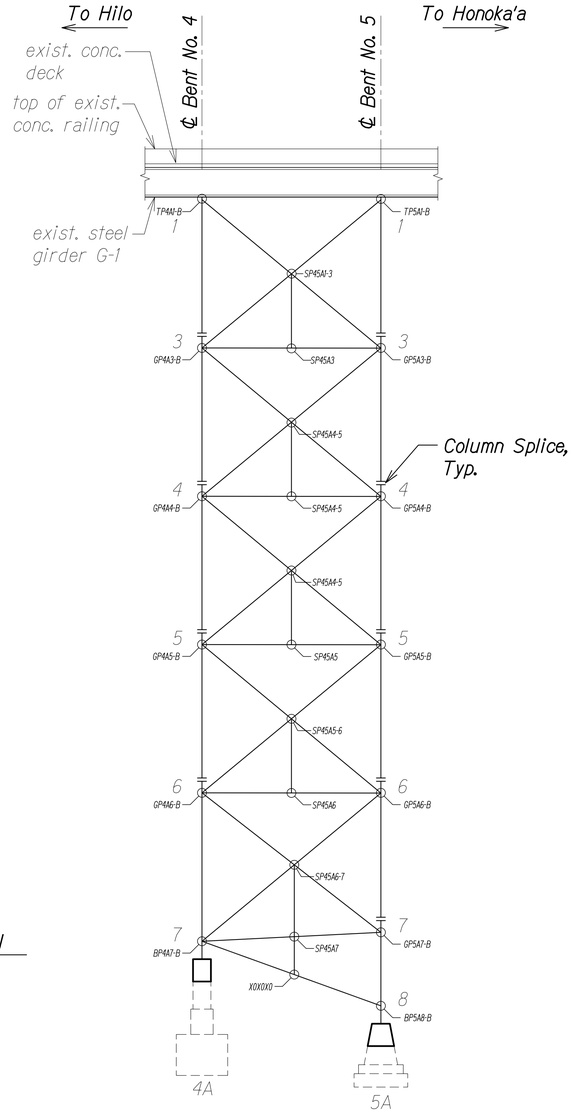
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



BENT NO. 4 ELEVATION

Scale: 1/16" = 1'-0"

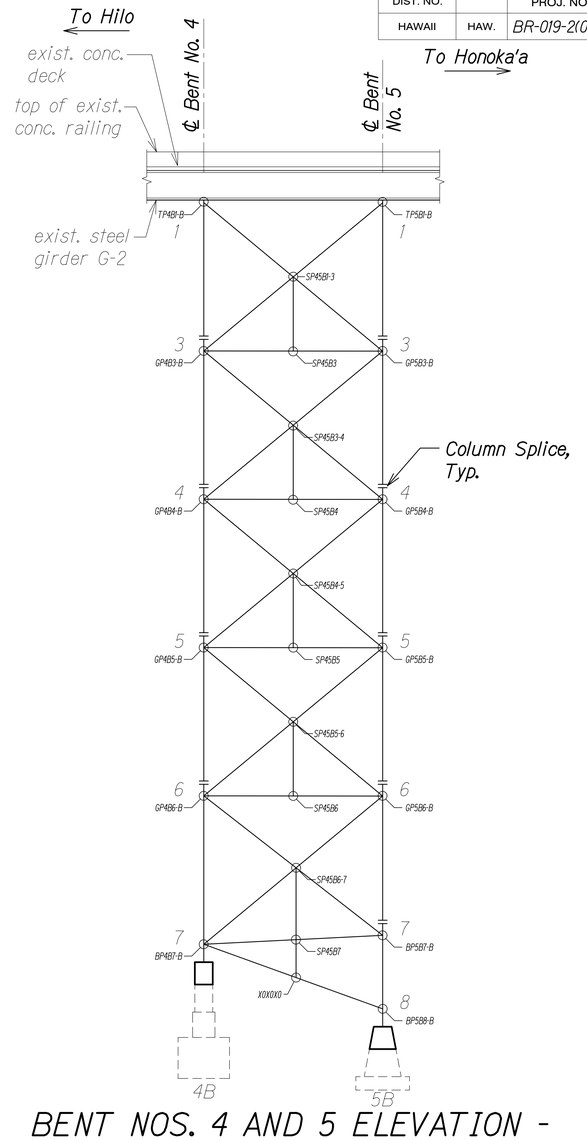
A SA4.14 | SA4.14



BENT NOS. 4 AND 5 ELEVATION - COLUMN LINE "A"

Scale: 1/16" = 1'-0"

B SA4.14 | SA4.14



BENT NOS. 4 AND 5 ELEVATION - COLUMN LINE "B"

Scale: 1/16" = 1'-0"

C SA4.14 | SA4.14

NOTE:

* Elevations will be finalized after in-depth survey information has been obtained at top of bent and at foundation pedestal locations.

ORIGINAL PLAN
NOTE BOOK
No.

SURVEY PLOTTED BY
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QUANTITIES BY
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DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BENT NOS. 4 AND 5 CONNECTION ELEVATIONS

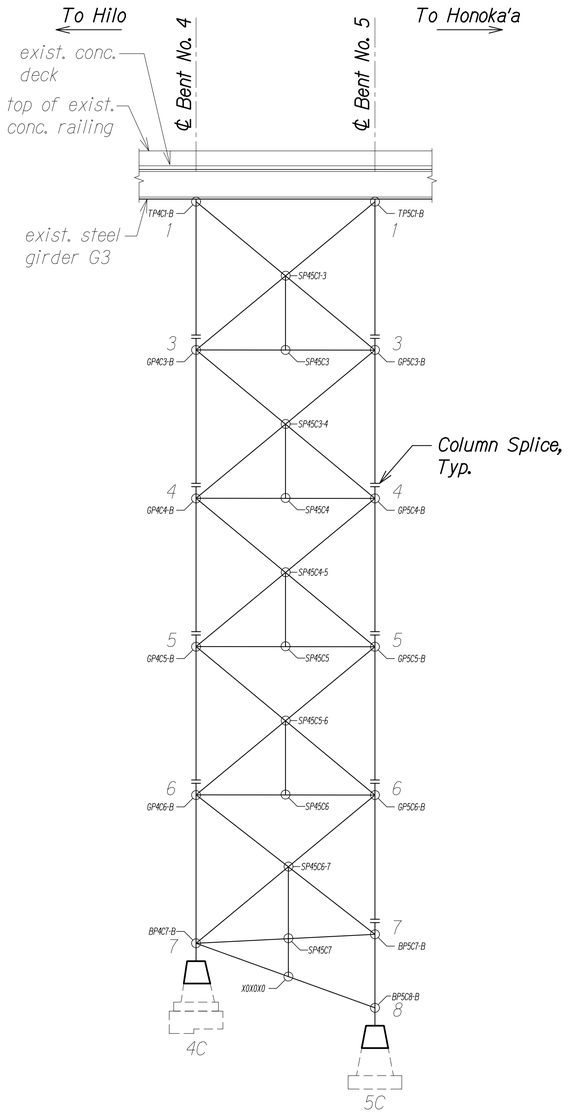
HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA4.14 OF 18 SHEETS

PLOT TIME: 03-29-24, 3:33 PM
DRAWING NAME: Z:\OD ONGOING\OD JF PROJECTS\22-001\12-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\NSR-SA0410-SA0418 BEND CONN.DWG

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



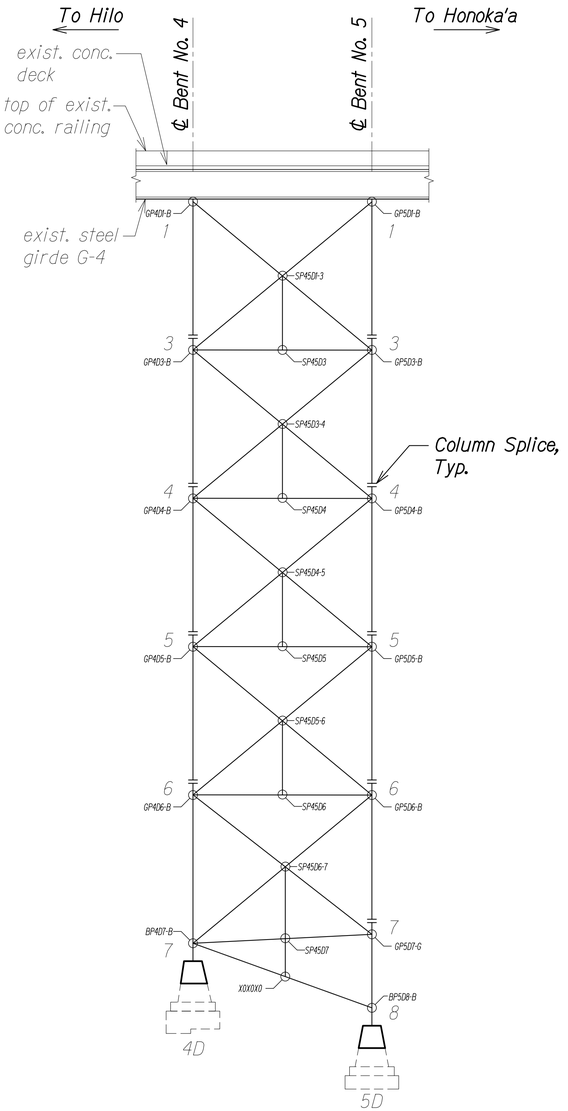
BENT NOS. 4 AND 5 ELEVATION - COLUMN LINE "C"

Scale: 1/16" = 1'-0"

A SA4.15 | SA4.15

NOTE:

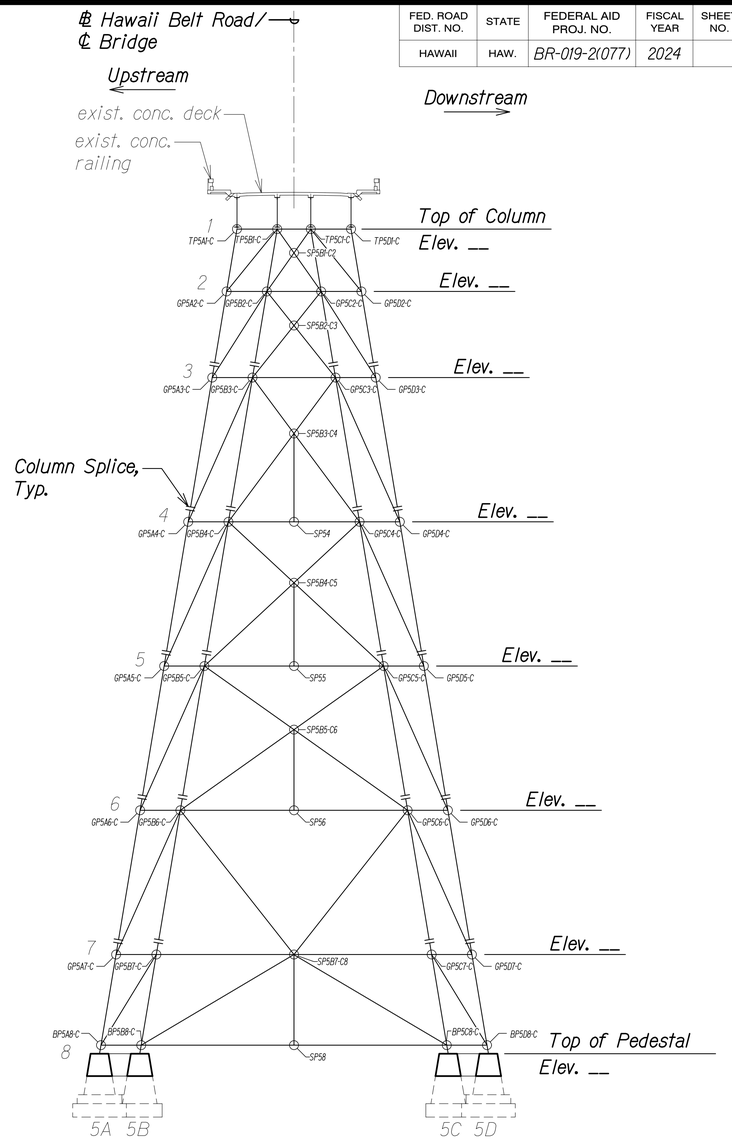
* Elevations will be finalized after in-depth survey information has been obtained at top of bent and at foundation pedestal locations.



BENT NOS. 4 AND 5 ELEVATION - COLUMN LINE "D"

Scale: 1/16" = 1'-0"

B SA4.15 | SA4.15



BENT NO. 5 ELEVATION

Scale: 1/16" = 1'-0"

C SA4.15 | SA4.15

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BENT NOS. 4 AND 5 CONNECTION ELEVATIONS

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA4.15 OF 18 SHEETS

ORIGINAL PLAN | NOTE BOOK No.
SURVEY PLOTTED BY
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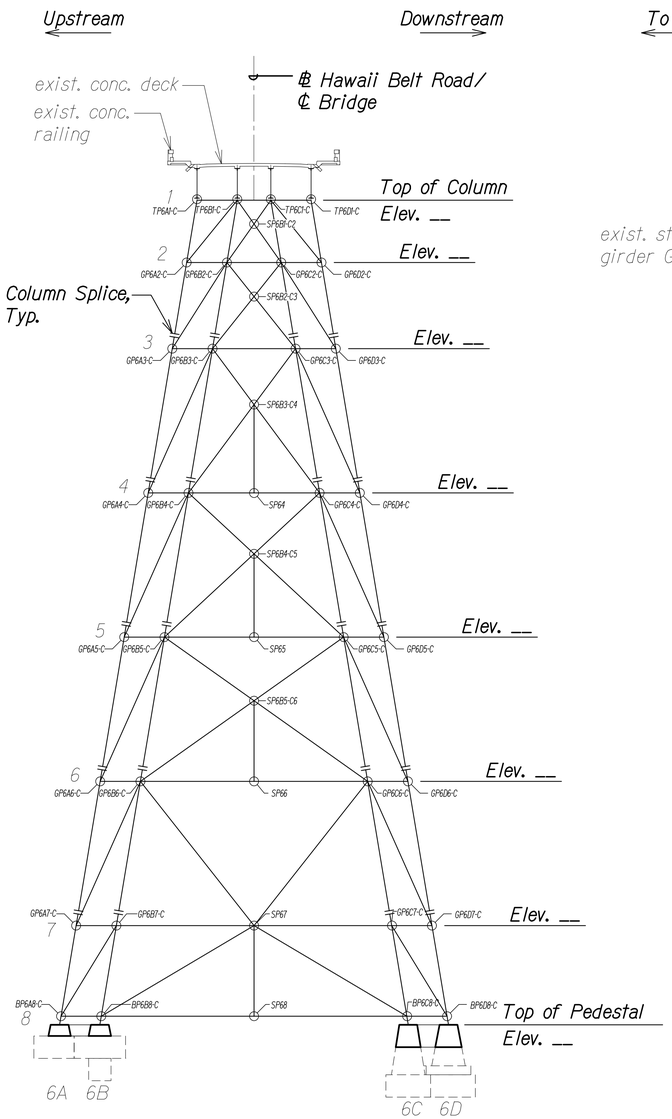
DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE

DRAWING NAME: Z:\OD ONGOING\OD JF PROJECTS\22-001.12-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\NSR-SA0410-SA0418 BEND CONN.DWG PLOT TIME: 03-29-24, 3:33 PM)

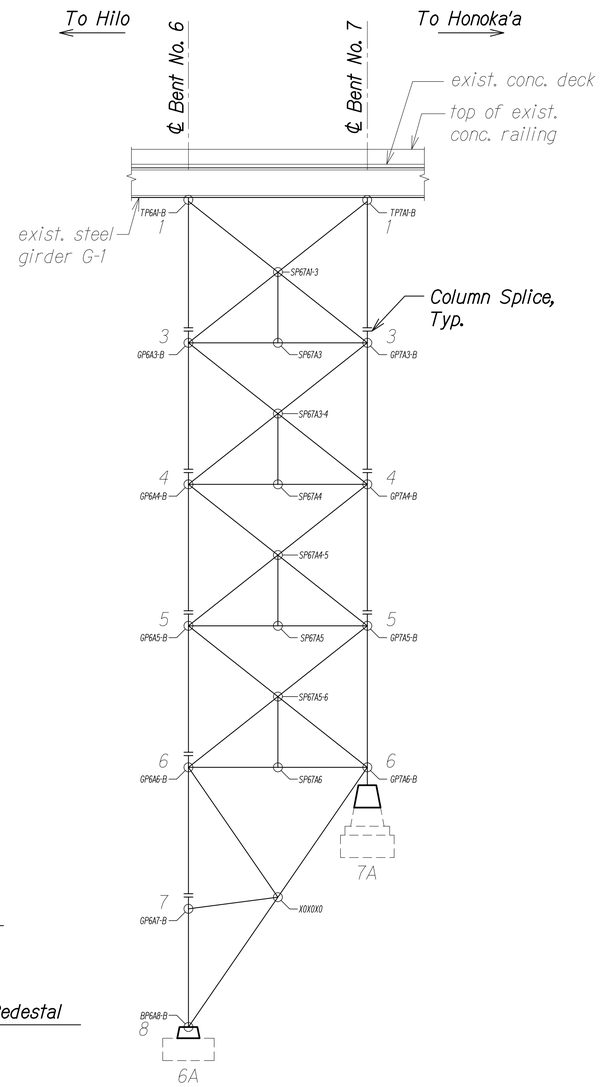
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



BENT NO. 6 ELEVATION

Scale: 1/16" = 1'-0"

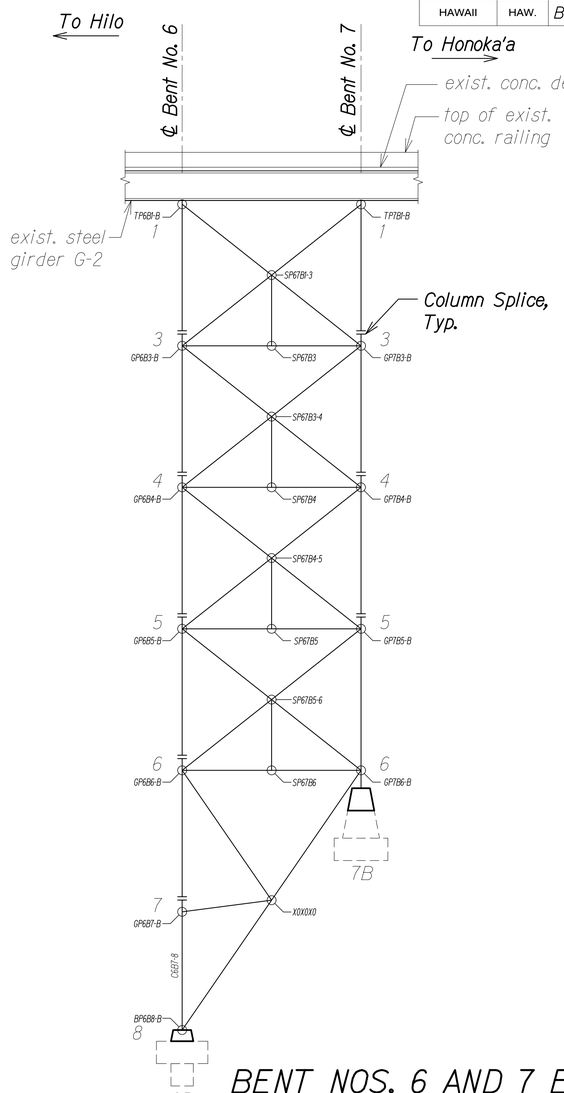
A SA4.16 | SA4.16



BENT NOS. 6 AND 7 ELEVATION - COLUMN LINE "A"

Scale: 1/16" = 1'-0"

B SA4.16 | SA4.16



BENT NOS. 6 AND 7 ELEVATION - COLUMN LINE "B"

Scale: 1/16" = 1'-0"

C SA4.16 | SA4.16

NOTE:

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ORIGINAL PLAN
NOTE BOOK No.
SURVEY PLOTTED BY
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BENT NOS. 6 AND 7 CONNECTION ELEVATIONS

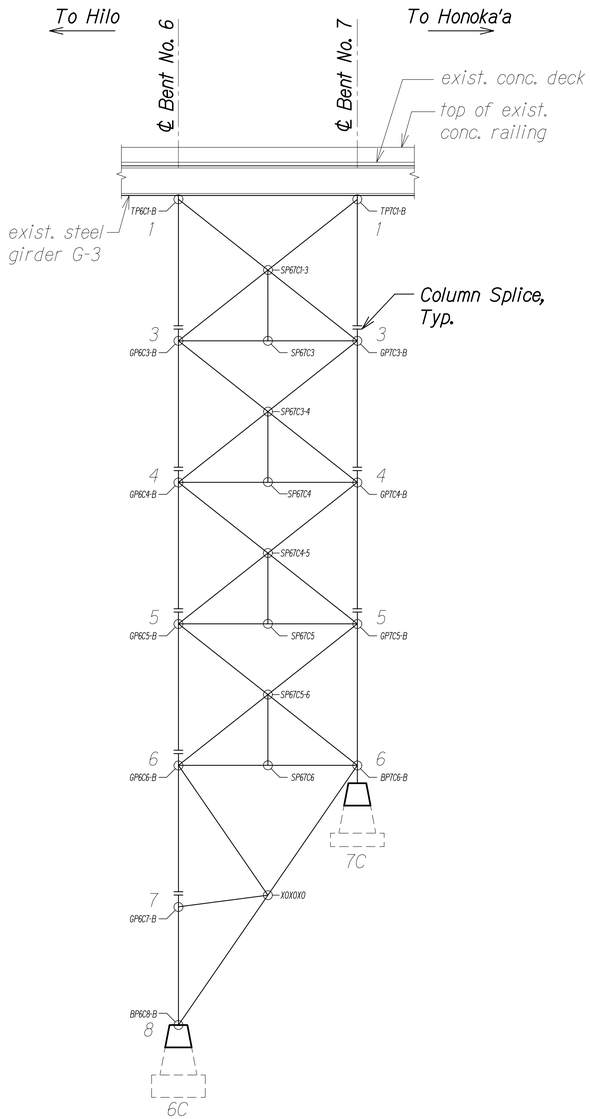
HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

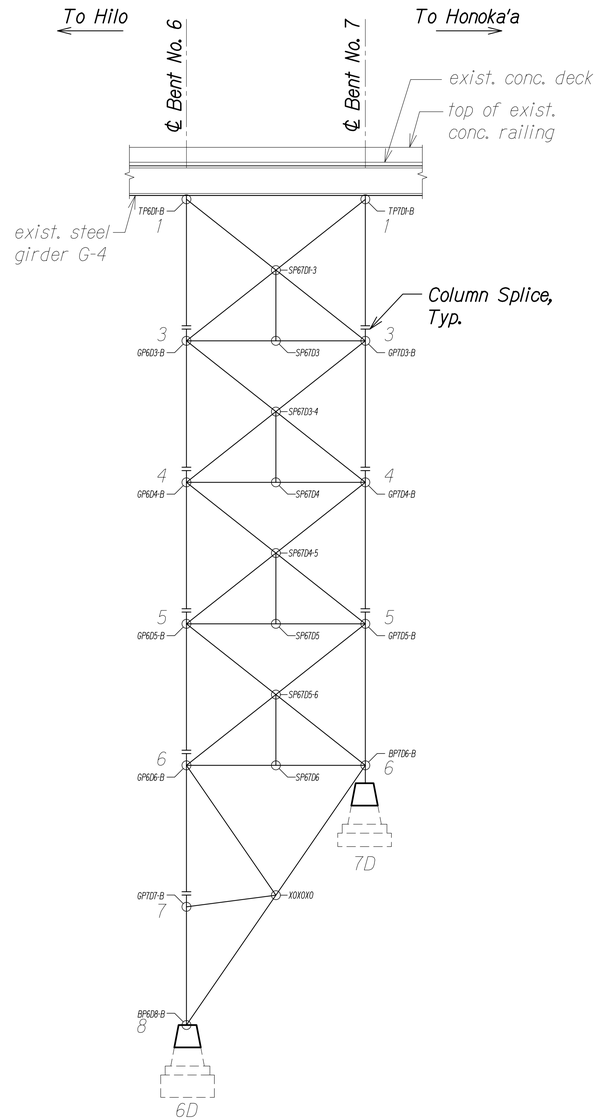
Scale: As Noted Date: Mar. 2024

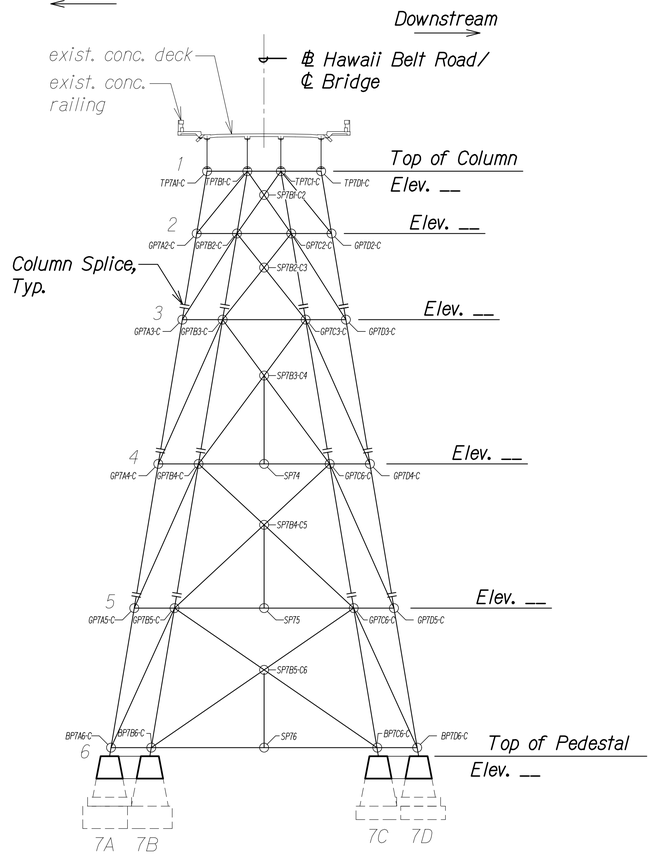
SHEET No. SA4.16 OF 18 SHEETS

DRAWING NAME: Z:\OD ONGOING\OD_JF_PROJECTS\22-001.12-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\NSR-SA0410-SA0418 BEND CONN.DWG PLOT TIME: 03-29-24, 3:33 PM

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		







BENT NOS. 6 AND 7 ELEVATION - COLUMN LINE "C"

Scale: 1/16" = 1'-0"

A SA4.17 | SA4.17

BENT NOS. 6 AND 7 ELEVATION - COLUMN LINE "D"

Scale: 1/16" = 1'-0"

B SA4.17 | SA4.17

BENT NO. 7 ELEVATION

Scale: 1/16" = 1'-0"

C SA4.17 | SA4.17

NOTE:

* Elevations will be finalized after in-depth survey information has been obtained at top of bent and at foundation pedestal locations.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
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	DESIGNED BY	
	QUANTITIES BY	
No.	CHECKED BY	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

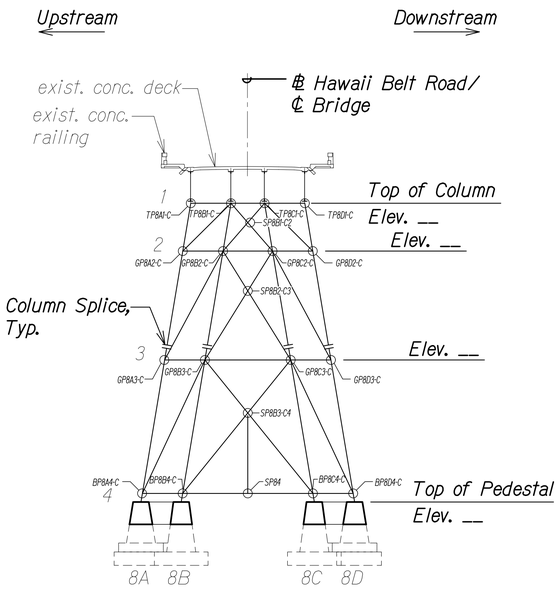
BENT NOS. 6 AND 7 CONNECTION ELEVATIONS

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA4.17 OF 18 SHEETS

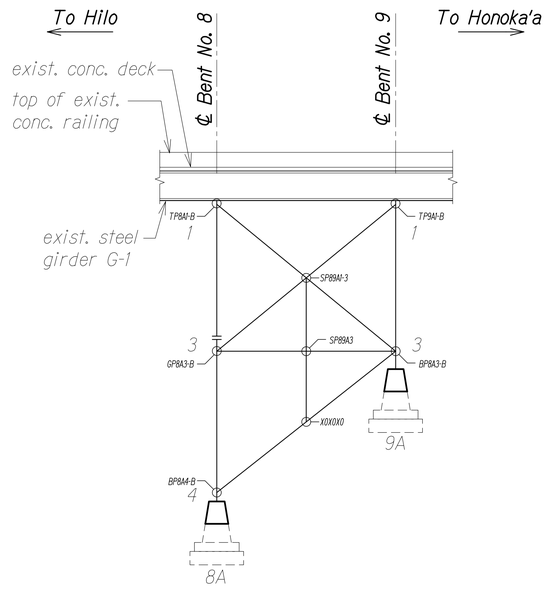
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



BENT NO. 8 ELEVATION (A)

Scale: 1/16" = 1'-0"

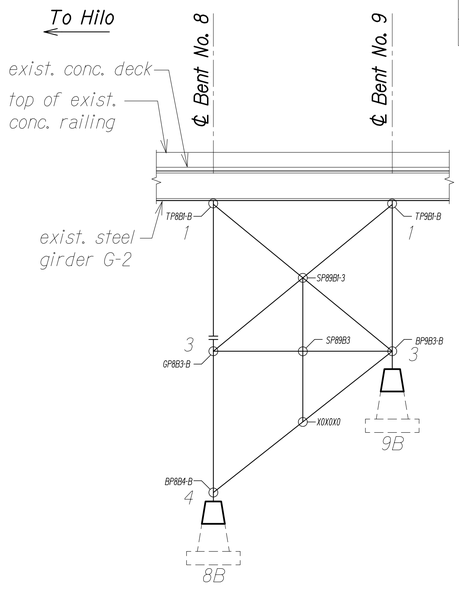
SA4.18 | SA4.18



BENT NOS. 8 AND 9 ELEVATION COLUMN LINE "A" (B)

Scale: 1/16" = 1'-0"

SA4.18 | SA4.18



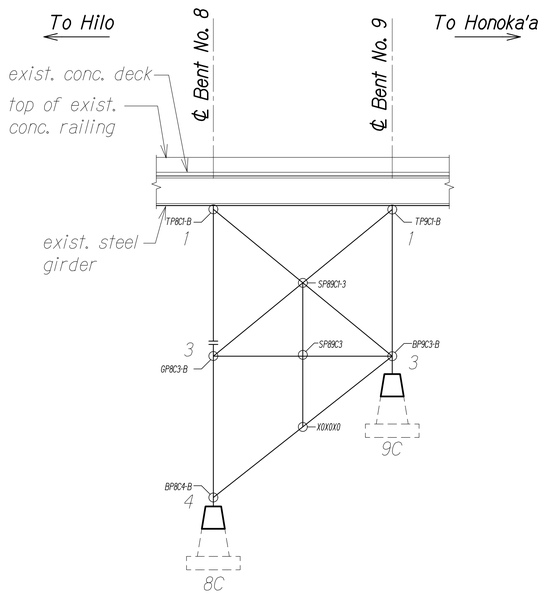
BENT NOS. 8 AND 9 ELEVATION COLUMN LINE "B" (C)

Scale: 1/16" = 1'-0"

SA4.18 | SA4.18

NOTE:

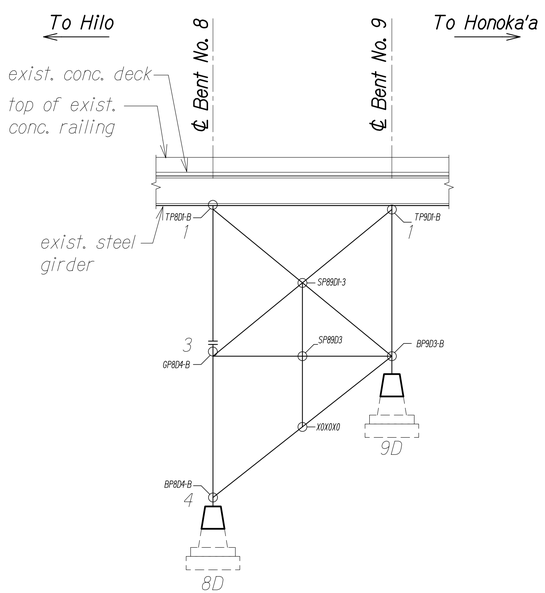
* Elevations will be finalized after in-depth survey information has been obtained at top of bent and at foundation pedestal locations.



BENT NOS. 8 AND 9 ELEVATION - COLUMN LINE "C" (D)

Scale: 1/16" = 1'-0"

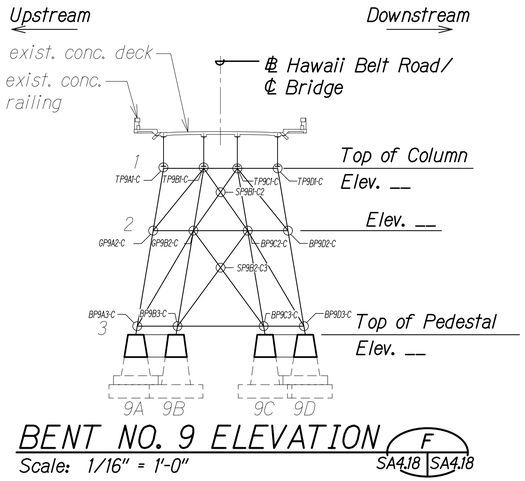
SA4.18 | SA4.18



BENT NOS. 8 AND 9 ELEVATION - COLUMN LINE "D" (E)

Scale: 1/16" = 1'-0"

SA4.18 | SA4.18



BENT NO. 9 ELEVATION (F)

Scale: 1/16" = 1'-0"

SA4.18 | SA4.18

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BENT NOS. 8 AND 9 CONNECTION ELEVATIONS

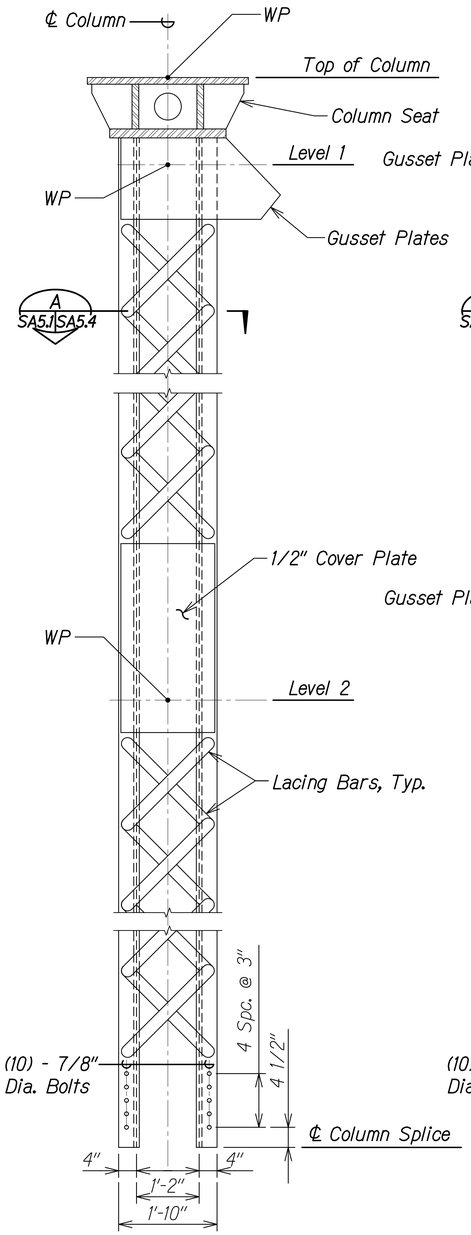
HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA4.18 OF 18 SHEETS

ORIGINAL PLAN | NOTE BOOK No. | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		

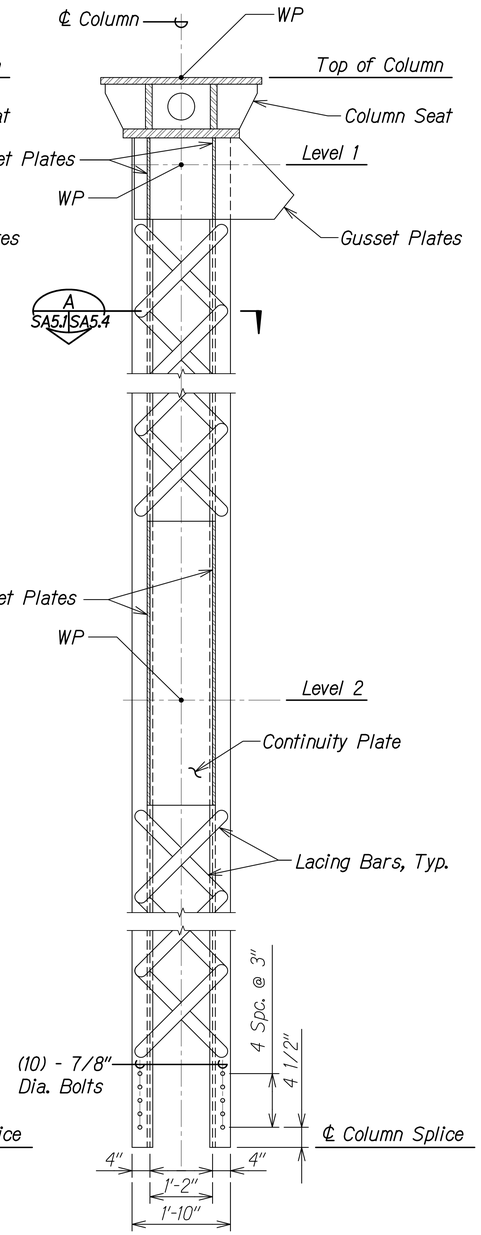


ELEVATION A

Scale: 3/4" = 1'-0" SA5.1 | SA5.4

NOTE:

Typical at upstream face of Column Line A or downstream face of Column Line D.

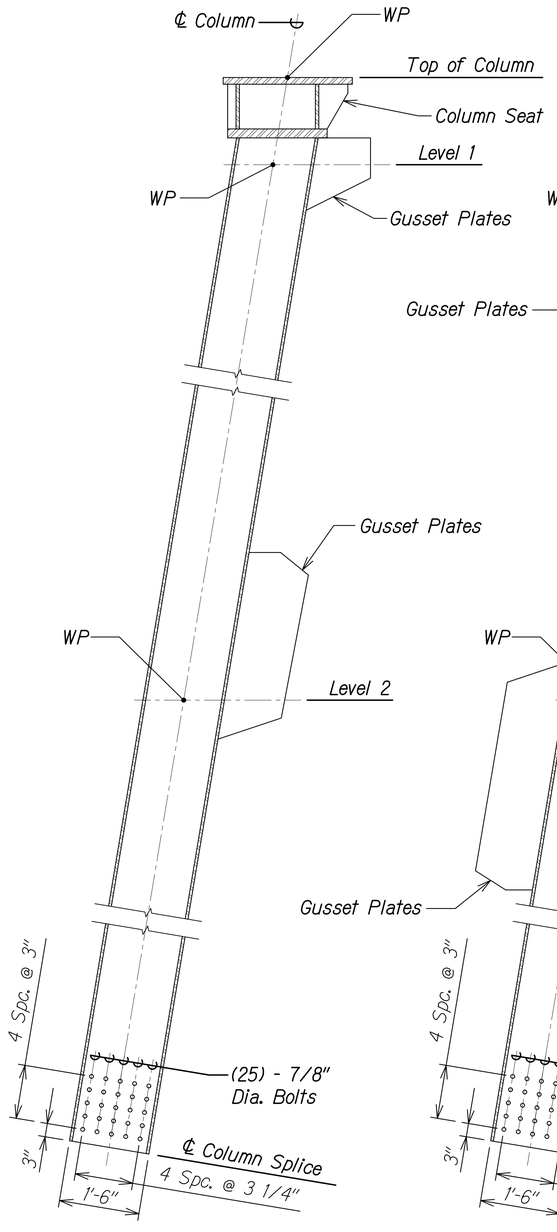


ELEVATION B

Scale: 3/4" = 1'-0" SA5.1 | SA5.4

NOTE:

Typical at all faces of Column Lines B and C, downstream face of Column Line A, and upstream face of Column Line D.

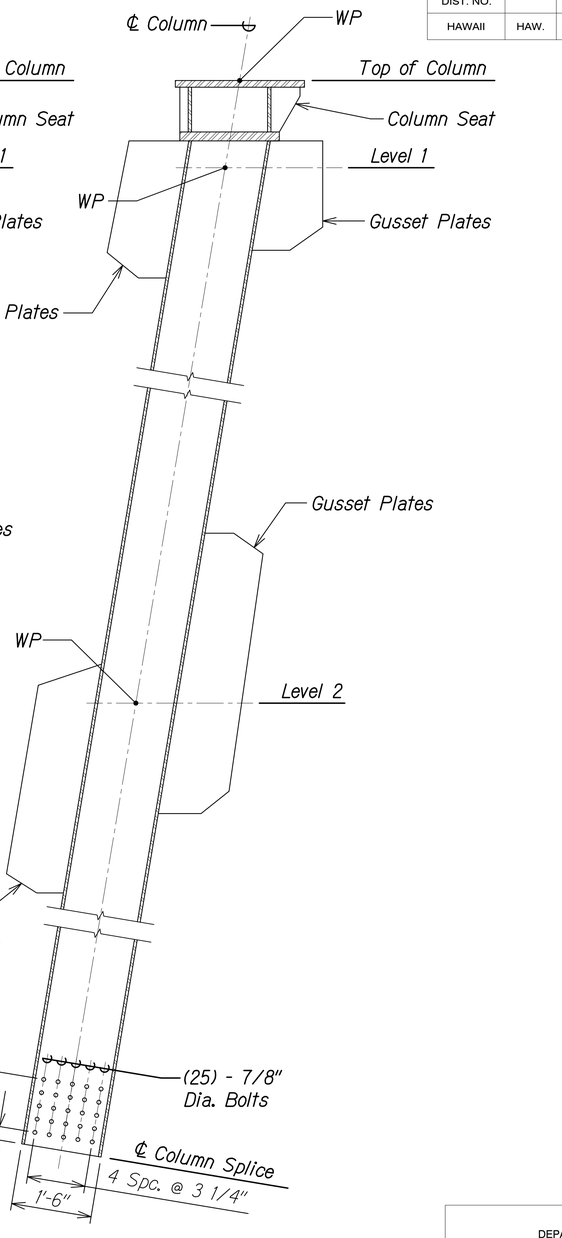


ELEVATION C

Scale: 3/4" = 1'-0" SA5.1 | SA5.4

NOTE:

Typical at Column Lines A and D.



ELEVATION D

Scale: 3/4" = 1'-0" SA5.1 | SA5.4

NOTE:

Typical at Column Lines B and C.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UPPER COLUMN ELEVATIONS

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA5.1 OF 22 SHEETS

ORIGINAL PLAN
NOTE BOOK
No.

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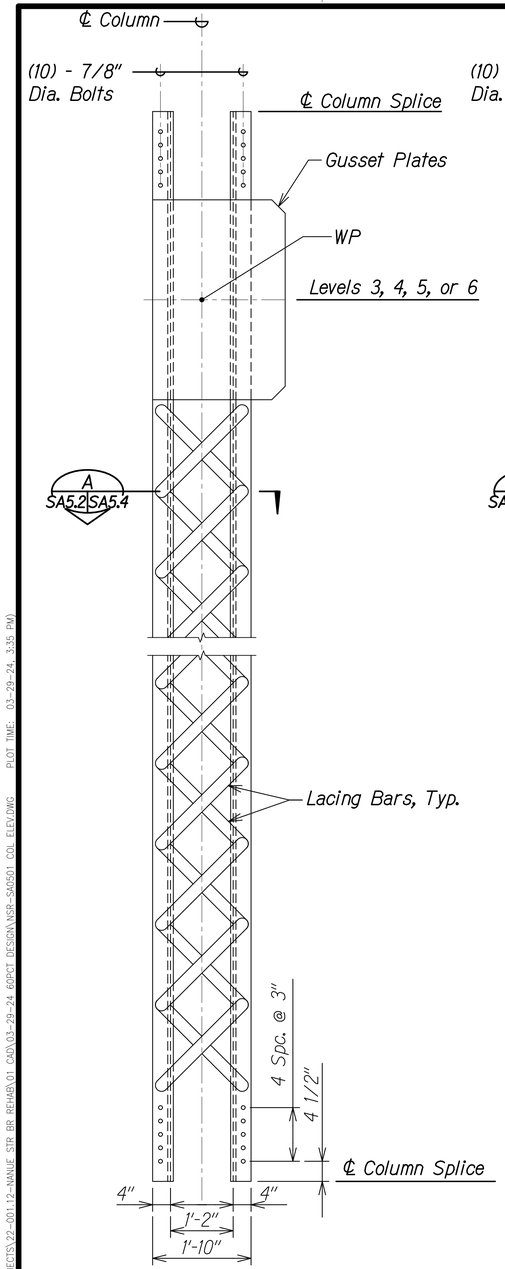
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		

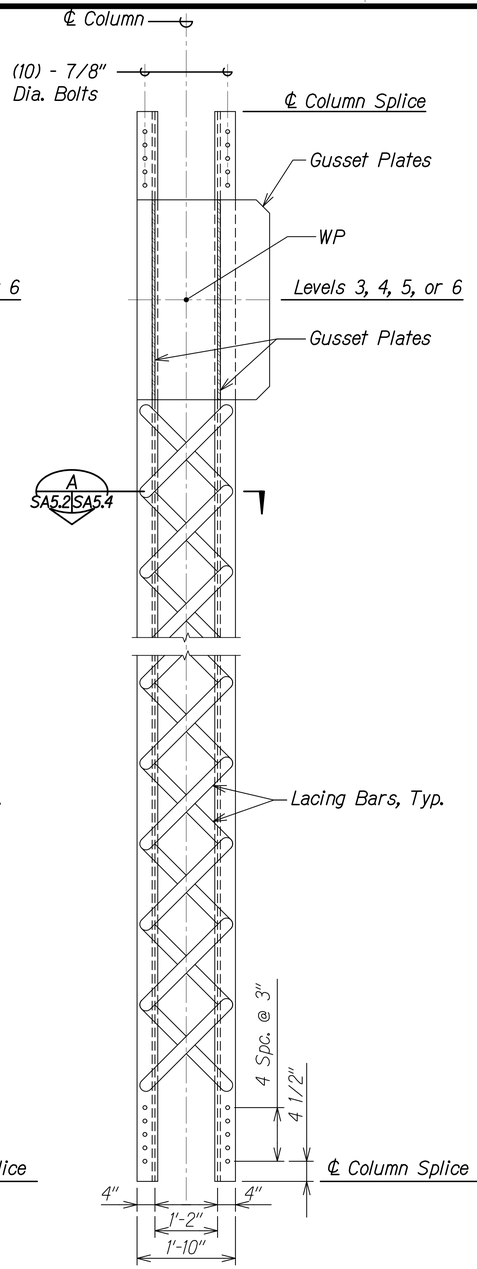


ELEVATION A

Scale: 3/4" = 1'-0" SA5.2 SA5.2

NOTE:

Typical at upstream face of Column Line A or downstream face of Column Line D.

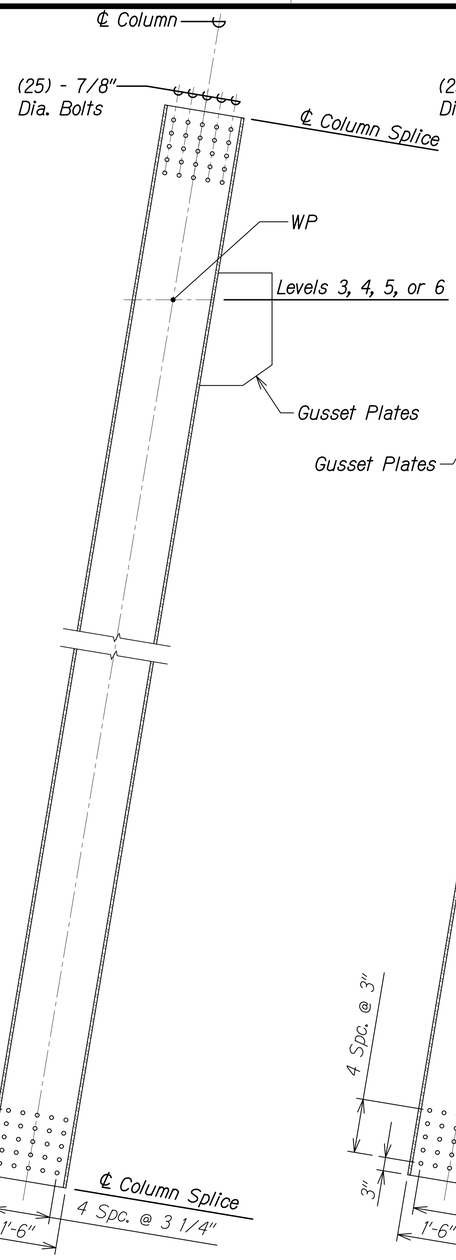


ELEVATION B

Scale: 3/4" = 1'-0" SA5.2 SA5.2

NOTE:

Typical at all faces of Column Lines B and C, downstream face of Column Line A, and upstream face of Column Line D.

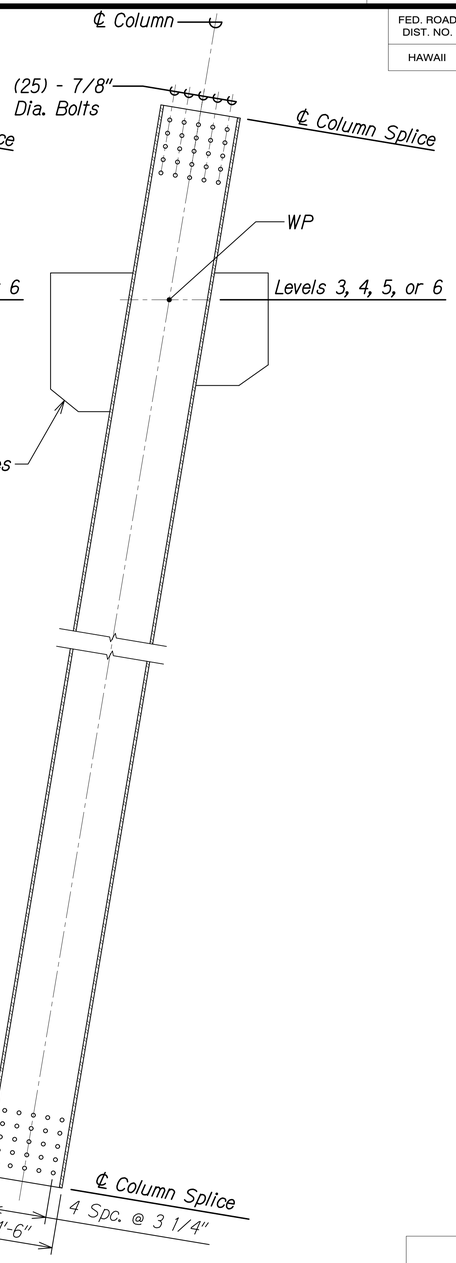


ELEVATION C

Scale: 3/4" = 1'-0" SA5.2 SA5.2

NOTE:

Typical at Column Lines A and D.



ELEVATION D

Scale: 3/4" = 1'-0" SA5.2 SA5.2

NOTE:

Typical at Column Lines B and C.

ORIGINAL PLAN
NOTE BOOK
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SURVEY PLOTTED BY
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DRAWING NAME: Z:\OD ONGOING\OD JF PROJECTS\22-001.12-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\NSR-SA0501 COL ELEV.DWG PLOT TIME: 03-29-24, 3:36 PM

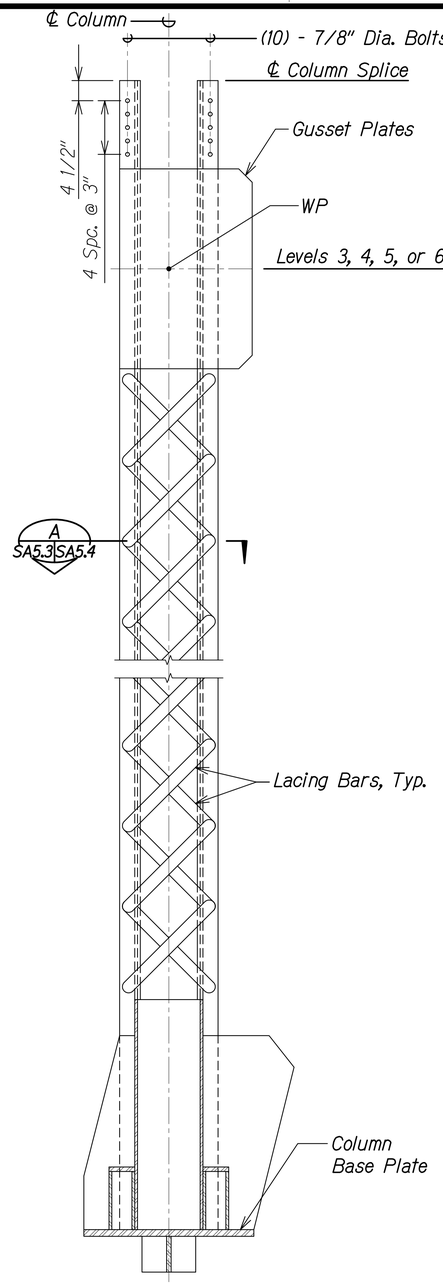
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPICAL COLUMN ELEVATIONS

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		

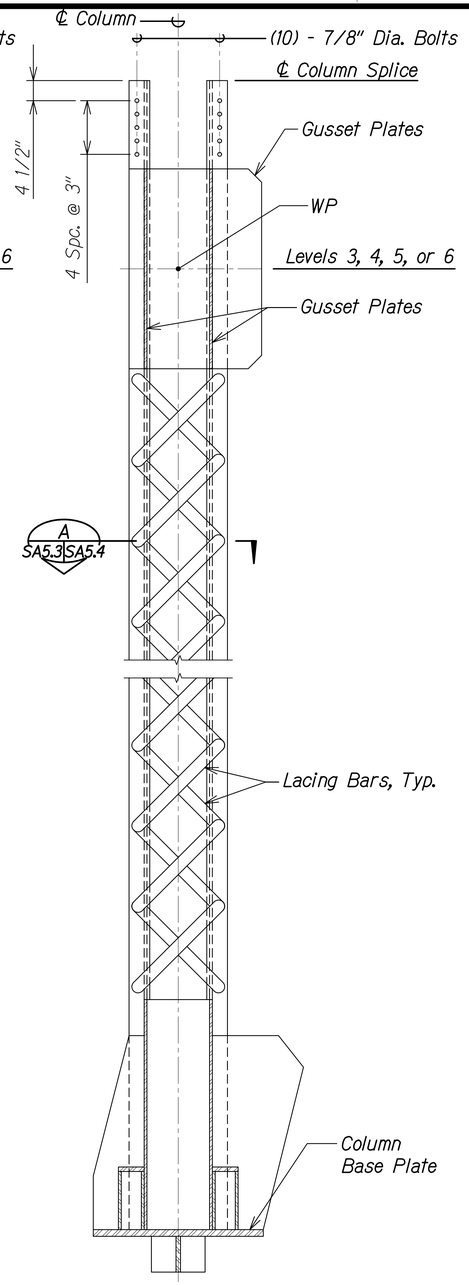


ELEVATION A

Scale: 3/4" = 1'-0" SA5.3 SA5.3

NOTE:

Typical at upstream face of Column Line A or downstream face of Column Line D.

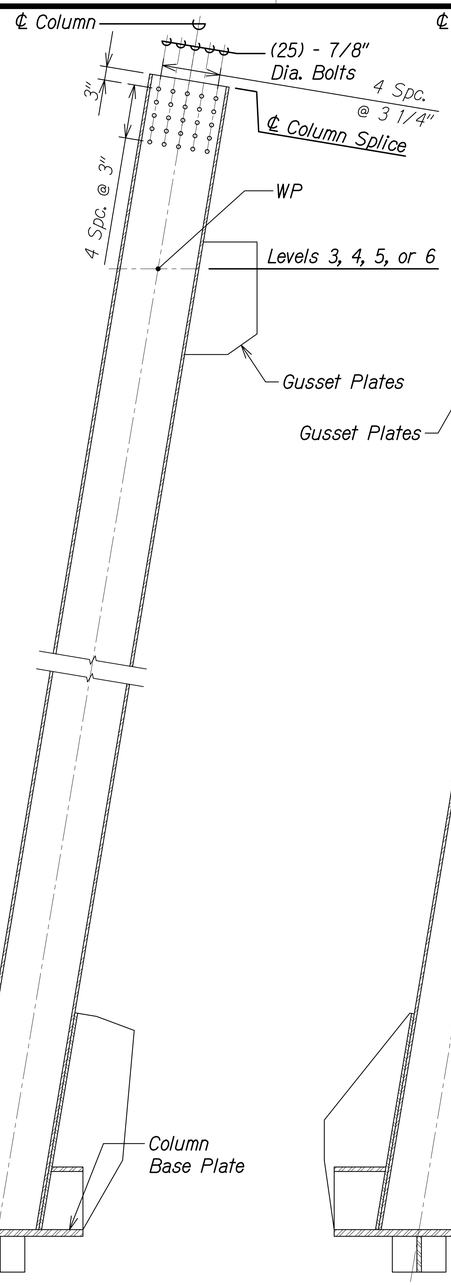


ELEVATION B

Scale: 3/4" = 1'-0" SA5.3 SA5.3

NOTE:

Typical at all faces of Column Lines B and C, downstream face of Column Line A, and upstream face of Column Line D.

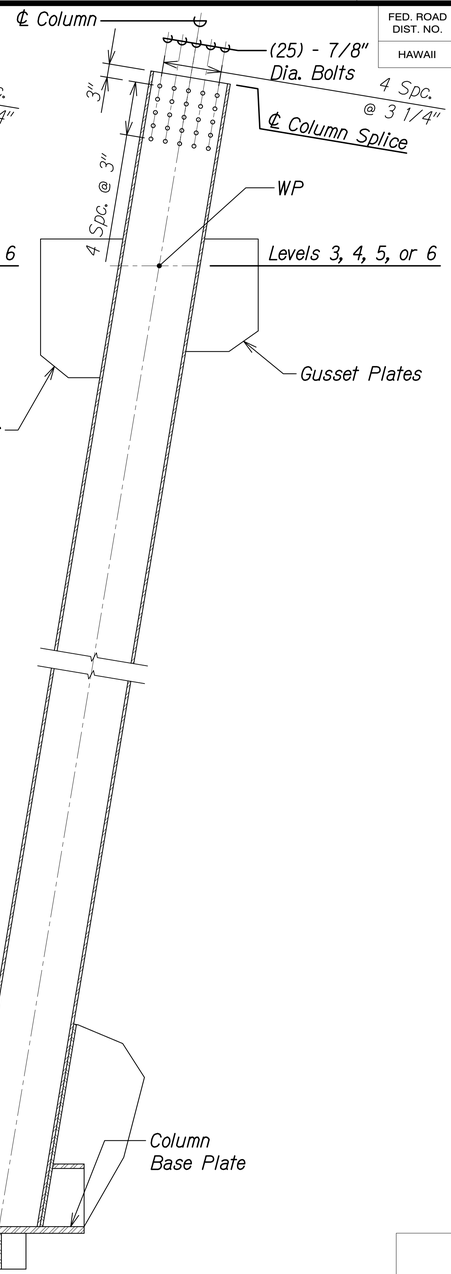


ELEVATION C

Scale: 3/4" = 1'-0" SA5.3 SA5.3

NOTE:

Typical at Column Lines A and D.



ELEVATION D

Scale: 3/4" = 1'-0" SA5.3 SA5.3

NOTE:

Typical at Column Lines B and C.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

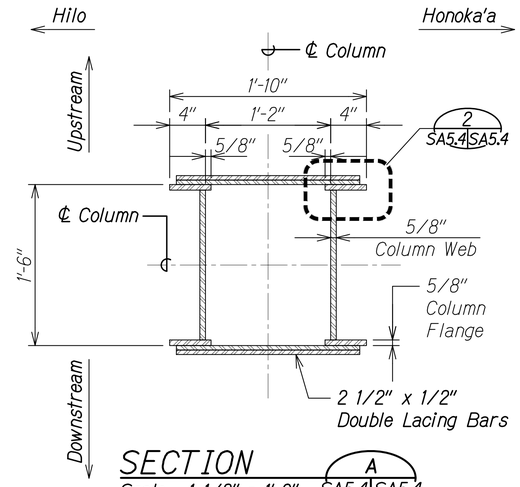
LOWER COLUMN ELEVATIONS

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

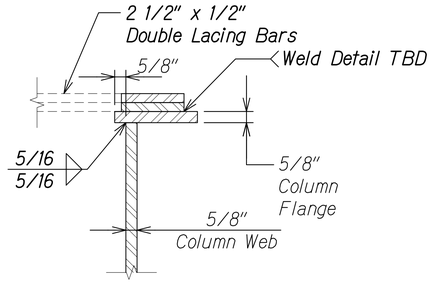
Scale: As Noted Date: Mar. 2024

SHEET No. SA5.3 OF 22 SHEETS

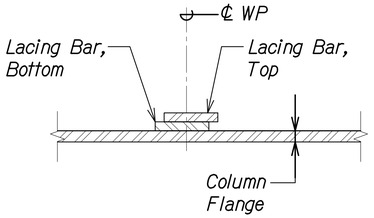
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024	00	



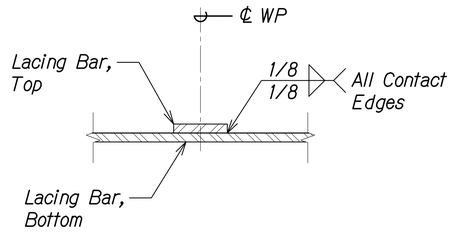
SECTION A
Scale: 1 1/2" = 1'-0"
SA5.4 | SA5.4



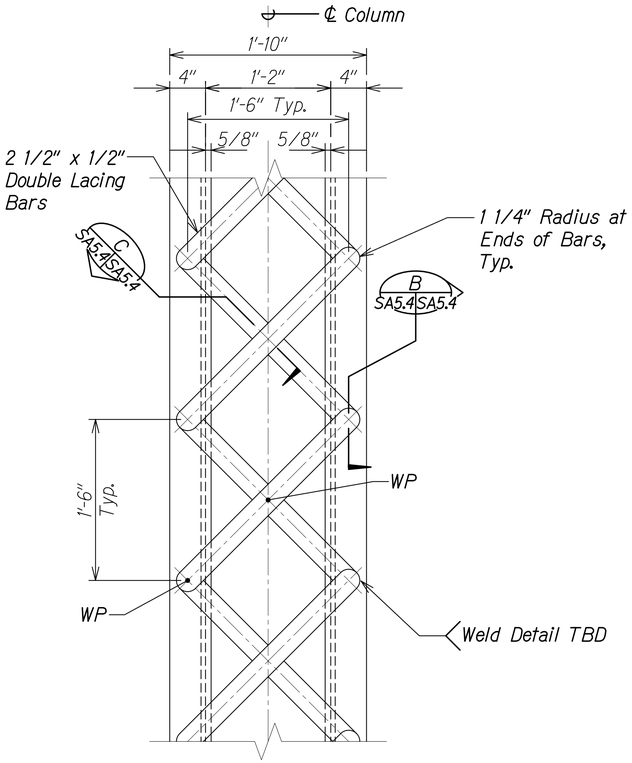
DETAIL 2
Scale: 3" = 1'-0"
SA5.4 | SA5.4



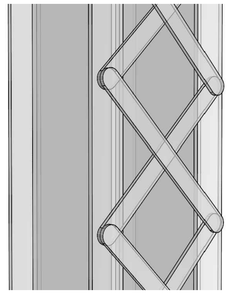
SECTION B
Scale: 3" = 1'-0"
SA5.4 | SA5.4



SECTION C
Scale: 3" = 1'-0"
SA5.4 | SA5.4



LACING BAR
ELEVATION DETAIL 1
Scale: 1 1/2" = 1'-0"
SA5.4 | SA5.4



LACING RENDERING DETAIL 3
NTS
SA5.4 | SA5.4

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	DESIGNED BY
No.	QUANTITIES BY
	CHECKED BY
	DATE

BRAWING NAME: Z:\OD ONGOING\OD JF PROJECTS\22-001.12-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\SR-SA0504 COL DET.DWG PLOT TIME: 03-29-24 3:36 PM)

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

COLUMN SECTIONS AND DETAILS

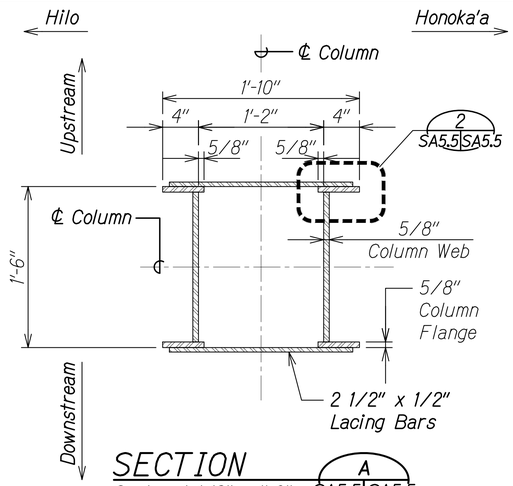
HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

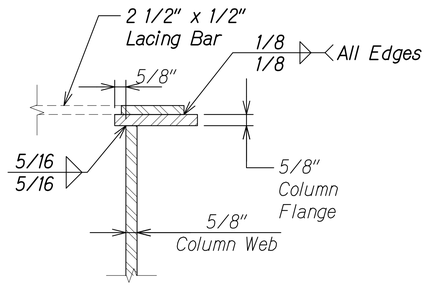
SHEET No. SA5.4 OF 22 SHEETS

00

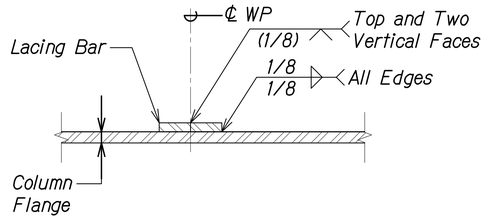
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024	00	



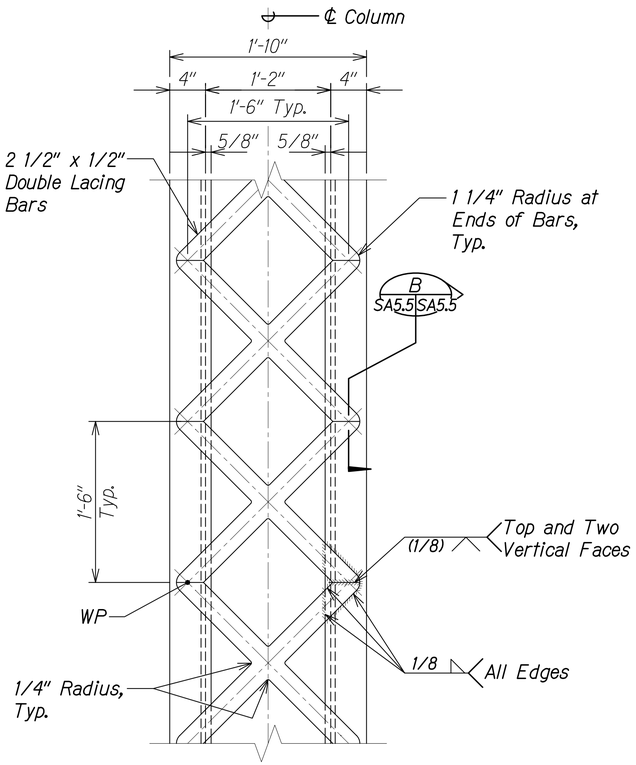
SECTION A
Scale: 1 1/2" = 1'-0" SA5.5|SA5.5



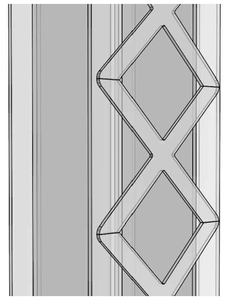
DETAIL 2
Scale: 3" = 1'-0" SA5.5|SA5.5



SECTION B
Scale: 3" = 1'-0" SA5.5|SA5.5



LACING BAR
ELEVATION DETAIL 1
Scale: 1 1/2" = 1'-0" SA5.5|SA5.5



LACING RENDERING DETAIL 3
NTS SA5.5|SA5.5

NOTE:

* These alternative details for lacing bar fabrication and attachment may be used in lieu of the details shown on sheet SA5.4. Details will be finalized at the time of 90% design.

ORIGINAL PLAN
NOTE BOOK No.
SURVEY PLOTTED BY
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DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ALTERNATIVE COLUMN SECTIONS AND DETAILS

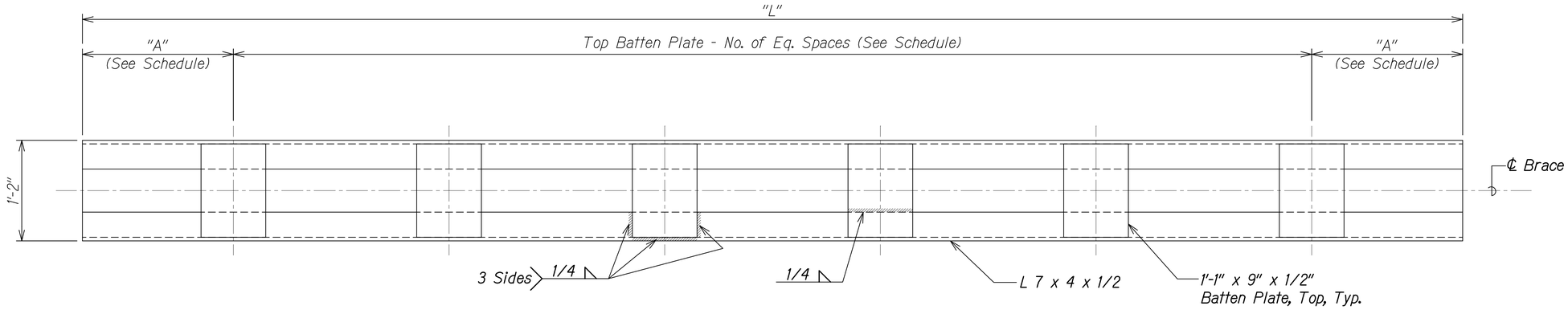
HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

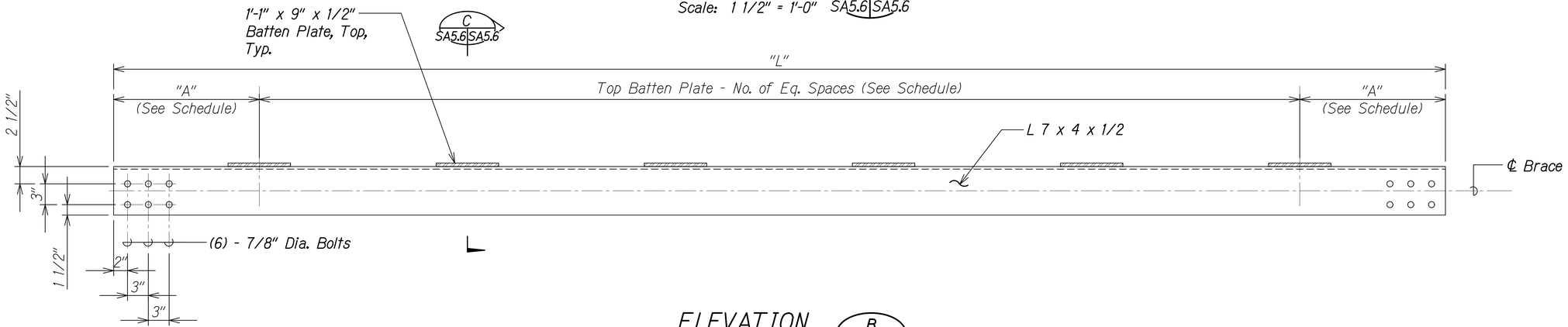
SHEET No. SA5.5 OF 22 SHEETS

00

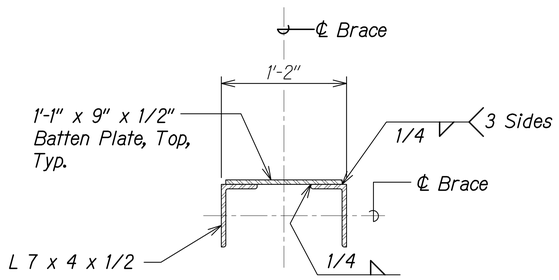
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024	00	



PLAN
Scale: 1 1/2" = 1'-0"
A SA5.6 | SA5.6



ELEVATION
Scale: 1 1/2" = 1'-0"
B SA5.6 | SA5.6



SECTION
Scale: 1 1/2" = 1'-0"
C SA5.6 | SA5.6

BENT UPPER INTERIOR DIAGONAL BRACING

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DIAGONAL BRACE PLAN, ELEVATION AND SECTION

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA5.6 OF 22 SHEETS

00

ORIGINAL PLAN | NOTE BOOK | No.
SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024	00	

BENT UPPER INTERIOR DIAGONAL BRACE SCHEDULE

	MEMBER ID	"A"	TOP BATTEN PLATE SPACES	BOTTOM BATTEN PLATE SPACES
BENT NO. 1	X1B1-C2	2'-0"	3 Eq. Spaces	2 Eq. Spaces
	X1C1-B2			
	X1B2-C1			
	X1C2-B1			
	X1B2-C3			
	X1C2-B3			
	X1B3-C2			
	X1C3-B2			
BENT NO. 2	X2B1-C2	2'-0"	3 Eq. Spaces	2 Eq. Spaces
	X2C1-B2			
	X2B2-C1			
	X2C2-B1			
	X2B2-C3			
	X2C2-B3			
	X2B3-C2			
	X2C3-B2			
	X2B3-C4			
	X2C3-B4			
	X2B4-C3			
	X2C4-B3			
	X2B4-C5			
	X2C4-C5			
	X2B5-C4			
	X2C5-B4			
BENT NO. 3	X3B1-C2	2'-0"	3 Eq. Spaces	2 Eq. Spaces
	X3C1-B2			
	X3B2-C1			
	X3C2-B1			
	X3B2-C3			
	X3C2-B3			
	X3B3-C2			
	X3C3-B2			
	X3B3-C4			
	X3C3-B4			
	X3B4-C3			
	X3C4-B3			
	X3B4-C5			
	X3C4-B5			
	X3B5-C4			
	X3C5-B4			
	X3B4-C6			
	X3C5-B6			
	X3B6-C5			
	X3C6-B5			

BENT UPPER INTERIOR DIAGONAL BRACE SCHEDULE

	MEMBER ID	"A"	TOP BATTEN PLATE SPACES	BOTTOM BATTEN PLATE SPACES
BENT NO. 4	X4B1-C2	2'-0"	3 Eq. Spaces	2 Eq. Spaces
	X4C1-B2			
	X4B2-C1			
	X4C2-B1			
	X4B2-C3			
	X4C2-B3			
	X4B3-C2			
	X4C3-B2			
	X4B3-C4			
	X4C3-B4			
	X4B4-C3			
	X4C4-B3			
	X4B4-C5			
	X4C4-B5			
	X4B5-C4			
	X4C5-B4			
	X4B5-C6			
	X4C5-B6			
	X4B6-C5			
	X4C6-B5			
BENT NO. 5	X5B1-C2	2'-0"	3 Eq. Spaces	2 Eq. Spaces
	X5C1-B2			
	X5B2-C1			
	X5C2-B1			
	X5B2-C3			
	X5C2-B3			
	X5B3-C2			
	X5C3-B2			
	X5B3-C4			
	X5C3-B4			
	X5B4-C3			
	X4C4-B3			
	X5B4-C5			
	X5C4-B5			
	X5B5-C4			
	X5C5-B4			
	X5B5-C6			
	X5C5-B6			
	X5B6-C5			
	X5C6-B5			

NOTE:

Table values will be populated when in depth survey of foundation and top of bent has been received.

ORIGINAL PLAN
NOTE BOOK No.
SURVEY PLOTTED BY DATE
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DIAGONAL BRACE SCHEDULE

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA5.7 OF 22 SHEETS

00

DRAWING NAME: Z:\OD ONCONCO OF PROJECTS\22-001 12-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\SR-SA5606 BMD BRACE DTLS.DWG PLOT TIME: 03-29-24, 5:23 PM

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024	00	

BENT UPPER INTERIOR DIAGONAL BRACE SCHEDULE

	MEMBER ID	"A"	TOP BATTEN PLATE SPACES	BOTTOM BATTEN PLATE SPACES
BENT NO. 6	X6B1-C2	2'-0"	3 Eq. Spaces	2 Eq. Spaces
	X6C1-B2			
	X6B2-C1			
	X6C2-B1			
	X6B2-C3			
	X6C2-B3			
	X6B3-C2			
	X6C3-B2			
	X6B3-C4			
	X6C3-B4			
	X6B4-C3			
	X6C4-B3			
	X6B4-C5			
	X6C4-B5			
	X6B5-C4			
	X6C5-B4			
	X6B5-C6			
	X6C5-B6			
	X6B6-C5			
	X6C6-B5			
BENT NO. 7	X7B1-C2	2'-0"	3 Eq. Spaces	2 Eq. Spaces
	X7C1-B2			
	X7B2-C1			
	X7C2-B1			
	X7B2-C3			
	X7C2-B3			
	X7B3-C2			
	X7C3-B2			
	X7B3-C4			
	X7C3-B4			
	X7B4-C3			
	X7C4-B3			
	X7B4-C5			
	X7C4-B5			
	X7B5-C4			
	X7C5-B4			
	X7B5-C6			
	X7C5-B6			
	X7B6-C5			
	X7C6-B5			

BENT UPPER INTERIOR DIAGONAL BRACE SCHEDULE

	MEMBER ID	"A"	TOP BATTEN PLATE SPACES	BOTTOM BATTEN PLATE SPACES
BENT NO. 8	X8B1-C2	2'-0"	3 Eq. Spaces	2 Eq. Spaces
	X8C1-B2			
	X8B2-C1			
	X8C2-B1			
	X8B2-C3			
	X8C2-B3			
	X8B3-C2			
	X8C3-B2			
	X8B3-C4			
	X8C3-B4			
	X8B4-C3			
	C8C4-B3			
BENT NO. 9	X9B1-C2	2'-0"	3 Eq. Spaces	2 Eq. Spaces
	X9C1-B2			
	X9B2-C1			
	X9C2-B1			
	X9B2-C3			
	X9C2-B3			
	X9B3-C2			
	X9C3-B2			

NOTE:

Table values will be populated when in depth survey of foundation and top of bent has been received.

ORIGINAL PLAN
NOTE BOOK
No.

SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DIAGONAL BRACE SCHEDULE

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

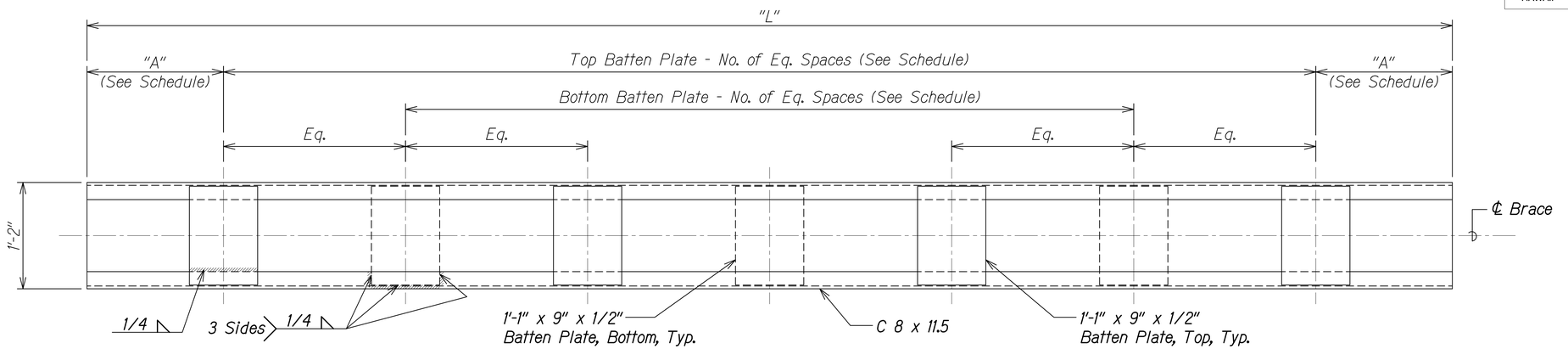
Scale: As Noted Date: Mar. 2024

SHEET No. SA5.8 OF 22 SHEETS

00

DRAWING NAME: Z:\OD ONDONG\OD JF PROJECTS\22-001 12-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\NSR-SA0506 DIAG BRACE DTLS.DWG PLOT TIME: 03-29-24, 5:23 PM

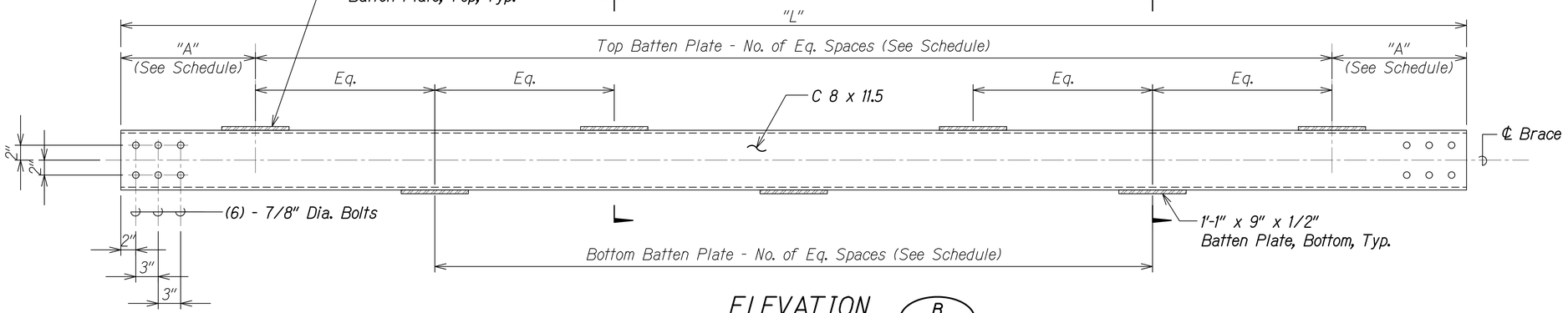
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024	00	



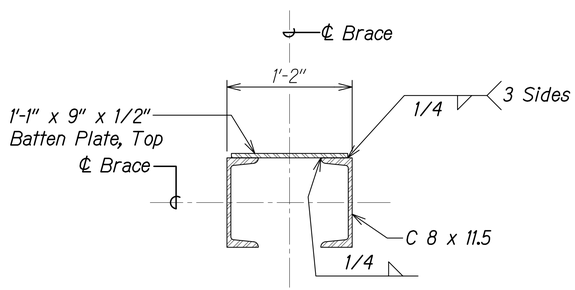
PLAN A SA5.9 SA5.9
Scale: 1 1/2" = 1'-0"

C SA5.9 SA5.9

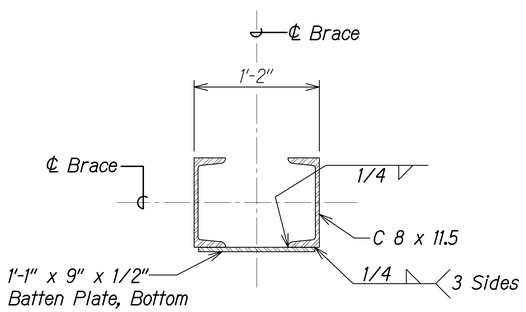
D SA5.9 SA5.9



ELEVATION B SA5.9 SA5.9
Scale: 1 1/2" = 1'-0"



SECTION C SA5.9 SA5.9
Scale: 1 1/2" = 1'-0"



SECTION D SA5.9 SA5.9
Scale: 1 1/2" = 1'-0"

BENT LOWER INTERIOR DIAGONAL BRACING

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
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	DESIGNED BY	
	PROJECT ENGR.	
	QUANTITIES BY	
No.	CHECKED BY	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DIAGONAL BRACE PLAN, ELEVATION AND SECTION

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA5.9 OF 22 SHEETS

00

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024	00	

BENT LOWER INTERIOR DIAGONAL BRACE SCHEDULE

	MEMBER ID	"A"	TOP BATTEN PLATE SPACES	BOTTOM BATTEN PLATE SPACES
BENT NO. 4	X4B6-C7	1'-6"	3 Eq. Spaces	2 Eq. Spaces
	X4C6-B7			
	X4B7-C6			
	X4C7-B6			
BENT NO. 5	X5B6-C7	1'-6"	3 Eq. Spaces	2 Eq. Spaces
	X5C6-B7			
	X5B8-C7			
	X5C8-B7			
BENT NO. 6	X6B6-C7	1'-6"	3 Eq. Spaces	2 Eq. Spaces
	X6C6-B7			
	X6B8-C7			
	X6C8-B7			

NOTE:

Table values will be populated when in depth survey of foundation and top of bent has been received.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	"
	TRACED BY	"
No.	DESIGNED BY	"
	QUANTITIES BY	"
	CHECKED BY	"

DRAWING NAME: Z:\OD ONGONKOD // PROJECTS\22-601 12-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\NSR-340506 DIAG BRACE DTLS.DWG PLOT TIME: 03-29-24, 5:24 PM

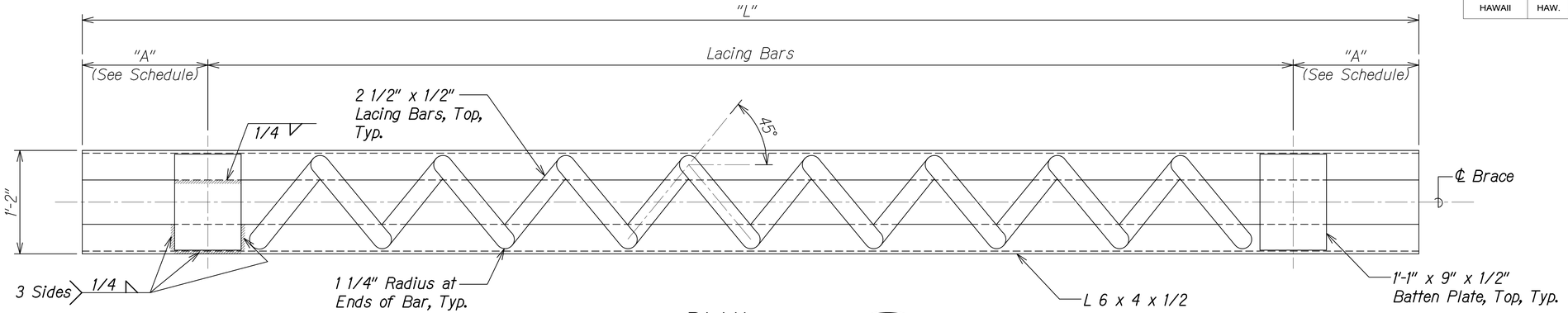
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DIAGONAL BRACE SCHEDULE

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024	00	

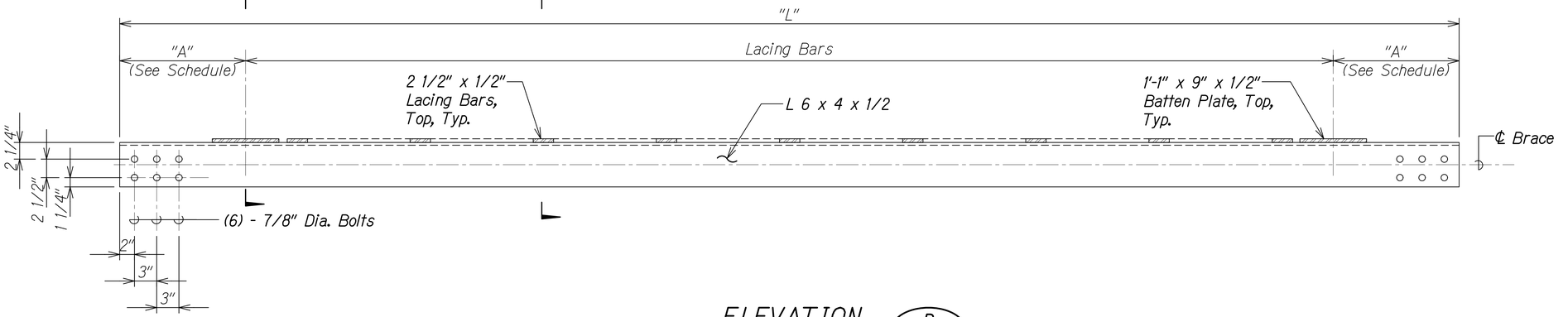


PLAN A SA5.11 | SA5.11

Scale: 1 1/2" = 1'-0"

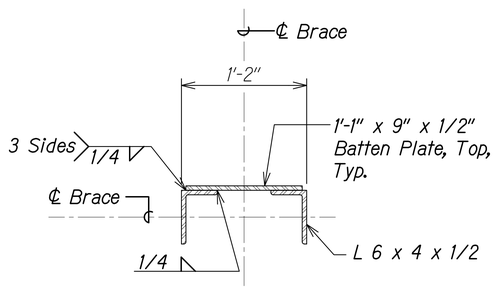
C SA5.11 | SA5.11

D SA5.11 | SA5.11



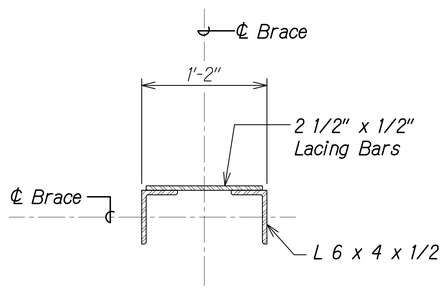
ELEVATION B SA5.11 | SA5.11

Scale: 1 1/2" = 1'-0"



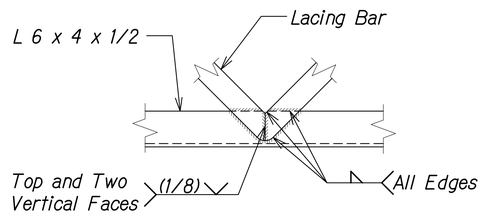
SECTION C SA5.11 | SA5.11

Scale: 1 1/2" = 1'-0"



SECTION D SA5.11 | SA5.11

Scale: 1 1/2" = 1'-0"



DETAIL 1 SA5.11 | SA5.11

Scale: 1 1/2" = 1'-0"

NOTE:

* Detail 1 shows alternative lacing bar fabrication and attachment detail. Detail may be used in lieu of stacked lacing bars. Details will be finalized at the time of 90% design.

BENT UPPER HORIZONTAL BRACING

ORIGINAL PLAN | NOTE BOOK | No.

SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HORIZONTAL BRACE PLAN, ELEVATION AND SECTION

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA5.11 OF 22 SHEETS

00

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024	00	

BENT UPPER HORIZONTAL BRACE SCHEDULE

BENT NO. 1	MEMBER ID	"A"
	H1A-B1	2'-0"
	H1B-C1	
	H1C-D1	
	H1A-B2	
	H1B-C2	
	H1C-D2	

BENT NO. 2	MEMBER ID	"A"
	H2A-B1	2'-0"
	H2B-C1	
	H2C-D1	
	H2A-B2	
	H2B-C2	
	H2C-D2	
	H2A-B3	
	H2B-C3	
	H2C-D3	
	H2A-B4	
	H2B-C4	
	H2C-D4	

BENT NO. 3	MEMBER ID	"A"
	H3A-B1	2'-0"
	H3B-C1	
	H3C-D1	
	H3A-B2	
	H3B-C2	
	H3C-D2	
	H3A-B3	
	H3B-C3	
	H3C-D3	
	H3A-B4	
	H3B-C4	
	H3C-D4	
	H3A-B5	
	H3B-C5	
	H3C-D5	

BENT NO. 4	MEMBER ID	"A"
	H4A-B1	2'-0"
	H4B-C1	
	H4C-D1	
	H4A-B2	
	H4B-C2	
	H4C-D2	
	H4A-B3	
	H4B-C3	
	H4C-D3	

BENT NO. 4	MEMBER ID	"A"
	H4A-B4	2'-0"
	H4B-C4	
	H4C-D4	
	H4A-B5	
	H4B-C5	
	H4C-D5	

BENT NO. 5	MEMBER ID	"A"
	H5A-B1	2'-0"
	H5B-C1	
	H5C-D1	
	H5A-B2	
	H5B-C2	
	H5C-D2	
	H5B-C3	
	H5C-D3	
	H5A-B4	
	H5A-B1	
	H5B-C4	
	H5C-D4	
	H5A-B5	
	H5B-C5	
	H5C-D5	

BENT NO. 6	MEMBER ID	"A"
	H6A-B1	2'-0"
	H6B-C1	
	H6C-D1	
	H6A-B2	
	H6B-C2	
	H6C-D2	
	H6A-B3	
	H6B-C3	
	H6C-D3	
	H6A-B4	
	H6B-C4	
	H6C-D4	
	H6A-B5	
	H6B-C5	
	H6C-D5	

BENT NO. 7	MEMBER ID	"A"
	H7A-B1	2'-0"
	H7B-C1	
	H7C-D1	
	H7A-B2	
	H7B-C2	
	H7C-D2	
	H7A-B3	

BENT NO. 7	MEMBER ID	"A"
	H7B-C3	2'-0"
	H7C-D3	
	H7A-B4	
	H7B-C4	
	H7C-D4	
	H7A-B5	
	H7B-C5	
	H7C-D5	

BENT NO. 8	MEMBER ID	"A"
	H8A-B1	2'-0"
	H8B-C1	
	H8C-D1	
	H8A-B2	
	H8B-C2	
	H8C-D2	
	H8A-B3	
	H8B-C3	
	H8C-D3	

BENT NO. 9	MEMBER ID	"A"
	H9A-B1	2'-0"
	H9B-C1	
	H9C-D1	
	H9A-B2	
	H9B-C2	
	H9C-D2	

NOTE:

Table values will be populated when in-depth survey of foundation and top of bent has been received.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
No.	TRACED BY	
	DESIGNED BY	
	QUANTITIES BY	
	CHECKED BY	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HORIZONTAL BRACE SCHEDULE

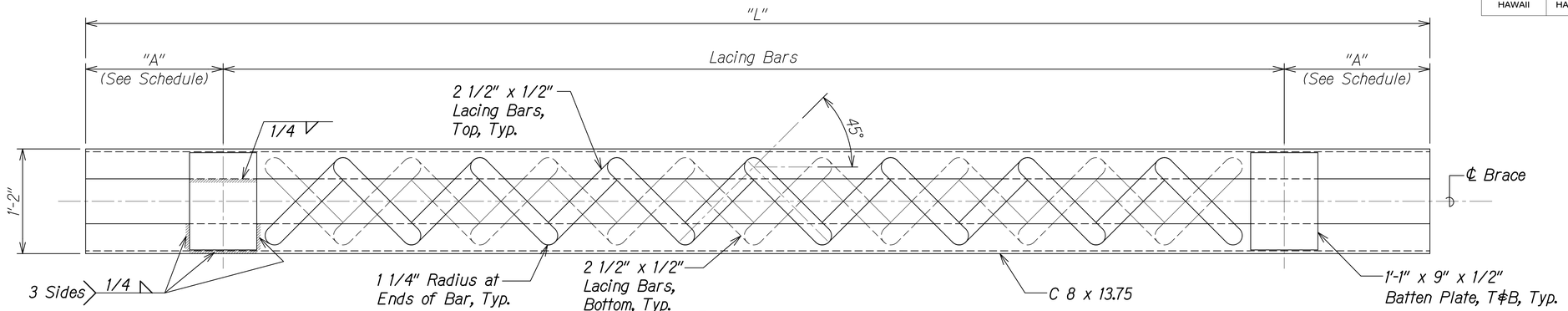
HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA5.12 OF 22 SHEETS

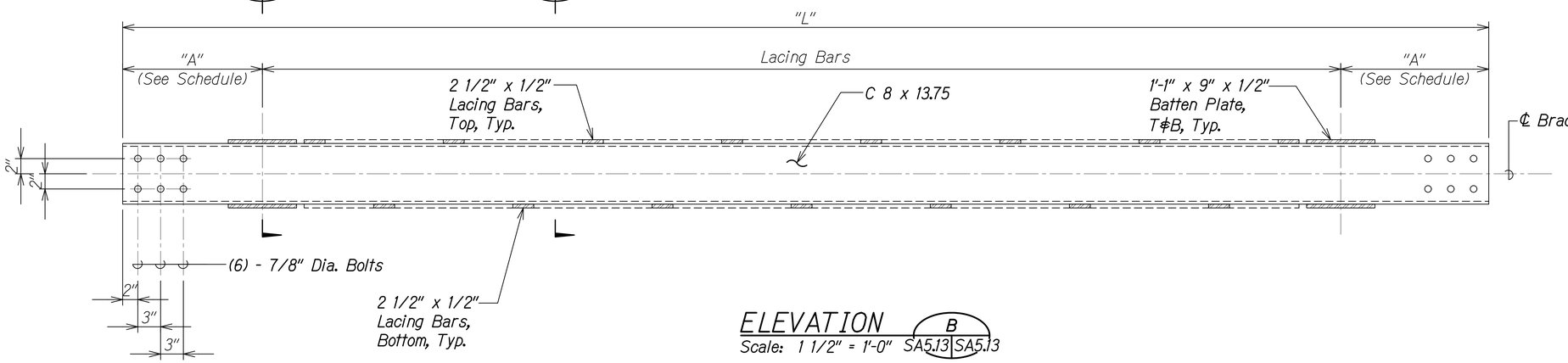
00

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024	00	

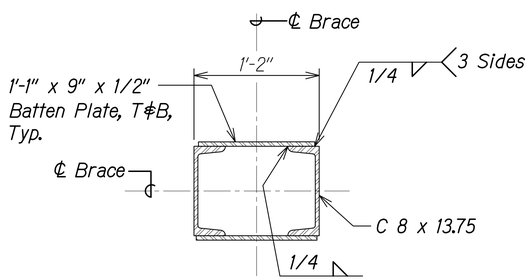


PLAN (A SA5.13|SA5.13)
Scale: 1 1/2" = 1'-0"

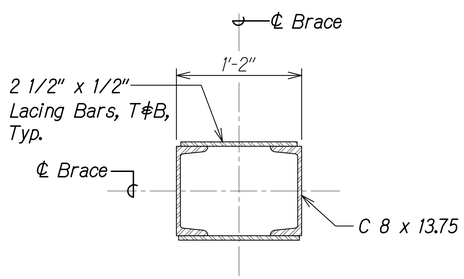
C SA5.13|SA5.13 D SA5.13|SA5.13



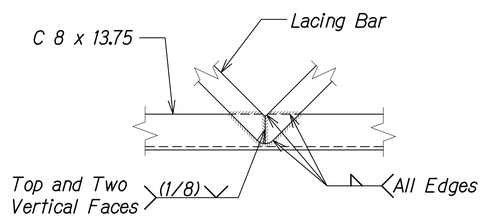
ELEVATION (B SA5.13|SA5.13)
Scale: 1 1/2" = 1'-0"



SECTION (C SA5.13|SA5.13)
Scale: 1 1/2" = 1'-0"



SECTION (D SA5.13|SA5.13)
Scale: 1 1/2" = 1'-0"



DETAIL (1 SA5.13|SA5.13)
Scale: 1 1/2" = 1'-0"

NOTE:

* Detail 1 shows alternative lacing bar fabrication and attachment detail. Detail may be used in lieu of stacked lacing bars. Details will be finalized at the time of 90% design.

BENT LOWER HORIZONTAL BRACING

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HORIZONTAL BRACE PLAN, ELEVATION AND SECTION

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA5.13 OF 22 SHEETS

00

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DATE

BENT LOWER HORIZONTAL BRACE SCHEDULE

BENT NO. 1	MEMBER ID	"A"
	H1A-B3	1'-6"
	H1B-C3	
	H1C-D3	

BENT NO. 2	MEMBER ID	"A"
	H2A-B5	1'-6"
	H2B-C5	
	H2C-D5	

BENT NO. 3	MEMBER ID	"A"
	H3A-B6	1'-6"
	H3B-C6	
	H3C-D6	

BENT NO. 4	MEMBER ID	"A"
	H4A-B6	1'-6"
	H4B-C6	
	H4C-D6	
	H4A-B7	
	H4B-C7	
	H4C-D7	

BENT NO. 5	MEMBER ID	"A"
	H5A-B6	1'-6"
	H5B-C6	
	H5C-D6	
	H5A-B7	
	H5B-C7	
	H5C-D7	
	H5A-B8	
	H5B-C8	
	H5C-D8	

BENT NO. 6	MEMBER ID	"A"
	H6A-B6	1'-6"
	H6B-C6	
	H6C-D6	
	H6A-B7	
	H6B-C7	
	H6C-D7	
	H6A-B8	
	H6B-C8	
	H6C-D8	

BENT NO. 7	MEMBER ID	"A"
	H7A-B6	1'-6"
	H7B-C6	
	H7C-D6	

BENT NO. 8	MEMBER ID	"A"
	H8A-B4	1'-6"
	H8B-C4	
	H8C-D4	

BENT NO. 9	MEMBER ID	"A"
	H9A-B3	1'-6"
	H9B-C3	
	H9C-D3	

NOTE:

Table values will be populated when in-depth survey of foundation and top of bent has been received.

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024	00	

ORIGINAL PLAN
NOTE BOOK
No.

SURVEY PLOTTED BY
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TRACED BY
DESIGNED BY
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CHECKED BY
DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HORIZONTAL BRACE SCHEDULE

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

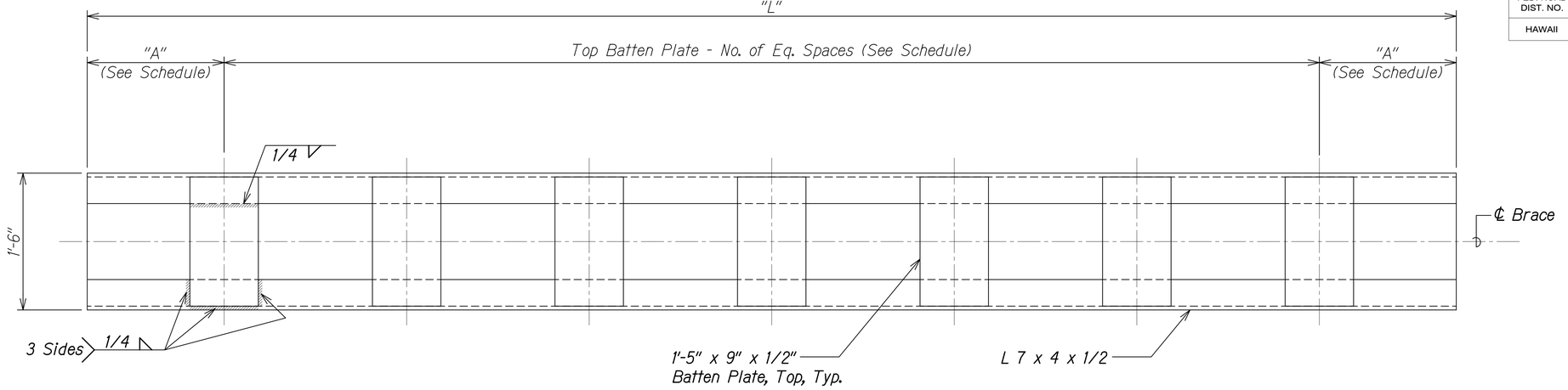
Scale: As Noted Date: Mar. 2024

SHEET No. SA5.14 OF 22 SHEETS

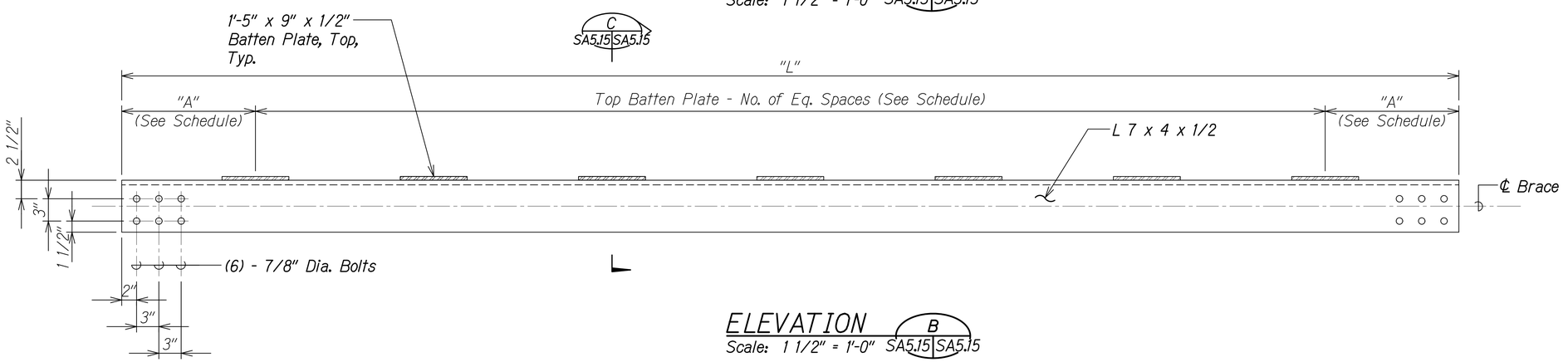
00

PLOT TIME: 03-29-24, 5:24 PM)
DRAWING NAME: Z:\OD ONGOING\OD_JF PROJECTS\22-00112-NANUE STR BR REHAB\01 CAD\03-29-24 60FET DESIGN\NSR-SA0506 DIAG BRACE DTLS.DWG

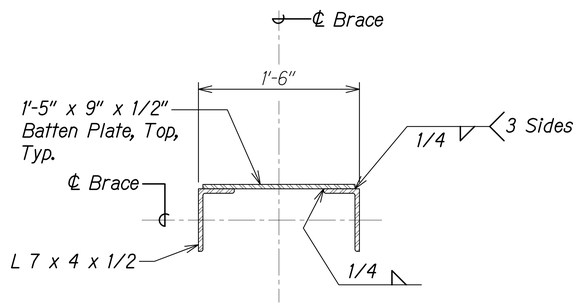
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024	00	



PLAN A
Scale: 1 1/2" = 1'-0" SA5.15 | SA5.15



ELEVATION B
Scale: 1 1/2" = 1'-0" SA5.15 | SA5.15



SECTION C
Scale: 1 1/2" = 1'-0" SA5.15 | SA5.15

BENT-TO-BENT DIAGONAL BRACE

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
No.	TRACED BY	
	DESIGNED BY	
	QUANTITIES BY	
	CHECKED BY	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DIAGONAL BRACE PLAN, ELEVATION AND SECTION

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA5.15 OF 22 SHEETS

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FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024	00	

BENT-TO-BENT DIAGONAL BRACE SCHEDULE

BENT NO. 2 TO 3

MEMBER ID	"A"	TOP BATTEN PLATE SPACES
X2A1-3A3	1'-6"	6 Eq. Spaces
X2B1-3B3		
X2C1-3C3		
X2D1-3D3		
X3A1-2A3		
X3B1-2B3		
X3C1-2C3		
X3D1-2D3		
X2A3-3A1		
X2B3-3B1		
X2C3-3C1		
X2D3-3D1		
X3A3-2A1		
X3B3-2B1		
X3C3-2C1		
X3D3-2D1		
X2A3-3A4		
X2B3-3B4		
X2C3-3C4		
X2D3-3D4		
X3A3-2A4		
X3B3-2B4		
X3C3-2C4		
X3D3-2D4		
X2A4-3A3		
X2B4-3B3		
X2C4-3C3		
X2D4-3D3		
X3A4-2A5		
X3B4-2B5		
X3C4-2C5		
X3D4-2D5		
X2A5-3A4		
X2B5-3B4		
X2C5-3C4		
X2D5-3D4		
X3A5-2A4		
X3B5-2B4		
X3C5-2C4		
X3D5-2D4		
X2A5-3A6		
X2B5-3B6		
X2C5-3CG		
X2D5-3D6		
X3A6-2A5		
X3B6-2B5		

BENT-TO-BENT DIAGONAL BRACE SCHEDULE

BENT NO. 2 TO 3

MEMBER ID	"A"	TOP BATTEN PLATE SPACES
X3C6-2C5	1'-6"	6 Eq. Spaces
X3D6-2D5		

BENT NO. 4 TO 5

MEMBER ID	"A"	TOP BATTEN PLATE SPACES
X4A1-5A3		
X4B1-5B3		
X4C1-5C3		
X4D1-5D3		
X5A1-4A3		
X5B1-4B3		
X5C1-4C3		
X5D1-4D3		
X4A3-5A1		
X4B3-5B1		
X4C3-5C1		
X4D3-5D1		
X5A3-4A1		
X5B3-4B1		
X5C3-4C1		
X5D3-4D1		
X4A3-5A4		
X4B3-5B4		
X4C3-5C4		
X4D3-5D4		
X5A3-4A4		
X5B3-4B4		
X5C3-4C4		
X5D3-4D4		
X4A4-5A3		
X4B4-5B3		
X4C4-5C3		
X4D4-5D3		
X5A4-4A3		
X5B4-4B3		
X5C4-4C3		
X5D4-4D3		
X4A4-5A5		
X4B4-5B5		
X4C4-5C5		
X4D4-5D5		
X5A4-4A5		
X5B4-4B5		
X5C4-4C5		

BENT-TO-BENT DIAGONAL BRACE SCHEDULE

BENT NO. 4 TO 5

MEMBER ID	"A"	TOP BATTEN PLATE SPACES
X5D4-4D5	1'-6"	6 Eq. Spaces
X4A5-5A4		
X4B5-5B4		
X4C5-5C4		
X4D5-5D4		
X5A5-4A4		
X5B5-4B4		
X5C5-4C4		
X5D5-4D4		
X4A5-5A6		
X4B5-5B6		
X4C5-5C6		
X4D5-5D6		
X5A5-4A6		
X5B5-4B6		
X5C5-4C6		
X5D5-4D6		
X4A6-5A5		
X4B6-5B5		
X4C6-5C5		
X4D6-5D5		
X5A6-4A5		
X5B6-4B5		
X5C6-4C5		
X5D6-4D5		
X4A6-5A7		
X4B6-5B7		
X4C6-5C7		
X4D6-5D7		
X5A6-4A7		
X5B6-4B7		
X5C6-4C7		
X5D6-4D7		
X4A7-5A6		
X4B7-5B6		
X4C7-5C6		

NOTE:

Table values will be populated when in-depth survey of foundation and top of bent has been received.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DIAGONAL BRACE SCHEDULE

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA5.16 OF 22 SHEETS

00

ORIGINAL PLAN
NOTE BOOK
No.

SURVEY PLOTTED BY DATE
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CHECKED BY

DRAWING NAME: Z:\OD ONGONGOO JF PROJECTS\22-001 12-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\NSR-SA0506 DIAG BRACE DTLS.DWG PLOT TIME: 03-29-24, 5:24 PM)

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024	00	

BENT-TO-BENT DIAGONAL BRACE SCHEDULE

	MEMBER ID	"A"	TOP BATTEN PLATE SPACES
BENT NO. 4 TO 5	X4D7-5D6	1'-6"	6 Eq. Spaces
	X5A7-4A6		
	X5B7-4B6		
	X5C7-4C6		
	X5D7-4D6		
	X4A7-5A8		
	X4B7-5B8		
	X4C7-5C8		
	X4D7-5D8		
	X5A8-4A7		
	X5B8-4B7		
	X5C8-4C7		
	X5D8-4D7		
BENT NO. 6 TO 7	X6A1-7A3		
	X6B1-7B3		
	X6C1-7C3		
	X6D1-7D3		
	X7A1-6A3		
	X7B1-6B3		
	X7C1-6C3		
	X7D1-6D3		
	X6A3-7A1		
	X6B3-7B1		
	X6C3-7C1		
	X6D3-7D1		
	X7A3-6A1		
	X7B3-6B1		
	X7C3-6C1		
	X7D3-6D1		
	X6A3-7A4		
	X6B3-7B4		
	X6C3-7C4		
	X6D3-7D4		
	X7A3-6A4		
	X7B3-6B4		
	X7C3-6C4		
	X7D3-6D4		
	X6A4-7A3		
	X6B4-7B3		
	X6C4-7C3		
	X6D4-7D3		
	X7A4-6A3		
	X7B4-6B3		
	X7C4-6C3		
	X7D4-6D3		

BENT-TO-BENT DIAGONAL BRACE SCHEDULE

	MEMBER ID	"A"	TOP BATTEN PLATE SPACES
BENT NO. 6 TO 7	X6A4-7A5	1'-6"	6 Eq. Spaces
	X6B4-7B5		
	X6C4-7C5		
	X6D4-7D5		
	X7A4-6A5		
	X7B4-6B5		
	X7C4-6C5		
	X7D4-6D5		
	X6A5-7A4		
	X6B5-7B4		
	X6C5-7C4		
	X6D5-7D4		
	X7A5-6A4		
	X7B5-6B4		
	X7C5-6C4		
	X7D5-6D4		
	X6A5-7A6		
	X6B5-7B6		
	X6C5-7C6		
	X6D5-7D6		
	X7A5-6A6		
	X7B5-6B6		
	X7C5-6C6		
	X7D5-6D6		
	X6A6-7A5		
	X6B6-7B5		
	X6C6-7C5		
	X6D6-7D5		
	X7A6-6A5		
	X7B6-6B5		
	X7C6-6C5		
	X7D6-6D5		
	X6A6-7A7		
	X6B6-7B7		
	X6C6-7C7		
	X6D6-7D7		
	X7A6-6A8		
	X7B6-6B8		
	X7B6-6B8		
	X7C6-6C8		
	X7D6-6D8		
	X6A8-7A6		
	X6B8-7B6		
	X6C8-7C6		
	X6D8-7D6		

BENT-TO-BENT DIAGONAL BRACE SCHEDULE

	MEMBER ID	"A"	TOP BATTEN PLATE SPACES
BENT NO. 8 TO 9	X8A1-9A3	1'-6"	6 Eq. Spaces
	X8B1-9B3		
	X8C1-9C3		
	X8D1-9D3		
	X9A1-8A3		
	X9B1-8B3		
	X9C1-8C3		
	X9D1-8D3		
	X8A3-9A1		
	X8B3-9B1		
	X8C3-9C1		
	X8D3-9D1		
	X9A3-8A1		
	X9B3-8B1		
	X9C3-8C1		
	X9D3-8D1		
	X8A4-9A3		
	X8B4-9B3		
	X8C4-9C3		
	X8D4-9D3		
	X9A3-8A4		
	X9B3-8B4		
	X9C3-8C4		
	X9D3-8D4		

NOTE:

Table values will be populated when in-depth survey of foundation and top of bent has been received.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DIAGONAL BRACE SCHEDULE

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA5.17 OF 22 SHEETS

00

ORIGINAL PLAN
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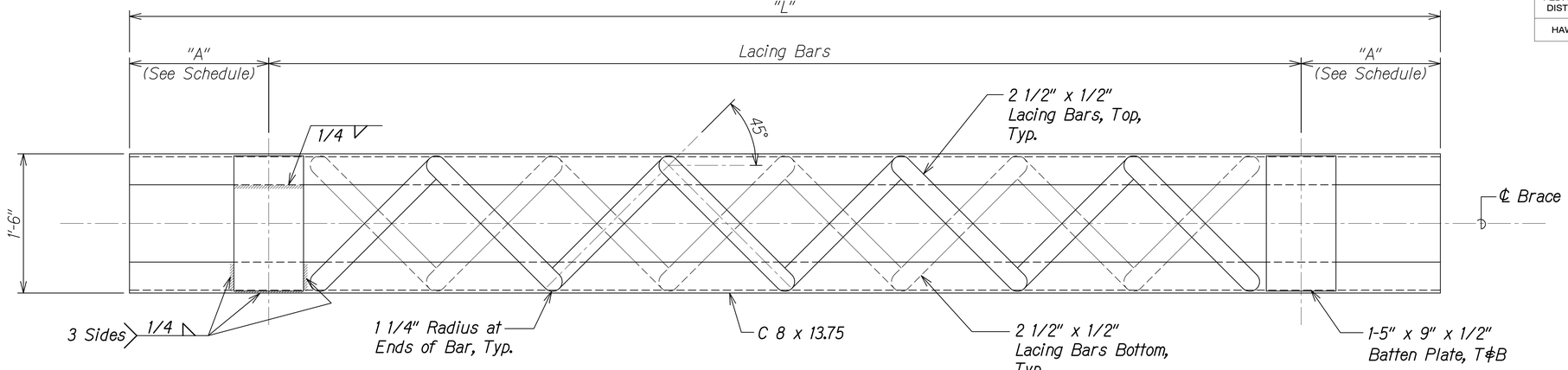
DATE

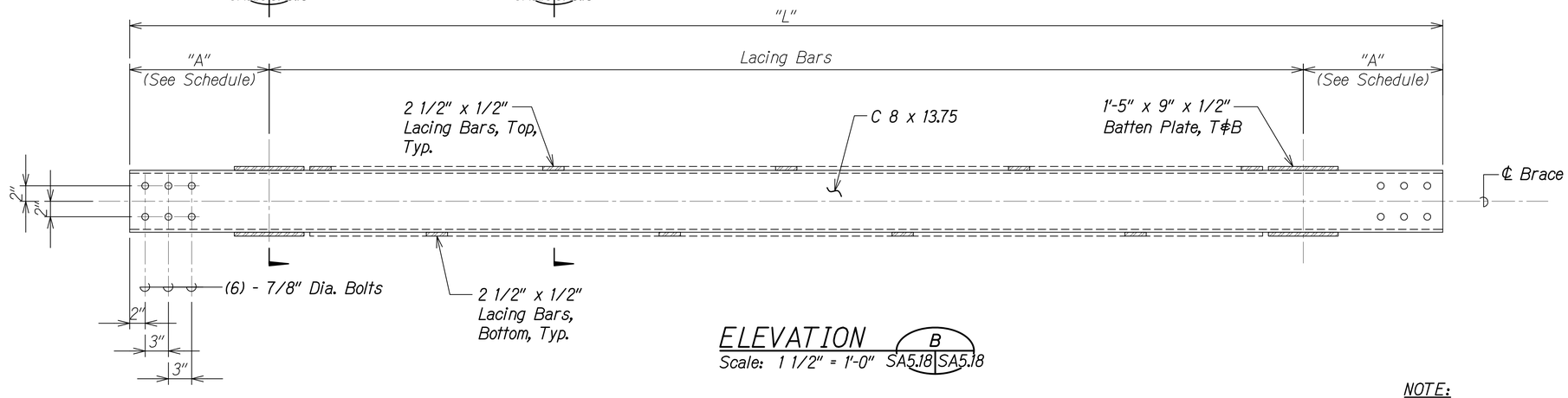
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024	00	



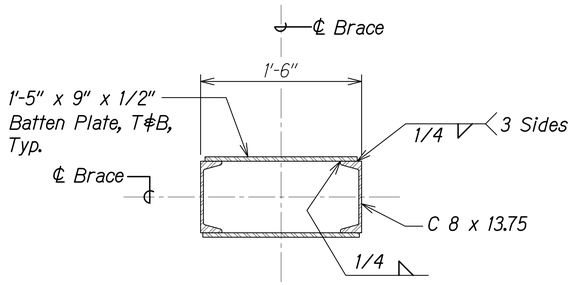
PLAN A SA5.18 | SA5.18
Scale: 1 1/2" = 1'-0"

C SA5.18 | SA5.18

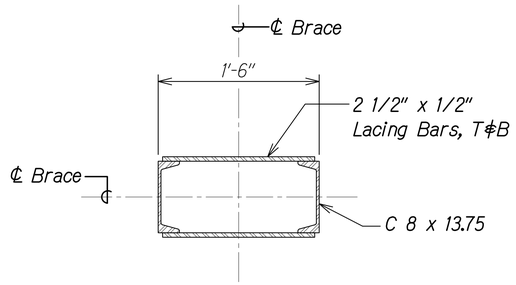
D SA5.18 | SA5.18



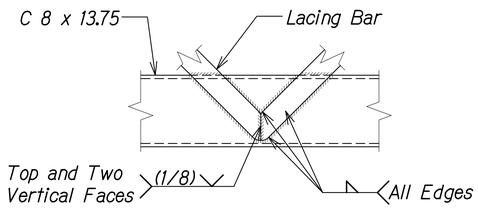
ELEVATION B SA5.18 | SA5.18
Scale: 1 1/2" = 1'-0"



SECTION C SA5.18 | SA5.18
Scale: 1 1/2" = 1'-0"



SECTION D SA5.18 | SA5.18
Scale: 1 1/2" = 1'-0"



DETAIL 1 SA5.18 | SA5.18
Scale: 1 1/2" = 1'-0"

NOTE:

* Detail 1 shows alternative lacing bar fabrication and attachment detail. Detail may be used in lieu of stacked lacing bars. Details will be finalized at the time of 90% design.

BENT-TO-BENT HORIZONTAL BRACE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HORIZONTAL BRACE PLAN, ELEVATION AND SECTION

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA5.18 OF 22 SHEETS

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ORIGINAL PLAN | NOTE BOOK | No.

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DRAWING NAME: Z:\OD ONGINO\OD JF PROJECTS\22-001 12-NANUE STR BR REHAB\01 CAD\01-29-24 60PCT DESIGN\NSR-240506 DIAG BRACE DTLS.DWG PLOT TIME: 03-

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024	00	

BENT-TO-BENT HORIZONTAL BRACE SCHEDULE

	MEMBER ID	"A"	- -
BENT NO. 2 TO 3	H2A3-3A3	1'-6"	-
	H2B3-3B3		
	H2C3-3C3		
	H2D3-3D3		
	H2A4-3A4		
	H2B4-3B4		
	H2C4-3C4		
	H2D4-3D4		
	H2A5-3A5		
	H2B5-3B5		
	H2C5-3C5		
	H2D5-3D5		
BENT NO. 4 TO 5	H4A3-5A3		
	H4B3-5B3		
	H4C3-5C3		
	H4D3-5D3		
	H4A4-5A4		
	H4B4-5B4		
	H4C4-5C4		
	H4D4-5D4		
	H4A5-5A5		
	H4B5-5B5		
	H4C5-5C5		
	H4D5-5D5		
	H4A6-5A6		
	H4B6-5B6		
	H4C6-5C6		
	H4D6-5D6		
	H4A7-5A7		
	H4B7-5B7		
	H4C7-5C7		
	H4D7-5D7		

BENT-TO-BENT HORIZONTAL BRACE SCHEDULE

	MEMBER ID	"A"	- -
BENT NO. 6 TO 7	H6A3-7A3	1'-6"	-
	H6B3-7B3		
	H6C3-7C3		
	H6D3-7D3		
	H6A4-7A4		
	H6B4-7B4		
	H6C4-7C4		
	H6D4-7D4		
	H6A5-7A5		
	H6B5-7B5		
	H6C5-7C5		
	H6D5-7D5		
	H6A6-7A6		
	H6B6-7B6		
	H6C6-7C6		
	H6D6-7D6		
BENT NO. 8 TO 9	H8A3-9A3		
	H8B3-9B3		
	H8C3-9C3		
	H8D3-9D3		

NOTE:

Table values will be populated when in-depth survey of foundation and top of bent has been received.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

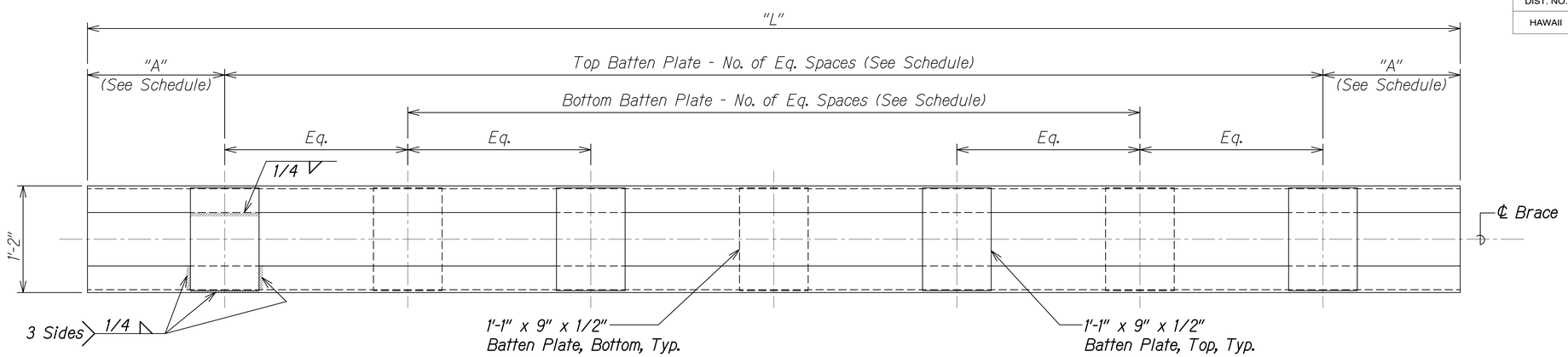
HORIZONTAL BRACE SCHEDULE

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

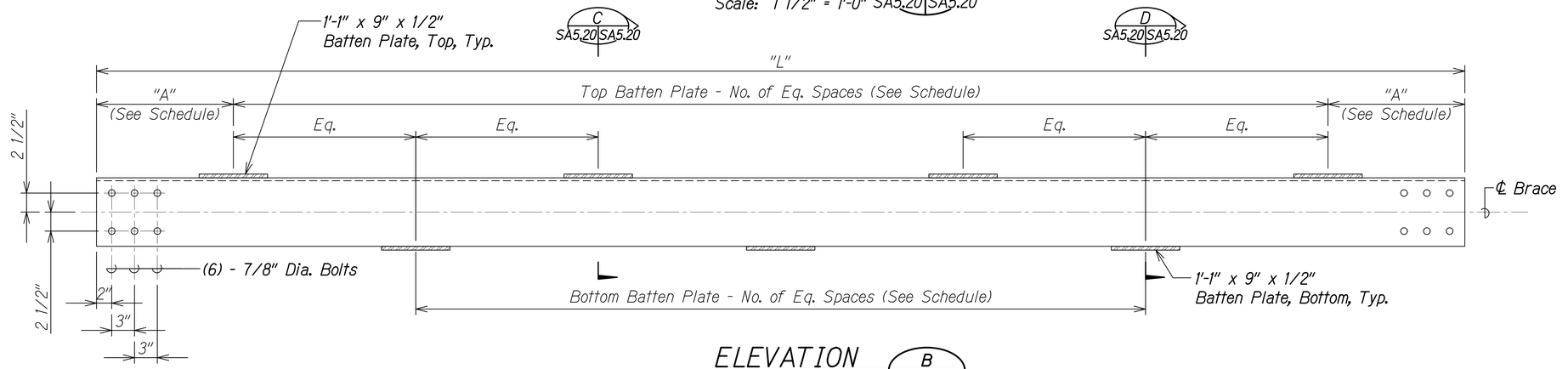
Scale: As Noted Date: Mar. 2024

SHEET No. SA5.19 OF 22 SHEETS

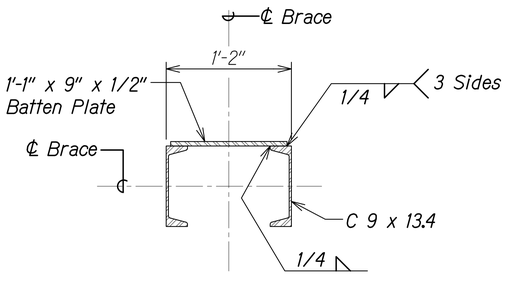
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024	00	



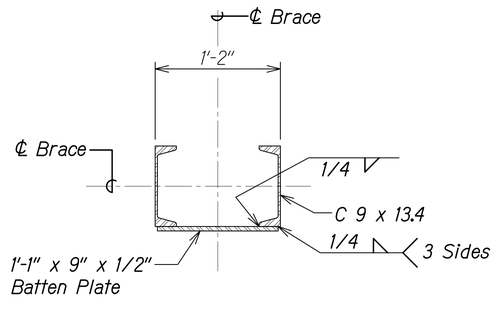
PLAN A
Scale: 1 1/2" = 1'-0" SA5.20|SA5.20



ELEVATION B
Scale: 1 1/2" = 1'-0" SA5.20|SA5.20



SECTION C
Scale: 1 1/2" = 1'-0" SA5.20|SA5.20



SECTION D
Scale: 1 1/2" = 1'-0" SA5.20|SA5.20

BENT EXTERIOR DIAGONAL BRACE

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DIAGONAL BRACE PLAN, ELEVATION AND SECTION

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET NO SA5.20 OF 22 SHEETS

00

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024	00	

BENT EXTERIOR DIAGONAL BRACE SCHEDULE

	MEMBER ID	"A"	TOP BATTEN PLATE SPACES	BOTTOM BATTEN PLATE SPACES
BENT NO. 1	X1A2-B1	1'-6"	3 Eq. Spcs	2 Eq. Spcs
	X1D2-C1			
	X1A3-B2			
	X1D3-C2			
BENT NO. 2	X2A2-B1	1'-6"	3 Eq. Spcs	2 Eq. Spcs
	X2D2-C1			
	X2A3-B2			
	X2D3-C2			
	X2A4-B3			
	X2D4-C3			
	X2A5-B4			
	X2D5-C4			
BENT NO. 3	X3A2-B1	1'-6"	3 Eq. Spcs	2 Eq. Spcs
	X3D2-C1			
	X3A3-B2			
	X3D3-C2			
	X3A4-B3			
	X3D4-C3			
	X3A5-B4			
	X3D5-C4			
	X3A6-B5			
	X3D6-B5			
BENT NO. 4	X4A2-B1	1'-6"	3 Eq. Spcs	2 Eq. Spcs
	X4D2-C1			
	X4A3-B2			
	X4D3-C2			
	X4A4-B3			
	X4D4-C3			
	X4A5-B4			
	X4D5-C4			
	X4A6-B5			
	X4D6-C5			
	X4A7-B6			
	X4D7-C6			

BENT EXTERIOR DIAGONAL BRACE SCHEDULE

	MEMBER ID	"A"	TOP BATTEN PLATE SPACES	BOTTOM BATTEN PLATE SPACES
BENT NO. 5	X5A2-B1	1'-6"	3 Eq. Spcs	2 Eq. Spcs
	X5D2-C1			
	X5A3-B2			
	X5D3-C2			
	X5A4-B3			
	X5D4-C3			
	X5A5-B4			
	X5D5-C4			
	X5A6-B5			
	X5D6-C5			
	X5A7-B6			
	X5D7-C6			
	X5A8-B7			
	X5D8-C7			
BENT NO. 6	X6A2-B1	1'-6"	3 Eq. Spcs	2 Eq. Spcs
	X6D2-C1			
	X6A3-B2			
	X6D3-C2			
	X6A4-B3			
	X6D4-C3			
	X6A5-B4			
	X6D5-C4			
	X6A6-B5			
	X6D6-C5			
	X6A7-B6			
	X6D7-C6			
	X6A8-B7			
	X6D8-C7			
BENT NO. 7	X7A2-B1	1'-6"	3 Eq. Spcs	2 Eq. Spcs
	X7D2-C1			
	X7A3-B2			
	X7D3-C2			
	X7A4-B3			
	X7D4-C3			
	X7A5-B4			
	X7D5-C4			
	X7A6-B5			
	X7D6-C5			

NOTE:

Table values will be populated when in-depth survey of foundation and top of bent has been received.

ORIGINAL PLAN
NOTE BOOK No.

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CHECKED BY
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DIAGONAL BRACE SCHEDULE

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA5.21 OF 22 SHEETS

00

BRAWING NAME: Z:\OD ONGOING\OD JF PROJECTS\22-001.12-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\NSR-SA0506 DIAG BRACE DTLS.DWG PLOT TIME: 03-29-24, 5:25 PM

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024	00	

BENT EXTERIOR DIAGONAL BRACE SCHEDULE

	MEMBER ID	"A"	TOP BATTEN PLATE SPACES	BOTTOM BATTEN PLATE SPACES
BENT NO. 8	X8A2-B1	1'-6"	3 Eq. Spcs	2 Eq. Spcs
	X8D2-C1			
	X8A3-B2			
	X8D3-C2			
	X8A4-B3			
	X8D4-C3			
BENT NO. 9	X9A2-B1	1'-6"	3 Eq. Spcs	2 Eq. Spcs
	X9D2-C1			
	X9A3-B2			
	X9D3-C2			

NOTE:

Table values will be populated when in-depth survey of foundation and top of bent has been received.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
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No.	DESIGNED BY	
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	CHECKED BY	

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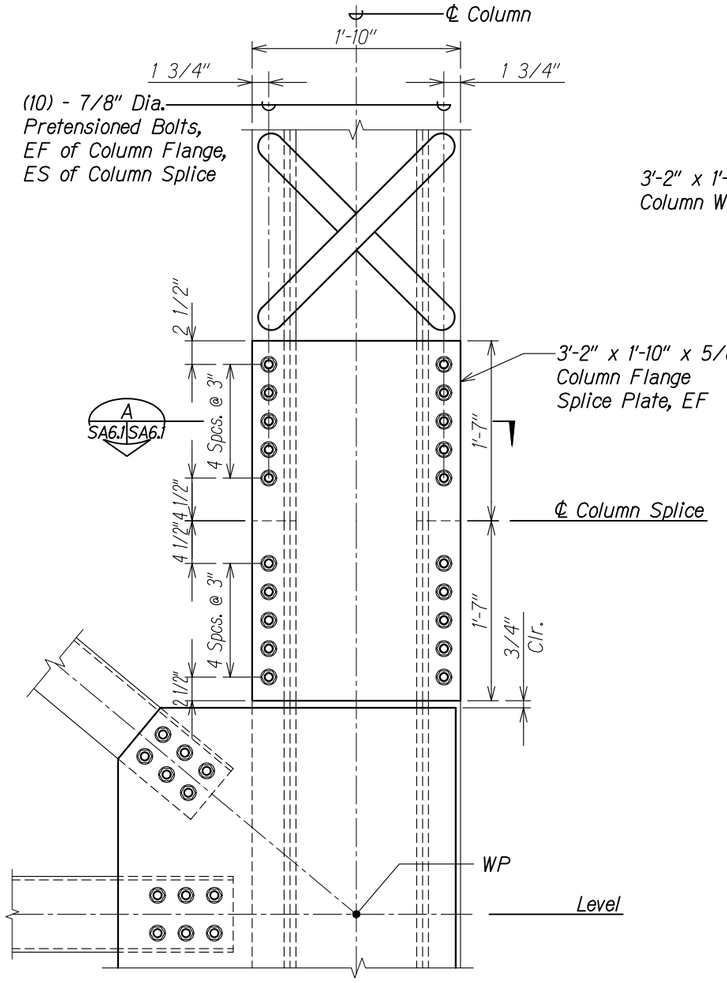
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DIAGONAL BRACE SCHEDULE

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

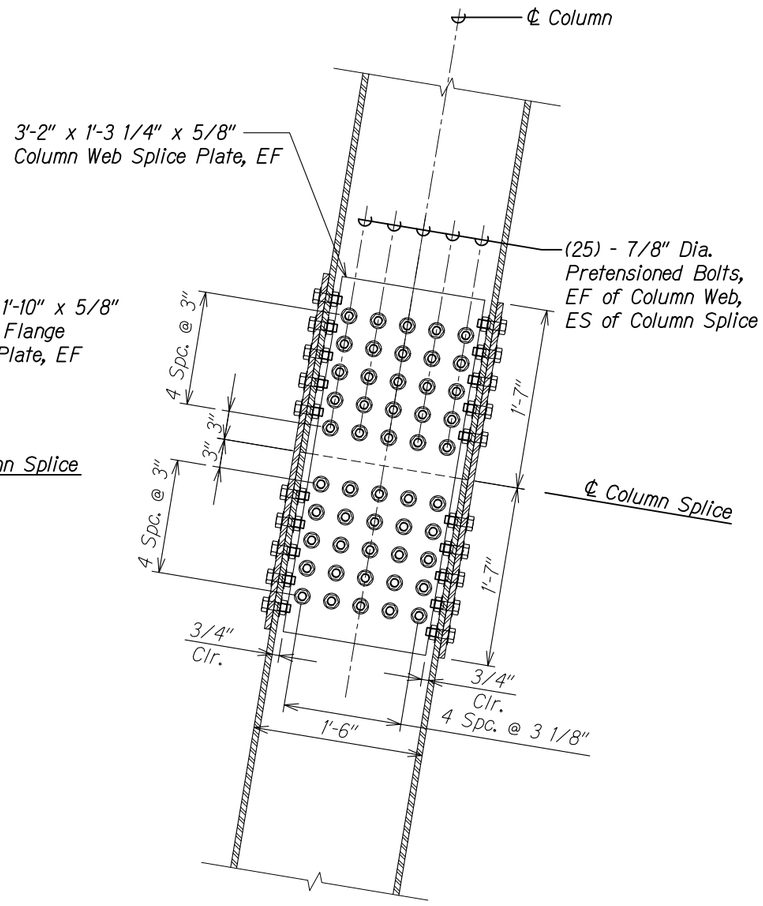
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



COLUMN SPLICE - CONNECTION DETAIL 1

Scale: 1 1/2" = 1'-0"

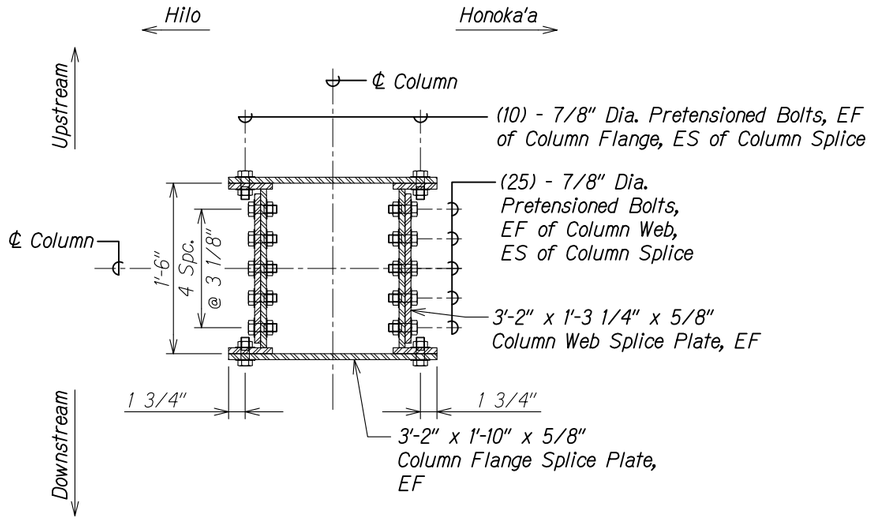
SA6.1 | SA6.1



COLUMN SPLICE - CONNECTION DETAIL 2

Scale: 1 1/2" = 1'-0"

SA6.1 | SA6.1



SECTION

Scale: 1 1/2" = 1'-0"

A SA6.1 | SA6.1

ORIGINAL PLAN
NOTE BOOK No.

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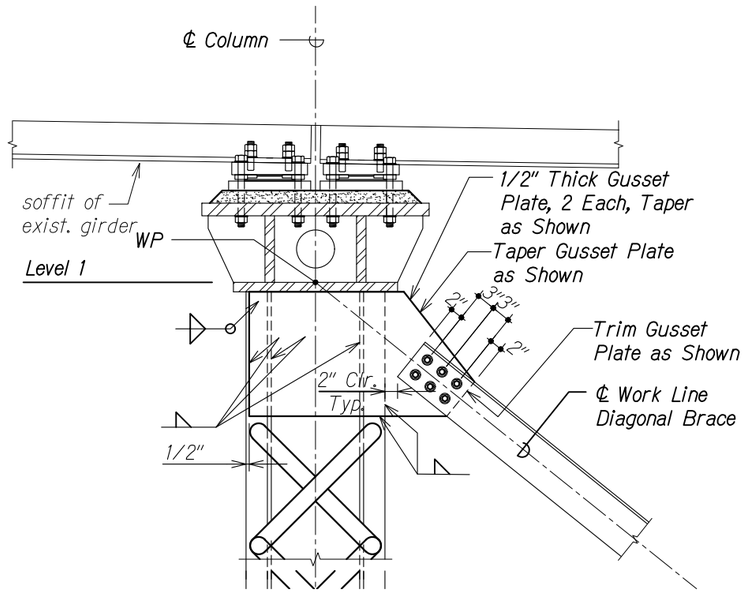
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CONNECTION DETAILS

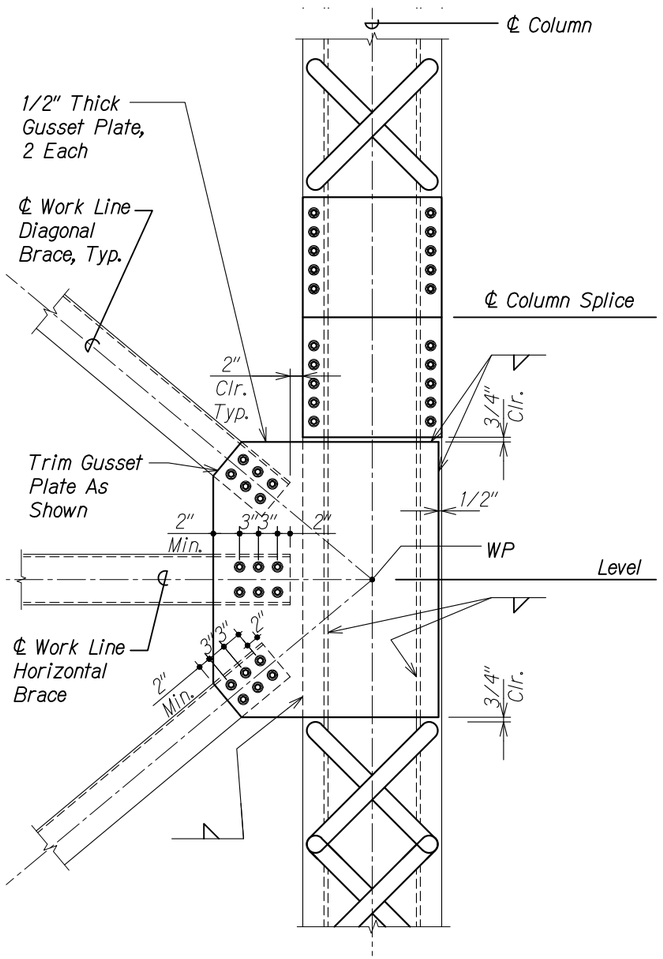
HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

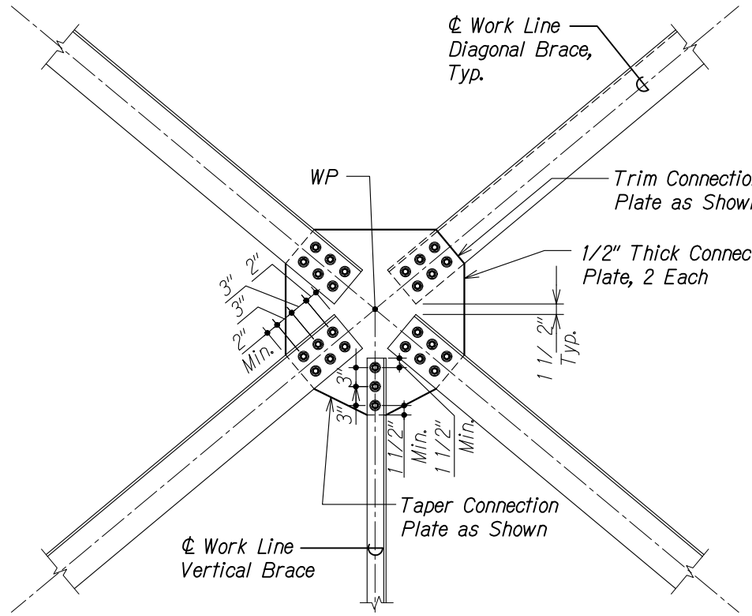
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



CONNECTION DETAIL 1
Scale: 1" = 1'-0"
SA6.2 | SA6.2



CONNECTION DETAIL 3
Scale: 1" = 1'-0"
SA6.2 | SA6.2



CONNECTION DETAIL 2
Scale: 1" = 1'-0"
SA6.2 | SA6.2

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CONNECTION DETAILS

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA6.2 OF 8 SHEETS

ORIGINAL PLAN
NOTE BOOK
No.
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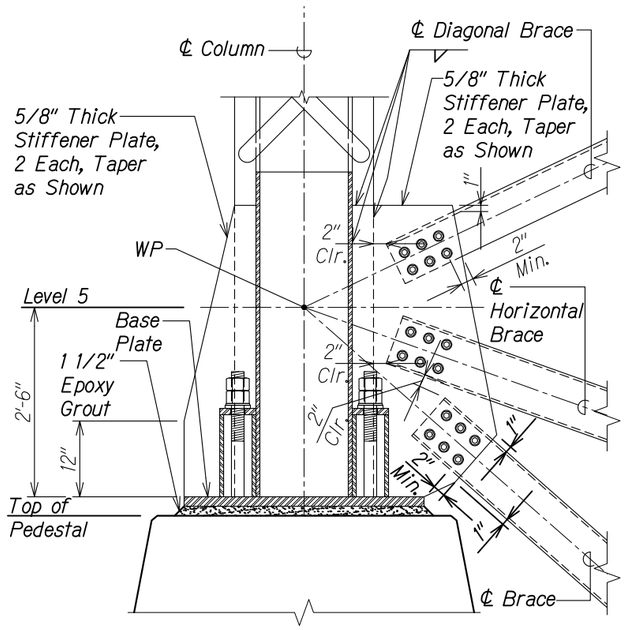
DRAWING NAME: Z:\OO ONGOING\OO JF PROJECTS\22-001.12-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\NSR-SA0601 CONN DTLS.DWG PLOT TIME: 03-29-24, 9:24 PM)

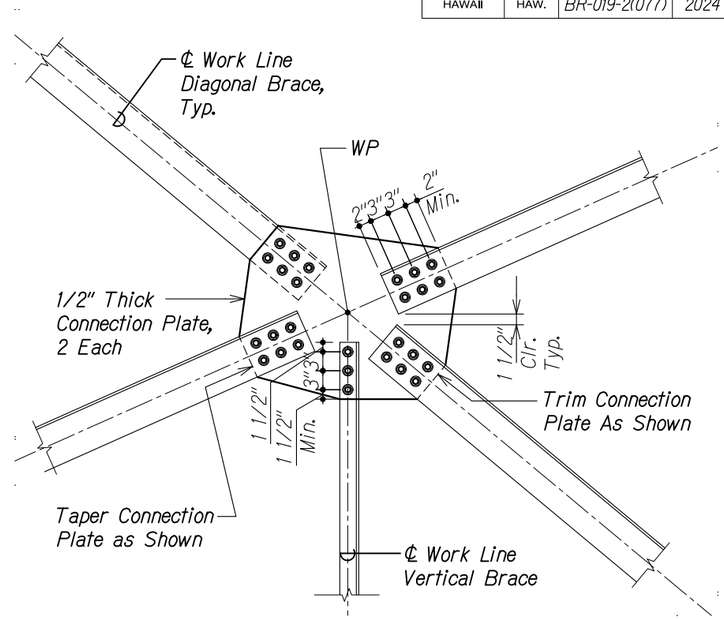
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



CONNECTION DETAIL 1

Scale: 1" = 1'-0"

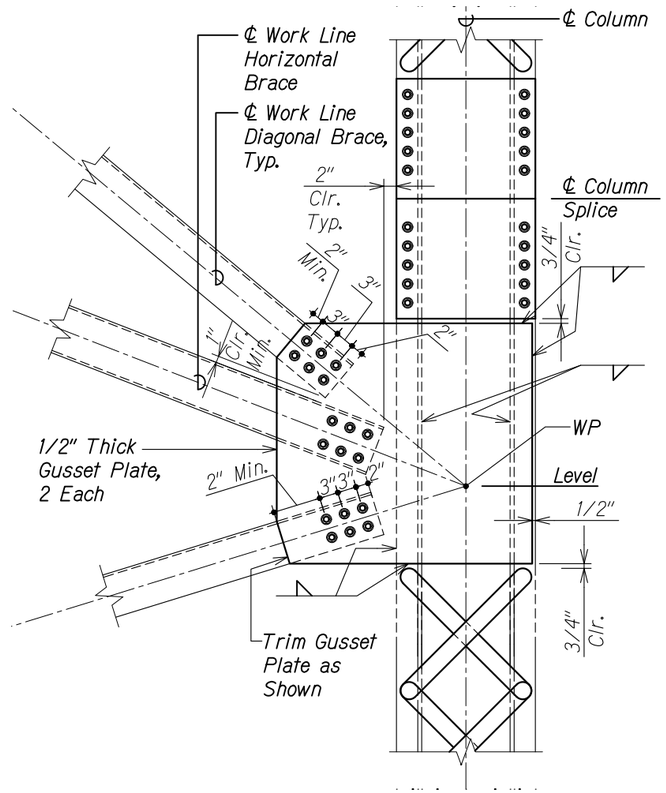
SA6.3 | SA6.3



CONNECTION DETAIL 2

Scale: 1" = 1'-0"

SA6.3 | SA6.3



CONNECTION DETAIL 3

Scale: 1" = 1'-0"

SA6.3 | SA6.3

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CONNECTION DETAILS

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

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SHEET No. SA6.3 OF 8 SHEETS

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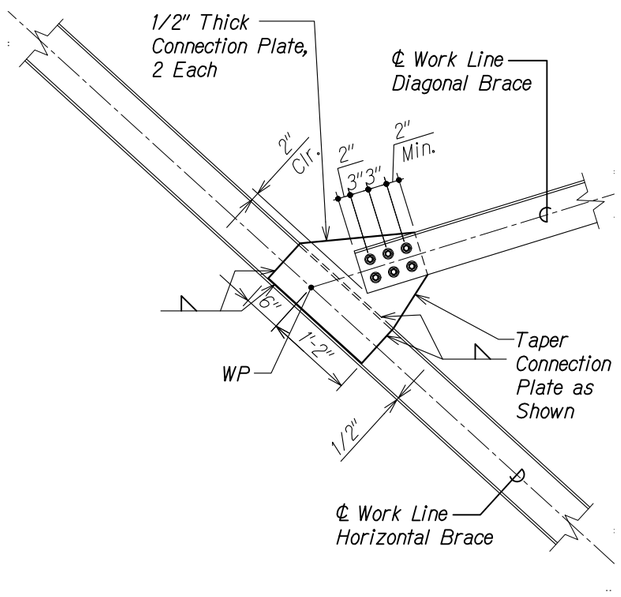
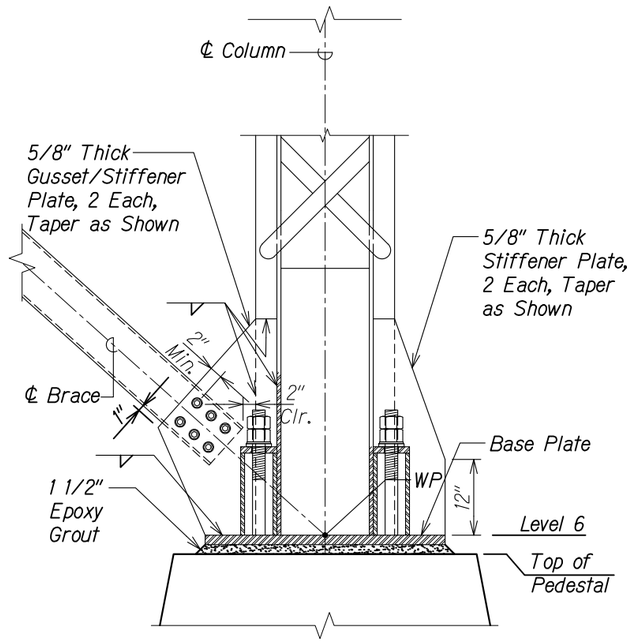
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



CONNECTION DETAIL 1

Scale: 1" = 1'-0"

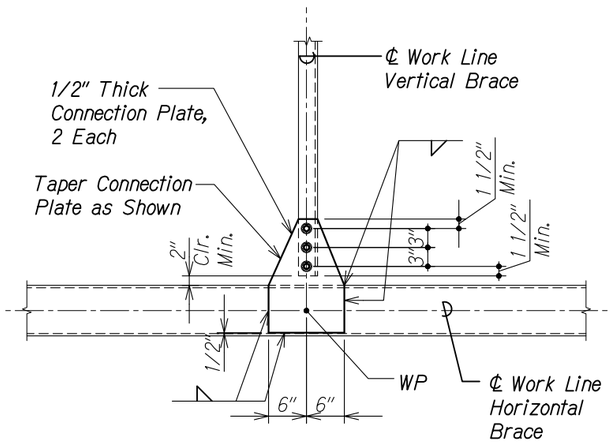
SA6.4 | SA6.4



CONNECTION DETAIL 2

Scale: 1" = 1'-0"

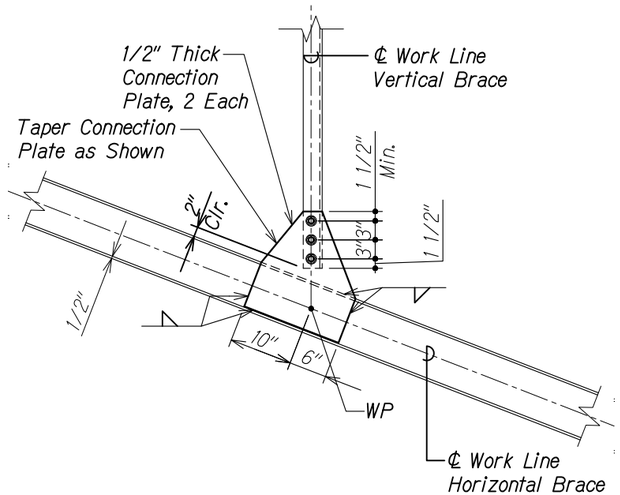
SA6.4 | SA6.4



CONNECTION DETAIL 3

Scale: 1" = 1'-0"

SA6.4 | SA6.4



CONNECTION DETAIL 4

Scale: 1" = 1'-0"

SA6.4 | SA6.4

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CONNECTION DETAILS

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA6.4 OF 8 SHEETS

ORIGINAL PLAN | NOTE BOOK | No.
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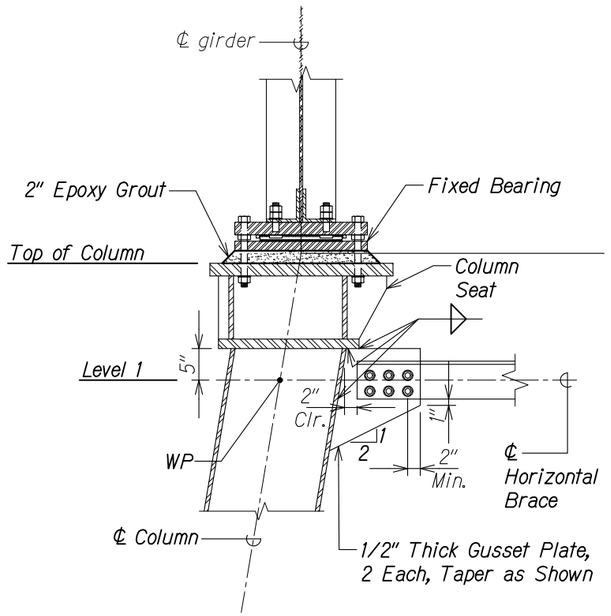
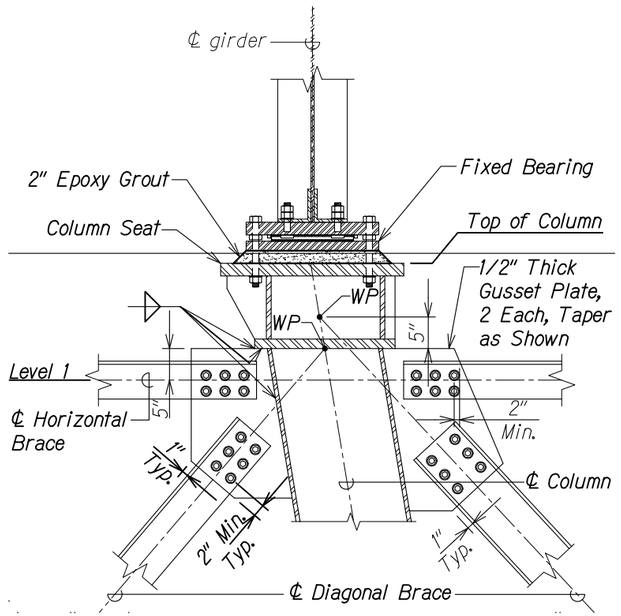
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



CONNECTION DETAIL 1

Scale: 1" = 1'-0"

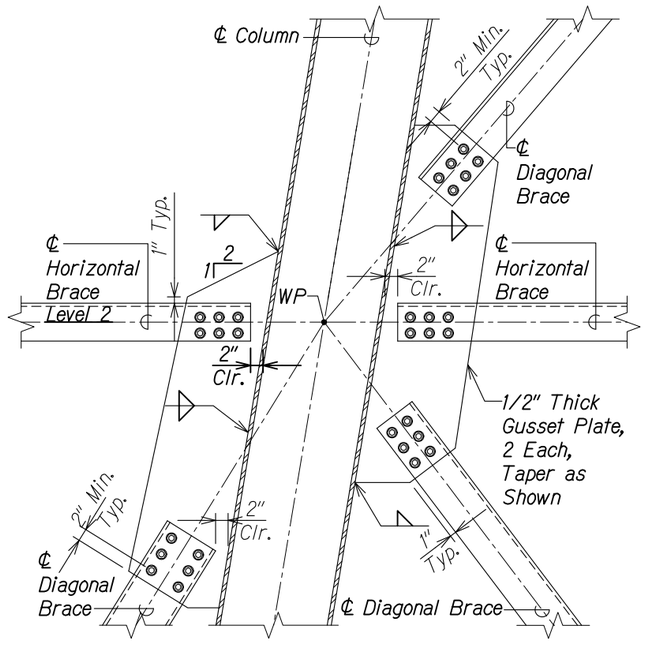
SA6.5 | SA6.5



CONNECTION DETAIL 2

Scale: 1" = 1'-0"

SA6.5 | SA6.5



CONNECTION DETAIL 3

Scale: 1" = 1'-0"

SA6.5 | SA6.5

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
No.	TRACED BY	
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DRAWING NAME: Z:\00 ONGOING\00 JF PROJECTS\22-001:12-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\NSR-SA0601 CONN DTLS.DWG PLOT TIME: 03-29-24, 9:25 PM)

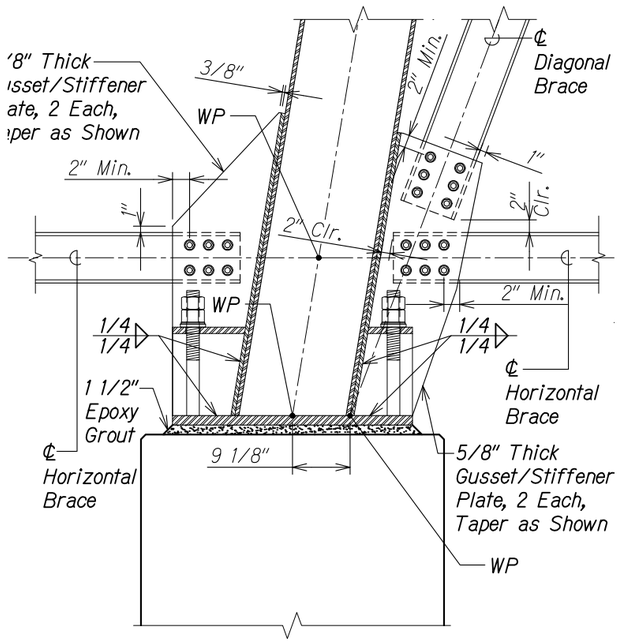
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CONNECTION DETAILS

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



CONNECTION DETAIL 1

Scale: 1" = 1'-0"

SA6.6 | SA6.6

ORIGINAL PLAN

NOTE BOOK

No.

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DESIGNED BY

QUANTITIES BY

CHECKED BY

DRAWING NAME: Z:\00 ONGOING\00 JF PROJECTS\22-001.12-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\NSR-SA0601 CONN DTLS.DWG PLOT TIME: 03-29-24, 9:25 PM)

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CONNECTION DETAILS

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA6.6 OF 8 SHEETS

CONNECTION REFERENCE

	CONNECTION ID	DETAIL DRAWING
BENT NO. 1	TP1A1-C	1/SA6.5
	TP1D1-C	1/SA6.5
	GP1B2-C	3/SA6.5
	GP1C2-C	3/SA6.5
	BP1B3-C	1/SA6.6
	BP1C3-C	1/SA6.6
BENT NO. 2	TP2A1-C	1/SA6.5
	TP2B1-C	2/SA6.5
	TP2C1-C	2/SA6.5
	TP2D1-C	1/SA6.5
	GP2A2-C	
	GP2B2-C	3/SA6.5
	GP2C2-C	3/SA6.5
	GP2D2-C	
	GP2A3-C	
	GP2B3-C	
	GP2C3-C	
	GP2D3-C	
BENT NO. 3	TP3A1-C	
	TP3B1-C	
	TP3C1-C	
	TP3D1-C	
	GP3A2-C	
	GP3B2-C	3/SA6.5
	GP3C2-C	3/SA6.5
	GP3D2-C	
	GP3A3-C	
	GP3B3-C	
	GP3C3-C	
	GP3D3-C	
	GP3A4-C	
	GP3B4-C	
	GP3C4-C	
	GP3D4-C	
BENT NO. 4	TP4A1-C	1/SA6.5
	TP4B1-C	2/SA6.5
	TP4C1-C	2/SA6.5
	TP4D1-C	1/SA6.5
	GP4A2-C	
	GP4B2-C	3/SA6.5
	GP4C2-C	3/SA6.5
	GP4D2-C	

	CONNECTION ID	DETAIL DRAWING
BENT NO. 4	GP4A3-2	
	GP4B3-2	
	GP4C3-2	
	GP4D3-2	
BENT NO. 5	TP5A1-C	
	TP5B1-C	
	TP5C1-C	
	TP5D1-C	
	GP5A2-C	
	GP5B2-C	3/SA6.5
	GP5C2-C	3/SA6.5
	GP5D2-C	
	GP5A3-C	
	GP5B3-C	
	GP5C3-C	
	GP5D3-C	
BENT NO. 6	TP6A1-C	1/SA6.5
	TP6B1-C	2/SA6.5
	TP6C1-C	2/SA6.5
	TP6D1-C	1/SA6.5
	GP6A2-C	
	GP6B2-C	3/SA6.5
	GP6C2-C	3/SA6.5
	GP6D2-C	
	GP6A3-C	
	GP6B3-C	
	GP6C3-C	
	GP6D3-C	
BENT NO. 7	TP7A1-C	
	TP7B1-C	
	TP7C1-C	
	TP7D1-C	
	GP7A2-C	
	GP7B2-C	3/SA6.5
	GP7C2-C	3/SA6.5

	CONNECTION ID	DETAIL DRAWING
BENT NO. 7	GP7D2-C	
	GP7A3-C	
	GP7B3-C	
	GP7C3-C	
	GP7D3-C	
BENT NO. 8	TP8A1-C	1/SA6.5
	TP8B1-C	2/SA6.5
	TP8C1-C	2/SA6.5
	TP8D1-C	1/SA6.5
	GP8A2-C	
	GP8B2-C	3/SA6.5
	GP8C2-C	3/SA6.5
	GP8D2-C	
	GP8A3-C	
BENT NO. 9	GP9B2-C	3/SA6.5
	GP9C2-C	3/SA6.5
	BP9B3-C	1/SA6.6
	BP9C3-C	1/SA6.6

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		

ORIGINAL PLAN
NOTE BOOK
No.

SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CONNECTION REFERENCE SCHEDULE

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA6.7 OF 8 SHEETS

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		

CONNECTION REFERENCE SCHEDULE

BENT NO. 2 TO 3

CONNECTION ID	DETAIL DRAWING
TP2A1-B	1/SA6.2
TP3A1-B	
GP2A3-B	3/SA6.2
GP3A3-B	3/SA6.2
BP2A5-B	1/SA6.3
GP3A5-B	3/SA6.3
BP3A6-B	2/SA6.4
SP23A1-3	2/SA6.2
SP23A3-4	2/SA6.2
SP23A4-5	2/SA6.3
SP23A3	3/SA6.4
SP23A4	3/SA6.4
SP23A5	4/SA6.4

BENT NO. 4 TO 5

CONNECTION ID	DETAIL DRAWING
TP4A1-B	1/SA6.2
TP5A1-B	
GP4A3-B	3/SA6.2
GP5A3-B	3/SA6.2
GP4A4-B	3/SA6.2
GP5A4-B	3/SA6.2
GP4A5-B	3/SA6.2
GP5A5-B	3/SA6.2
GP4A6-B	3/SA6.2
GP5A6-B	3/SA6.2
BP4A7-B	
BP5B7-B	
BP5B8-B	
SP45B1-3	2/SA6.2
SP45B3-4	2/SA6.2
SP45B4-5	2/SA6.2
SP45B5-6	2/SA6.2
SP45B6-7	
SP45B3	3/SA6.4
SP45B4	3/SA6.4

BENT NO. 6 TO 7

CONNECTION ID	DETAIL DRAWING
TP6A1-B	1/SA6.2
TP7A1-B	
GP6A3-B	3/SA6.2
GP7A3-B	3/SA6.2
GP6A4-B	3/SA6.2
GP7A4-B	3/SA6.2
GP6A5-B	3/SA6.2
GP7A5-B	3/SA6.2
GP6A6-B	3/SA6.2
BP7A6-B	
GP6A7-B	
BP6A8-B	
SP67A1-3	2/SA6.2
SP67A3-4	2/SA6.2
SP67A4-5	2/SA6.2
SP67A5-6	2/SA6.2

BENT NO. 8 TO 9

CONNECTION ID	DETAIL DRAWING
TP8A1-B	1/SA6.2
TP9A1-B	
GP4A3-B	
BP9A3-B	
BP8A4-B	
SP89A1-3	2/SA6.2
SP89A3	

ORIGINAL PLAN
NOTE BOOK
No.
SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE

DRAWING NAME: Z:\00 ONGOING\00 JF PROJECTS\22-001.12-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\NSR-SA0601 CONN DTLS.DWG PLOT TIME: 03-29-24, 9:26 PM)

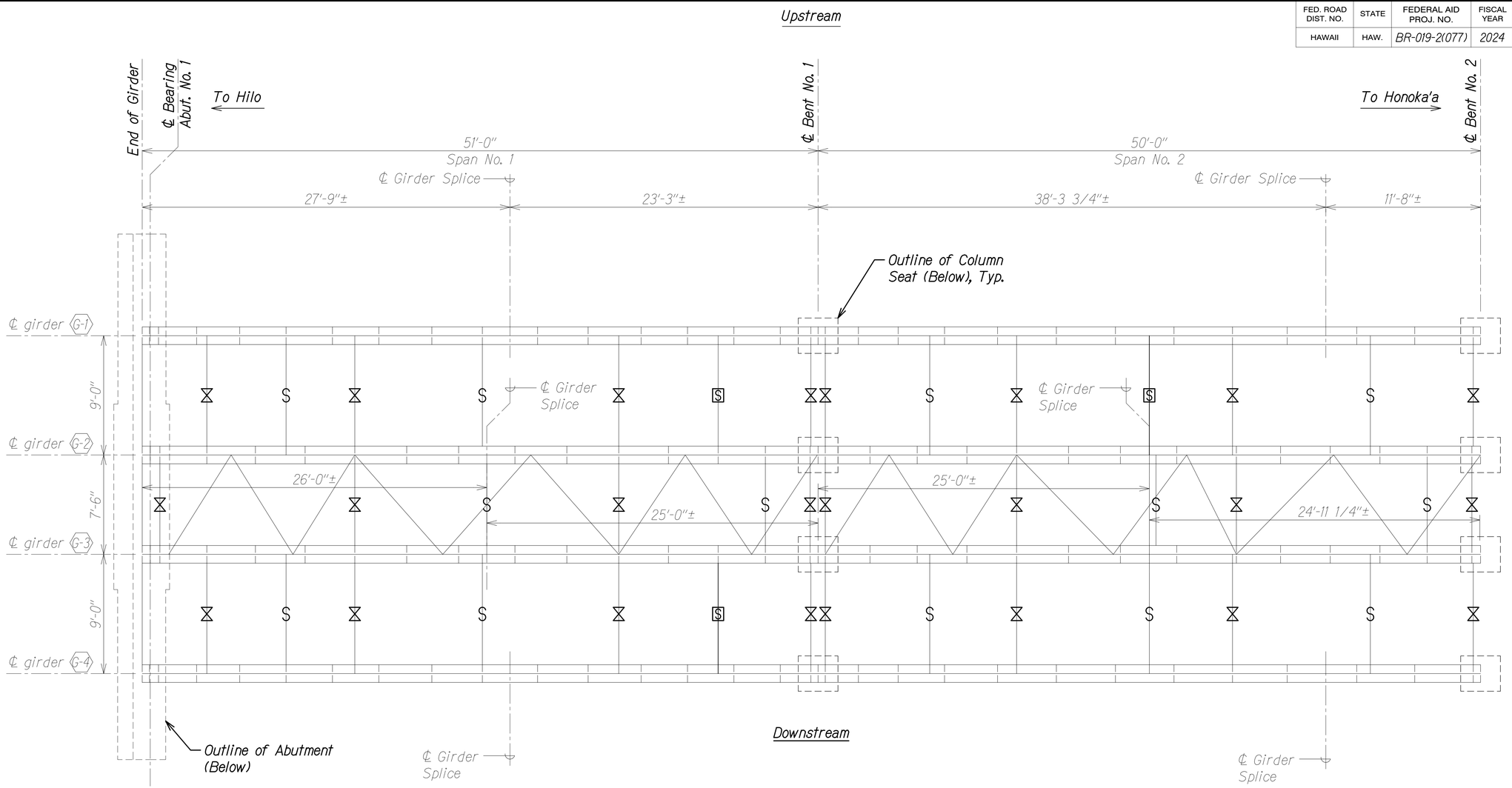
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CONNECTION REFERENCE SCHEDULE

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024	00	



GIRDER FRAMING PLAN - SPANS 1 AND 2

Scale: 1/4" = 1'-0"

LEGEND:

- Exist. Cross Frame to Remain
- Exist. Cross Frame to be Removed and Replaced
- Exist. Strut to Remain
- Exist. Strut to be Removed and Replaced
- Exist. Lateral Bracing to be Removed and Replaced

NOTES:

1. Cross Frames, Struts, Stiffeners and Lateral Bracing locations to be verified.
2. Provided dimensions are based on As-built plans.

ORIGINAL PLAN | NOTE BOOK | No. | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE

DRAWING NAME: Z:\OD ONGOING\OD JF PROJECTS\22-001 12-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\NSR-SA07D1 GIRDER SPAN 1 & 2 PLN.DWG PLOT TIME: 03-29-24, 3:44 PM

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GIRDER FRAMING PLAN - SPANS 1 AND 2

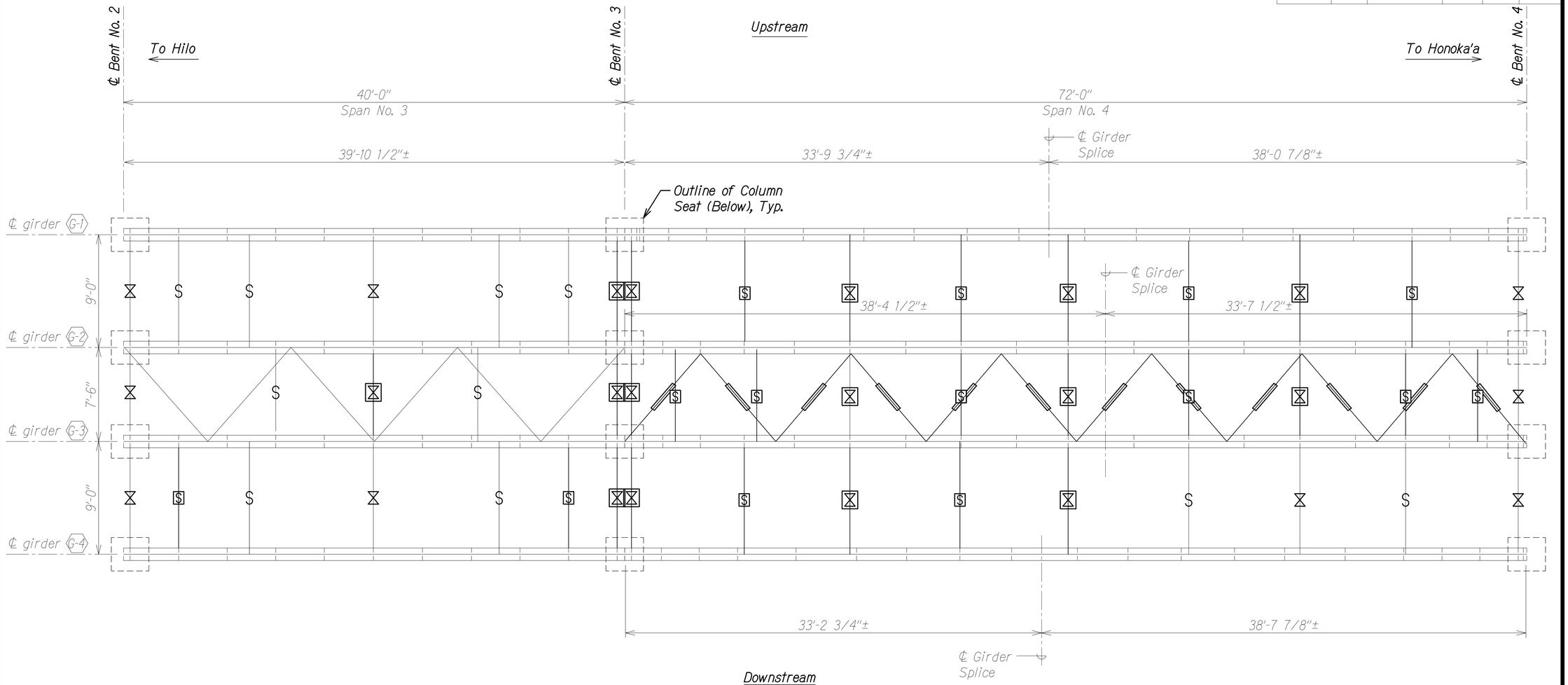
HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA7.1 OF 17 SHEETS

00

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024	00	



GIRDER FRAMING PLAN - SPANS 3 AND 4

Scale: 1/4" = 1'-0"

LEGEND:

- Exist. Cross Frame to Remain
- Exist. Cross Frame to be Removed and Replaced
- Exist. Strut to Remain
- Exist. Strut to be Removed and Replaced
- Exist. Lateral Bracing to be Removed and Replaced

NOTES:

1. Cross Frames, Struts, Stiffeners and Lateral Bracing locations to be verified.
2. Provided dimensions are based on As-built plans.
3. All lateral bracing within Span No. 4 to be removed and replaced.

ORIGINAL PLAN | NOTE BOOK | No. | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GIRDER FRAMING PLAN - SPANS 3 AND 4

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA7.2 OF 17 SHEETS

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PLOT TIME: 03-29-24, 3:44 PM
DRAWING NAME: Z:\OD ONGOING\OD_JF_PROJECTS\22-001 12-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\NSR-SA0702 GIRDER SPAN 3 & 4 PLN.DWG

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
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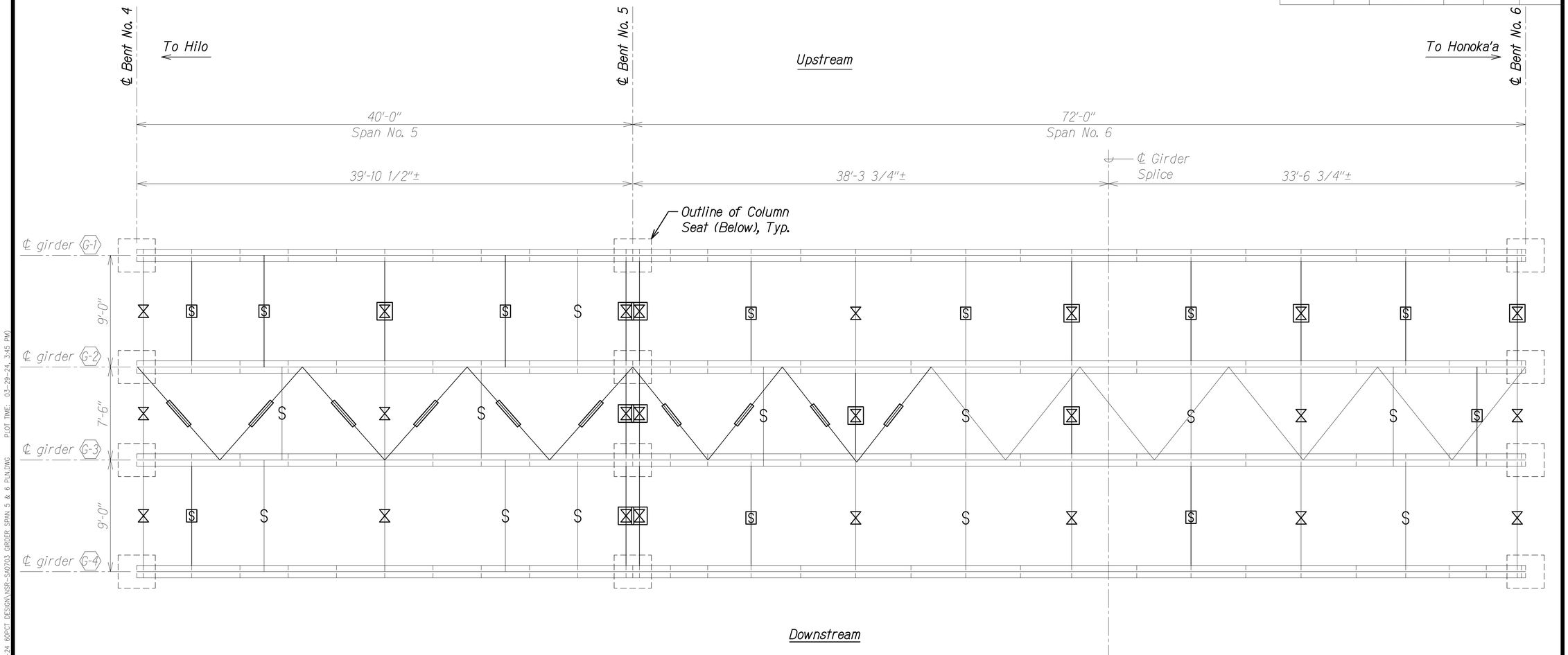

GIRDER FRAMING PLAN - SPANS 5 AND 6

Scale: 1/4" = 1'-0"

LEGEND:

- Exist. Cross Frame to Remain
- Exist. Cross Frame to be Removed and Replaced
- Exist. Strut to Remain
- Exist. Strut to be Removed and Replaced
- Exist. Lateral Bracing to be Removed and Replaced

NOTES:

1. Cross Frames, Struts, Stiffeners and Lateral Bracing locations to be verified.
2. Provided dimensions are based on As-built plans.
3. All lateral bracing within Span No. 5 to be removed and replaced.

ORIGINAL PLAN
NOTE BOOK No.
SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE

DRAWING NAME: Z:\OD ONGOING\OD_JF PROJECTS\22-001.12-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\NSR-SA0703 GIRDER SPAN 5 & 6 PLN.DWG
PLOT TIME: 03-29-24, 3:45 PM

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GIRDER FRAMING PLAN - SPANS 5 AND 6

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA7.3 OF 17 SHEETS

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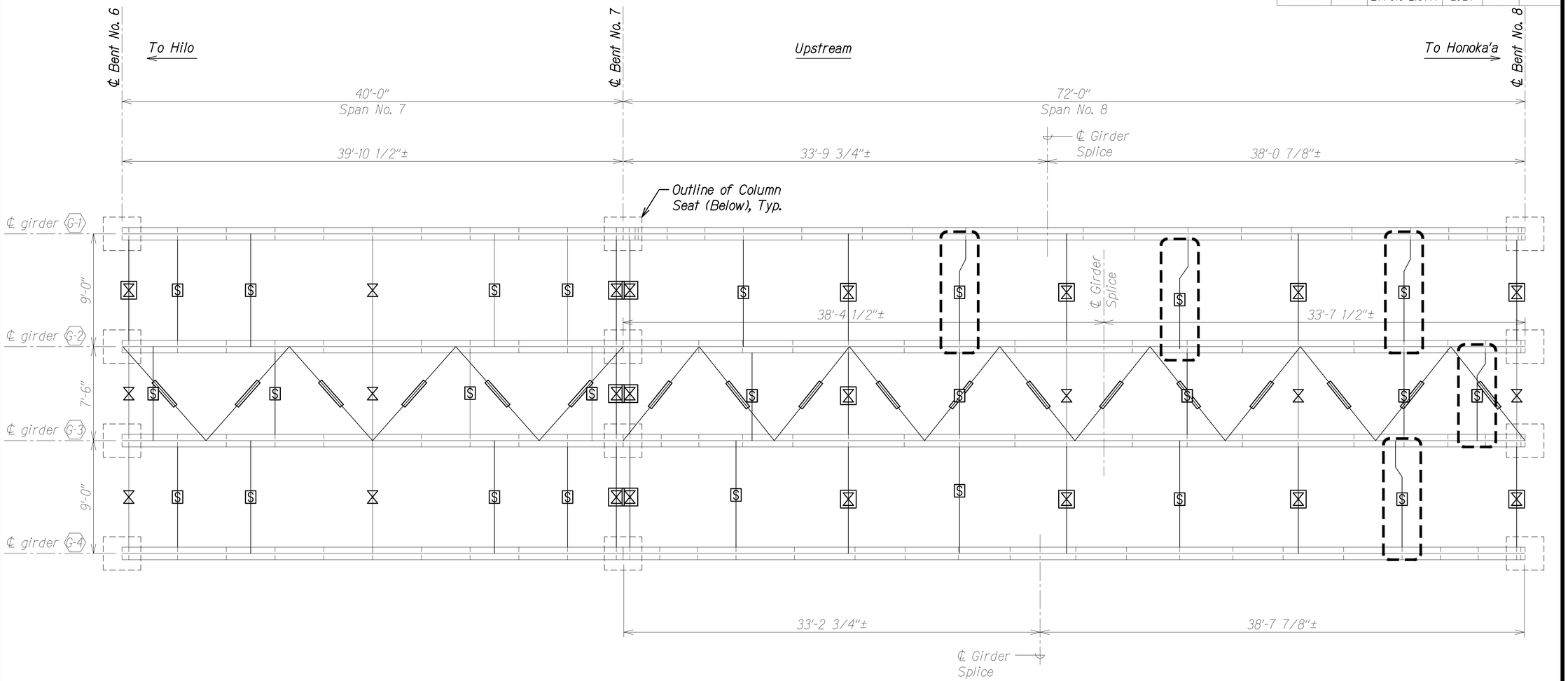
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024	00	



Downstream

GIRDER FRAMING PLAN - SPANS 7 AND 8

Scale: 1/4" = 1'-0"

LEGEND:

- Exist. Cross Frame to Remain
- Exist. Cross Frame to be Removed and Replaced
- Exist. Strut to Remain
- Exist. Strut to be Removed and Replaced
- Exist. Lateral Bracing to be Removed and Replaced
- Circled Struts, Locations to be Verified

NOTES:

1. Cross Frames, Struts, Stiffeners and Lateral Bracing locations to be verified.
2. Provided dimensions are based on As-built plans.
3. All lateral bracing within Span Nos. 7 and 8 to be removed and replaced.

ORIGINAL PLAN
NOTE BOOK
No.

SURVEY PLOTTED BY
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QUANTITIES BY
CHECKED BY
DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GIRDER FRAMING PLAN - SPANS 7 AND 8

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

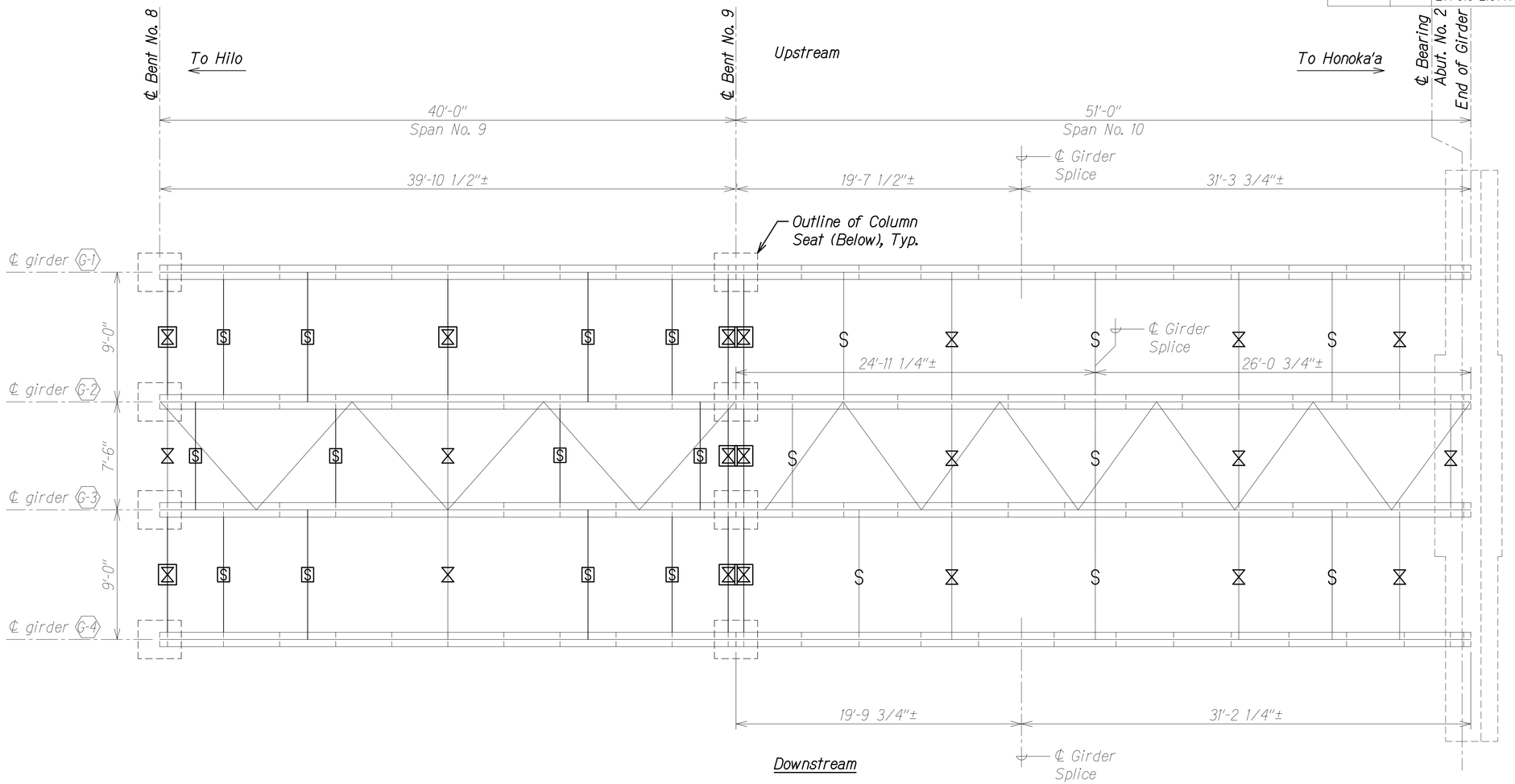
Scale: As Noted Date: Mar. 2024

SHEET No. SA7.4 OF 17 SHEETS

00

DRAWING NAME: Z:\00 ONGOING\00 JF PROJECTS\22-001.12-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\NSR-SA0704 GIRDER SPAN 7 & 8 PLN.DWG PLOT TIME: 03-29-24, 3:45 PM

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024	00	



GIRDER FRAMING PLAN - SPANS 9 AND 10

Scale: 1/4" = 1'-0"

LEGEND:

- Exist. Cross Frame to Remain
- Exist. Cross Frame to be Removed and Replaced
- Exist. Strut to Remain
- Exist. Strut to be Removed and Replaced
- Exist. Lateral Bracing to be Removed and Replaced

NOTES:

1. Cross Frames, Struts, Stiffeners and Lateral Bracing locations to be verified.
2. Provided dimensions are based on As-built plans.

ORIGINAL PLAN
NOTE BOOK
No.

SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGN BY
QUANTITIES BY
CHECKED BY
DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GIRDER FRAMING PLAN - SPANS 9 AND 10

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

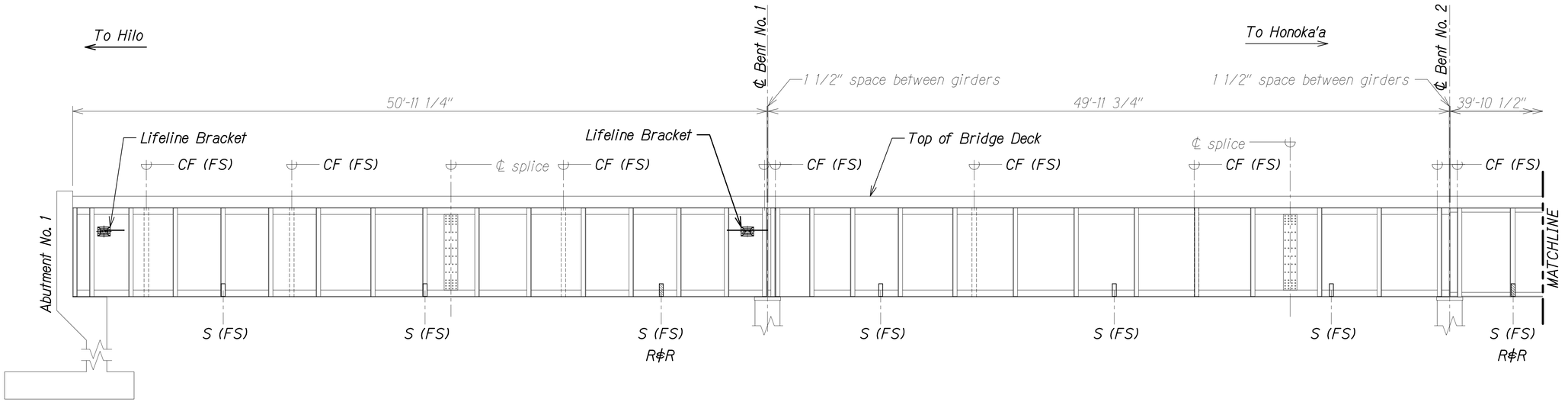
Scale: As Noted Date: Mar. 2024

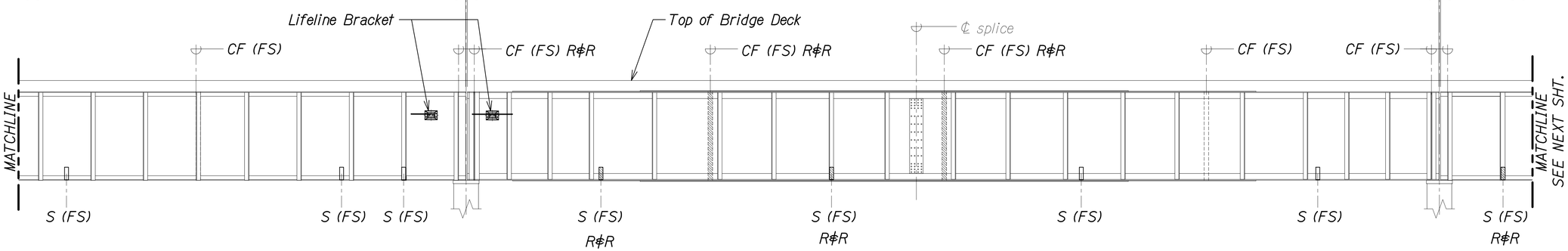
SHEET No. SA7.5 OF 17 SHEETS

00

DRAWING NAME: Z:\OD ONGOING\OD JF PROJECTS\22-001 12-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\NSR-SA07D5 GIRDER SPAN 9 & 10 P.N.DWG PLOT TIME: 03-29-24, 3:45 PM

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024	00	





LEGEND:

CF	Cross Frame
FS	Far Side
NS	Near Side
S	Strut
	Remove ℄ Replace (R℄R)
*	Locations to be Verified

TYPICAL GIRDER G1 DOWNSTREAM ELEVATION

A SA7.6 | SA7.6

Scale: 1/4" = 1'-0"

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GIRDER 1
DOWNSTREAM ELEVATION

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA7.6 OF 17 SHEETS

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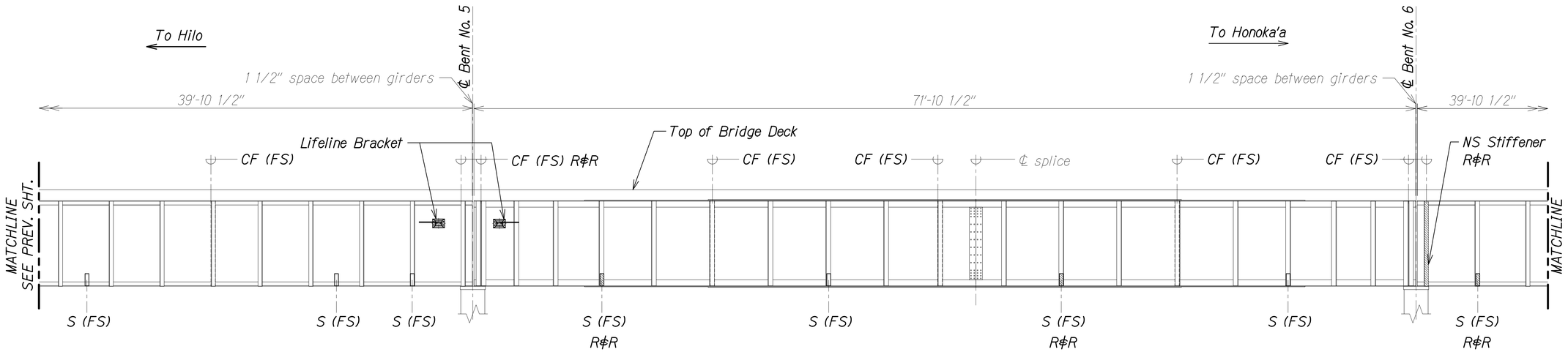
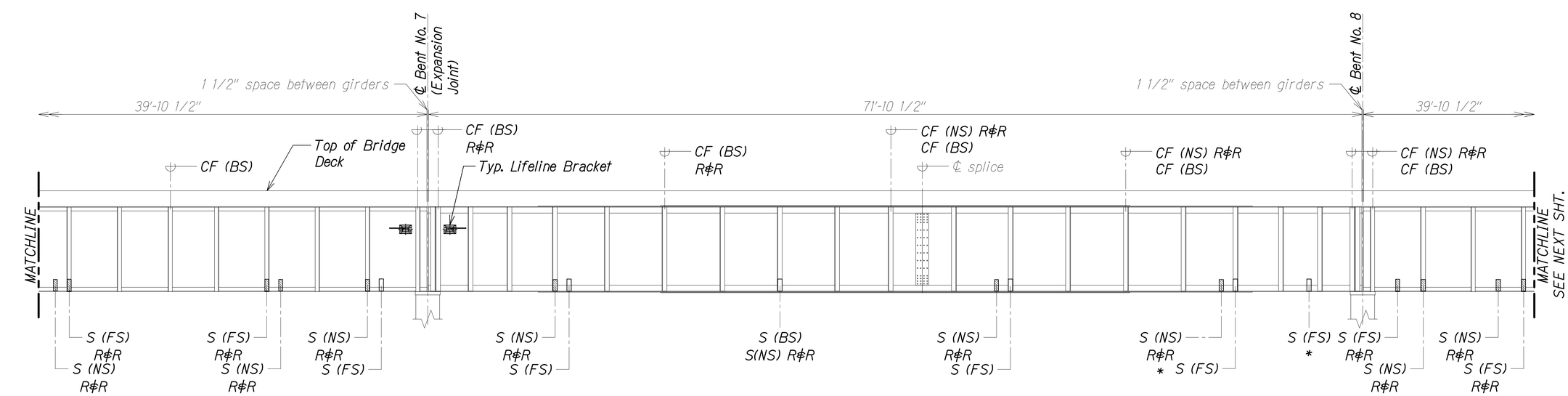
ORIGINAL PLAN
NOTE BOOK No.
SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE

DRAWING NAME: Z:\OD ONGONGO\05 JF PROJECTS\22-001 12-NANUE STR BR REHAB\01 CAD\03-29-24 69PCT DESIGN\NSR-SA0706 GIRDER ELEV.DWG PLOT TIME: (03-29-24, 5:57 PM)

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024	00	





LEGEND:

CF	Cross Frame
FS	Far Side
NS	Near Side
S	Strut
▨	Remove & Replace (R&R)
*	Locations to be Verified

TYPICAL GIRDER G1 DOWNSTREAM ELEVATION

A SA7.7 | SA7.7

Scale: 1/4" = 1'-0"

NOTE:

Span 2 & 3 member locations (stiffeners, CF, & struts) need to be verified for all girders. Drawing is based on as-builts and overall drone photos.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GIRDER 1
DOWNSTREAM ELEVATION

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA7.7 OF 17 SHEETS

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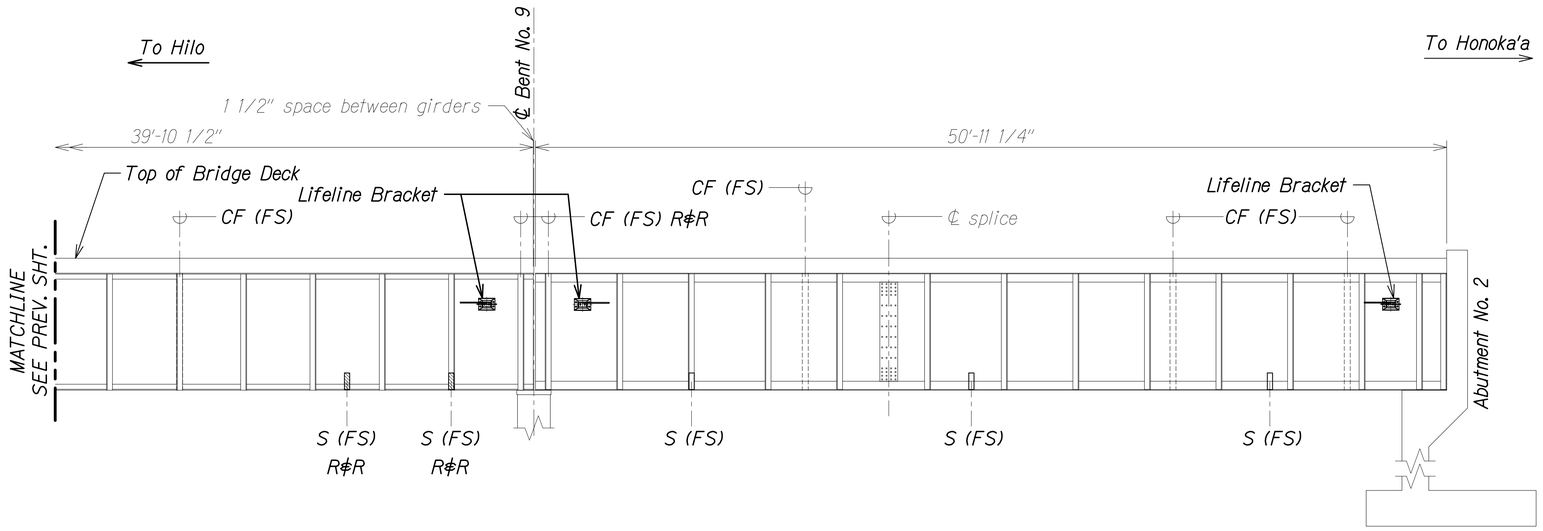
ORIGINAL PLAN | NOTE BOOK | No. | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE

DRAWING NAME: Z:\OD ONGOING\OD JF PROJECTS\22-001.12-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\NSR-SA07G6 GIRDER ELEV.DWG PLOT TIME: (03-29-24, 5:58 PM)

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024	00	



TYPICAL GIRDER G1
DOWNSTREAM ELEVATION

Scale: 1/4" = 1'-0"

A SA7.8 | SA7.8

LEGEND:

CF	Cross Frame
FS	Far Side
NS	Near Side
S	Strut
▨	Remove & Replace (R&R)
*	Locations to be Verified

NOTE:

Span 2 & 3 member locations (stiffeners, CF, & struts) need to be verified for all girders. Drawing is based on as-builts and overall drone photos.

ORIGINAL PLAN
NOTE BOOK
No.

SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GIRDER 1
DOWNSTREAM ELEVATION

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

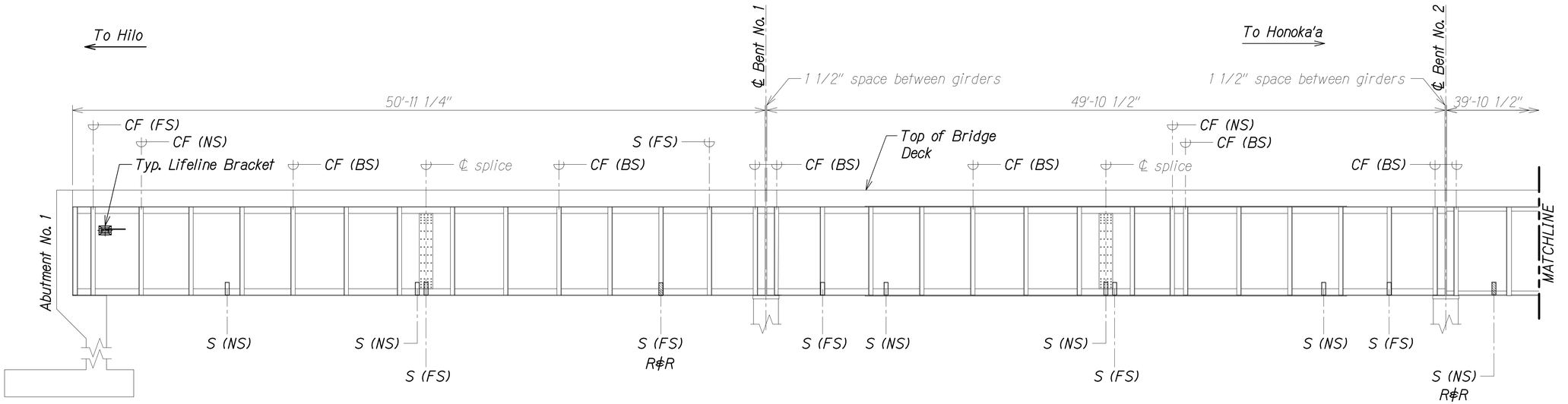
Scale: As Noted Date: Mar. 2024

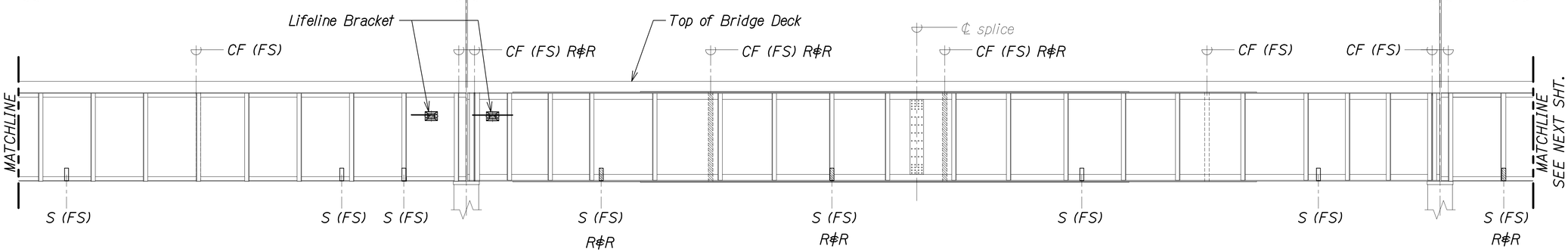
SHEET No. SA7.8 OF 17 SHEETS

00

DRAWING NAME: Z:\A\D ONGOING\D GF PROJECTS\22-00112-NANUE STR BR REHAB\01 CAD\03-29-24 60FT DESIGN\NSR-SA0706 GIRDER ELEV.DWG PLOT TIME: 03-29-24, 5:58 PM

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024	00	





LEGEND:

CF	Cross Frame
FS	Far Side
NS	Near Side
S	Strut
▨	Remove & Replace (R℄R)
*	Locations to be Verified

TYPICAL GIRDER G2
DOWNSTREAM ELEVATION

A
SA7.9 | SA7.9

Scale: 1/4" = 1'-0"

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GIRDER 2
DOWNSTREAM ELEVATION

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA7.9 OF 17 SHEETS

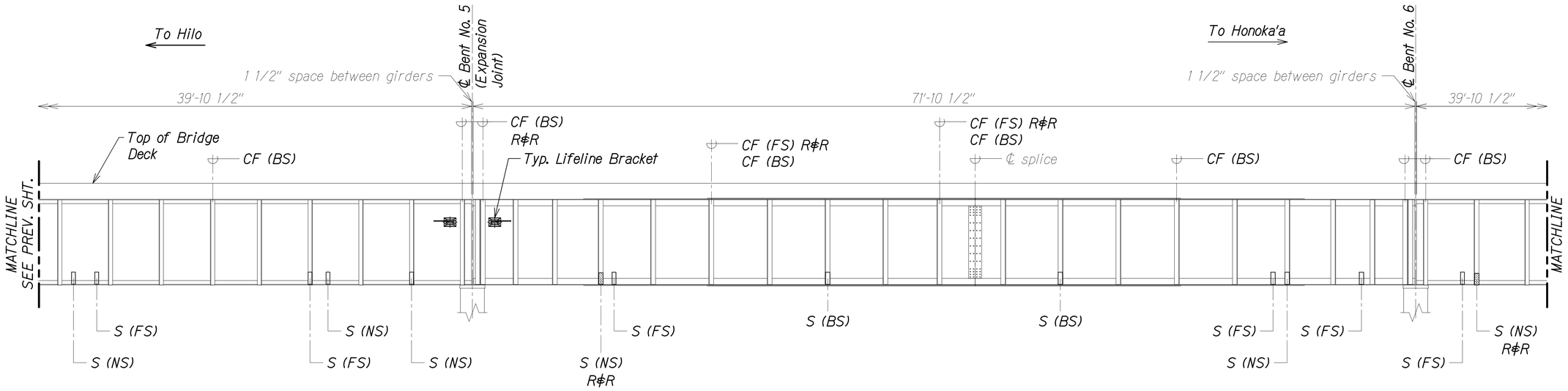
00

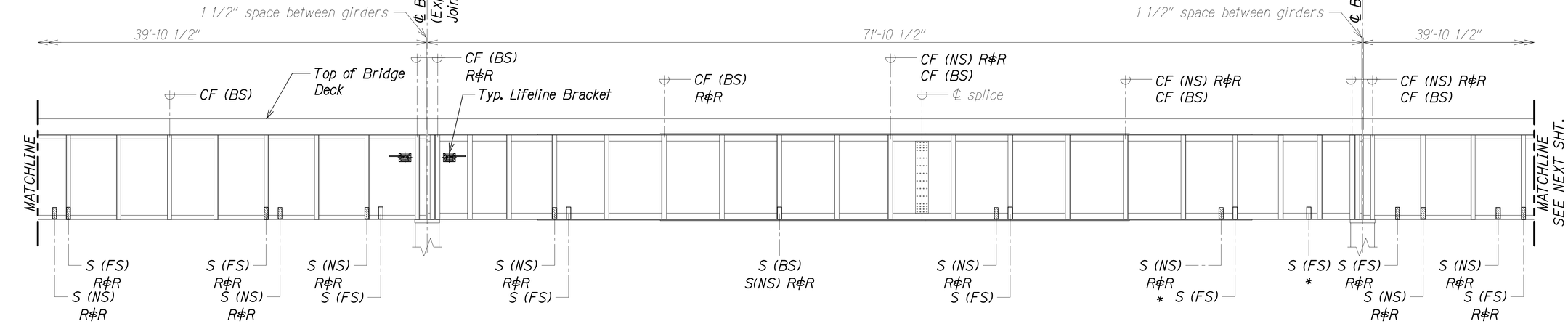
ORIGINAL PLAN
NOTE BOOK
No.

SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE

DRAWING NAME: Z:\OD ONGONGO\05 JF PROJECTS\22-001 12-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\NSR-SA0706 GIRDER ELEV.DWG PLOT TIME: (03-29-24, 5:58 PM)

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024	00	





LEGEND:

CF	Cross Frame
FS	Far Side
NS	Near Side
S	Strut
▨	Remove & Replace (R&R)
*	Locations to be Verified

TYPICAL GIRDER G2 DOWNSTREAM ELEVATION

Scale: 1/4" = 1'-0"

A SA7.10 | SA7.10

NOTE:

Span 2 & 3 member locations (stiffeners, CF, & struts) need to be verified for all girders. Drawing is based on as-builts and overall drone photos.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GIRDER 2
DOWNSTREAM ELEVATION

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA7.10 OF 17 SHEETS

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
No.	TRACED BY	
	DESIGNED BY	
	QUANTITIES BY	
	CHECKED BY	

DRAWING NAME: Z:\OD ONGOING\OD JF PROJECTS\22-001.12-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\NSR-SA0706 GIRDER ELEV.DWG PLOT TIME: (03-29-24, 5:58 PM)

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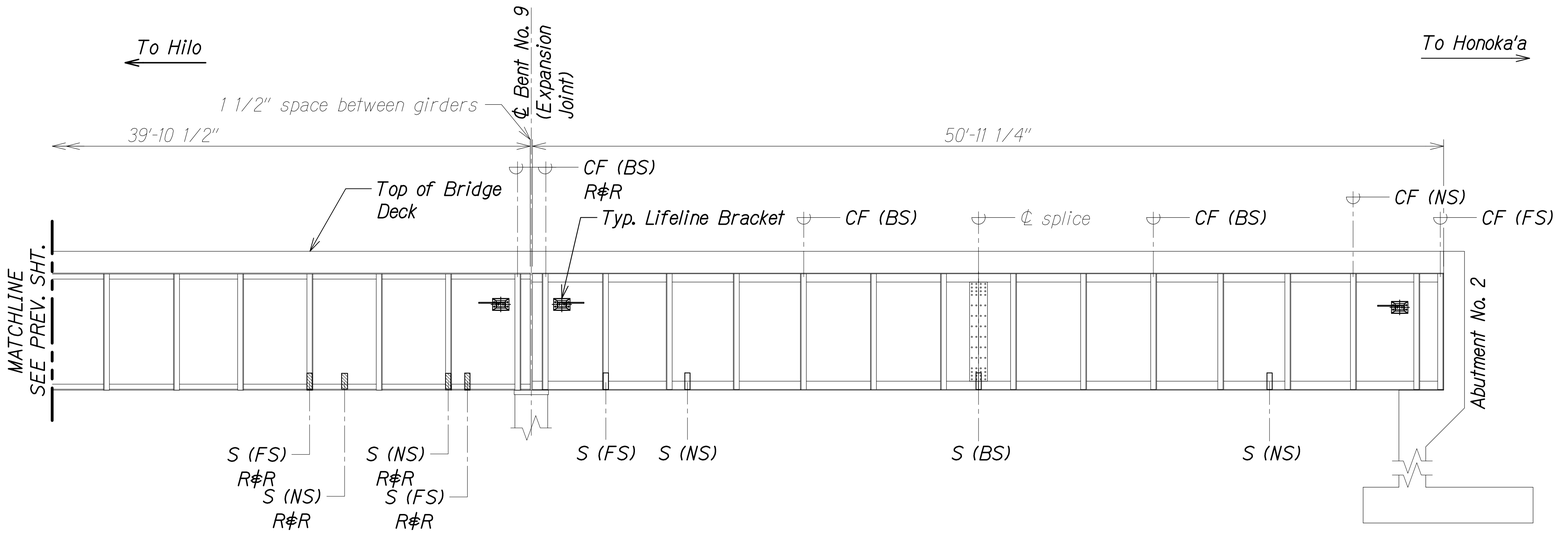
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024	00	



TYPICAL GIRDER G2 DOWNSTREAM ELEVATION

Scale: 1/4" = 1'-0"

A SA7.11 | SA7.11

LEGEND:

CF	Cross Frame
FS	Far Side
NS	Near Side
S	Strut
▨	Remove & Replace (R&R)
*	Locations to be Verified

NOTE:

Span 2 & 3 member locations (stiffeners, CF, & struts) need to be verified for all girders. Drawing is based on as-builts and overall drone photos.

ORIGINAL PLAN
NOTE BOOK
No.

SURVEY PLOTTED BY
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DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GIRDER 2
DOWNSTREAM ELEVATION

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA7.11 OF 17 SHEETS

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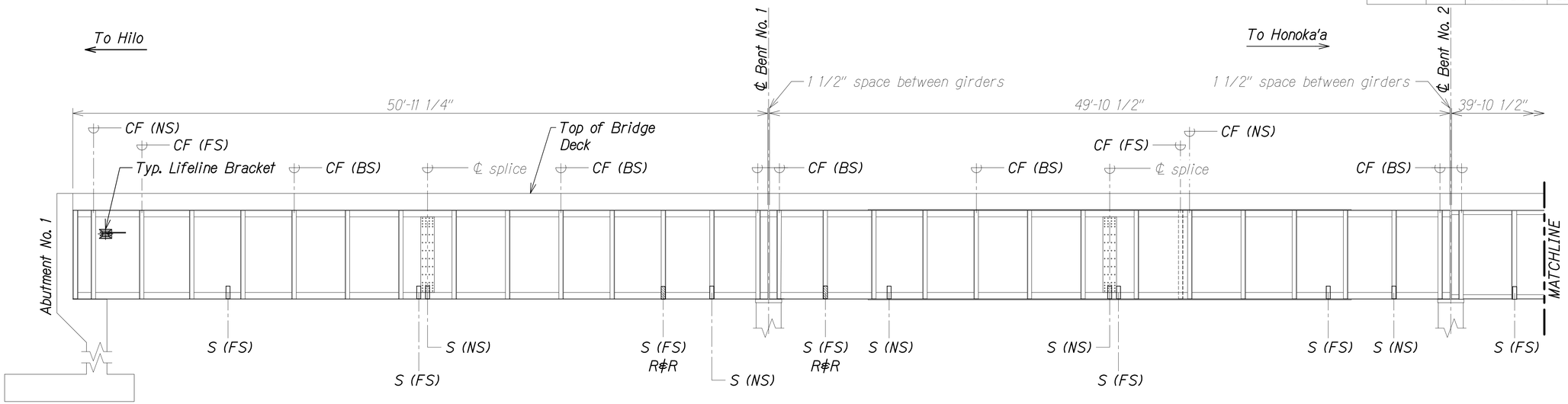
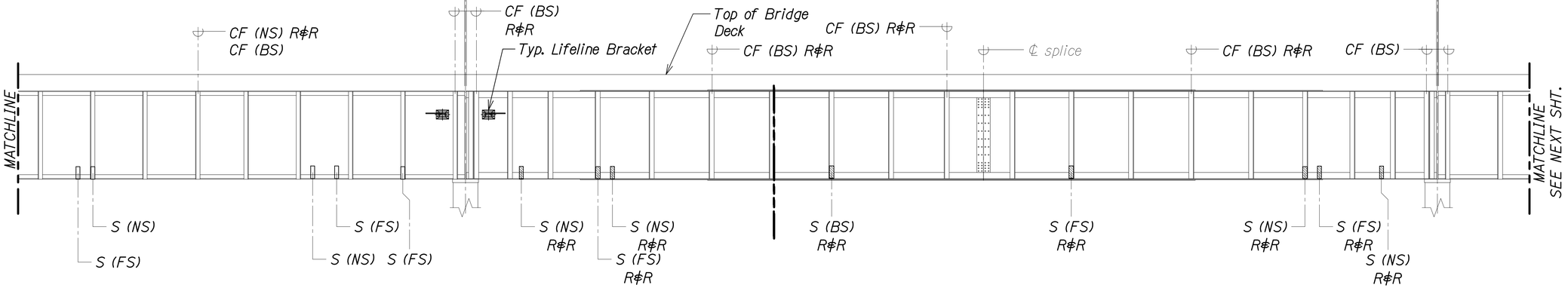
DRAWING NAME: Z:\00 ONGOING\00 JF PROJECTS\22-00112-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\NSR-SA0706 GIRDER ELEV.DWG PLOT TIME: 03-29-24, 5:59 PM

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024	00	





LEGEND:

CF	Cross Frame
FS	Far Side
NS	Near Side
S	Strut
▨	Remove & Replace (R&R)
*	Locations to be Verified

TYPICAL GIRDER G3 DOWNSTREAM ELEVATION

A SA7.12 | SA7.12

Scale: 1/4" = 1'-0"

ORIGINAL PLAN | NOTE BOOK | No. | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GIRDER 3 DOWNSTREAM ELEVATION

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

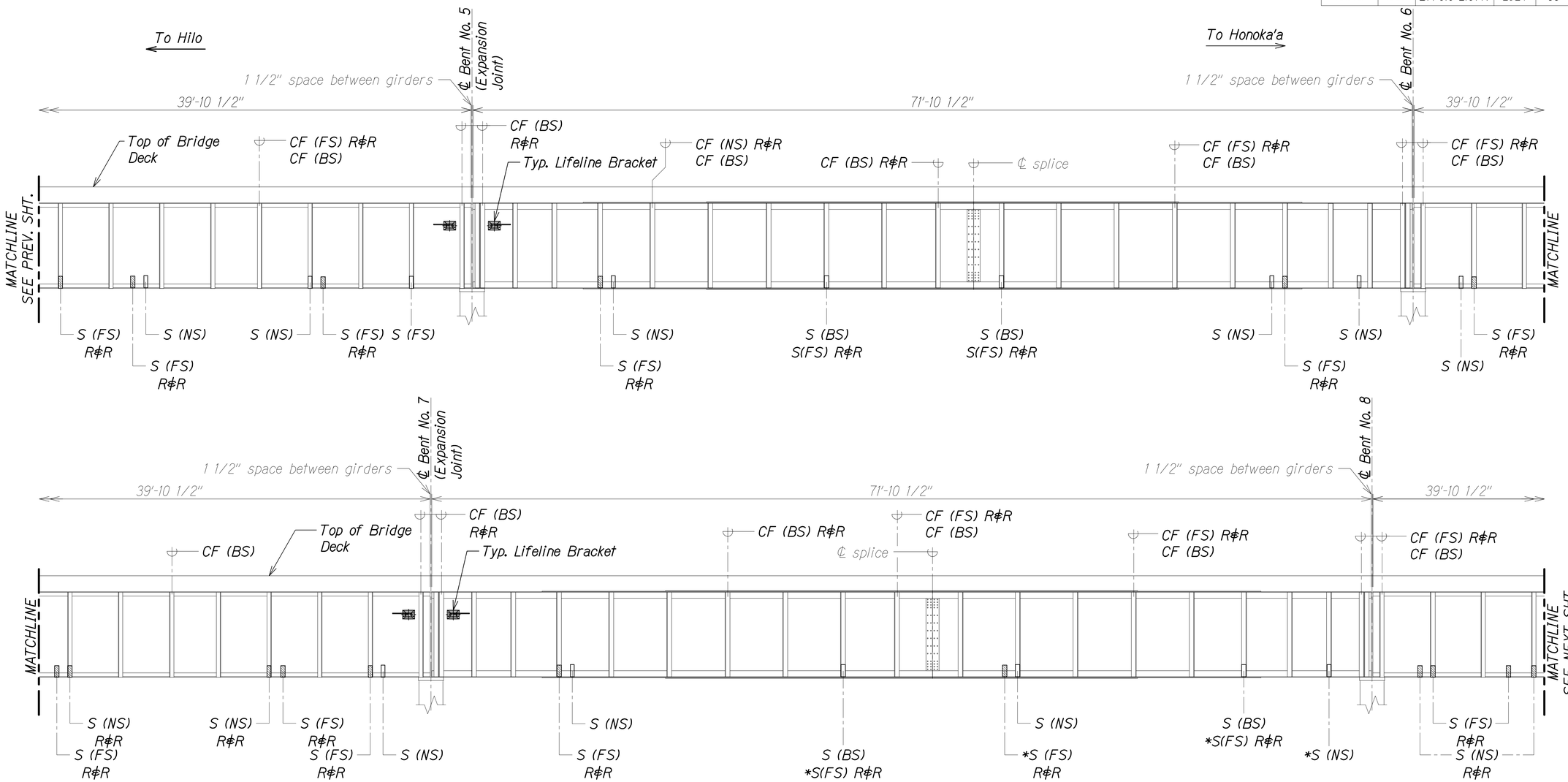
Scale: As Noted Date: Mar. 2024

SHEET No. SA7.12 OF 17 SHEETS

00

DRAWING NAME: Z:\JOB ONGOING\JOB JF PROJECTS\JF2-2011.2-NANUE STR BR REHAB\01 CAD\03-29-24 60FT DESIGN\NSR-SA0706 GIRDER ELEV.DWG PLOT TIME: 03-29-24, 5:59 PM

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024	00	



TYPICAL GIRDER G3 DOWNSTREAM ELEVATION

A SA7.13 | SA7.13

Scale: 1/4" = 1'-0"

LEGEND:

CF	Cross Frame
FS	Far Side
NS	Near Side
S	Strut
	Remove & Replace (R&R)
*	Locations to be Verified

NOTE:

Span 2 & 3 member locations (stiffeners, CF, & struts) need to be verified for all girders. Drawing is based on as-builts and overall drone photos.

ORIGINAL PLAN | NOTE BOOK | No. | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE

BRAWING NAME: Z:\OD ONGOING\OD_JF_PROJECTS\22-001 12-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\SR-SA0706 GIRDER ELEVDWG PLOT TIME: (03-29-24, 5:59 PM)

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GIRDER 3 DOWNSTREAM ELEVATION

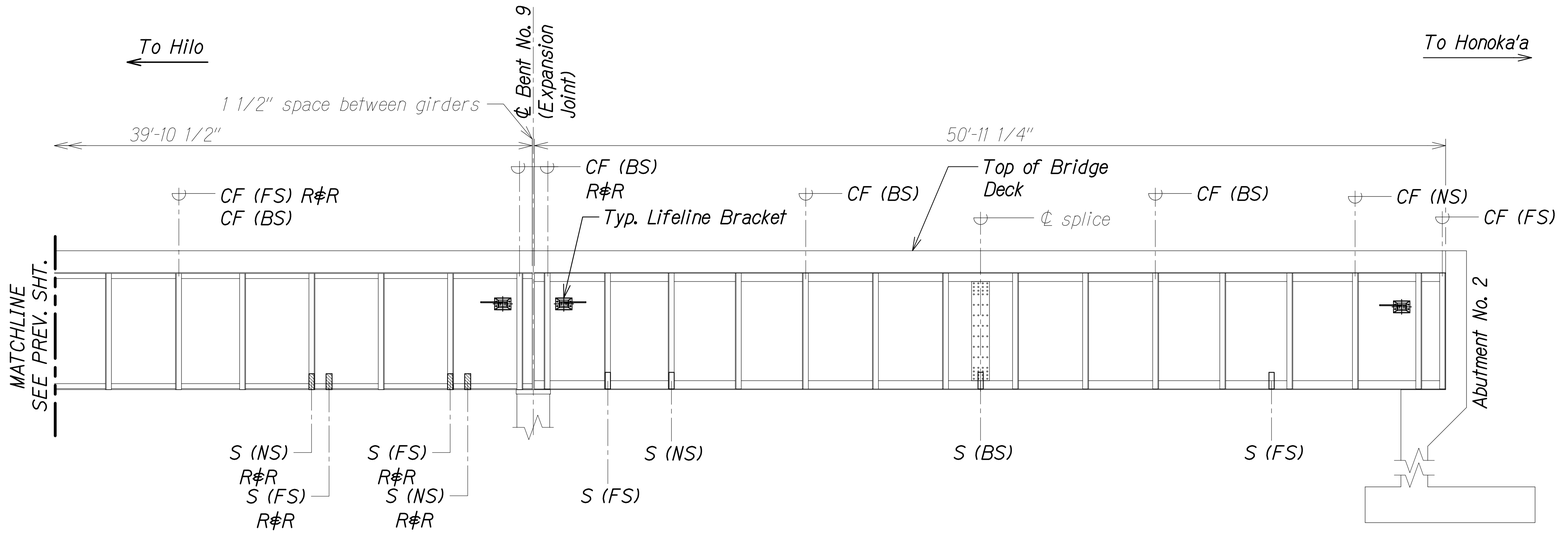
HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA7.13 OF 17 SHEETS

00

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024	00	



TYPICAL GIRDER G3 DOWNSTREAM ELEVATION

Scale: 1/4" = 1'-0"

A SA7.14 | SA7.14

LEGEND:

CF	Cross Frame
FS	Far Side
NS	Near Side
S	Strut
▨	Remove & Replace (R&R)
*	Locations to be Verified

NOTE:

Span 2 & 3 member locations (stiffeners, CF, & struts) need to be verified for all girders. Drawing is based on as-builts and overall drone photos.

ORIGINAL PLAN
NOTE BOOK
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DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GIRDER 3
DOWNSTREAM ELEVATION

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA7.14 OF 17 SHEETS

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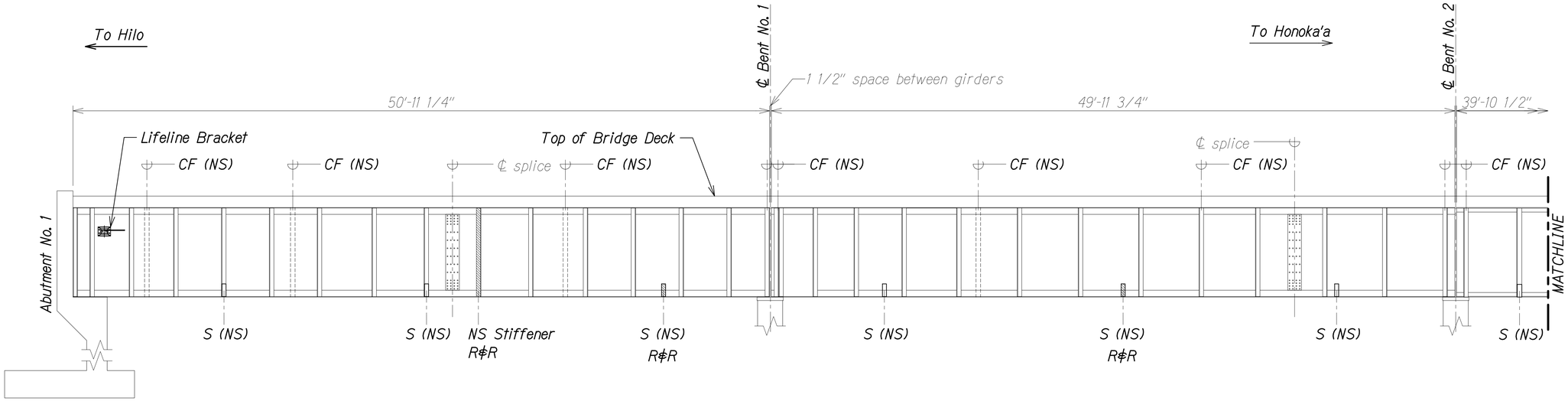
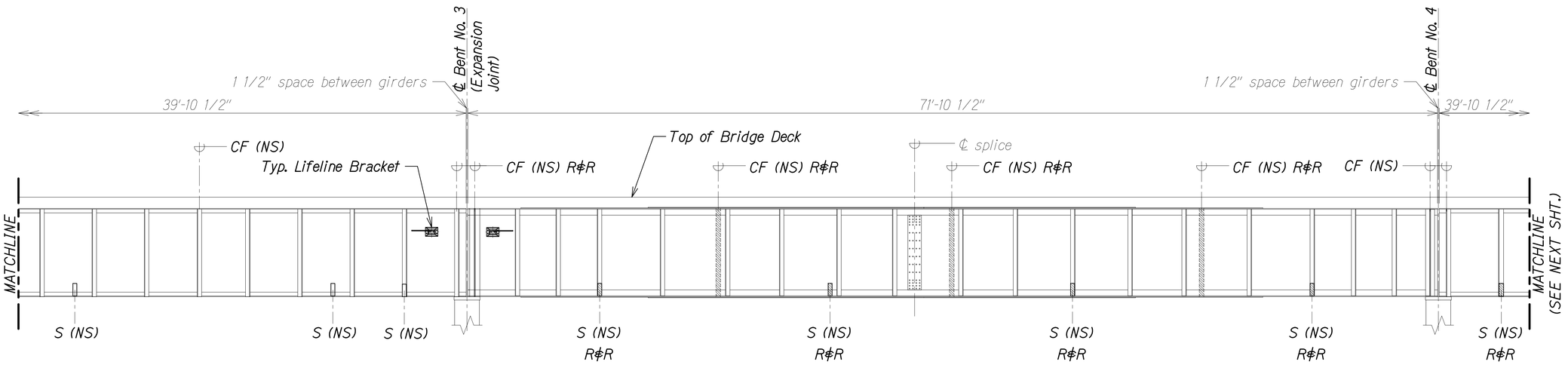
DRAWING NAME: Z:\00 ONGOING\00_JF PROJECTS\22-00112-NANUE STR BR REHAB\01 CAD\03-29-24 60FT DESIGN\NSR-SA0706 GIRDER ELEV.DWG PLOT TIME: 03-29-24, 5:59 PM

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024	00	





LEGEND:

CF	Cross Frame
FS	Far Side
NS	Near Side
S	Strut
▨	Remove & Replace (R&R)
*	Locations to be Verified

TYPICAL GIRDER G4 DOWNSTREAM ELEVATION

Scale: 1/4" = 1'-0"

A
SA7.15 | SA7.15

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
NOTE BOOK	TRACED BY	
No.	DESIGNED BY	
	QUANTITIES BY	
	CHECKED BY	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GIRDER 4 DOWNSTREAM ELEVATION

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA7.15 OF 17 SHEETS

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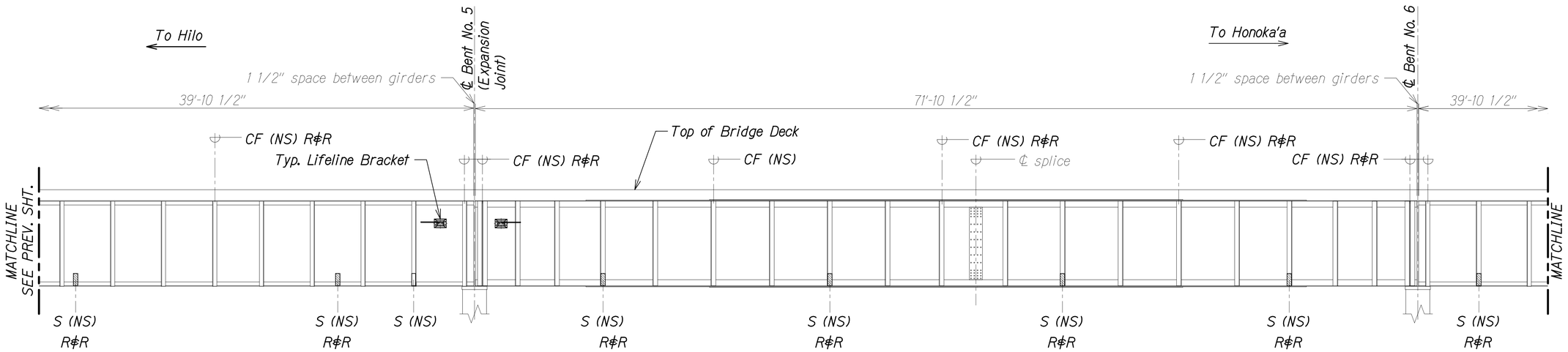
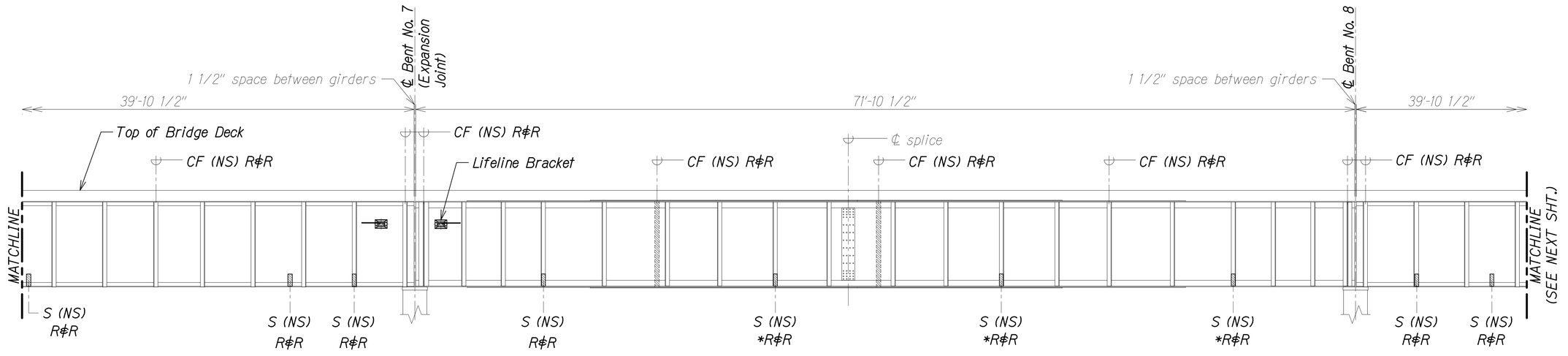
PLOT TIME: 03-29-24, 6:00 PM)
DRAWING NAME: Z:\AD ONDONK\DO JF PROJECTS\22-601.12-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\NSR-040706 GIRDER ELEV.DWG

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024	00	





LEGEND:

CF	Cross Frame
FS	Far Side
NS	Near Side
S	Strut
▨	Remove & Replace (R&R)
*	Locations to be Verified

TYPICAL GIRDER G4 DOWNSTREAM ELEVATION

Scale: 1/4" = 1'-0"

A
SA7.16 | SA7.16

NOTE:

Span 2 & 3 member locations (stiffeners, CF, & struts) need to be verified for all girders. Drawing is based on as-builts and overall drone photos.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
No.	TRACED BY	
	DESIGNED BY	
	QUANTITIES BY	
	CHECKED BY	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GIRDER 4
DOWNSTREAM ELEVATION

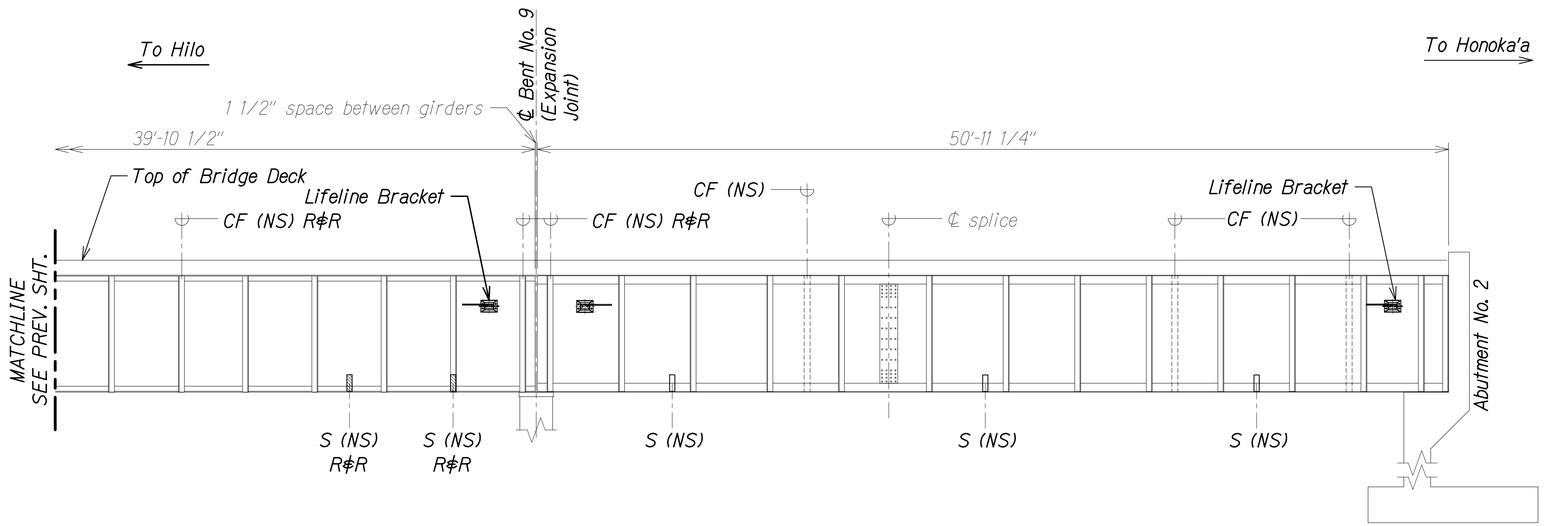
HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA7.16 OF 17 SHEETS

00

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024	00	



TYPICAL GIRDER G4 DOWNSTREAM ELEVATION

Scale: 1/4" = 1'-0"

A SA7.17 | SA7.17

LEGEND:

CF	Cross Frame
FS	Far Side
NS	Near Side
S	Strut
▨	Remove & Replace (R&R)
*	Locations to be Verified

NOTE:

Span 2 & 3 member locations (stiffeners, CF, & struts) need to be verified for all girders. Drawing is based on as-builts and overall drone photos.

ORIGINAL PLAN
NOTE BOOK
No.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GIRDER 4
DOWNSTREAM ELEVATION

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA7.17 OF 17 SHEETS

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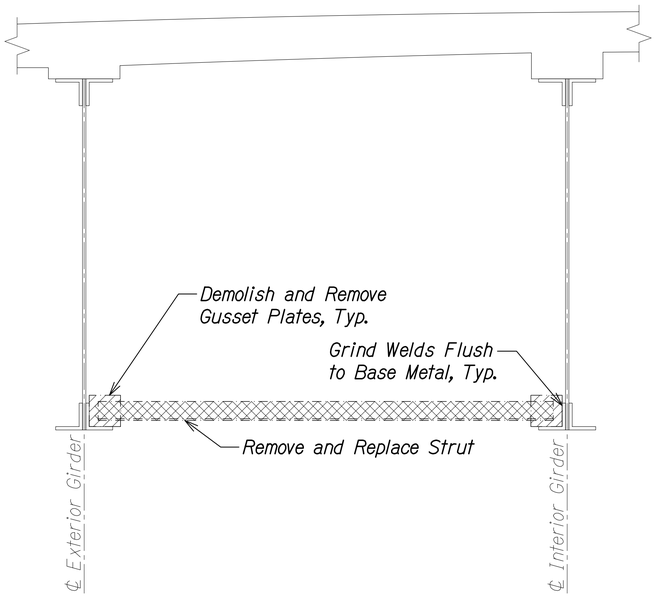
DRAWING NAME: Z:\A\00 ONGOING\00_JF PROJECTS\22-00112-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\SR-SA0706 GIRDER ELEV.DWG PLOT TIME: 03-29-24 6:00 PM

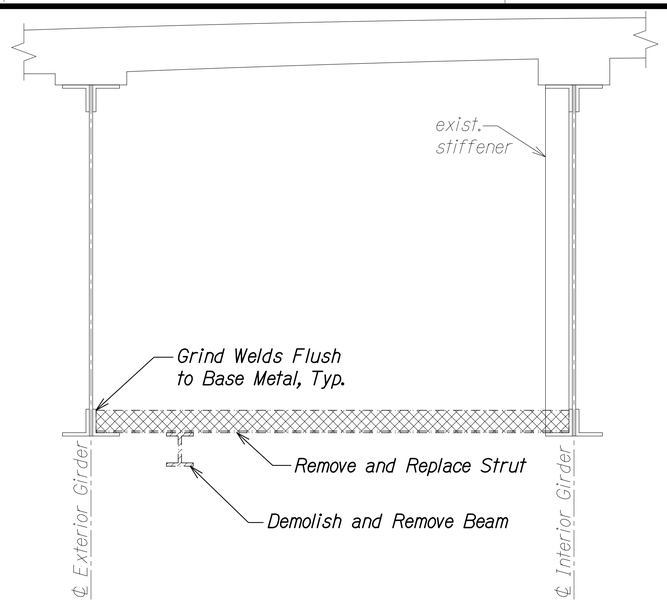
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024	00	



EXTERIOR BAY STRUT DEMO SECTION (A)

Scale: 3/4" = 1'-0"

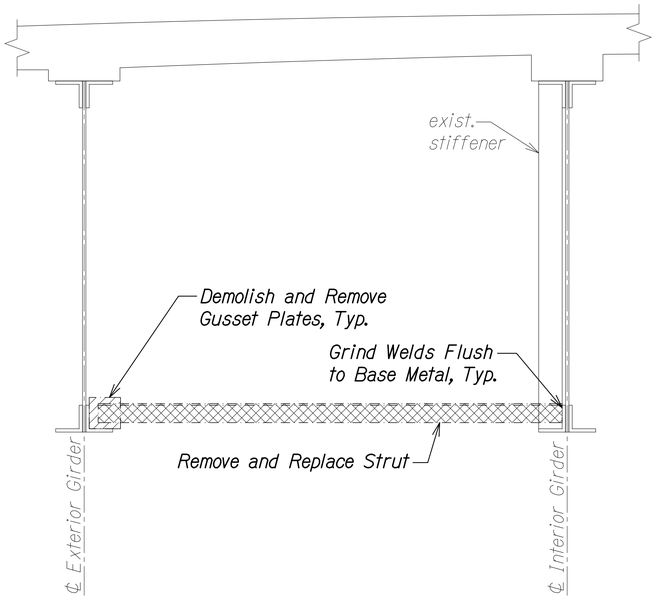
SA8.1 | SA8.1



EXTERIOR BAY STRUT DEMO SECTION (C)

Scale: 3/4" = 1'-0"

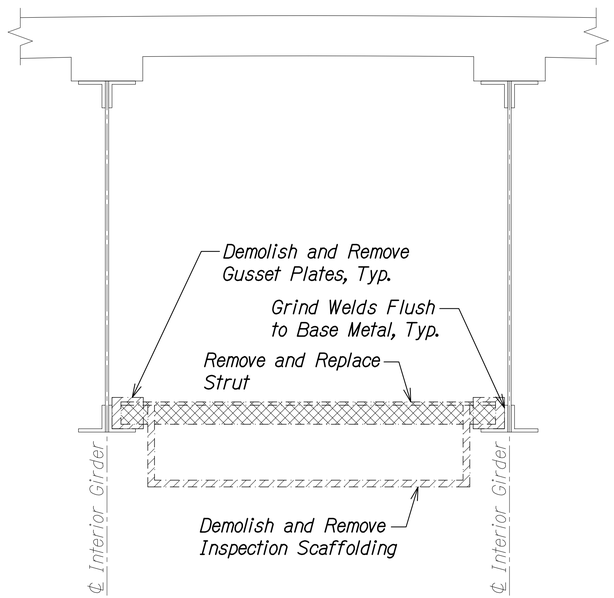
SA8.1 | SA8.1



EXTERIOR BAY STRUT DEMO SECTION (B)

Scale: 3/4" = 1'-0"

SA8.1 | SA8.1



INTERIOR BAY STRUT DEMO SECTION (D)

Scale: 3/4" = 1'-0"

SA8.1 | SA8.1

LEGEND:

Demolish and Remove

Remove and Replace

NOTES:

1. The Contractor shall take care when removing existing steel members so as not to damage the existing steel members to remain.
2. Remove all exist. wood board inspection planks (not shown) and deliver to HDOT maintenance yard.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
No.	TRACED BY	
	DESIGNED BY	
	QUANTITIES BY	
	CHECKED BY	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GIRDER BRACING DEMOLITION SECTIONS

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA8.1 OF 8 SHEETS

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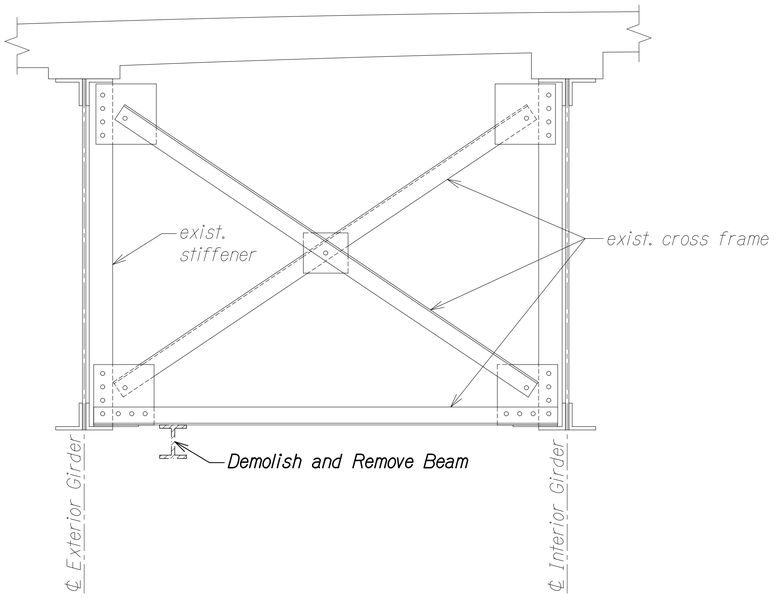
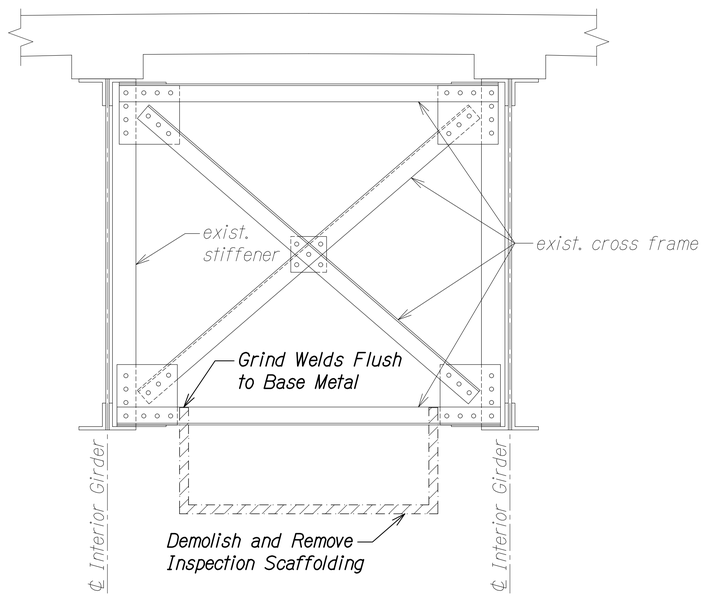
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024	00	



EXTERIOR BAY DEMO
SECTION AT IN-SPAN CROSS FRAME (A)

Scale: 3/4" = 1'-0"

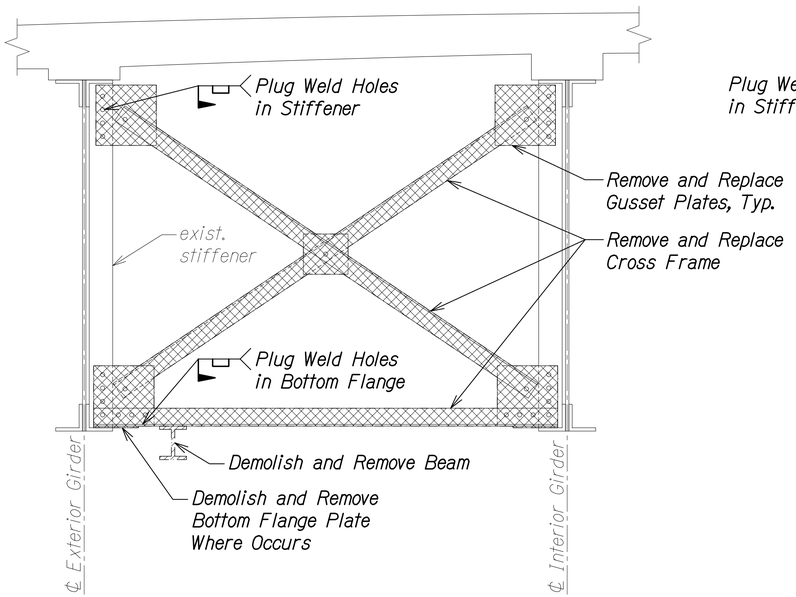
SA8.2 | SA8.2



INTERIOR BAY DEMO
SECTION AT IN-SPAN CROSS FRAME (C)

Scale: 3/4" = 1'-0"

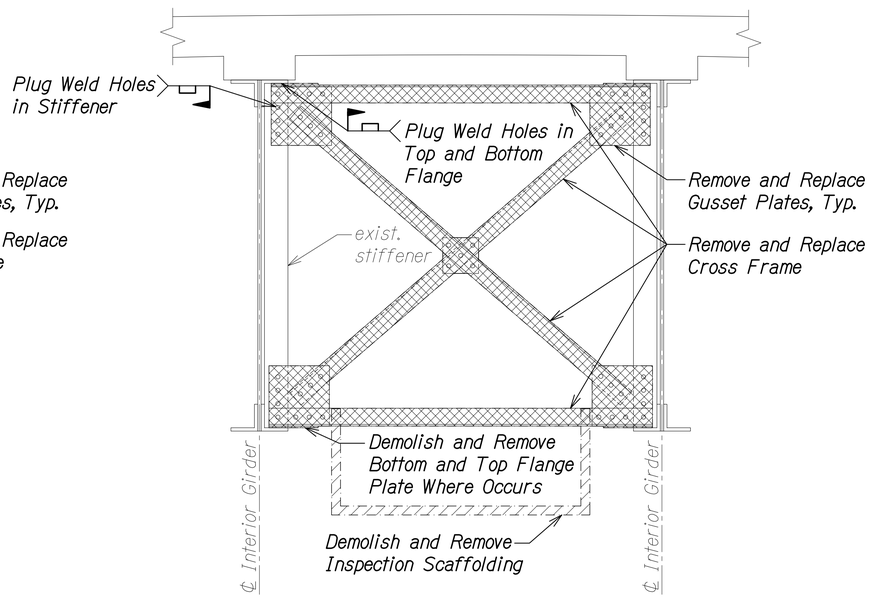
SA8.2 | SA8.2



EXTERIOR BAY DEMO
SECTION AT IN-SPAN CROSS FRAME (B)

Scale: 3/4" = 1'-0"

SA8.2 | SA8.2



INTERIOR BAY DEMO
SECTION AT IN-SPAN CROSS FRAME (D)

Scale: 3/4" = 1'-0"

SA8.2 | SA8.2

LEGEND:

Demolish and Remove

Remove and Replace

NOTES:

1. The Contractor shall take care when removing existing steel members so as not to damage the existing steel members to remain.
2. Remove all exist. wood board inspection planks (not shown) and deliver to HDOT maintenance yard.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GIRDER BRACING DEMOLITION SECTIONS

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA8.2 OF 8 SHEETS

00

ORIGINAL PLAN | NOTE BOOK | No.
SURVEY PLOTTED BY
DRAWN BY
TRACED BY
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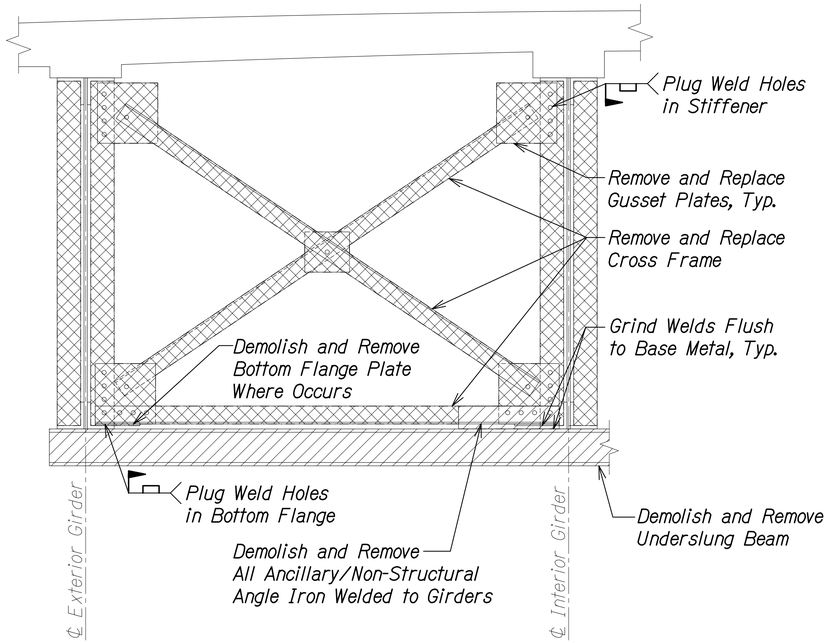
QUANTITIES BY
CHECKED BY
DATE

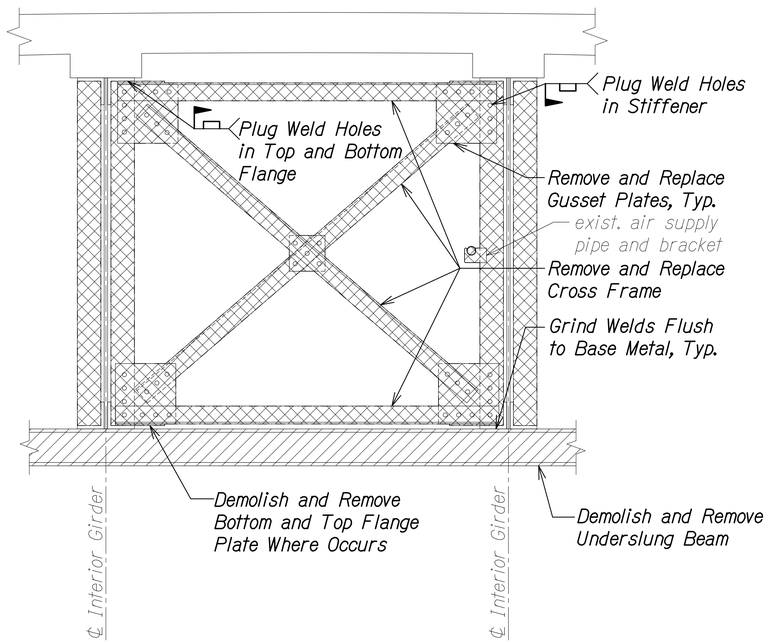
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024	00	



EXTERIOR BAY DEMO SECTION AT FIXED BEARING

Scale: 3/4" = 1'-0"

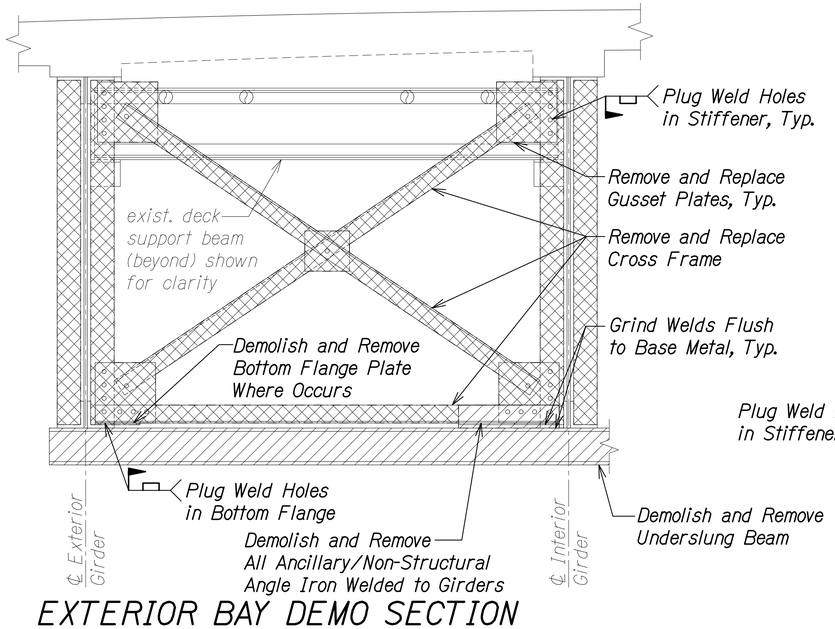
A SA8.3 | SA8.3



TYPICAL INTERIOR BAY DEMO SECTION AT FIXED BEARING

Scale: 3/4" = 1'-0"

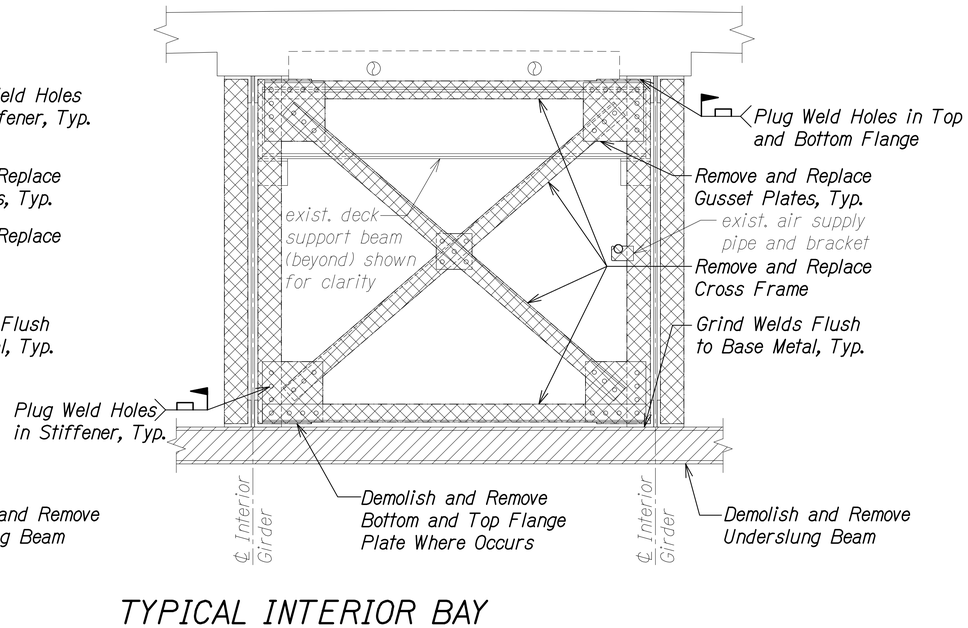
C SA8.3 | SA8.3



EXTERIOR BAY DEMO SECTION AT EXPANSION BEARING

Scale: 3/4" = 1'-0"

B SA8.3 | SA8.3



TYPICAL INTERIOR BAY DEMO SECTION AT EXPANSION BEARING

Scale: 3/4" = 1'-0"

D SA8.3 | SA8.3

LEGEND:

- Demolish and Remove
- Remove and Replace

NOTES:

1. The Contractor shall take care when removing existing steel members so as not to damage the existing steel members to remain.
2. Remove all exist. wood board inspection planks (not shown) and deliver to HDOT maintenance yard.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
NOTE BOOK	TRACED BY	
	DESIGNED BY	
No.	QUANTITIES BY	
	CHECKED BY	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GIRDER BRACING DEMOLITION SECTIONS

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA8.3 OF 8 SHEETS

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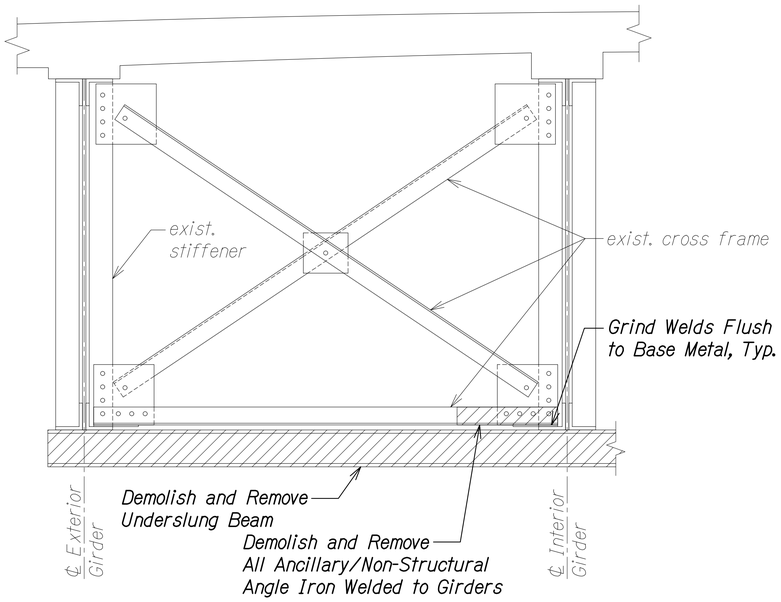
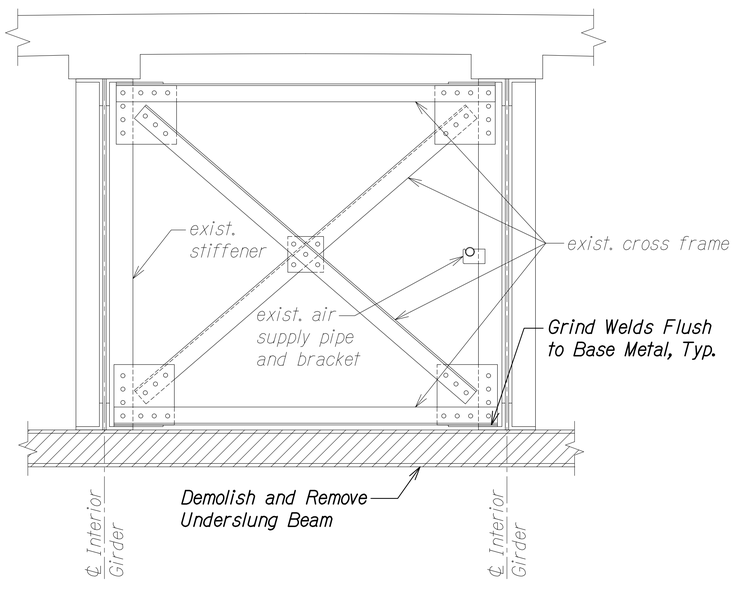
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024	00	



EXTERIOR BAY DEMO SECTION AT FIXED BEARING

Scale: 3/4" = 1'-0"

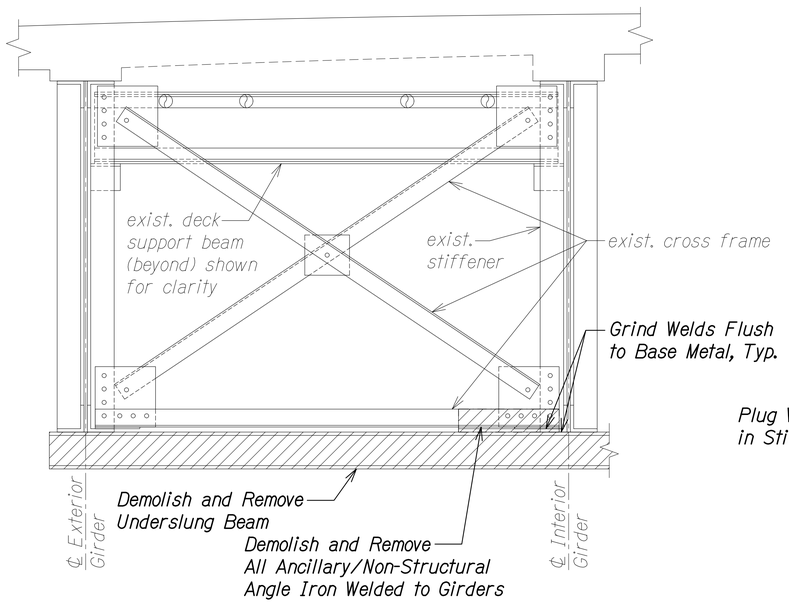
A SA8.4 | SA8.4



INTERIOR BAY DEMO SECTION AT FIXED BEARING

Scale: 3/4" = 1'-0"

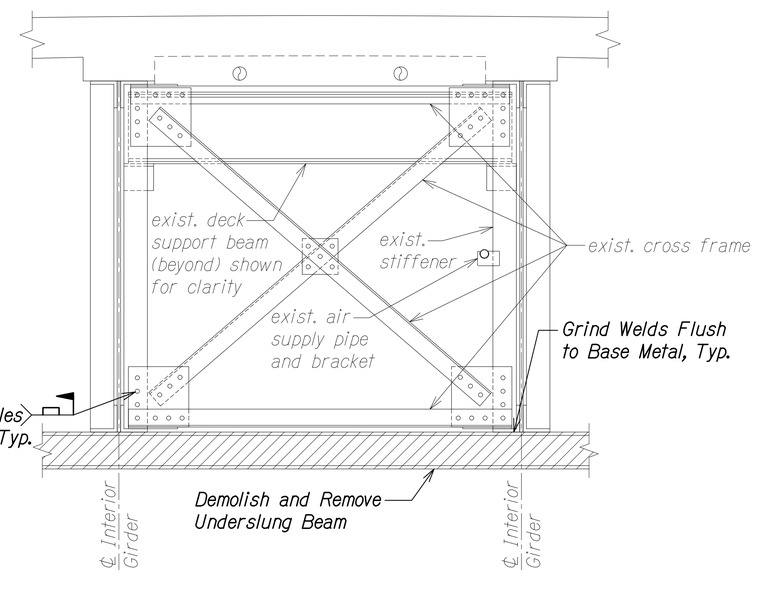
C SA8.4 | SA8.4



EXTERIOR BAY SECTION AT EXPANSION BEARING

Scale: 3/4" = 1'-0"

B SA8.4 | SA8.4



INTERIOR BAY SECTION AT EXPANSION BEARING

Scale: 3/4" = 1'-0"

D SA8.4 | SA8.4

LEGEND:

Demolish and Remove

Remove and Replace

NOTES:

1. The Contractor shall take care when removing existing steel members so as not to damage the existing steel members to remain.
2. Remove all exist. wood board inspection planks (not shown) and deliver to HDOT maintenance yard.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
	TRACED BY	
	DESIGNED BY	
	QUANTITIES BY	
No.	CHECKED BY	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GIRDER BRACING DEMOLITION SECTIONS

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA8.4 OF 8 SHEETS

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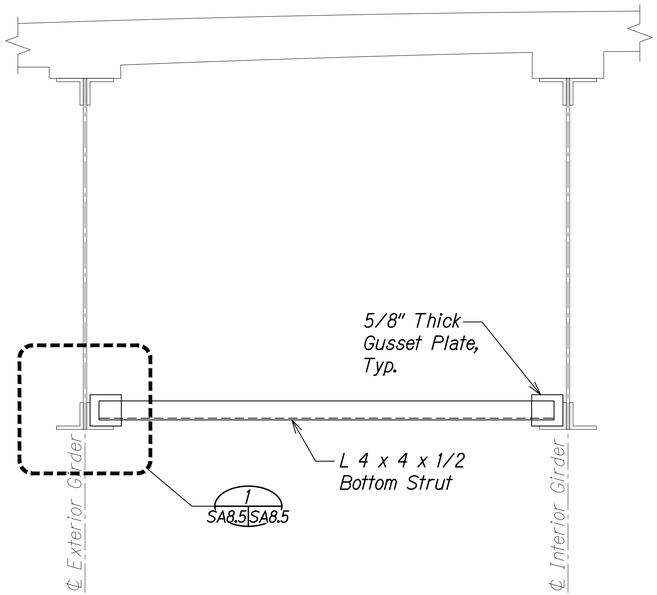
PLOT TIME: 03-29-24, 3:50 PM
DRAWING NAME: Z:\OD ONGOING\OD_JF_PROJECTS\22-001 12-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\NSR-SA060 GIRDER DEMO SECT.DWG

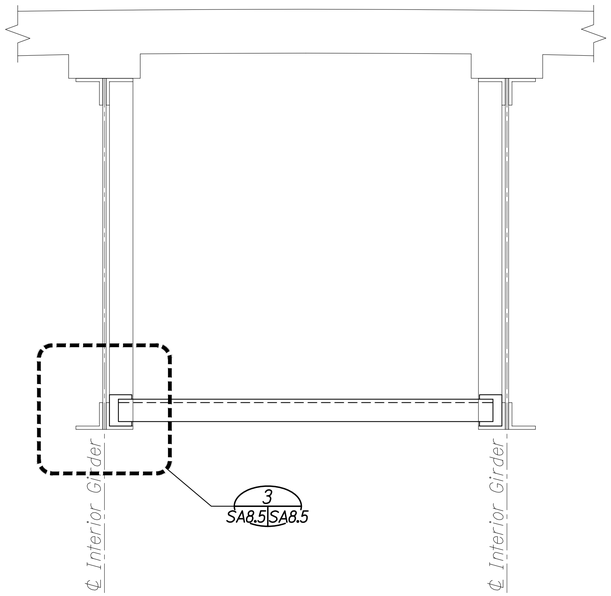
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024	00	



EXTERIOR BAY STRUT SECTION

Scale: 3/4" = 1'-0"

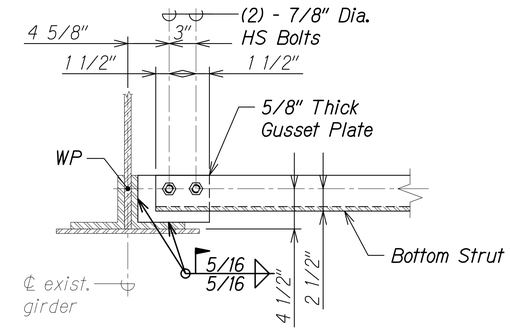
A SA8.5 SA8.5



INTERIOR BAY STRUT SECTION

Scale: 3/4" = 1'-0"

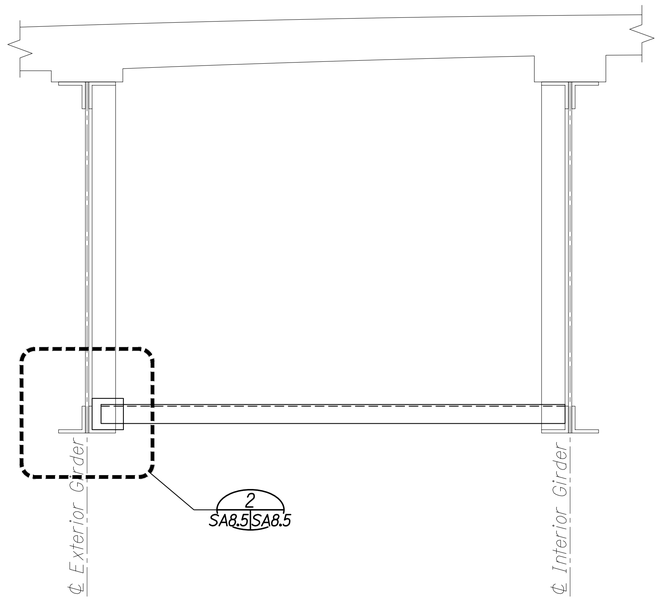
C SA8.5 SA8.5



DETAIL

Scale: 1 1/2" = 1'-0"

1 SA8.5 SA8.5



EXTERIOR BAY STRUT SECTION

Scale: 3/4" = 1'-0"

B SA8.5 SA8.5

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
NOTE BOOK	TRACED BY	
	DESIGNED BY	
No.	QUANTITIES BY	
	CHECKED BY	

PLOT TIME: 03-29-24, 3:50 PM

DRAWING NAME: Z:\OD ONOINO\OD JF PROJECTS\22-001\12-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\NSR-SA08S GIRDER FRAMING.DWG

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GIRDER BRACING SECTIONS

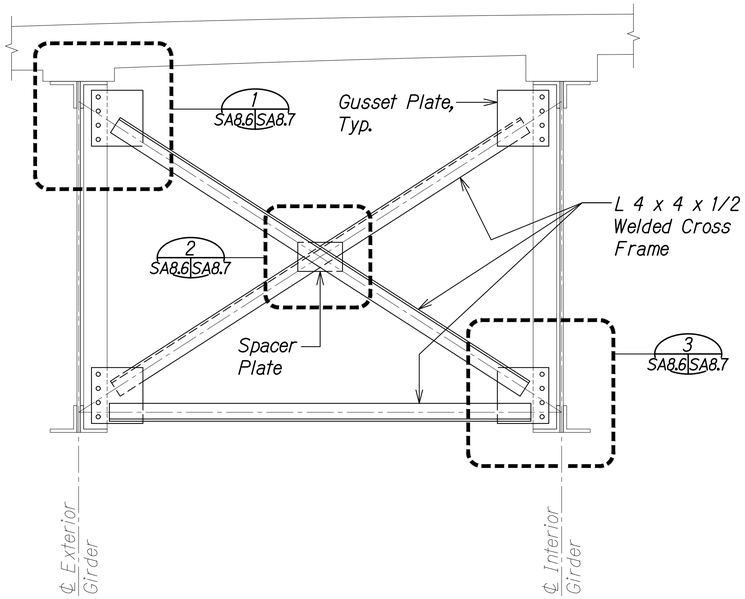
HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA8.5 OF 8 SHEETS

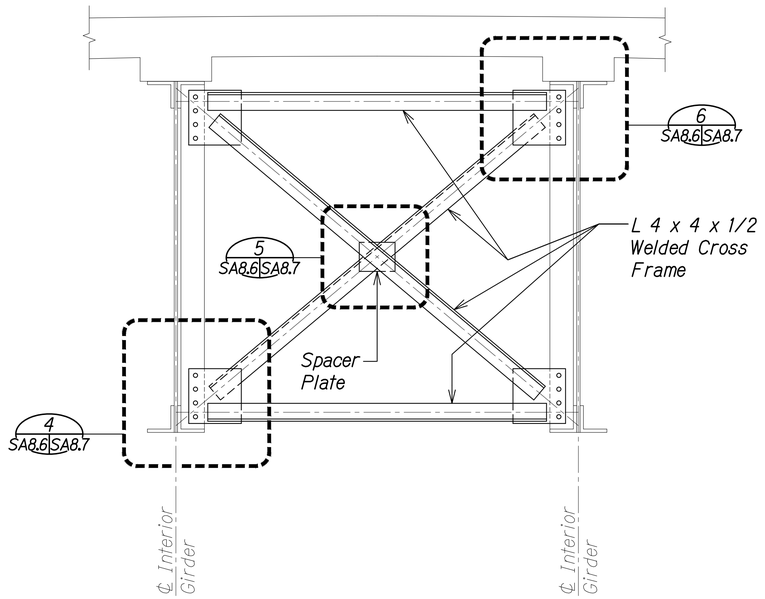
00

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024	00	



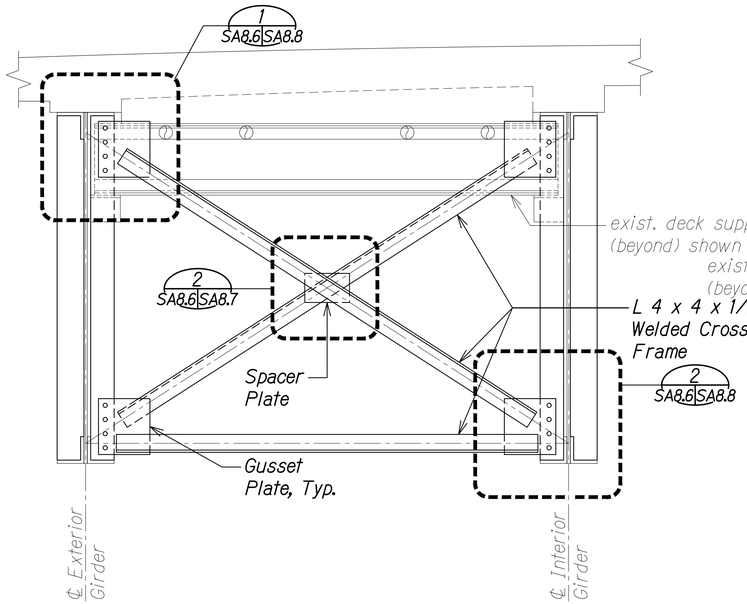
EXTERIOR BAY SECTION AT IN-SPAN CROSS FRAME (A SA8.6|SA8.6)

Scale: 3/4" = 1'-0"



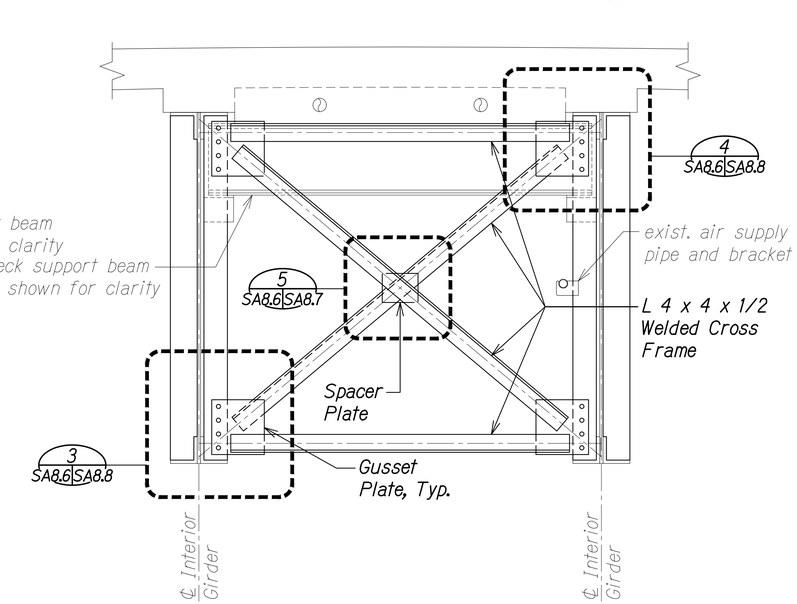
INTERIOR BAY SECTION AT IN-SPAN CROSS FRAME (C SA8.6|SA8.6)

Scale: 3/4" = 1'-0"



EXTERIOR BAY SECTION AT EXPANSION BEARING CROSS FRAME (B SA8.6|SA8.6)

Scale: 3/4" = 1'-0"



INTERIOR BAY SECTION AT EXPANSION BEARING CROSS FRAME (D SA8.6|SA8.6)

Scale: 3/4" = 1'-0"

NOTES:

1. Welded cross frames shall be delivered to the site fully assembled, hot-dip zinc galvanized per ASTM A123, and shop painted in accordance with Special Provisions Section 698 - PREPARATION AND COATING OF GALVANIZED BRIDGE COMPONENTS.
2. New stiffeners shall be ungalvanized and field welded to existing plate girders and painted in accordance with Special Provisions Section 697. CLEAN AND PAINT EXISTING BRIDGE STEEL prior to installation of new cross frames.
3. Existing stiffeners shall have holes drilled and be abrasive blasted and painted in accordance with Special Provisions Section 697 - CLEAN AND PAINT EXISTING BRIDGE STEEL prior to installation of new cross frames.
4. See Sheet SX.XX for construction sequence of bracing elements and corresponding traffic control requirements.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
NOTE BOOK	TRACED BY	
	DESIGNED BY	
No.	QUANTITIES BY	
	CHECKED BY	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GIRDER BRACING SECTIONS

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA8.6 OF 8 SHEETS

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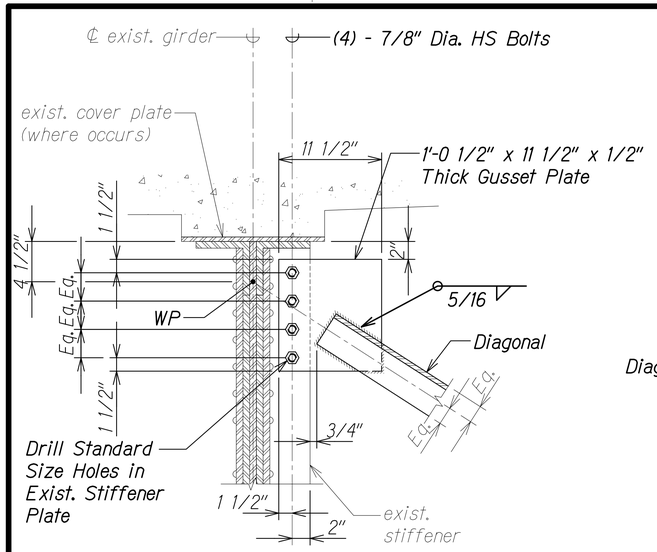
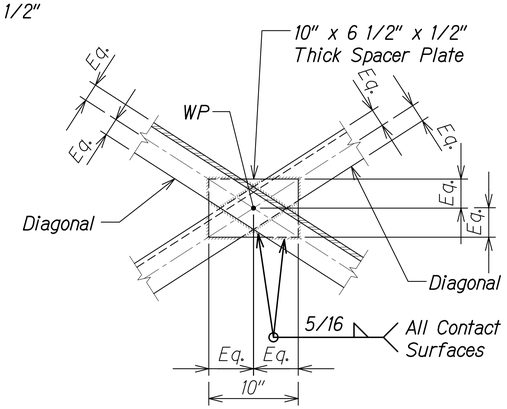
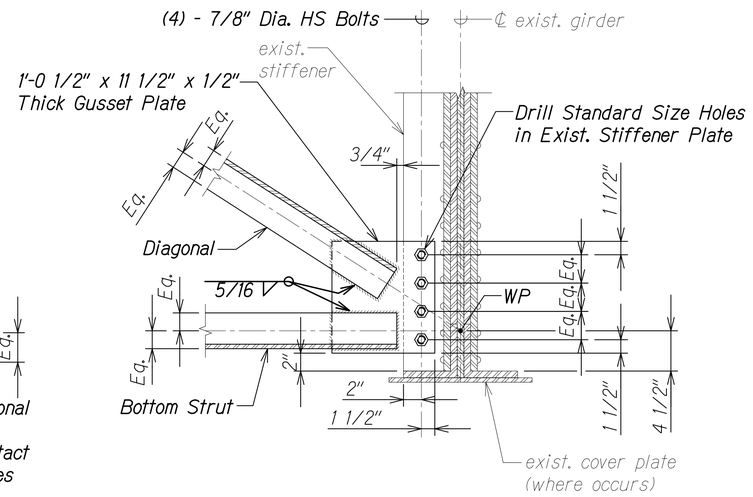
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024	00	



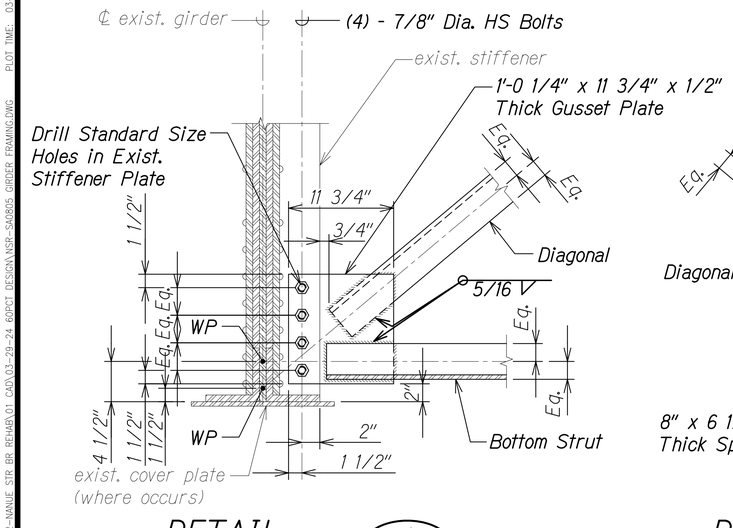
DETAIL 1
Scale: 1 1/2" = 1'-0" SA8.6 | SA8.7



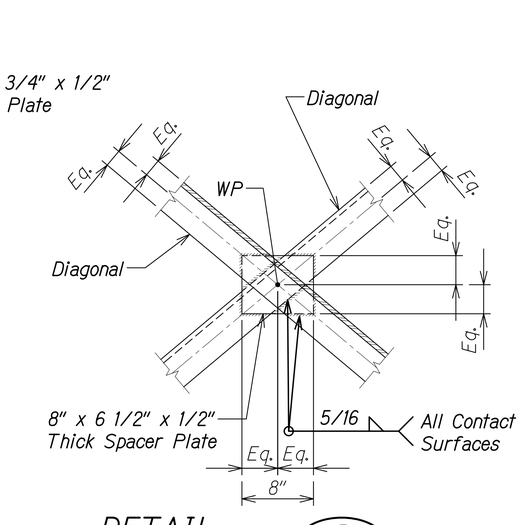
DETAIL 2
Scale: 1 1/2" = 1'-0" SA8.6 | SA8.7



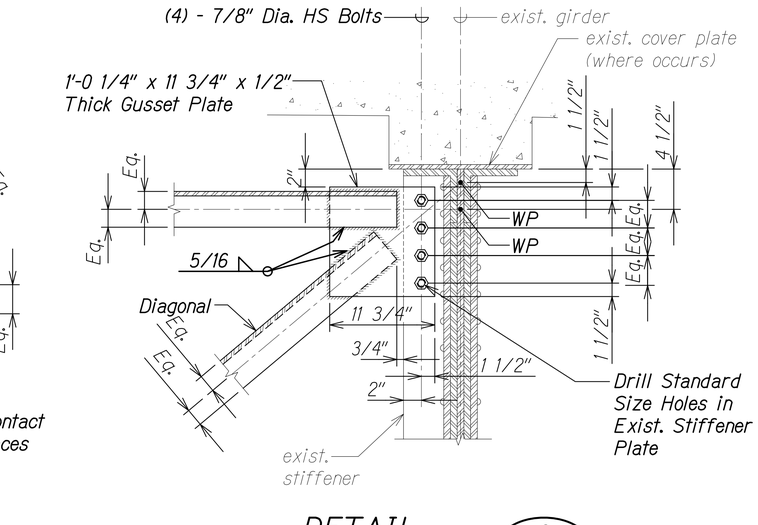
DETAIL 3
Scale: 1 1/2" = 1'-0" SA8.6 | SA8.7



DETAIL 4
Scale: 1 1/2" = 1'-0" SA8.6 | SA8.7



DETAIL 5
Scale: 1 1/2" = 1'-0" SA8.6 | SA8.7



DETAIL 6
Scale: 1 1/2" = 1'-0" SA8.6 | SA8.7

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
No.	TRACED BY	
	DESIGNED BY	
	QUANTITIES BY	
	CHECKED BY	

DRAWING NAME: Z:\OD ONGOING\OD JF PROJECTS\22-001 12-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\NSR-240095 GIRDER FRAMING.DWG PLOT TIME: 03-29-24, 3:51 PM

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GIRDER BRACING DETAILS

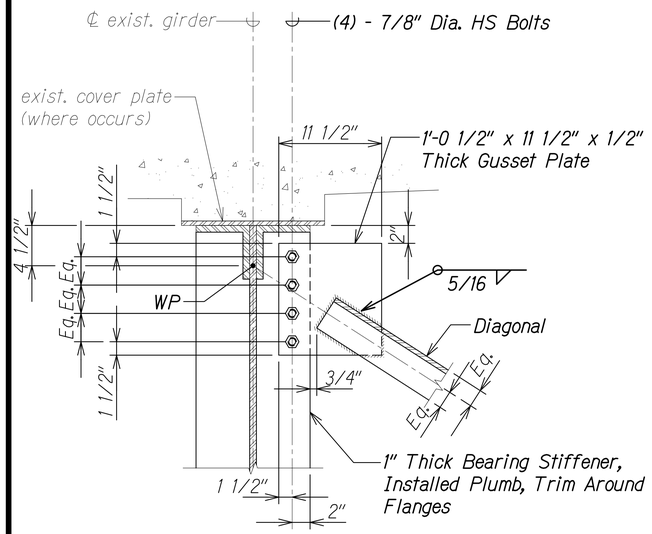
HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

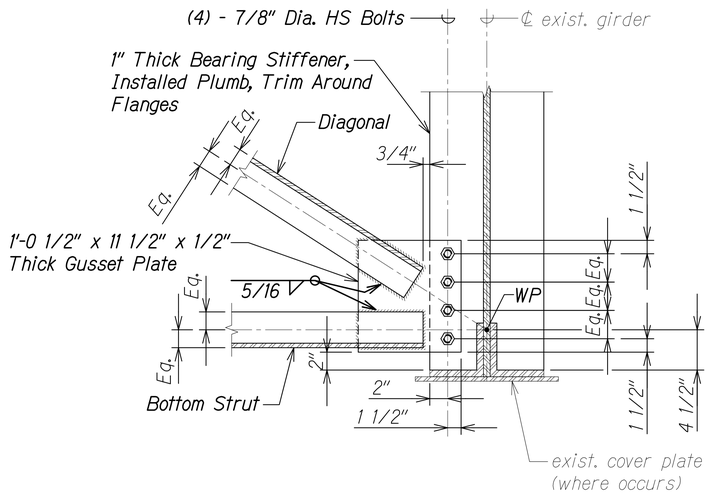
SHEET No. SA8.7 OF 8 SHEETS

00

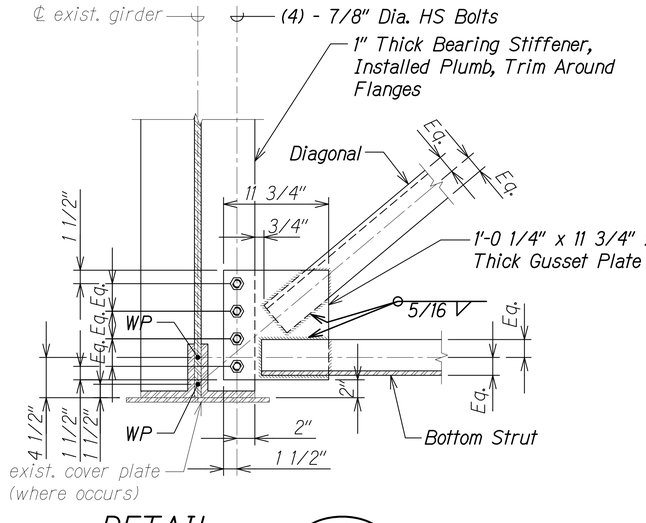
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024	00	



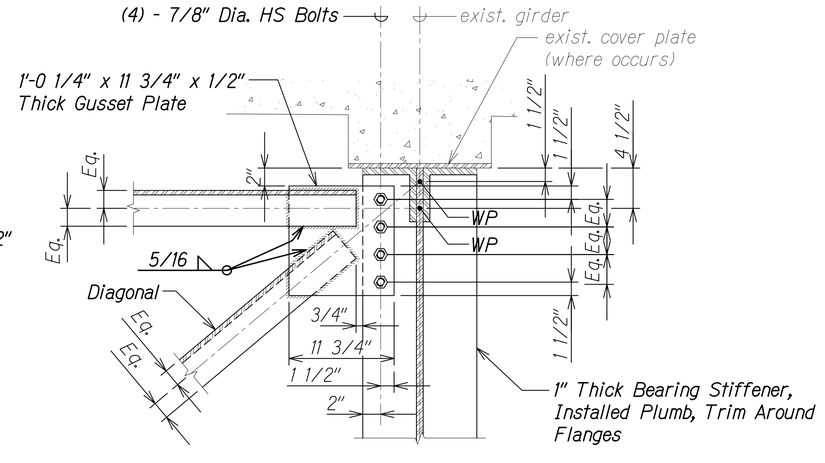
DETAIL 1
Scale: 1 1/2" = 1'-0" SA8.6 | SA8.8



DETAIL 2
Scale: 1 1/2" = 1'-0" SA8.6 | SA8.8



DETAIL 3
Scale: 1 1/2" = 1'-0" SA8.6 | SA8.8



DETAIL 4
Scale: 1 1/2" = 1'-0" SA8.6 | SA8.8

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GIRDER BRACING DETAILS

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

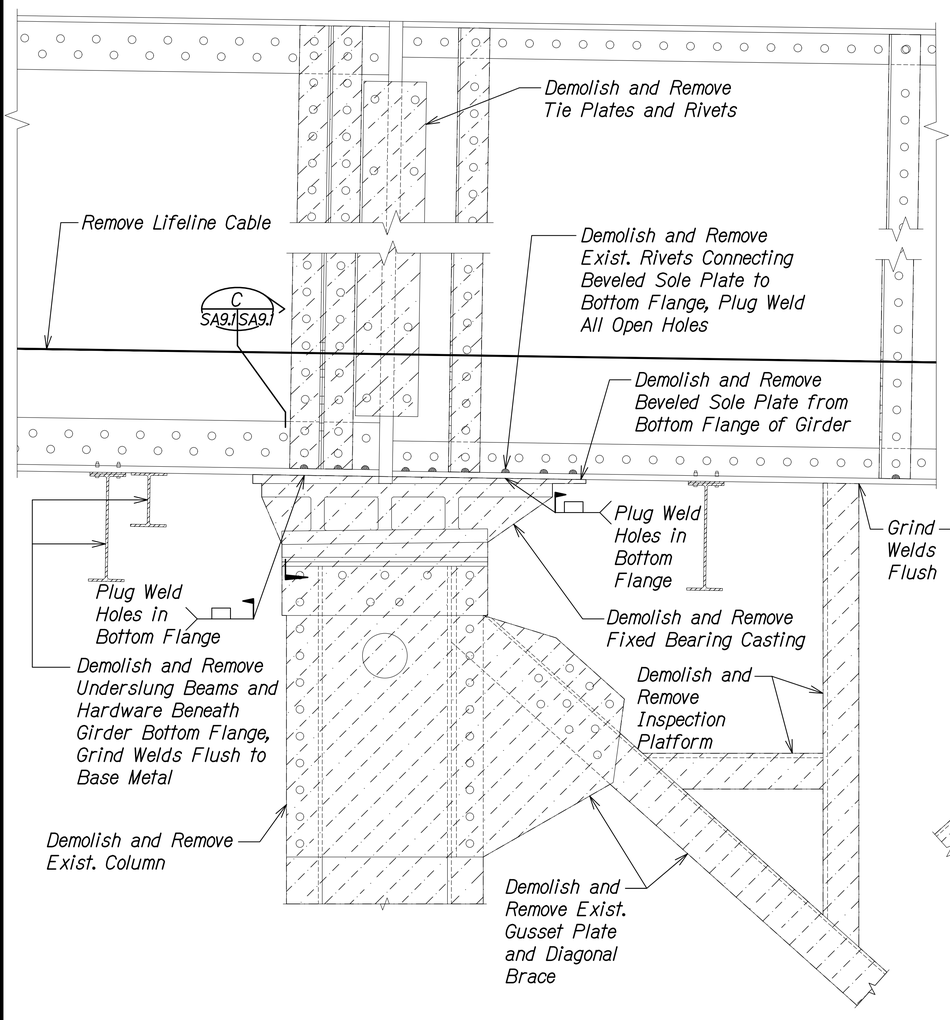
SHEET No. SA8.8 OF 8 SHEETS

00

ORIGINAL PLAN
NOTE BOOK No.
SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE

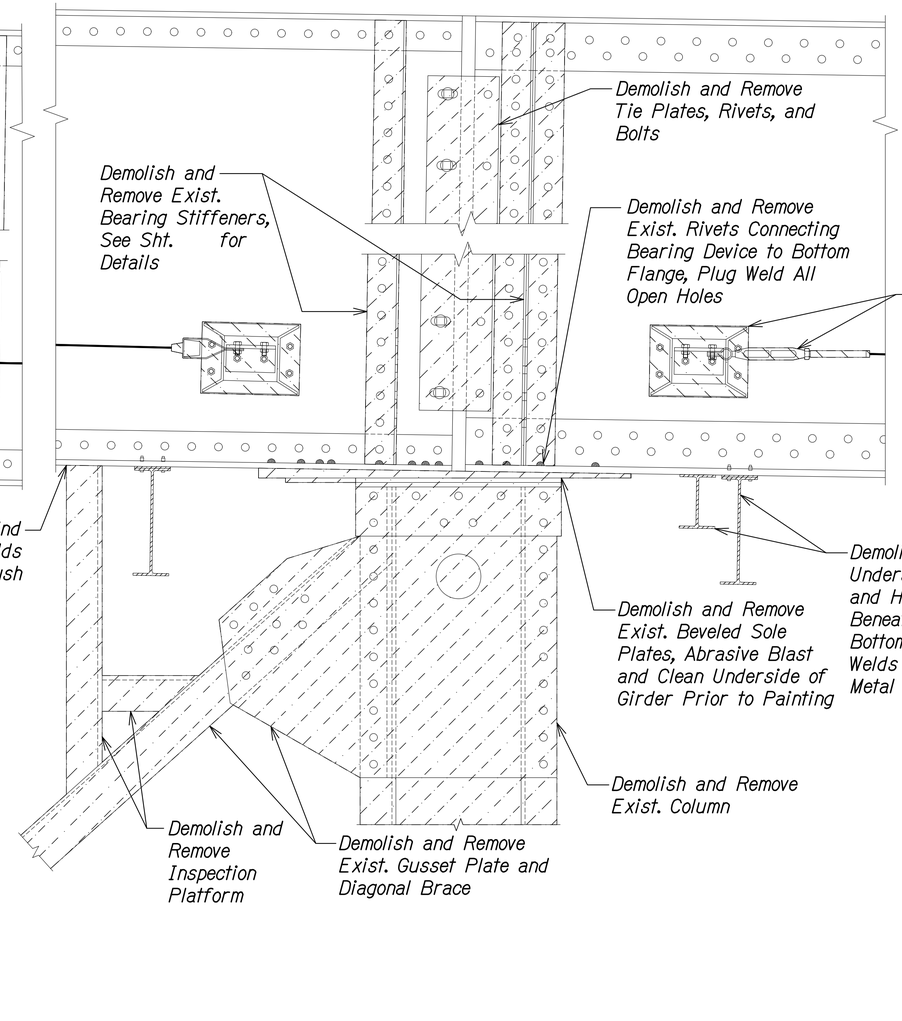
DRAWING NAME: Z:\JOB ONGOING\JOB #' PROJECTS\22-001\12-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\NSR-SA08S GIRDER FRAMING.DWG PLOT TIME: 03-29-24, 3:51 PM

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024	00	



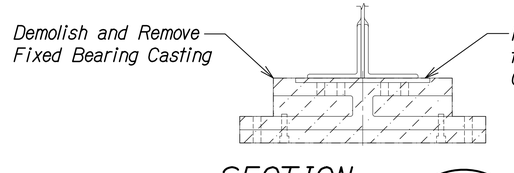
DEMO ELEVATION - FIXED BEARING (A SA9.1 SA9.1)

Scale: 1 1/2" = 1'-0"



DEMO ELEVATION - EXPANSION BEARING (B SA9.1 SA9.1)

Scale: 1 1/2" = 1'-0"



SECTION (C SA9.1 SA9.1)

Scale: 1 1/2" = 1'-0"

LEGEND:

- Demolish and Remove
- Remove and Reinstall After Painting

NOTE:

After column removal, plug weld all open rivet holes. Abrasive blast, clean, and paint bearing seat locations prior to installation of new bent column.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
No.	TRACED BY	
	DESIGNED BY	
	QUANTITIES BY	
	CHECKED BY	

DRAWING NAME: Z:\OD ONGOING\OD_P PROJECTS\22-001 12-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT BESIGN\NSB-S00901-S00907 BEARING DEMO.DWG PLOT TIME: 03-29-24, 3:52 PM

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DEMOLITION ELEVATION AT BEARINGS

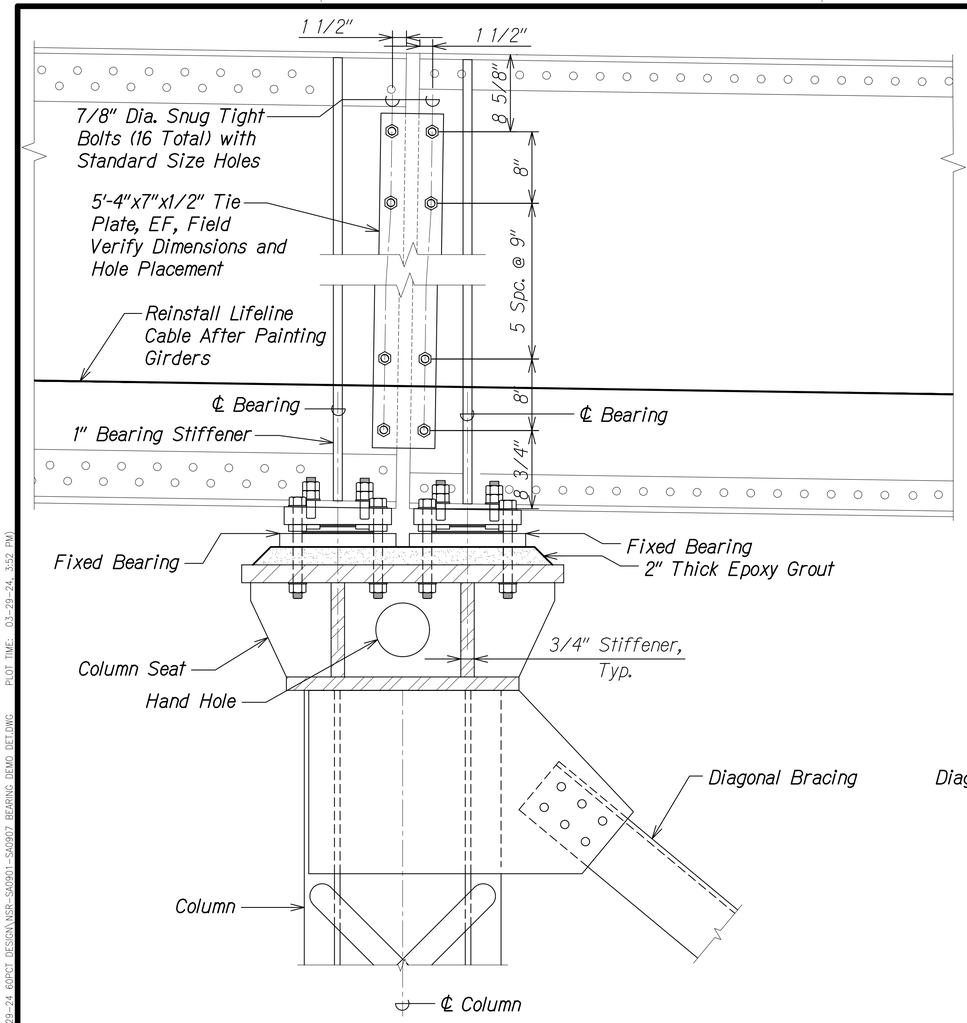
HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA9.1 OF 7 SHEETS

00

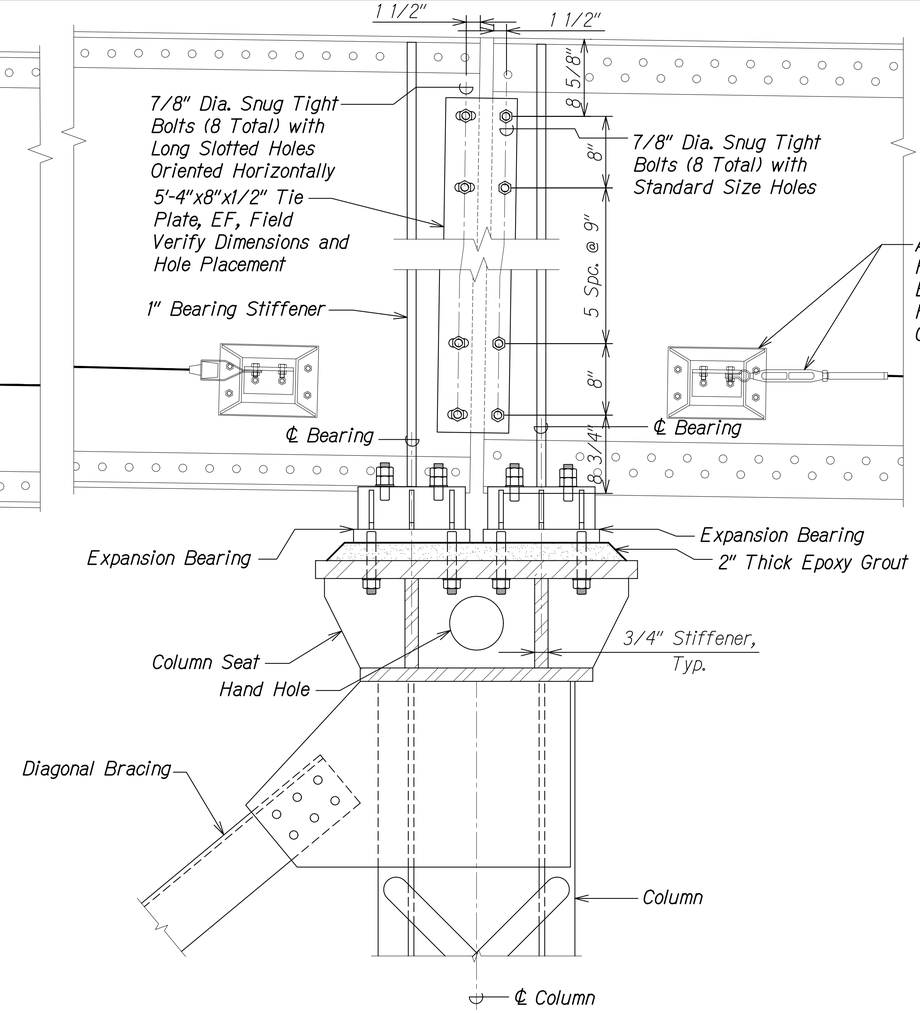
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024	00	



ELEVATION - FIXED BEARING (A)

Scale: 1 1/2" = 1'-0"

SA9.2 | SA9.2



ELEVATION - EXPANSION BEARING (B)

Scale: 1 1/2" = 1'-0"

SA9.2 | SA9.2

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
No.	TRACED BY	
	DESIGNED BY	
	QUANTITIES BY	
	CHECKED BY	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ELEVATION AT BEARINGS

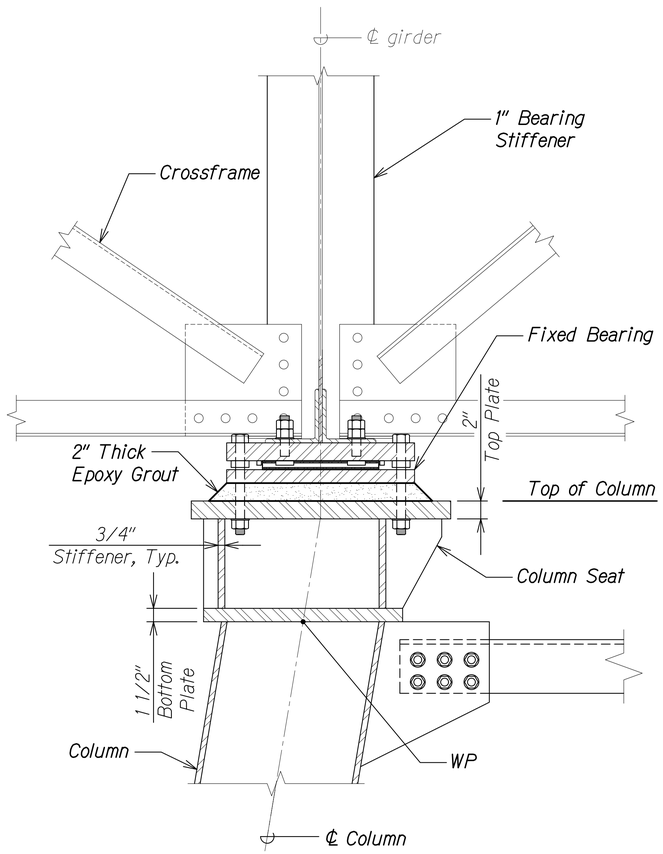
HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA9.2 OF 7 SHEETS

00

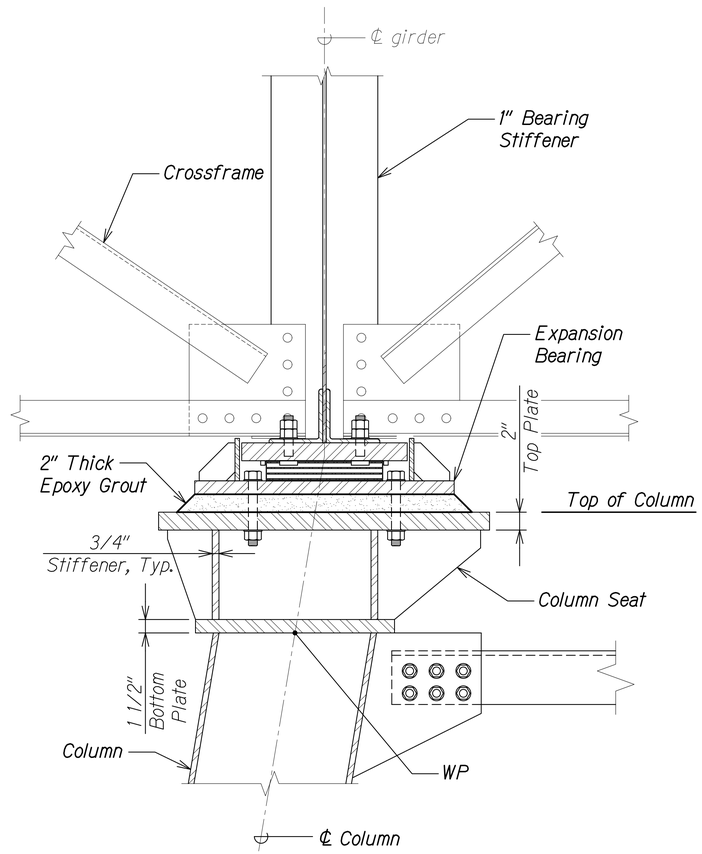
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024	00	



ELEVATION - FIXED BEARING

Scale: 1 1/2" = 1'-0"

A SA9.3 | SA9.3



ELEVATION - EXPANSION BEARING

Scale: 1 1/2" = 1'-0"

B SA9.3 | SA9.3

ORIGINAL PLAN | NOTE BOOK No. | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE

DRAWING NAME: Z:\AOD ONGOING\OD_JF PROJECTS\22-00112-NANUE STR BR REHAB\01 CAD\03-29-24 60FET DESIGN\NSR-SA0901-SA0907 BEARING DEMO DETAILS.DWG PLOT TIME: 03-29-24, 4:52 PM

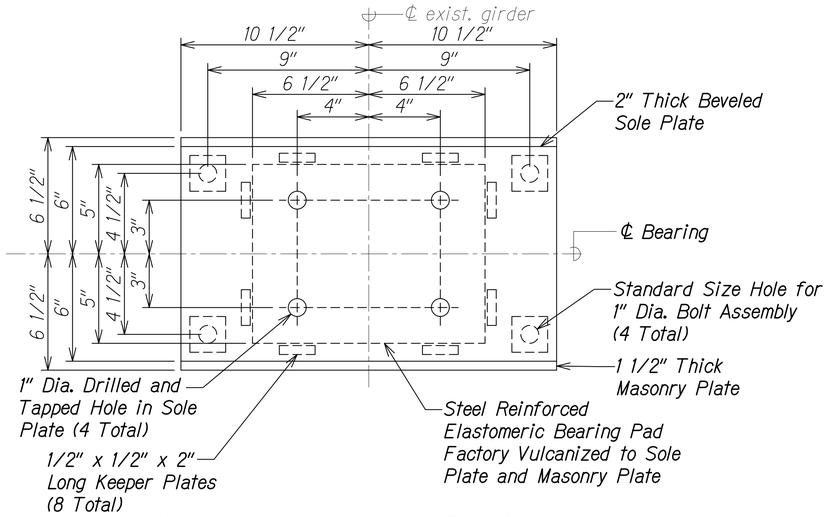
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ELEVATION AT BEARINGS

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

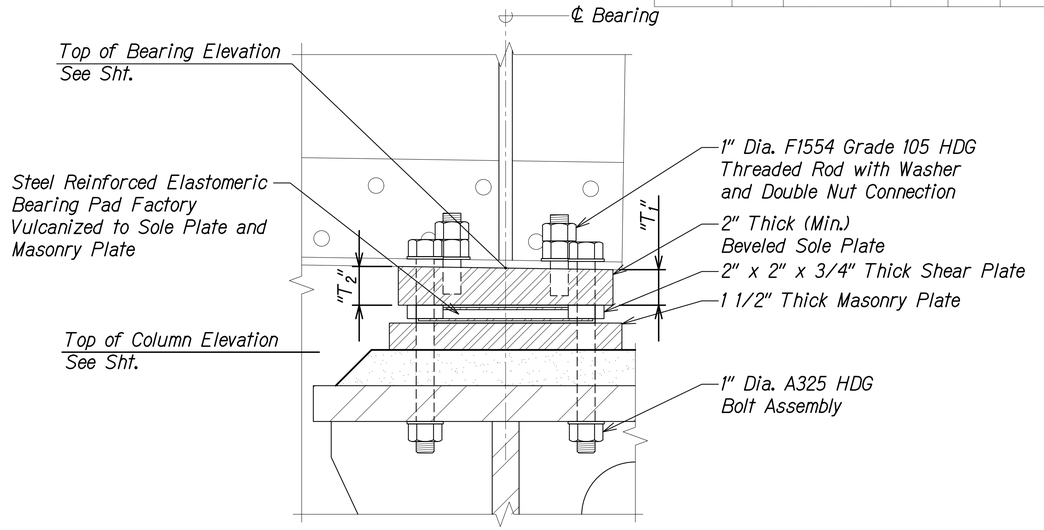
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024	00	



PLAN - FIXED BEARING (A)

Scale: 3" = 1'-0"

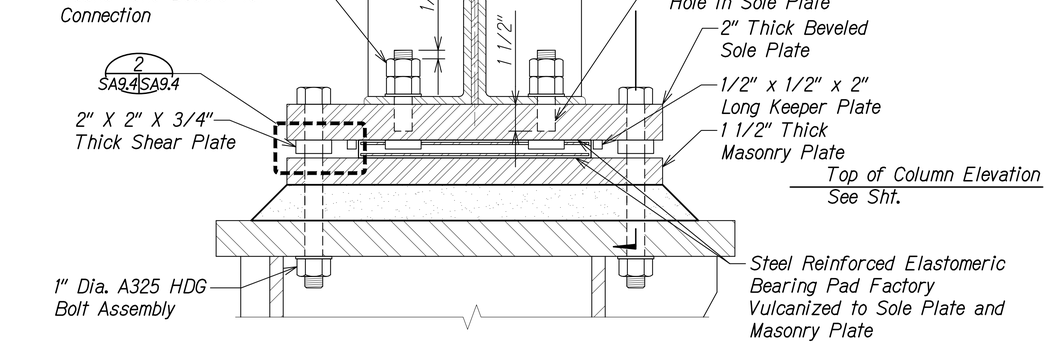
SA9.4 | SA9.4



SECTION - FIXED BEARING (C)

Scale: 3" = 1'-0"

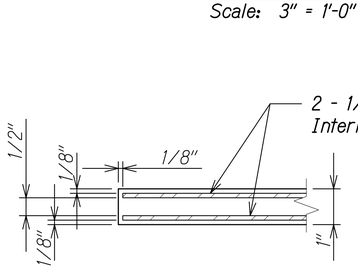
SA9.4 | SA9.4



ELEVATION - FIXED BEARING (B)

Scale: 3" = 1'-0"

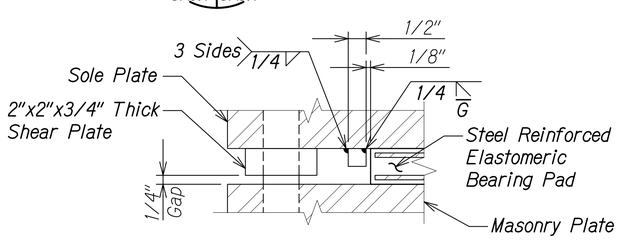
SA9.4 | SA9.4



ELASTOMERIC DETAIL (1)

Scale: 6" = 1'-0"

SA9.4 | SA9.4



DETAIL (2)

Scale: 6" = 1'-0"

SA9.4 | SA9.4

ORIGINAL PLAN | NOTE BOOK

SURVEY PLOTTED BY
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CHECKED BY
No. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

FIXED BEARING DETAILS

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA9.4 OF 7 SHEETS

00

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024	00	

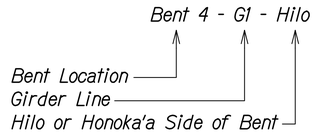
FIXED STEEL REINFORCED ELASTOMERIC BEARING SCHEDULE

LOCATION	BEVELED SOLE PLATE		TOP OF BEARING ELEVATION
	"T_1"	"T_2"	
Bent 1 - G1 - Hilo	-	-	-
Bent 1 - G2 - Hilo	-	-	-
Bent 1 - G3 - Hilo	-	-	-
Bent 1 - G4 - Hilo	-	-	-
Bent 1 - G1 - Honoka'a	-	-	-
Bent 1 - G2 - Honoka'a	-	-	-
Bent 1 - G3 - Honoka'a	-	-	-
Bent 1 - G4 - Honoka'a	-	-	-
Bent 2 - G1 - Hilo	-	-	-
Bent 2 - G2 - Hilo	-	-	-
Bent 2 - G3 - Hilo	-	-	-
Bent 2 - G4 - Hilo	-	-	-
Bent 2 - G1 - Honoka'a	-	-	-
Bent 2 - G2 - Honoka'a	-	-	-
Bent 2 - G3 - Honoka'a	-	-	-
Bent 2 - G4 - Honoka'a	-	-	-
Bent 4 - G1 - Hilo	-	-	-
Bent 4 - G2 - Hilo	-	-	-
Bent 4 - G3 - Hilo	-	-	-
Bent 4 - G4 - Hilo	-	-	-
Bent 4 - G1 - Honoka'a	-	-	-
Bent 4 - G2 - Honoka'a	-	-	-
Bent 4 - G3 - Honoka'a	-	-	-
Bent 4 - G4 - Honoka'a	-	-	-

FIXED STEEL REINFORCED ELASTOMERIC BEARING SCHEDULE

LOCATION	BEVELED SOLE PLATE		TOP OF BEARING ELEVATION
	"T_1"	"T_2"	
Bent 6 - G1 - Hilo	-	-	-
Bent 6 - G2 - Hilo	-	-	-
Bent 6 - G3 - Hilo	-	-	-
Bent 6 - G4 - Hilo	-	-	-
Bent 6 - G1 - Honoka'a	-	-	-
Bent 6 - G2 - Honoka'a	-	-	-
Bent 6 - G3 - Honoka'a	-	-	-
Bent 6 - G4 - Honoka'a	-	-	-
Bent 8 - G1 - Hilo	-	-	-
Bent 8 - G2 - Hilo	-	-	-
Bent 8 - G3 - Hilo	-	-	-
Bent 8 - G4 - Hilo	-	-	-
Bent 8 - G1 - Honoka'a	-	-	-
Bent 8 - G2 - Honoka'a	-	-	-
Bent 8 - G3 - Honoka'a	-	-	-
Bent 8 - G4 - Honoka'a	-	-	-
Abutment 2 - G1	-	-	-
Abutment 2 - G2	-	-	-
Abutment 2 - G3	-	-	-
Abutment 2 - G4	-	-	-

BEARING LOCATION KEY:



NOTE:

Elevations will be finalized after in-depth survey information has been obtained at top of bent locations.

ORIGINAL PLAN
NOTE BOOK
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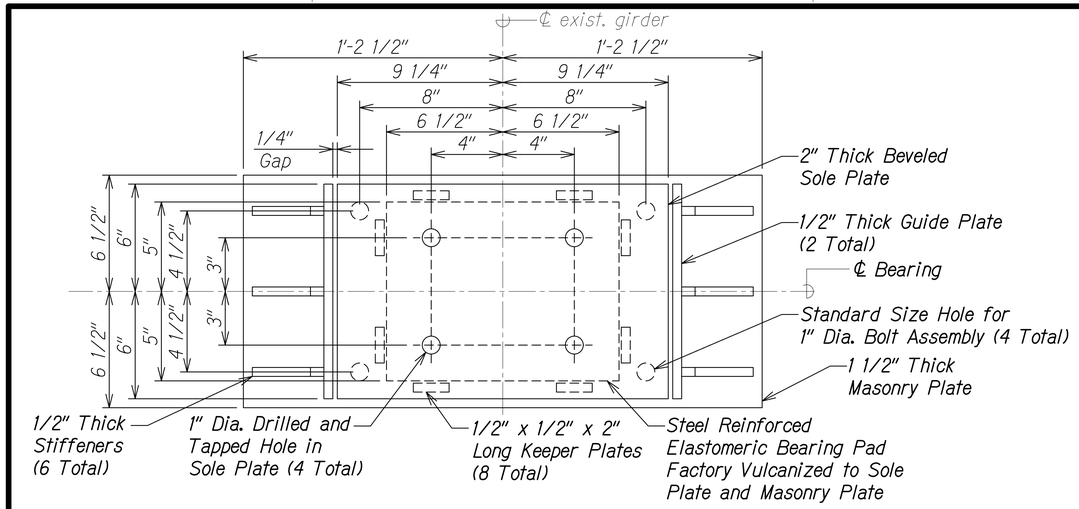
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

FIXED BEARING SCHEDULE

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

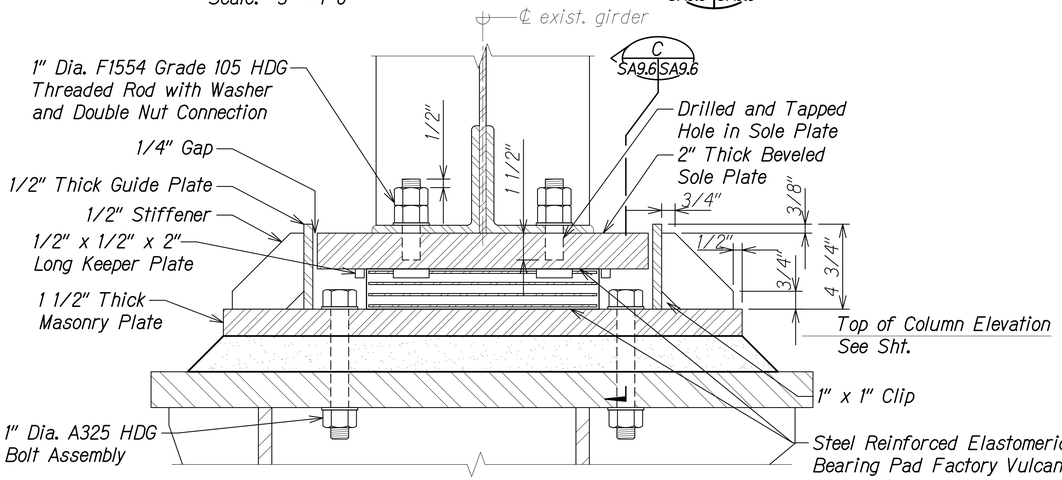
Scale: As Noted Date: Mar. 2024

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024	00	



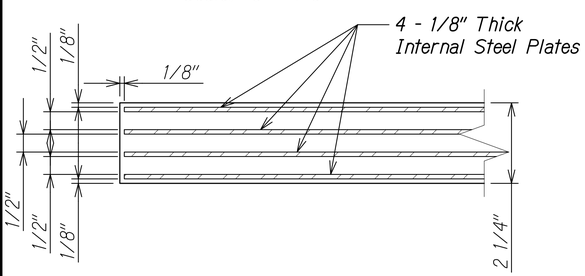
PLAN - EXPANSION BEARING (A SA9.6 | SA9.6)

Scale: 3" = 1'-0"



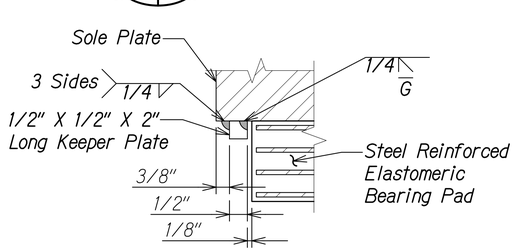
ELEVATION - EXPANSION BEARING (B SA9.6 | SA9.6)

Scale: 3" = 1'-0"



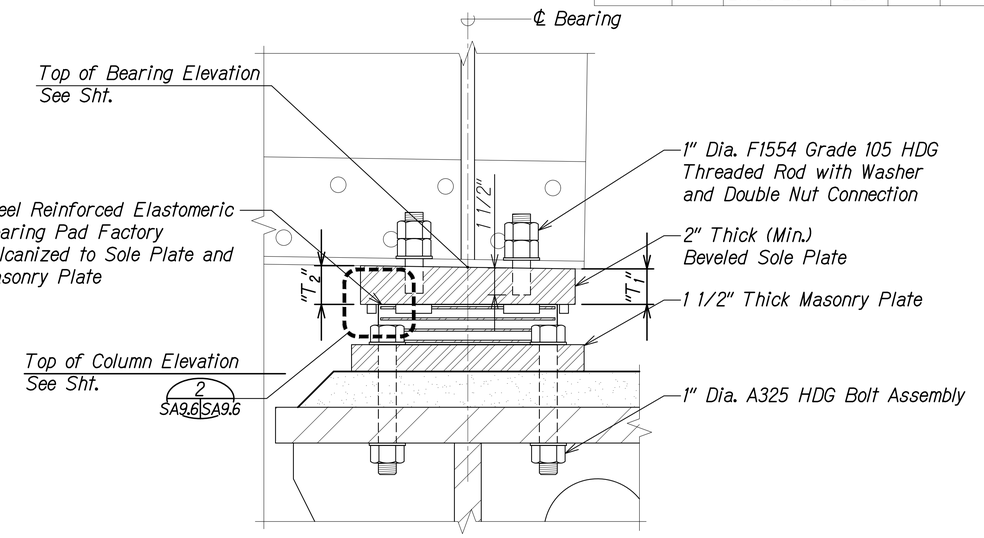
ELASTOMERIC DETAIL (1 SA9.6 | SA9.6)

Scale: 6" = 1'-0"



DETAIL (2 SA9.6 | SA9.6)

Scale: 6" = 1'-0"



SECTION - EXPANSION BEARING (C SA9.6 | SA9.6)

Scale: 3" = 1'-0"

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

EXPANSION BEARING DETAILS

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA9.6 OF 7 SHEETS

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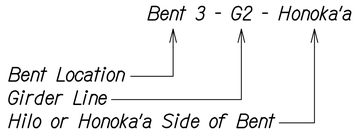
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024	00	

EXPANSION STEEL REINFORCED ELASTOMERIC BEARING SCHEDULE

LOCATION	BEVELED SOLE PLATE		TOP OF BEARING ELEVATION
	"T_1"	"T_2"	
Abutment 1 - G1	-	-	-
Abutment 1 - G2	-	-	-
Abutment 1 - G3	-	-	-
Abutment 1 - G4	-	-	-
Bent 3 - G1 - Hilo	-	-	-
Bent 3 - G2 - Hilo	-	-	-
Bent 3 - G3 - Hilo	-	-	-
Bent 3 - G4 - Hilo	-	-	-
Bent 3 - G1 - Honoka'a	-	-	-
Bent 3 - G2 - Honoka'a	-	-	-
Bent 3 - G3 - Honoka'a	-	-	-
Bent 3 - G4 - Honoka'a	-	-	-
Bent 5 - G1 - Hilo	-	-	-
Bent 5 - G2 - Hilo	-	-	-
Bent 5 - G3 - Hilo	-	-	-
Bent 5 - G4 - Hilo	-	-	-
Bent 5 - G1 - Honoka'a	-	-	-
Bent 5 - G2 - Honoka'a	-	-	-
Bent 5 - G3 - Honoka'a	-	-	-
Bent 5 - G4 - Honoka'a	-	-	-
Bent 7 - G1 - Hilo	-	-	-
Bent 7 - G2 - Hilo	-	-	-
Bent 7 - G3 - Hilo	-	-	-
Bent 7 - G4 - Hilo	-	-	-
Bent 7 - G1 - Honoka'a	-	-	-
Bent 7 - G2 - Honoka'a	-	-	-
Bent 7 - G3 - Honoka'a	-	-	-
Bent 7 - G4 - Honoka'a	-	-	-
Bent 9 - G1 - Hilo	-	-	-
Bent 9 - G2 - Hilo	-	-	-
Bent 9 - G3 - Hilo	-	-	-
Bent 9 - G4 - Hilo	-	-	-
Bent 9 - G1 - Honoka'a	-	-	-
Bent 9 - G2 - Honoka'a	-	-	-
Bent 9 - G3 - Honoka'a	-	-	-
Bent 9 - G4 - Honoka'a	-	-	-

BEARING LOCATION KEY:



NOTE:

Elevations will be finalized after in-depth survey information has been obtained at top of bent locations.

DRAWING NAME: Z:\00 ONGOING\00 JF PROJECTS\22-001.12-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\SR-SA0901-SA0907 BEARING DEVD DET.DWG PLOT TIME: 03-29-24 3:53 PM

ORIGINAL PLAN
NOTE BOOK
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DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE

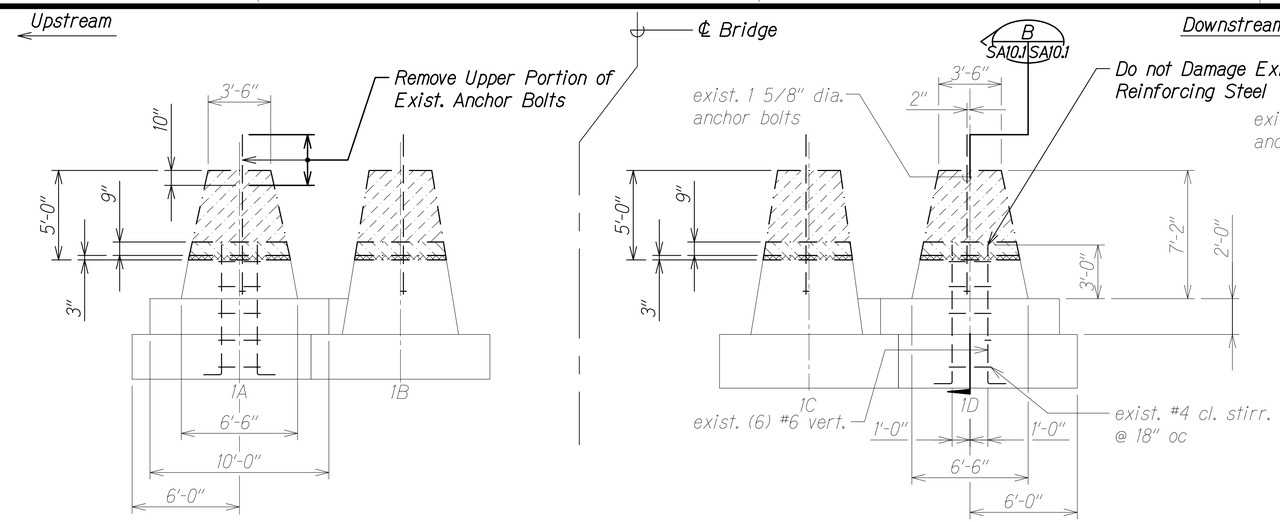
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

EXPANSION BEARING SCHEDULE

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

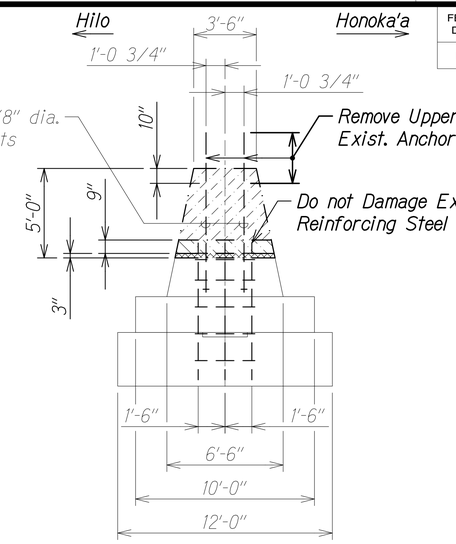
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024	00	



BENT NO. 1 FOUNDATION - DEMOLITION ELEVATION

A SA10.1 SA10.1

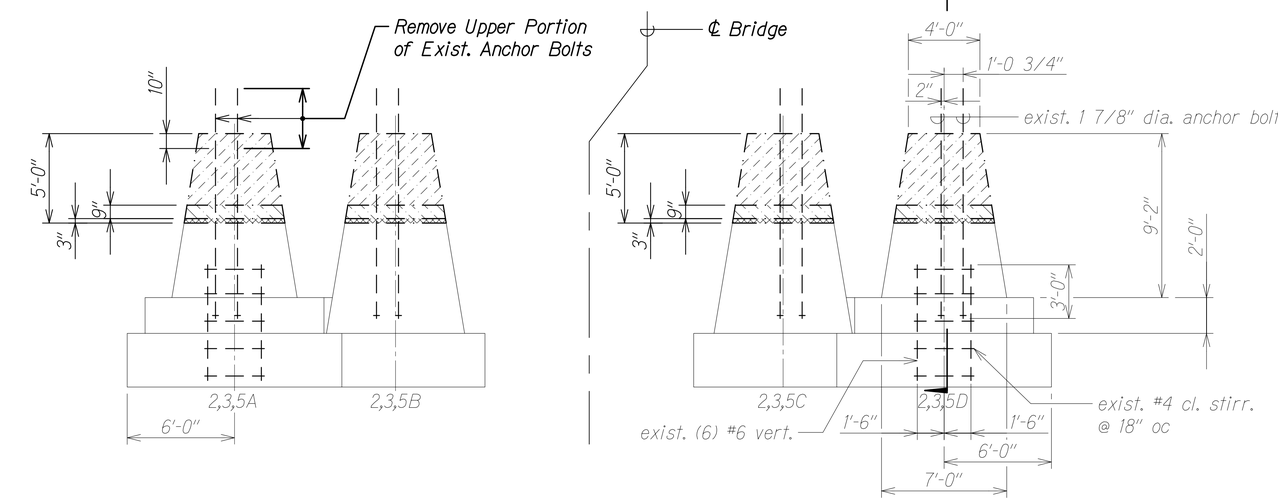
Scale: 1/4" = 1'-0"



DEMOLITION SECTION

B SA10.1 SA10.1

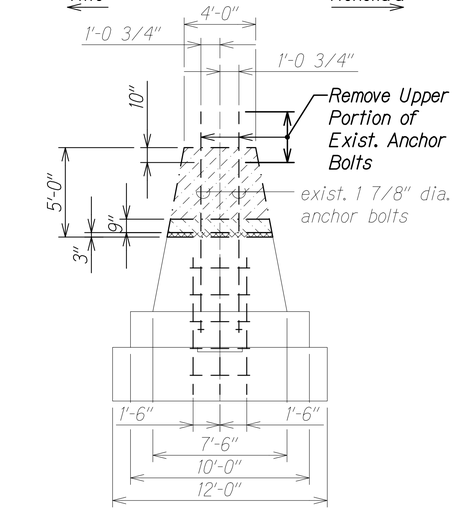
Scale: 1/4" = 1'-0"



BENT NOS. 2, 3, & 5 FOUNDATION - DEMOLITION ELEVATION

C SA10.1 SA10.1

Scale: 1/4" = 1'-0"



DEMOLITION SECTION

D SA10.1 SA10.1

Scale: 1/4" = 1'-0"

LEGEND

- Demolish and Remove
- Demolish and Remove with No Larger Than a 60-Lb Pneumatic Demolition Hammer
- Demolish and Remove with No Larger Than a 30-Lb Pneumatic Demolition Hammer

NOTES:

1. The Contractor shall not damage, demolish, or remove any existing reinforcing steel or anchor bolts, unless explicitly shown.
2. If reinforcing steel is encountered within the demolition limits and is not shown on the contract drawings, inform the Engineer immediately.

ORIGINAL PLAN
NOTE BOOK No.
SURVEY PLOTTED BY
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

FOUNDATION DEMOLITION ELEVATIONS AND SECTIONS

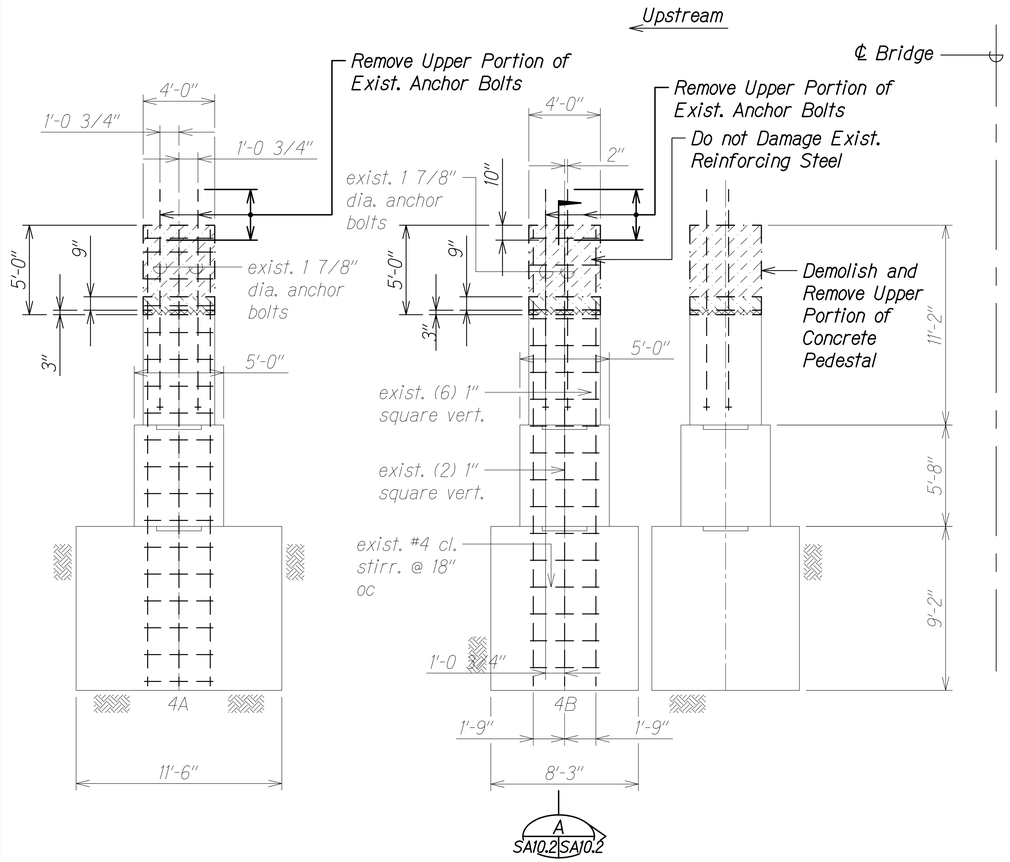
HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA10.1 OF 14 SHEETS

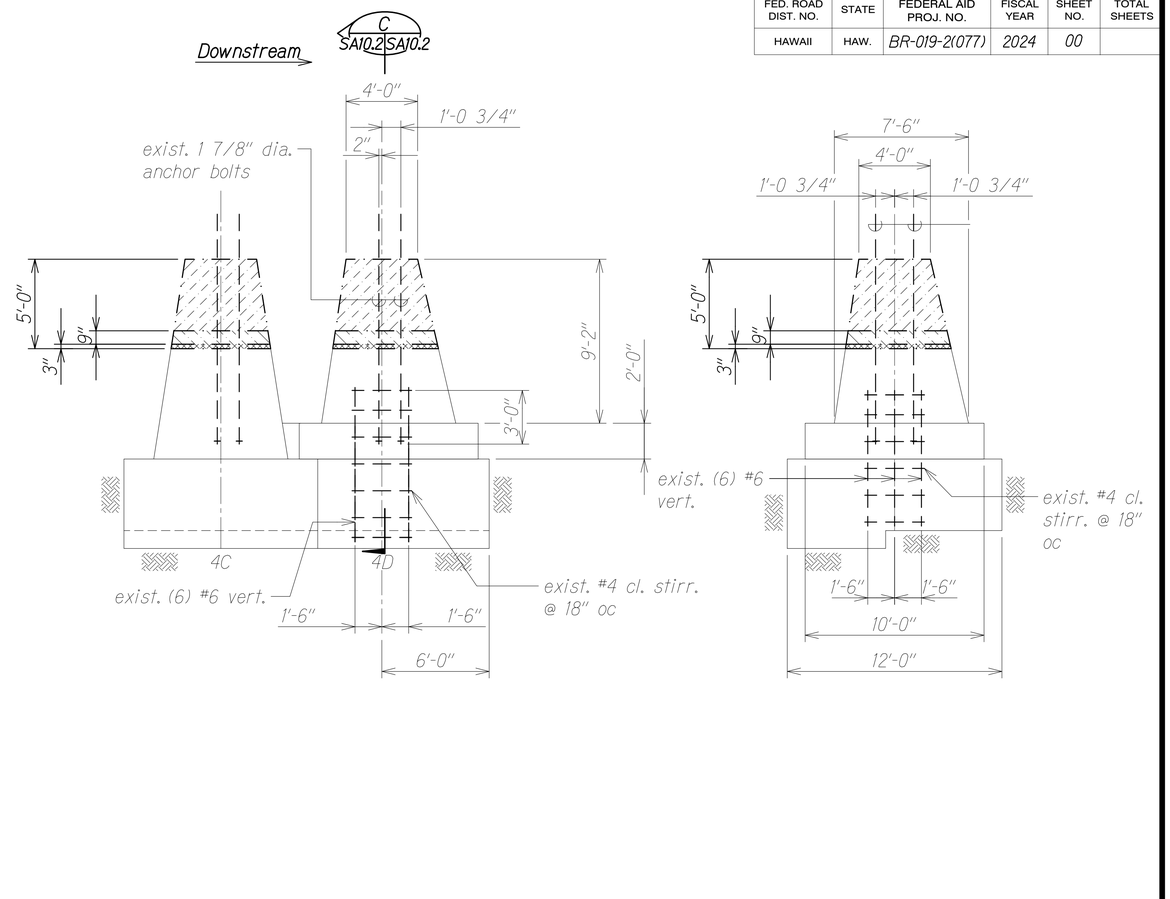
00

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024	00	



SECTION A

Scale: 1/4" = 1'-0"



BENT NO. 4 FOUNDATION - DEMOLITION ELEVATION

Scale: 1/4" = 1'-0"

B SA10.2 SA10.2

SECTION C

Scale: 1/4" = 1'-0" SA10.2 SA10.2

LEGEND

- Demolish and Remove
- Demolish and Remove with No Larger Than a 60-Lb Pneumatic Demolition Hammer
- Demolish and Remove with No Larger Than a 30-Lb Pneumatic Demolition Hammer

NOTES:

1. The Contractor shall not damage, demolish, or remove any existing reinforcing steel or anchor bolts, unless explicitly shown.
2. If reinforcing steel is encountered within the demolition limits and is not shown on the contract drawings, inform the Engineer immediately.

ORIGINAL PLAN
NOTE BOOK No.
SURVEY PLOTTED BY
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DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

FOUNDATION DEMOLITION ELEVATIONS AND SECTIONS

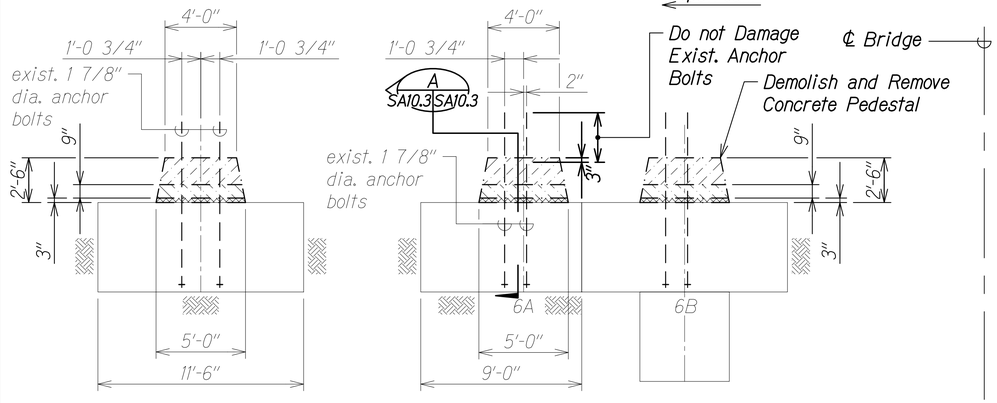
HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

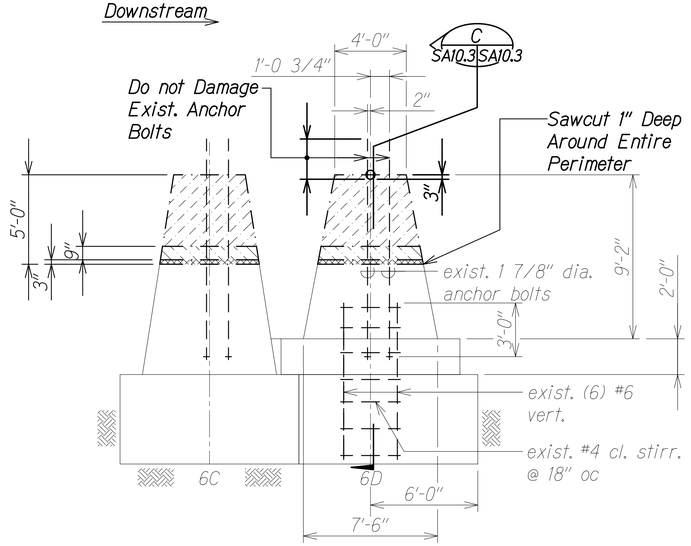
SHEET No. SA10.2 OF 14 SHEETS

00

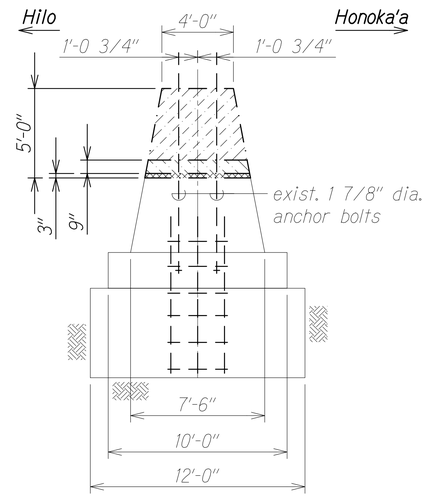
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024	00	



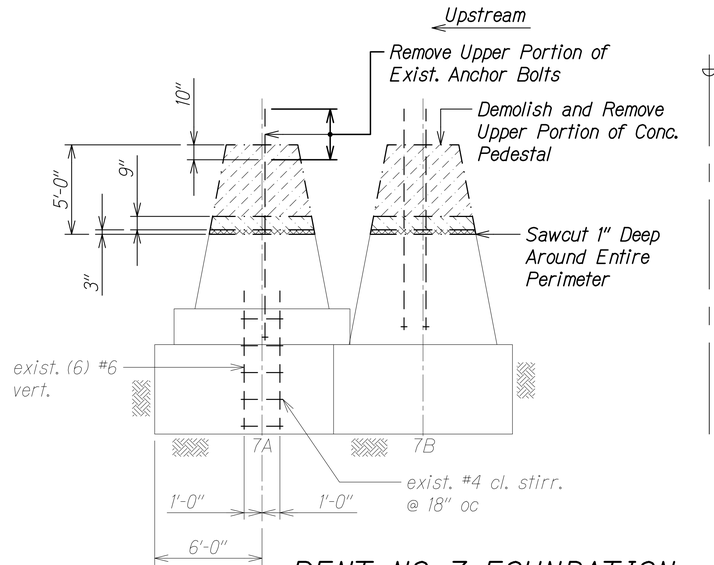
SECTION A
Scale: 1/4" = 1'-0" SA10.3 | SA10.3

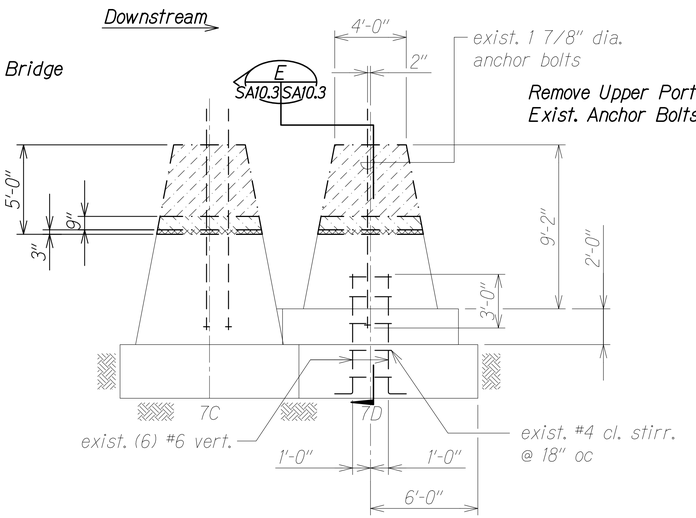


BENT NO. 6 FOUNDATION - DEMOLITION ELEVATION
Scale: 1/4" = 1'-0" B SA10.3 | SA10.3

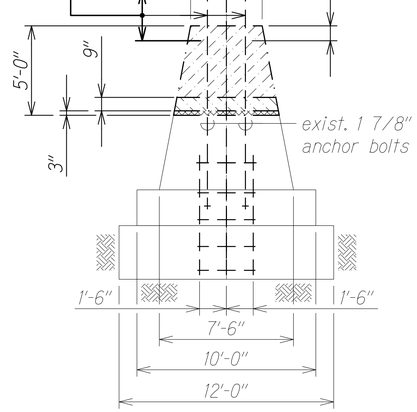


SECTION C
Scale: 1/4" = 1'-0" SA10.3 | SA10.3





BENT NO. 7 FOUNDATION - DEMOLITION ELEVATION
Scale: 1/4" = 1'-0" D SA10.3 | SA10.3



SECTION E
Scale: 1/4" = 1'-0" SA10.3 | SA10.3

LEGEND

- Demolish and Remove
- Demolish and Remove with No Larger Than a 60-Lb Pneumatic Demolition Hammer
- Demolish and Remove with No Larger Than a 30-Lb Pneumatic Demolition Hammer

NOTES:

1. The Contractor shall not damage, demolish, or remove any existing reinforcing steel or anchor bolts, unless explicitly shown.
2. If reinforcing steel is encountered within the demolition limits and is not shown on the contract drawings, inform the Engineer immediately.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

FOUNDATION DEMOLITION ELEVATIONS AND SECTIONS

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

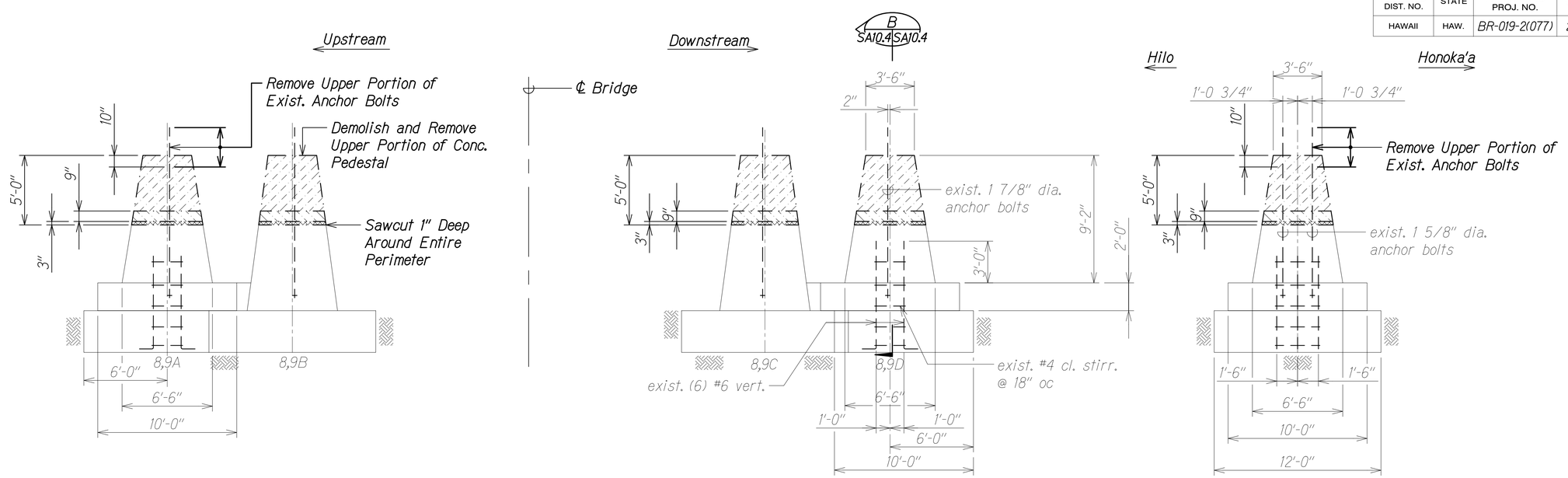
SHEET No. SA10.3 OF 14 SHEETS

00

ORIGINAL PLAN | NOTE BOOK | No. | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE

PLOT TIME: 03-29-24, 3:54 PM
DRAWING NAME: Z:\OD ONGOING\OD JF PROJECTS\22-001.12-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\NSR-SA1101 DEMO FDN.DWG

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024	00	



BENT NOS. 8 AND 9 FOUNDATION - DEMOLITION ELEVATION

Scale: 1/4" = 1'-0"

A SA10.4 | SA10.4

DEMOLITION SECTION

Scale: 1/4" = 1'-0"

A SA5.4 | SA5.4

LEGEND

- Demolish and Remove
- Demolish and Remove with No Larger Than a 60-Lb Pneumatic Demolition Hammer
- Demolish and Remove with No Larger Than a 30-Lb Pneumatic Demolition Hammer

NOTES:

1. The Contractor shall not damage, demolish, or remove any existing reinforcing steel or anchor bolts, unless explicitly shown.
2. If reinforcing steel is encountered within the demolition limits and is not shown on the contract drawings, inform the Engineer immediately.

ORIGINAL PLAN
NOTE BOOK
No.

SURVEY PLOTTED BY
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TRACED BY
DESIGNED BY
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DATE

DRAWING NAME: Z:\OD ONGOING\OD JF PROJECTS\22-001 12-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\NSB-SA1001 DEMO FIN.DWG PLOT TIME: 03-29-24, 3:54 PM

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

FOUNDATION DEMOLITION ELEVATIONS AND SECTIONS

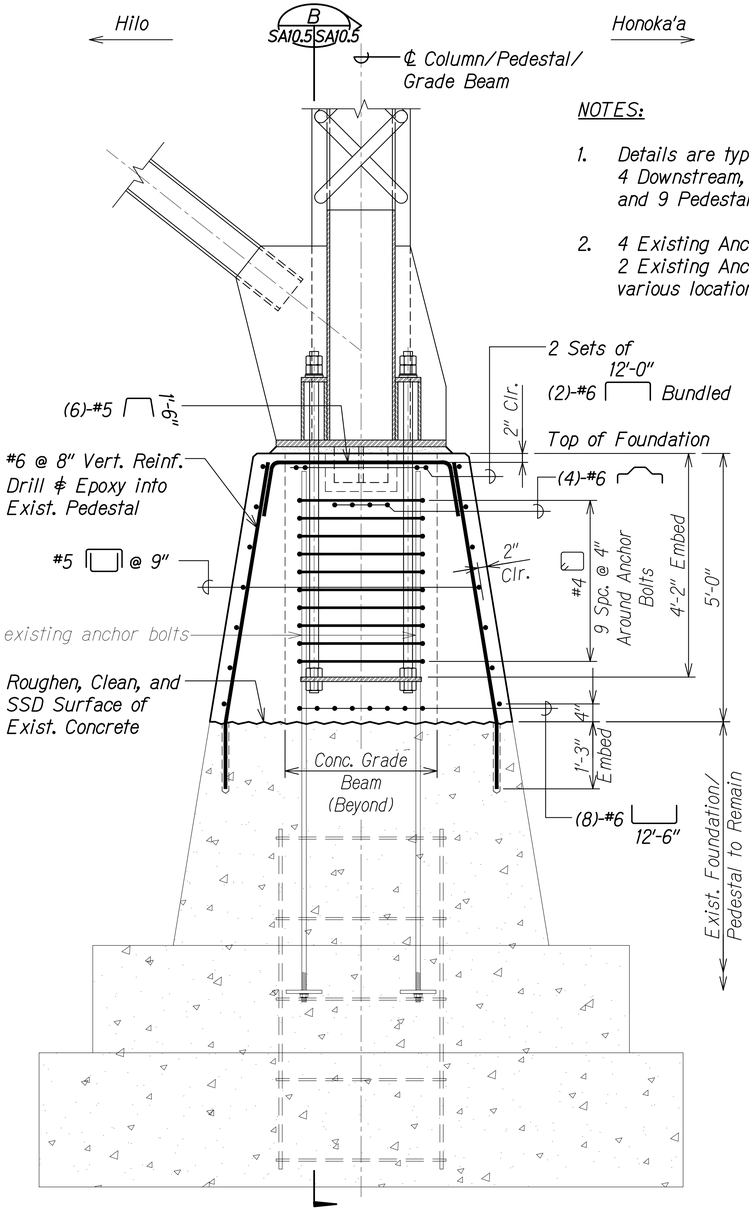
HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA10.4 OF 14 SHEETS

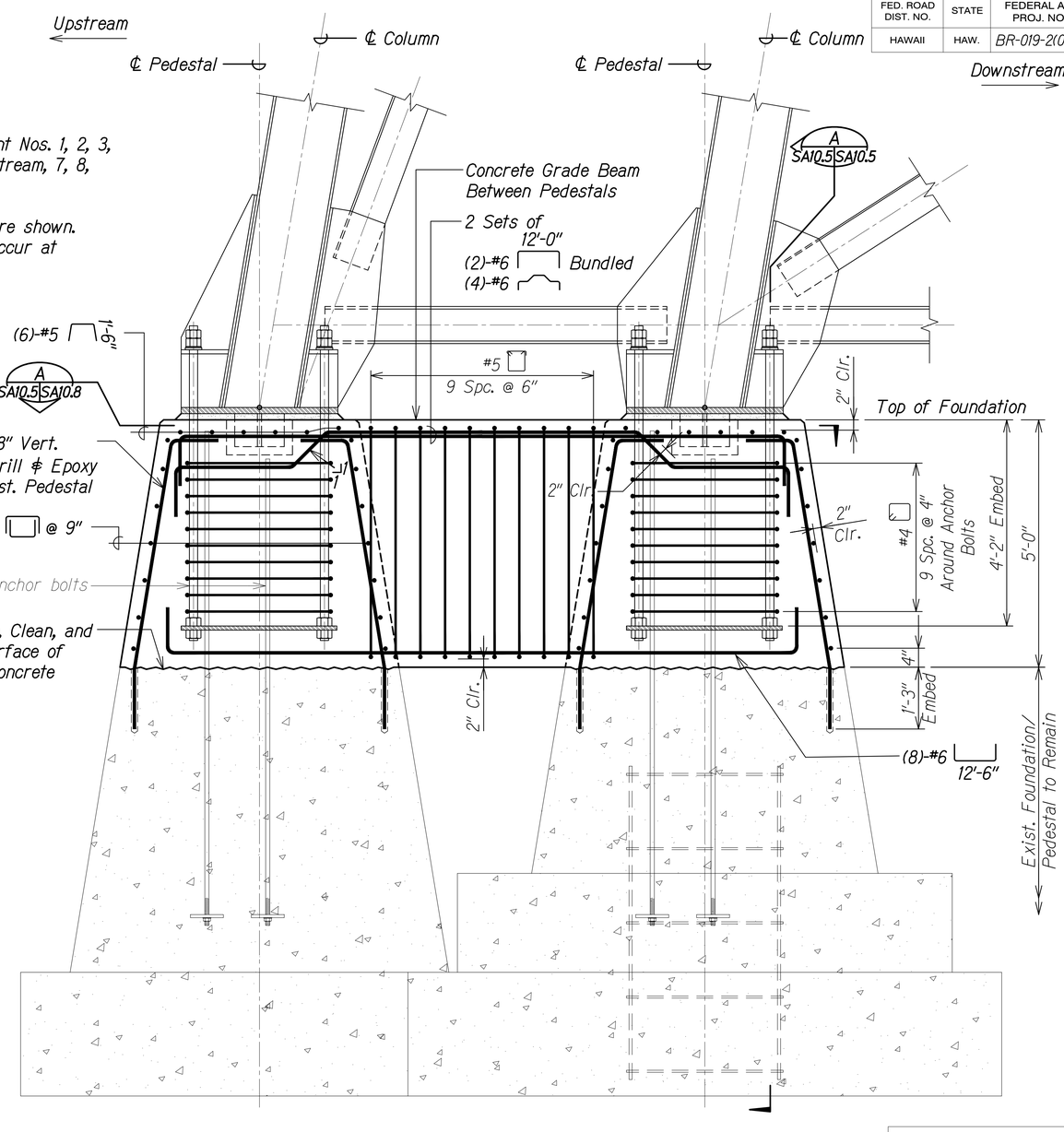
00

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



TYPICAL FOUNDATION
PEDESTAL REINFORCING SECTION A SA10.5 SA10.5

Scale: 3/4" = 1'-0"



TYPICAL FOUNDATION
PEDESTAL REINFORCING SECTION B SA10.5 SA10.5

Scale: 3/4" = 1'-0"

NOTES:

1. Details are typical for Bent Nos. 1, 2, 3, 4 Downstream, 5, 6 Downstream, 7, 8, and 9 Pedestals.
2. 4 Existing Anchor Bolts are shown. 2 Existing Anchor Bolts occur at various locations.

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NOTE BOOK	TRACED BY
	DESIGNED BY
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PEDESTAL REINFORCING SECTIONS

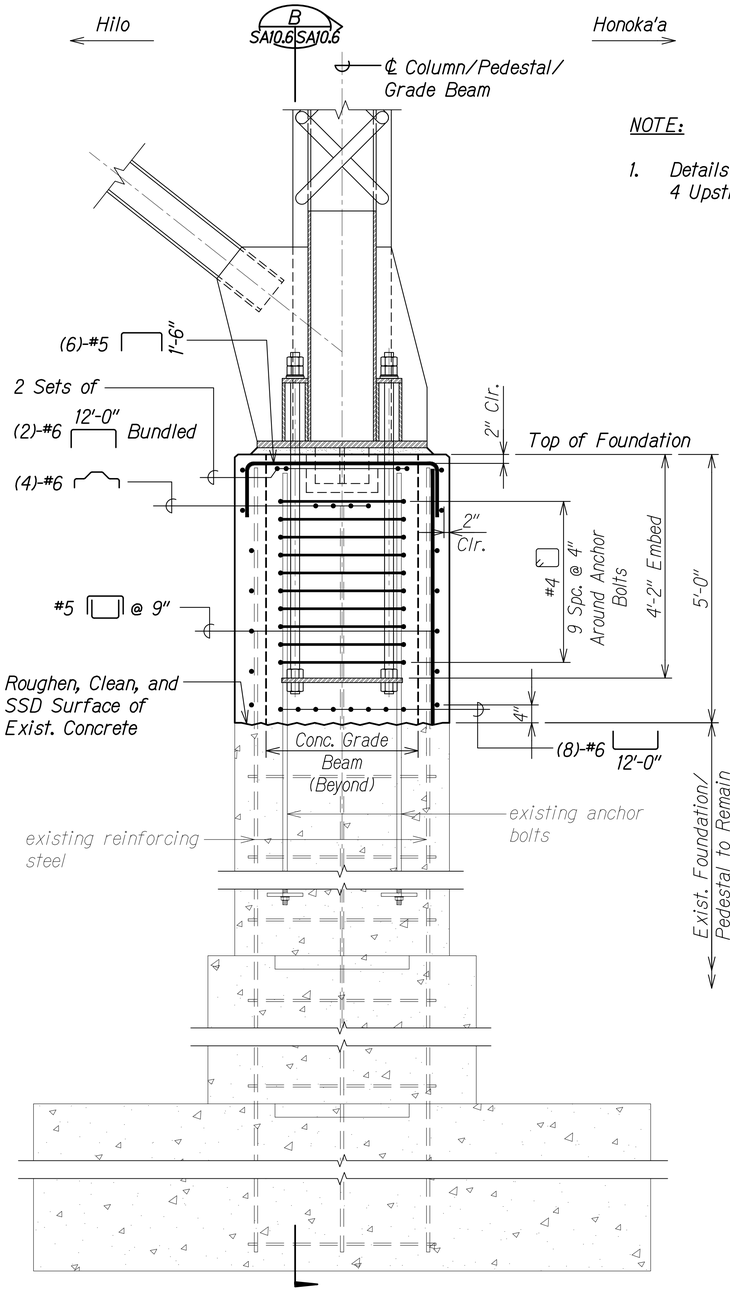
HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No SA10.5 OF 14 SHEETS

PLOT TIME: 03-29-24, 3:54 PM
DRAWING NAME: Z:\OD ONGINO\OD # PROJECTS\22-001 12-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\NSR-SA10S5 PED REINF.DWG

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



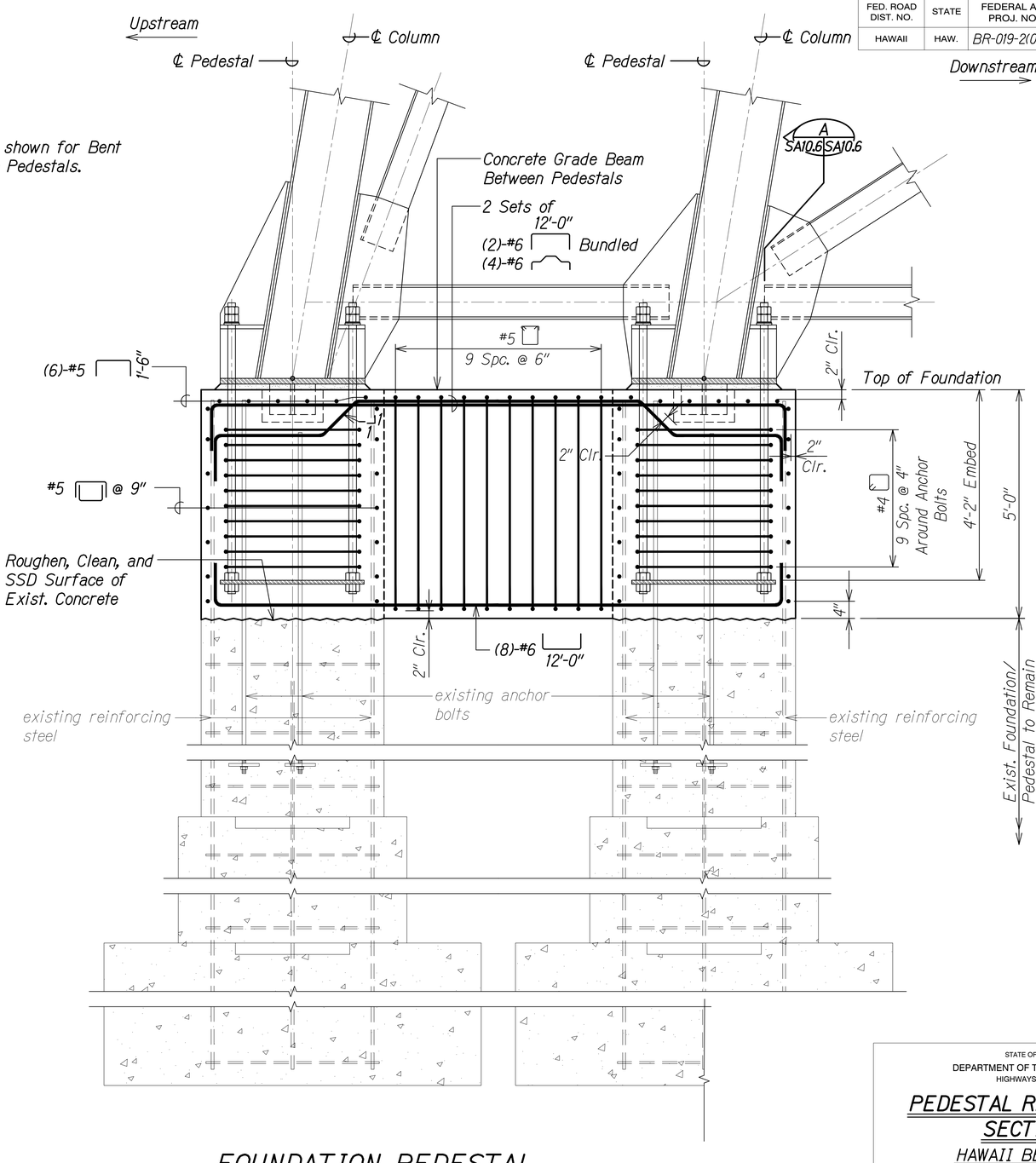
NOTE:

1. Details are shown for Bent 4 Upstream Pedestals.

FOUNDATION PEDESTAL REINFORCING SECTION A

Scale: 3/4" = 1'-0"

SA10.6 | SA10.6



FOUNDATION PEDESTAL REINFORCING SECTION B

Scale: 3/4" = 1'-0"

SA10.6 | SA10.6

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PEDESTAL REINFORCING SECTIONS

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA10.6 OF 14 SHEETS

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
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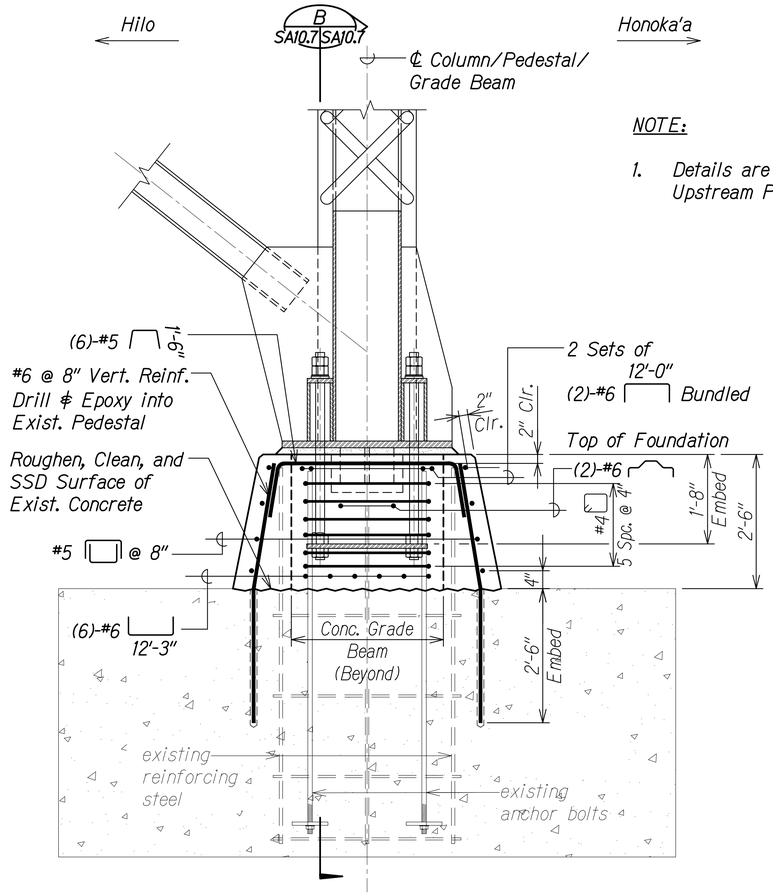
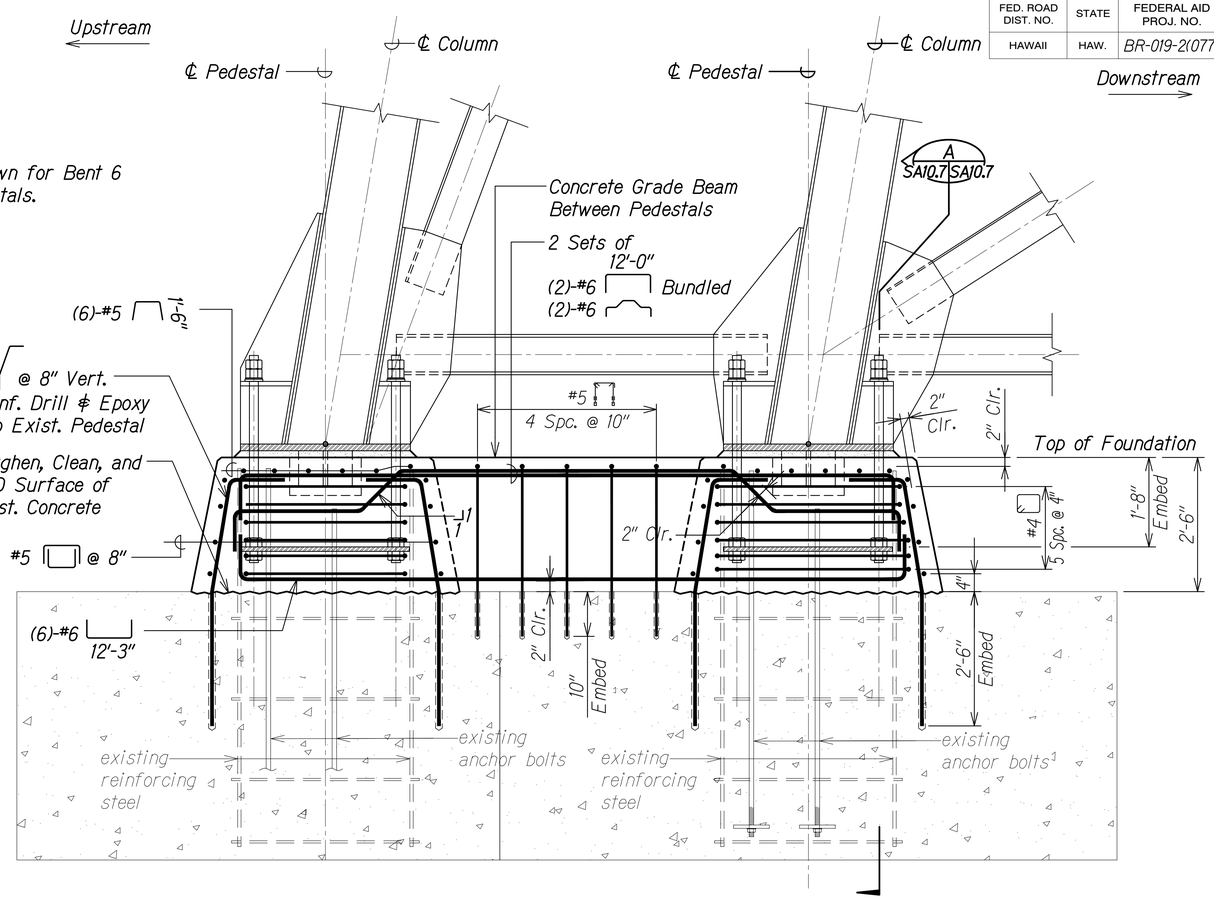
DRAWING NAME: Z:\OD ONGOING\OD JF PROJECTS\22-001\12-NANUE STR BR REHAB\[OD\03-29-24 60PCT DESIGN\NSR-SA1006 PED REINF.DWG PLOT TIME: 03-29-24, 3:55 PM]

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



NOTE:

1. Details are shown for Bent 6 Upstream Pedestals.



FOUNDATION PEDESTAL REINFORCING SECTION A

Scale: 3/4" = 1'-0"

SA10.7 | SA10.7

FOUNDATION PEDESTAL REINFORCING SECTION B

Scale: 3/4" = 1'-0"

SA10.7 | SA10.7

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
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NOTE BOOK	TRACED BY	"
	DESIGNED BY	"
No.	QUANTITIES BY	"
	CHECKED BY	"

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

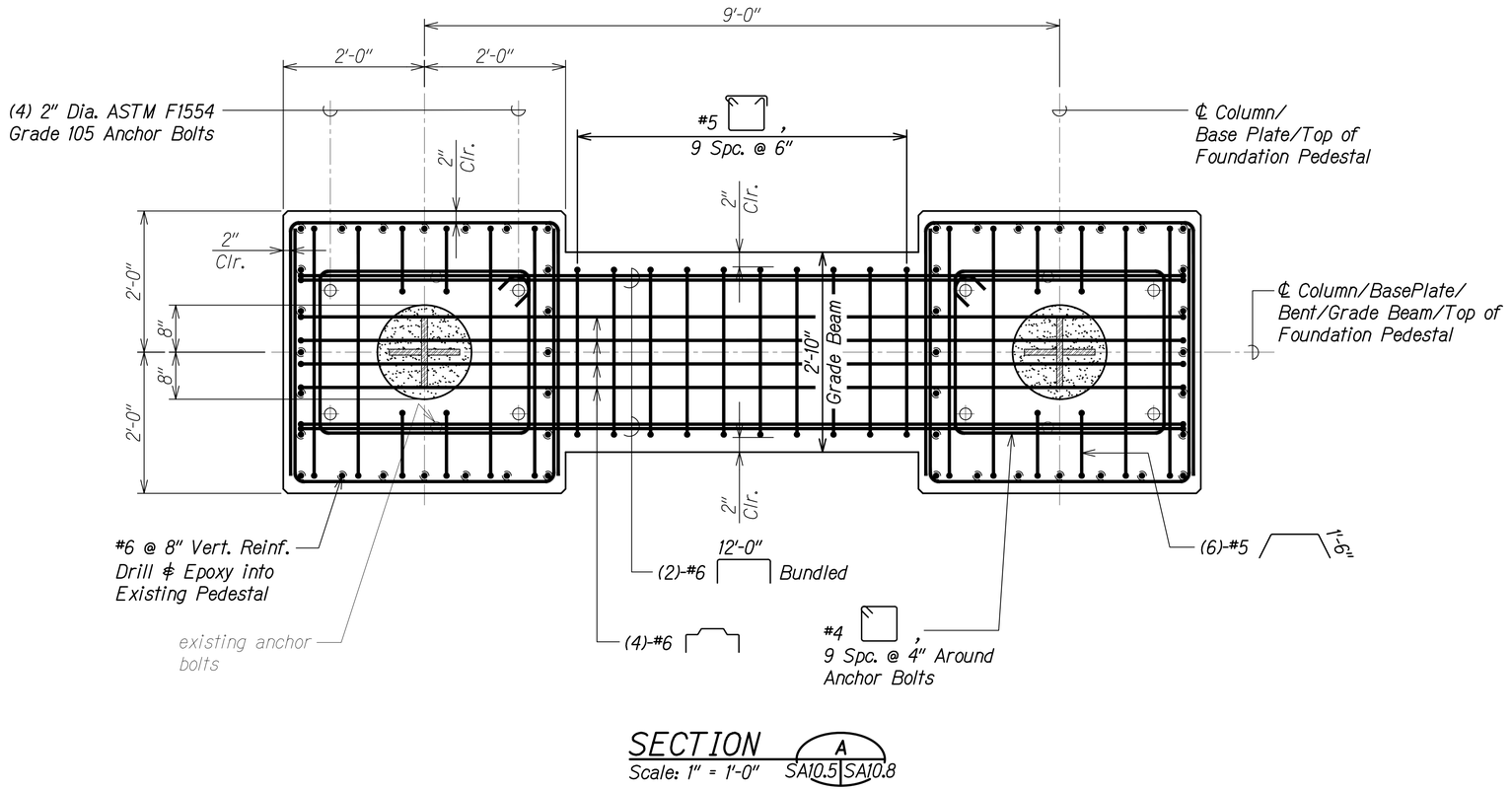
PEDESTAL REINFORCING SECTIONS

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA10.7 OF 14 SHEETS

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



SECTION
Scale: 1" = 1'-0"

A SA10.5 | SA10.8

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
No.	TRACED BY	
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DRAWING NAME: Z:\AD ONGOING\DD_dF PROJECTS\Z2-00112-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\NSR-SA1008 FDN DET.DWG PLOT TIME: 03-29-24 3:55 PM)

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PEDESTAL/GRADE BEAM REINFORCING SECTION

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

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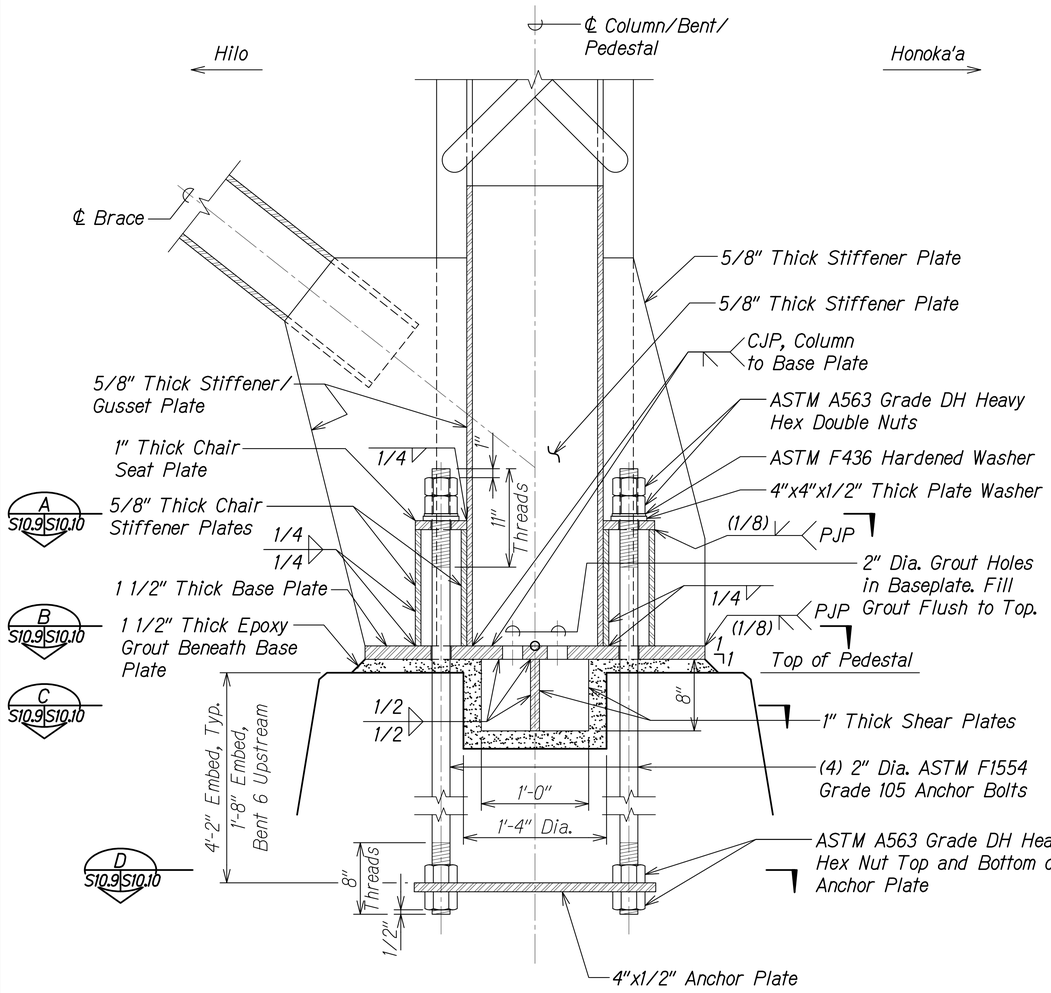
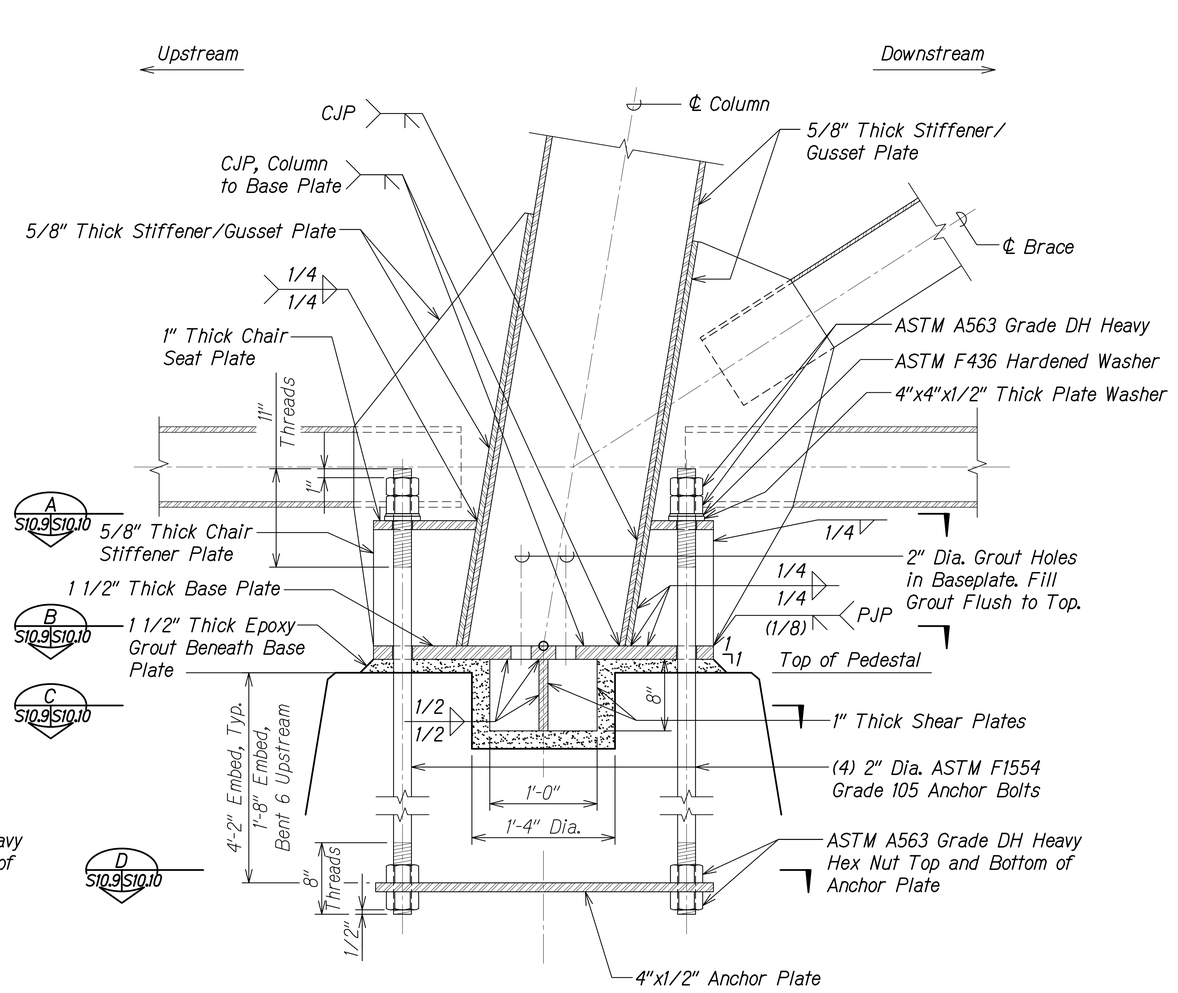
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



COLUMN BASE PLATE AND ANCHOR BOLTS DETAIL 1

Scale: 1 1/2" = 1'-0"

SA10.9 SA10.9



COLUMN BASE PLATE AND ANCHOR BOLTS DETAIL 2

Scale: 1 1/2" = 1'-0"

SA10.9 SA10.9

NOTES:

1. Anchor bolts shall be shipped fastened to the bottom anchor plate and a temporary steel top template to ensure proper layout during installation.

2. Anchor bolts shall be installed with misalignments of less than 1:40 from vertical. After installation, firm contact shall exist between the anchor bolt, nuts, washers, and seat plate.

ORIGINAL PLAN
NOTE BOOK
No.

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DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

COLUMN BASE PLATE DETAILS

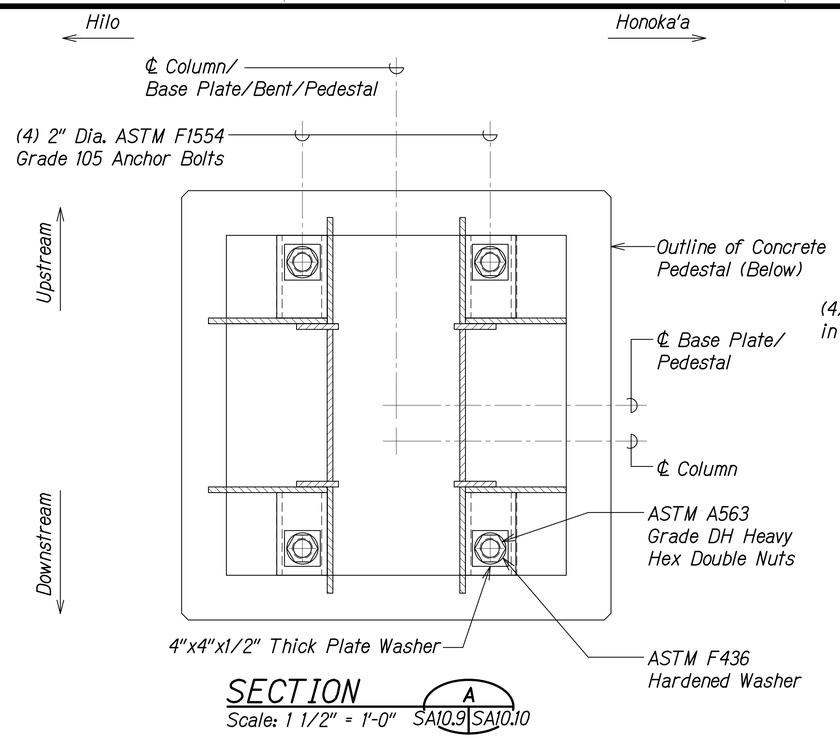
HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

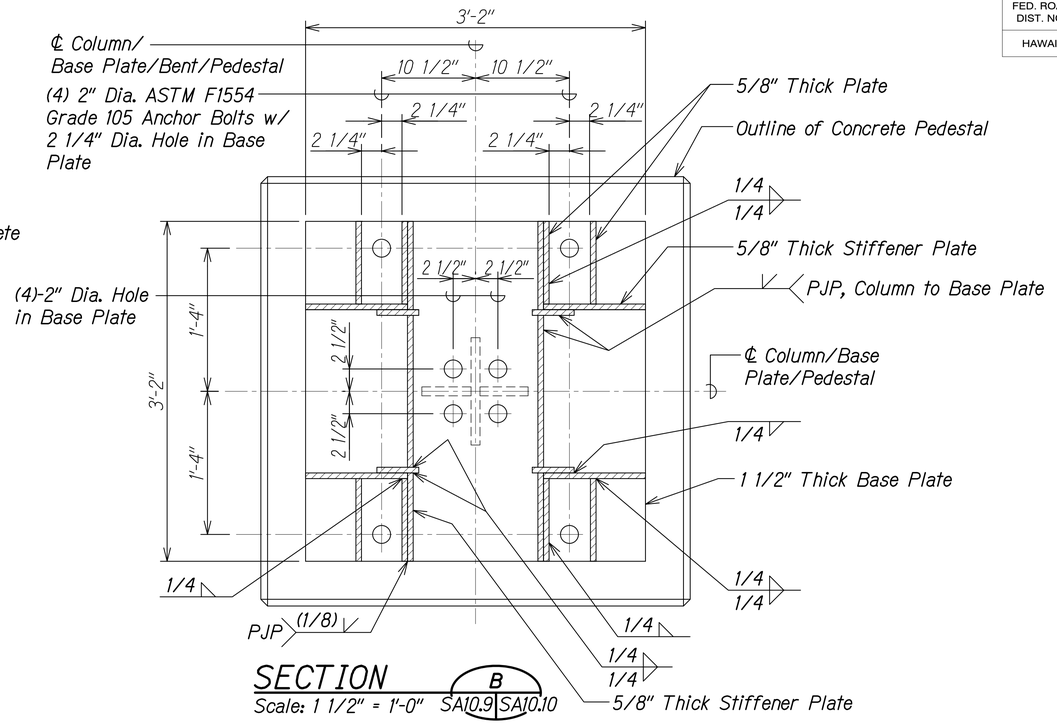
SHEET No. SA10.9 OF 14 SHEETS

PLOT TIME: 03-29-24, 3:56 PM)
DRAWING NAME: Z:\OD ONGOING\OD JF PROJECTS\22-001.12-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\SR-SA1608 FDN DETAILS.DWG PLOT TIME

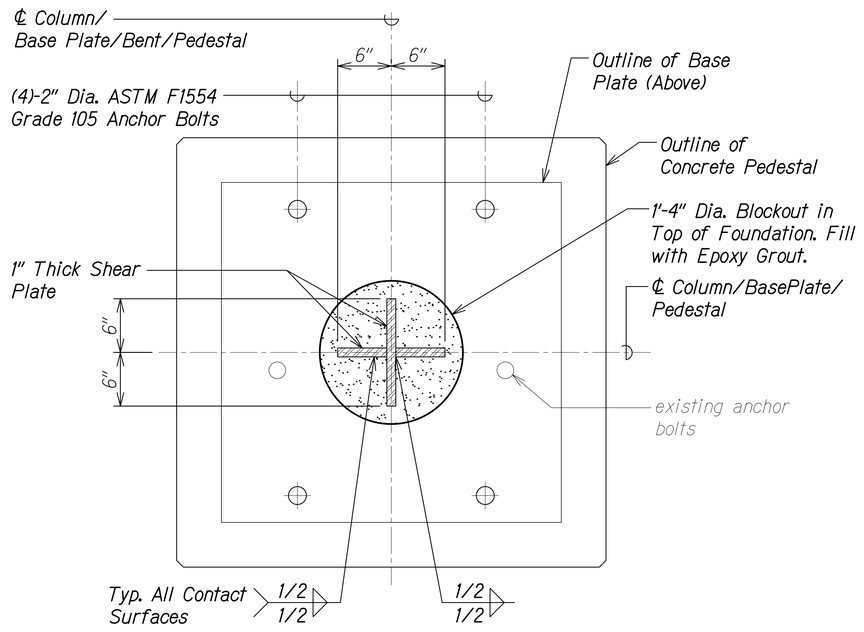
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



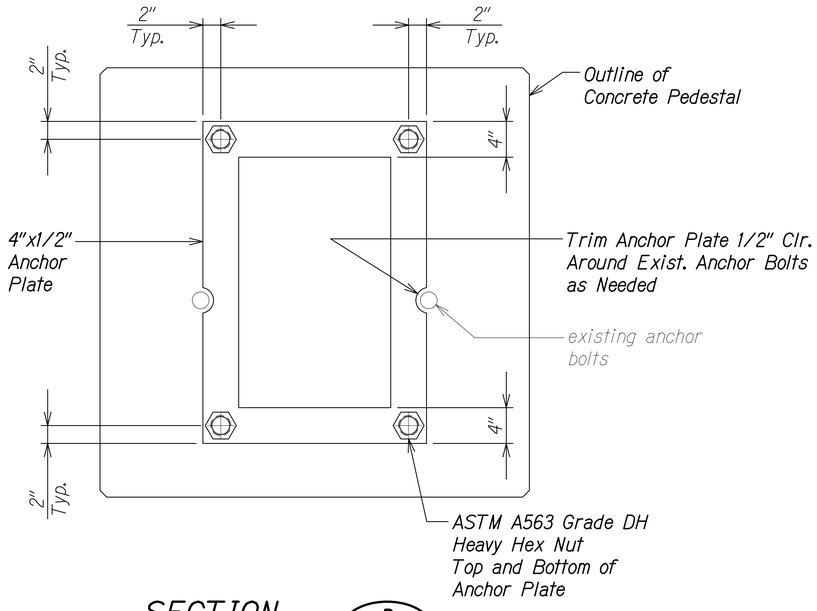
SECTION A
Scale: 1 1/2" = 1'-0" SA10.9 SA10.10



SECTION B
Scale: 1 1/2" = 1'-0" SA10.9 SA10.10



SECTION C
Scale: 1 1/2" = 1'-0" SA10.9 SA10.10



SECTION D
Scale: 1 1/2" = 1'-0" SA10.9 SA10.10

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
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No.	TRACED BY	
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

COLUMN BASE PLATE SECTIONS

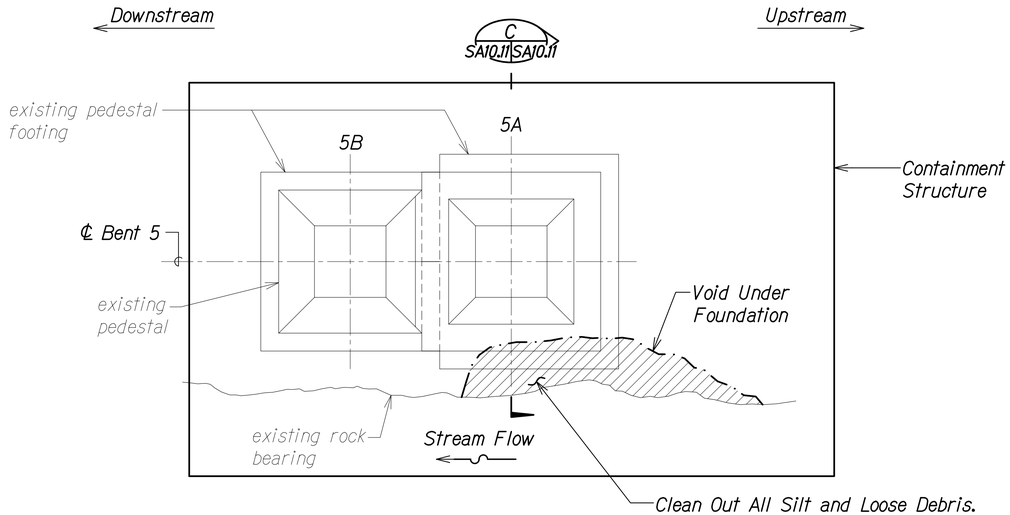
HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

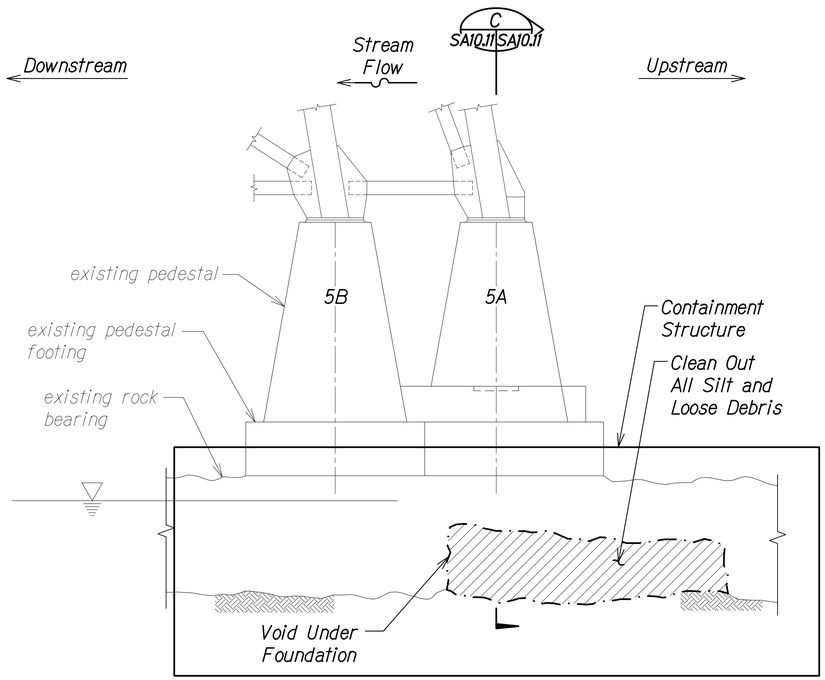
SHEET No SA10.10 OF 14 SHEETS

DRAWING NAME: Z:\OD ONGOING\OD JF PROJECTS\22-001.12-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\NSR-SA1008 FDN DETS.DWG PLOT TIME: 03-29-24 3:56 PM

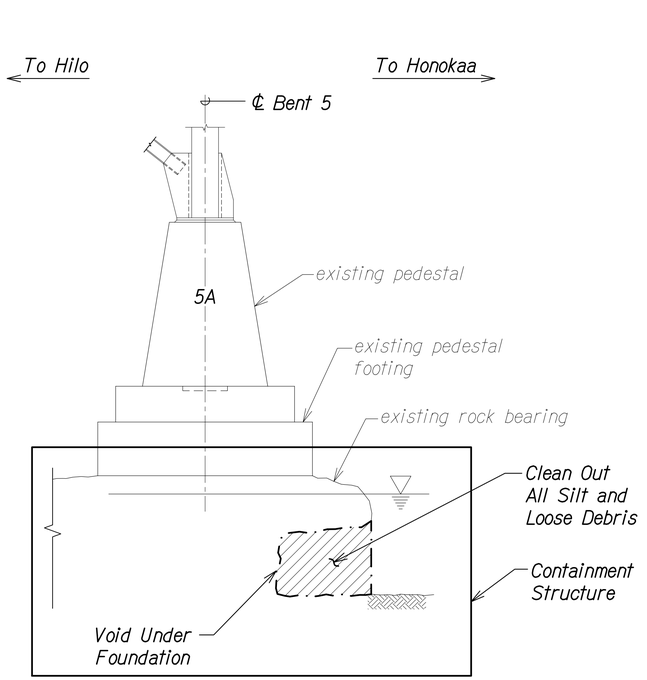
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



PLAN
Scale: 1/4" = 1'-0"
A SA10.11 SA10.11



ELEVATION
Scale: 1/4" = 1'-0"
B SA10.11 SA10.11



SECTION
Scale: 1/4" = 1'-0"
C SA10.11 SA10.11

LEGEND:

Void Under Foundation

NOTES:

1. Containment structure shall prevent all construction debris and existing waste material from entering the river and banks. See Special Provisions Section 209 for requirements.
2. Clean out all silt and loose debris from voids. Remove all deleterious material and organic growth from footing/rock surfaces by high-pressure water blasting.
3. Repairs shall be conducted prior to replacement of steel bents.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
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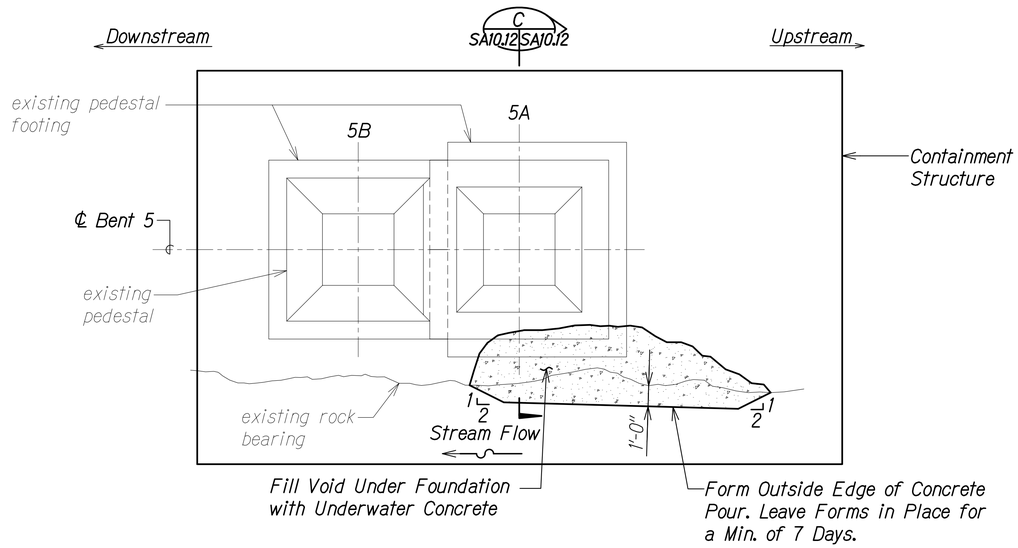
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BENT 5 FOOTING PLAN, ELEVATION, AND SECTION

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

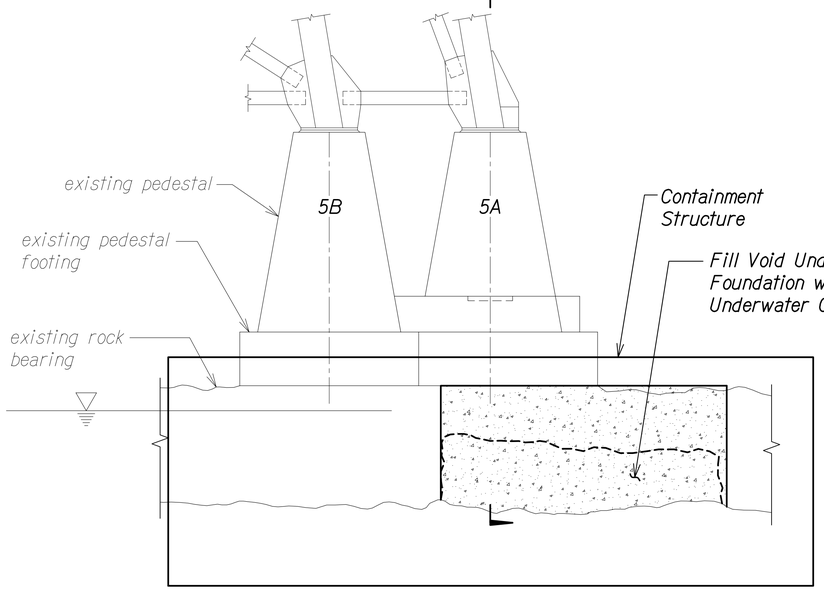
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



PLAN VIEW

Scale: 1/4" = 1'-0"

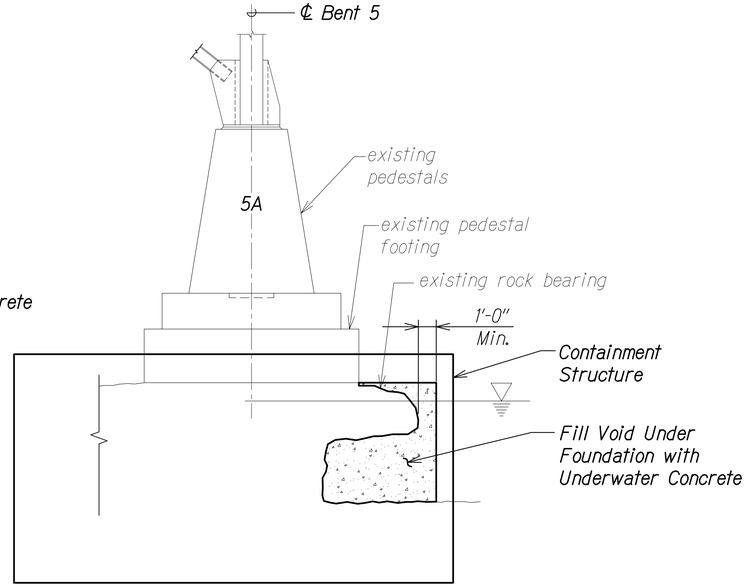
A SA10.12 SA10.12



ELEVATION VIEW

Scale: 1/4" = 1'-0"

B SA10.12 SA10.12



SECTION VIEW

Scale: 1/4" = 1'-0"

C SA10.12 SA10.12

LEGEND:

Under Water Concrete

NOTE:

Traffic control plan with Mauka lane closures, as shown on Sheet TCXX.X, shall be in effect prior to placing underwater concrete and a minimum of 3 days after completion of placing underwater concrete. Traffic control plan shall transition to Reduced Speed Traffic Control Plan, shown on Sheet TCXX.X, after the 3 days and shall be in effect a minimum of 4 additional days.

ORIGINAL PLAN | NOTE BOOK | No.
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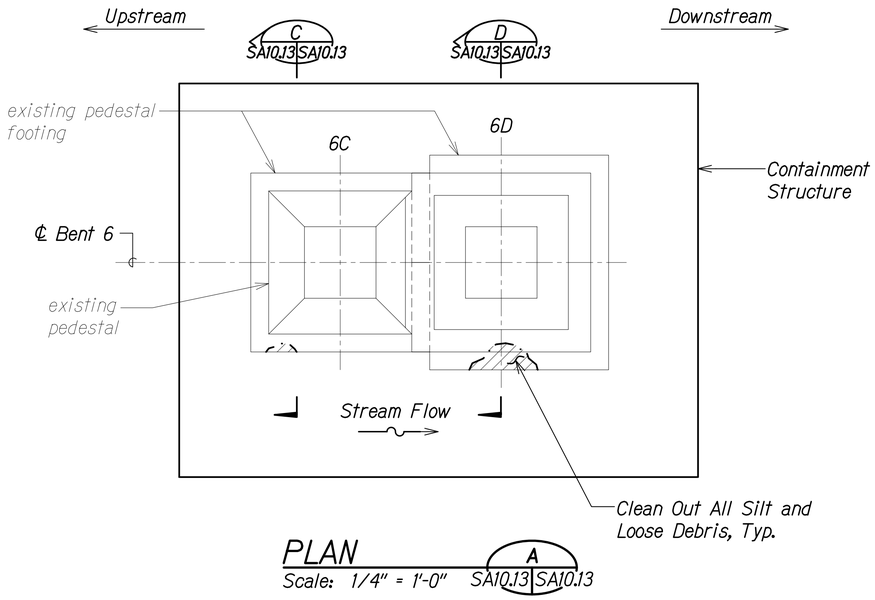
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BENT 5 FOOTING PLAN, ELEVATION, AND SECTION

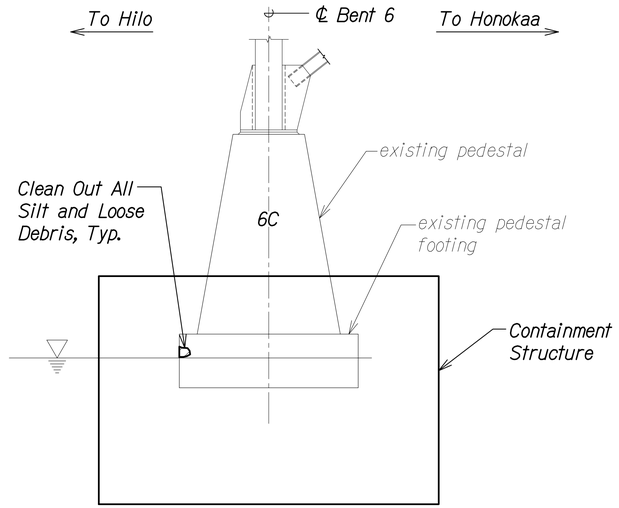
HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

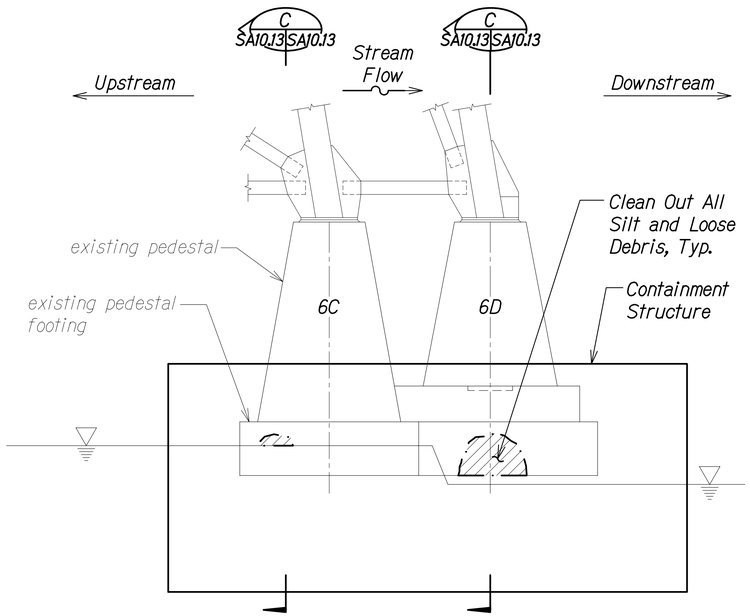
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



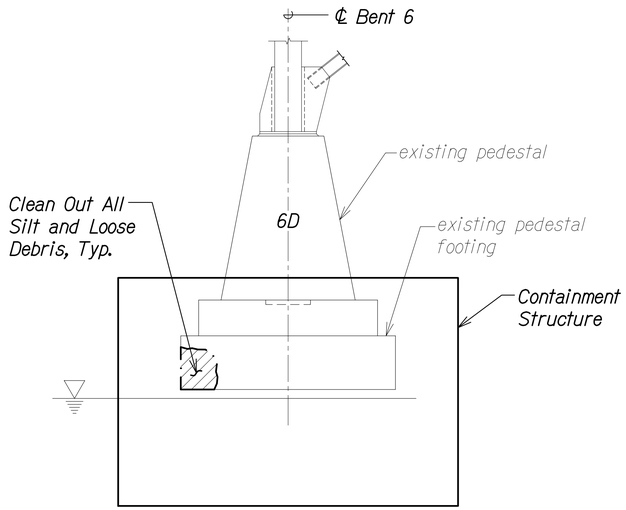
PLAN A
Scale: 1/4" = 1'-0" SA10.13 SA10.13



SECTION C
Scale: 1/4" = 1'-0" SA10.13 SA10.13



ELEVATION B
Scale: 1/4" = 1'-0" SA10.13 SA10.13



SECTION D
Scale: 1/4" = 1'-0" SA10.13 SA10.13

LEGEND:

Void Under Foundation

NOTES:

1. Containment structure shall prevent all construction debris and existing waste material from entering the river and banks. See Special Provisions Section 209 for requirements.
2. Clean out all silt and loose debris from voids. Remove all deleterious material and organic growth from footing/rock surfaces by high-pressure water blasting.
3. Repairs shall be conducted prior to replacement of steel bents.

ORIGINAL PLAN
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BENT 6 FOOTING PLAN, ELEVATION, AND SECTION

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA10.13 OF 14 SHEETS

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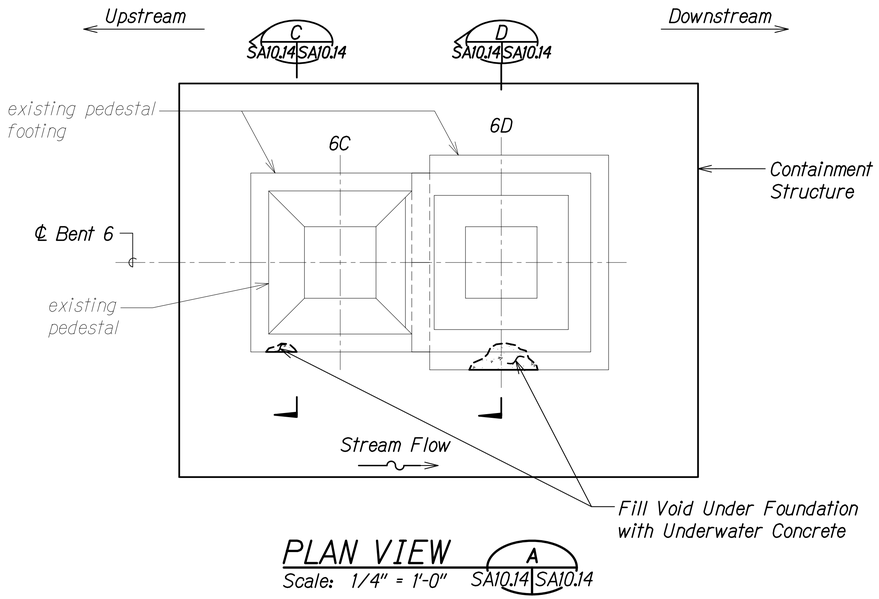
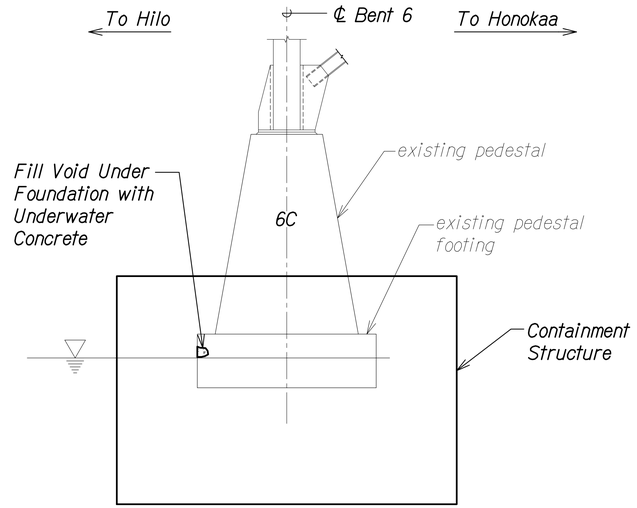
HAWAII	HAW.	BR-019-2(077)	2024		



PLAN VIEW A
Scale: 1/4" = 1'-0" SA10.14 SA10.14



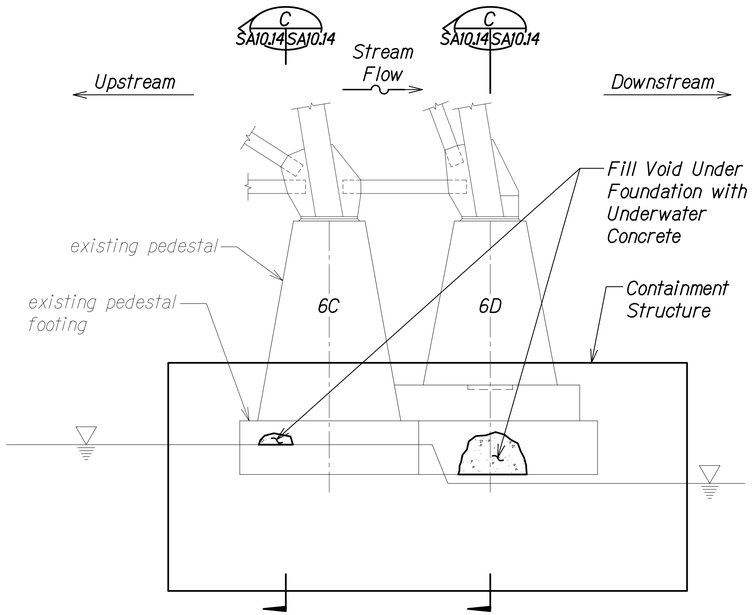
SECTION VIEW C
Scale: 1/4" = 1'-0" SA10.14 SA10.14

LEGEND:

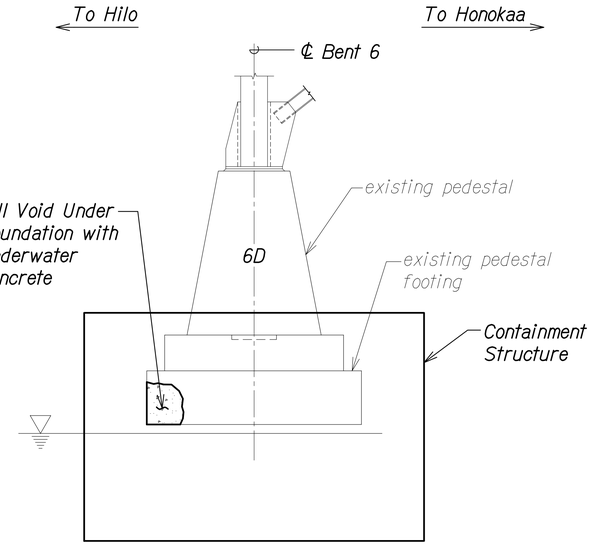
Under Water Concrete

NOTE:

Traffic control plan with Makai lane closures, as shown on Sheet TCXX.X, shall be in effect prior to placing underwater concrete and a minimum of 3 days after completion of placing underwater concrete. Traffic control plan shall transition to Reduced Speed Traffic Control Plan, shown on Sheet TCXX.X, after the 3 days and shall be in effect a minimum of 4 additional days.



ELEVATION VIEW B
Scale: 1/4" = 1'-0" SA10.14 SA10.14



SECTION VIEW D
Scale: 1/4" = 1'-0" SA10.14 SA10.14

ORIGINAL PLAN	SURVEY PLOTTED BY
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BENT 6 FOOTING PLAN, ELEVATION, AND SECTION

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

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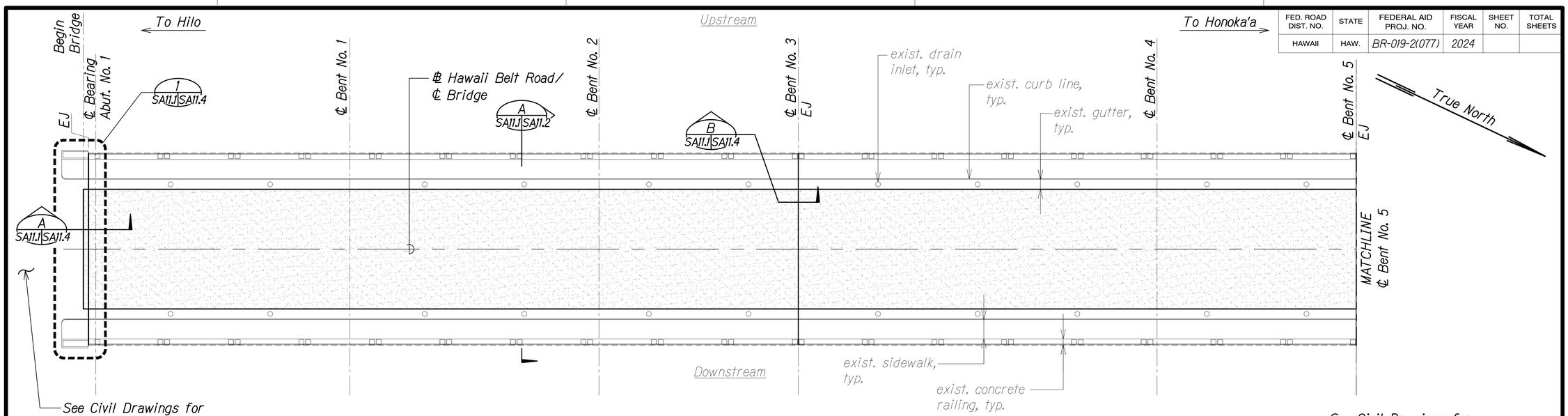
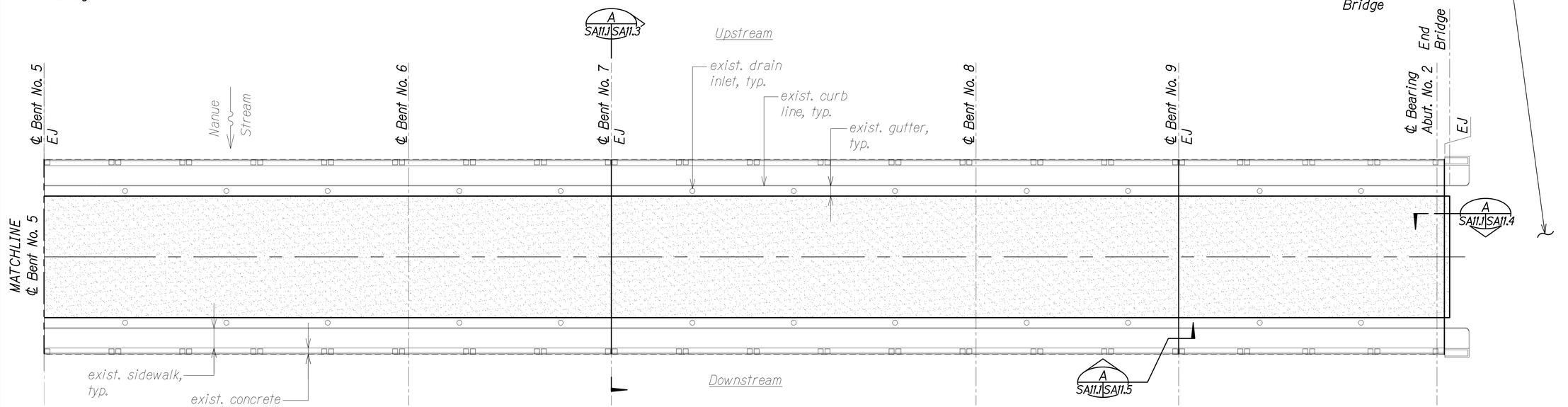
SHEET No. SA10.14 OF 14 SHEETS

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		





BRIDGE DECK OVERLAY AND JOINTING PLAN

Scale: 1" = 10'-0"

LEGEND:

Penetrating Sealer with HPC Overlay

EJ Expansion Joint in Deck

NOTES:

1. HPC Overlay shall be applied over the penetrating sealer.
2. Replace deck expansion joint seals at Abutment No. 1, Bent Nos. 3, 5, 7, and 9, and Abutment No. 2.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BRIDGE DECK OVERLAY AND JOINTING PLAN

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA11.1 OF 5 SHEETS

ORIGINAL PLAN
NOTE BOOK
No.

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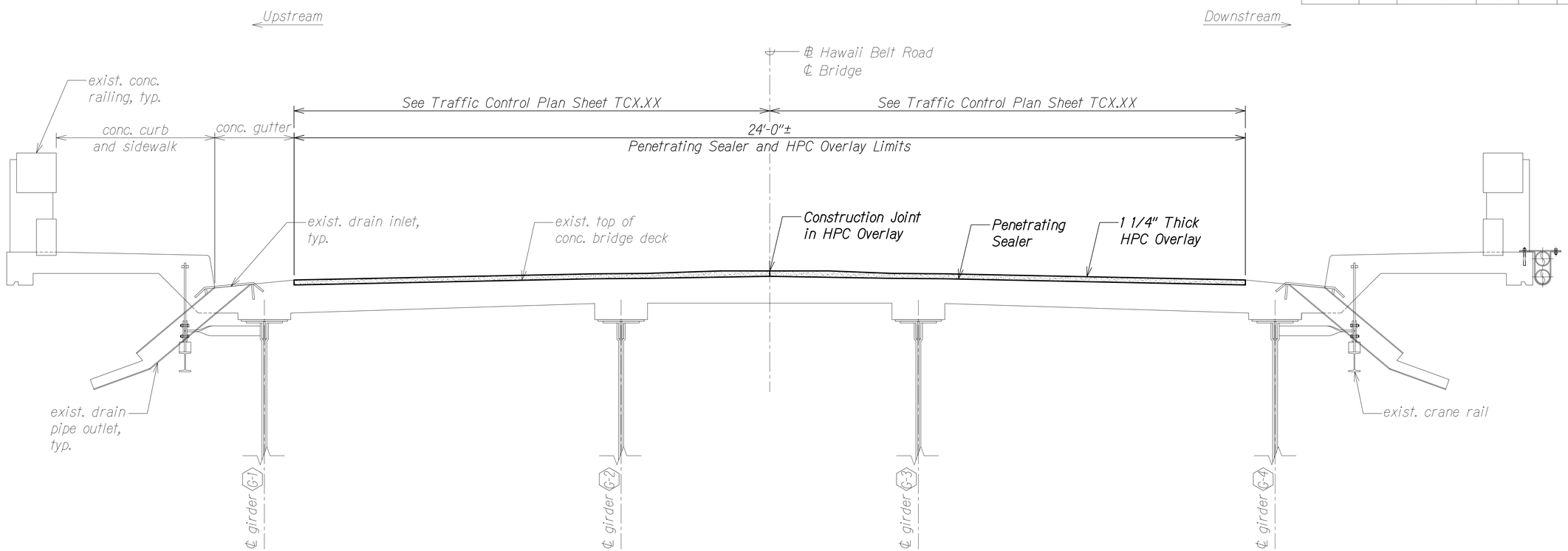
QUANTITIES BY
CHECKED BY
DATE

DRAWING NAME: Z:\OD ONGINO\OD JF PROJECTS\22-0112-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\SBR-SA1101 LAYPLAN.DWG PLOT TIME: 03-29-24, 3:58 PM

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



TRANSVERSE SECTION WITH HPC OVERLAY

A SA11.1 | SA11.2

Scale: 3/4" = 1'-0"

LEGEND:

HPC Overlay

NOTES:

1. Penetrating sealer and HPC overlay shall conform to Special Provisions Sections 683 PENETRATING SEALER and 678 HYBRID POLYMER CONCRETE.
2. The existing AC wearing surface shall be removed, followed by shotblasting of the existing concrete deck surface.
3. The concrete deck surface shall be cleaned with a vacuum sweeper and blown with oil free/moisture free compressed air after shotblasting is completed
4. The Contractor shall not remove more than 1/4" of the existing concrete deck when removing the existing AC wearing surface.
5. Existing concrete surface to receive penetrating sealer and HPC Overlay shall not have a moisture content greater than or equal to 5% at the time of material placement.
6. Vehicular traffic shall not be allowed onto the prepared concrete deck surface prior to application of the penetrating sealer and HPC Overlay.
7. The concrete surface with applied penetrating sealer shall be lightly shotblasted and blown with oil free/moisture free compressed air if the HPC Overlay is not placed within 48 hours of penetrating sealer placement or if the surface becomes contaminated.
8. HPC overlay shall not be placed directly against the AC. All HPC construction joints must be formed.
9. Notify the Engineer immediately if spalls or delaminations are discovered in the concrete deck after removing the existing AC wearing surface.
10. Application of penetrating sealer and HPC Overlay shall not occur until after the deck soffit cracks have been epoxy injected.
11. The Contractor shall submit penetrating sealer, HPC Overlay, and jointing plans for approval.

ORIGINAL PLAN | NOTE BOOK | No. | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

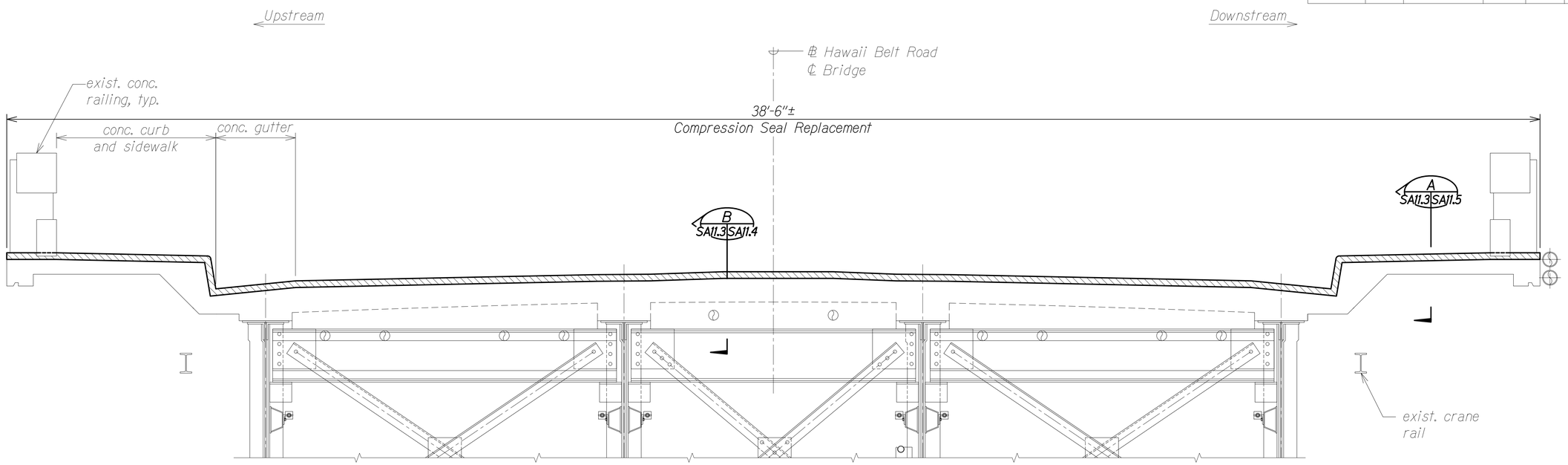
TRANSVERSE SECTION WITH HPC OVERLAY

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA11.2 OF 5 SHEETS

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



TRANSVERSE SECTION AT EXPANSION JOINTS (A SA11.1 SA11.3)

Scale: 3/4" = 1'-0"

LEGEND:

New Expansion Joint
Compression Seal

NOTES:

1. The new compression seal shall be monolithic, unless otherwise approved by the Engineer.
2. New compression seals shall conform to Special Provisions Section 515 DECK EXPANSION JOINTS.
3. The Contractor shall field verify expansion joint widths prior to ordering compression seal materials. The Contractor shall be aware of the date and time the field measurements are recorded due to the effects of temperature.
4. The concrete at the expansion joint shall be sound before replacement of existing compression seals. If defective concrete is discovered after the removal of the existing expansion joint seal, notify the Engineer immediately.

ORIGINAL PLAN
NOTE BOOK No.
SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

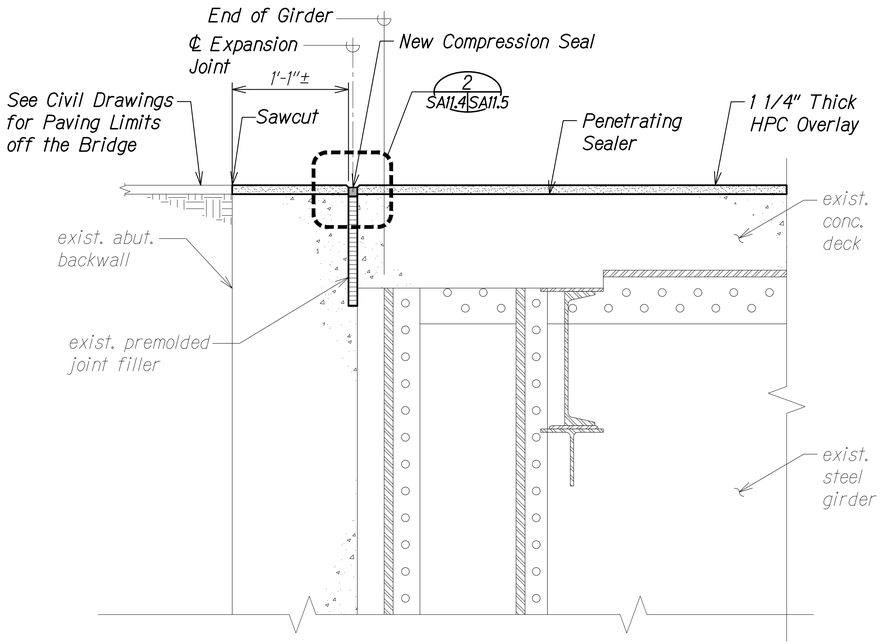
TRANSVERSE SECTION AT EXPANSION JOINTS

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA11.3 OF 5 SHEETS

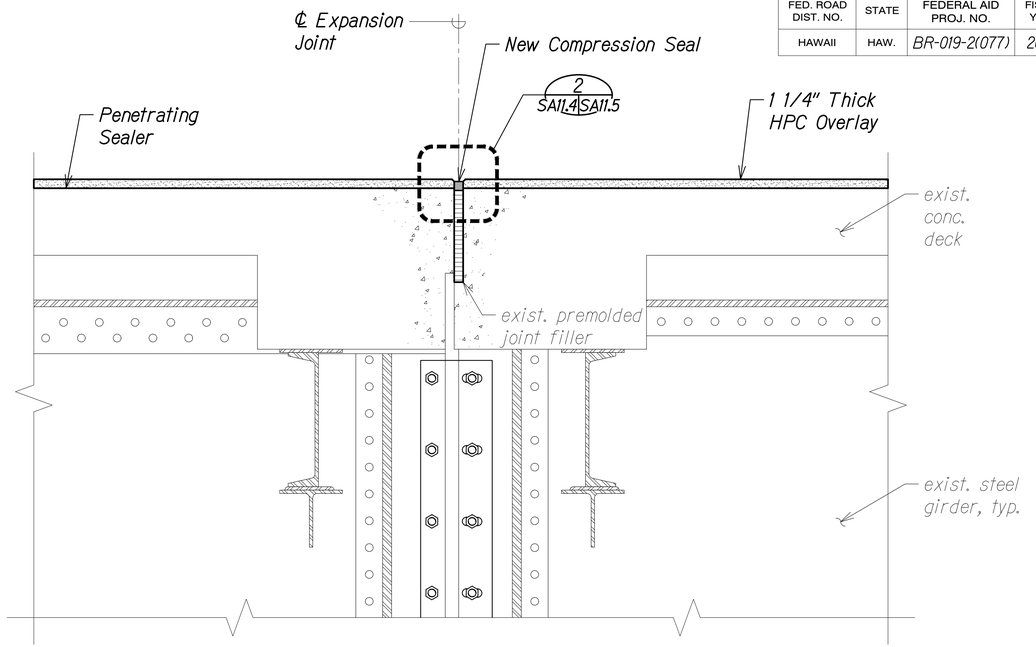
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



TYPICAL DECK EXPANSION JOINT SECTION AT ABUTMENTS

Scale: 1 1/2" = 1'-0"

A
SA11.1 | SA11.4



TYPICAL DECK EXPANSION JOINT SECTION AT BENTS

Scale: 1 1/2" = 1'-0"

B
SA11.1 | SA11.4
SA11.3

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
No.	TRACED BY	
	DESIGNED BY	
	QUANTITIES BY	
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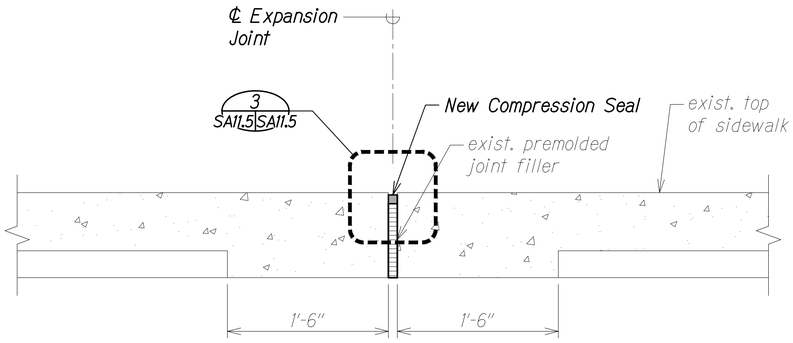
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

EXPANSION JOINT SECTIONS

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

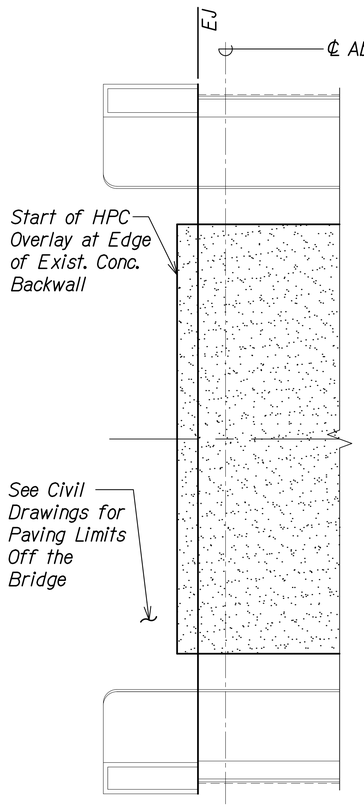
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



TYPICAL SECTION AT SIDEWALK EXPANSION JOINTS

Scale: 1 1/2" = 1'-0"

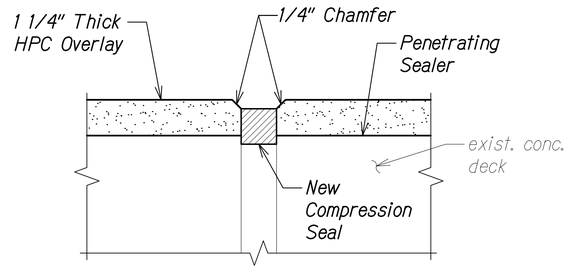
A
SA11.1 | SA11.5
SA11.3



DETAIL

Scale: 1/4" = 1'-0"

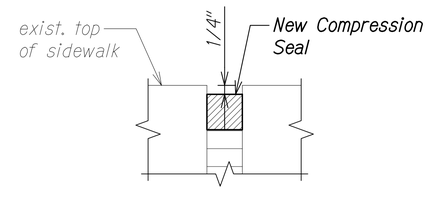
1
SA11.1 | SA11.5



COMPRESSION SEAL DETAIL

Scale: 6" = 1'-0"

2
SA11.4 | SA11.5



COMPRESSION SEAL DETAIL

Scale: 6" = 1'-0"

3
SA11.5 | SA11.5

ORIGINAL PLAN	SURVEY PLOTTED BY _____ DATE
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NOTE BOOK	TRACED BY "
	DESIGNED BY "
No.	QUANTITIES BY "
	CHECKED BY "

DRAWING NAME: Z:\AOD ONGOING\OD JF PROJECTS\22-001 12-NANUE STR BR REHAB\01 CAD\01-29-24 60PCT DESIGN\NSR-SA1102 HPC DET.DWG PLOT TIME: 03-29-24 3:59 PM

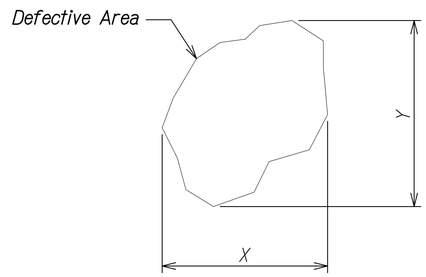
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

EXPANSION JOINT DETAILS

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

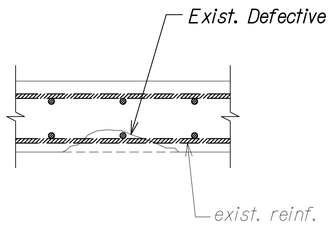
Scale: As Noted Date: Mar. 2024

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		

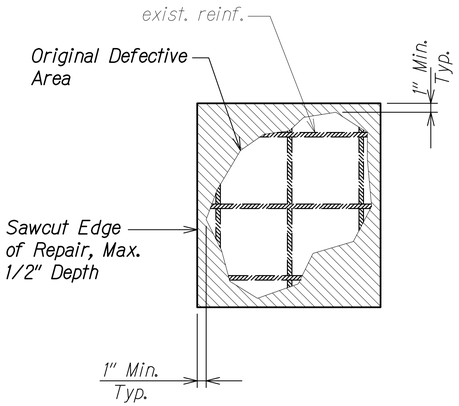


Exist. Defective Area = X x Y

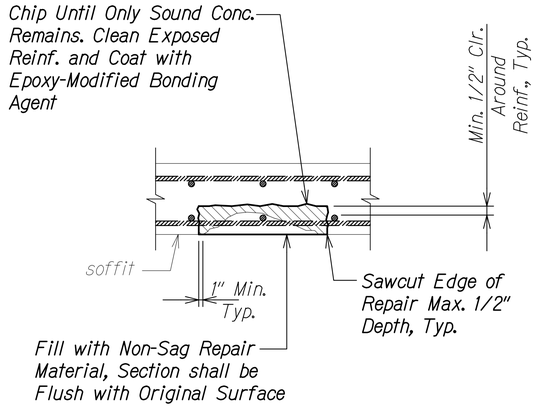
DEFECT PLAN/ELEVATION



DEFECT SECTION



DEFECT PLAN/ELEVATION



DEFECT SECTION

OVERHEAD AND VERTICAL DEFECTIVE CONCRETE REPAIRS

Scale: 1 1/2" = 1'-0"

LEGEND:

	Defective Concrete to be Removed
OH	Overhead
V	Vertical

OVERHEAD AND VERTICAL CONCRETE REPAIR NOTES:

1. The Contractor shall use a non-sag polymer modified repair mortar to repair defective concrete on the deck soffit, and other vertical and overhead repairs. The Contractor shall be aware of the extensive repair requirements in Section 680 - DEFECTIVE CONCRETE REPAIRS of the Special Provisions.
2. Spalls, delaminations, and honeycombing as noted on the drawings shall all be referred to as defective concrete.
3. Any existing defective concrete and cracked concrete that the Contractor discovers throughout the construction process that was not shown on the contract documents shall be brought to the attention of the Engineer.
4. All contaminated concrete containing any oil, dirt, etc. shall be removed. The Contractor shall take necessary precautions to avoid damaging the underlying sound concrete and reinforcing.
5. The defective concrete repair area shall be squared by sawcutting and chipping the concrete at the perimeter beyond the defect area a minimum of 1-inch. Exercise great care to avoid vibrating, cutting or damaging any existing embedded steel reinforcing. Angles between adjacent saw-cuts around the perimeter shall be 90 degrees.
6. Existing concrete surfaces within the repair area shall be roughened to ensure proper adhesion. Follow Special Provisions and Manufacturer's recommendations for further surface preparation.
7. If any reinforcing steel is observed to have section loss during the removal of existing concrete patches, removing unsound concrete, or during surface preparation, the Contractor shall follow SG1.1 and the requirements in the Special Provisions.
8. The Contractor shall not saw-cut beyond the repair limits.
9. Any defective concrete that the Contractor discovers throughout the project that is not covered in the estimated quantities shall be brought to the attention of the Engineer.

DEFECTIVE CONCRETE REPAIR QUANTITIES

LOCATION	POSITION	AREA (SF)
Abutment No. 1	V	3
Abutment No. 2	V	4
Concrete Deck Soffit	OH	7
Bottom of Concrete Railing	OH	4
		Total SF: 18

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
No.	TRACED BY	
	DESIGNED BY	
	QUANTITIES BY	
	CHECKED BY	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

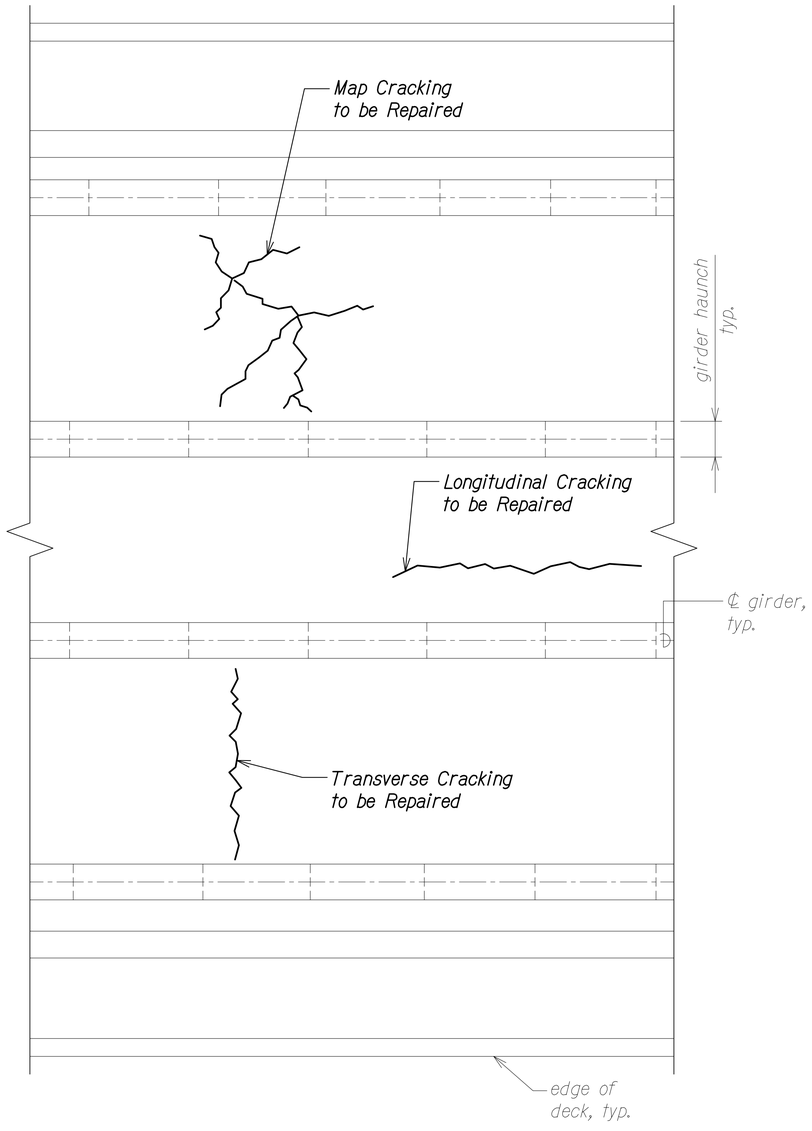
OVERHEAD DEFECTIVE CONCRETE REPAIR DETAILS

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA12.1 OF 2 SHEETS

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



TYPICAL DECK REFLECTIVE SOFFIT PLAN

Scale: 3/8" = 1'-0"

NOTES:

1. All cracks greater than or equal to 0.010" wide shall be repaired by epoxy injection. The Contractor shall verify crack widths prior to epoxy injection. The Contractor shall also sound the surrounding concrete for any delaminations. Notify the Engineer if any delamination or spalls are discovered.

2. Crack repairs shall be performed in accordance with ACI 503.7.

3. The Contractor shall follow the Manufacturer's recommendations for crack repairs.

4. Any cracked concrete that the Contractor discovers throughout the project that is not covered in the contract quantities shall be brought to the attention of the Engineer.

5. Refer to Sheet SA11.1 for span numbers.

CRACK REPAIR QUANTITIES	
SPAN NO.	LINEAR FOOT (LF)
1	480
2	470
3	376
4	677
5	376
6	677
7	376
8	677
9	376
10	480
	Total LF: 4965

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
NOTE BOOK	TRACED BY	
	DESIGNED BY	
No.	QUANTITIES BY	
	CHECKED BY	

DRAWING NAME: Z:\OD ENGINEERING\OD_IF_PROJECTS\22-60112-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\SR-SA1201 REPAIR DTLS.DWG PLOT TIME: 03-29-24, 3:59 PM

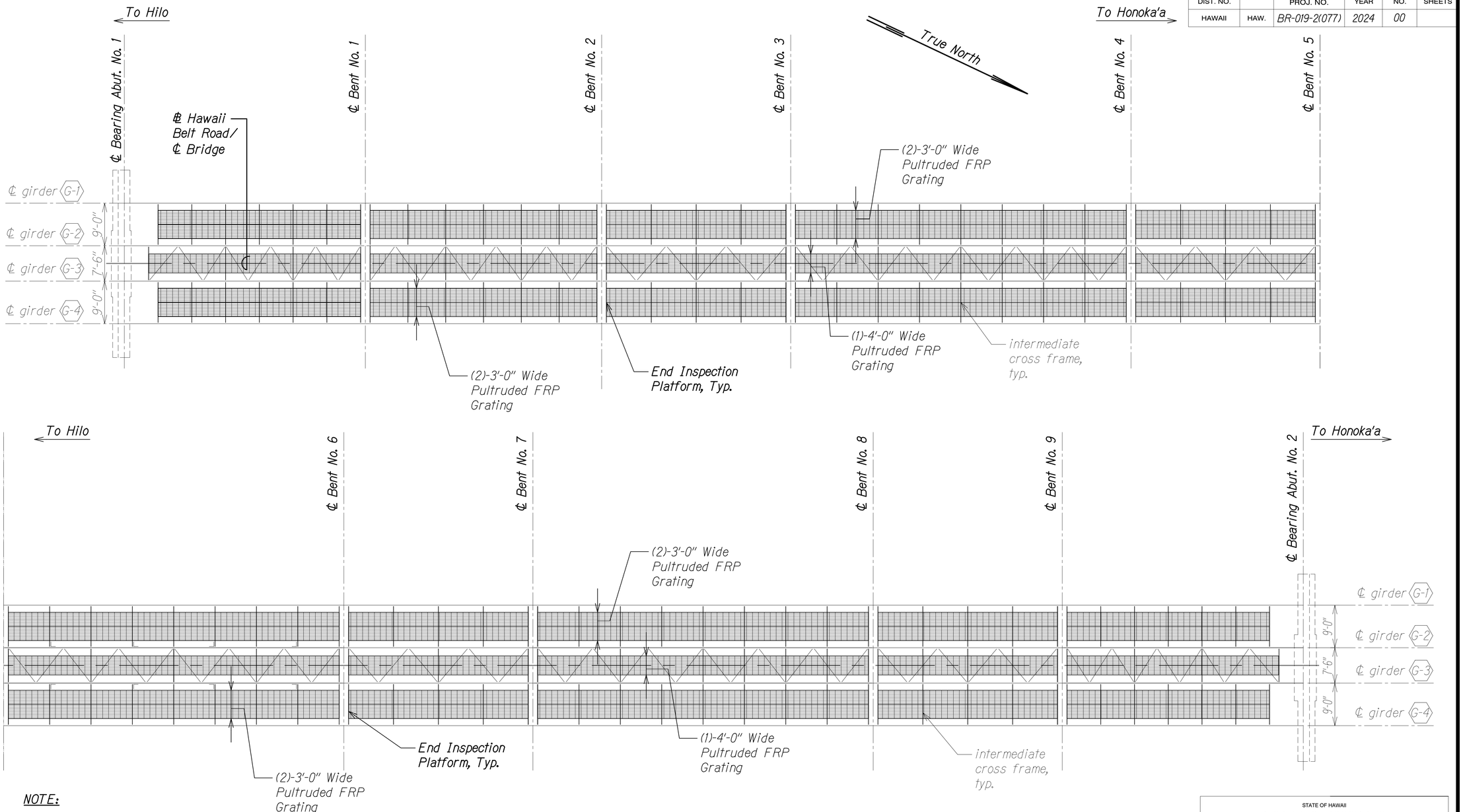
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CONCRETE DECK SOFFIT CRACK REPAIR DETAILS

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024	00	



NOTE:

* FRP Grating Inspection Platform will need added bottom flange support struts for spans greater than 9'-0" o.c.

INSPECTION PLATFORM FRAMING PLAN

Scale: 1" = 10'-0"

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
No.	TRACED BY	
	DESIGNED BY	
	QUANTITIES BY	
	CHECKED BY	

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

INSPECTION PLATFORM FRAMING PLAN

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SA13.1 OF 1 SHEETS

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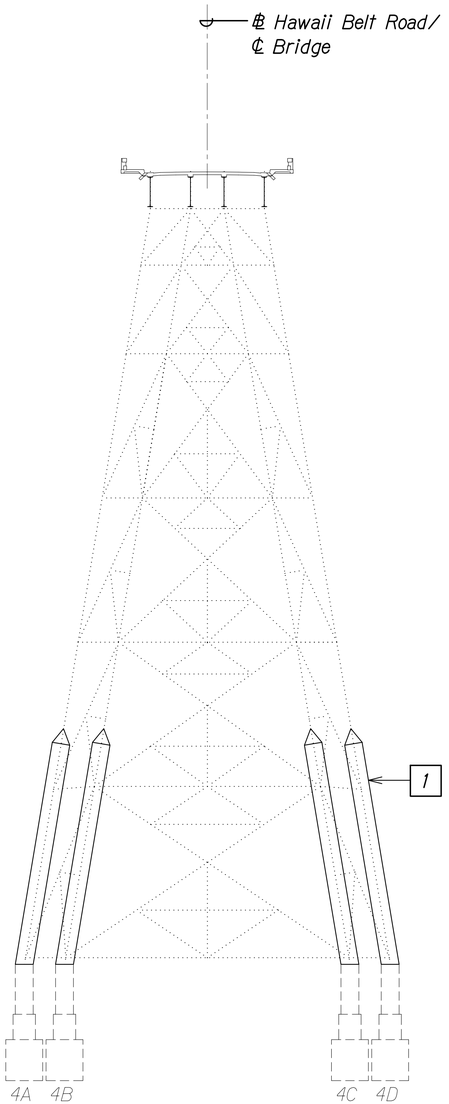
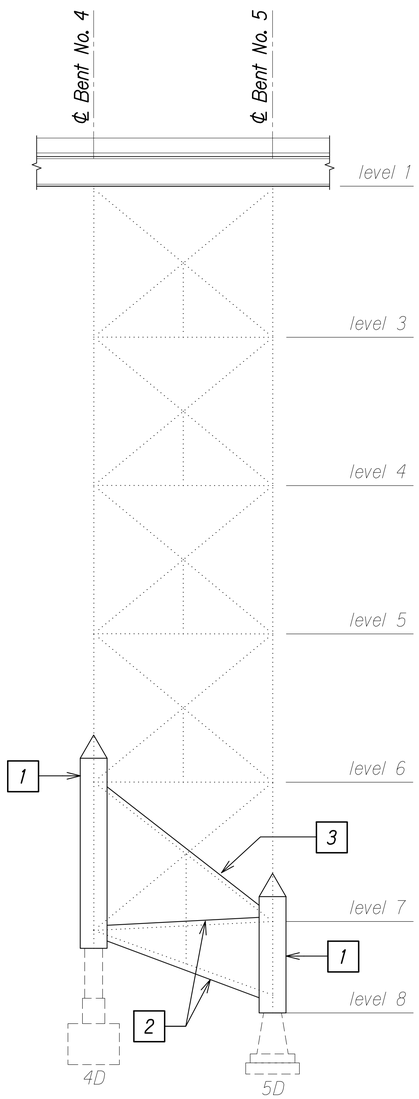
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



BENT NO. 4 ELEVATION CONSTRUCTION SEQUENCE

Scale: 1/16" = 1'-0"

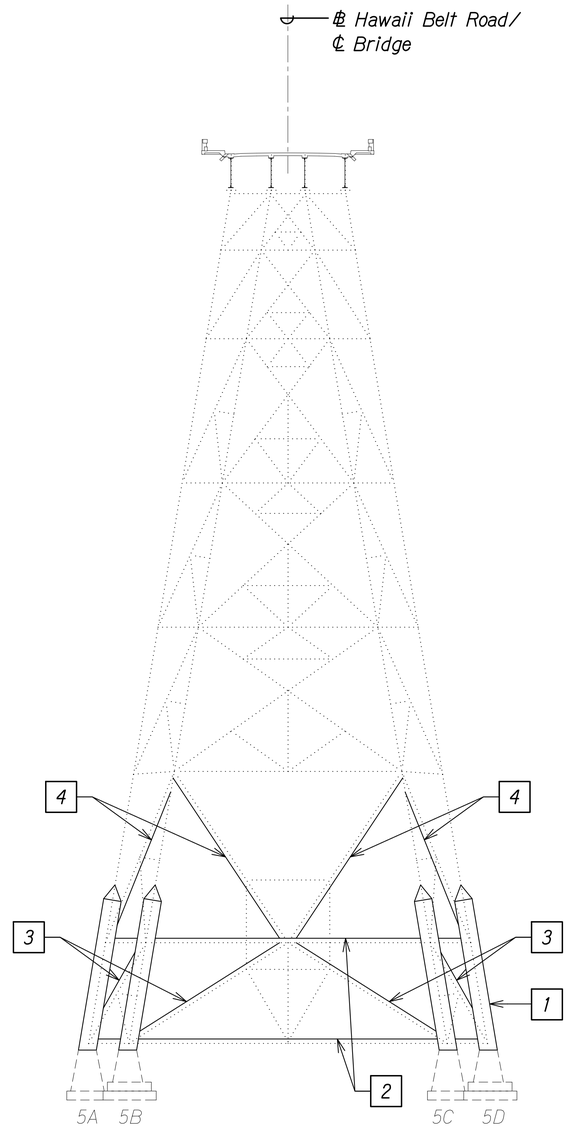
A SB1.1 | SB1.1



BENT NOS. 4 AND 5 ELEVATION CONSTRUCTION SEQUENCE

Scale: 1/16" = 1'-0"

B SB1.1 | SB1.1



BENT NO. 5 ELEVATION CONSTRUCTION SEQUENCE

Scale: 1/16" = 1'-0"

C SB1.1 | SB1.1

CONSTRUCTION SEQUENCE:

STAGE 1:

1. Install Column Bypass Assembly at Bottom of Bents. See Sht. SB2.7.
2. Install Temporary Horizontal Compression Bracings. See Sht. SB2.7.
3. Install Temporary Diagonal Cable Bracing within Column Bypass Level. See Sht. SB2.7.
4. Install Temporary Diagonal Bracing to Level Above. Temporary Bracing shall Connect to Existing Column Gusset Plate of Above Level. See Sht. SB2.7.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BENT REHABILITATION CONSTRUCTION SEQUENCE

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SB1.1 OF 29 SHEETS

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
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NOTE BOOK	TRACED BY	
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	QUANTITIES BY	
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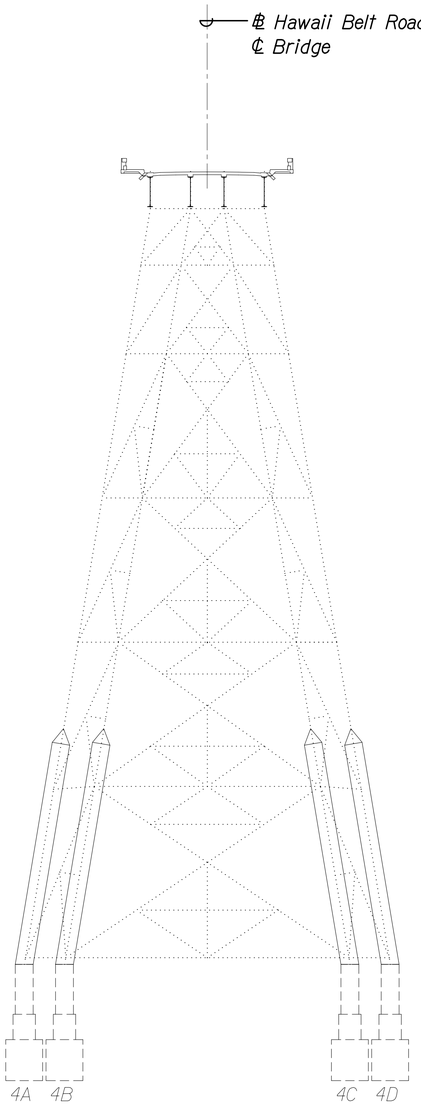
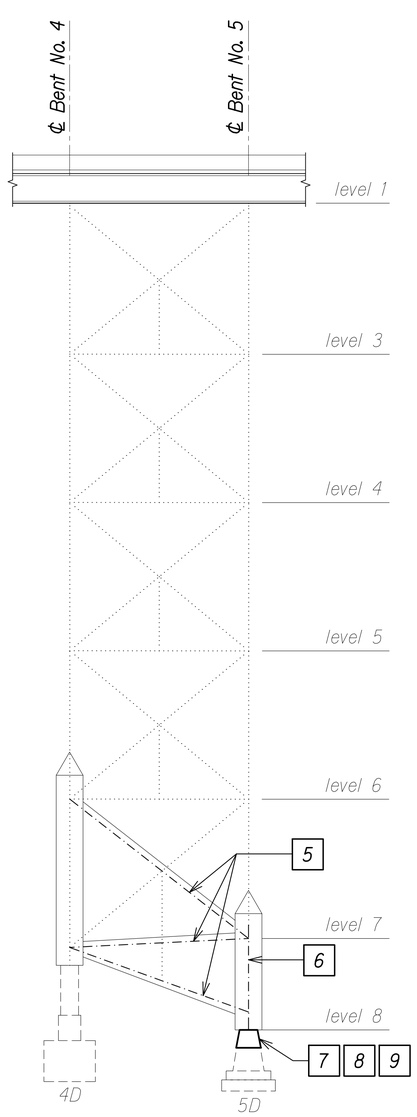
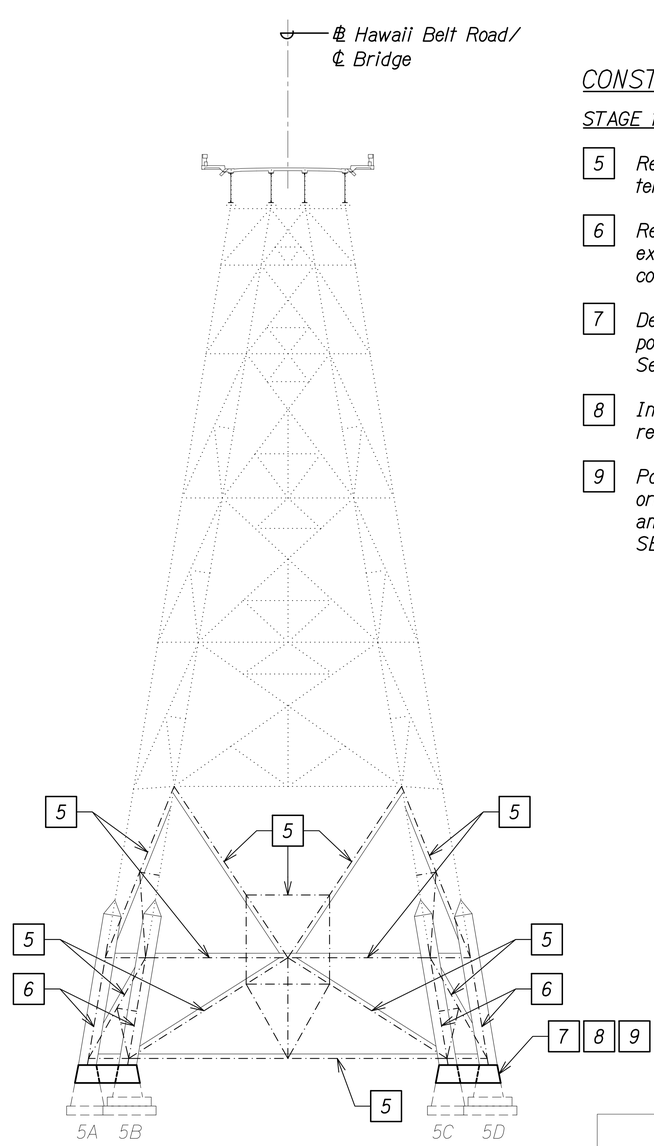
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		







CONSTRUCTION SEQUENCE:

STAGE 1:

5 Remove existing bracings along temporary bracings. See sht. SB2.8.

6 Remove existing column between existing column splice points within column bypass. See sht. SB2.8.

7 Demolish top of pedestal and upper portion of existing anchor bolts. See sht. SB2.8.

8 Install pedestal anchor bolts and reinforcing. See sht. SB2.9.

9 Pour top of pedestal back to original top of foundation height and added grade beam. See sht. SB2.9.

BENT NO. 4 ELEVATION CONSTRUCTION SEQUENCE

A SB1.2 SB1.2

Scale: 1/16" = 1'-0"

BENT NOS. 4 AND 5 ELEVATION CONSTRUCTION SEQUENCE

B SB1.2 SB1.2

Scale: 1/16" = 1'-0"

BENT NO. 5 ELEVATION CONSTRUCTION SEQUENCE

C SB1.2 SB1.2

Scale: 1/16" = 1'-0"

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BENT REHABILITATION CONSTRUCTION SEQUENCE

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SB1.2 OF 29 SHEETS

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
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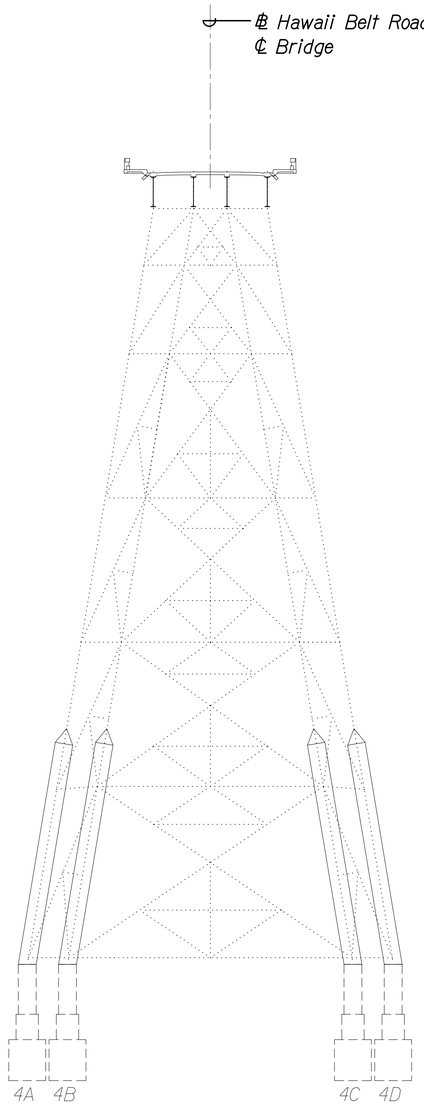
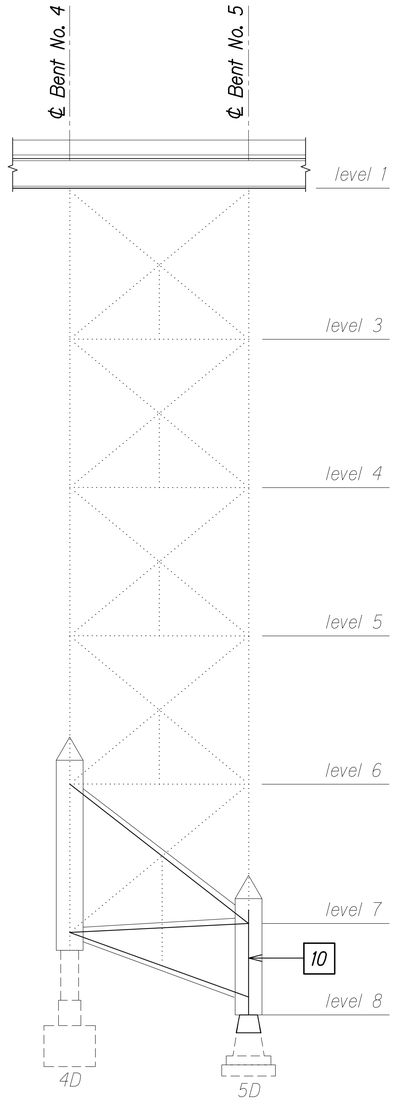
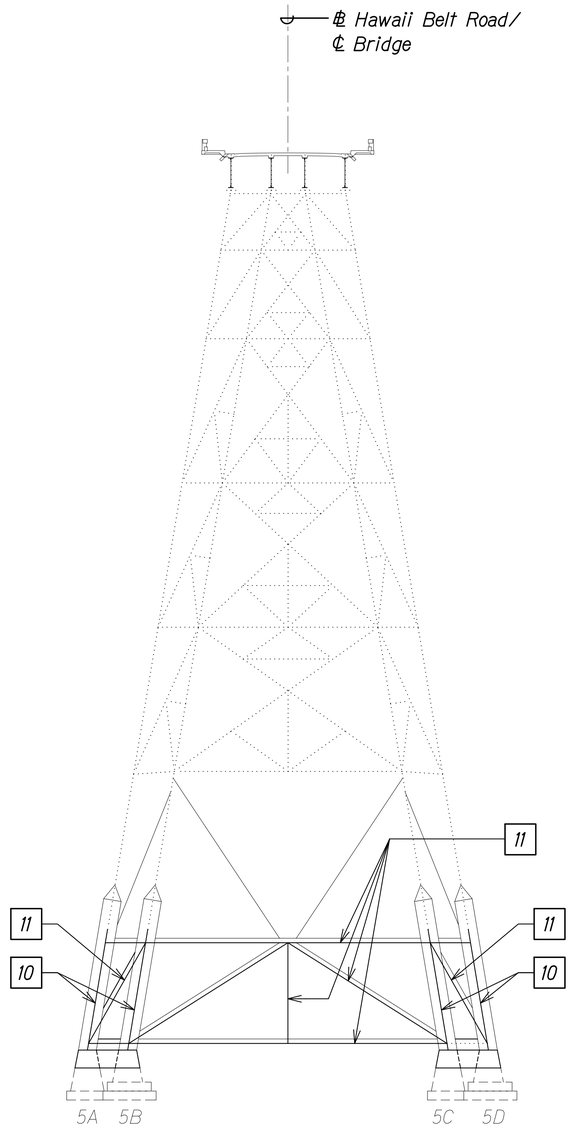
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		







CONSTRUCTION SEQUENCE:

STAGE 1:

10 Install new column between splice locations within column bypass. See sht. SB2.10.

11 Install new bracings within level of column bypass. See sht. SB2.10.

BENT NO. 4 ELEVATION CONSTRUCTION SEQUENCE (A)
Scale: 1/16" = 1'-0"
SB1.3 | SB1.3

BENT NOS. 4 AND 5 ELEVATION CONSTRUCTION SEQUENCE (B)
Scale: 1/16" = 1'-0"
SB1.3 | SB1.3

BENT NO. 5 ELEVATION CONSTRUCTION SEQUENCE (C)
Scale: 1/16" = 1'-0"
SB1.3 | SB1.3

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BENT REHABILITATION CONSTRUCTION SEQUENCE

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SB1.3 OF 29 SHEETS

ORIGINAL PLAN
NOTE BOOK
No.

SURVEY PLOTTED BY
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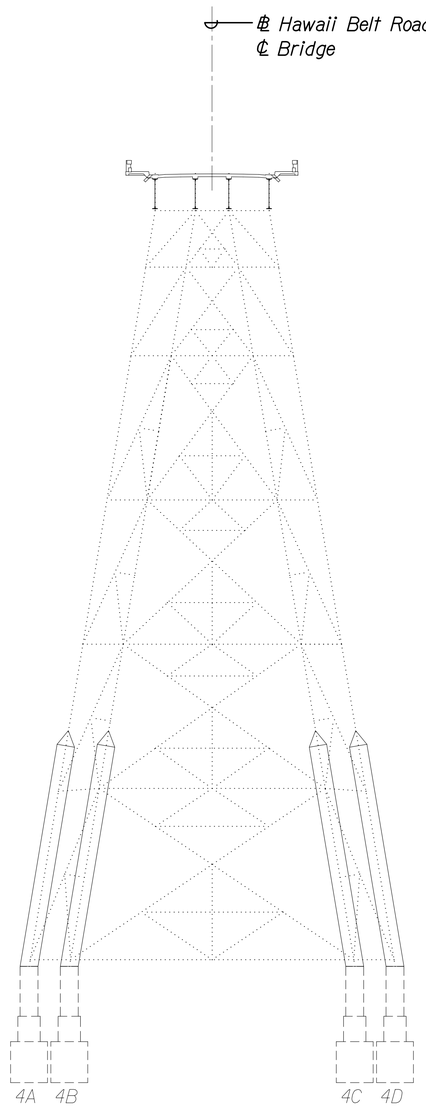
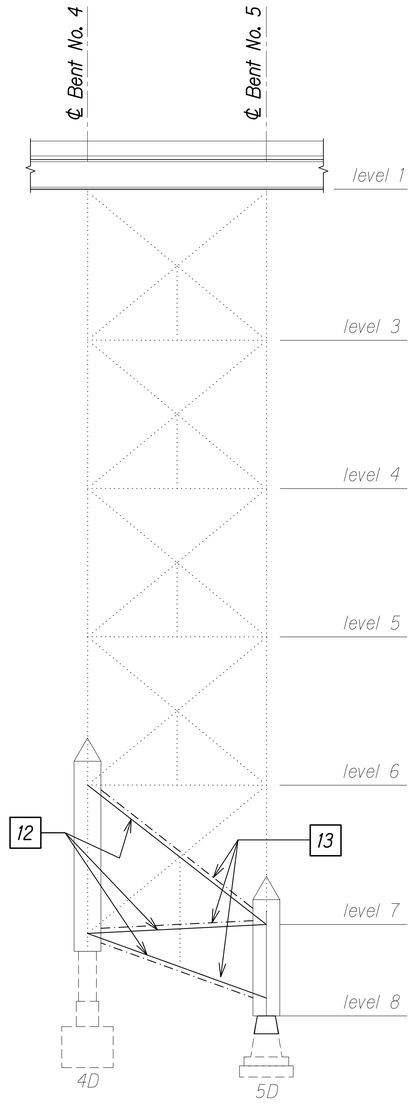
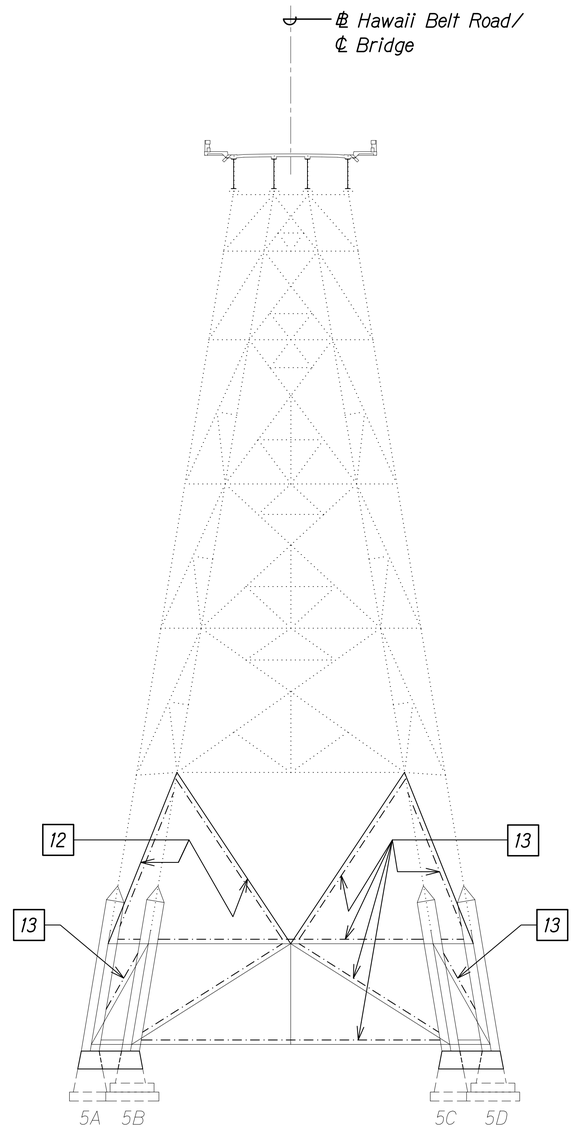
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		







CONSTRUCTION SEQUENCE:

STAGE 1:

12 Install in-plane temporary bracing between new column at column bypass level and existing column gusset plate at level above. See sht. SB2.10.

13 Remove temporary bracings.

BENT NO. 4 ELEVATION CONSTRUCTION SEQUENCE (A) SB1.4 | SB1.4
Scale: 1/16" = 1'-0"

BENT NOS. 4 AND 5 ELEVATION CONSTRUCTION SEQUENCE (B) SB1.4 | SB1.4
Scale: 1/16" = 1'-0"

BENT NO. 5 ELEVATION CONSTRUCTION SEQUENCE (C) SB1.4 | SB1.4
Scale: 1/16" = 1'-0"

ORIGINAL PLAN
NOTE BOOK
No.

SURVEY PLOTTED BY
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BENT REHABILITATION CONSTRUCTION SEQUENCE

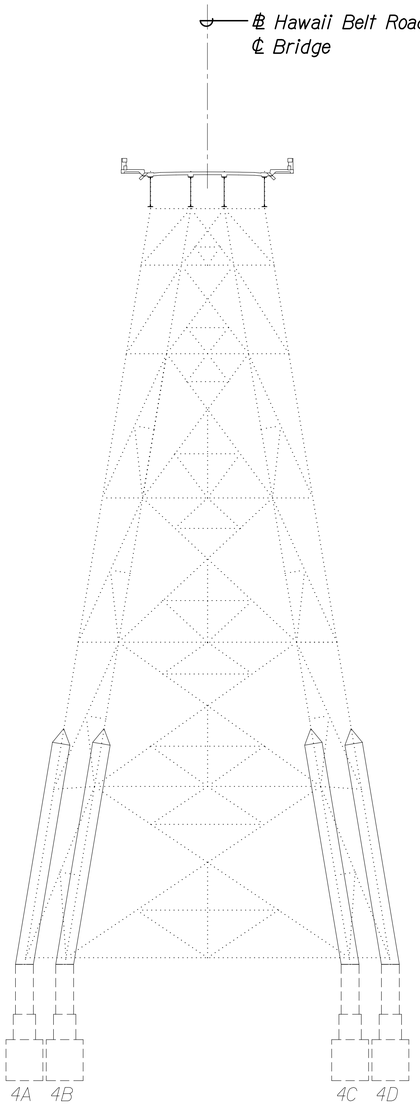
HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

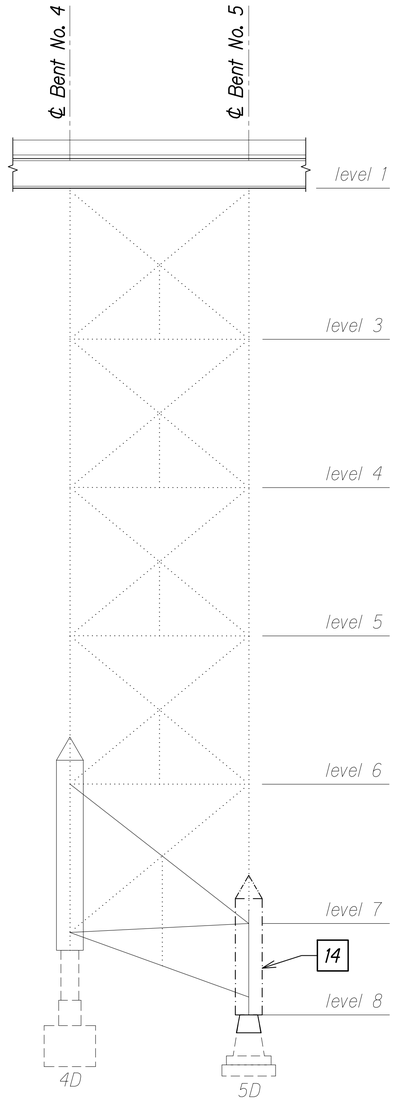
Scale: As Noted Date: Mar. 2024

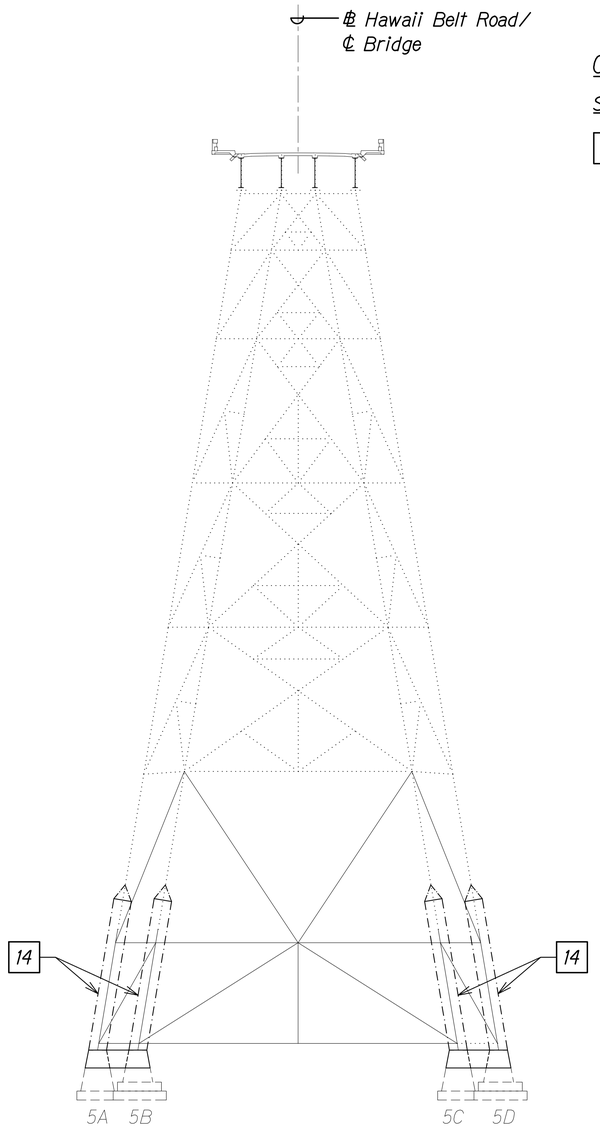
SHEET No. SB1.4 OF 29 SHEETS

DRAWING NAME: Z:\OD ONGOING\OD JF PROJECTS\22-001_12-NANUE STR BR REHAB\01 CAD\03-29-24 69PCT DESIGN\NSR-SB0101 ELEV REP CONS SEQ.DWG PLOT TIME: 03-29-24, 4:01 PM

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		







CONSTRUCTION SEQUENCE:

STAGE 1:

14 Remove column bypass.
See sht. SB2.10.
Proceed to next stage.

BENT NO. 4 ELEVATION
CONSTRUCTION SEQUENCE (A)
Scale: 1/16" = 1'-0"
SB1.5 SB1.5

BENT NOS. 4 AND 5 ELEVATION
CONSTRUCTION SEQUENCE (B)
Scale: 1/16" = 1'-0"
SB1.5 SB1.5

BENT NO. 5 ELEVATION
CONSTRUCTION SEQUENCE (C)
Scale: 1/16" = 1'-0"
SB1.5 SB1.5

ORIGINAL PLAN
NOTE BOOK
No.

SURVEY PLOTTED BY
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BENT REHABILITATION
CONSTRUCTION SEQUENCE

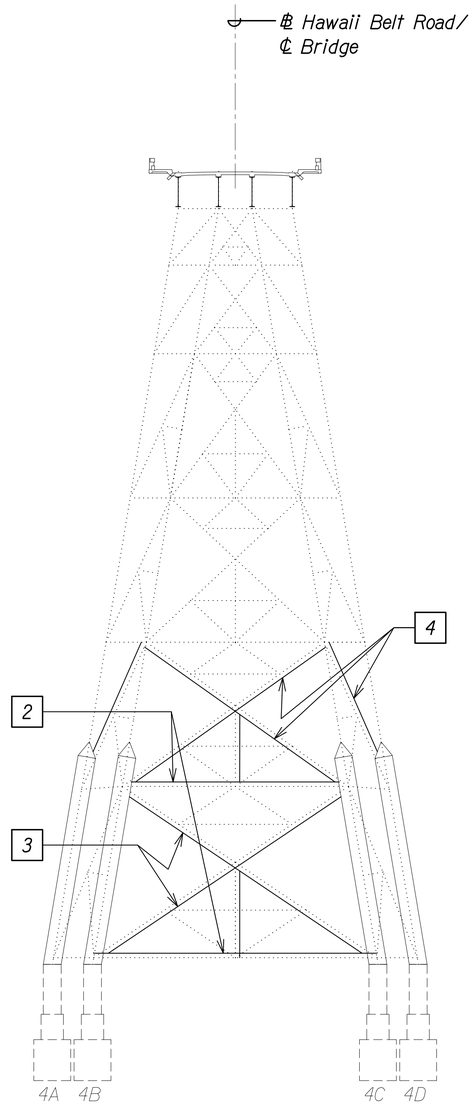
HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SB1.5 OF 29 SHEETS

DRAWING NAME: Z:\OD ONSONIO\OD JF PROJECTS\22-001_12-NANUE STR BR REHAB\01 CAD\03-29-24 69PCT DESIGN\NSR-SB0101 ELEV REP CONS SEQ.DWG PLOT TIME: 03-29-24, 4:02 PM

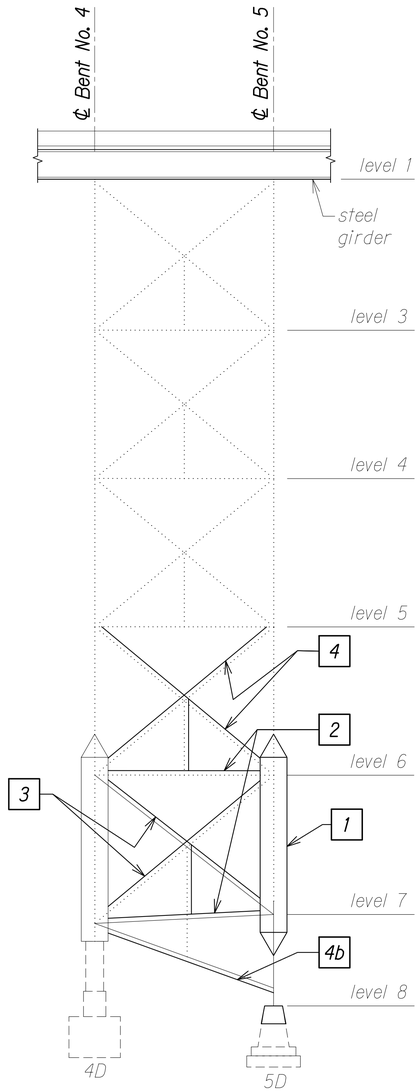
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



BENT NO. 4 ELEVATION CONSTRUCTION SEQUENCE

Scale: 1/16" = 1'-0"

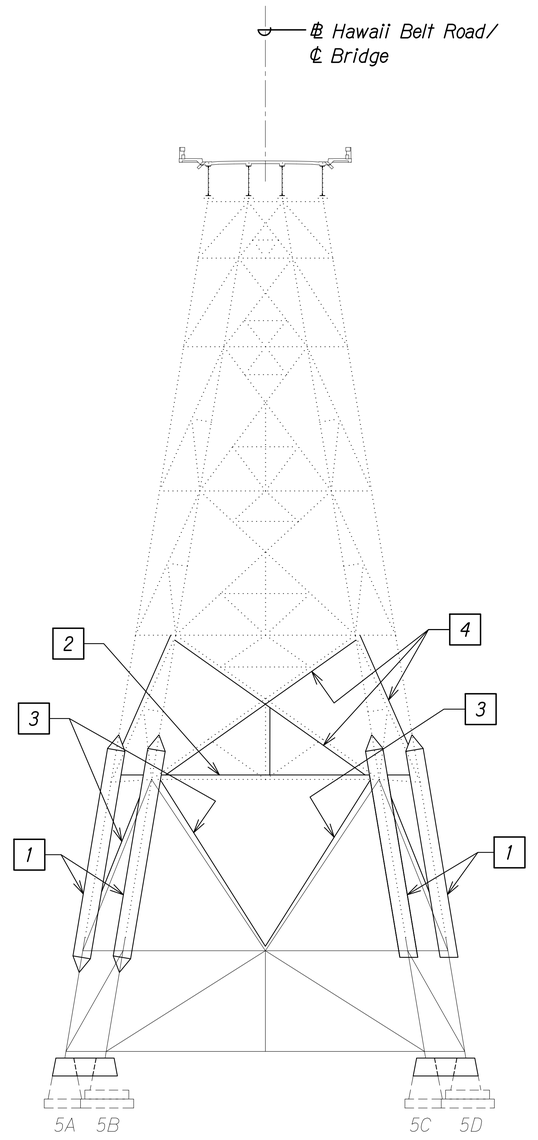
A SB1.6 SB1.6



BENT NOS. 4 AND 5 ELEVATION CONSTRUCTION SEQUENCE

Scale: 1/16" = 1'-0"

B SB1.6 SB1.6



BENT NO. 5 ELEVATION CONSTRUCTION SEQUENCE

Scale: 1/16" = 1'-0"

C SB1.6 SB1.6

CONSTRUCTION SEQUENCE:

STAGE 2:

1 At Bent 5, install column bypass beyond existing column splice points. See sht. SB2.1.
At Bent 4, column bypass assembly at bottom of bent remains installed from previous stage.
See sht. SB2.7.

2 Install temporary horizontal compression bracings.
See sht. SB2.2

3 Install temporary diagonal cable bracing within column bypass level.
See sht. SB2.2

4 Install temporary diagonal cable bracing to level above. Temporary bracing shall connect to existing column gusset plate of above level.
See sht. SB2.2

4b Install temporary diagonal cable bracing to level below. Temporary bracing shall connect to new gusset plate at below level.

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NOTE BOOK	TRACED BY	
	DESIGNED BY	
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

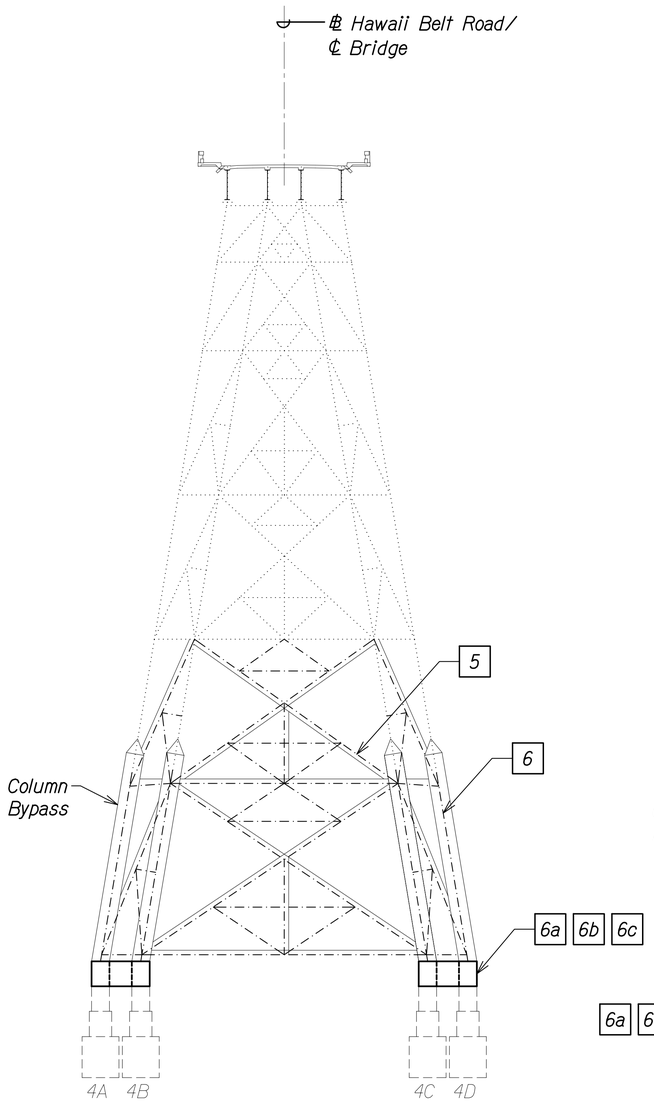
BENT REHABILITATION CONSTRUCTION SEQUENCE

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SB1.6 OF 29 SHEETS

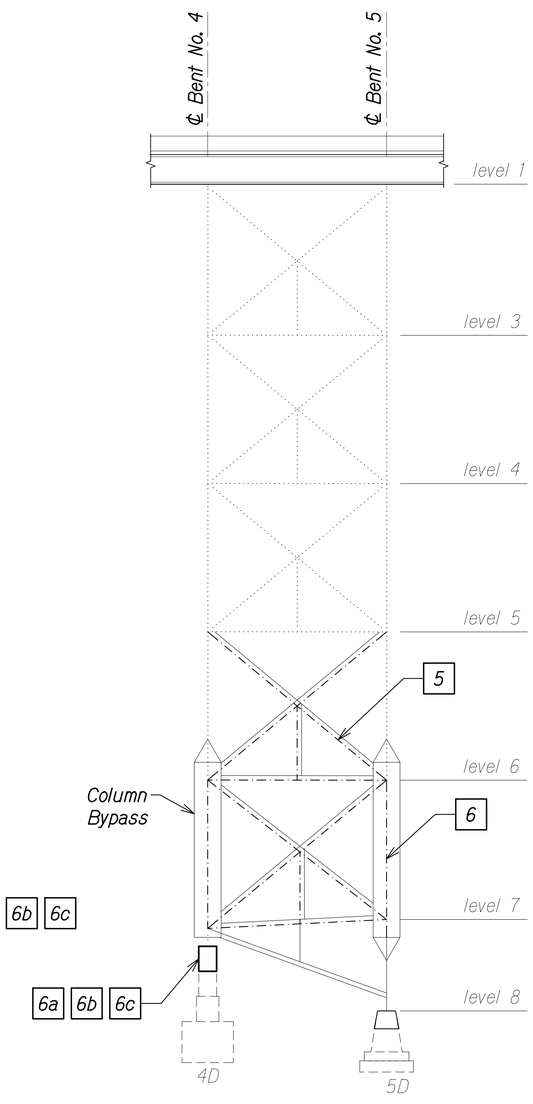
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



BENT NO. 4 ELEVATION CONSTRUCTION SEQUENCE

Scale: 1/16" = 1'-0"

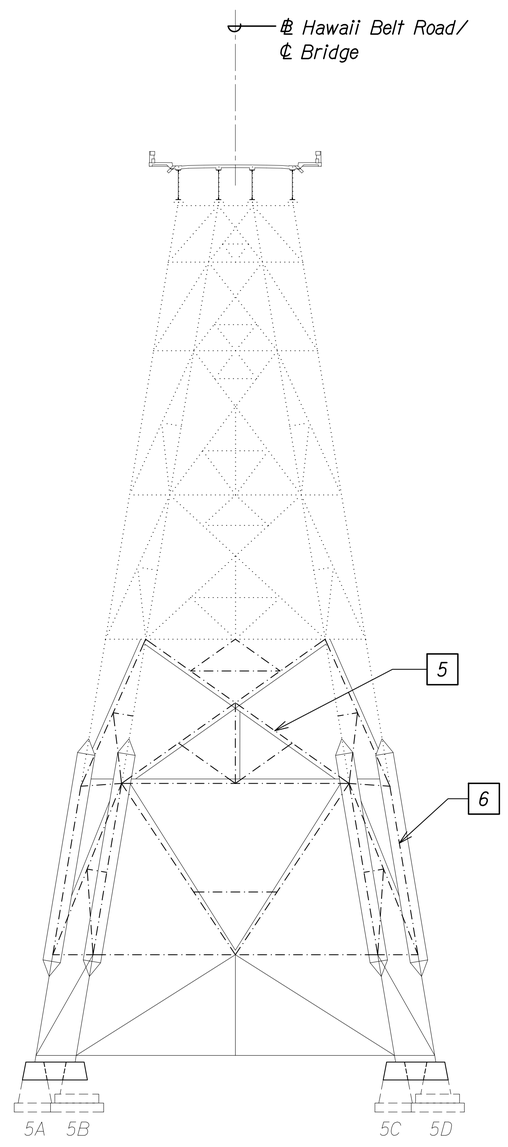
A SB1.7 SB1.7



BENT NOS. 4 AND 5 ELEVATION CONSTRUCTION SEQUENCE

Scale: 1/16" = 1'-0"

B SB1.7 SB1.7



BENT NO. 5 ELEVATION CONSTRUCTION SEQUENCE

Scale: 1/16" = 1'-0"

C SB1.7 SB1.7

CONSTRUCTION SEQUENCE:

STAGE 2:

5 Remove existing bracings along temporary bracings.
See sht. SB2.3

6 Remove existing column between existing column splice points. within column bypass.
See sht. SB2.3

6a Demolish top of pedestal and upper portion of existing anchor bolts

6b Install footing anchor bolts and reinforcing.

6c Pour top of pedestal back to original top of foundation height and added grade beam.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
NOTE BOOK	TRACED BY	
	DESIGNED BY	
No.	QUANTITIES BY	
	CHECKED BY	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

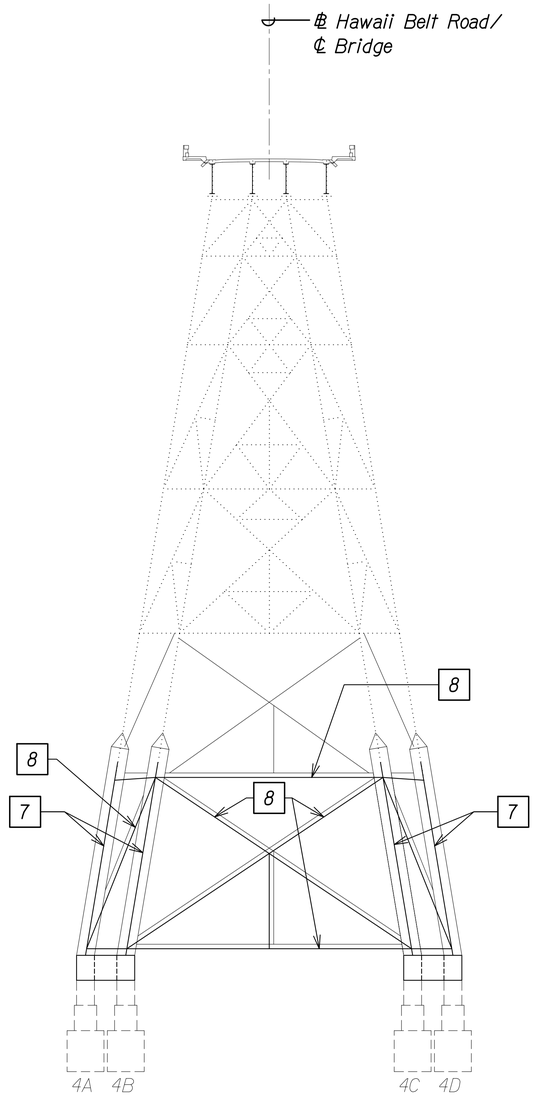
BENT REHABILITATION CONSTRUCTION SEQUENCE

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SB1.7 OF 29 SHEETS

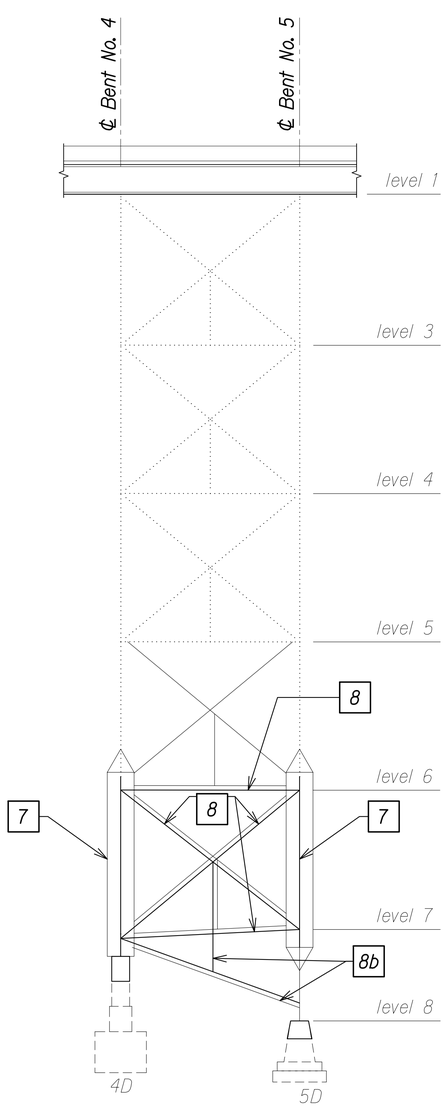
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



BENT NO. 4 ELEVATION
CONSTRUCTION SEQUENCE

Scale: 1/16" = 1'-0"

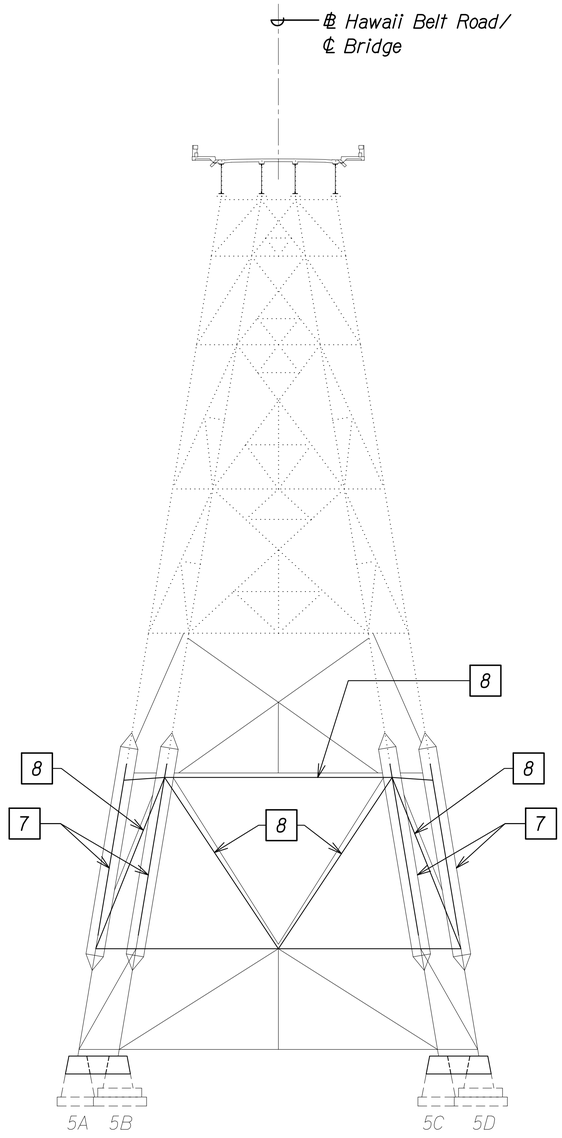
A SB1.8 SB1.8



BENT NOS. 4 AND 5 ELEVATION
CONSTRUCTION SEQUENCE

Scale: 1/16" = 1'-0"

B SB1.8 SB1.8



BENT NO. 5 ELEVATION
CONSTRUCTION SEQUENCE

Scale: 1/16" = 1'-0"

C SB1.8 SB1.8

CONSTRUCTION SEQUENCE:

STAGE 2:

7 Install new column between column splice locations within column bypass. See sht. SB2.4.

8 Install new bracing within level of column bypass. See sht. SB2.4.

8b Install new bracing to level below.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
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NOTE BOOK	TRACED BY	
	DESIGNED BY	
No.	QUANTITIES BY	
	CHECKED BY	

DRAWING NAME: Z:\OD ONGOING\05 JF PROJECTS\22-001\2-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\NSB-SB0101 ELEV REP CONS SEQ.DWG PLOT TIME: 03-29-24, 4:02 PM

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BENT REHABILITATION CONSTRUCTION SEQUENCE

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

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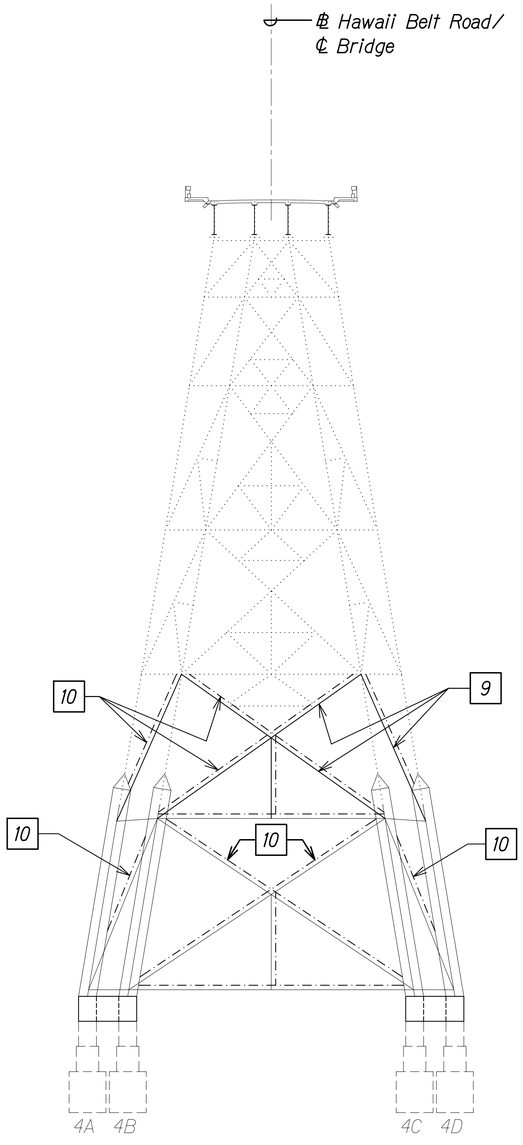
SHEET No. SB1.8 OF 29 SHEETS

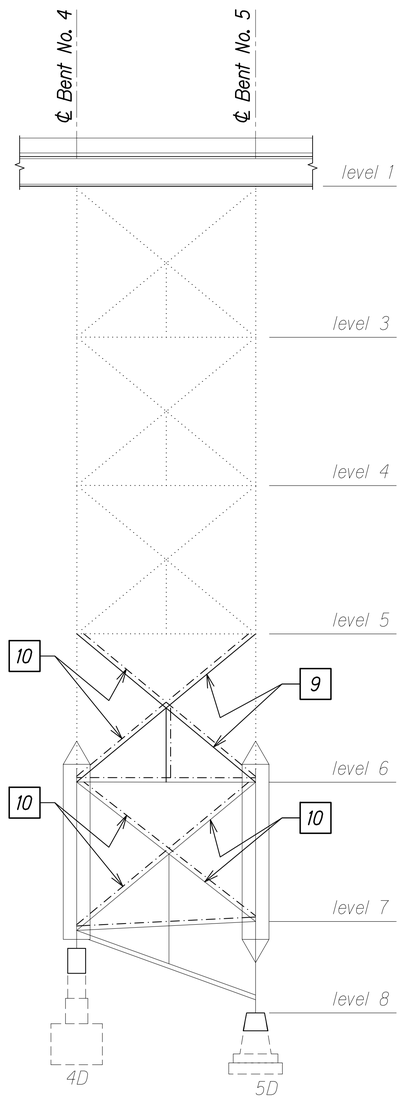
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



BENT NO. 4 ELEVATION
CONSTRUCTION SEQUENCE

Scale: 1/16" = 1'-0"

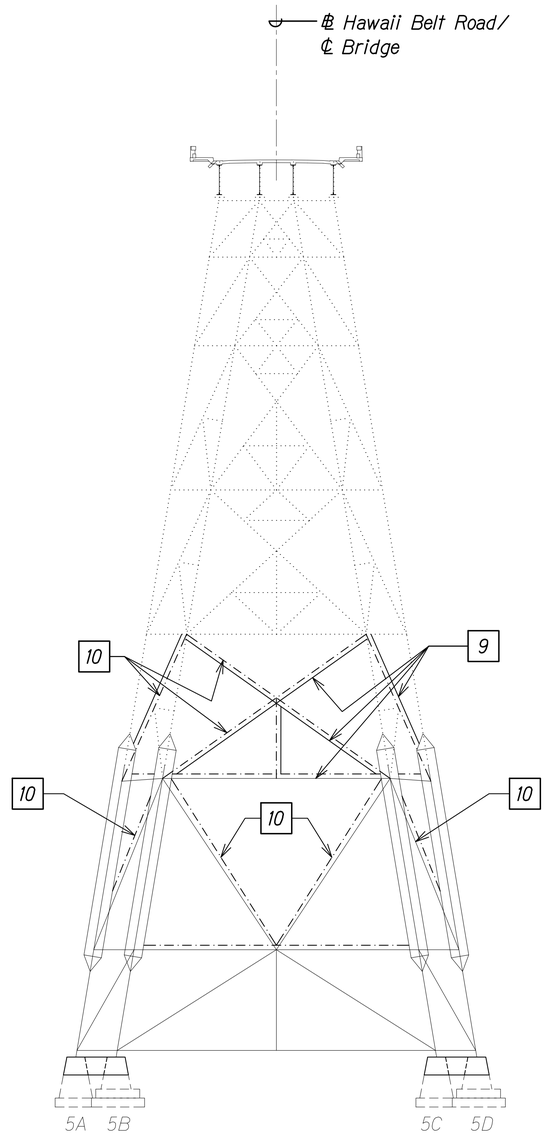
A SB1.9 SB1.9



CONSTRUCTION SEQUENCE
CONSTRUCTION SEQUENCE

Scale: 1/16" = 1'-0"

B SB1.9 SB1.9



BENT NO. 5 ELEVATION
CONSTRUCTION SEQUENCE

Scale: 1/16" = 1'-0"

C SB1.9 SB1.9

CONSTRUCTION SEQUENCE:

STAGE 2:

9 Install in-plane temporary cable bracing between new column at column bypass level and existing column gusset plate at level above. See sht. SB2.5.

10 Remove temporary bracing. See sht. SB2.5.

ORIGINAL PLAN
NOTE BOOK
No.

SURVEY PLOTTED BY
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DATE

DRAWING NAME: Z:\OD ONGONICA\OD JF PROJECTS\22-001_12-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\NSR-SB0101 ELEV REP CONS SEQ.DWG PLOT TIME: 03-29-24, 4:02 PM

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BENT REHABILITATION CONSTRUCTION SEQUENCE

HAWAII BELT ROAD
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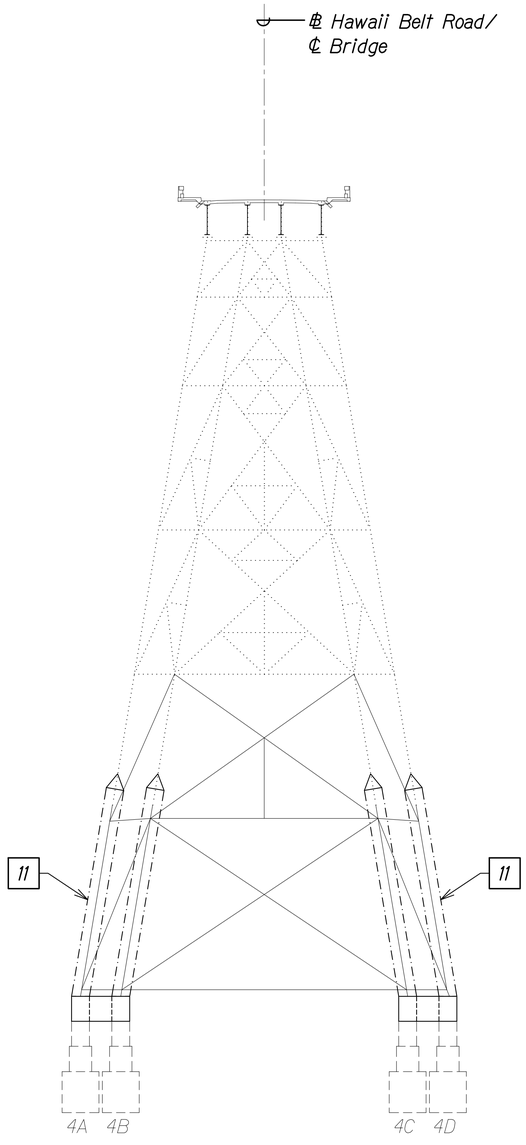
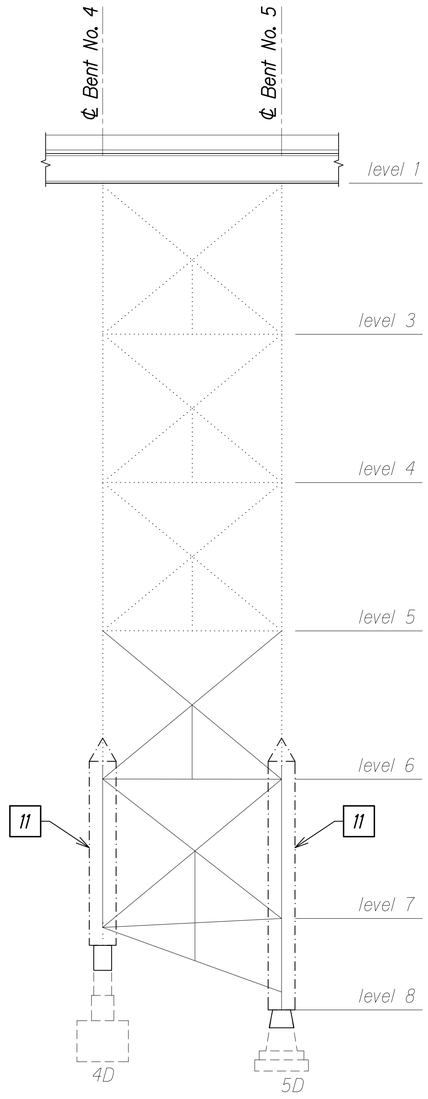
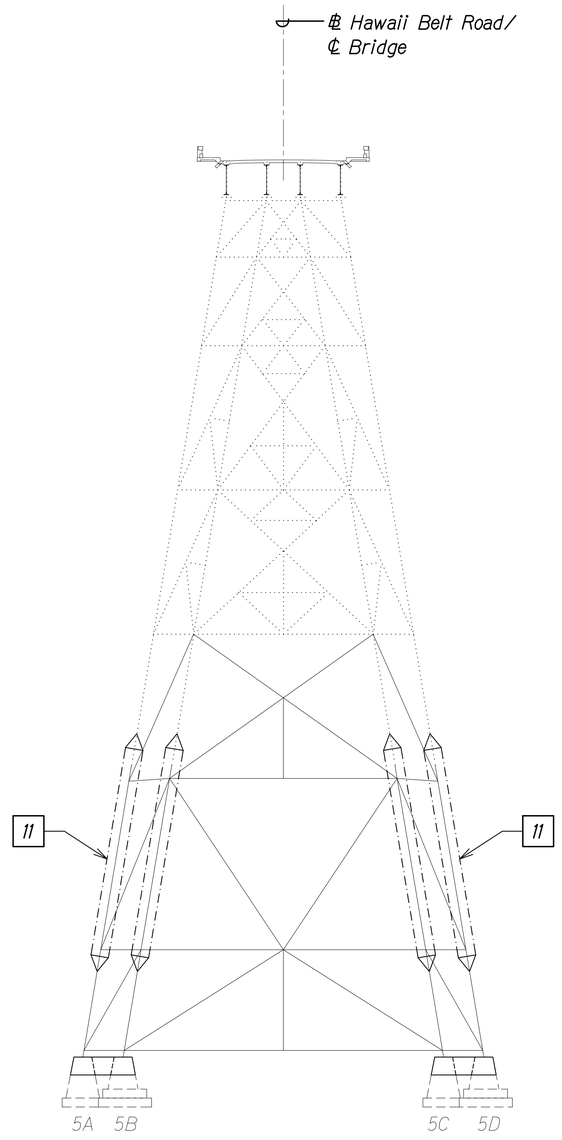
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		







CONSTRUCTION SEQUENCE:

STAGE 2:

11 Remove column bypass.
Proceed to next stage.
See sht. SB2.6

BENT NO. 4 ELEVATION
CONSTRUCTION SEQUENCE (A) SB1.10 | SB1.10
Scale: 1/16" = 1'-0"

BENT NOS. 4 AND 5 ELEVATION
CONSTRUCTION SEQUENCE (B) SB1.10 | SB1.10
Scale: 1/16" = 1'-0"

BENT NO. 5 ELEVATION
CONSTRUCTION SEQUENCE (C) SB1.10 | SB1.10
Scale: 1/16" = 1'-0"

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
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BENT REHABILITATION CONSTRUCTION SEQUENCE

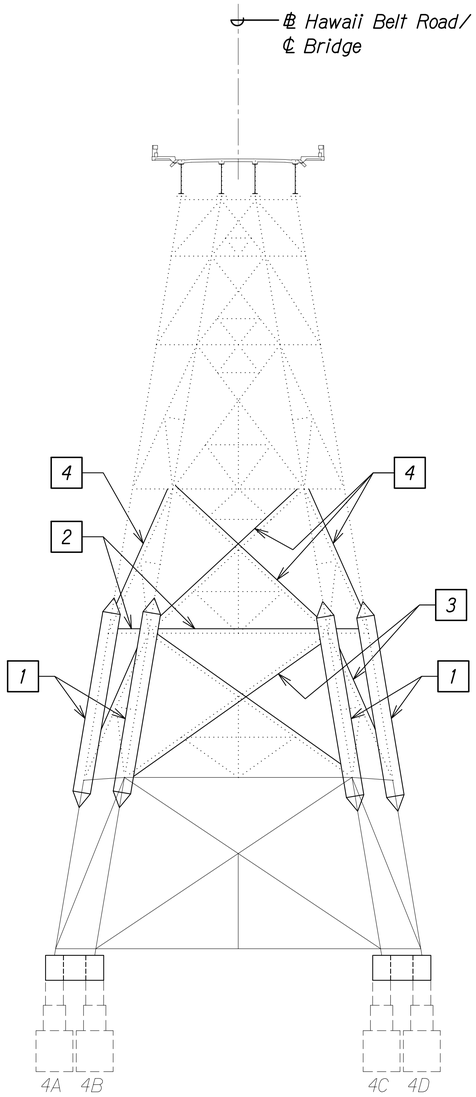
HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SB1.10 OF 29 SHEETS

DRAWING NAME: Z:\OD ONGOING\OD JF PROJECTS\22-001_12-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\NSR-SB0101 ELEV REP CONS SEQ.DWG PLOT TIME: 03-29-24, 4:03 PM

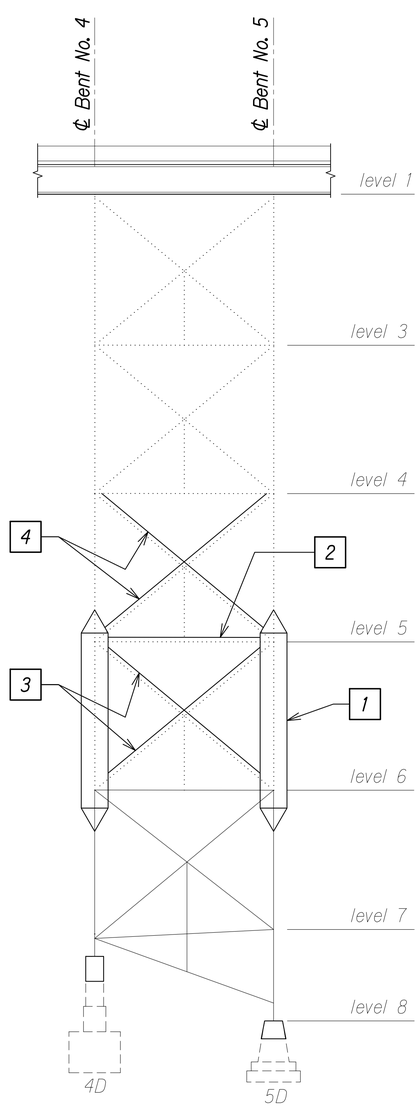
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



BENT NO. 4 ELEVATION
CONSTRUCTION SEQUENCE

Scale: 1/16" = 1'-0"

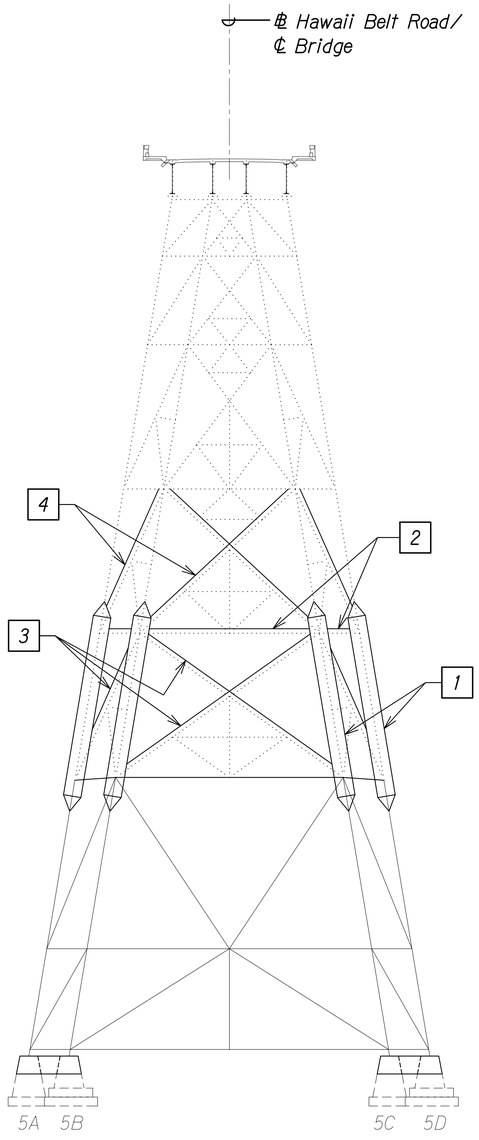
A SB1.11 | SB1.11



BENT NOS. 4 AND 5 ELEVATION
CONSTRUCTION SEQUENCE

Scale: 1/16" = 1'-0"

B SB1.11 | SB1.11



BENT NO. 5 ELEVATION
CONSTRUCTION SEQUENCE

Scale: 1/16" = 1'-0"

C SB1.11 | SB1.11

CONSTRUCTION SEQUENCE:

STAGE 3:

1. Install column bypass beyond existing column splice points. See sht. SB2.1.
2. Install temporary horizontal compression bracings. See sht. SB2.2
3. Install temporary diagonal cable bracing within column bypass level. See sht. SB2.2
4. Install temporary diagonal cable bracing to level above. Temporary bracing shall connect to existing column gusset plate of above level. See sht. SB2.2

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SHEET No. SB1.11 OF 29 SHEETS

ORIGINAL PLAN
NOTE BOOK
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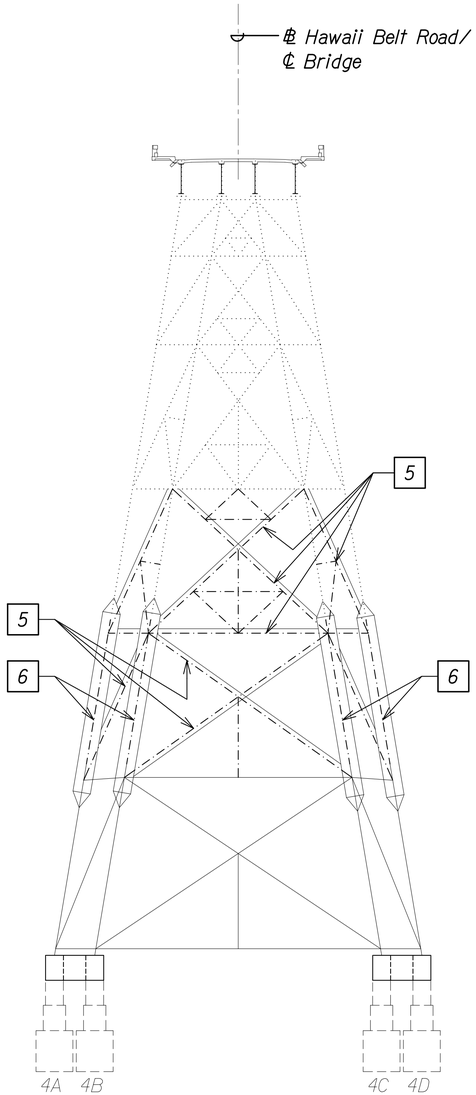
DRAWING NAME: Z:\OD ONGOING\05 JF PROJECTS\22-001\2-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\NSB-SB0101 ELEV REP CONS SEQ.DWG PLOT TIME: 03-29-24, 1:03 PM

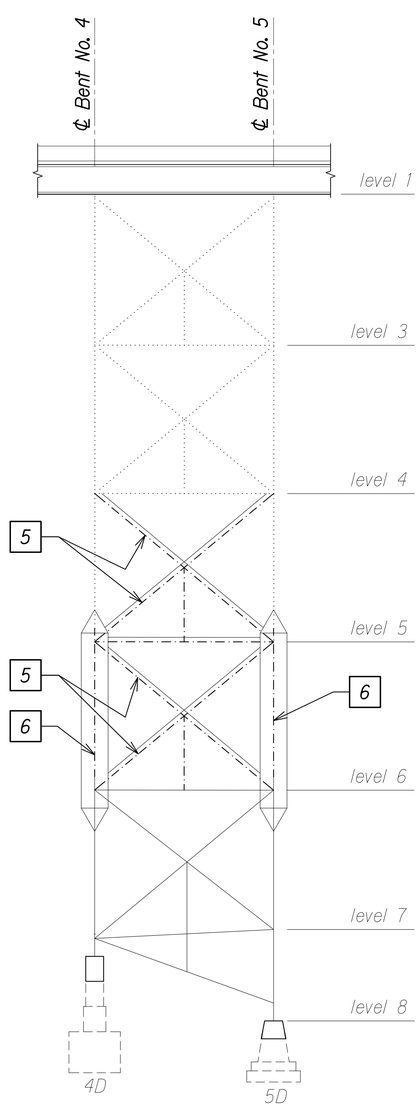
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



BENT NO. 4 ELEVATION CONSTRUCTION SEQUENCE

Scale: 1/16" = 1'-0"

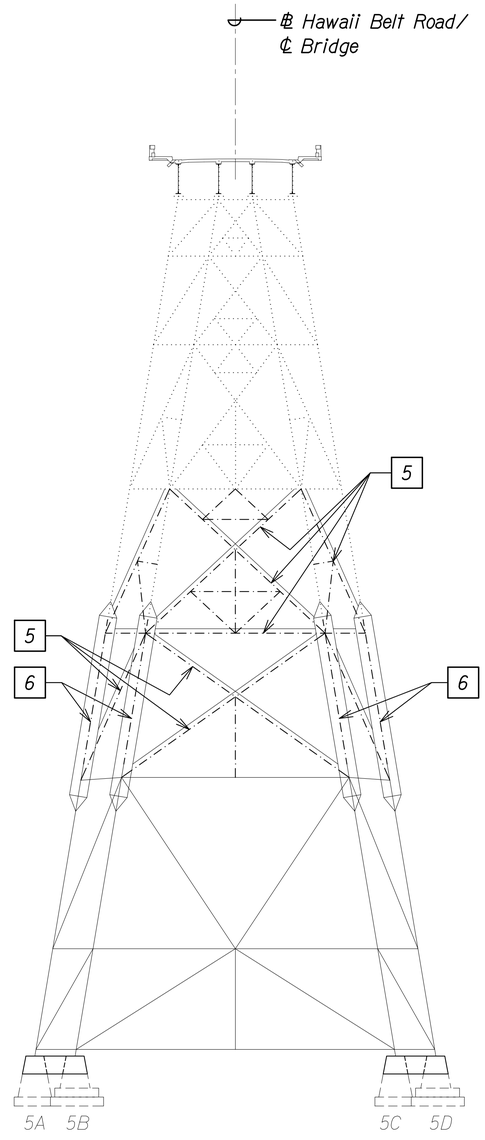
A SB1.12 | SB1.12



BENT NOS. 4 AND 5 ELEVATION CONSTRUCTION SEQUENCE

Scale: 1/16" = 1'-0"

B SB1.12 | SB1.12



BENT NO. 5 ELEVATION CONSTRUCTION SEQUENCE

Scale: 1/16" = 1'-0"

C SB1.12 | SB1.12

CONSTRUCTION SEQUENCE:

STAGE 3:

5 Remove existing bracings along temporary bracings.
See sht. SB2.3

6 Remove existing column between existing column splice points. within column bypass.
See sht. SB2.3

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
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NOTE BOOK	TRACED BY	
	DESIGNED BY	
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

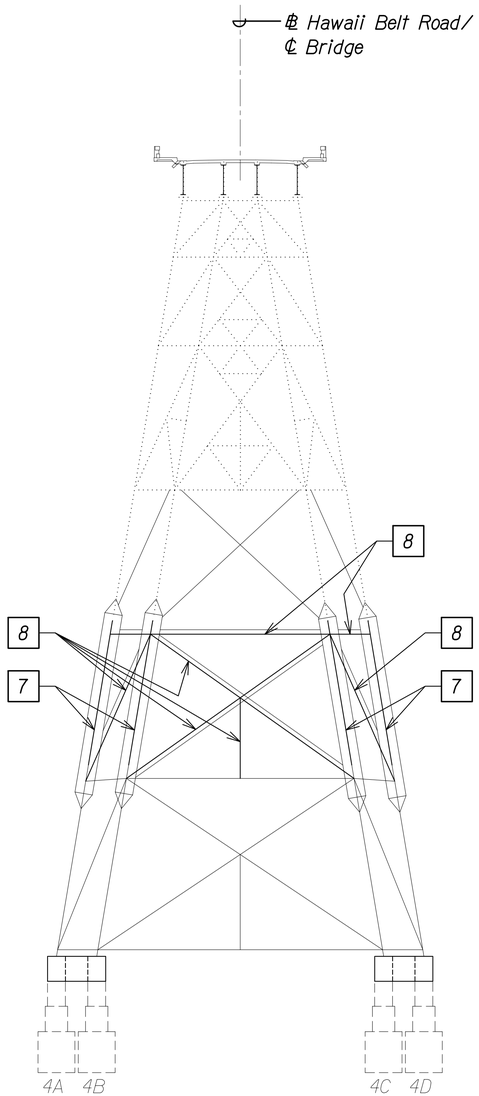
BENT REHABILITATION CONSTRUCTION SEQUENCE

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SB1.12 OF 29 SHEETS

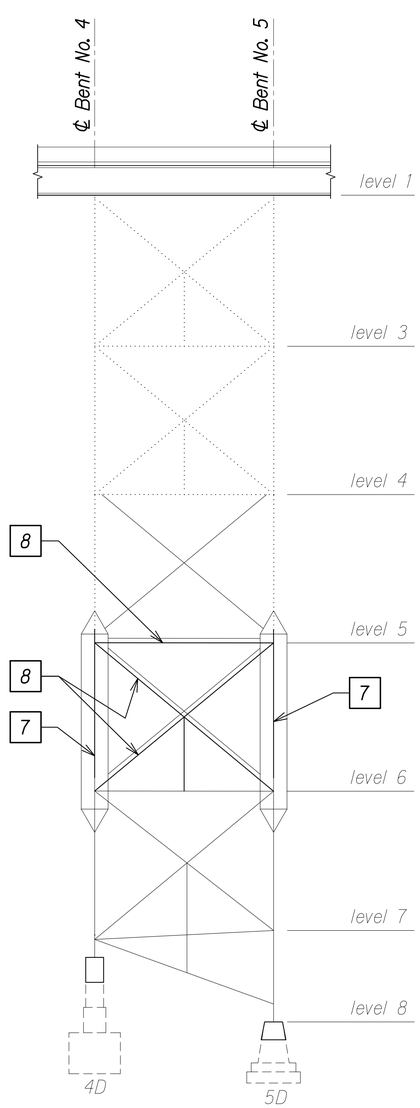
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



BENT NO. 4 ELEVATION
CONSTRUCTION SEQUENCE

Scale: 1/16" = 1'-0"

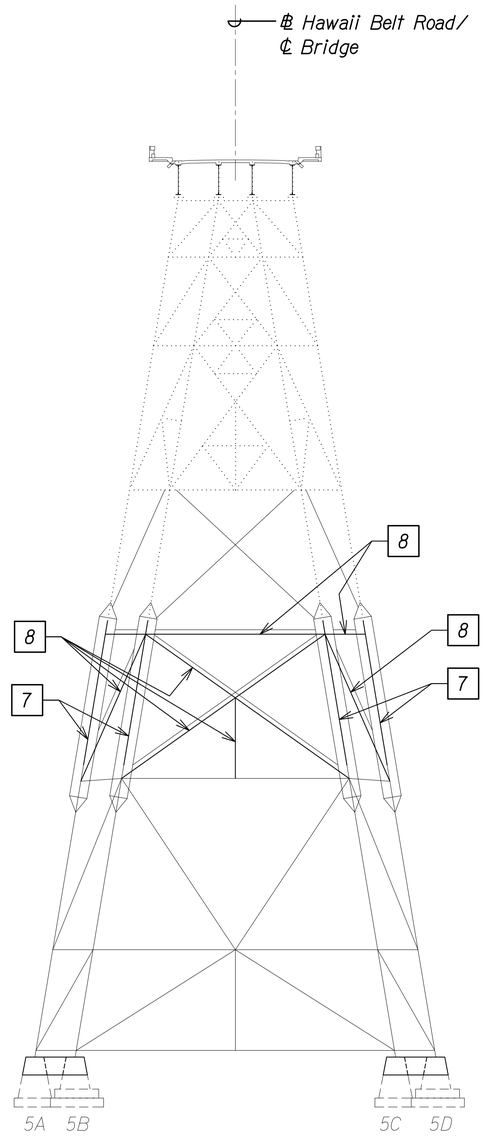
A SBI.13 SBI.13



BENT NOS. 4 AND 5 ELEVATION
CONSTRUCTION SEQUENCE

Scale: 1/16" = 1'-0"

B SBI.13 SBI.13



BENT NO. 5 ELEVATION
CONSTRUCTION SEQUENCE

Scale: 1/16" = 1'-0"

C SBI.13 SBI.13

CONSTRUCTION SEQUENCE:

STAGE 3:

7 Install new column between column splice locations within column bypass. See sht. SB2.4.

8 Install new bracing within level of column bypass. See sht. SB2.4.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
NOTE BOOK	TRACED BY	
	DESIGNED BY	
No.	QUANTITIES BY	
	CHECKED BY	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BENT REHABILITATION
CONSTRUCTION SEQUENCE

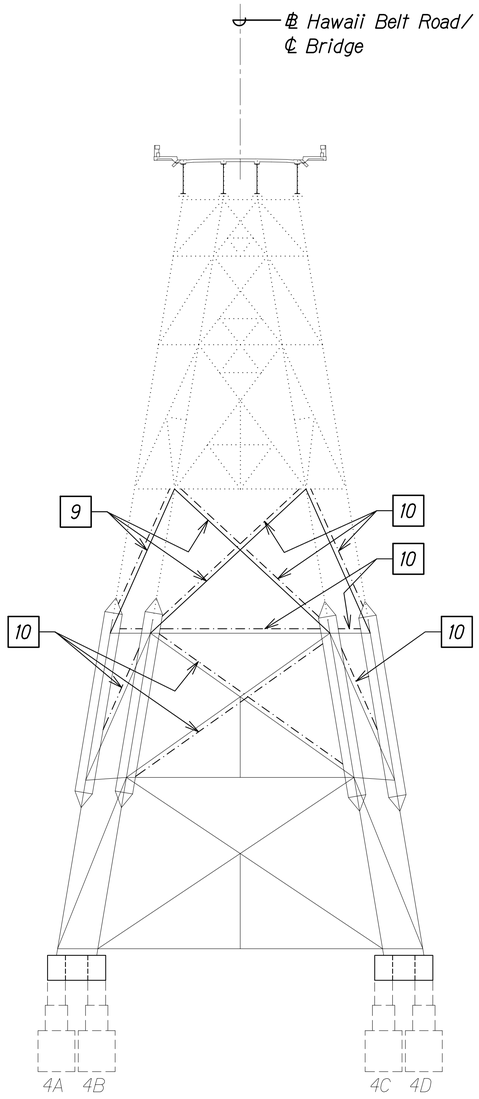
HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

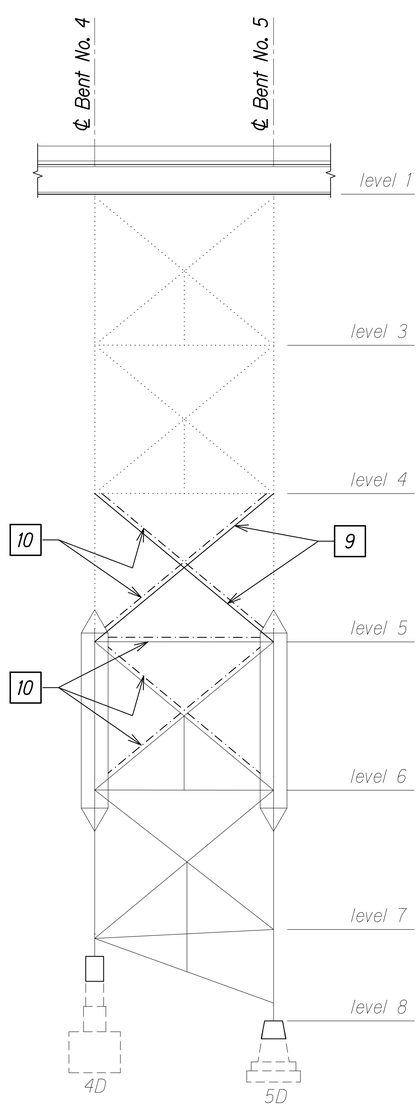
SHEET No. SBI.13 OF 29 SHEETS

DRAWING NAME: Z:\OD ONGOING\OD JF PROJECTS\Y22-001\12-NANUE STR BR REHAB\01 CAD\01-29-24 60PCT DESIGN\NSR-SB0101 ELEV REP CONS SEQ.DWG PLOT TIME: 03-29-24, 1:03 PM

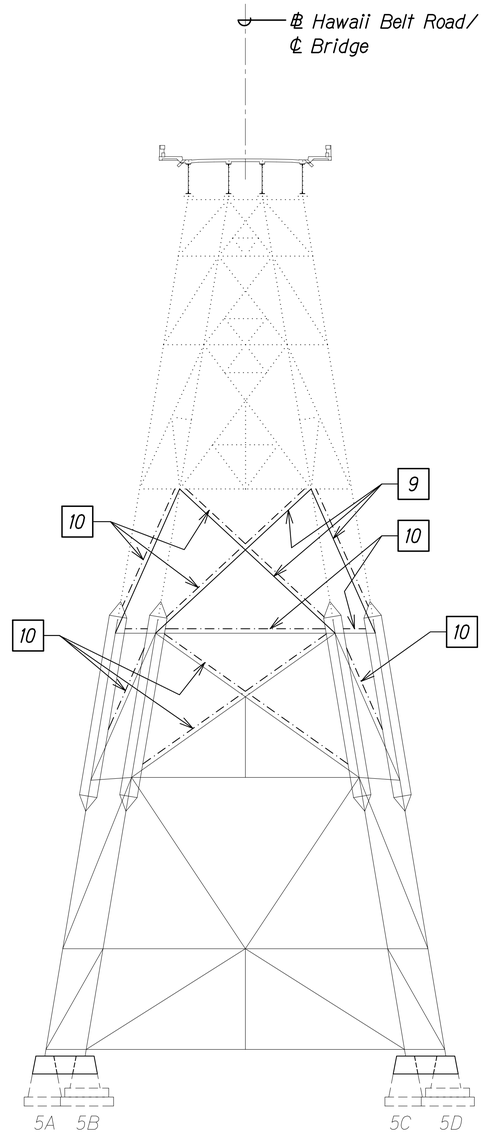
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



BENT NO. 4 ELEVATION
CONSTRUCTION SEQUENCE (A)
Scale: 1/16" = 1'-0"
SBI.14 SBI.14



BENT NOS. 4 AND 5 ELEVATION
CONSTRUCTION SEQUENCE (B)
Scale: 1/16" = 1'-0"
SBI.14 SBI.14



BENT NO. 5 ELEVATION
CONSTRUCTION SEQUENCE (C)
Scale: 1/16" = 1'-0"
SBI.14 SBI.14

CONSTRUCTION SEQUENCE:

STAGE 3:

9 Install in-plane temporary cable bracing between new column at column bypass level and existing column gusset plate at level above. See sht. SB2.5.

10 Remove temporary bracing. See sht. SB2.5.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BENT REHABILITATION CONSTRUCTION SEQUENCE

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

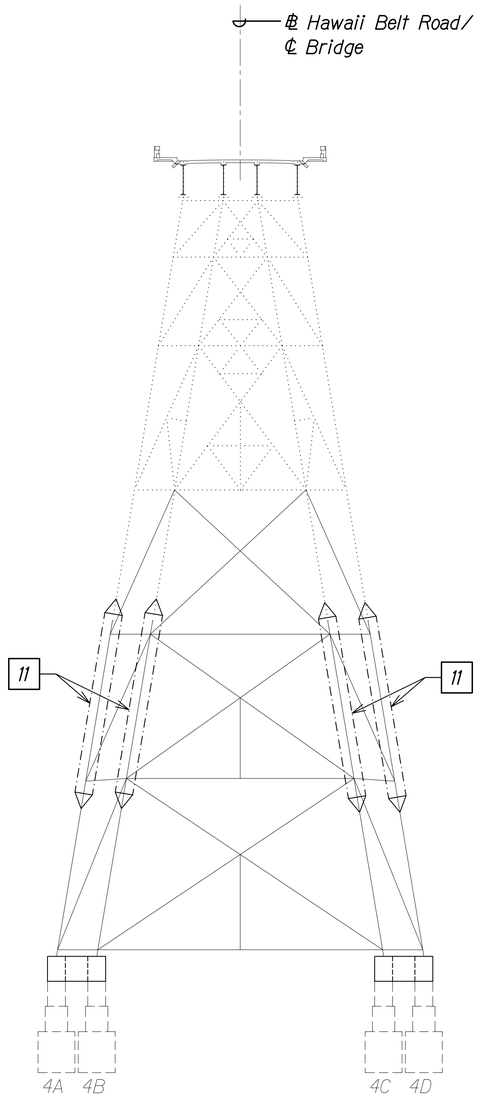
Scale: As Noted Date: Mar. 2024

SHEET No. SBI.14 OF 29 SHEETS

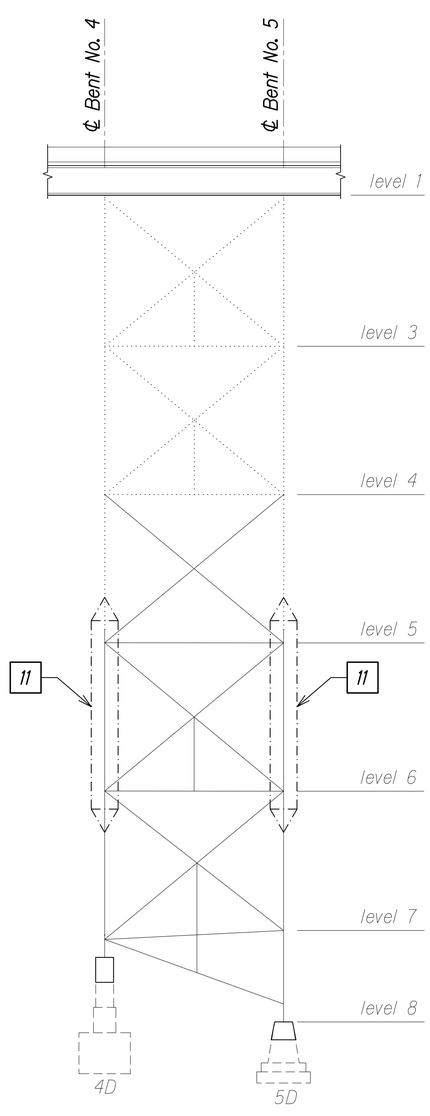
ORIGINAL PLAN
NOTE BOOK
No.
SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE

DRAWING NAME: Z:\OD ONGOING\OD JF PROJECTS\22-001.12 - NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\NSR-SB0101 ELEV REP CONS SEQ.DWG PLOT TIME: 03-29-24, 4:04 PM

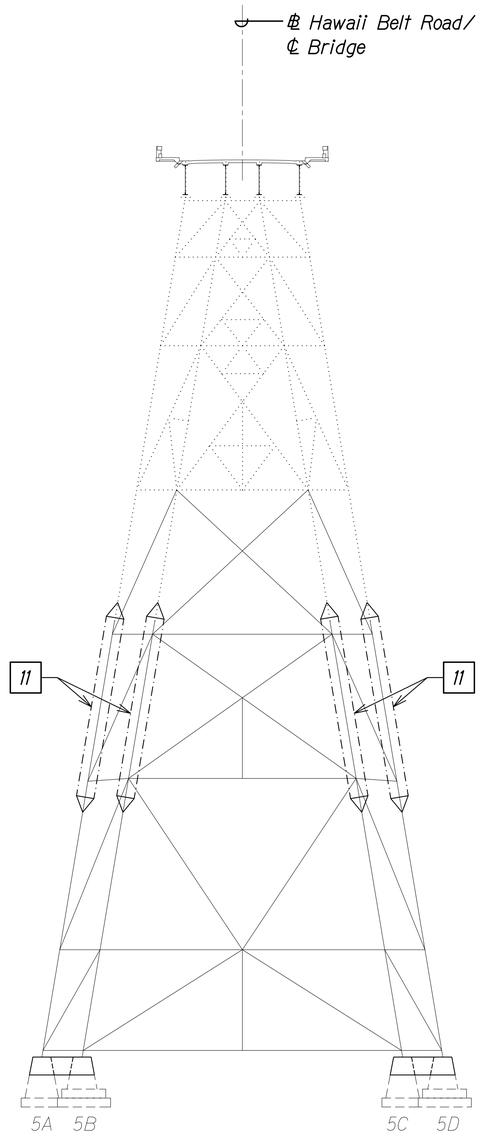
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



BENT NO. 4 ELEVATION
CONSTRUCTION SEQUENCE
Scale: 1/16" = 1'-0"
A SB1.15 SB1.15



BENT NOS. 4 AND 5 ELEVATION
CONSTRUCTION SEQUENCE
Scale: 1/16" = 1'-0"
B SB1.15 SB1.15



BENT NO. 5 ELEVATION
CONSTRUCTION SEQUENCE
Scale: 1/16" = 1'-0"
C SB1.15 SB1.15

CONSTRUCTION SEQUENCE:

STAGE 3:

11 Remove column bypass.
Proceed to next stage.
See sht. SB2.6

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BENT REHABILITATION CONSTRUCTION SEQUENCE

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

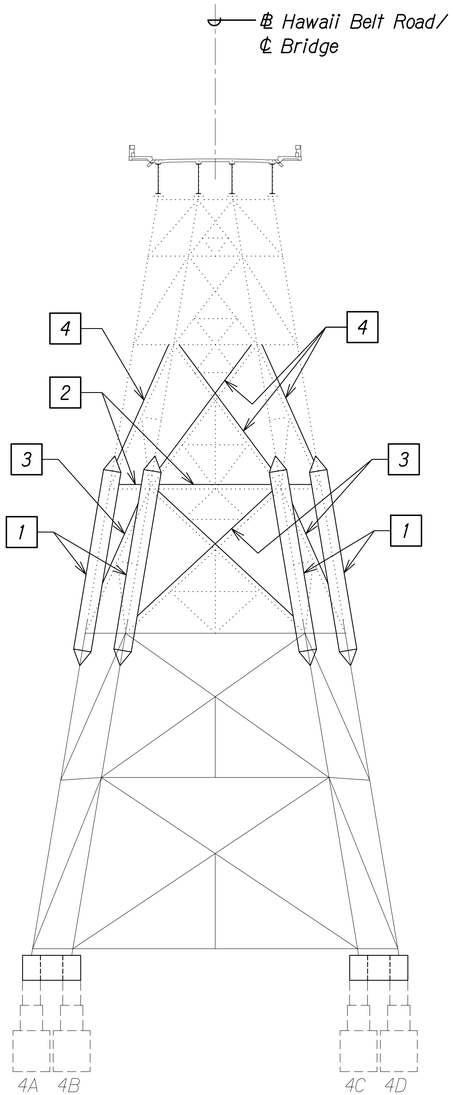
SHEET No. SB1.15 OF 29 SHEETS

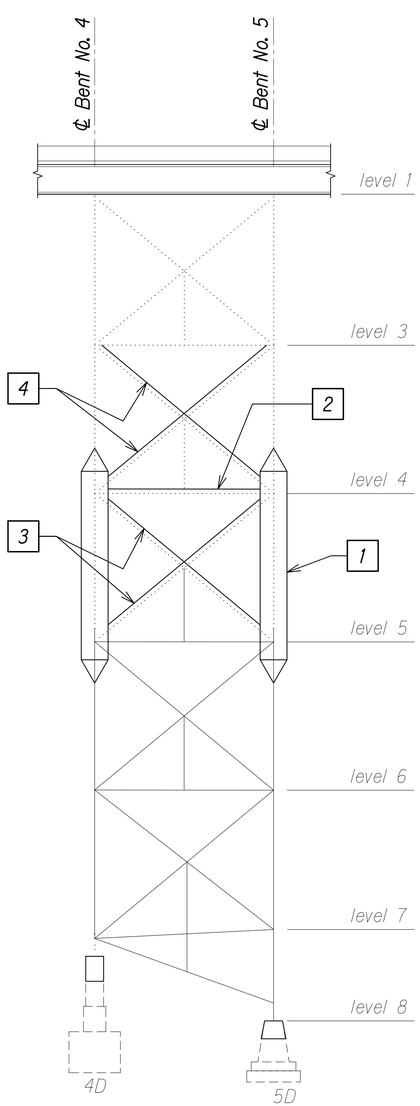
ORIGINAL PLAN
NOTE BOOK
No.

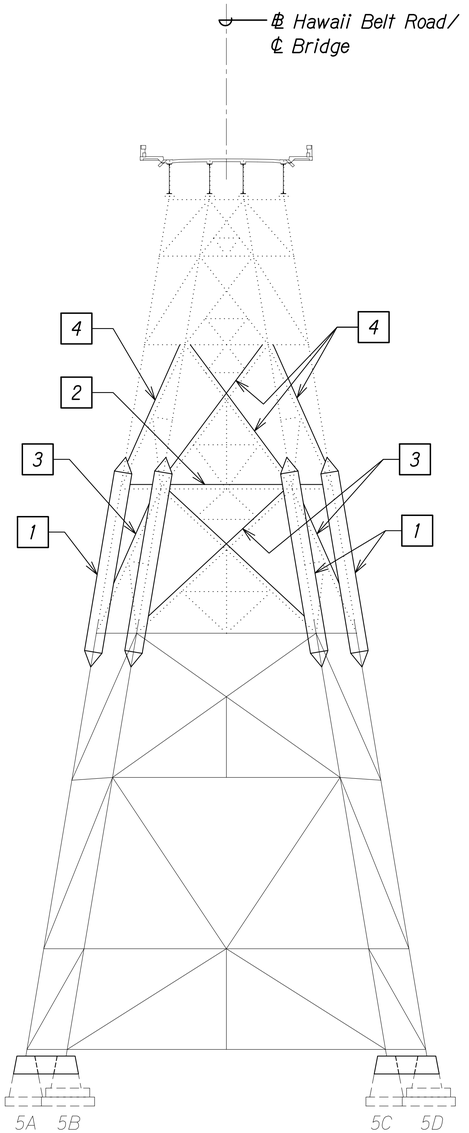
SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE

DRAWING NAME: Z:\OD ONGOING\OD JF PROJECTS\22-001.12-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\SR-SB0101 ELEV REP CONS SEQ.DWG PLOT TIME: 03-29-24, 4:04 PM

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		







CONSTRUCTION SEQUENCE:

STAGE 4:

1. Install column bypass beyond existing column splice points. See sht. SB2.1.
2. Install temporary horizontal compression bracings. See sht. SB2.2
3. Install temporary diagonal cable bracing within column bypass level. See sht. SB2.2
4. Install temporary diagonal cable bracing to level above. Temporary bracing shall connect to existing column gusset plate of above level. See sht. SB2.2

BENT NO. 4 ELEVATION CONSTRUCTION SEQUENCE (A) SB1.16 | SB1.16
Scale: 1/16" = 1'-0"

BENT NOS. 4 AND 5 ELEVATION CONSTRUCTION SEQUENCE (B) SB1.16 | SB1.16
Scale: 1/16" = 1'-0"

BENT NO. 5 ELEVATION CONSTRUCTION SEQUENCE (C) SB1.16 | SB1.16
Scale: 1/16" = 1'-0"

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
No.	TRACED BY	
	DESIGNED BY	
	QUANTITIES BY	
	CHECKED BY	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

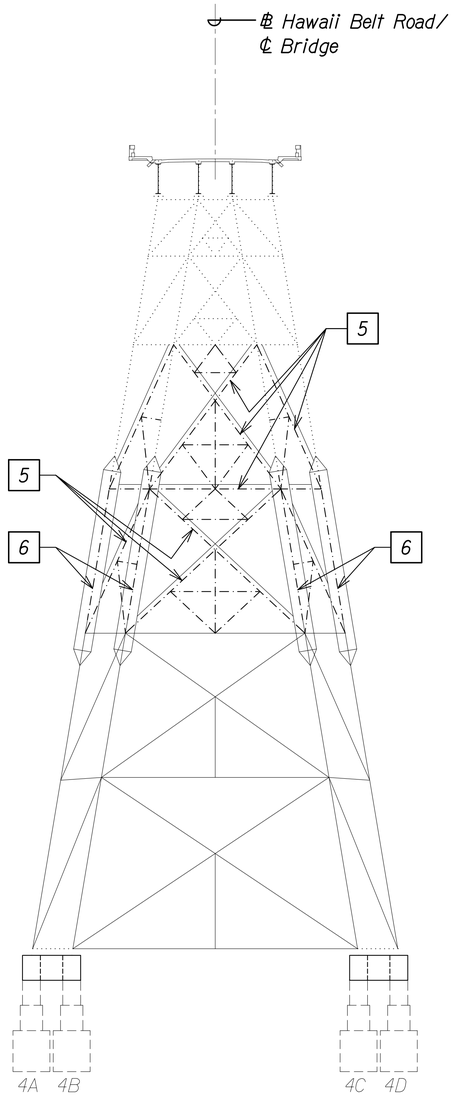
BENT REHABILITATION CONSTRUCTION SEQUENCE

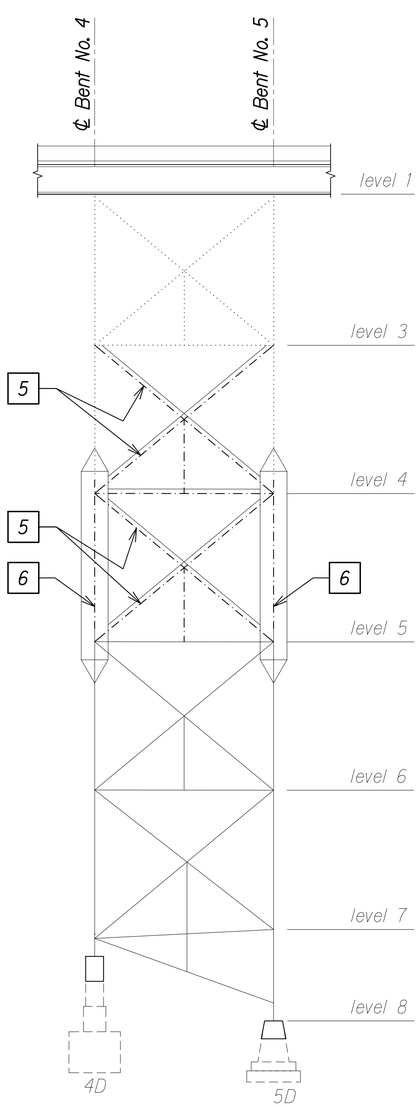
HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

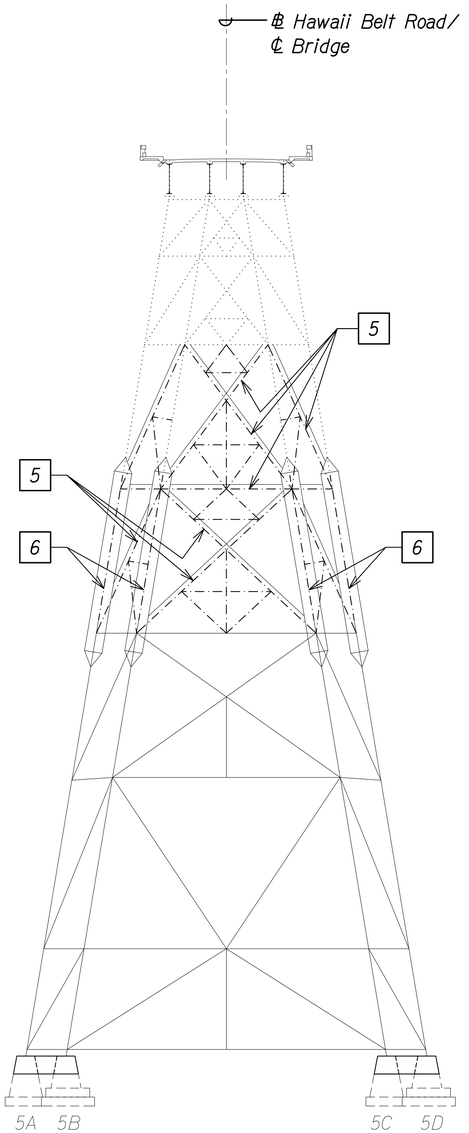
Scale: As Noted Date: Mar. 2024

SHEET No. SB1.16 OF 29 SHEETS

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		







CONSTRUCTION SEQUENCE:

STAGE 4:

5 Remove existing bracings along temporary bracings.
See sht. SB2.3

6 Remove existing column between existing column splice points. within column bypass.
See sht. SB2.3

BENT NO. 4 ELEVATION CONSTRUCTION SEQUENCE (A) SBI.17 | SBI.17
Scale: 1/16" = 1'-0"

BENT NOS. 4 AND 5 ELEVATION CONSTRUCTION SEQUENCE (B) SBI.17 | SBI.17
Scale: 1/16" = 1'-0"

BENT NO. 5 ELEVATION CONSTRUCTION SEQUENCE (C) SBI.17 | SBI.17
Scale: 1/16" = 1'-0"

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
NOTE BOOK	TRACED BY	
	DESIGNED BY	
No.	QUANTITIES BY	
	CHECKED BY	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

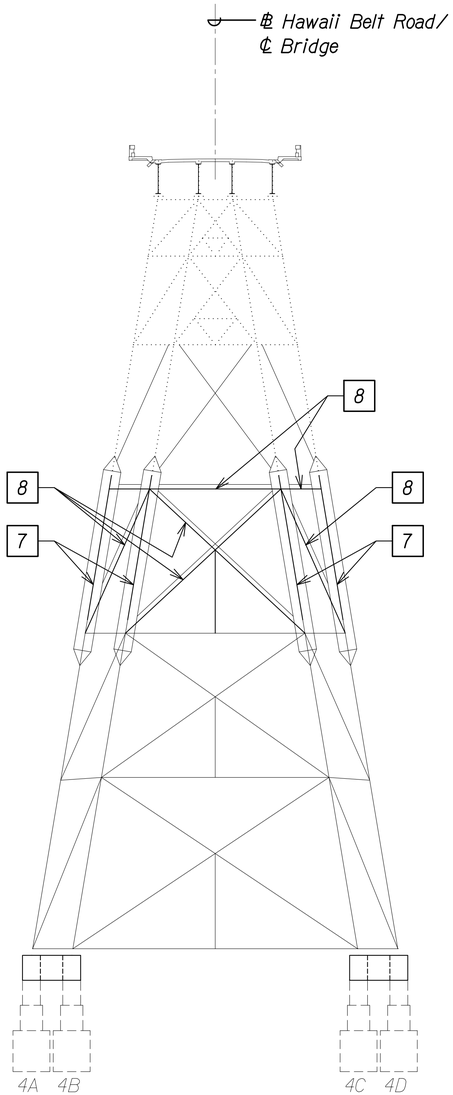
BENT REHABILITATION CONSTRUCTION SEQUENCE

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SBI.17 OF 29 SHEETS

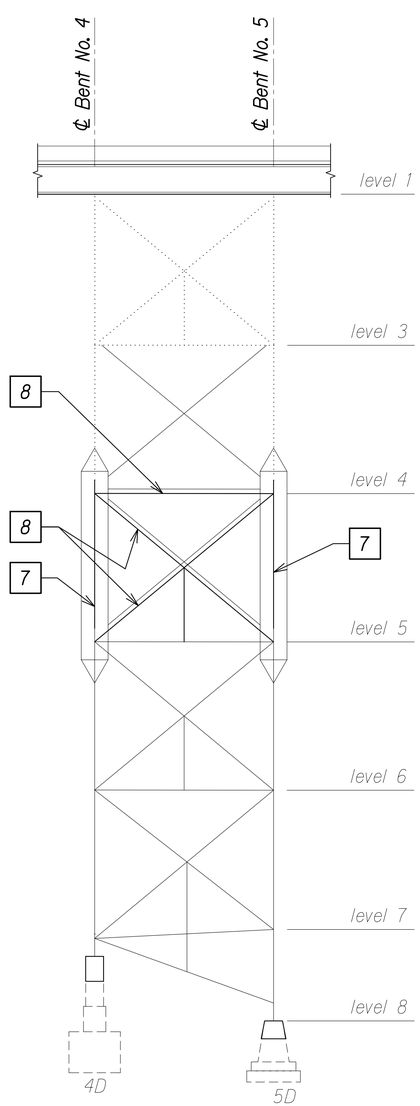
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



BENT NO. 4 ELEVATION
CONSTRUCTION SEQUENCE

Scale: 1/16" = 1'-0"

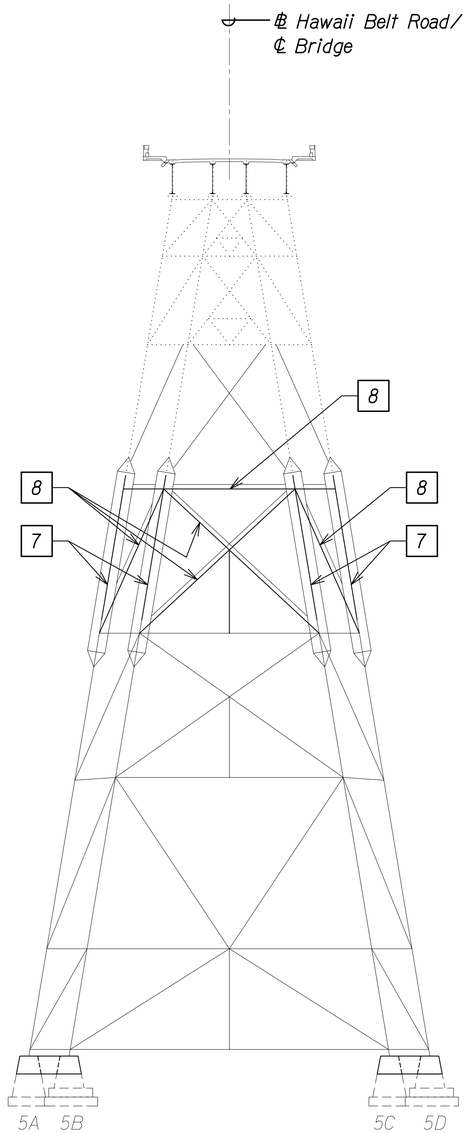
A SB1.18 | SB1.18



BENT NOS. 4 AND 5 ELEVATION
CONSTRUCTION SEQUENCE

Scale: 1/16" = 1'-0"

B SB1.18 | SB1.18



CONSTRUCTION SEQUENCE
LOOKING TOWARD HONOKA'A

Scale: 1/16" = 1'-0"

C SB1.18 | SB1.18

CONSTRUCTION SEQUENCE:

STAGE 4:

7 Install new column between column splice locations within column bypass. See sht. SB2.4.

8 Install new bracing within level of column bypass. See sht. SB2.4.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
NOTE BOOK	TRACED BY	
	DESIGNED BY	
No.	QUANTITIES BY	
	CHECKED BY	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

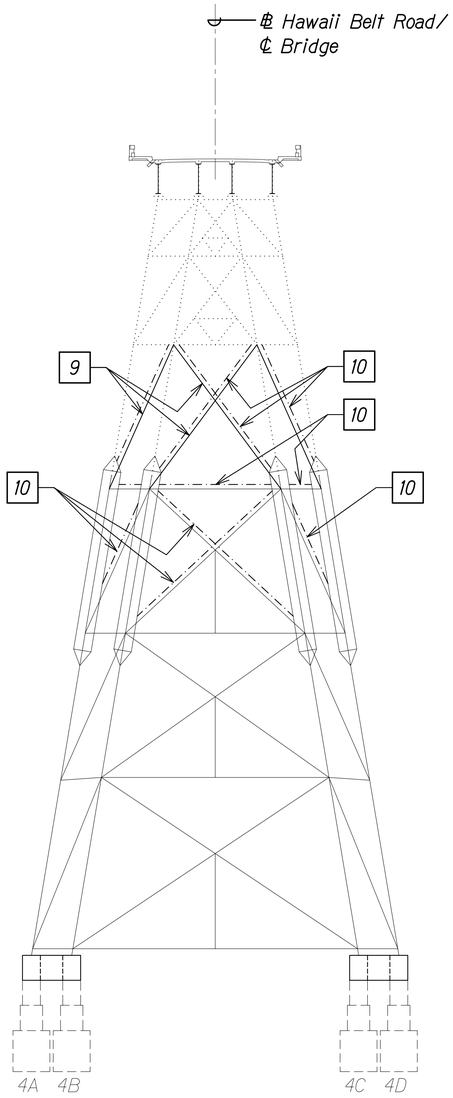
BENT REHABILITATION CONSTRUCTION SEQUENCE

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SB1.18 OF 29 SHEETS

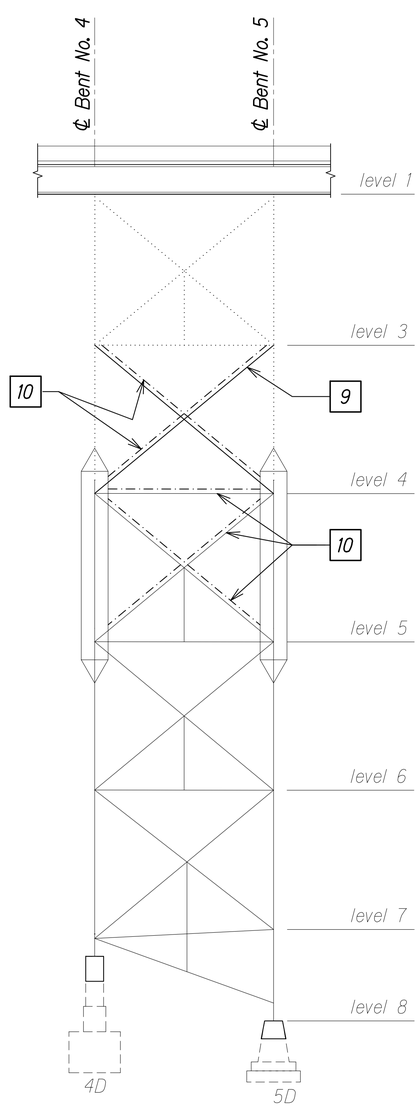
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



BENT NO. 4 ELEVATION
CONSTRUCTION SEQUENCE

Scale: 1/16" = 1'-0"

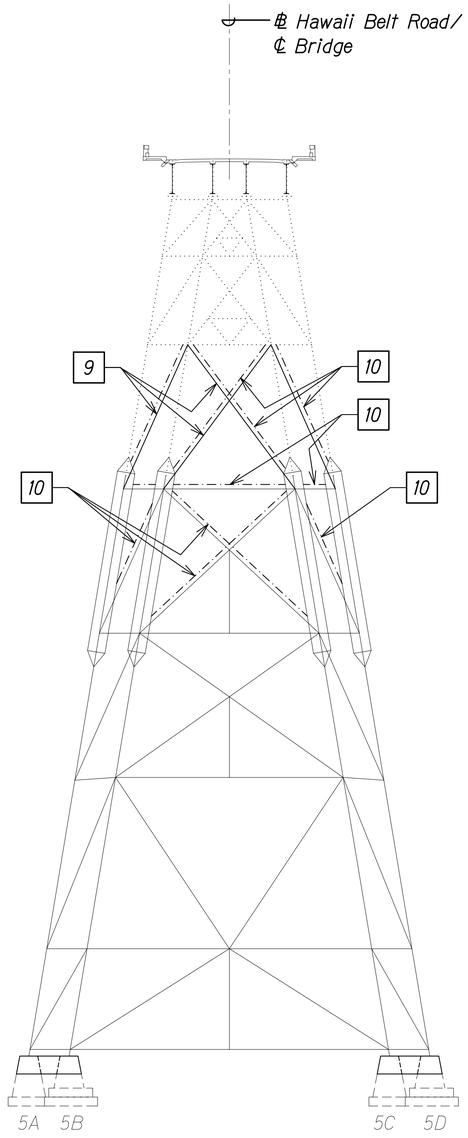
A SB1.19 | SB1.19



BENT NOS. 4 AND 5 ELEVATION
CONSTRUCTION SEQUENCE

Scale: 1/16" = 1'-0"

B SB1.19 | SB1.19



BENT NO. 5 ELEVATION
CONSTRUCTION SEQUENCE

Scale: 1/16" = 1'-0"

C SB1.19 | SB1.19

CONSTRUCTION SEQUENCE:

STAGE 4:

9 Install in-plane temporary cable bracing between new column at column bypass level and existing column gusset plate at level above. See sht. SB2.5.

10 Remove temporary bracing. See sht. SB2.5.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BENT REHABILITATION CONSTRUCTION SEQUENCE

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

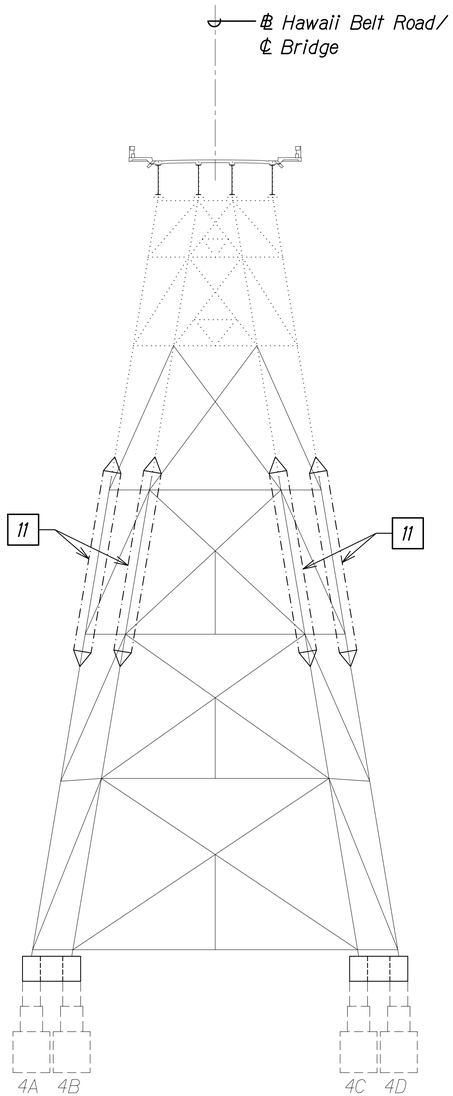
SHEET No. SB1.19 OF 29 SHEETS

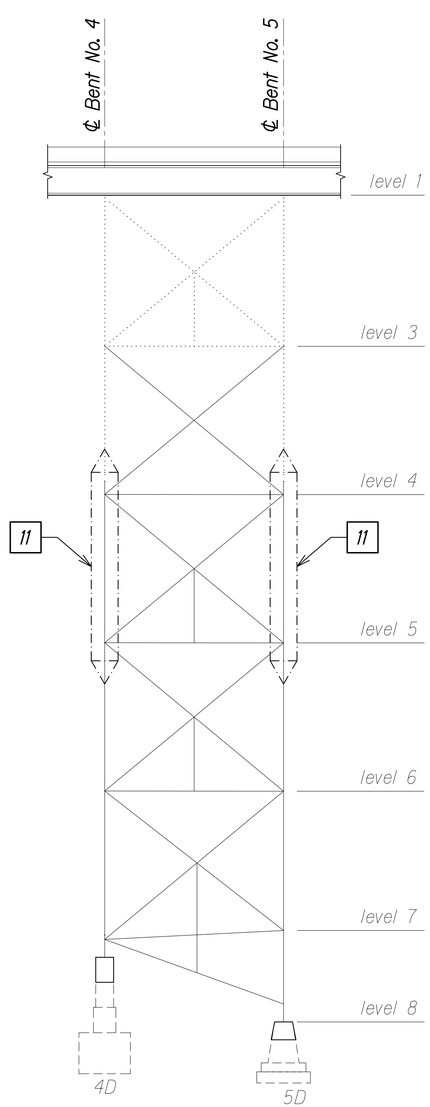
ORIGINAL PLAN
NOTE BOOK
No.

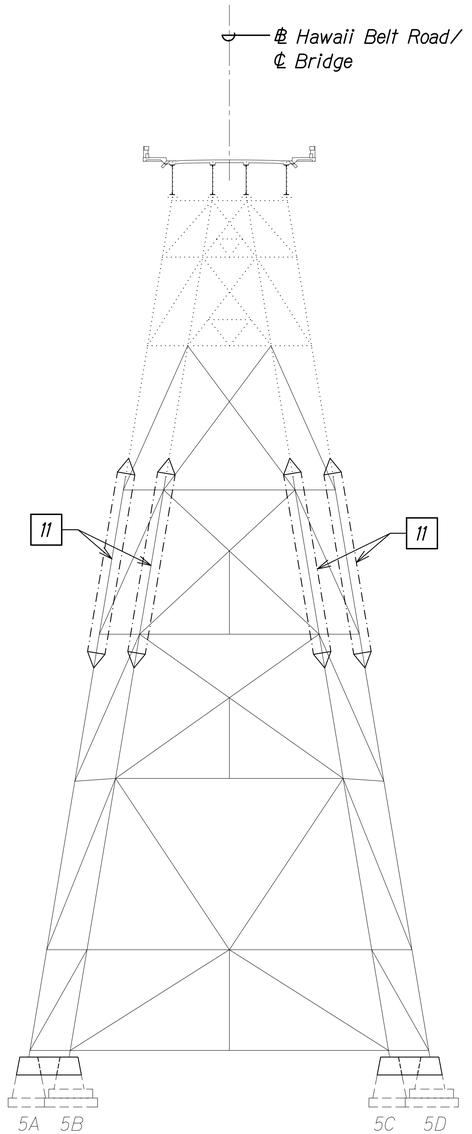
SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE

DRAWING NAME: Z:\OD ONGONGO\0 JF PROJECTS\22-001 12-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\NSR-SB0101 ELEV REP CONS SEQ.DWG PLOT TIME: 03-29-24, 1:05 PM

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		







CONSTRUCTION SEQUENCE:

STAGE 4:

11 Remove column bypass.
Proceed to next stage.
See sht. SB2.6

BENT NO. 4 ELEVATION
CONSTRUCTION SEQUENCE (A)
Scale: 1/16" = 1'-0"
SBI.20 | SBI.20

BENT NOS. 4 AND 5 ELEVATION
CONSTRUCTION SEQUENCE (B)
Scale: 1/16" = 1'-0"
SBI.20 | SBI.20

BENT NO. 5 ELEVATION
CONSTRUCTION SEQUENCE (C)
Scale: 1/16" = 1'-0"
SBI.20 | SBI.20

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
NOTE BOOK	TRACED BY	
	DESIGNED BY	
No.	QUANTITIES BY	
	CHECKED BY	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

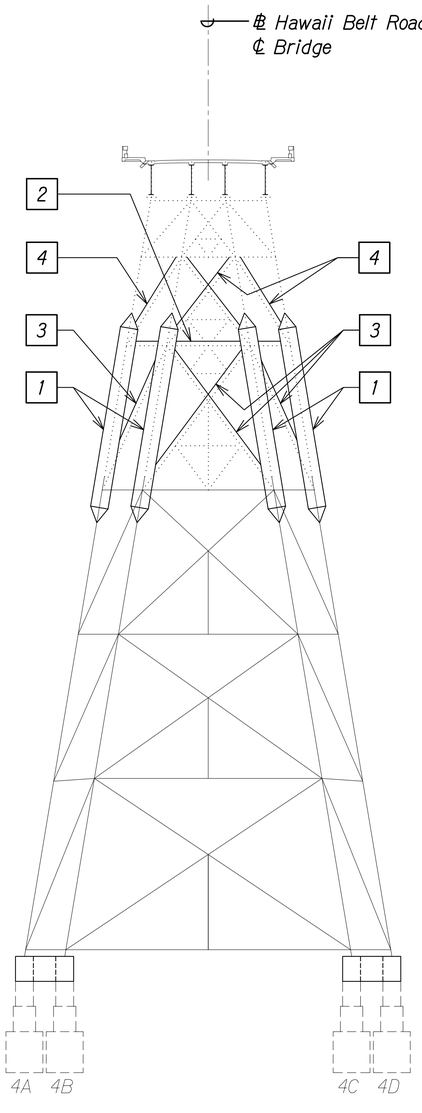
BENT REHABILITATION CONSTRUCTION SEQUENCE

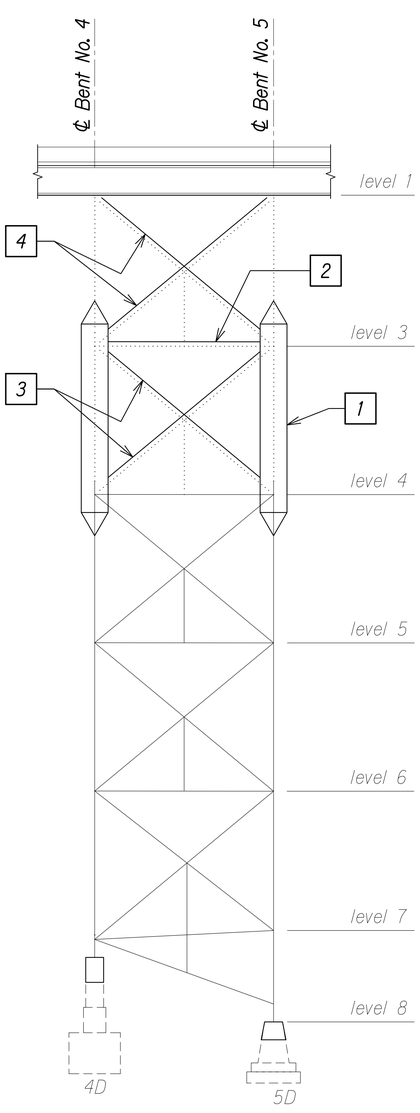
HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

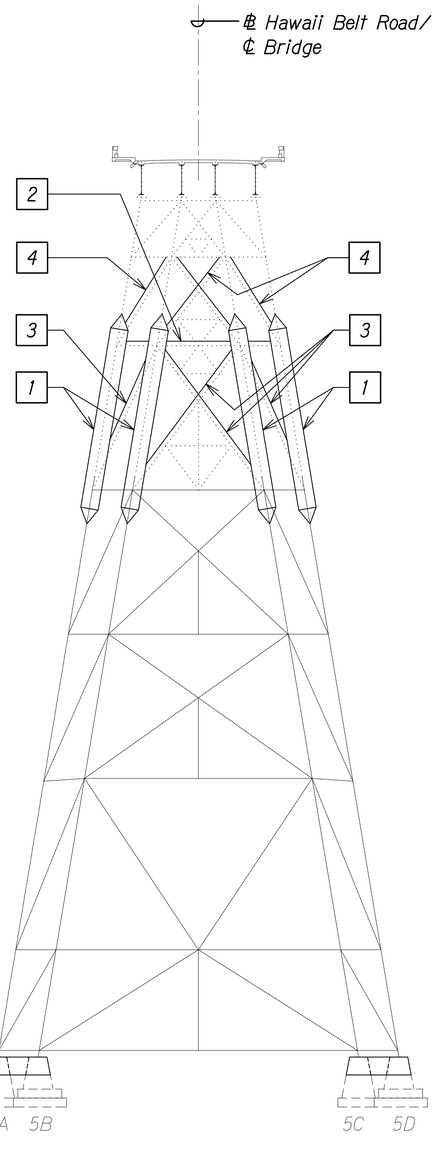
Scale: As Noted Date: Mar. 2024

SHEET No SBI.20 OF 29 SHEETS

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		







CONSTRUCTION SEQUENCE:

STAGE 5:

1. Install column bypass beyond existing column splice points. See sht. SB2.1.
2. Install temporary horizontal compression bracings. See sht. SB2.2
3. Install temporary diagonal cable bracing within column bypass level. See sht. SB2.2
4. Install temporary diagonal cable bracing to level above. Temporary bracing shall connect to existing column gusset plate of above level. See sht. SB2.2

BENT NO. 4 ELEVATION CONSTRUCTION SEQUENCE (A) SB1.21 | SB1.21
Scale: 1/16" = 1'-0"

BENT NOS. 4 AND 5 ELEVATION CONSTRUCTION SEQUENCE (B) SB1.21 | SB1.21
Scale: 1/16" = 1'-0"

BENT NO. 5 ELEVATION CONSTRUCTION SEQUENCE (C) SB1.21 | SB1.21
Scale: 1/16" = 1'-0"

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
NOTE BOOK	TRACED BY	
	DESIGNED BY	
No.	QUANTITIES BY	
	CHECKED BY	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

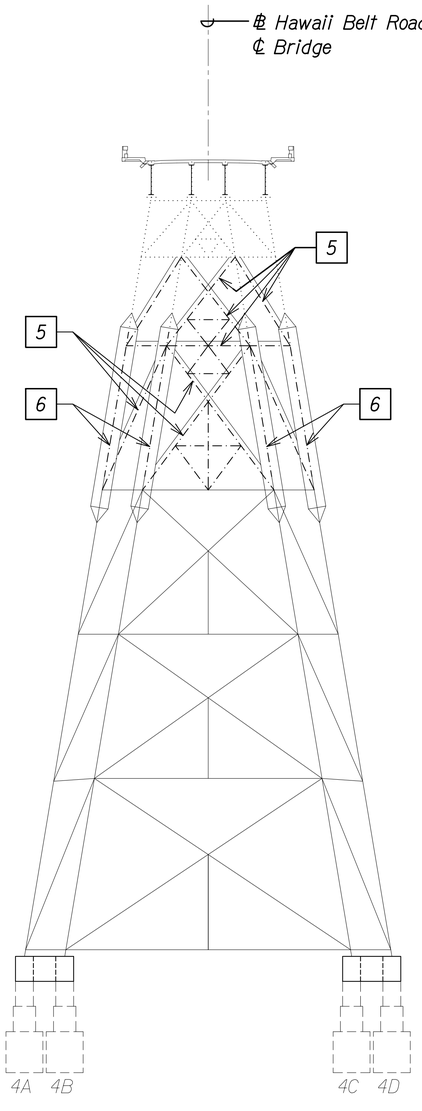
BENT REHABILITATION CONSTRUCTION SEQUENCE

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SB1.21 OF 29 SHEETS

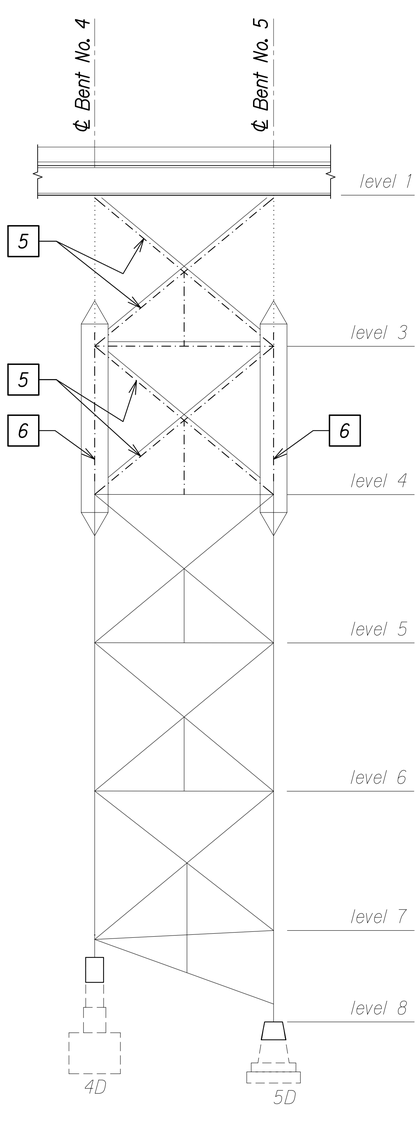
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



BENT NO. 4 ELEVATION
CONSTRUCTION SEQUENCE

Scale: 1/16" = 1'-0"

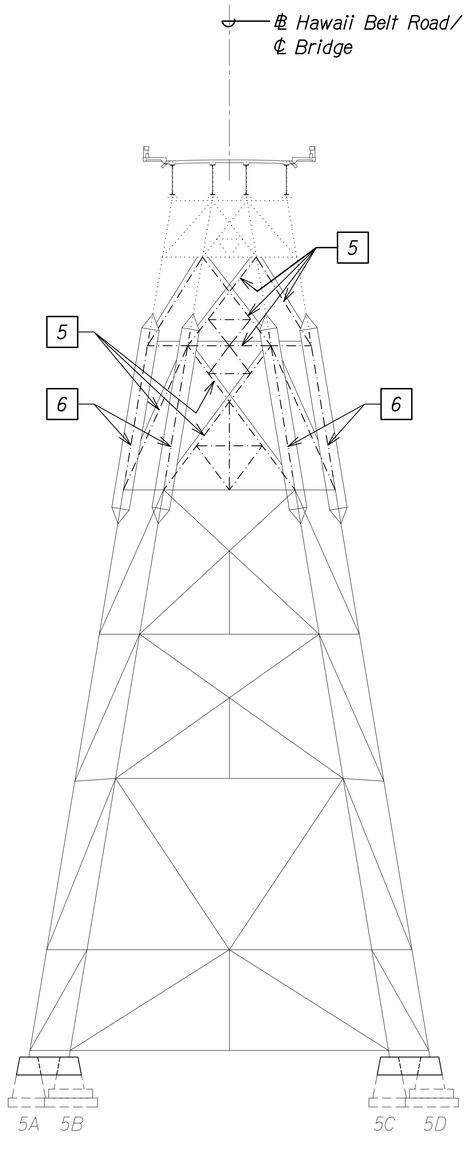
A SBI.22 SBI.22



BENT NOS. 4 AND 5 ELEVATION
CONSTRUCTION SEQUENCE

Scale: 1/16" = 1'-0"

B SBI.22 SBI.22



BENT NO. 5 ELEVATION
CONSTRUCTION SEQUENCE

Scale: 1/16" = 1'-0"

C SBI.22 SBI.22

CONSTRUCTION SEQUENCE:

STAGE 5:

5 Remove existing bracings along temporary bracings.
See sht. SB2.3

6 Remove existing column between existing column splice points. within column bypass.
See sht. SB2.3

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BENT REHABILITATION CONSTRUCTION SEQUENCE

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

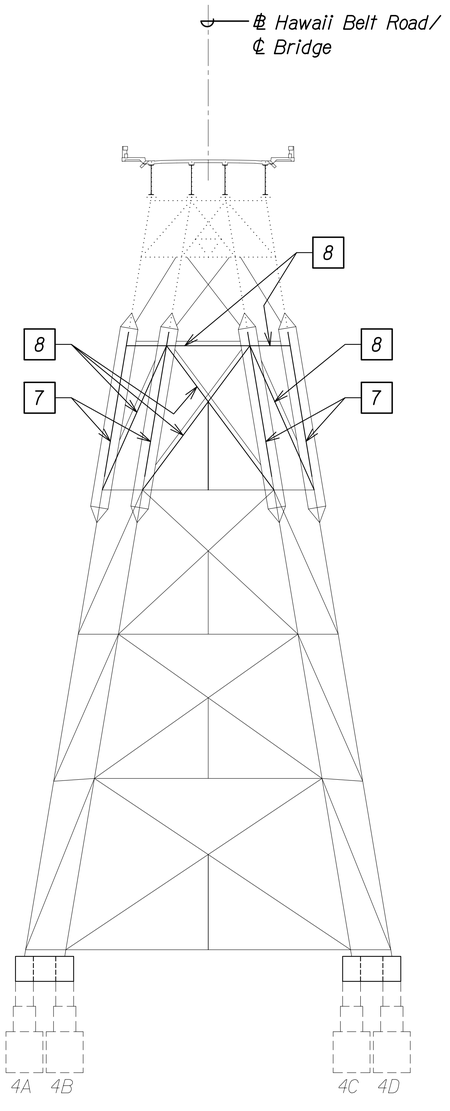
Scale: As Noted Date: Mar. 2024

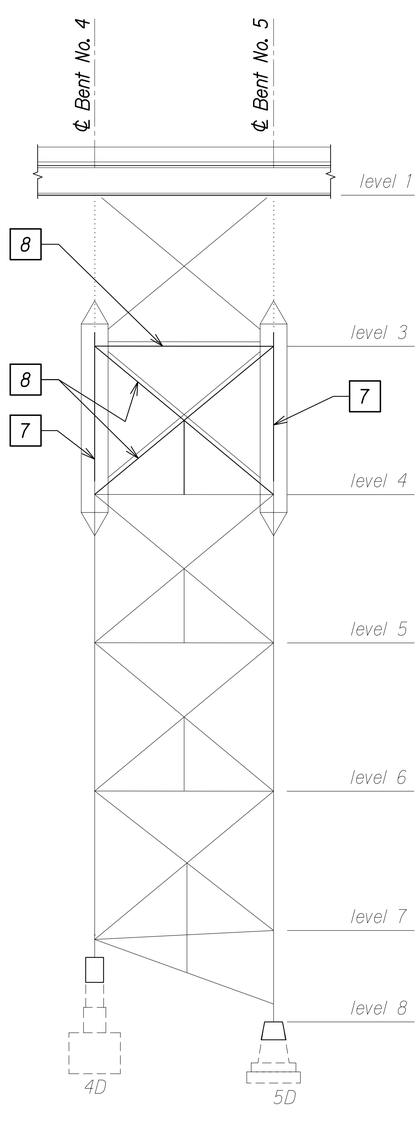
SHEET No SBI.22 OF 29 SHEETS

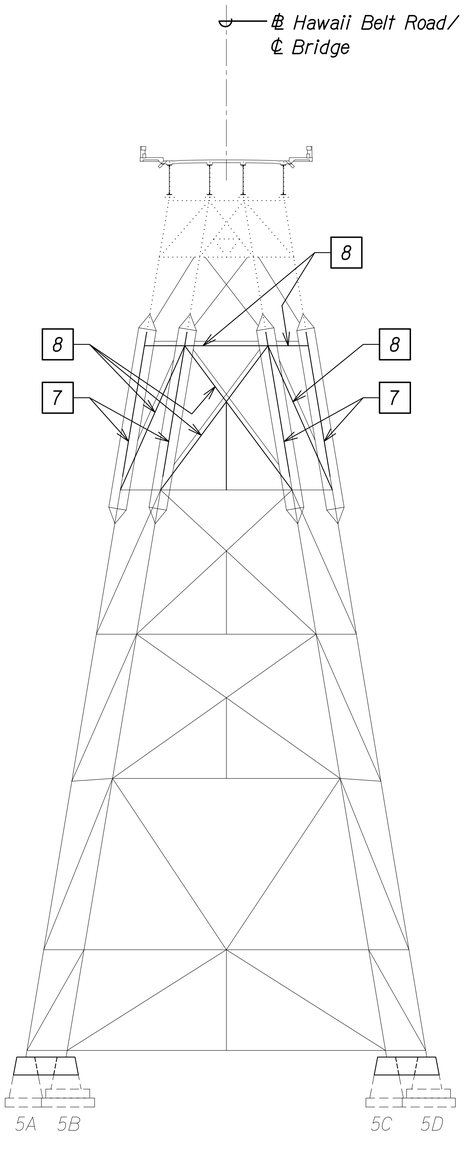
ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
NOTE BOOK	TRACED BY	
	DESIGNED BY	
No.	QUANTITIES BY	
	CHECKED BY	

DRAWING NAME: Z:\OD ENGINEERING\PROJECTS\22-01\12-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\SBR-SB0101 ELEV REP CONS SEQ.DWG PLOT TIME: 03-29-24, 4:05 PM

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		







CONSTRUCTION SEQUENCE:

STAGE 5:

7 Install new column between column splice locations within column bypass. See sht. SB2.4.

8 Install new bracing within level of column bypass. See sht. SB2.4.

BENT NO. 4 ELEVATION CONSTRUCTION SEQUENCE (A SBI.23 | SBI.23)
Scale: 1/16" = 1'-0"

BENT NOS. 4 AND 5 ELEVATION CONSTRUCTION SEQUENCE (B SBI.23 | SBI.23)
Scale: 1/16" = 1'-0"

BENT NO. 5 ELEVATION CONSTRUCTION SEQUENCE (C SBI.23 | SBI.23)
Scale: 1/16" = 1'-0"

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
NOTE BOOK	TRACED BY	
	DESIGNED BY	
No.	QUANTITIES BY	
	CHECKED BY	

DRAWING NAME: Z:\JOB ENDING\JOB #\PROJECTS\22-01\12-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\SBR-SB0101 ELEV REP CONS SEQ.DWG PLOT TIME: 03-29-24, 4:06 PM

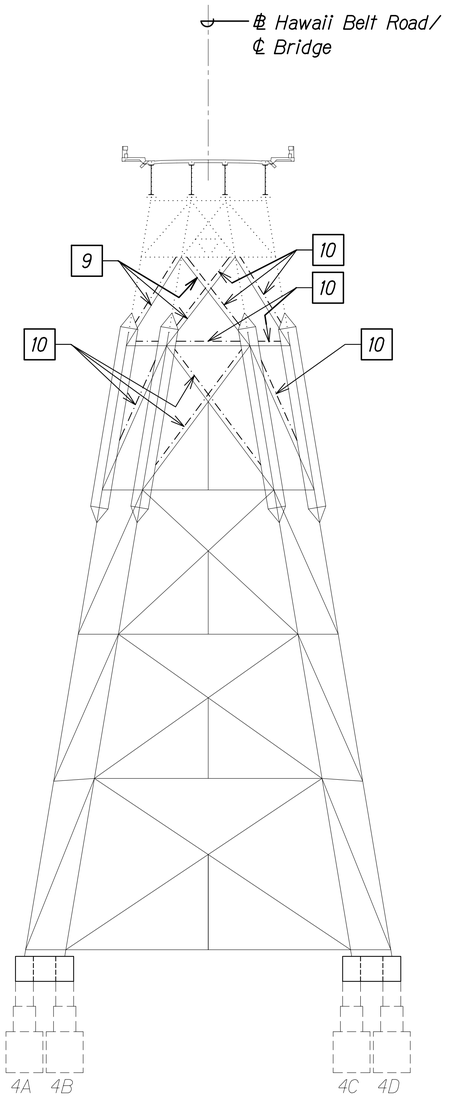
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BENT REHABILITATION CONSTRUCTION SEQUENCE

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

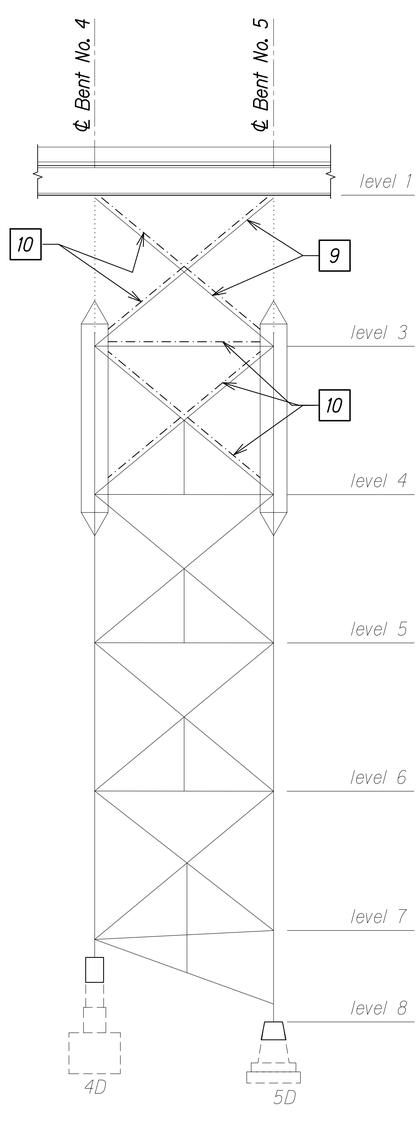
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



BENT NO. 4 ELEVATION
CONSTRUCTION SEQUENCE

Scale: 1/16" = 1'-0"

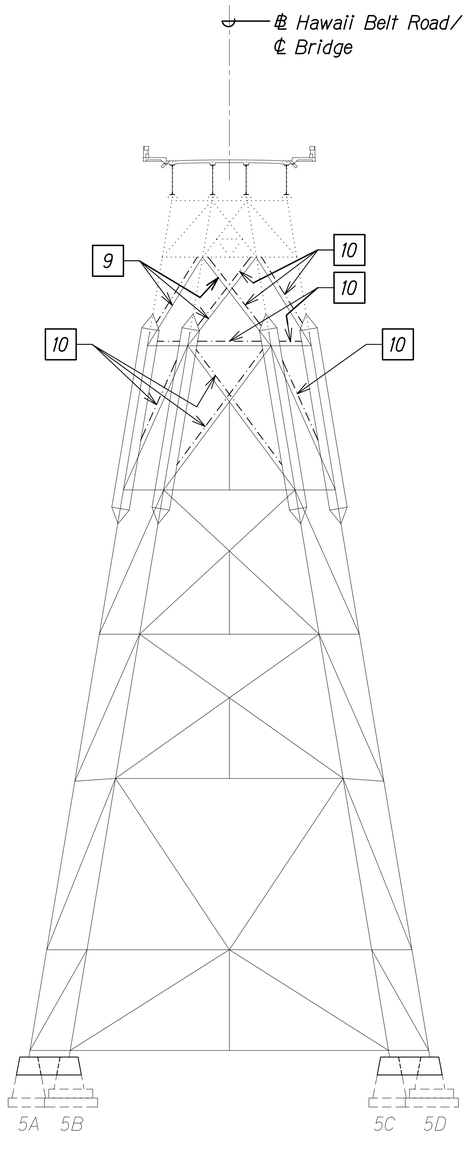
A SB1.24 SB1.24



BENT NOS. 4 AND 5 ELEVATION
CONSTRUCTION SEQUENCE

Scale: 1/16" = 1'-0"

B SB1.24 SB1.24



BENT NO. 5 ELEVATION
CONSTRUCTION SEQUENCE

Scale: 1/16" = 1'-0"

C SB1.24 SB1.24

CONSTRUCTION SEQUENCE:

STAGE 5:

9 Install in-plane temporary cable bracing between new column at column bypass level and existing column gusset plate at level above. See sht. SB2.5.

10 Remove temporary bracing. See sht. SB2.5.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
NOTE BOOK	TRACED BY	
	DESIGNED BY	
	QUANTITIES BY	
No.	CHECKED BY	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

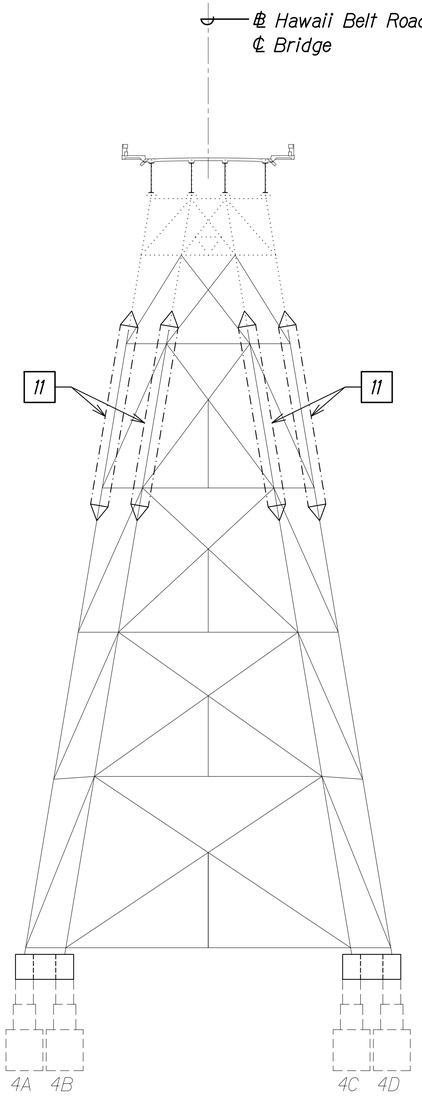
BENT REHABILITATION
CONSTRUCTION SEQUENCE

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No SB1.24 OF 29 SHEETS

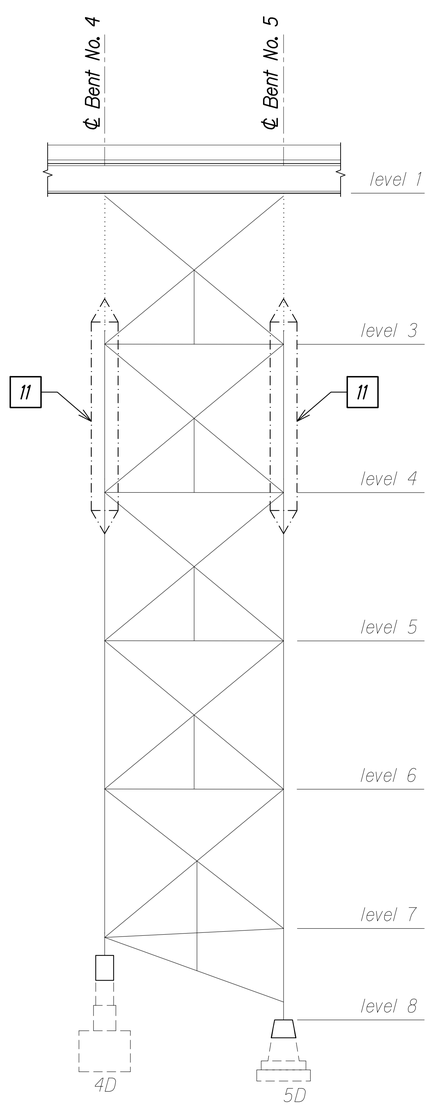
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



BENT NO. 4 ELEVATION
CONSTRUCTION SEQUENCE

Scale: 1/16" = 1'-0"

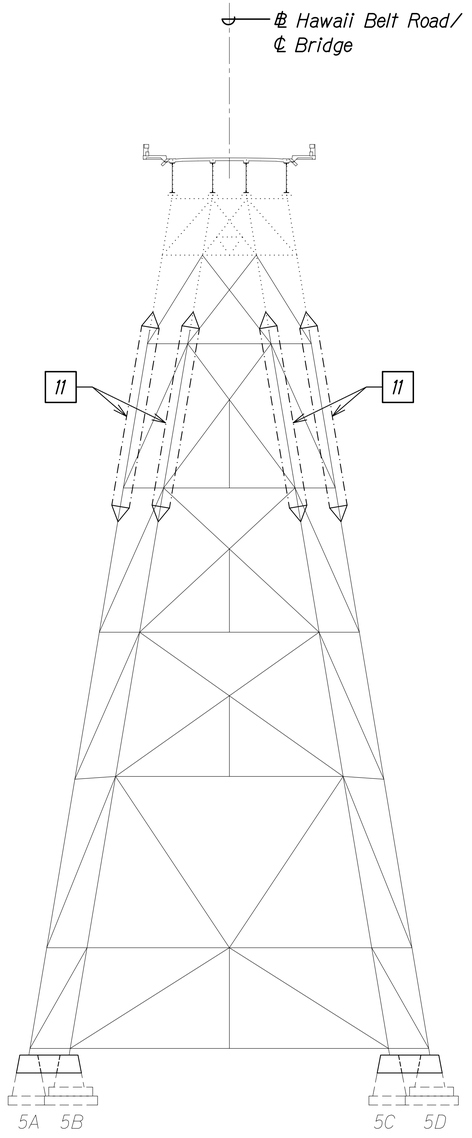
A SBI.25 | SBI.25



BENT NOS. 4 AND 5 ELEVATION
CONSTRUCTION SEQUENCE

Scale: 1/16" = 1'-0"

B SBI.25 | SBI.25



BENT NO. 5 ELEVATION
CONSTRUCTION SEQUENCE

Scale: 1/16" = 1'-0"

C SBI.25 | SBI.25

CONSTRUCTION SEQUENCE:

STAGE 5:

11 Remove column bypass.
Proceed to next stage.
See sht. SB2.6

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BENT REHABILITATION CONSTRUCTION SEQUENCE

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

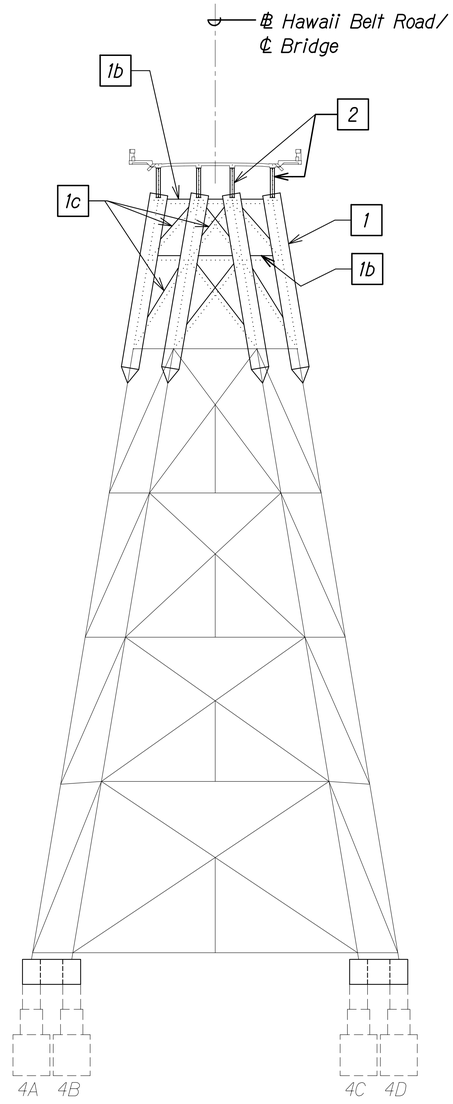
SHEET No SBI.25 OF 29 SHEETS

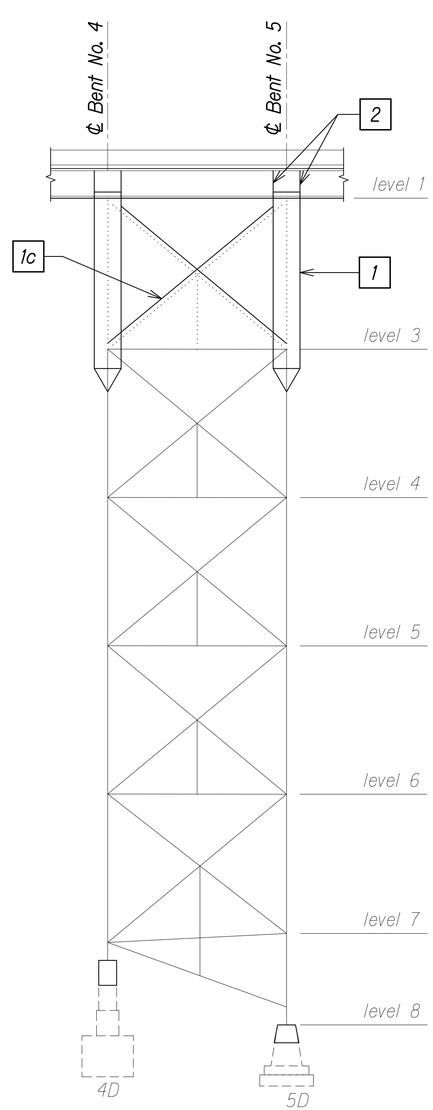
ORIGINAL PLAN
NOTE BOOK
No.

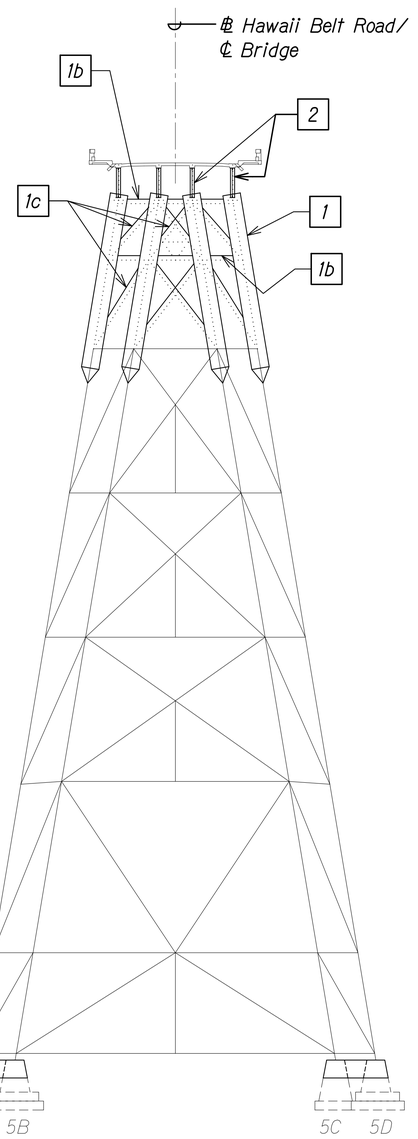
SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE

BRAWING NAME: Z:\OD ONGOING\OD JF PROJECTS\22-001\12-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\NSR-SB0101 ELEV REP CONS SEQ.DWG PLOT TIME: 03-29-24, 4:06 PM

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		







CONSTRUCTION SEQUENCE:

STAGE 6:

1 *Install column bypass assembly at top of bent. See sht. SB2.11.*

1b *Install temporary horizontal compression bracings. See sht. SB2.2.*

1c *Install temporary diagonal bracing. See sht. SB2.2.*

2 *Add bearing stiffeners to existing girders at column bypass bearing locations. See sht. SB2.11.*

BENT NO. 4 ELEVATION CONSTRUCTION SEQUENCE (A) SBI.26 | SBI.26
Scale: 1/16" = 1'-0"

BENT NOS. 4 AND 5 ELEVATION CONSTRUCTION SEQUENCE (B) SBI.26 | SBI.26
Scale: 1/16" = 1'-0"

BENT NO. 5 ELEVATION CONSTRUCTION SEQUENCE (C) SBI.26 | SBI.26
Scale: 1/16" = 1'-0"

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BENT REHABILITATION CONSTRUCTION SEQUENCE

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

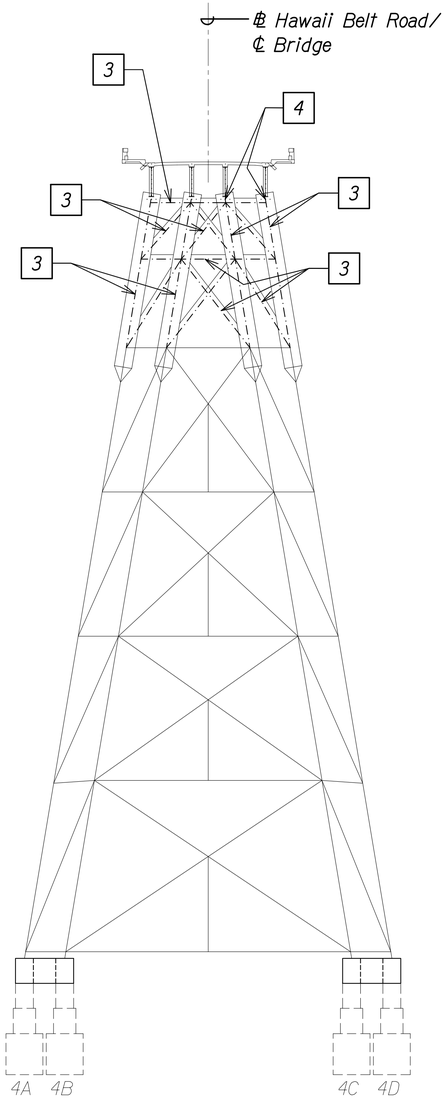
Scale: As Noted Date: Mar. 2024

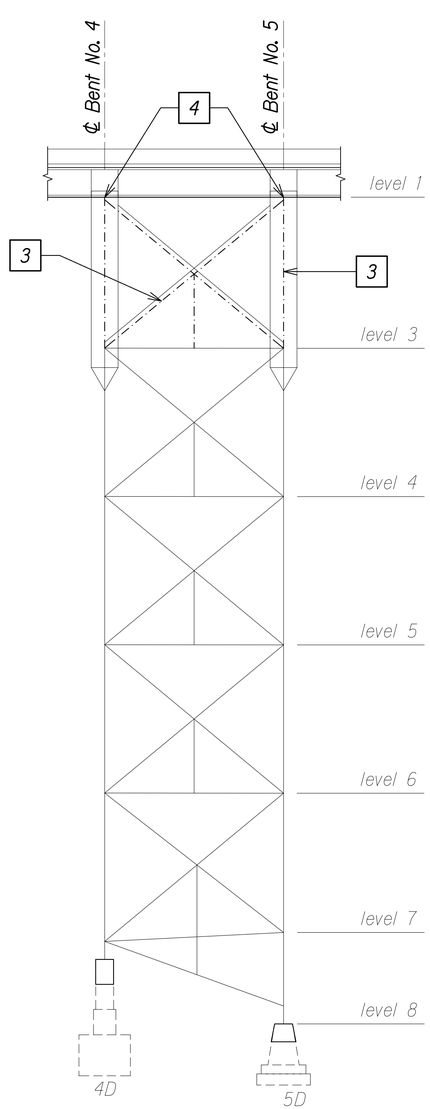
SHEET No SBI.26 OF 29 SHEETS

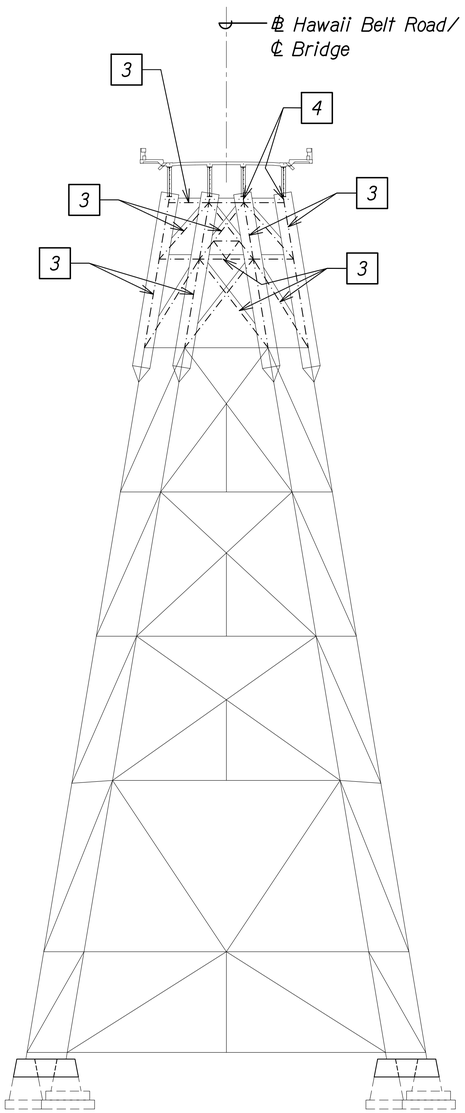
ORIGINAL PLAN
NOTE BOOK
No.
SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE

BRAWING NAME: 2:\OD ONGOING\OD JF PROJECTS\22-001\12-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\NSR-SB0101 ELEV REP CONS SEQ.DWG PLOT TIME: 03-29-24, 4:07 PM

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		







CONSTRUCTION SEQUENCE:

STAGE 6:

3 Remove existing columns and bracings. See sht. SB2.11.

4 Clean bottom of girders at bent bearing locations. See sht. SB2.11.

BENT NO. 4 ELEVATION
CONSTRUCTION SEQUENCE (A)
Scale: 1/16" = 1'-0"
SB1.27 | SB1.27

BENT NOS. 4 AND 5 ELEVATION
CONSTRUCTION SEQUENCE (B)
Scale: 1/16" = 1'-0"
SB1.27 | SB1.27

BENT NO. 5 ELEVATION
CONSTRUCTION SEQUENCE (C)
Scale: 1/16" = 1'-0"
SB1.27 | SB1.27

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BENT REHABILITATION CONSTRUCTION SEQUENCE

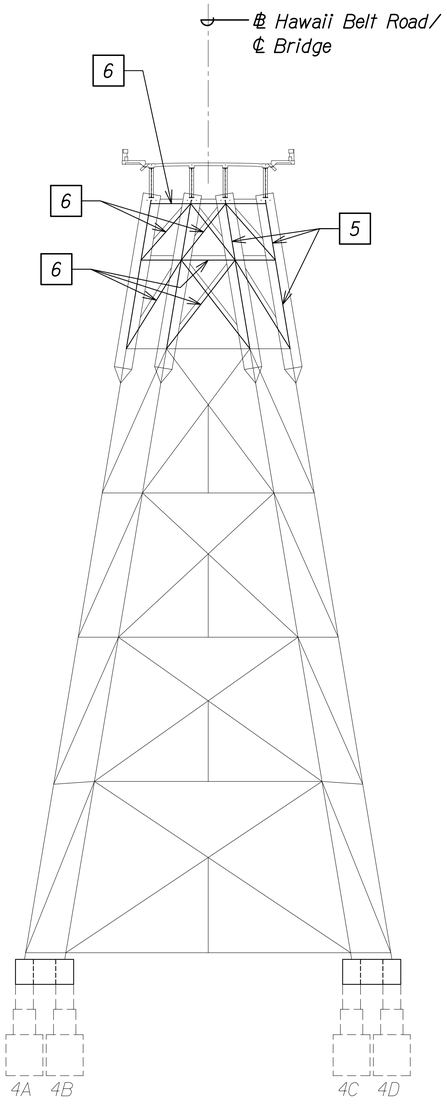
HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No SB1.27 OF 29 SHEETS

ORIGINAL PLAN
NOTE BOOK
No.
SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE

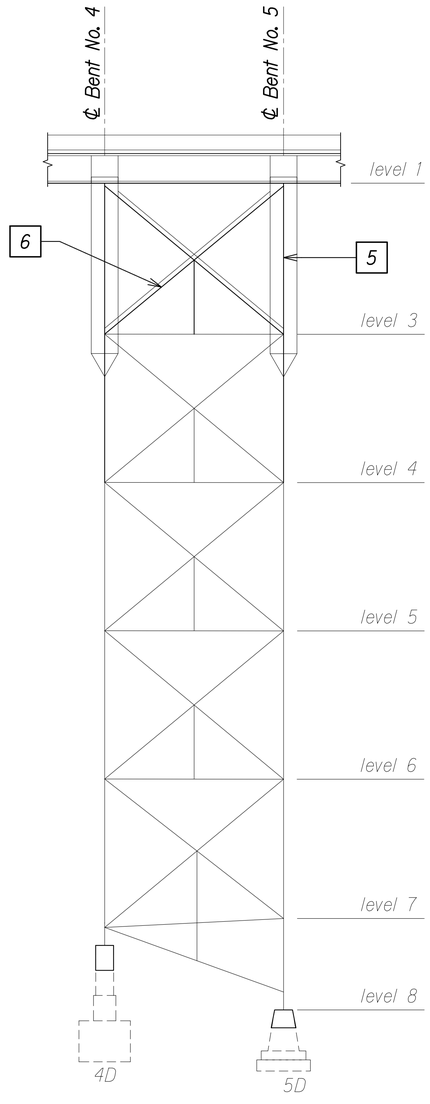
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



BENT NO. 4 ELEVATION
CONSTRUCTION SEQUENCE

Scale: 1/16" = 1'-0"

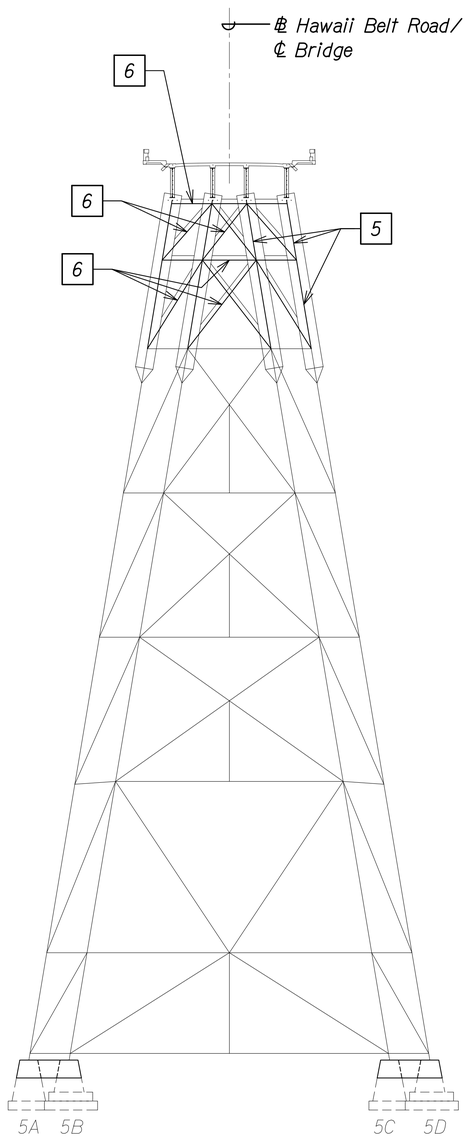
A SBI.28 SBI.28



BENT NOS. 4 AND 5 ELEVATION
CONSTRUCTION SEQUENCE

Scale: 1/16" = 1'-0"

B SBI.28 SBI.28



BENT NO. 5 ELEVATION
CONSTRUCTION SEQUENCE

Scale: 1/16" = 1'-0"

C SBI.28 SBI.28

CONSTRUCTION SEQUENCE:

STAGE 6:

5 Install new column.
See sht. SB2.12.

6 Install new bracings.
See sht. SB2.12.

ORIGINAL PLAN

NOTE BOOK
No.

SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

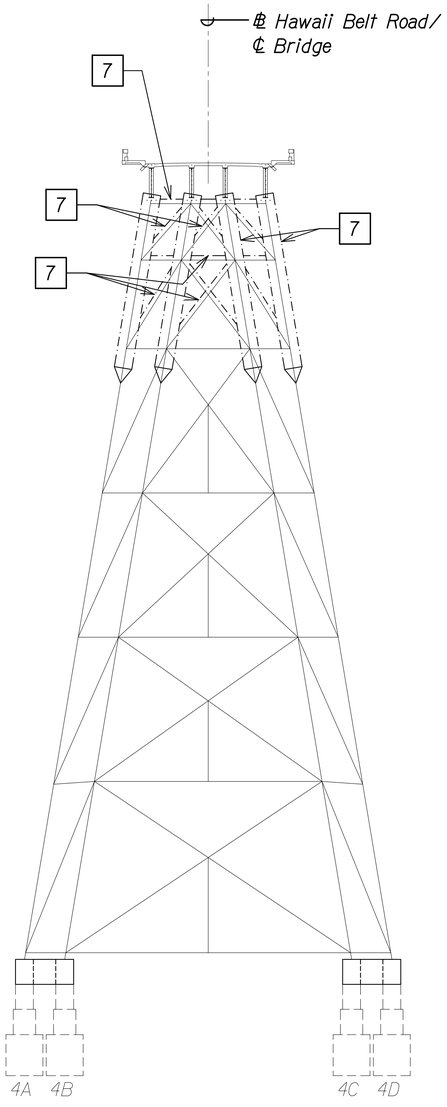
BENT REHABILITATION CONSTRUCTION SEQUENCE

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No SBI.28 OF 29 SHEETS

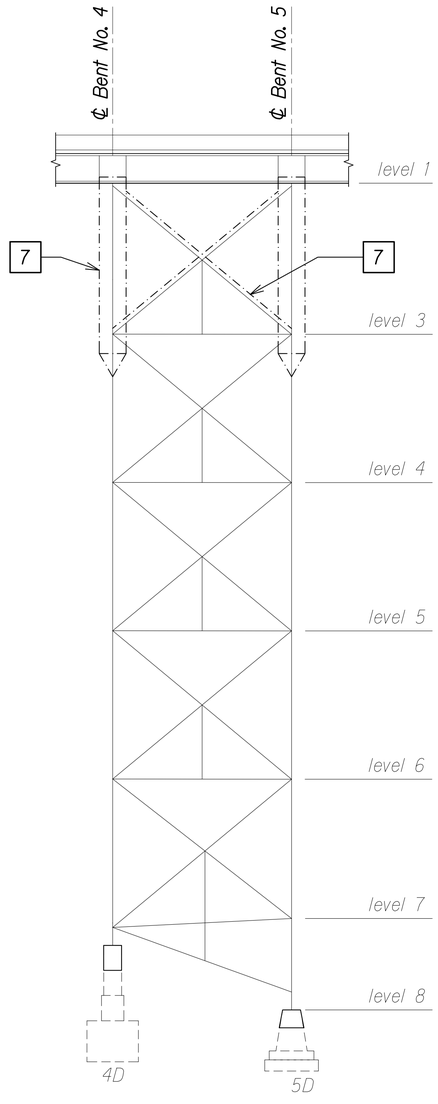
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



BENT NO. 4 ELEVATION
CONSTRUCTION SEQUENCE

Scale: 1/16" = 1'-0"

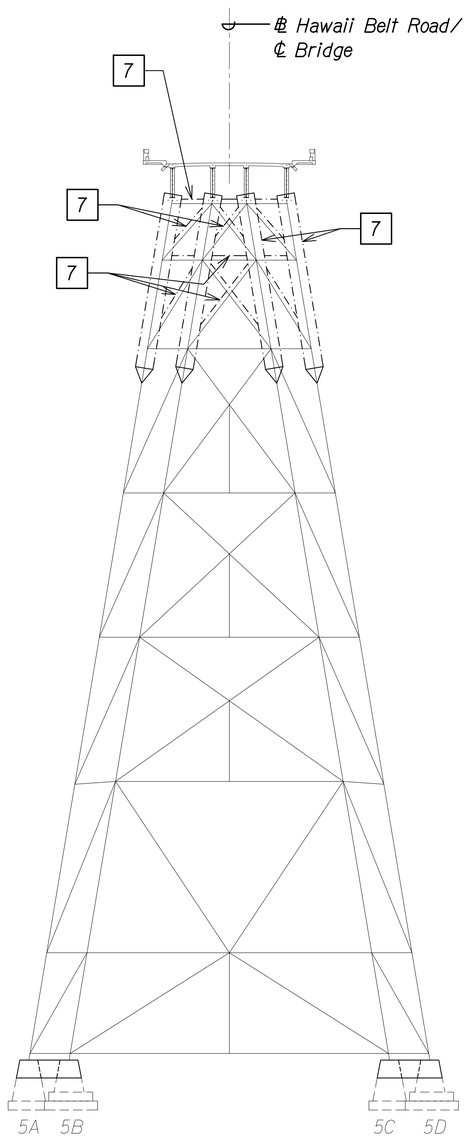
A SBI.29 | SBI.29



BENT NOS. 4 AND 5 ELEVATION
CONSTRUCTION SEQUENCE

Scale: 1/16" = 1'-0"

B SBI.29 | SBI.29



BENT NO. 5 ELEVATION
CONSTRUCTION SEQUENCE

Scale: 1/16" = 1'-0"

C SBI.29 | SBI.29

CONSTRUCTION SEQUENCE:

STAGE 6:

7 Remove column bypass assembly and temporary bracings. See sht. SB2.13.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
No.	TRACED BY	
	DESIGNED BY	
	QUANTITIES BY	
	CHECKED BY	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

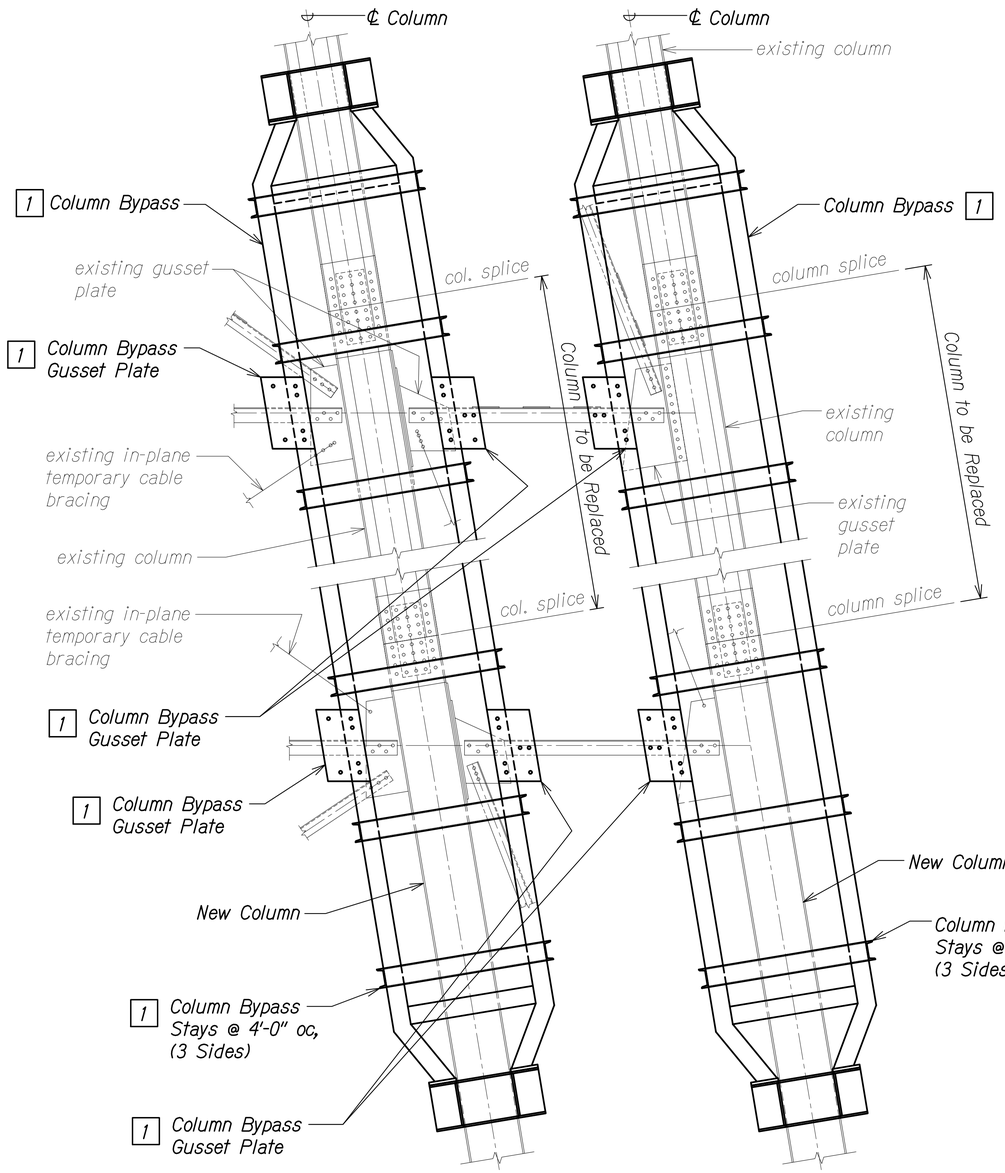
BENT REHABILITATION CONSTRUCTION SEQUENCE

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No SBI.29 OF 29 SHEETS

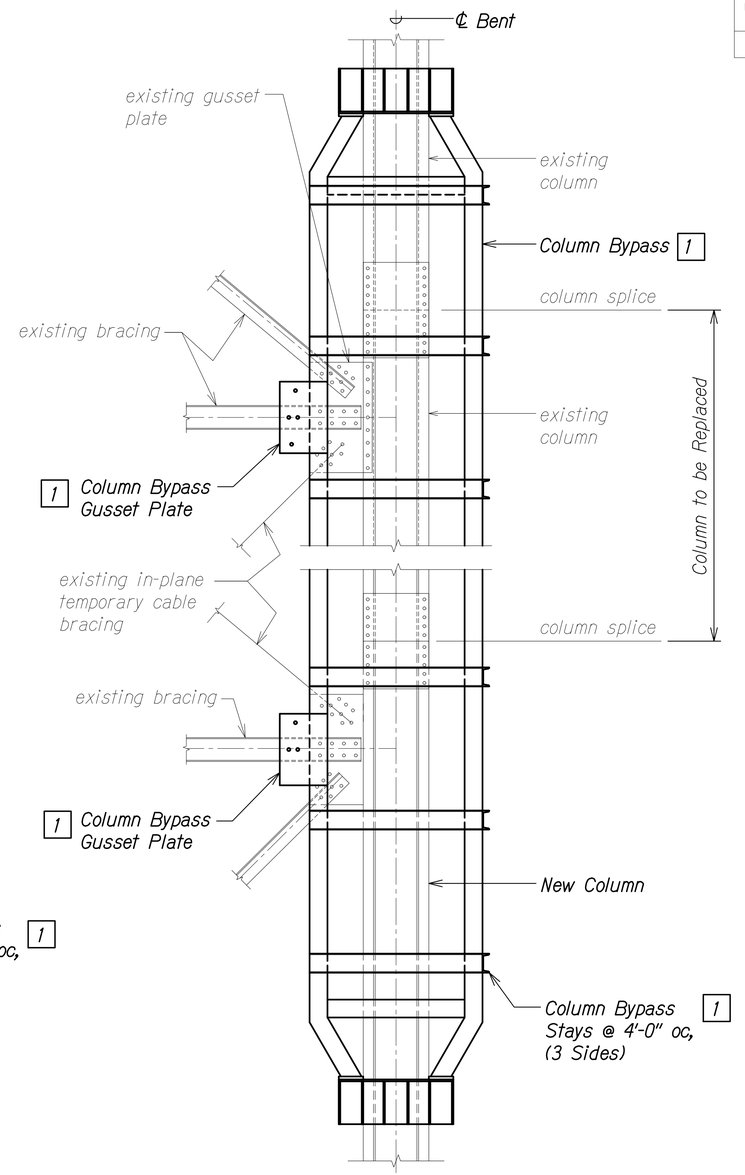
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



TYPICAL COLUMN BYPASS DETAIL

Scale: 1/2" = 1'-0"

A SB2.1 | BS2.1



TYPICAL COLUMN BYPASS DETAIL

Scale: 1/2" = 1'-0"

B SB2.1 | SB2.1

CONSTRUCTION SEQUENCE:

PHASE:

1 Install Column bypass beyond existing column splice points.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
NOTE BOOK	TRACED BY	
	DESIGNED BY	
No.	QUANTITIES BY	
	CHECKED BY	

DRAWING NAME: Z:\OD ENGINEERING\OD JF PROJECTS\22-001\12-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\NSR-SB0201 SHORING DETAILS.DWG PLOT TIME: 03-29-24, 4:08 PM

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

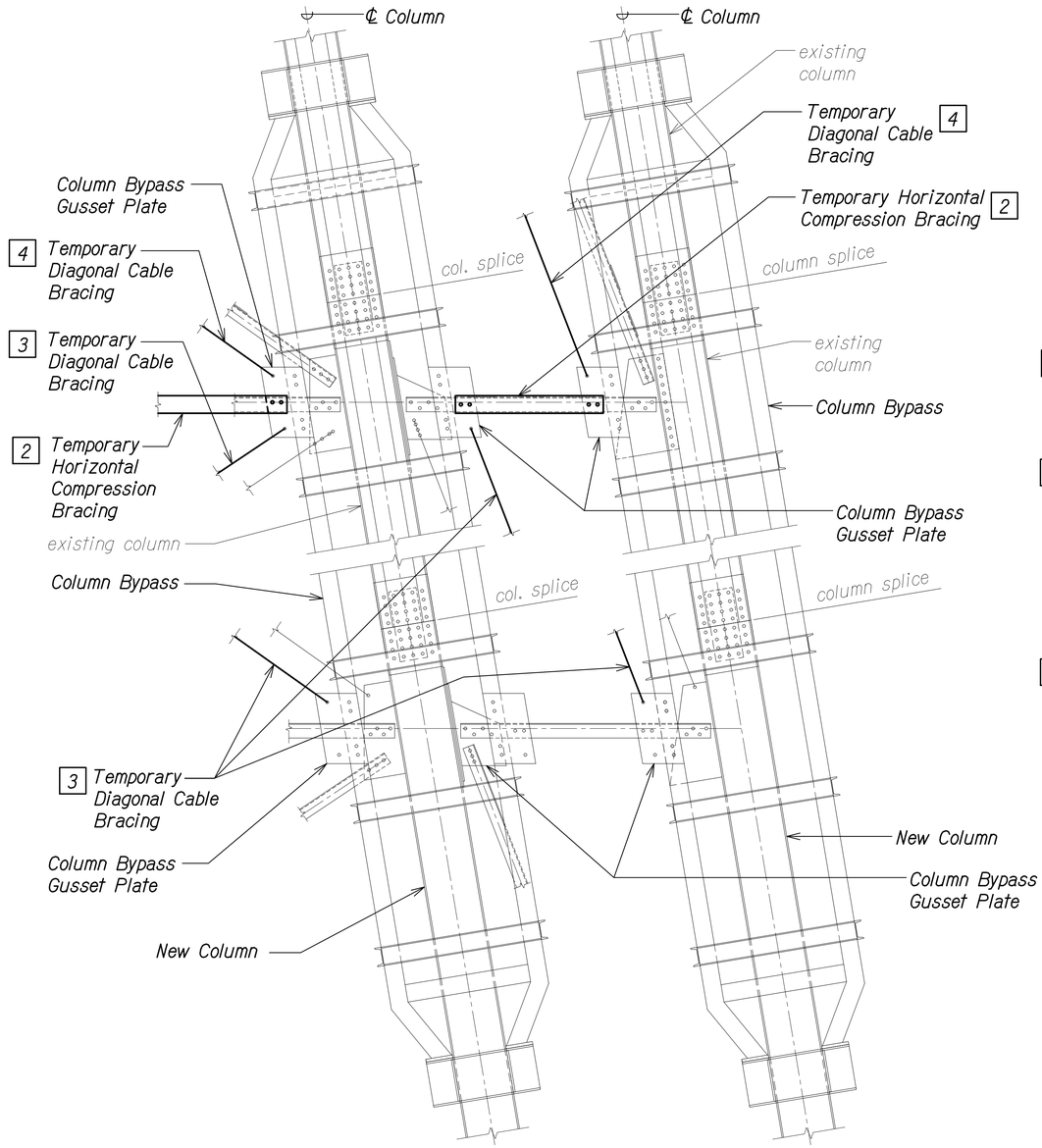
COLUMN BYPASS CONSTRUCTION PHASE DETAIL

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SB2.1 OF 13 SHEETS

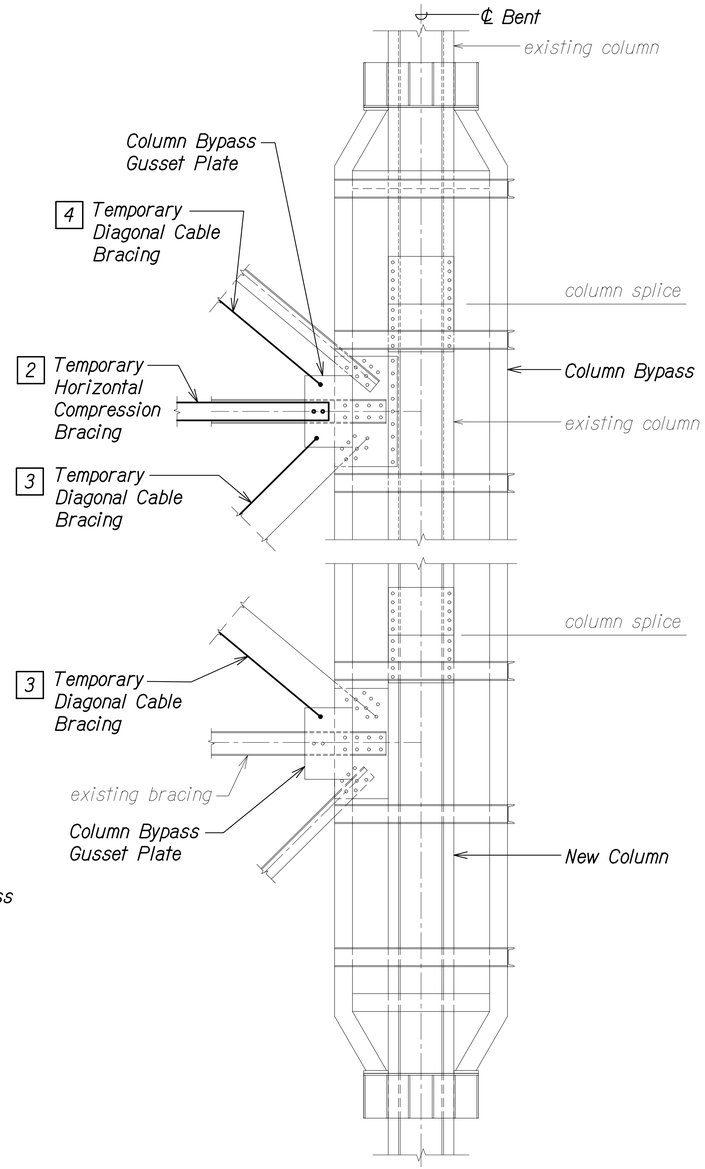
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



TYPICAL COLUMN BYPASS DETAIL (A)

Scale: 1/2" = 1'-0"

A | SB2.2 | BS2.2



TYPICAL COLUMN BYPASS DETAIL (B)

Scale: 1/2" = 1'-0"

B | SB2.2 | SB2.2

CONSTRUCTION SEQUENCE:

PHASE:

2 Install temporary horizontal compression bracings.

3 Install temporary diagonal cable bracing within column bypass level.

4 Install temporary diagonal cable bracing to level above. Temporary bracing shall connect to existing column gusset plate of above level.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

COLUMN BYPASS CONSTRUCTION PHASE DETAIL

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

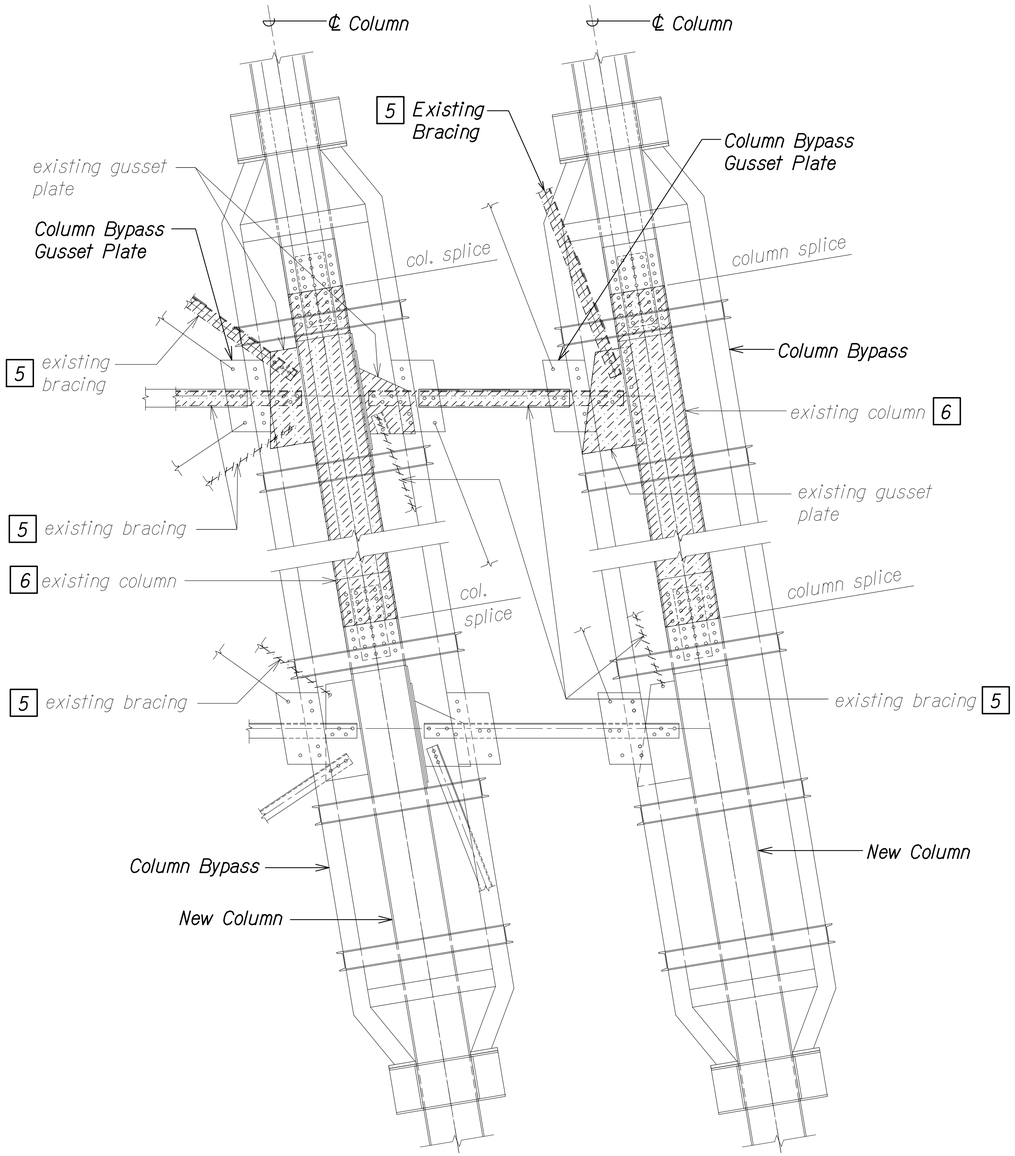
Scale: As Noted Date: Mar. 2024

SHEET No. SB2.2 OF 13 SHEETS

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
NOTE BOOK	TRACED BY	
	DESIGNED BY	
No.	QUANTITIES BY	
	CHECKED BY	

DRAWING NAME: Z:\OD ENGINEERING\OD JF PROJECTS\22-001\12-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\SBR-SB0201 SHORING DETAILS.DWG PLOT TIME: 03-29-24, 4:08 PM

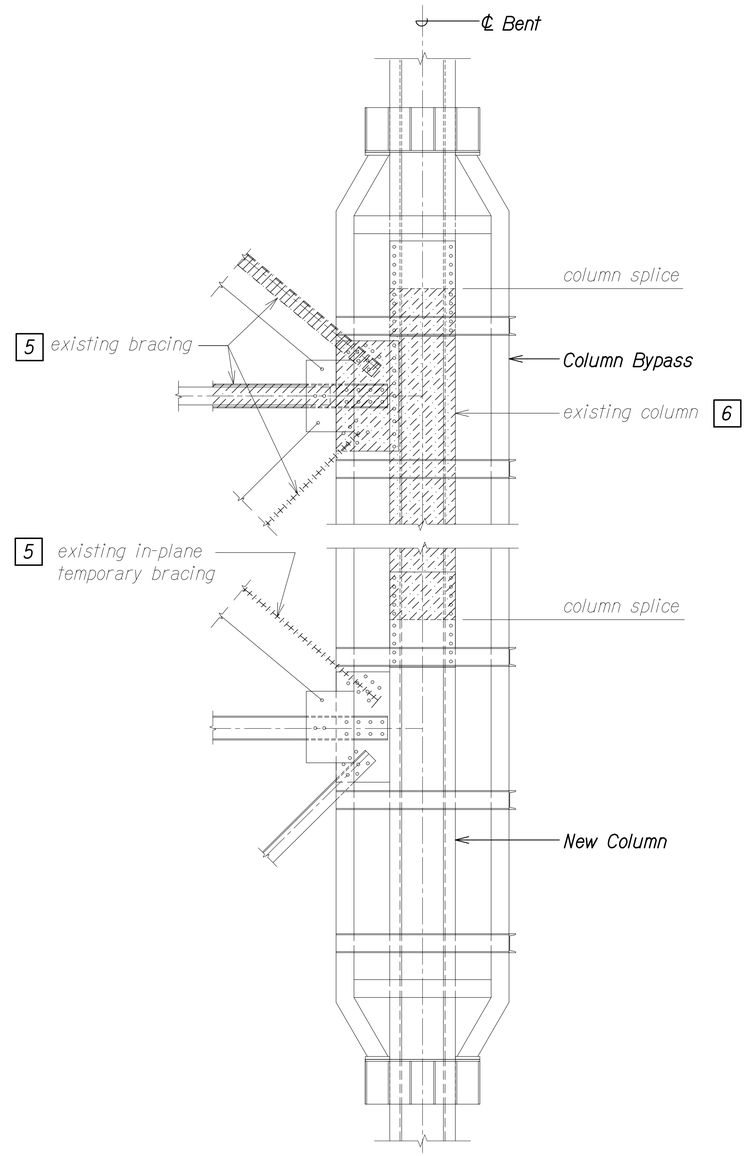
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



TYPICAL COLUMN BYPASS DETAIL (A)

Scale: 1/2" = 1'-0"

SB2.3 | SB2.3



TYPICAL COLUMN BYPASS DETAIL (B)

Scale: 1/2" = 1'-0"

SB2.3 | SB2.3

CONSTRUCTION SEQUENCE:

PHASE:

5 Remove existing bracing along temporary bracings.

6 Remove existing column between existing column splice points within column bypass.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

COLUMN BYPASS CONSTRUCTION PHASE DETAIL

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

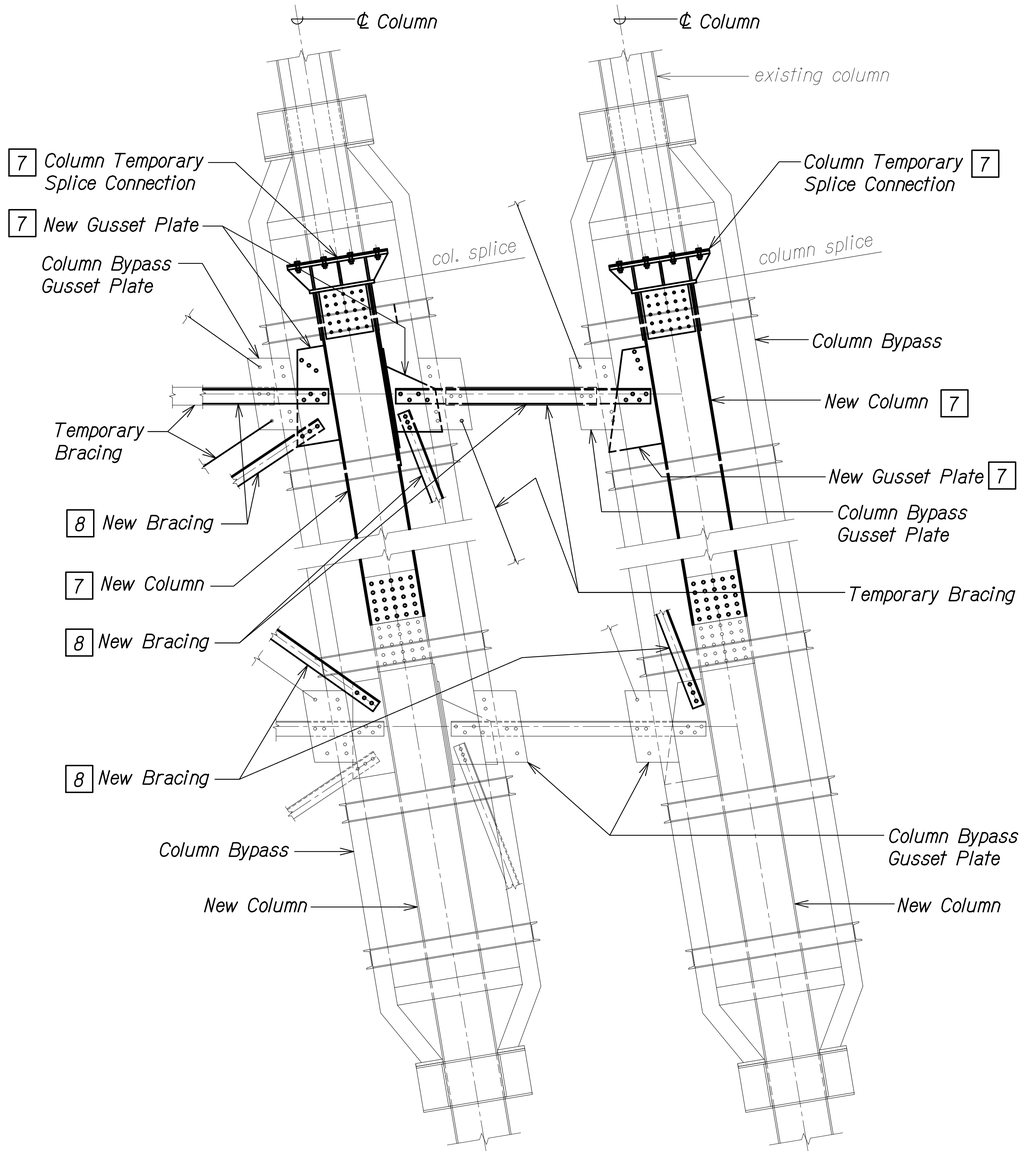
Scale: As Noted Date: Mar. 2024

SHEET No. SB2.3 OF 13 SHEETS

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
NOTE BOOK	TRACED BY	
	DESIGNED BY	
No.	QUANTITIES BY	
	CHECKED BY	

DRAWING NAME: Z:\JOB ONGOING\JOB OF PROJECTS\22-001\12-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\SBR-SB0201 SHORING DETAILS.DWG PLOT TIME: 03-29-24, 4:08 PM

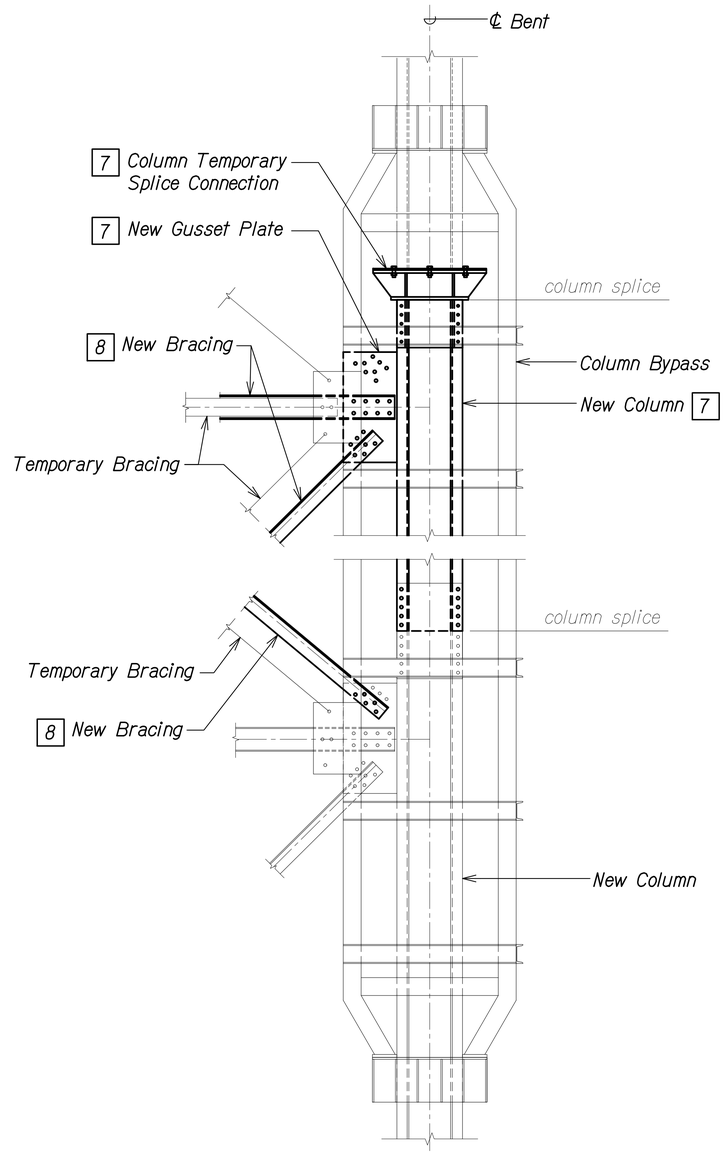
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



TYPICAL COLUMN BYPASS DETAIL (A)

Scale: 1/2" = 1'-0"

SB2.4 | SB2.4



TYPICAL COLUMN BYPASS DETAIL (B)

Scale: 1/2" = 1'-0"

SB2.4 | SB2.4

CONSTRUCTION SEQUENCE:

PHASE:

7 Install new column between column spice locations within column bypass. Install column temporary splice connection at top of new column; See sht. SB3.6.

8 Install new bracing within column bypass level.

ORIGINAL PLAN | SURVEY PLOTTED BY | DATE
NOTE BOOK | DRAWN BY
No. | TRACED BY
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QUANTITIES BY
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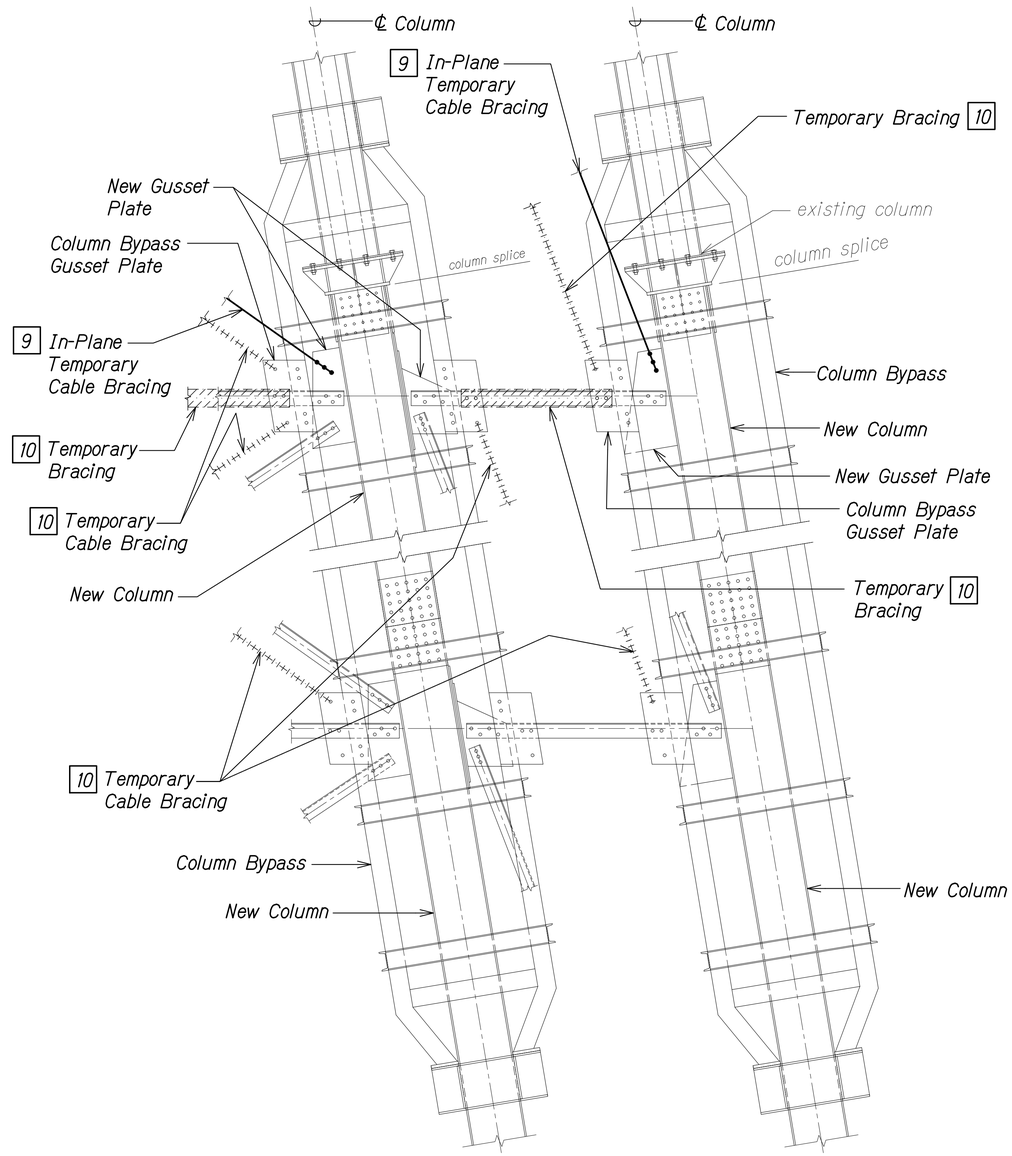
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

COLUMN BYPASS CONSTRUCTION PHASE DETAIL

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

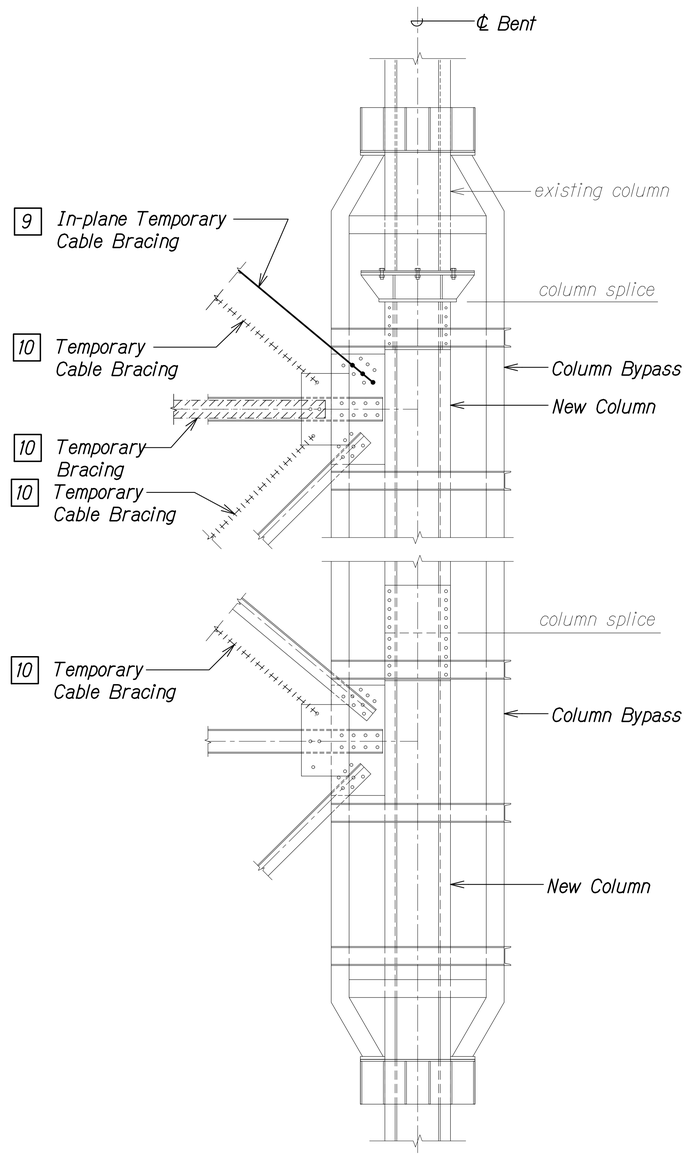
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



TYPICAL COLUMN BYPASS DETAIL (A)

Scale: 1/2" = 1'-0"

SB2.5 | SB2.5



TYPICAL COLUMN BYPASS DETAIL (B)

Scale: 1/2" = 1'-0"

SB2.5 | SB2.5

CONSTRUCTION SEQUENCE:

PHASE:

9 Install in-plane temporary cable bracing between new column gusset plate at column bypass level and existing column gusset plate at level above.

10 Remove temporary bracing.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE	
	DRAWN BY		
NOTE BOOK	TRACED BY		
	DESIGNED BY		
No.	QUANTITIES BY		
	CHECKED BY		

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

COLUMN BYPASS CONSTRUCTION PHASE DETAIL

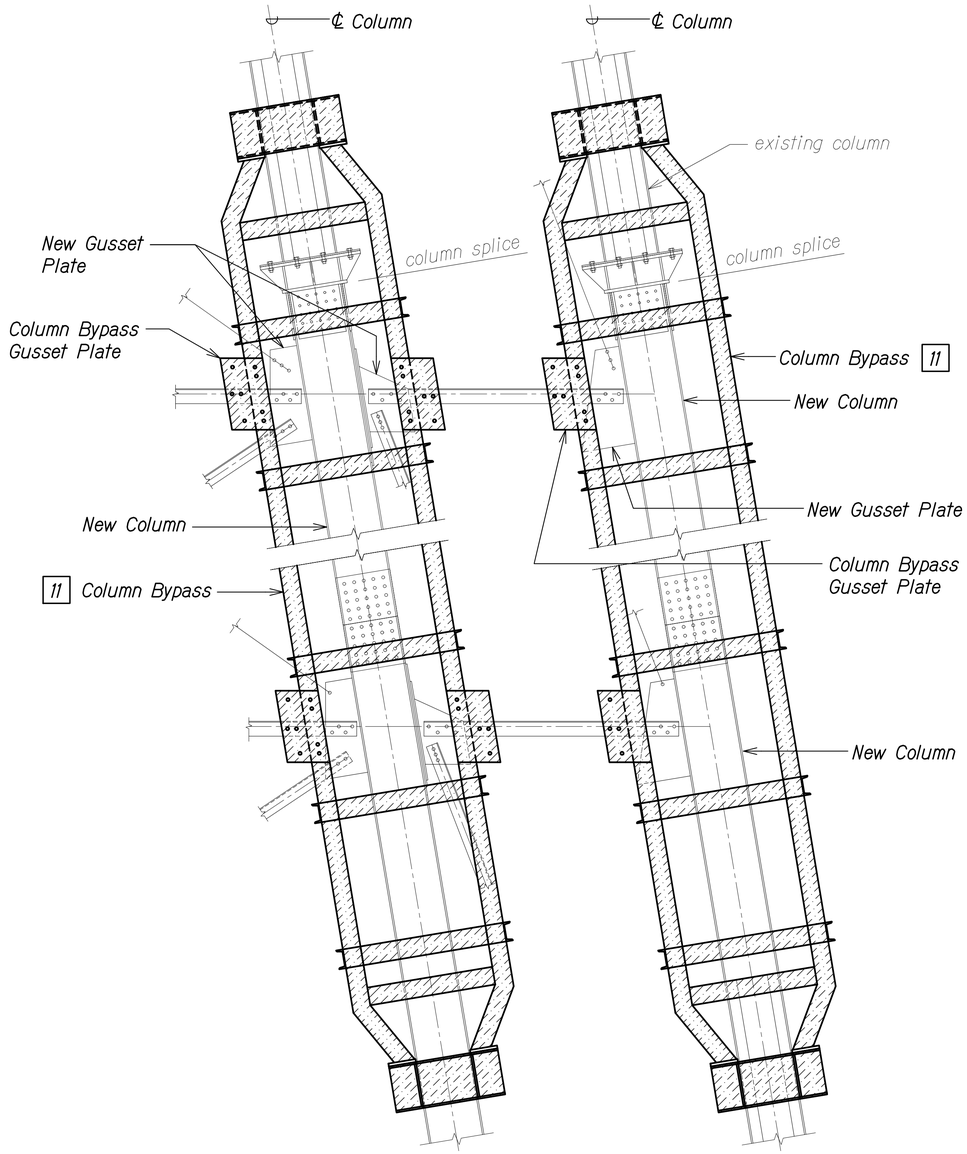
HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SB2.5 OF 13 SHEETS

DRAWING NAME: Z:\OD ENGINEERING\0 JF PROJECTS\22-001 12-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\SR-SB0201 SHORING DETAILS.DWG PLOT TIME: 03-29-24, 4:09 PM

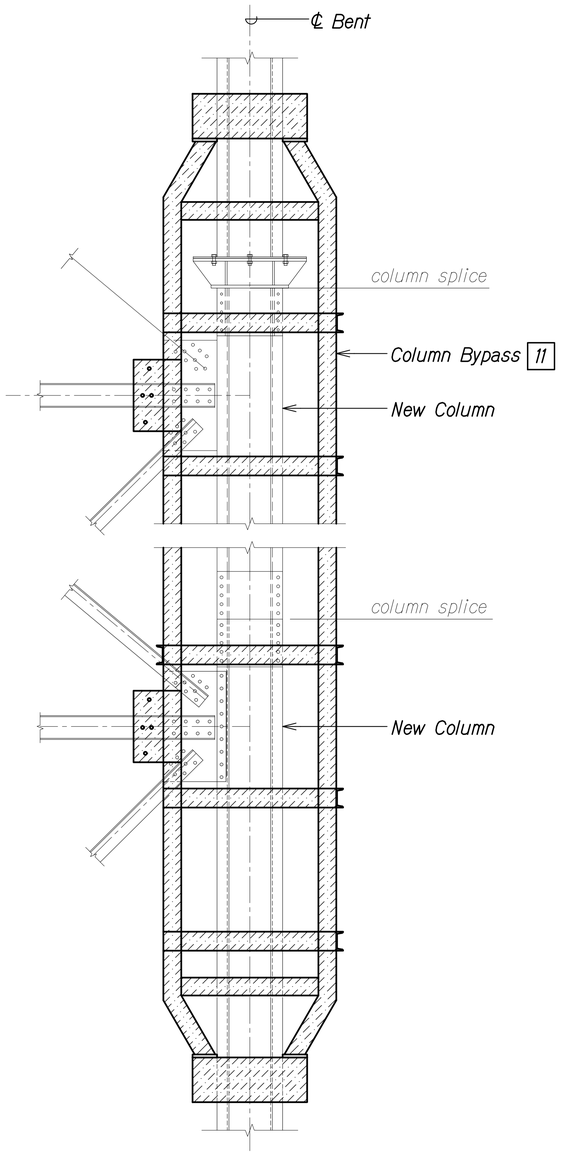
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



TYPICAL COLUMN BYPASS DETAIL

Scale: 1/2" = 1'-0"

A SB2.6 | SB2.6



TYPICAL COLUMN BYPASS DETAIL

Scale: 1/2" = 1'-0"

B SB2.6 | SB2.6

CONSTRUCTION SEQUENCE:

PHASE:

11 Remove column bypass.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
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	DESIGNED BY	
	QUANTITIES BY	
	CHECKED BY	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

COLUMN BYPASS CONSTRUCTION PHASE DETAIL

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

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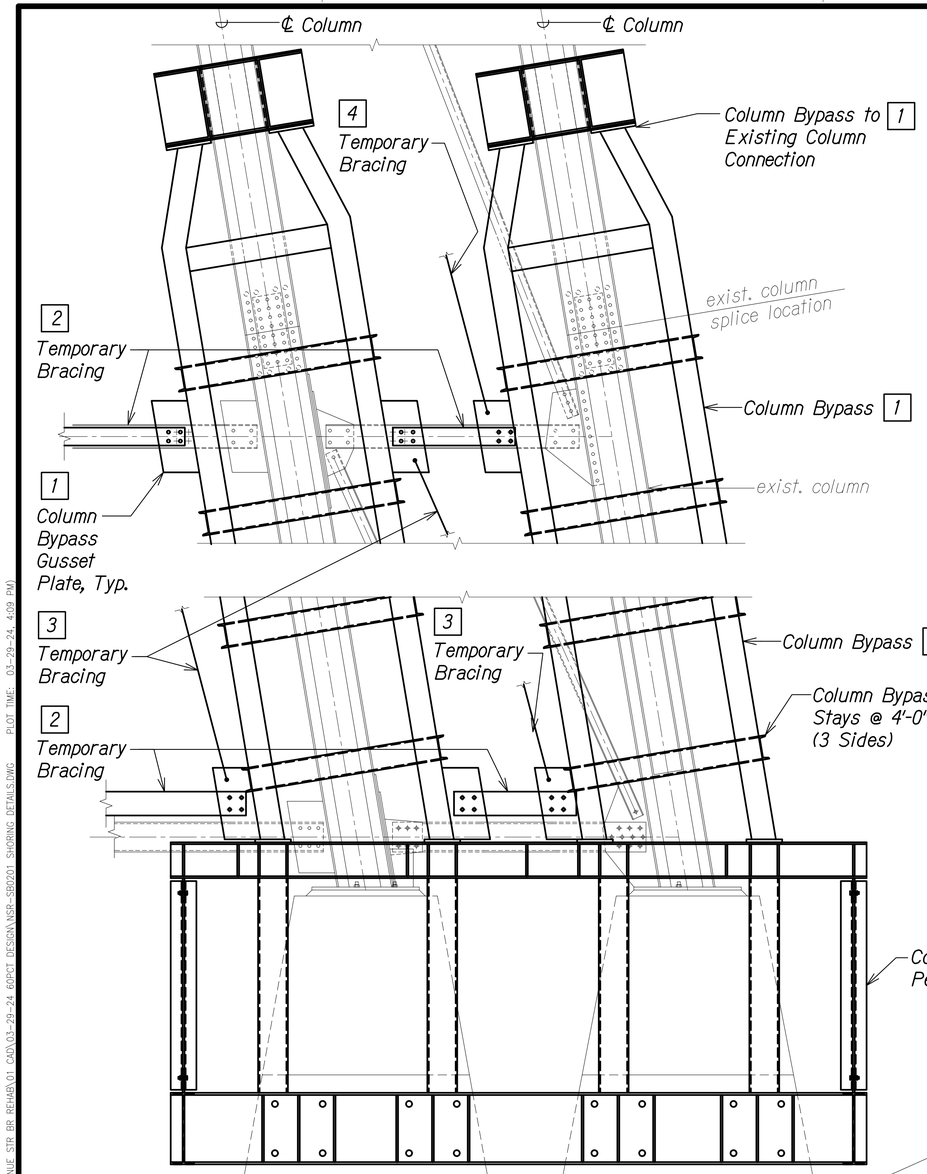
SHEET No. SB2.6 OF 13 SHEETS

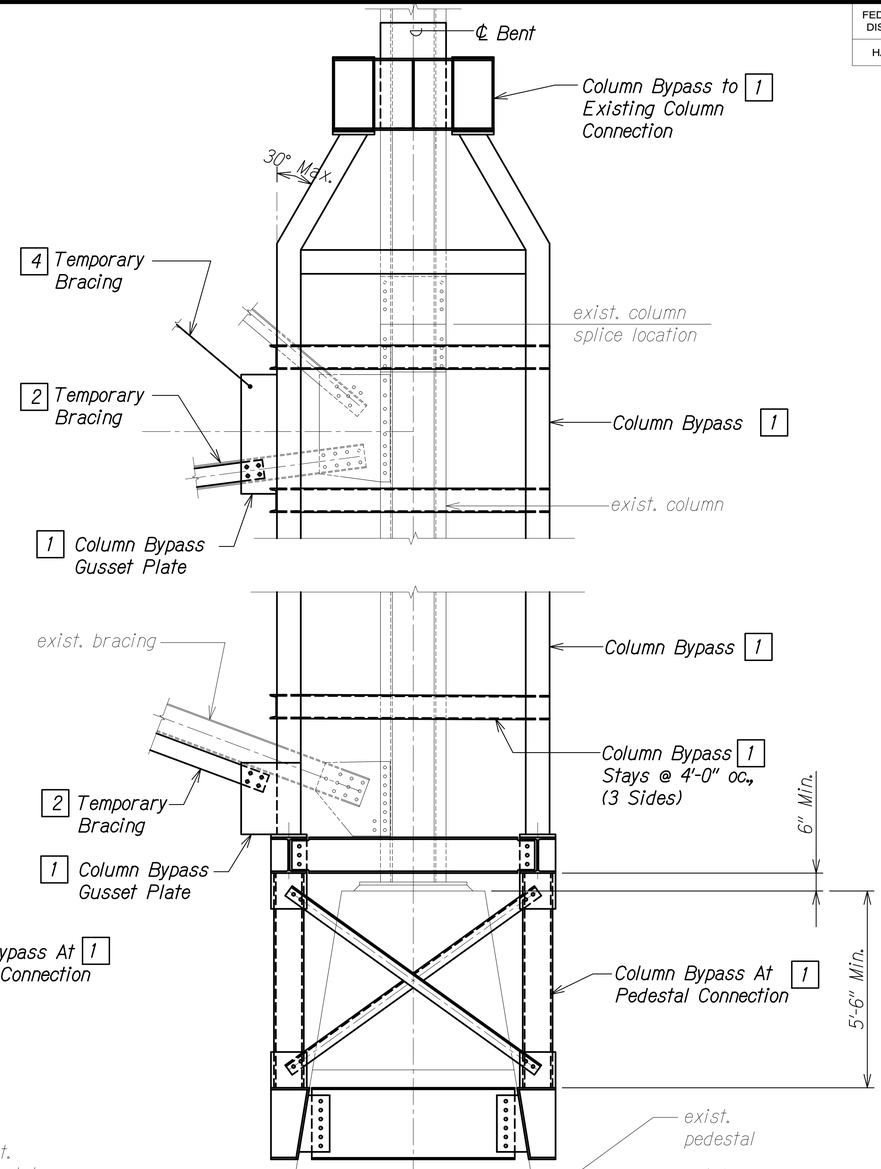
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



COLUMN BYPASS TO BENT PEDESTAL DETAIL A

Scale: 1/2" = 1'-0"

SB2.7 | SB2.7



COLUMN BYPASS TO BENT PEDESTAL DETAIL B

Scale: 1/2" = 1'-0"

SB2.7 | SB2.7

CONSTRUCTION SEQUENCE:

PHASES:

1 Install bottom of bent column bypass assembly. See sht. SB3.7.

2 Install temporary horizontal compression bracings.

3 Install temporary diagonal cable bracing within column bypass level.

4 Install temporary diagonal bracing to level above temporary bracing shall connect to existing columns gusset plate of above level.

STATE OF HAWAII
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COLUMN BYPASS CONSTRUCTION PHASE DETAIL

HAWAII BELT ROAD
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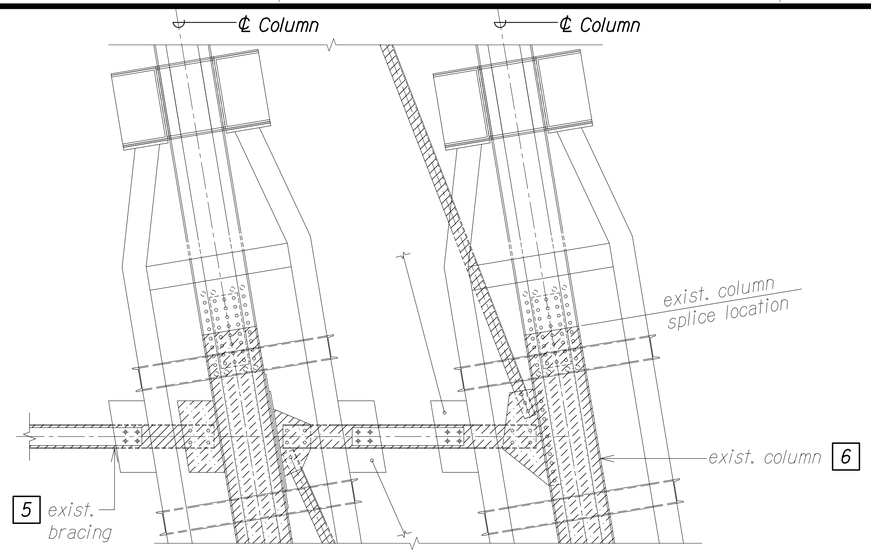
Scale: As Noted Date: Mar. 2024

SHEET No. SB2.7 OF 13 SHEETS

ORIGINAL PLAN | NOTE BOOK | No.
SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE

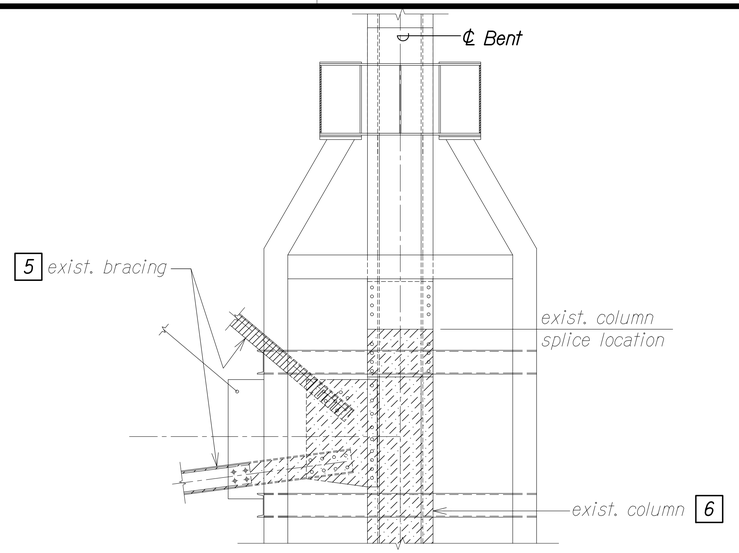
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



COLUMN BYPASS TO BENT PEDESTAL DETAIL A

Scale: 1/2" = 1'-0"

SB2.8 | SB2.8



COLUMN BYPASS TO BENT PEDESTAL DETAIL B

Scale: 1/2" = 1'-0"

SB2.8 | SB2.8

CONSTRUCTION SEQUENCE:

PHASES:

5 Remove existing bracings.

6 Remove existing Column.

7 Demolish and remove top of pedestal and upper portion of existing anchor bolts. See Sheet SA10.1.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
NOTE BOOK	TRACED BY	
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

COLUMN BYPASS CONSTRUCTION PHASE DETAIL

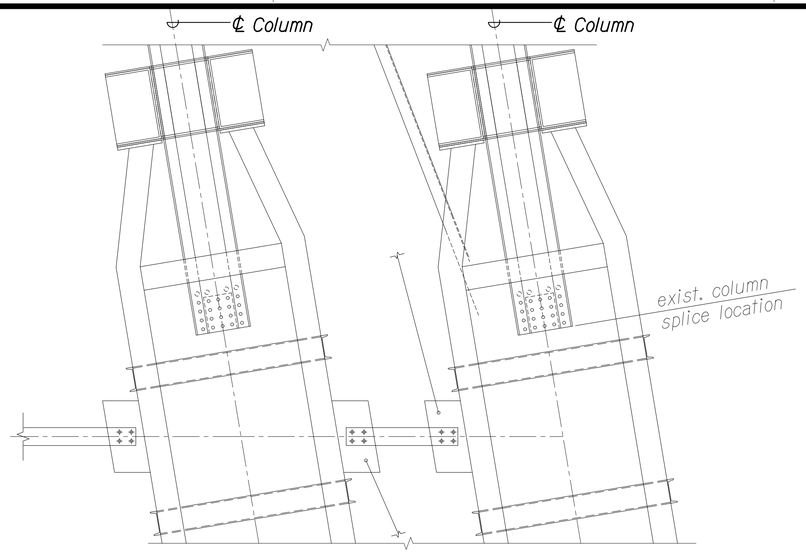
HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

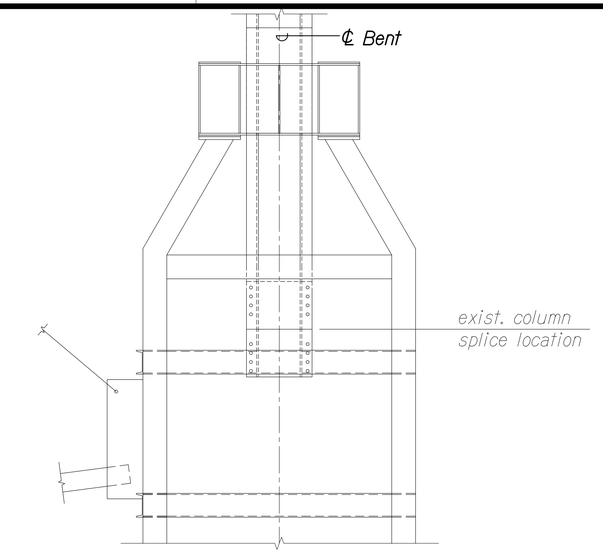
SHEET No. SB2.8 OF 13 SHEETS

DRAWING NAME: Z:\OD ENGINEERING\00 JF PROJECTS\22-00112-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\SR-SB0201 SHORING DETAILS.DWG PLOT TIME: 03-29-24, 4:09 PM

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



COLUMN BYPASS
TO BENT PEDESTAL DETAIL A
Scale: 1/2" = 1'-0"
SB2.9 | SB2.9



COLUMN BYPASS
TO BENT PEDESTAL DETAIL B
Scale: 1/2" = 1'-0"
SB2.9 | SB2.9

CONSTRUCTION SEQUENCE:

PHASES:

8 Install pedestal anchor bolts and reinforcing. See sht. SA10.5.

9 Pour top of pedestal back to original top of foundation height and added grade beam. See sht. SA10.5.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
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NOTE BOOK	TRACED BY	
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STATE OF HAWAII
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HIGHWAYS DIVISION

COLUMN BYPASS
CONSTRUCTION PHASE DETAIL

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
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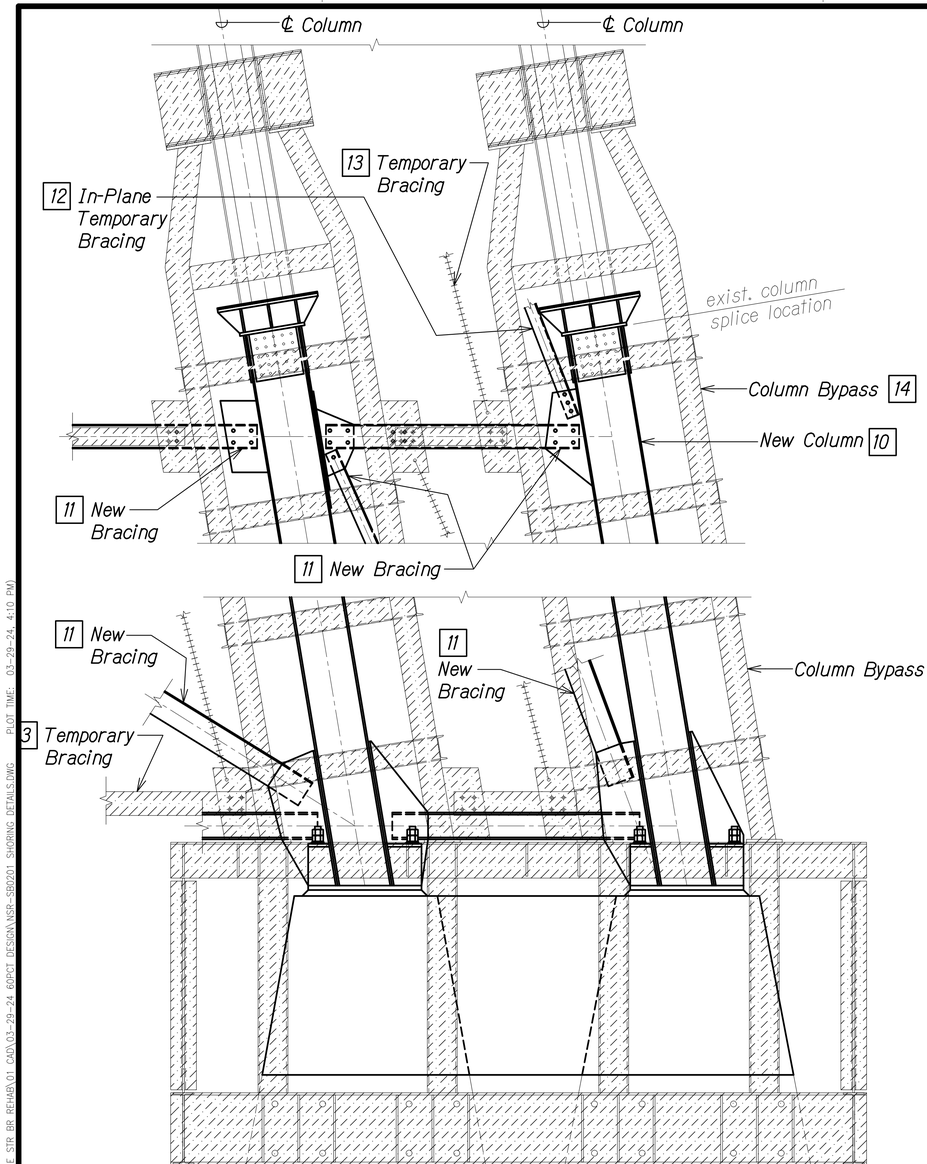
Scale: As Noted Date: Mar. 2024

SHEET No. SB2.9 OF 13 SHEETS

DRAWING NAME: Z:\OD ENGINEERING\OD JF PROJECTS\22-00112-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\SB\SB2001 SHORING DETAILS.DWG PLOT TIME: 03-29-24, 4:10 PM

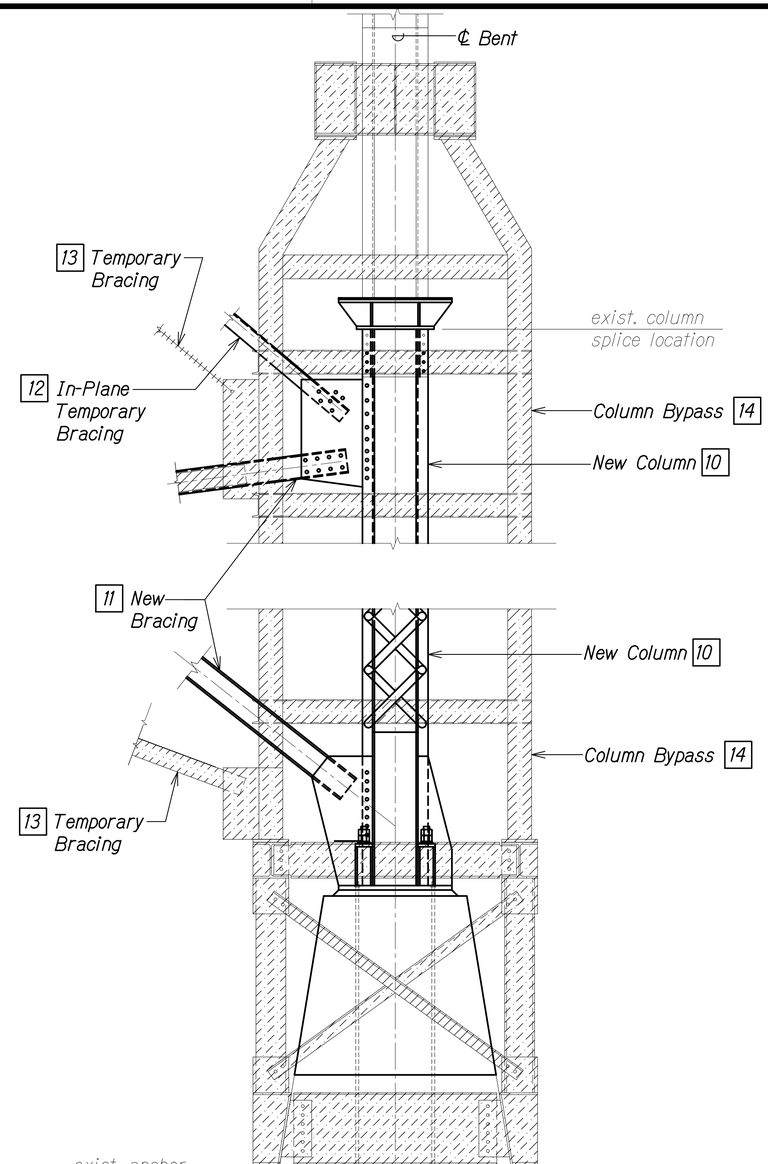
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



COLUMN BYPASS TO BENT PEDESTAL DETAIL A

Scale: 1/2" = 1'-0"

SB2.10 | SB2.10



COLUMN BYPASS TO BENT PEDESTAL DETAIL B

Scale: 1/2" = 1'-0"

SB2.10 | SB2.10

CONSTRUCTION SEQUENCE:

PHASES:

10 Install new column.

11 Install new bracing.

12 Install in-place temporary bracing between new column at column bypass level and existing column gusset plate at level above.

13 Remove temporary bracings.

14 Remove Column Bypass assembly.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
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STATE OF HAWAII
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HIGHWAYS DIVISION

COLUMN BYPASS CONSTRUCTION PHASE DETAIL

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
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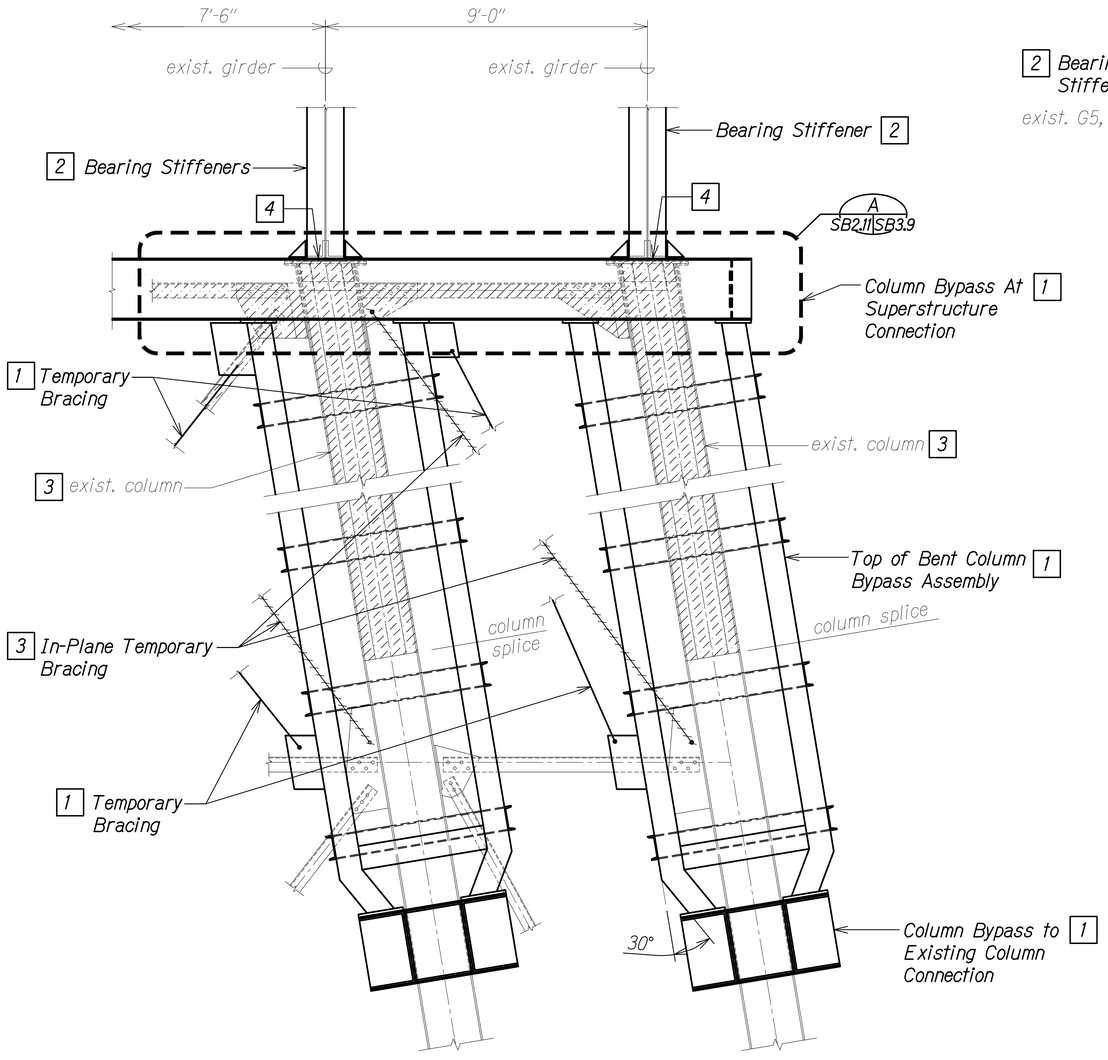
SHEET No. SB2.10 OF 13 SHEETS

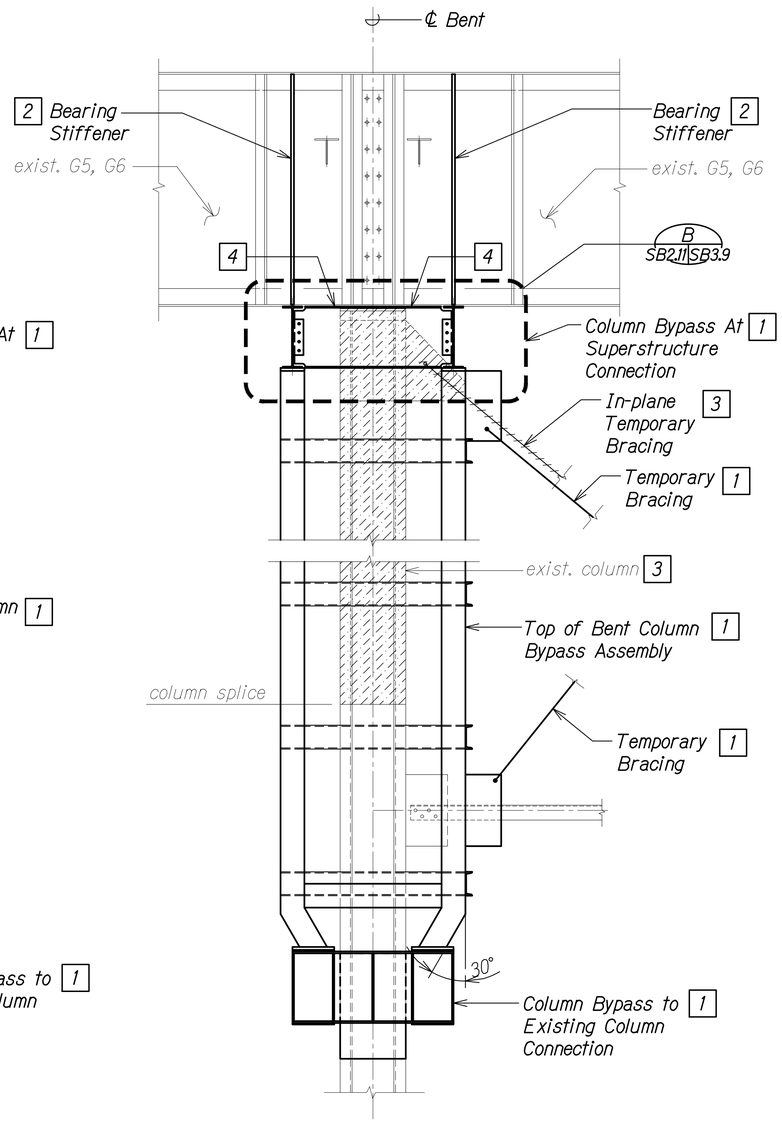
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



COLUMN BYPASS TO SUPERSTRUCTURE DETAIL A

Scale: 1/2" = 1'-0"

SB2.11 SB2.11



COLUMN BYPASS TO SUPERSTRUCTURE DETAIL B

Scale: 1/2" = 1'-0"

SB2.11 SB2.11

CONSTRUCTION SEQUENCE:

PHASES:

1. Install top of bent column bypass assembly and temporary bracing.
2. Add bearing stiffeners to existing girders at column bypass bearing locations.
3. Remove existing column and bracing.
4. Clean bottom of girder at bearing locations. See sht. SA9.1.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
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	QUANTITIES BY	
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

COLUMN BYPASS CONSTRUCTION PHASE DETAIL

HAWAII BELT ROAD
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Federal Aid Project No. BR-019-2(077)

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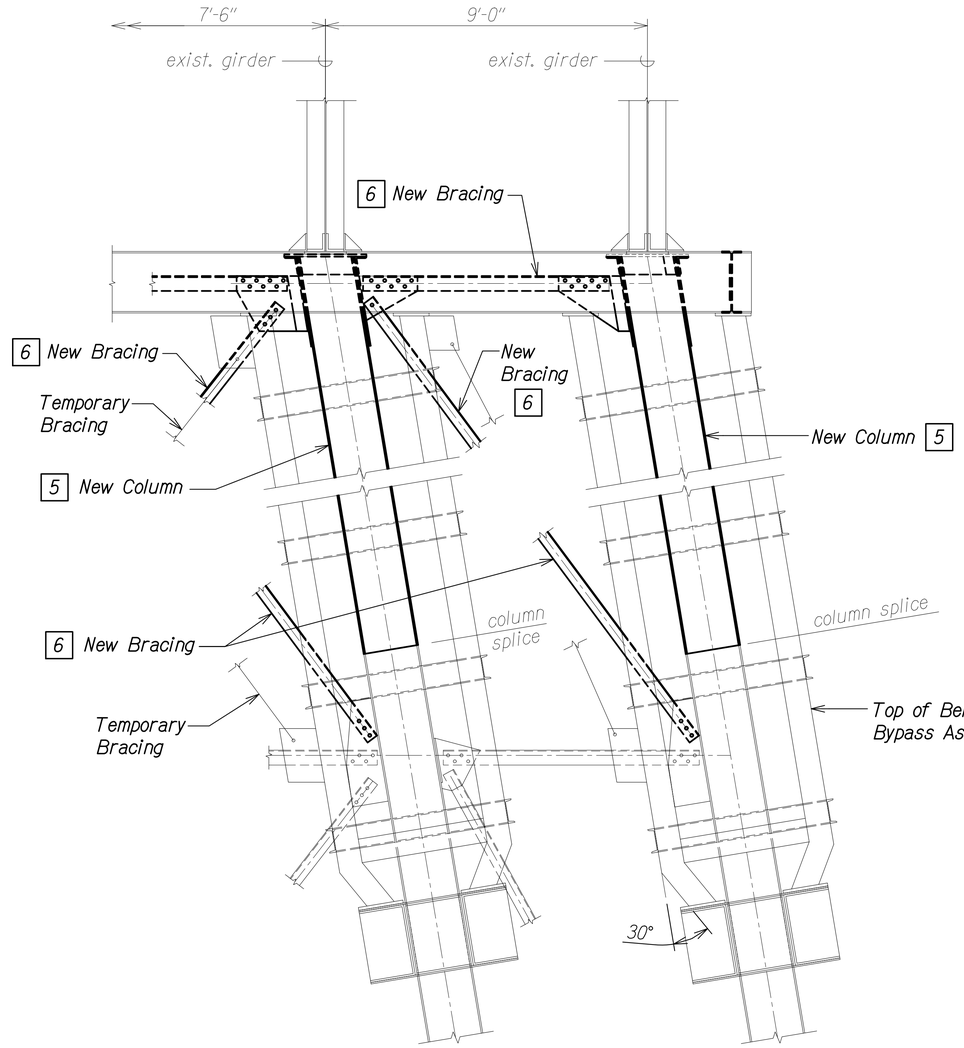
SHEET No. SB2.11 OF 13 SHEETS

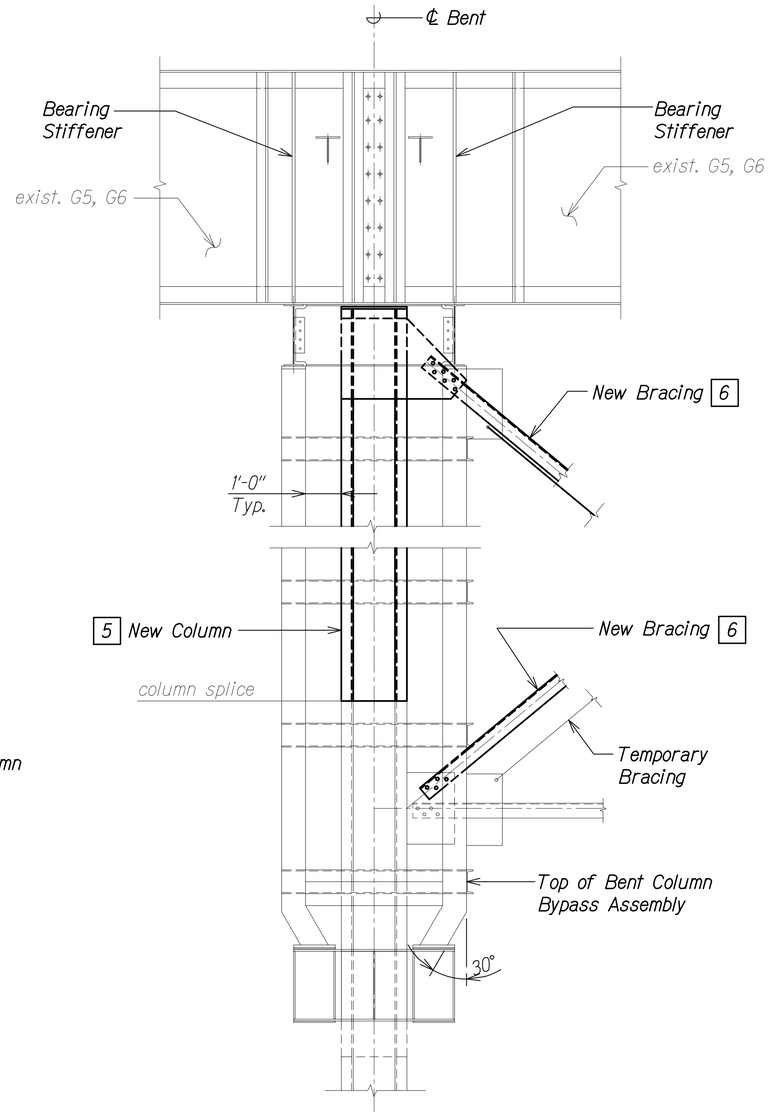
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



COLUMN BYPASS TO SUPERSTRUCTURE DETAIL A

Scale: 1/2" = 1'-0"

SB2.12 | SB2.12



COLUMN BYPASS TO SUPERSTRUCTURE DETAIL B

Scale: 1/2" = 1'-0"

SB2.12 | SB2.12

CONSTRUCTION SEQUENCE:

PHASES:

5 Install new column

6 Install new bracing

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

COLUMN BYPASS CONSTRUCTION PHASE DETAIL

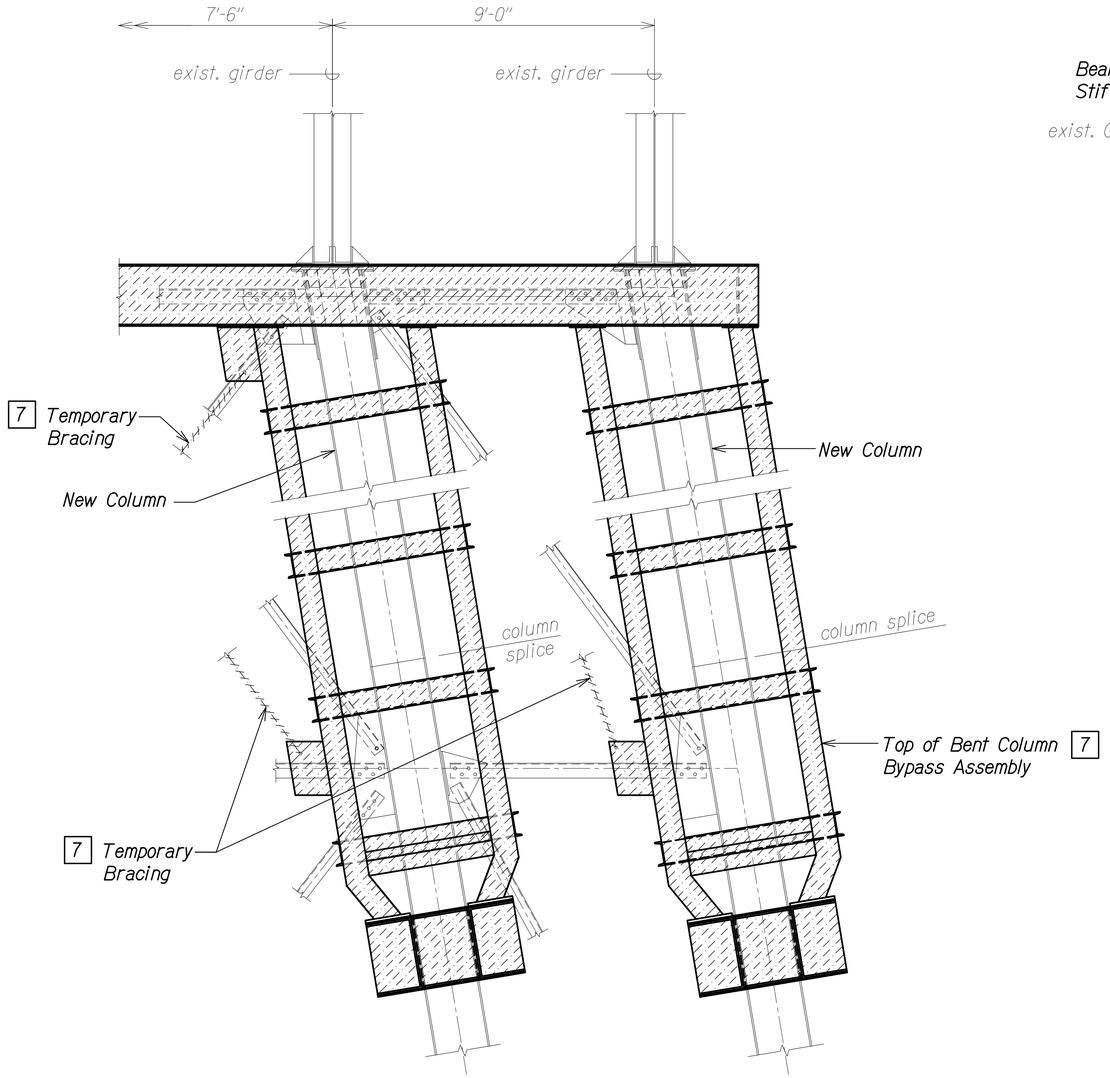
HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

SHEET No. SB2.12 OF 13 SHEETS

DRAWING NAME: Z:\OD ONGOING\OD JF PROJECTS\22-001.12-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\NSR-SB0201 SHORING DETAILS.DWG PLOT TIME: 03-29-24, 4:10 PM

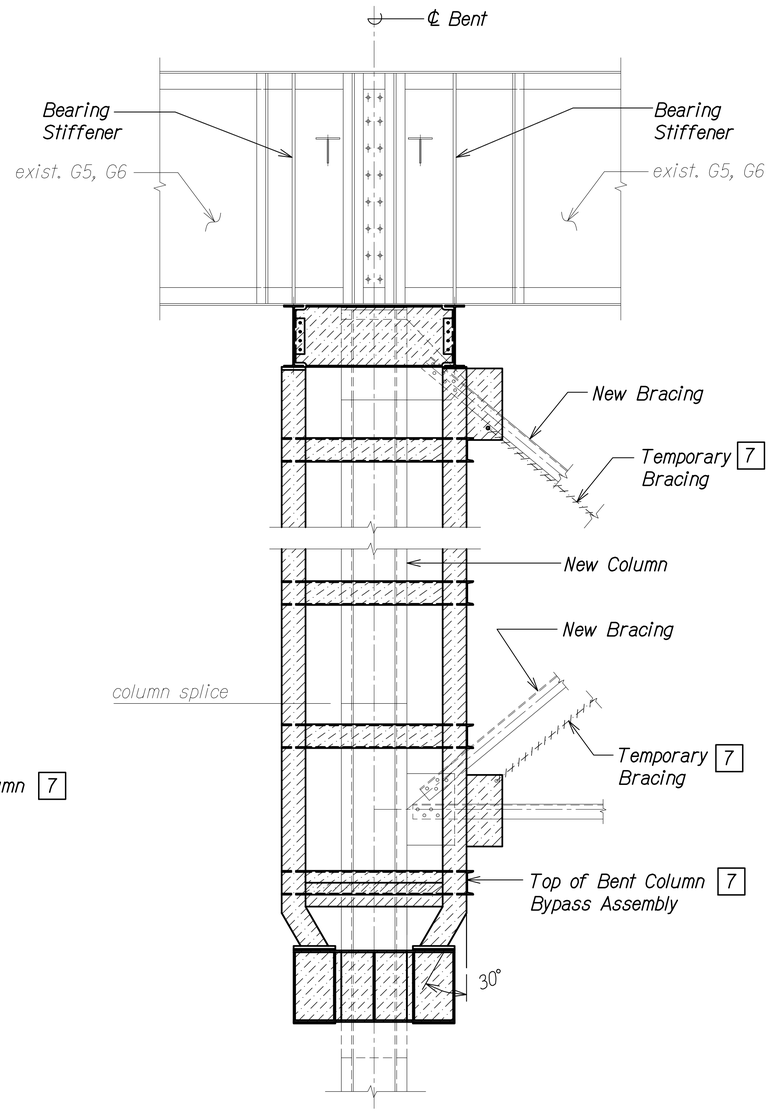
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



COLUMN BYPASS TO SUPERSTRUCTURE DETAIL A

Scale: 1/2" = 1'-0"

SB2.13 | SB2.13



COLUMN BYPASS TO SUPERSTRUCTURE DETAIL B

Scale: 1/2" = 1'-0"

SB2.13 | SB2.13

CONSTRUCTION SEQUENCE:

PHASES:

7 Remove column bypass assembly and temporary bracing.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
No.	TRACED BY	
	DESIGNED BY	
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STATE OF HAWAII
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HIGHWAYS DIVISION

COLUMN BYPASS CONSTRUCTION PHASE DETAIL

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

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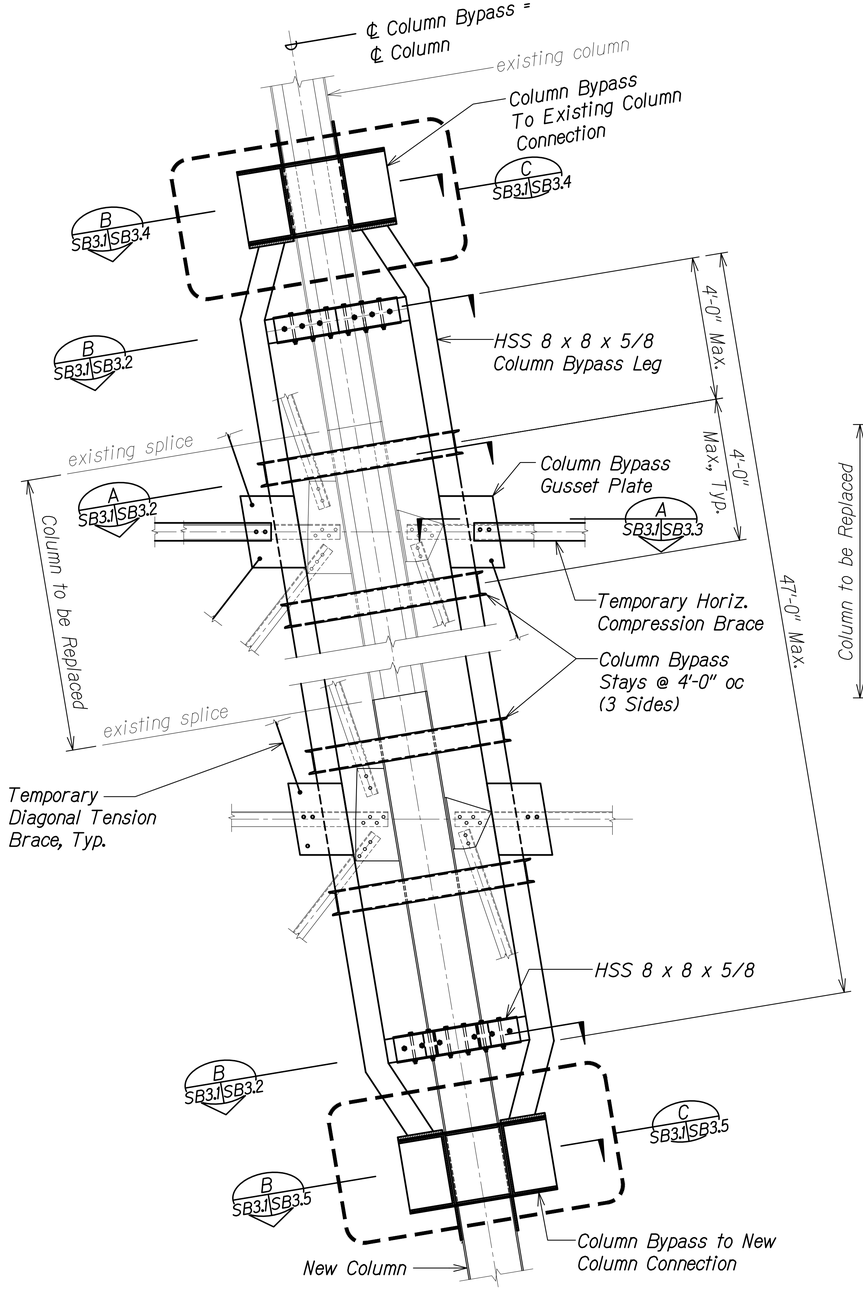
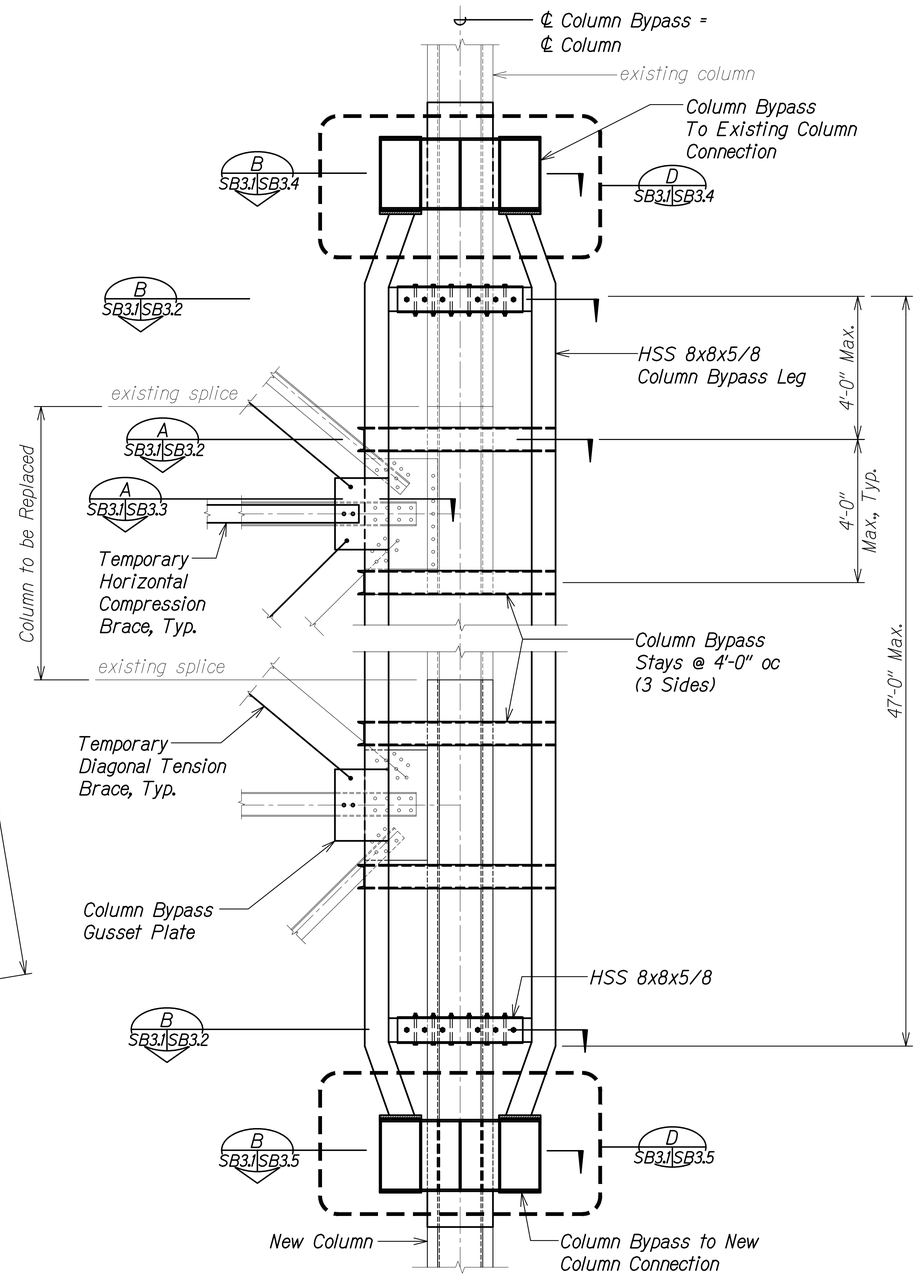
SHEET No. SB2.13 OF 13 SHEETS

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



HILO - HONOKA'A ELEVATION



UPSTREAM - DOWNSTREAM ELEVATION

TYPICAL COLUMN BYPASS CONNECTION DETAILS

Scale: 1/2" = 1'-0"

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
	TRACED BY	
	DESIGNED BY	
No.	QUANTITIES BY	
	CHECKED BY	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

COLUMN BYPASS CONSTRUCTION DETAILS

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

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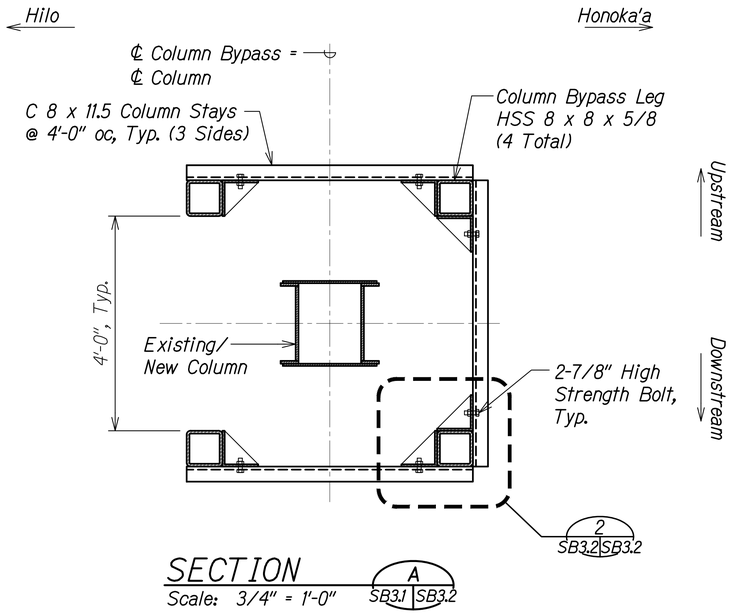
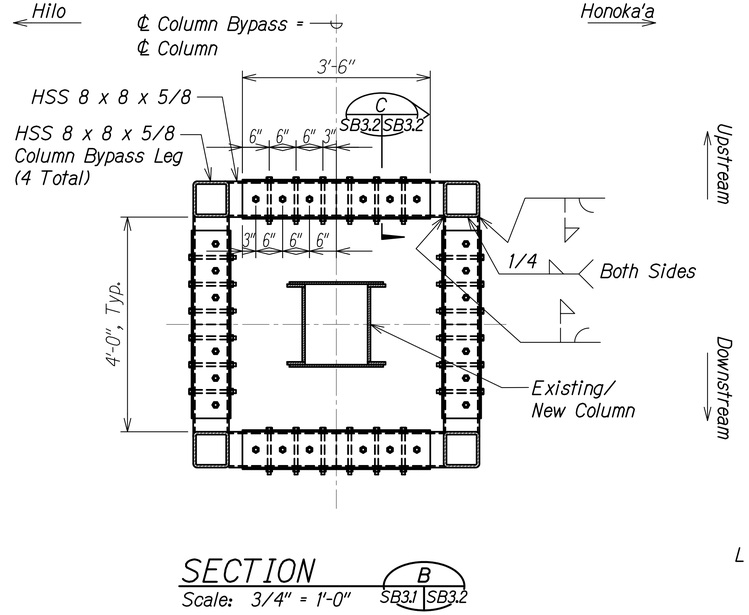
SHEET No. SB3.1 OF 9 SHEETS

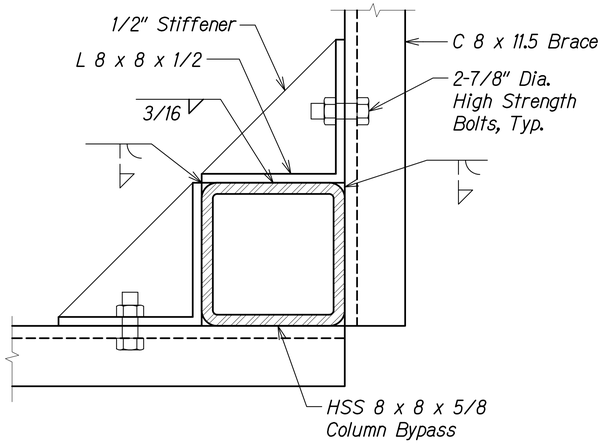
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



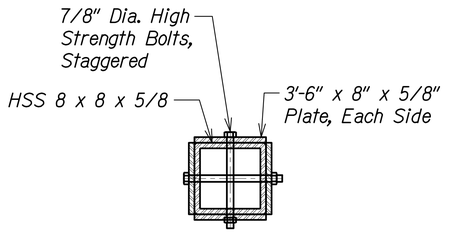
SECTION A
Scale: 3/4" = 1'-0" SB3.1 SB3.2



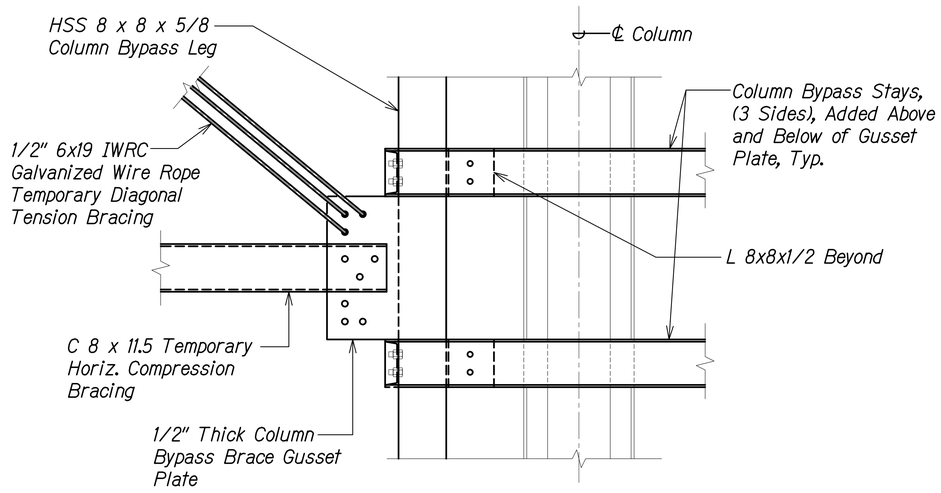
SECTION B
Scale: 3/4" = 1'-0" SB3.1 SB3.2



DETAIL 2
Scale: 3" = 1'-0" SB3.2 SB3.2



SECTION C
Scale: 1 1/2" = 1'-0" SB3.2 SB3.2



COLUMN BYPASS CONNECTION DETAILS 1
Scale: 1" = 1'-0" SB3.2 SB3.2

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
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DRAWING NAME: Z:\OD ONGOING\OD JF PROJECTS\22-001.12-NANUE STR BR REHAB\01 CAD\03-29-24 60PCT DESIGN\NSB-SB03D1 DTL.DWG PLOT TIME: 03-29-24, 4:11 PM

STATE OF HAWAII
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HIGHWAYS DIVISION

COLUMN BYPASS CONSTRUCTION DETAILS

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

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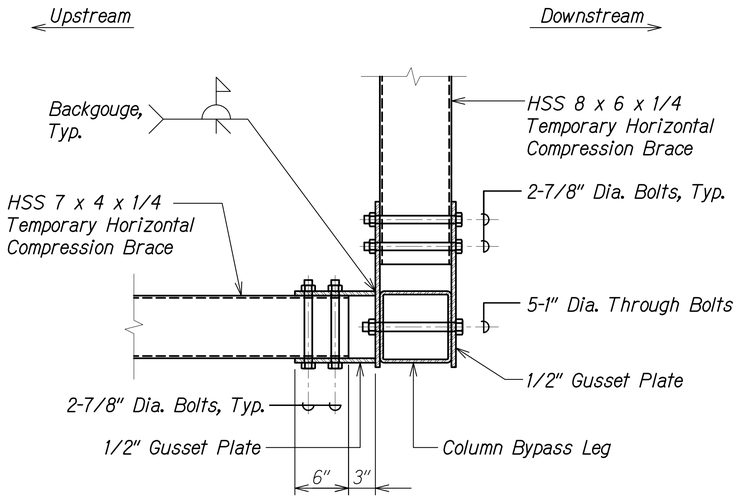
SHEET No. SB3.2 OF 9 SHEETS

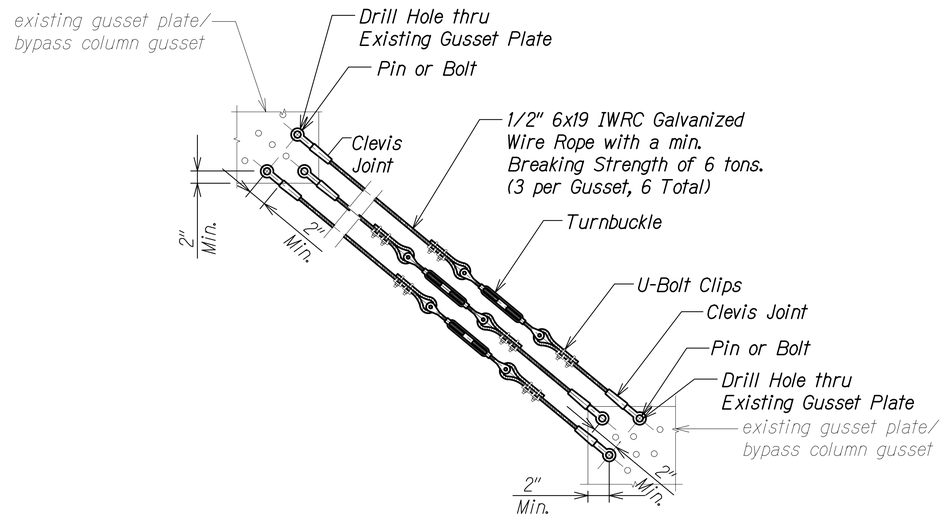
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(077)	2024		



COLUMN BYPASS GUSSET PLATE SECTION DETAIL

Scale: 1 1/2" = 1'-0"

A SB3.1 | SB3.3



COLUMN BYPASS TEMPORARY DIAGONAL TENSION BRACING DETAIL

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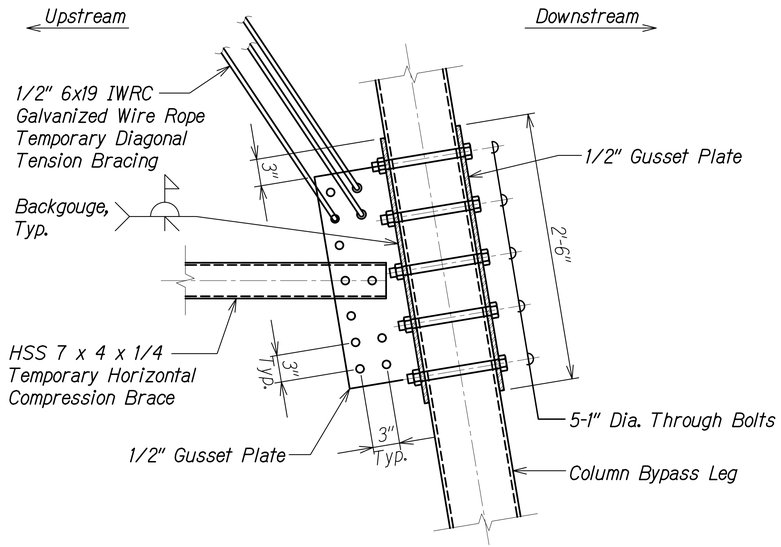
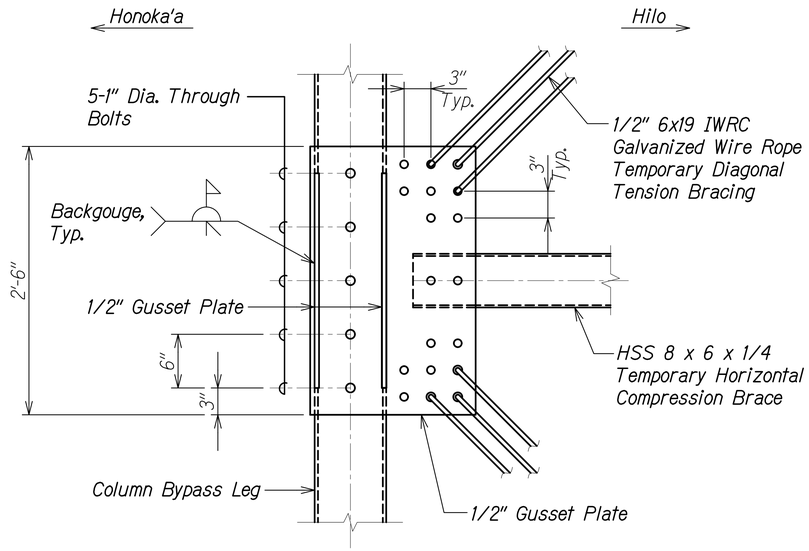
1 SB3.3 | SB3.3



COLUMN BYPASS GUSSET PLATE HILO TO HONOKA'A ELEVATION DETAIL

Scale: 1 1/2" = 1'-0"

B SB3.3 | SB3.3



COLUMN BYPASS GUSSET PLATE UPSTREAM DOWNSTREAM ELEVATION DETAIL

Scale: 1 1/2" = 1'-0"

C SB3.3 | SB3.3

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

COLUMN BYPASS CONSTRUCTION DETAILS

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

Scale: As Noted Date: Mar. 2024

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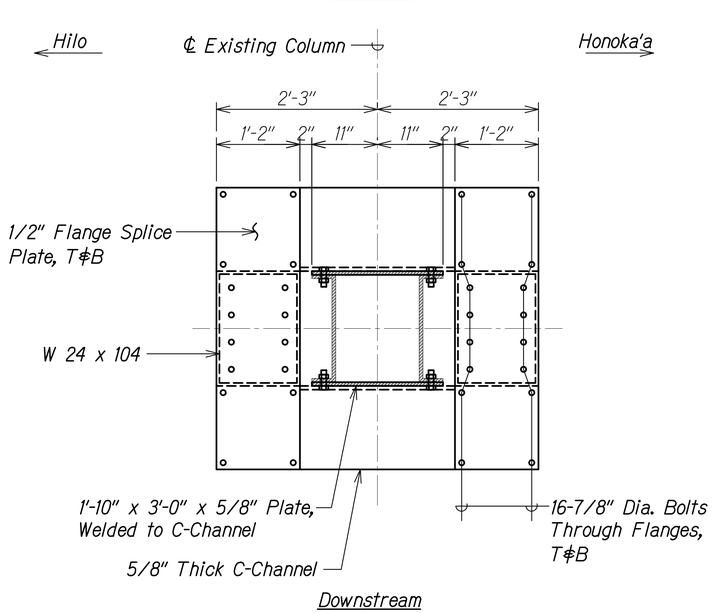
HAWAII	HAW.	BR-019-2(077)	2024		



TOP CONNECTION ASSEMBLY PLAN

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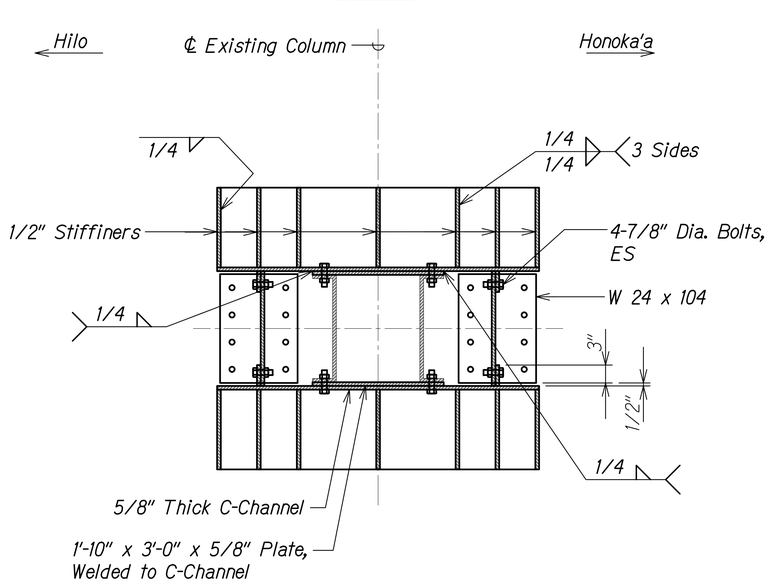

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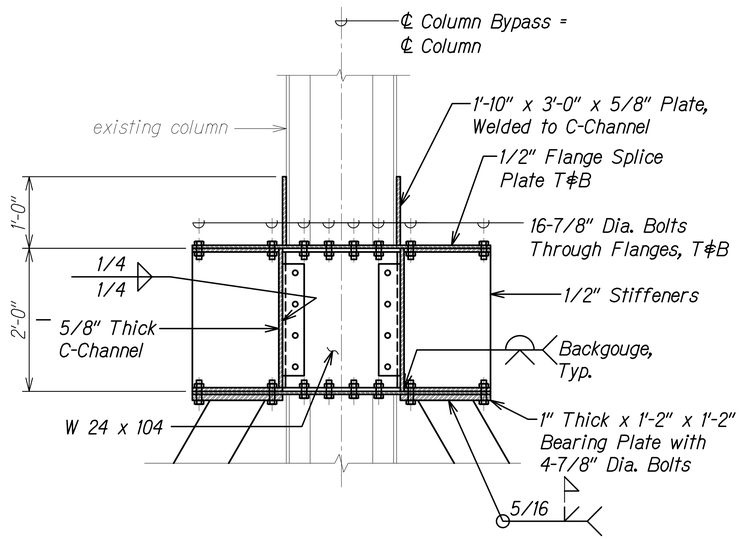

TOP CONNECTION ASSEMBLY HILO - HONOKA'A ELEVATION

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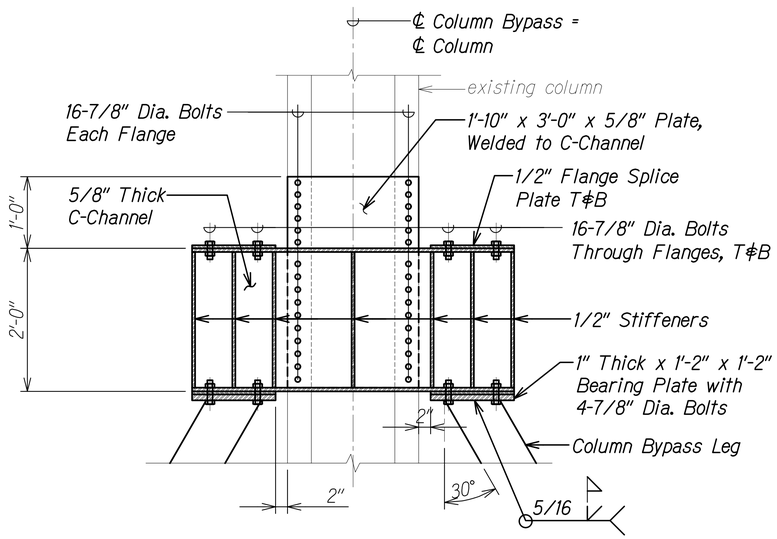

TOP CONNECTION ASSEMBLY UPSTREAM - DOWNSTREAM ELEVATION

Scale: 1" = 1'-0"

D SB3.1 | SB3.4

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

COLUMN BYPASS CONSTRUCTION DETAILS

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
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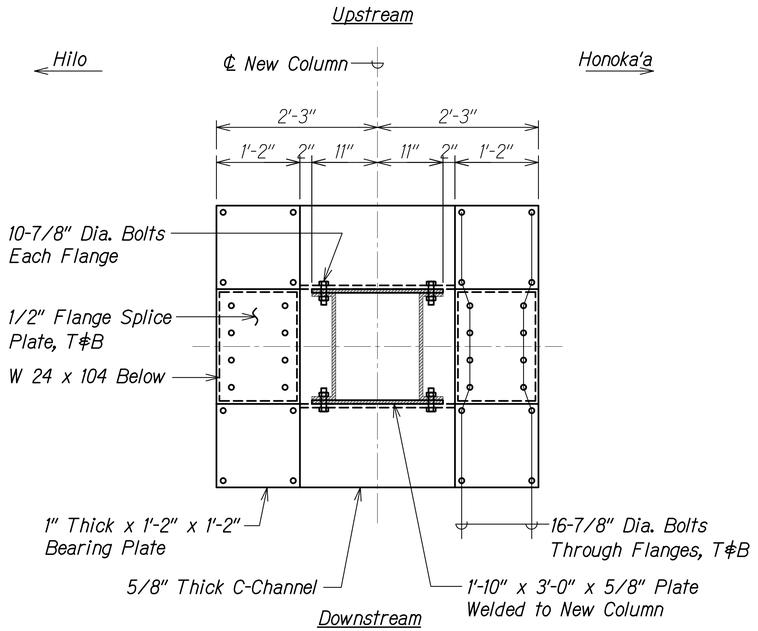
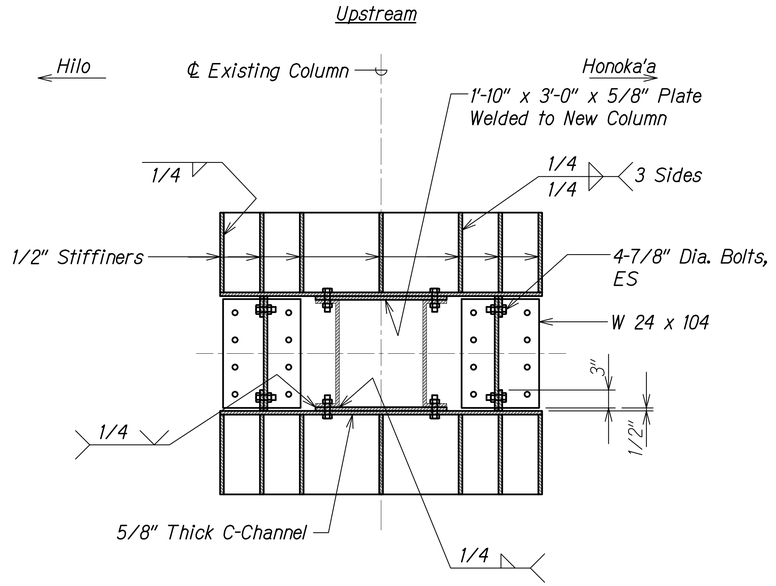


BOTTOM CONNECTION ASSEMBLY PLAN

Scale: 1" = 1'-0"

A SB3.5 | SB3.5



BOTTOM CONNECTION ASSEMBLY SECTION

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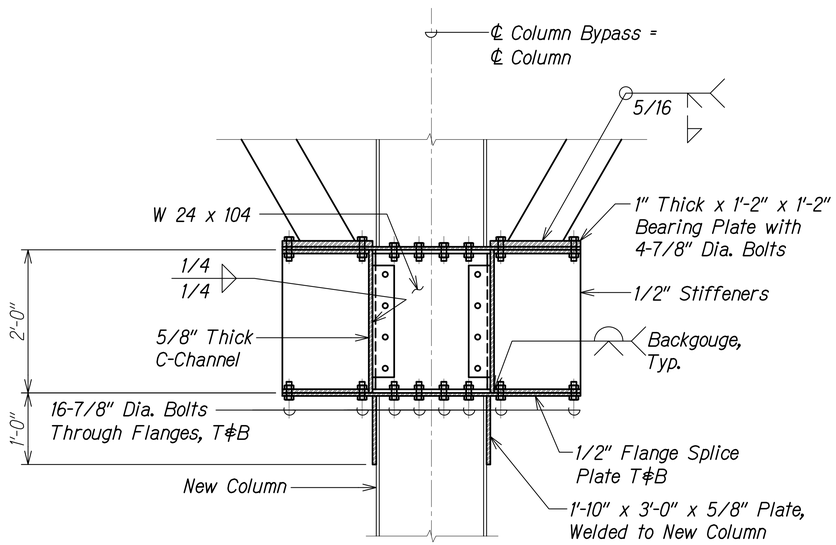

BOTTOM CONNECTION ASSEMBLY HILO - HONOKA'A ELEVATION

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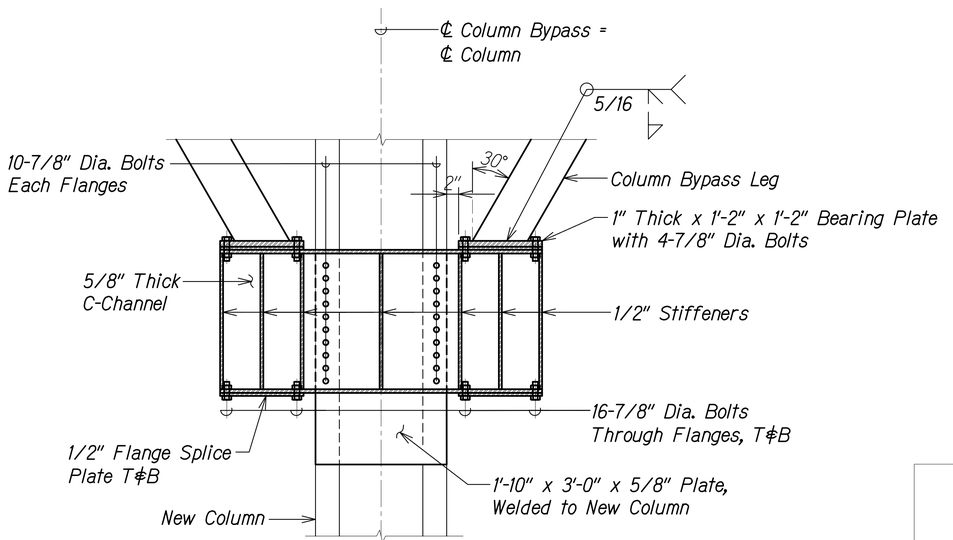
C SB3.1 | SB3.5



BOTTOM CONNECTION ASSEMBLY UPSTREAM - DOWNSTREAM ELEVATION

Scale: 1" = 1'-0"

D SB3.1 | SB3.5

STATE OF HAWAII
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HIGHWAYS DIVISION

COLUMN BYPASS CONSTRUCTION DETAILS

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
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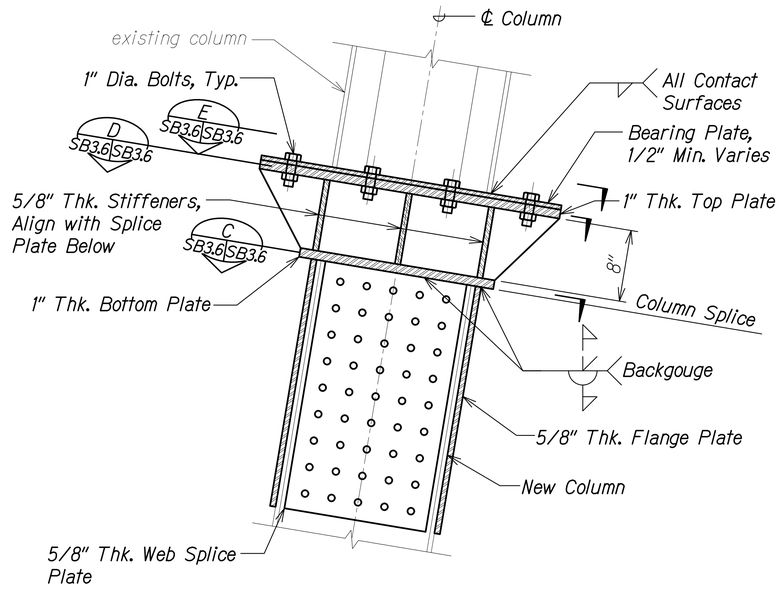

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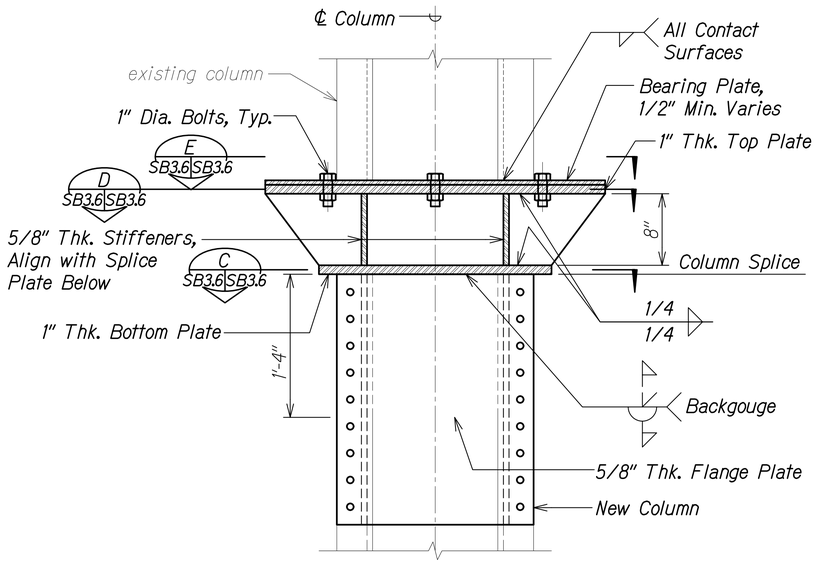

ELEVATION B
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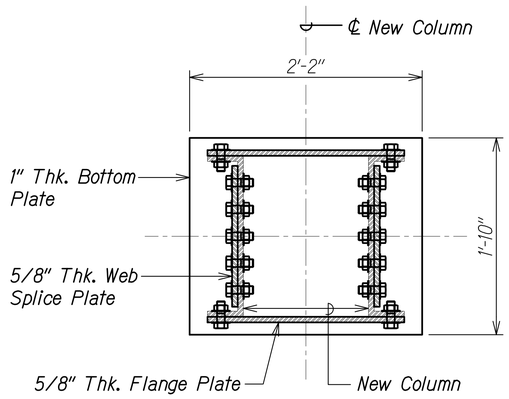
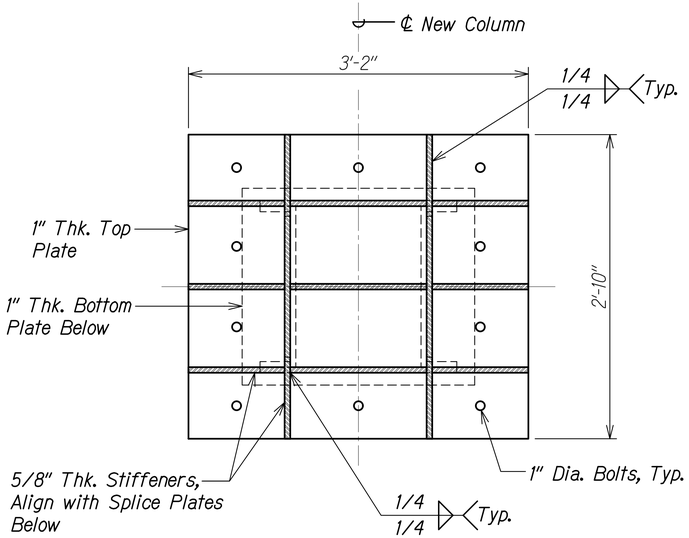


SECTION C
Scale: 1 1/2" = 1'-0" SB3.6 SB3.6



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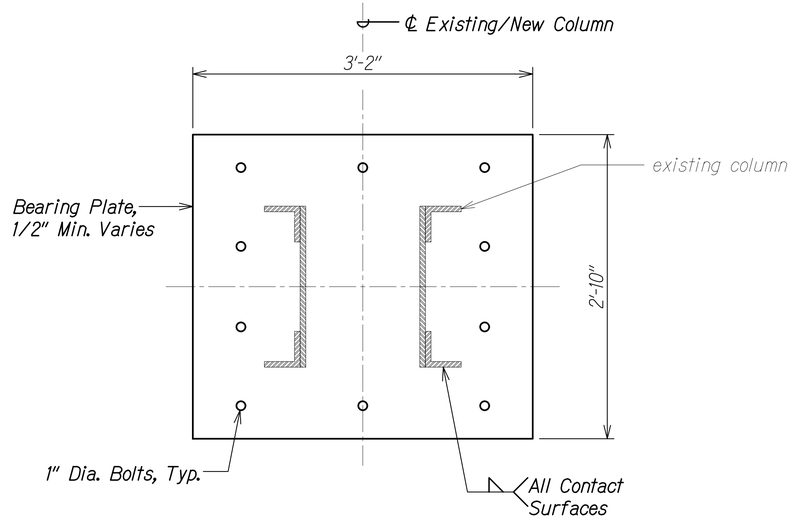

SECTION E
Scale: 1 1/2" = 1'-0" SB3.6 SB3.6

COLUMN TEMPORARY SPLICE CONNECTION DETAIL

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

COLUMN BYPASS CONSTRUCTION DETAILS

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
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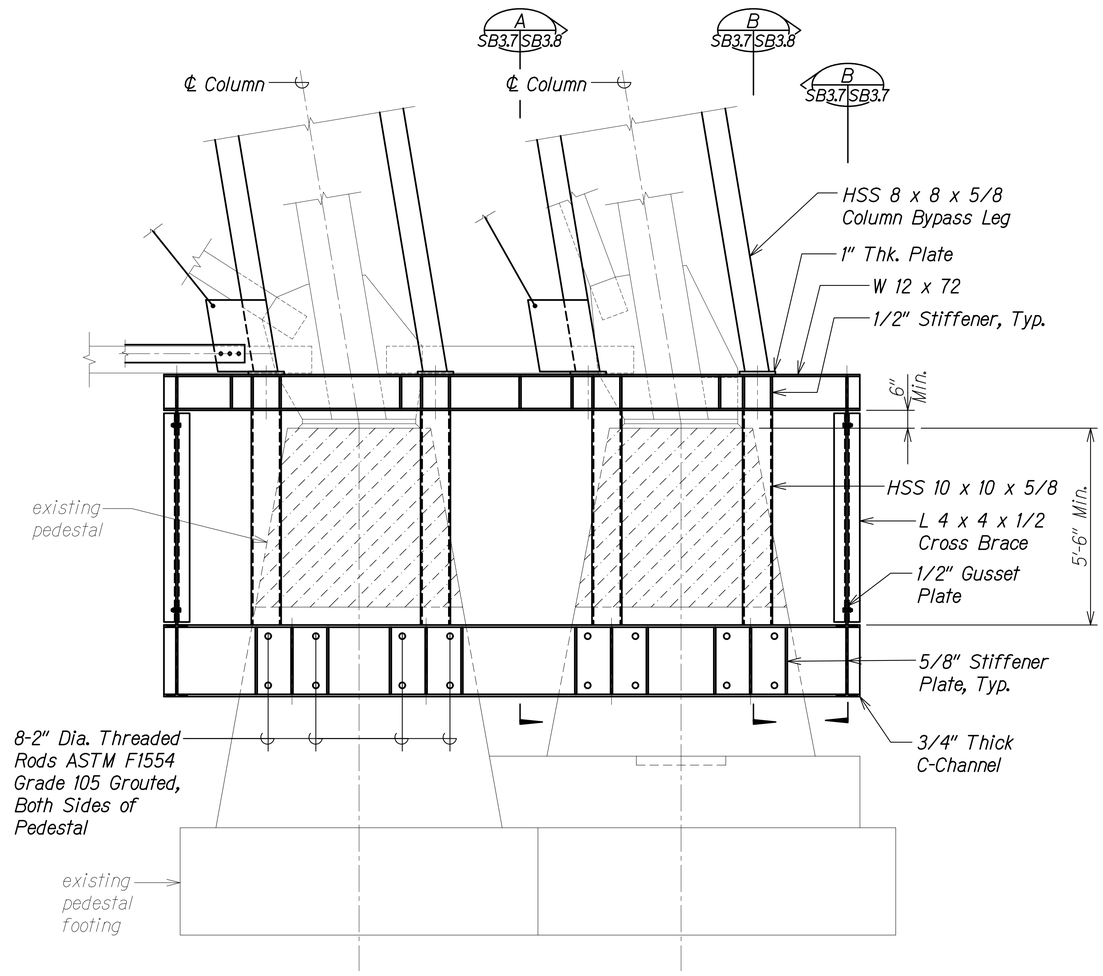

HILO-HONOKAA ELEVATION (A SB3.7 | SB3.7)

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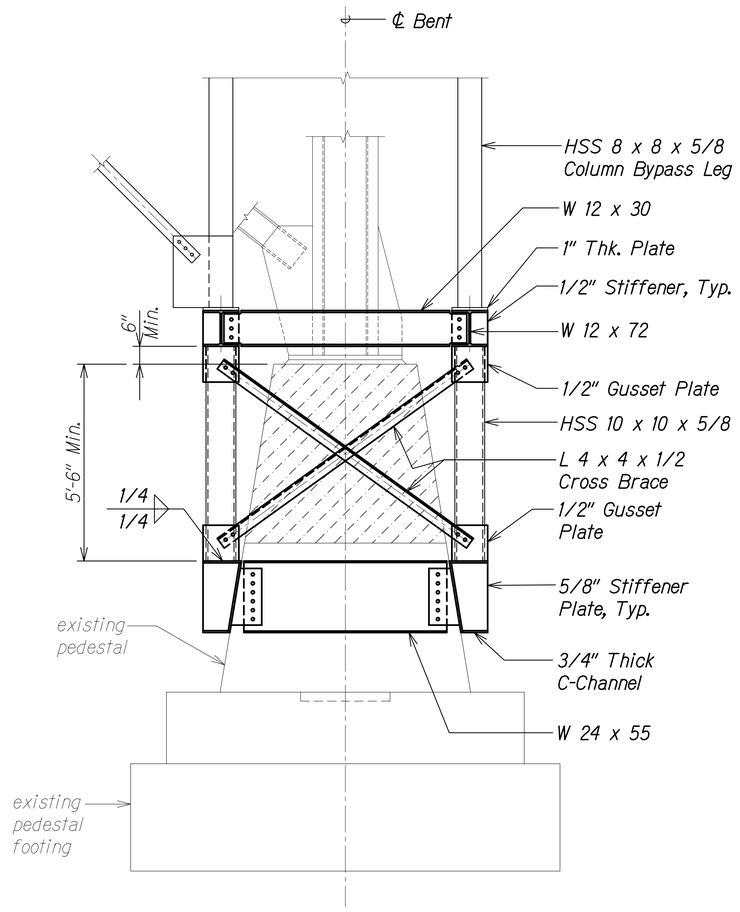

SECTION (B SB3.7 | SB3.7)

Scale: 1/2" = 1'-0"

NOTE:

Bolts shall be 7/8" Dia. High Strength Bolts unless otherwise noted.

LEGEND:

Portion of footing to be repaired.

COLUMN BYPASS TO BENT FOOTING CONNECTION DETAILS

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

COLUMN BYPASS CONSTRUCTION DETAILS

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
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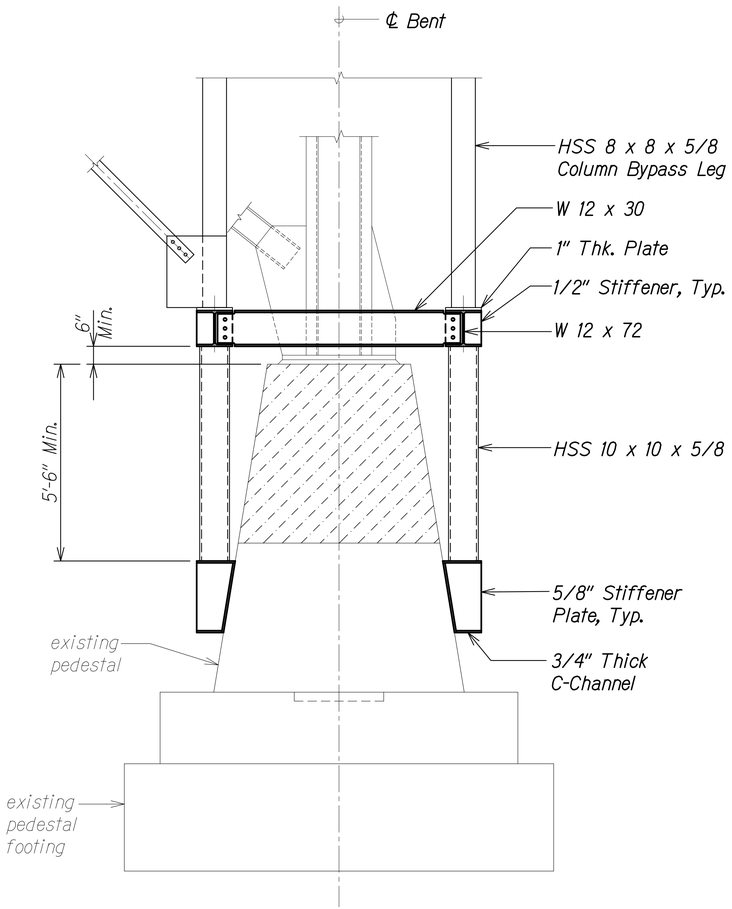

SECTION A
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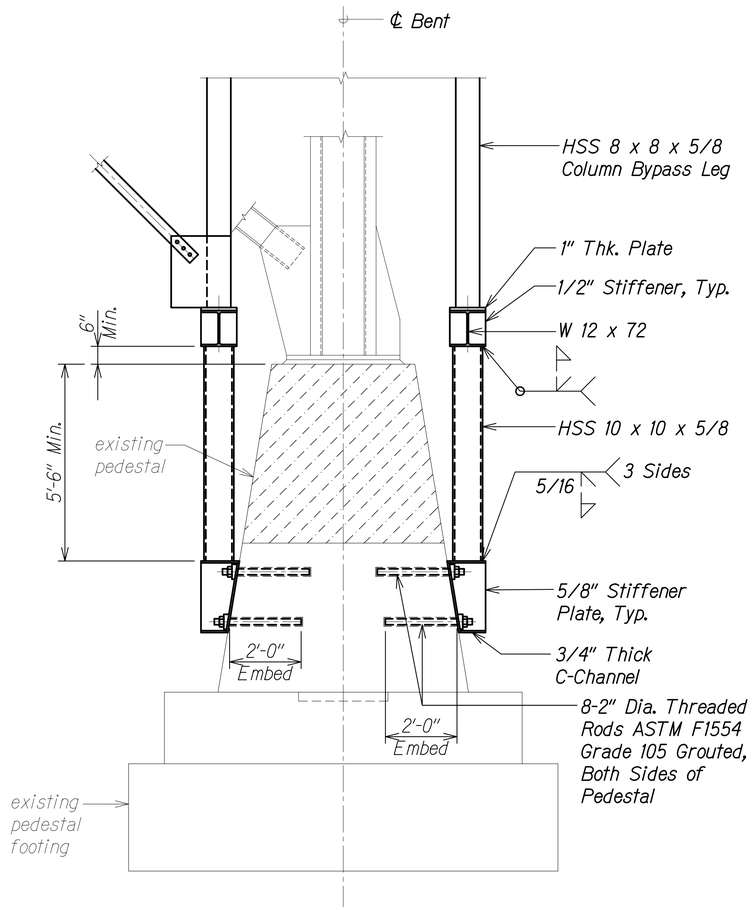
SB3.7 | SB3.8



SECTION B
Scale: 1/2" = 1'-0"
SB3.7 | SB3.8

NOTE:

Bolts shall be 7/8" Dia.
High Strength Bolts unless
otherwise noted.

LEGEND:

Portion of footing
to be repaired.

COLUMN BYPASS TO BENT FOOTING CONNECTION DETAILS

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

COLUMN BYPASS CONSTRUCTION DETAILS

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

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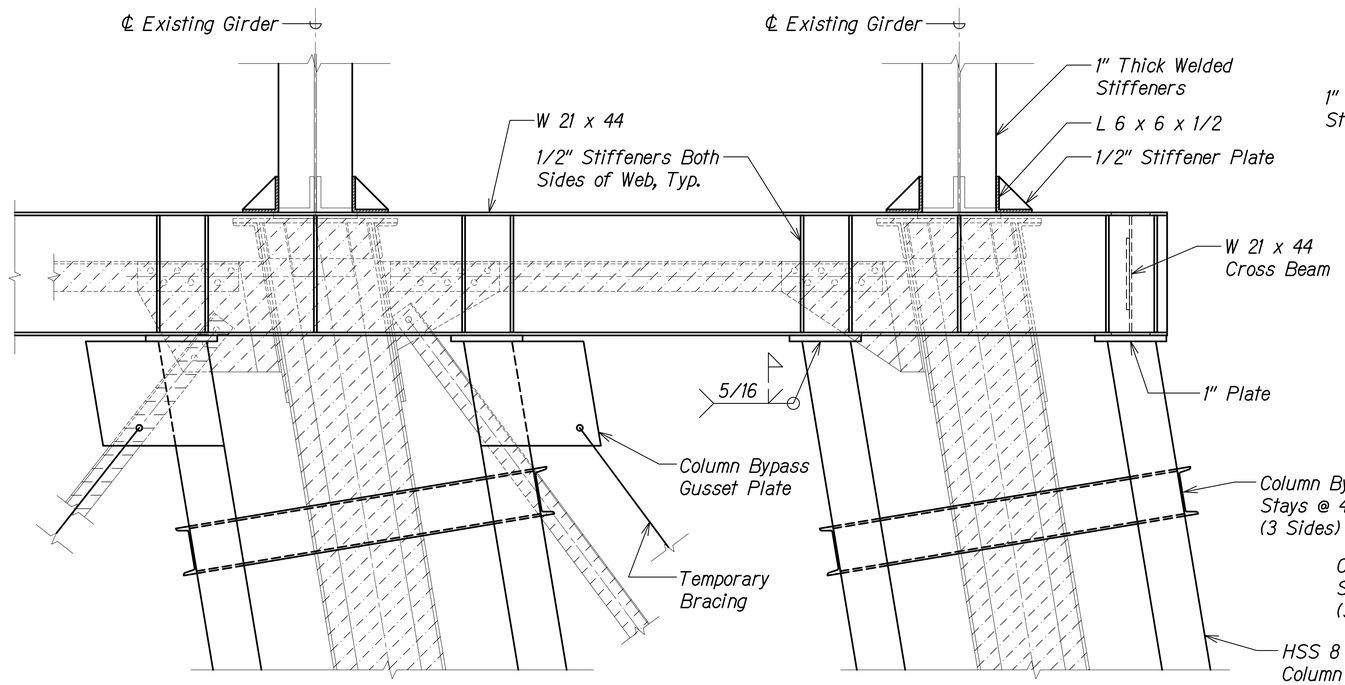
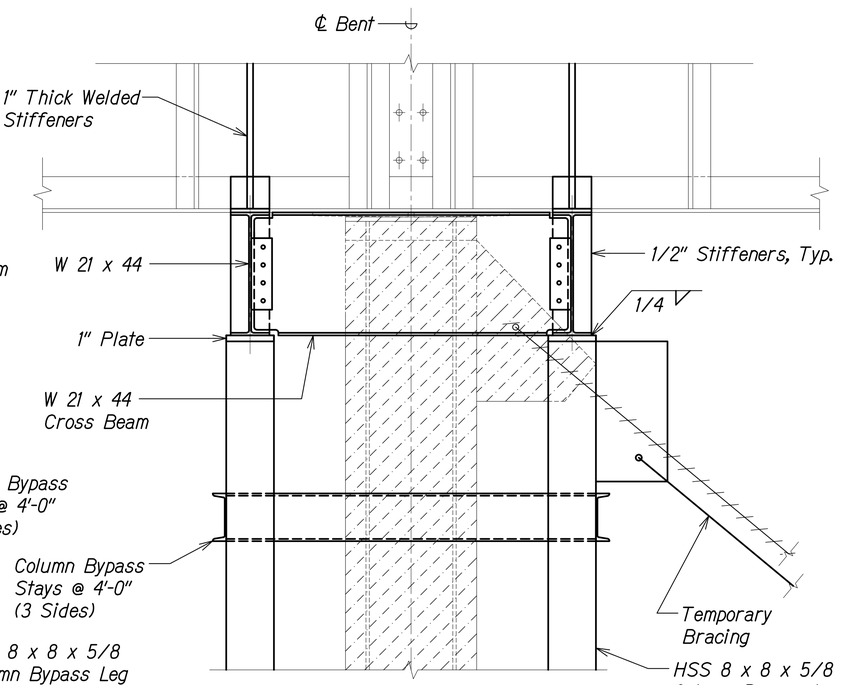


HILO - HONOKA'A ELEVATION A SB2.11 | SB3.9



UPSTREAM - DOWNSTREAM ELEVATION B SB2.11 | SB3.9

COLUMN BYPASS TO SUPERSTRUCTURE CONNECTION DETAILS

Scale: 1" = 1'-0"

LEGEND:

Existing Column to be Repaired

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

COLUMN BYPASS CONSTRUCTION DETAILS

HAWAII BELT ROAD
Nanue Stream Bridge Rehabilitation
Federal Aid Project No. BR-019-2(077)

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SHEET No. SB3.9 OF 9 SHEETS

APPENDIX C
REMEDIAL ALTERNATIVES ANALYSIS REPORT FOR LEAD IMPACTED SOIL AT NANUE BRIDGE

REMEDIAL ALTERNATIVES ANALYSIS REPORT
For LEAD-IMPACTED SOIL
AT
NANUE BRIDGE, NINOLE, HI

Credit: Consor Engineering, Inc.

Prepared For:
Hawaii State Department of Transportation

Prepared For:
KSF Inc.
615 Piikoi Street, Ste 300
Honolulu, Hawaii 96734

Prepared By:
EnviroQuest, Inc.
98-029 Hekaha Street, #21
Aiea, Hawaii, 96701

June 2024

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FIGURES

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LIST OF ACRONYMS AND ABBREVIATIONS

ARARs	Applicable or Relevant and Appropriate Requirements
bgs	below ground surface
c-EHMP	Project-specific Construction Environmental Hazard Management Plan
CFR	Code of Federal Regulations
COC	Contaminant of Concern
COPC	Contaminants of Potential Concern
CSM	Conceptual site model
CY	Cubic yard(s)
DU	Decision Unit
EAL	Environmental Action Level
EHMP	Environmental Hazard Management Plan
EPA	United States Environmental Protection Agency
EQI	Enviroquest Inc.
HAR	Hawaii Administrative Rules
HDOH	State of Hawaii Department of Health
HDOH TGM	State of Hawaii Department of Health Technical Guidance Manual
HDOT	State of Hawaii Department of Transportation
HEER	Hazardous Evaluation and Emergency Response
Kd	Desorption coefficient (SPLP test results)
KPC	Kealamahi Pacific Consultants
LBP	Lead-Based Paint
mg/kg	Milligram per kilogram
NPS	National Parks Service
OSHA	Occupational Safety and Health Administration
PCB	polychlorinated biphenyls
PPE	personal protective equipment
RAA	Remedial Alternatives Analysis
RCRA	Resource Conservation and Recovery Act

ROW	right-of-way
RSL	Regional Screening Levels
SAP	Sampling and Analysis Plan
SCP	State Contingency Plan
SPLP	Synthetic Precipitation Leaching Procedure
TBC	to be considered
TBD	to be determined
TCLP	Toxicity Characteristic Leaching Procedure
TMK	Tax Map Key
TSP	trisodium phosphate
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
USDA NRCS	United States Department of Agriculture National Resource Conservation Service-
USEPA	United States Environmental Protection Agency

1 Introduction and Purpose

The site is located below Nanue Bridge, Ninole, Hawaii on the Hamakua Coast approximately 16 miles north of Hilo HI. The site is a right of way for the County of Hawaii Department of Transportation (Figure 1). The site includes the Hawaii County Tax Map Key (TMK) (3) 3-2-001 Parcel 999, which is owned by the County of Hawaii (County of Hawaii 2015).

The ROW is located below the Nanue Bridge. This steel girder and trestle bridge lies 250+ feet above the park area. The bridge was originally constructed in 1911, and lead-based paints were frequently applied to the structure throughout the 20th Century (Historic Hawaii 2014). Lead-based paint flaked off and may have spilled during application. The lead paint was removed from the bridge in 1997 (Hawaii Tribue-Herald 1997), but the area below the bridge now has lead-impacted soil.

1.1 Purpose

Lead-impacted soil has been documented at other nearby bridges (Hakalau and Kolekole), and it was suspected that Nanue Bridge would have comparable results. The bridge requires maintenance, and workers will need to be on site to repair and replace girders and trusses shore up footings, and remove vegetation. Soil disturbance during foundation work and access requirements will potentially expose workers to contaminants of potential concern (COPC)-impacted soils. When COPC are found to exceed the Hawaii Department of Health (HDOH) Tier 1 Environmental Action Levels (EALs) for unrestricted land use, a Construction Environmental Hazard Management Plan (C-EHMP) will need to be completed prior to site work. A site investigation was conducted in March 2023 to identify and delineate the extent of lead-impacted soil within Decision Units (DUs) at the site.

This report evaluates existing data and associated human health and/or environmental hazards and provides an analysis of potential remedial alternatives at the site.

2 Background

2.1 Site Description

The site is located in a steep gulch and is bisected by Nanue Stream which opens to the Pacific Ocean approximately 500 ft east of the bridge. The terrain is steep varying between 49% to 88% grade (ControlPoint 2023). In some areas, there are vertical drops of approximately 20 feet. A set of old wooden stairs allows access to the first set of footing/bents along the southern embankment and a prone wooden ladder offers access to the first bents on the northern embankment.

The area under Nanue Bridge is rocky with tall grasses, non-native trees, and ferns. Overhead utility lines run along the western side of the ROW and vegetation in the area is regularly knocked back using gas-powered pole saws by workers in an articulating manlift connected to a truck positioned on the bridge deck. The trees are topped and the vegetation is left to decay on the valley floor below. Because of the wet climate, the vegetation regrows rapidly. The Hamakua area receives heavy and often torrential rainfall. A scoured natural swale on the western edge of the ROW clearly funnels water to the footings at DU12 on the southern embankment during heavy rains. This swale has caused significant erosion along the western side of the ROW.

The United States Fish and Wildlife Service (USFWS) does not identify the site as a critical habitat. The project is within the Special Management Area for the State of Hawaii (KPC 2023).

Soils in the project area consist of volcanic saprolite exhibiting a silty clay loam consistency. The soil in the northern embankment was composed of finer silt than in the southern embankment. DUs closest to the bridge decks (DU1, DU2 DU8, and DU9) were in general drier than the lower elevation DUs and had less vegetation.

2.2 Climate

The site is located on the Hamakua Coast of Hawaii Island on the windward side of the island. This area experiences higher than average rainfall than most of Hawaii. The average annual rainfall for the site is approximately 138 inches. March is the wettest month with over 15 inches of rainfall and June is the driest with approximately 8 inches (Giambelluca et al 2013). Temperatures have minimal variances with an average low of 65 to 70 degrees Fahrenheit and average highs of 79 to 84 degrees Fahrenheit (NOAA 2019).

2.3 Soils/Geology

The site is located to the north and south of Nanue Stream. Soils are identified by the United States Department of Agriculture National Resource Conservation Service (USDA NRCS) as Hilo Rock outcrop, with slopes of 35 to 100 percent. These are typical of gulches in lava flows and consist of hydrous silty clay loam over basalt (United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) 2023).

2.4 Surface Water

Nanue Stream bisects the site. This is a perennial freshwater stream that is approximately 10 miles long with a rocky channel. It is part of a 5.5-square-mile watershed (USGS 2019). The stream is not channelized and has steep embankments, but it could scour upstream and backscour the area below Nanue Bridge. Evidence of high-velocity stream flows was observed below the bridge where potholes have formed where grinding action of eddy currents carrying coarse sediment has carved out holes in the riverbed. The stream bed observed below Nanue Stream consisted of mainly large, rounded boulders and solid rock with potholes of varying sizes indicating high stream discharge rates dominate this portion of the stream channel.

2.5 Groundwater

The site is located above the Underground Injection Line according to the HDOH Safe Drinking Water Branch (HDOH SDWB 2019) as the coastline serves as the demarcation in this part of Hamakua. It is unlikely that groundwater at the bridge is a source of drinking water due to the proximity of the shoreline.

2.6 Historic Land Use

The parcel targeted for remedial action alternatives is located below Hawaii Belt Road. This particular tax map key (TMK) was never identified as an agricultural site on historical maps. The steep terrain makes access to the Nanue Stream challenging.

The bridge itself spans approximately 531-feet and is 286-feet tall at the deck (Historic Hawaii 2014). It is the tallest one in Hawaii (NPS 2009). The bridge was originally constructed in 1911/1912 for the Hilo Railroad Company to access the sugar plantations along the coast. The former sugarcane camp town of Hinohina was located southwest of the bridge (1910s – 1960s), but today only the cemetery remains west of the bridge (Hakalau Home 2023). A former dump site associated with Hinohina was identified during the site inspection. Discarded metal and glassware from the upper elevation were found in the swale along the southwest bank of Nanue Bridge. Nanue Bridge survived the 1946 tsunami, and the railroad was rebuilt in 1953 as a highway (NPS 2009).

In the early 1950s, lead-red and black bridge paint was applied to the Nanue Bridge and all over bridges along the Hamakua Coast (Honolulu Advertiser 1953). Lead paint was removed from the bridge in 1997.

2.7 Current/Future Land Use

The site is a County of Hawaii Department of Transportation right-of-way with no public access, no private easements, and no identified users besides bridge maintenance crews. The site is anticipated to remain a right-of-way for the near future.

3 Magnitude and Extent of Contamination

Previous site investigations on bridges along the Hamakua Coast identified that lead-based paint flakes could be a concern in the Hawaii Department of Transportation (HDOT) Highways right of way below the bridges.

Three (3) fifty (50) multi-increment (MI) soil samples were collected by hand on the north side of the bridge on March 5 and March 6th, 2023, from three decision units (DUs), following the Sampling and Analysis Plan (SAP) (EQI 2023). Two replicate samples were also collected from one of the DUs on the northern embankment. Similarly, five (5) DU MI samples were collected on the southern side of the bridge by hand on March 9 and 10th 2023. Samples were analyzed for Resource Conservation and Recovery Act (RCRA) 8 metals and PCBs. PCB analysis was requested by the HDOH Hazard Evaluation and Emergency Response (HEER) office, who were concerned that it may have been used in the bridge expansion joints. Lab tables and reports are found in Appendix A-1 and Appendix A-2.

Samples were analyzed using the following test methods.

RCRA 8 Methods

Arsenic	EPA* 6020B
Barium	EPA 6020B
Cadmium	EPA 6020B
Chromium	EPA 6020B
Lead	EPA 6020B
Mercury	EPA 7471A
Selenium	EPA 6020B
Silver	EPA 6020B

* *United States Environmental Protection Agency*

Polychlorinated Biphenyls (PCBs)

PCB-1016	EPA 8082A/3546
PCB-1221	EPA 8082A/3546
PCB-1232	EPA 8082A/3546
PCB-1242	EPA 8082A/3546
PCB-1248	EPA 8082A/3546
PCB-1254	EPA 8082A/3546
PCB-1260	EPA 8082A/3546

Decision Units (DUs) were established on the north and south embankments of the site at three depth profiles, 0 to 3 inches below ground surface (bgs), 3 to 6 inches bgs, and 6 to 9 inches bgs.

DUs begin on the northern embankment (Honokaa side) and include DU1, DU2, and DU3. Primary, replicate, and triplicate samples were collected in DU1. DUs on the southern embankment include DU8, DU9, DU10, DU11, and DU12.

DUs were adjusted to match the proposed bridge improvement work areas which will be primarily at /below the bridge decks and trusses. Sampling in these areas directly below the bridge and footings was prioritized as this is the site where workers will be. Expanding the DUs to the wider ROW would not reflect the majority of the worker exposure. The ROW vegetation clearing also occurs from the bridge with a vertical tree trimmer, reducing the exposure of regular landscape maintenance workers.

The embankments are steep and challenging to access. For DU 3, 11, and 12 belaying equipment was necessary. In the SAP (EQI 2023), some DUs were planned, but with the caveat that “samples will not be collected where the steepness of the slope makes it inaccessible or dangerous or where adequate soil is not present”. The entirety of the site was not accessible during the initial site inspection as belaying equipment would be required to review the length of the ROW safely. During sample collection, belaying equipment was used, and DU4 and DU5 on the southern equipment were determined to be too rocky and steep to collect adequate samples.

3.1.1 Areas Not Sampled

Sampling was completed at 8 of the 14 planned DUs. The six DUs were not sampled for the following reasons. A couple of the DUs were not sampled because of the steepness of the incline and a visible bare rock substrate, four other DUs were not sampled due to heavy vegetation preventing access to locations along with steep slopes.

3.1.1.1 DUs on Northern Embankment

DUs at the lowest bent elevations on the north side of the bridge (DU4 and DU5) were not sampled due to access and substrate. DU4 consisted of a heavily vegetated 80% slope face with many large African tulip trees (*Spathodea campanulata)* preventing ingress/egress to the DU area. DU 5 was a completely vertical face with bare rock exposed and few locations where soil may have been present. Even though sampling was being performed with belay gear it was not possible to sample these DUs. The physical characteristics of DU4 and DU5 create a low potential for exposure to human receptors.

3.1.1.2 Boundary DUs in HDOT ROW

Originally planned “edge” DUs DU6, 7, 13, and 14, which were linear DUs that bounded the exterior of the HDOT ROW were not collected because they were deemed to be inaccessible as a result of thick vegetation and composting debris that prevented access to these areas. These DUs were 69 % slope average on the northern embankment and 78% slope on the southern embankment and both were covered in thick vegetation.

In addition to the thick stands of African tulip, Australian tree fern (*Cyathea cooperi),* Pohole/Fiddlehead fern (*Diplazium esculentum*), Strawberry guava (*Psidium cattleianum, Myrtaceae*), Maile pilau (*Paederia foetida*), and California grass (*Urochloa*

mutica) completely surrounded these DUs. Additionally, fresh green waste cuttings from the DOT's periodic vegetation control (using an articulating man-lift basket that is lowered from the bridge deck with tree trimmers using a long extension pole chain saw to cut the trees) which had taken place a couple of days before our sampling event.

There simply is no direct exposure pathway since receptors could not access these areas under current conditions unless the site was to be grubbed and cleared. The primary reason we decided not to sample these wedge-shaped DUs is that there is no direct pathway for current/future occasional users/trespassers, particularly due to a lack of access and vegetation covering the soil. This is essentially a physical barrier that prevents direct exposure.

3.2 Total Lead Results

Every DU sampled in the HDOT ROW exceeded both the HDOH Tier 1 EAL for unrestricted land use and all but one exceeded the construction/trench worker action level of 800 milligrams per kilogram (mg/kg) of total lead. The southern embankment HDOT ROW (DU10 at 3 to 6 inches bgs) contained the highest lead concentration sample results (Table 3-1, Appendix A-2).

Levels that exceed the construction trench worker EAL require a Construction EHMP while working on the site and may require additional personal protective equipment (PPE) and monitoring equipment.

3.2.1 Total Lead: Northern Embankment

On the northern embankment, all of the sample results were between 1100 to 1200 mg/kg for lead in the first three inches (Figure 2a). In DU1, the highest elevation DU, there was a drop-off in the depth profiles. The mean decreased from 1133 at 0 to 3 inches bgs to 577 mg/kg at 6 to 9 inches bgs. DU1 at 6 to 9 inches was the only DU where the total lead results were below Construction/Trench Worker EALs. The surface soil was most heavily impacted by lead and the surface contamination was consistent across DUs. The lead-impacted soil had clearly run off onto the lower elevation DUs over time, building up the soil on the lower elevation DUs to match the surface levels.

Replicate sample precision and accuracy calculations are presented in Table A-1b (Appendix A-1). The relative standard deviation of all detected analytes ranged between X% and Y% which is considered to represent very low variability and was well below 50%, so the mean values of the primary, duplicate, and triplicate were used as the reported final concentration.

On DU2 the lead results were consistent – between 1200 to 1400 mg/kg from 0 to 9 inches bgs at the three profiles.

At DU3 (the lowest elevation) the top six inches were 1200 mg/kg and the 6-to-9-inch profile was at 1500 mg/kg (Figure 2b and Figure 2c).

3.2.2 Total Lead: Southern Embankment

DU8, the highest elevation DU, located just below the southern bridge abutment, had the lowest total lead concentration on that side of the bridge and had a noticeable falloff in total lead concentration from 4300 mg/kg in the 0-to-3-inch layer dropping to 2900 mg/kg in the 6-to-9-inch depth profile. This mirrors the results in DU1 in the northern embankment. However, the results at DU8 are all greatly elevated compared to DU1. DU8 has sheer exposed rocks and soil that differs from the lower elevation DUs.

DU9 included a mixture of sheer cliff and bench-like plateau areas. Vegetation cover varied with fern and buffelgrass. Results were consistent varying from 6400 to 6000 mg/kg total lead with the lowest results at the 6-to-9-inch depth profile.

DU10 had the highest concentration of total at 3 to 6 inches bgs and a total lead result of 9700 mg/kg. This DU is steep, but heavily vegetated with grasses and had a greater amount of soil in the DU compared to some of the rockier DUs (DU9 and DU11). This area likely had more soil build-up and somewhat less erosion.

DU11 was steep enough to require belaying equipment. It also had more exposed rocks and a sheer drop at the end of the DU. Total lead surface results varied from 4300 to 6000 mg/kg. Results were lower than the 0-to-3-inch profile indicating that soil likely runs off.

DU12 was the stream level channel, and it is primarily level and slightly elevated from the stream. This area had higher results than DU11 varying from 6300 mg/kg of total lead at 0 to 3 inches bgs, 7900 mg/kg at 3 to 6 inches bgs, and 6500 at 6 to 9 bgs. Water from the swale is funneled to this DU on the western corner and it is obvious that the area is eroding during heavy rains.

3.3 Total Arsenic Results

Arsenic was the only other COPC that exceeded the HDOH Tier 1 EALs in the site investigation. However, only six DUs were at or above the HDOH Tier I EALs of 24 mg/kg. While the residential direct exposure is set to 23 mg/kg, this site is not now, nor will be become residential in the foreseeable future due to slope and land use. The highest exceedance was 32 mg/kg in DU8 at 6 to 9 inches bgs (Figure 3).

The highest exceedances were at the highest elevation DUs, in the areas that were drier and protected from runoff due to the proximity to the bridge deck. The DUs with arsenic exceedances also had wooden access ladders onsite. The DUs may have had arsenic pesticides applied which remained in the soil and did not runoff to lower DUs due to better rain coverage from the bridge.

Due to the low total results, bioaccessible arsenic was not run as the results were primarily at the EAL for unrestricted land use.

All results were well below the construction/trench worker EAL of 95 mg/kg and are not identified as a site-specific contaminant of concern (COC) for the EHMP.

3.3.1 Total Arsenic: Northern Embankment

DU1 was the only DU with arsenic exceedances. Total arsenic results were 26 mg/kg at 0 to 3 inches bgs. No other DUs were above 24 mg/kg.

3.3.2 Total Arsenic: Southern Embankment

At DU8 total arsenic in the surface soil (0 to 6 inches bgs) was 20 mg/kg. However, at 6 to 9 inches bgs total arsenic results were 32 mg/kg. This was the highest sample result.

At DU9 all three depth profiles were at 24 to 25 mg/kg. No other DUs downslope had any exceedances for arsenic greater than 24 mg/kg.

Table 3-1: Nanue Bridge Total Lead Summary Table

	Lead results above HDOH Tier 1 EAL Unrestricted Land Use (200 mg/kg), but below Construction/Trench Worker Scenario (800 mg/kg) (HDOH 2012)
	Lead results above HDOH Tier 1 EAL above Construction/Trench Worker Scenario (800 mg/kg), but below gross contamination (1,000 mg/kg)
	Lead results above gross contamination (1,000 mg/kg)

DU ID	Depth (in)	Lead Results (mg/kg)	Sq Ft	CY	Description
DU1	0-3	1133	1722	16	Northern Embankment highest elevation
	3-6	930	1722	16	
	6-9	577	1722	16	
DU2	0-3	1200	1985	18.4	Northern Embankment Mid elevation
	3-6	1000	1985	18.4	
	6-9	1400	1985	18.4	
DU3	0-3	1200	4413	41	Northern Embankment Lowest DU on north, very steep.
	3-6	1200	4413	41	
	6-9	1500	4413	41	
DU8	0-3	4300	2161	20	Southern Embankment Highest elevation
	3-6	3100	2161	20	
	6-9	2900	2161	20	
DU9	0-3	6400	2843	26	Southern Embankment Second Highest elevation
	3-6	6200	2843	26	
	6-9	6000	2843	26	
DU10	0-3	8500	3848	37	Southern Embankment Steep slope, heavily vegetated
	3-6	9700	3848	37	
	6-9	8100	3848	37	
DU11	0-3	4300	3498	32	Southern Embankment Steepest slope
	3-6	6400	3498	32	
	6-9	6000	3498	32	
DU12	0-3	6300	7185	67	Southern Embankment Lowest elevation – at stream. Relatively flat
	3-6	7900	7185	67	
	6-9	6500	7185	67	

**DU1 results are the mean of the primary sample, duplicate, and triplicate.*

3.4 Contaminant Fate and Transport

It was anticipated that lead-impacted soil would have run off from the upper elevation DUs to the lower elevation DUs and this was confirmed by the sampling. Erosion from the upper elevation to the stream channel was obvious during sampling.

Visible paint flakes were seen at the site in soil 6-9 inches below the subsurface indicating that the soil higher on the valley wall had mobilized via sheet flow or soil creep (horizontal and vertical action from repeated wetting and drying). The conditions are fair for this process since there is a developed soil horizon up to two feet thick over a weathered saprolite rock with slopes under the bridge up to 88 percent slope commonly over 70 percent in most of the DUs (Table 3-3). During cyclic wetting and drying the soil particles move out as they expand during the wetting cycle and are then pulled downward by gravity and drying out only to have this process repeat itself during the next wetting cycle. Any rainwater sheet flowing on this surface causes soil to cover the soil below it.

Table 3-3: Nanue Bridge DU Slope Estimates

	Top Elevation	Bottom Elevation	Rise	Run	Slope
N. ROW	Feet	Feet	Feet	Feet	%
DU1	201	180	20	41	49%
DU2	180	148	32	40	80%
DU3	148	90	58	73	79%
S. ROW					
DU8	212	170	42	48	88%
DU9	170	130	40	50	80%
DU10	130	85	45	56	80%
DU11	85	48	37	53	70%
DU12	48	0	48	67	72%

Source: Survey ControlPoint Surveying 2023

4 Environmental Hazard Evaluations

4.1 Chemicals of Potential Concern

Lead paint was used for decades on the Nanue Bridge until removed in 1997. Other bridges in the Hamakua Coast (Hakalau and Kolekole) have also been identified as sources of lead-based paint which have flaked off and been deposited below the structure on the valley floor.

Studies at other Hamakua bridges identified lead as the COC. Nanue Bridge is no different, as all of the DUs were found to be above the HDOH Tier 1 EALs for unrestricted land use (200 mg/kg) and all but one DU was above the construction trench worker EAL (800 mg/kg) for lead.

Lead is persistent in the environment and accumulates in soils and sediments through deposition. Once absorbed into the body, lead may be stored for prolonged periods in mineralizing tissue (e.g., teeth, bones, etc.). The stored lead may be released again into the bloodstream, especially in times of calcium stress (e.g., pregnancy, lactation, osteoporosis, etc.) or calcium deficiency.

Depending on the level of exposure, lead can adversely affect the nervous system, kidney function, immune system, reproduction and developmental systems, and the cardiovascular system. Lead exposure also affects the oxygen-carrying capacity of the blood.

The most commonly encountered lead impacts in current populations are neurological in children and cardiovascular effects (e.g., high blood pressure, heart disease, etc.) in adults. Infants and young children are especially sensitive to even low levels of lead, which may contribute to behavioral problems, learning deficits, and lowered IQ. No children access this site.

Ecosystems near point sources of lead demonstrate a wide range of adverse effects including losses in biodiversity, changes in community composition, decreased growth and reproductive rates in plants and animals, and neurological effects in vertebrates.

4.2 Exposure Setting

Nanue Bridge is a County of Hawaii Department of Transportation bridge and right of way. The entirety of the site is located within the HDOT tax parcel.

4.3 Conceptual Site Model

A conceptual site model (CSM) provides a framework regarding potential sources of contamination, types of contaminants, contaminated media, exposure and migration pathways, and receptors. The CSM (Table 4-1) was used in the preparation of the Remedial Alternatives Analysis (RAA). Based on the results of the document review, the following are identified as potential human receptors:

- On-site construction workers – including personnel involved in repair or construction/ trenching during future site activities; and
- On-site landscapers/site workers – personnel who may maintain landscaped areas and may trim/clear trees and brush from the ground or remove plants from the bridge supports and may mow, weed whack, and perform general site maintenance (stair access to lower footings).
- Trespassers– Including individuals of all ages, who may camp, recreate, or otherwise trespass on the site and may potentially dig, touch, drive, lie, or be exposed to lead-impacted soil or dust. There was no evidence of encampments under the bridge.
- Ecological Receptors – There was clear evidence that the site was used by pigs including wallows and trails crossing the ROW. Native and non-native birds may also nest, loaf, hunt, or transit across the site (AECOS, 2019).

4.4 Exposure Pathway Analysis

Direct exposure to lead-impacted soil is a potential exposure pathway to human receptors at the site via the following pathways:

- Direct Contact: Incidental ingestion or dermal contact with soil;
- Air: Inhalation of fugitive dust;
- Surface Runoff and Sediment Exposure: Contaminants bourn by water or revealed by erosion; and
- Groundwater Exposure: Contaminants leaching from soil or impacting flowing groundwater.

4.4.1 Direct Contact Pathways

Direct contact with soil may result in incidental oral ingestion and/or dermal absorption of lead. Dermal absorption is not considered a pathway at the site, as lead at the site is not organic. Direct contact exposure may occur for the following groups:

- *Construction/Trench Workers and Landscaping/Site Workers:* may experience direct contact with lead-impacted soils during trenching, construction, and landscaping activities.

  The HDOH construction/trench worker exposure scenarios are set equal to assumptions used in the United States Environmental Protection Agency (USEPA) Regional Screening Levels (RSLs) for consistency with screening levels for occupational exposure assumptions. The exposure rate reflects projects that may require the same workers to return frequently to the same site (construction workers in utility trenches). The HDOH Technical Guidance Manual (TGM) uses a total exposure duration of seven years for both carcinogens and noncarcinogens. An exposure frequency of 20 days (4 weeks) per year for 7 years yields a total of 140 days total exposure. Construction workers may receive 140 days (roughly 6 months) of exposure in a single year and never visit the site again. The United States Environmental Protection Agency (EPA) evaluates lead exposure by using

blood-lead modeling, such as the Integrated Exposure-Uptake Biokinetic Model which recommends that soil lead levels less than 400 mg/kg are generally safe for residential use (HDOH 2017). Residual dirt on hands after digging may contribute to lead exposure through accidental ingestion of soil particles. Direct contact with lead-impacted soil is a concern as 20% to 70% of ingested lead is absorbed.

- *Trespassers:* It is unlikely that trespassers will be onsite long enough to be impacted by a brief time traversingthe site to hunt or fish.
- *Ecological Receptors:* Ecological receptors including birds, mammals, and aquatic species may come into contact with the impacted soil through walking, loafing, digging, or directly in sediments.

4.4.2 Air Exposure Pathways

Inhalation of lead dust is another route of exposure, and almost all inhaled lead is absorbed into the body (ATSDR 2005). Lead particles can be absorbed from fugitive dust particles. The generation of fugitive dust may occur through disturbance of affected soil; such as wind or construction activities. Dust particles may be inhaled, may settle on human skin, and be ingested (hand to mouth), and/or may settle on vegetation ingested by humans.

- *Construction/Trench Workers and Landscaping/Site Workers:* may inhale fugitive dust during normal construction, landscaping, or maintenance activities. Total lead results in the HDOT ROW exceed 1,000 mg/kg for lead. This level is above the construction/trench worker scenario of 800 mg/kg and only trained personnel familiar with risks associated with exposure to lead should be allowed to conduct activities such as trenching, grading, and drilling operations. If the soil in these areas is disturbed, site workers would potentially require respirators based on air monitoring results.
- *Ecological receptors:* Ecological receptors including birds, mammals, and aquatic species may come into contact with the dust through walking, loafing, nesting, or digging.

4.4.3 Surface Runoff and Sediment Exposure Pathway

Surface runoff is part of the current conceptual exposure site model. Upstream and ROW DUs had exceedances of the gross contamination EAL of 1,000 mg/kg.

The exposed shoreline area did not have enough soil to sample.

The stream bank on DU12 could shift or be flooded from the western swale during storms. If extensive flooding, scouring, or high waves (tsunami or hurricane) cause extensive erosion of surface soil from the impacted DUs they may migrate to the Nanue Stream. Sediment may accumulate in the adjacent marine environment and be available for contact with various receptors. The area is not an identified or accessible recreation site, but it is possible that sediments could migrate, and users of the marine environment (swimmers, surfers, fishermen) could come into direct contact with sediment and be

exposed through oral ingestion and/or dermal absorption. However, given the remoteness and difficult terrain, it is unlikely to be accessed with any frequency by recreational users/trespassers. Ecological receptors may live directly in the impacted sediment and may be exposed to COC through feeding within the sediment. As a secondary transport mechanism, lead may bioaccumulate in ecological receptors (i.e., fish, shellfish), and then be ingested by human receptors.

4.4.4 Groundwater Exposure Pathway

To assess the potential environmental/groundwater leaching pathway, the Synthetic Precipitation Leaching Procedure (SPLP) analysis was conducted on soil samples collected from DU1 at 0 to 3 inches bgs, DU3 at 6 to 9 inches bgs, DU8 at 0 to 3 inches bgs, DU10 at 3 to 6 inches bgs, DU11 at 3 to 6 inches bgs and DU12 at 3 to 6 inches bgs. Total lead results varied from 1133 mg/kg at DU1 to the highest total lead result of 9700 mg/kg at DU10. The SPLP value varied from 0.08 mg/L to 8 mg/L respectively (Appendix B-1). The limit of quantification is 0.030 mg/L.

The SPLP assists in the determination of the mobility of both organic and inorganic analytes present in liquids, solids, and wastes. The results of the SPLP test are used to determine the Desorption Partitioning Coefficient (Kd), which is important to understanding how mobile the lead in the soil is and whether it poses a potential risk to ecological receptors in the vicinity of the park (e.g., vertebrate and invertebrate organisms). EPA Method 1312 SPLP West extraction procedure was used on the Nanue soil samples identified in Appendix B-1. West refers to the pH of the extraction fluid that is made by adding 60/40 weight percent of sulfuric and nitric acids to reagent water until the pH is 5.00 +/- 0.05 used to determine the leachability of a site that is west of the Mississippi River. This method's pH is higher than the EPA method extraction fluid for sites east of the Mississippi River (4.20 +/- 0.05) (KPC 2023).

The result of the SPLP was inputted in the Batch Test Leaching Model (HDOH, 2007 revised 2011), and used to determine the relative mobility of lead in the soil. Batch tests involve placing a small amount of the soil in buffered, de-ionized water, agitating the mixture for a set period of time, and measuring the fraction of the contaminant that desorbs from the soil and goes into the solution. The ratio of the mass of a contaminant that remains sorbed to the mass that goes into the solution, adjusted to the test method, is referred to as the contaminant's "desorption coefficient" or "Kd" value (HDOH 2007 revised 2011).

If the calculated desorption coefficient is greater than 20 (Kd>20), the contaminant is considered not significantly mobile and is unlikely to pose a leaching hazard to groundwater. If it is less than 20, then an estimated concentration in groundwater should be calculated and compared to the HDOH Tier 1 EAL. The Kd value uses micrograms/L and when calculated by this model for the soil samples Kd coefficient varied from 1193 to 14,143, all significantly greater than a Kd value of 20.

This result demonstrates that the lead present in the soil is strongly bound to the soil and is considered immobile (soil is weathered volcanic alluvial sediments including gravel,

sand, and clay). Thus, there is a low likelihood that the lead concentrations in the soil at the park pose a risk to ecological receptors (e.g., aquatic organisms) as a result of lead leaching from the soil into rainwater and sediments or impacting the groundwater below the site.

4.5 Environmental Hazard Evaluation Summary

The exposure pathway analysis described in the previous section identifies various exposure pathways (direct and indirect) where lead-impacted soil may pose a risk to human and ecological receptors. The conceptual site exposure model provides a graphical comparison of release mechanism, pathways, and exposure routes to potential current and future receptors at the Site (Table 4-1).

4.5.1 COPC Sources and Release Mechanisms

The primary source of the COPC at Nanue Bridge is lead-impacted surface and subsurface soil from lead released into the environment from lead-based paint used in historical bridge maintenance activities.

Lead-impacted soil present at the site has been shown to exist at concentrations above the HDOH Tier EALs for gross contamination (1000 mg/kg). Total concentrations vary across the site and include portions that are at or below HDOH Tier 1 EALs for unrestricted land use. The secondary release mechanism, besides direct contact with soil, includes dust, surface water runoff, and leaching.

4.5.2 Pathways and Exposure Routes

Lead poses a hazard to potential receptors through direct exposure to contaminated media through pathways including surface soil, subsurface soil, ambient air, surface water and sediments, and groundwater. These pathways potentially expose receptors to lead via inhalation, ingestion, or dermal adsorption.

4.5.3 Potential Receptors Current and Future Land Use

The main human exposure scenarios identified under current land use as a County of Hawaii Dept of Transportation right of way are construction/maintenance workers and ecological receptors. The site’s land use and steep, inaccessible terrain limits trespassing. It is not open or appealing to the public. The land use is not likely to change as it serves as a primary highway for the Hamakua Coast, and future land use includes these same human exposure scenarios. This is also true for avian and aquatic receptors.

4.5.4 Complete Exposure Pathways

Complete exposure pathways exist for all receptor scenarios exposed to surface and subsurface soil at this site under current and future conditions. Exposure to dust is a complete pathway to on-site maintenance and construction workers when the current grass cover is disturbed and there is potential for inhalation of dust under dry windy conditions when activities such as land mowing and excavation occur.

4.5.5 Potentially Complete Exposure Pathways

Potentially complete pathways to user trespasser/construction workers (trench and maintenance exposure scenario) and terrestrial and aquatic ecological receptors exist via direct exposure to soil and potentially fugitive dust if the grass cover was not maintained or a construction excavation project was conducted under the bridge and dust controls were not implemented correctly. This potential exposure route could be controlled using proper PPE and BMPs for construction/stormwater runoff and could limit this exposure pathway.

Currently, there is no complete pathway to any receptors via surface water runoff, but again, future construction activities could potentially complete this pathway if not conducted with care. Additionally, if there were a natural disaster such as a tsunami that could scour away the current stream bank and redistribute lead-impacted soils to the stream mouth and runoff could be a completed exposure pathway.

4.5.6 Exposure to Lead Leaching

There has not been an identified complete pathway to current and future receptors via leaching in subsurface soil or groundwater. A batch test leachability model based on SPLP analyses from soil collected from DUs with total lead results between 1133 mg/kg at DU1 to total lead results of 9700 mg/kg at DU10 demonstrated that the absorption coefficient is high enough to prevent contaminant mobilization from the soil to groundwater (Appendix B-1). The DUs end at a steep drop-off on the northern embankment, and a rocky embankment on the south.

Table 4-1: Conceptual Site Exposure Model

Primary Sources	Primary Release Mechanism	Secondary Sources	Secondary Release Mechanism	Pathway	Exposure Route	Potential Receptors							
						Current Land Use				Future Land Use*			
						On-site Landscape or Construction Workers	User Trespassers	Terrestrial Ecological	Aquatic Ecological	On-site Landscape or Construction Workers	User trespassers	Terrestrial Ecological	Aquatic Ecological
Lead-Impacted Soil	Lead-Based Paint from Bridge	Lead-Impacted Soil	None	Surface Soil	Ingestion	X	X	X	O	X	X	X	O
					Dermal	X	X	X	O	X	X	X	O
			None	Sub-Surface Soil	Ingestion	X	X	X	O	X	X	X	O
					Dermal	X	X	X	O	X	X	X	O
			Dust	Ambient Air	Inhalation	X	O	O	O	X	O	O	O
			Surface Water Runoff	Surface Water and Sediments	Ingestion	O	O	O	O	O	O	O	O
					Dermal	O	O	O	O	O	O	O	O
			Leaching	Subsurface Soil	Ingestion	I	I	I	I	I	I	I	I
					Dermal	I	I	I	I	I	I	I	I
				Groundwater	Ingestion	I	I	I	I	I	I	I	I
					Dermal	I	I	I	I	I	I	I	I
					Inhalation	I	I	I	I	I	I	I	I

Notes: X - Complete exposure pathway O – Potentially Complete I - Incomplete
** - No significant change to the land use is planned in the near future*

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5 Establishing Alternatives

5.1 Introduction

Under amended Section 121(d) of CERCLA, remedial actions for hazardous substance cleanup must attain or waive federal environmental potentially applicable or relevant and appropriate requirements (ARARs), or more stringent state environmental ARARs, upon completion of the remedial action (EPA 2019).

ARARs include only federal and state environmental or facility-citing laws/regulations and do not include occupational safety or worker protection requirements. Compliance with Occupational Safety and Health Administration (OSHA) standards is required by 40 C.F.R. 300.150 and therefore the CERCLA requirement for compliance with or a waiver of ARARs does not apply to OSHA standards (EPA 2019). In addition to ARARs, non-promulgated criteria, advisories, guidance, or policies referred to as to-be-considered criteria (TBC) information may also apply to the conditions found at a site. Unlike ARARs, identification of and compliance with to be considered (TBC) information is not mandatory or legally binding; however, where TBC information is used as a cleanup level, its use for this purpose should be explained and justified.

See Appendix C for a table for ARARs and TBC criteria for remedial alternatives considered for the Nanue Bridge. The alternatives evaluated to meet the ARARs, and compliance may require consultation with State and Federal Agencies.

5.2 Potential ARARs and TBC Criteria

5.2.1 Potential Chemical-Specific ARARs and TBCs

Chemical-specific ARARs include those environmental laws and regulations that regulate the release to the environment of materials with certain chemical or physical characteristics or that contain specified chemical compounds. These requirements generally set health- or risk-based concentration limits or discharge limits for specific hazardous substances by media. In this instance, the chemical of concern is lead. This contaminant is identified in the EPA RSLs, which identify industrial/non-residential soil screening levels at 800 ppm for soil. The RSLs are defined as TBCs as they are not promulgated.

5.2.2 Potential Location-Specific ARARs and TBCs

Location-specific ARARs govern activities in certain environmentally sensitive areas. The specific location and the proposed activity at the site trigger these requirements. The site is solely a right of way under a highway bridge with no public access, residential or commercial activities. The terrain is challenging due to its steepness and thick vegetation and limits trespassing. Pigs transverse the site. The primary site users would be bridge repair workers and maintenance/landscapers. The HDOH EALs for construction/trench workers have set a standard of 800 mg/kg for lead, the same as the lead RSL for industrial/non-residential use. The EALs are not promulgated.

Portions of the site are less than 150 meters from the water and within the Coastal Zone Management Special Management Area. It is above the Hawaii-designated underground injection control line but is not likely an area that will be developed as a source of drinking water. It is not located in a designated critical habitat or a designated wetland.

5.2.3 Potential Action-Specific ARARs and TBCs

Action-specific ARARs generally set performance, design, or other similar action-specified controls or restrictions on particular kinds of response activities. For example, action-specific ARARs may include restrictions that define acceptable treatment and disposal procedures for hazardous substances under 40 Code of Federal Regulations (CFR) Part 261 and 262. The EPA regulatory limit for lead is 5 mg/L. DUs at the site have been identified as exceeding this limit and would be classified as hazardous waste.

DUs were analyzed for Toxicity Characteristic Leaching Procedures (TCLP) using method 6010D for RCRA8 metals, and lead was the only analyte that failed TCLP (Appendix B-2). DUs were chosen to represent a range of total lead results. During the Hakalau Bridge TCLP assessment, "soil with total lead concentrations somewhere between 1410 mg/kg and 5080+ mg/kg (approximate range of total lead concentration 1500 - 5000 mg/kg) may likely have TCLP lead results greater than 5 mg/L." Soils from Hakalau at had total lead results above 5000 mg/kg failed TCLP (KPC 2023). It was anticipated that Nanue would have comparable results.

Three DU samples failed TCLP at Nanue; they were all at a depth of 3 to 6 inches and included DU10, DU11, and DU12. DU9 and DU11 had identical total lead results, but DU11 failed TCLP and DU9 did not (Table 5-1, Appendix B-2). Lead release is influenced by the soil's natural pH, organic matter presence, soil cation exchange capacity, particle size, buffering capacity, and soil mineralogy (Pinto and Al-Abed 2017). DU8 and DU9 included a rocky cliff face with limited organic matter and drier conditions, whereas topsoil layers were thicker with dense vegetation in DU10, DU11, and DU12. Soils appeared siltier on the northern embankment and had limited vegetation in DU1 and DU2. There are no approved waste disposal sites in Hawaii authorized to accept this waste, it will need to be shipped out of state.

Table 5-1: TCLP Summary Results Nanue Bridge

	DU ID	**Total Lead**	**TCLP**
Northern Embankment		*mg/kg*	*mg/L*
	DU1_0-3_B	1200	0.6
	DU2_6-9	1400	0.69
	DU3_6-9	1200	1.1
Southern Embankment	DU8_0-3	4300	3.7
	DU9_0-3	6400	2.8
	DU10_3-6	9700	17
	DU11_3-6	6400	12
	DU12_3-6	7900	23

5.3 Remedial Action Objectives

The Remedial Action Objectives for Nanue Bridge as identified by the site owners and as recommended by the state guidance is to remove the direct contact pathway to human receptors (site workers) and ecological receptors to lead-impacted soil which exceeds concentrations of 800 mg/kg.

5.4 General Response Actions

Actions may include restricting access, fencing, administrative/institutional controls, reducing contact with lead-impacted soil through physical barriers, or removing the source of contamination.

6 Detailed Analysis of Alternatives

The HDOH TGM (Section 16.2.2.2) and the Hawaii State Contingency Plan (SCP) [Hawaii Administrative Rules (HAR) 11-451-8(c)] (HAR 1995) identify a hierarchy of remedial response actions in this descending order:

1. No Action
2. Recycle or reuse
3. Destruction or detoxification
4. Separation, concentration, or volume reduction
5. Immobilization of hazardous substances
6. On-site or off-site disposal, isolation, or containment
7. Institutional controls, fencing and long-term monitoring.

6.1 Alternative 1: No Action

Under the no-action, no remediation activities will be performed. The site will remain as-is. Workers will still be exposed to lead-impacted soil that exceeds construction trench worker EALs during site work, and no EHMP will be completed. Trespassers and ecological receptors could still be exposed to lead contaminated soil, but trespassers are limited due to the terrain. Maintenance workers would continue to have a direct pathway to highly contaminated soil media. Lead is persistent in the environment and will not decay in the soil over time.

6.2 Alternative 2: Recycle or Reuse

The contaminant of concern is dispersed lead-paint flakes. The lead paint material is not dense enough to be separated from the soil in order to be recycled or reused. This alternative is not suitable to remove the contaminant from the site or reduce potential exposure pathways.

6.3 Alternative 3: Destruction or Detoxification

The lead at the site is also not organic, corrosive, or explosive and is relatively immobile. This alternative is not suitable to remove the contaminant from the site or reduce potential exposure pathways.

6.4 Alternative 4: Separation, concentration, or volume reduction

Under this alternative, contaminated material may be completely or partially separated from material that is not contaminated, or contamination may be reduced in a large volume of material by concentrating the contaminant in a smaller volume. Soil particle size separation is conducted to reduce contaminated soil volume. Soils at Nanue Bridge and lead paint flakes are not suitable for volume reduction in this form and contamination would not be reduced significantly.

6.5 Alternative 5: Immobilization of Hazardous Substances

Portions of the site exceed gross contamination and fail TCLP for lead (Appendix B-2). The TCLP regulatory limit for lead is 5 mg/L. DUs which failed TCLP include DU 10, DU11 and DU12 at 3 to 6 inches bgs (and could include other depth profiles). TCLP results varied from 12 to 23 mg/L for lead.

The soil in DU10, DU11 and DU12 (approximately 14,535 sq ft and 136 to 400 cubic yards (CY) of soil) would be classified as hazardous waste if removed for disposal. This soil cannot be disposed of in Hawaii as there are no facilities that are permitted to accept hazardous waste. Reducing bioavailability by stabilizing the lead with a strong buffering agent application was tested to reduce the concentration which could allow for disposal in the state (e.g., through the application of triple superphosphate (TSP) as an amendment to the soil). This would be in conjunction with soil excavation and removal and would not be used for in-situ stabilization (Fabian 2008). Treated soil would be hauled to RCRA subpart D permitted landfill (e.g., West Hawaii Sanitary Landfill). This would require extensive soil removal, handling, and processing and offer limited value due to the cost of excavation and handling. Successful permitting to have a temporary hazardous waste treatment facility would be very unlikely and may take years of effort.

6.6 Alternative 6: On-site or off-site disposal, isolation, or containment

This method offers a good option to prevent the site workers from coming into direct contact with lead-impacted soils.

There are two scenarios evaluated in the RAA that are considered effective presumptive remedies for addressing lead-impacted sites by the USEPA. Generally, if lead-impacted soil remains on-site it will be encapsulated, limiting exposure to site maintenance workers/construction worker. An Environmental Hazard Management Plan (EHMP) will need to be maintained and updated when future work activities are planned in areas where encapsulated contaminated soil is present. A project-specific construction EHMP (C-EHMP) will need to be prepared for each future repair and construction activity to manage lead-impacted soil and be protective of all potentially exposed receptors for the duration of the project. This alternative presents the remedial alternatives that reduce or remove contamination from direct contact with receptors at the site.

6.6.1 Alternative 6a: On-site isolation and containment through a hard cap

HDOH and EPA-acceptable mitigation measures include soil encapsulation. All but one of the DUs exceed HDOH construction/trench worker's EALs (800 mg/kg) (HDOH 2012) for total lead) and would be encapsulated along with the remaining HDOT ROW, not solely the known and sampled DUs. The site would first be grubbed of all vegetation with chain saws and green waste would be removed. The bare soil would be covered with orange mirafi (geotextile) or black geotextile material that would be fastened to the slope with soil nails. A steel screen mesh would cover this area up to the limits of the DOT easement. Soil micro piles with anchors to the mesh would be installed. Since the slope

is so steep and difficult to maintain, concrete and course riprap stones would be placed over the mesh to minimize the potential for erosion (Figure 4).

On the southwest portion of the DOT easement, an erosional channel has formed. This starts where runoff leaves the roadbed and then flows down the side of the valley forming is large gully adjacent to the bridge and has caused severe scour which has begun to undermine the last concrete bent on the southwest side of the bridge right before entering the stream. This alternative could address that erosion by incorporating flow velocity reduction measures into a concrete channel (rip rap).

- Remove vegetation.
- Install a geomembrane with soil nails.
- Install heavy wire mesh and anchor with soil micro piles over the geomembrane.
- Shotcrete or other concrete spray equipment would be brought in and overlaid across the wire mesh and rip rap would be installed to minimize water sheeting and channelization.
- Design to include a large channel on the southwest side of the bridge.

This option leaves the lead-impacted soil on site (including areas of Gross Contamination) and an EHMP would still be needed. Batch Test Leachability analysis demonstrated that lead is immobile and unlikely to affect groundwater and surface water. Although the need for future maintenance measures below the hard cap is unlikely. workers within the DOT ROW would need respirators when performing maintenance tasks where they are digging/trenching in soil below the cap.

Table 6-1: Alternative 6a: No Removal, Cap Only on ROW

Site	**Sq. Ft**
HDOT ROW (North) 800+ mg/kg	27,428
HDOT ROW (South) 800+ mg/kg	33,254
Total	**60,682**

**Minimum, the paved surface would likely require additional coverage.*

Annual operation and maintenance costs would need to reflect the potential for erosion due to the heavy rains and steep slopes.

The hard cap option may be undermined during large storms. If this occurs, additional repairs may be needed. This is unlikely and covering the entire DOT easement instead of just covering the contaminated DUs would reduce this possibility. If it were to be undermined there is a potential that impacted soil would flow directly to the stream despite the cap if water infiltrated from below. An annual inspection of this cap will be required per the EHMP and will be documented and submitted to HDOH. Due to the steepness of the slope some areas may not be feasible to cap, however these are surface rock and would not require shotcrete.

6.6.2 Alternative 6b: Removal of all soil that exceeds 800 mg/kg for lead and replacement with clean fill.

All but one of the DUs exceeded 800 mg/kg for lead and will require removal under this scenario. If the entirety of the ROW were to be tested and exceed 800 mg/kg, this would result in over 2200 CY of soil removal (Table 6-2). If DUs were below 800 mg/kg they would stay on site to minimize soil removal costs. Cleaning the site to unrestricted land use EALs of 200 mg/kg for total lead is not an identified priority as the site is only used by site workers/maintenance crews who can have access to EHMP information and PPE. Unlike Hakalau and Kolekole, the area is and is not a public site, accessible, or attractive for the public.

If only the DUs which were sampled were excavated and removed to a depth of 9 inches this would be 756.2 CY (Table 6-3). However, this would not address all of the areas that workers will be in and would be an incomplete alternative. It is presented here to identify and quantify the known risks in comparison to the total volume and give an idea of the percent of required removal volume.

Table 6-2: Estimated Soil Removal Area – Entire ROW

	Approx. Area	**Removal Depth**	**Cubic Yards**
	Sq. Ft.	*inches*	
North ROW	27,428	12	1016
South ROW	33,254	12	1232
Total ROW	**60,682**		**2,248**

Table 6-3: Known Soil Removal Area – Sampled DUs

	Approx. Area	**Removal Depth**	**Cubic Yards**
	Sq. Ft.	*inches*	
DU1	1722	6	32
DU2	1985	9	55.2
DU3	4413	9	123
Total Known North DUs	**8120**		**210.2**
DU8	2161	9	60
DU9	2843	9	78
DU10	3848	9	111
DU11	3498	9	96
DU12	7185	9	201
Total Known South DUs	**19,535**		**546**
Total Combined DUs	**27,655**		**756.2**

Soil would be hauled to different disposal sites depending on TCLP analysis. DUs which pass TCLP will be excavated (Figure 5), hauled to West Hawaii Sanitary Landfill and replaced with clean fill at a design fill depth of 9 to 24 inches (soil depths onsite include

areas of exposed rock face where soil cap may not be needed). DUs which fail TCLP will be shipped out of state. Not all depth profiles were analyzed for TCLP initially – an assessment was run to determine if total lead results had a relationship to TCLP. If this alternative is chosen, additional TCLP analysis will be necessary for other DUs to determine if some of the DUs can be scraped and disposed of at West Hawaii Landfill.

Costs would be high as soil which is classified as hazardous waste could not be disposed of at facilities in Hawaii. DU10, DU11 and DU12 failed TCLP at the 3 to 6-inch depth profile. Approximately 14,531 sq ft. of the site failed TCLP, representing 136 cubic yards (Table 6-4). Not all DUs were analyzed, and it is possible that additional depth profiles would also fail TCLP in the known impacted areas or could be so difficult to remove in three-inch lifts that the entirety of the DU would end up being removed as it cannot be easily segregated on the steep slopes. This would increase the volume of out of state soil disposal to 400 cubic yards (Table 6-5 and Table 6-6).

Table 6-4: DUs which Failed TCLP and Require Mainland Disposal

DU	sq. ft	Depth* (inches)	CY	Total Lead mg/kg	TCLP
DU10_3-6	3848	3 to 6	37	9700	17
DU11_3-6	3498	3 to 6	32	6400	12
DU12_3-6	7185	3 to 6	67	7900	23
Total Identified	**14,531**	**3 inches**	**136**		

Soil removal would require hand digging in areas of the steepest slopes and removal to the bridge deck via lifts and hoists. Backhoes and excavation equipment would not be feasible or would require additional grading/temporary leveling in some of the DUs due to the slope. This activity would expose workers to lead soil and lead dust during excavation and removal.

Confirmation sampling will be conducted to ensure that all targeted soil is removed from each DU. All DUs would be excavated until reaching 1-foot depth or confirmation samples indicated that soil concentrations were below the HDOH EAL construction worker safety (800 mg/kg). This would impact the entire HDOT ROW: 60,682 sq. ft to various depths. The sampling depth went to 9 inches bgs, but it would potentially require 12” excavation or until rock is encountered. For this alternative, an estimated depth of 12 inches is possible, but the depth will likely be less on a site-wide average as surface rock is present in several DUs.

Typically, clean fill would then be brought in and overlaid across the impacted site at a depth of 18- 24 inches to re-level the site for use and allow for revegetation, drainage, and grading. However, due to the steep slopes, this would not be an acceptable method to try to restore the site. Final stabilization for this alternative could include no cover, cover area with jute mats to encourage vegetation and minimize water scour that would be

nailed down to the slope with soil nails, and the hard cap installation as described in Alternative 6a.

An archaeological consultation and monitoring would be required during the excavation. The lead-impacted soil would be left on site therefore an EHMP will be needed.

Depending on the confirmation sample results, an EHMP for the remaining lead-impacted soil on site would still be needed. The primary maintenance item would be addressing any erosional issues to the finished grade which would vary based on the selected alternative. As this alternative already risks destabilizing the steep slopes of the bridge a hard cap alternative was evaluated as it provides several optimal benefits:

- Stabilizes the bare slope.
- Provides additional protectiveness to potential future receptors.
- Addresses stormwater erosional issues identified under current conditions.

Table 6-5: Alternative 6b, Soil Removal 800+ mg/kg, Summary Table: Known and Potential Disposal Sites

CY	Disposal Site
16	Left onsite: Meets Construction/Trench Worker EALs (below 800 mg/kg Total Lead)
136	TCLP Fail: Removal Out of State
272	Potential TCLP Fail: Removal Out of State
121.4	TCLP Passed: West Hawaii
226.8	Potential West Hawaii Landfill

Table 6-6: Alternative 6b, Soil Removal 800+ mg/kg: Known and Potential Disposal Sites and Quantities

DU ID	Depth (in)	Lead Results (mg/kg)	Sq Ft	CY	Disposal Site
DU1	0-3	1133	1722	16	Passed TCLP: West Hawaii Landfill
	3-6	930	1722	16	Unknown: Likely West Hawaii Landfill
	6-9	577	1722	16	Can be left onsite
DU2	0-3	1200	1985	18.4	Unknown: Likely West Hawaii Landfill
	3-6	1000	1985	18.4	Unknown: Likely West Hawaii Landfill
	6-9	1400	1985	18.4	West Hawaii Landfill
DU3	0-3	1200	4413	41	Unknown: Likely West Hawaii Landfill
	3-6	1200	4413	41	Unknown: Likely West Hawaii Landfill
	6-9	1500	4413	41	Passed TCLP: West Hawaii Landfill
DU8	0-3	4300	2161	20	Passed TCLP: West Hawaii Landfill
	3-6	3100	2161	20	Unknown: Likely West Hawaii Landfill
	6-9	2900	2161	20	Unknown: Likely West Hawaii Landfill
DU9	0-3	6400	2843	26	Passed TCLP: West Hawaii Landfill
	3-6	6200	2843	26	Unknown: Likely West Hawaii Landfill
	6-9	6000	2843	26	Unknown: Likely West Hawaii Landfill
DU10	0-3	8500	3848	37	Unknown: Potential out of state
	3-6	9700	3848	37	TCLP Fail: Out of State
	6-9	8100	3848	37	Unknown: Potential out of state
DU11	0-3	4300	3498	32	Unknown: Potential out of state*
	3-6	6400	3498	32	TCLP Fail: Out of State
	6-9	6000	3498	32	Unknown: Potential out of state
DU12	0-3	6300	7185	67	Unknown: Potential out of state
	3-6	7900	7185	67	TCLP Fail: Out of State
	6-9	6500	7185	67	Unknown: Potential out of state

**This DU may pass TCLP based on total lead results, but logistical difficulties in scraping only the 0 to 3 inches of surface soil on the steep slope may require it to be removed along with the 3-to-6-inch depth profile.*

6.7 Alternative 7 Institutional Controls, and Institutional Controls/ Fencing and Long-Term Monitoring

These options identify the risks but do not remove or reduce the lead-impacted soil. Workers are prevented from coming into direct contact with the soil using an EHMP, PPE, and decontamination methods.

There are two options available under these alternatives:

- Alternative 7a: A site-specific Environmental Hazard Management Plan (EHMP) would be prepared that would outline the areas where various lead concentrations are on the site to facilitate awareness about the risks to current and future workers. The EHMP would need to be updated periodically and the effectiveness of this alternative would be reviewed every 5 years. This alternative assumes four updates per 30-year period to accommodate park maintenance and use changes. Appropriate PPE would be identified and used to perform work on-site. Decontamination sites would be established and used by workers.

- Alternative 7b: This alternative would include the site-specific EHMP and PPE identified in Alternative 7a, and in addition, fencing and signage would be installed but no remediation activities will be performed. Signage and fencing would be installed to prevent access to the ROW and to warn workers and trespassers of the hazards (Figure 6).

  Periodic inspections of the fencing and signage would be required under Alternative 7b and will need to be documented in annual reports. Site workers may be required to wear respirators due to the high levels of lead in some areas.

  This alternative would include clearing all the vegetation along the perimeter of the DOT easement and installing a fence down a very steep slope from the top of the embankment down to the stream floor. Gates would need to be incorporated in the fence design to allow future maintenance workers to access the enclosed area.

  The fence would eventually be covered in vines and brush so periodic maintenance would need to be performed.

These alternatives meet the needs of the County of Hawaii Department of Transportation needs and costs. The site is highly challenging, steep, and is not used by the public. No outside users are anticipated on the site.

7 Comparative Analysis of Remedial Alternatives

7.1 Overall Protectiveness

The first four identified alternatives do not meet the overall protectiveness requirements as these alternatives would not remove, limit, or reduce the potential lead exposure pathways for receptors. Alternative 4 could potentially be used in conjunction with other remedial actions to reduce disposal costs.

- Alternative 1: No action, including no EHMP, would not protect the workers who must perform repairs at the bridge. Soil results exceed construction/trench worker EALs.
- Alternative 2: The lead paint material is not dense enough to be separated from the soil in order to be recycled or reused.
- Alternative 3: The lead at the site is also not organic, corrosive, or explosive and is relatively immobile.
- Alternative 4: Soils at Nanue and lead paint flakes are not suitable for volume reduction in this form and lead would not be reduced significantly.
- Alternative 5: Previous assessments at Hakalau Bridge using the Bench Test Treatability study had demonstrated that immobilization via treatment with trisodium phosphate (TSP) to reduce the mobility of lead is potentially feasible but would require extensive excavation and soil removal from the challenging terrain, which would expose many more workers to lead-impacted soil. This alternative would reduce the quantity of lead-impacted soil that would need to be disposed of at mainland US facilities but would require a permit to treat hazardous waste at the designated treatment location. This alternative also has additional costs associated with treatment (industrial machinery for mixing TSP or Portland Cement into the lead-impacted soil, grading, managing stormwater controls on site). The application of this alternative would be in conjunction with soil excavation and removal and would not be used for in-situ stabilization.

Alternatives 6a, 6b, and 7a and 7b presented in Table 7-1 and summarized below vary in protectiveness. The following assumptions are made.

- The public obeys signage and restricted areas.
- Regular site workers (Landscapers) have infrequent exposure to surface soil as tree trimming is conducted from the bridge deck. Brush trimmers onsite primarily handle vegetation and do not excavate below the surface (0 to 3 inches).
- Construction/Trench Workers dig below surface soil (6+ inches bgs) and handle soil.
- Ecological receptors primarily wallow, nest, dig, loaf, or lie on the surface of the soil.
- The site remains primarily vegetated, as consistent rainfall in the area typically ensures vegetation growth.

Table 7-1: Alternatives Analysis - Protectiveness

	6a. On-site isolation and containment. Hard cap on areas of 800 mg/kg exceedances	**6b.** Removal of all soil which exceeds 800 mg/kg for lead, containment, and replacement with clean fill.	**7a.** Institutional and Engineering Controls: PPE/EHMP – No Fencing	**7b.** Institutional and Engineering Controls: Fencing to Limit Access
Is Lead-Impacted Soil Still Present?	Yes	Yes	Yes	Yes
	Direct Contact Does the site have a complete exposure pathway for the following users under the scenario?			
Public	No	Potential: Unlikely - only trespassers	Potential: Unlikely - only trespassers	No
Construction/ Bridge Workers	No	No	Yes	Yes
Site Workers (Landscapers)	No	No	Yes	Yes
Ecological Receptors	No	Potential: Unlikely	Yes	Yes
	Air Exposure Does the site have a complete exposure pathway for the following users under the scenario?			
Public	No	No	No	No
Construction/ Trench Workers	Potential	Potential: If deeper than 12”	Yes	Yes
Site Workers (Landscapers)	No	No	Yes	Yes
Ecological Receptors	No	No	Yes	Yes
	Surface Water Runoff (Sediment) in River Does the site have a complete exposure pathway for the following users under the scenario?			
Public	No	No	Potential: Trespassers only	Potential: Trespassers only
Construction/ Trench Workers	No	No	Yes	Yes
Site Workers (Landscapers)	No	No	Yes	Yes
Ecological Receptors	No	No	Potential	Potential

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7.2 Compliance with ARARs

All of the alternatives shall meet the requirements of the ARARs (Appendix C) and will use TBC as guidance (EPA RSLs, HDOH EALs). The actions are compatible with standard excavation and/or earth-moving activities and waste disposal in Hawaii. Depending on the chosen alternative, the site work plan will identify methods to prevent, mitigate, and respond to the conservation of cultural and ecological resources ARARs. ARARs evaluation is presented in Appendix C.

7.3 Reduction of Toxicity, Mobility, and Volume through Treatment

The degree to which the remedial alternative reduces toxicity, mobility, and reduction of volume is achieved, including how the treatment is used to address the COC at the site is presented below (Table 7-2). Factors considered, as appropriate, include the following:

- The number of hazardous substances, pollutants, or contaminants that will be destroyed, treated, or recycled;
- The degree of the expected reduction in toxicity, mobility, or volume of the waste due to treatment; and
- The degree to which the treatment is irreversible.

Alternative 6a - On-site isolation and containment would not remove the volume of contamination, but it would reduce the mobility through a hard cap. This cap is potentially vulnerable to scouring from flooding and sloughing if water gets under the cap. The toxicity would not be reduced but the potential for landscapers/site workers to encounter it would be reduced. Treatment under this alternative may not protect against future seismic or climatic events (e.g., tsunami, flooding, or sea-level rise) Table 7-2).

Alternative 6b - Removal of all soil which exceeds the HDOH Tier 1 EAL for commercial/industrial land use for lead (800 mg/kg), containment, and replacement with clean fill offers a reduction in toxicity. Mobility will be reduced through the soil cap, but the soil cap could be scoured during extensive flooding. The overall volume of lead-impacted soil would be reduced by over 2000 CY.

Alternative 7a: Use of an EHMP PPE and identifying risks with appropriate decontamination areas for workers on the site will limit direct exposure for site workers. Lead-impacted soil could still runoff to the stream and Pacific Ocean. There is no reduction of contaminant volume under this option. (Table 7- 2).

Alternative 7b: Use of an EHMP and PPE and identifying risks with appropriate decontamination areas for workers on the site will limit direct exposure for site workers. Fencing and signage will warn trespassers and will reduce opportunities for pigs, but not birds to be exposed. Lead-impacted soil could still runoff to the stream and Pacific Ocean. There is no reduction of contaminant volume under this option. (Table 7- 2).

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Table 7-2: Reduction of Toxicity, Mobility, and Volume through Treatment Comparison

6a. On-site isolation and containment. Hard cap on areas of 800 mg/kg exceedances.	**6b.** Removal of all soil which exceeds 800 mg/kg for lead, containment, and replacement with clean fill.	**7a.** Institutional Controls: EHMP and PPE used for site workers	**7b.** Institutional and Engineering Controls: EHMP and PPE used for site workers, Entire ROW fenced, signage installed.
Toxicity: No change under cap - contaminants are still present for construction/site workers if work under the cap is needed. Impacts are reduced for maintenance crews, trespassers, and ecological receptors. **Mobility:** Contaminant is limited/eliminated to eroding to the stream as long as cap is present. **Volume:** No reduction in volume of contaminant.	**Toxicity:** Reduced. **Mobility:** Reduced but potentially mobile during extensive erosion due to scouring. **Volume:** Reduced – all soil above 800 mg/kg removed	**Toxicity:** No Change - contaminants are still present for ecological receptors, maintenance crews and any potential construction/site workers. **Mobility:** No change - contaminant is potentially mobile through erosion and surface runoff. **Volume:** No reduction in volume of contaminant	**Toxicity:** No Change - contaminants are still present for ecological receptors. PPE is used for maintenance crews and any potential construction/site workers. Public/Trespassers are informed. Some ecological receptors may be limited by fencing. **Mobility:** No change - contaminant is potentially mobile through erosion and surface runoff. **Volume:** No reduction in volume of contaminant

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7.4 Long-Term and Short-Term Effectiveness

Alternative 6a: Offers short-term and long-term effectiveness. Sitework is still needed in terms of applying mirafi, soil for grading, and the hard cap. Contaminant mobility will be reduced. The hard cap will protect ecological receptors and limit runoff to the stream and Pacific Ocean. The cap will need to be maintained to ensure that it is not scoured or breached during torrential rains and associated flooding. Landscapers and work crews who need to work below the cap will need to wear appropriate PPE and follow the site specific EHMP.

Alternative 6b: Repairs to the site will take longer and be more complicated due to the logistics of removing is much volume from the base of bridge footings. This alternative has long-term effectiveness. Sitework will include scraping soil, disposing of soil (off-island), laying clean soil, and stabilization.

Site work will take longer than alternative 6a and will require additional materials and fill. Soil disposal costs and soil disposal work will remain high. Sitework will include scraping soil, disposing of soil (off-island), applying mirafi, laying clean fill, and stabilization. An EHMP will also be required as lead-impacted soil will remain on-site. The removal of soils with total lead greater than 800 mg/kg will mean that construction/trench workers will not require additional PPE while working on the site. Lead-impacted soil may be present in the upper steep gulch slopes and could migrate to the stream below. However, the site is not used by the public and this alternative is by far the costliest scenario.

Institutional controls Alternative 7a and 7b offer short-term and effectiveness. The lead-impacted soil would remain, but this could be managed with an EHMP and PPE for site and construction/trench workers. Ecological receptors will still access the site and be exposed. The site will need to be protected from erosion and washouts. Surface soil may wash into Nanue Stream and the Pacific Ocean. Site work will need to refer to recommendations in the EHMP.

Under Alternative 7b, the site would also be more restricted and warn potential trespassers and the fencing would limit the number of pigs that may cross the site (as long as the fence is maintained). This could offer a longer-term effectiveness than Alternative 7a.

7.5 Implementability

Alternative 6a is implementable using equipment and supplies from Hawaii County or shipped to Hawaii County. This alternative will require excavators, work crews, some clean fill, shotcrete/concrete (from Hawaii County), and EHMP document production.

Alternative 6b is implementable using equipment and supplies from Hawaii County or shipped to Hawaii County. However, this alternative requires at least 136 CY of off-island soil disposal and shipping. This alternative will require excavators, work crews, topsoil, and clean fill (from Hawaii County) and an EHMP. The source of the topsoil and clean fill will need to be documented that the source is free of chemical and biological

contamination (e.g., chlordane, little fire ants, etc.). The steepness of the site will offer logistical challenges and expose workers to lead contaminated dust potentially in excess of normal site work.

Alternatives 7a and 7b will be the easiest and most affordable to implement. This alternative requires an EHMP document, and Alterative 7b adds fencing installation and signage. These alternatives will require the County of Hawaii to maintain an EHMP and conduct periodic inspections. The fencing will need to be maintained in Alternative 7b.

7.6 Estimated Cost - TBD

A complete cost table of the alternatives is TBD and will be found in Appendix D. A summary table will be completed in Table 7-3. All alternatives are assumed to have the same costs for the planning component including project management, permitting, and public meeting support. This cost is estimated at $XXXXX and is included in all alternative costs.

Table 7-3: Cost Comparison: TBD

	6a. On-site isolation and containment. Hard Cap	**6b.** Removal of all soil which exceeds 800 mg/kg for lead, containment, and replace with clean fill.	**7a.** Institutional and Engineering Controls: EHMP, no fencing	**7.** Institutional and Engineering Controls: EHMP, Entire Site Restricted: Fencing, Gates, Signage
Planning and permitting?	Yes	Yes	Yes	Yes
EHMP Needed?	Yes	Yes	Yes	Yes
Soil Removal?	No	Yes	No	No
Archeological consultation and monitoring?	Yes	Yes	No	During fencing installation: fewer days than Alternatives 6a and 6b
Hard Cap Needed?	Yes	No	No	No
Mirafi/ Geotextile defined boundary	Yes	Yes	No	No
Additional CY clean soil for drainage grading.	Potential	Yes	No	No
Fencing/Signage	No	No	No	Yes
COST SUMMARY				
Planning and Permitting	$TBD	$TBD	$TBD	$TBD
EHMP	$TBD	$TBD	$TBD	$TBD
Soil Removal: West Hawaii	0	$TBD	0	0
Soil Removal: Off-Island	0	$TBD	0	0
Archaeological Monitoring	$TBD	$TBD	0	$TBD
Hard Cap	$TBD	NA	0	0
Mirafi/geotextile	$TBD	$TBD	0	0
Soil Fill	$TBD	$TBD	0	0
Fencing Costs	0	0	0	$
O&M Cost -30 years	$TBD	$TBD	$TBD	$TBD
Total	$TBD	$TBD	$TBD	$TBD

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8 Preferred Alternative

The four remedial alternatives are compared the to nine evaluation criteria previously in Section 7 presented qualitatively in a summary comparison in Table 8-1.

Table 8-1: Evaluation of Cleanup Alternatives: Nanue Bridge RAA

	6a. On-site isolation and containment.	6b. Removal of all soil that exceeds 800 mg/kg.	7a. Institutional and Engineering Controls: EHMP, no fencing	7b. Institutional and Engineering Controls: EHMP, fencing
1. Overall protection of human health and the environment.	●	●	○	○
2. Compliance with applicable or relevant and appropriate requirements.	◎	●	◎	◎
3. Long-term effectiveness and permanence	◎	●	○	○
4. Reduction of toxicity, mobility, or volume through treatment.	◎	◎	○	○
5. Short-term effectiveness	●	○	●	●
6. Implementability	◎	◎	●	●
7. Cost.	○	○	●	●
8. State regulator acceptance.	●	●	◎	◎
9. Community acceptance.	●	●	◎	◎
○ satisfies the criteria to a low degree or does not satisfy in a timely manner				
◎ satisfies the criteria to a moderate degree in a timely manner				
● satisfies the criteria to high degree in a timely manner				

Alternative 6a fully satisfies 5 out of 9 of the evaluation criteria to a high degree,

Alternatives 6b fully satisfies 5 of 9 evaluation criteria to a high degree, however the challenges and cost to implement would results in a much longer time to execute this plan and would also expose additional site remediation workers to lead-impacted dirt during site work.

Alternative 7a and 7b, Institutional and Engineering controls with an EHMP would be effective in the short term, straightforward to implement and affordable. The site is not used by the public, only site workers, occasional trespassers, and some ecological receptors (pigs primarily). The plan would receive state and community acceptance, but

it does not address overall protection to the environment, long-term effectiveness and permanence, or the reduction of toxicity, mobility, or volume through treatment.

Alternative 6b has a potentially prohibitive price point and would expose site workers to additional lead-impacted soil while performing remediation work, potentially in excess of normal maintenance and work. Soil removal would require hand digging. This is ranked low relative to alternative 6a at satisfying the other evaluation criteria.

Alternatives 7a and 7b are by far the most cost-effective. Bridge repair workers would be exposed to lead-impacted soil on-site during repairs, and these workers will have appropriate PPE and site-specific training due to the EHMP. Alternative 7a and 7b would not remove the source of lead-impacted soil.

9 References

AECOS. 2019. Avian Habitat Survey Kapue Stream, Hamakua District, Hawaii. Feb.

ControlPoint. 2023. Topographic Survey Map Nanue Bridge. For Department of Transportation, State of Hawaii

County of Hawaii. 2015. Hawaii Statewide GIS Program. Office of Planning. http://planning.hawaii.gov/gis/.

EQI. 2023. Final Sampling and Analysis Plan at Nanue Stream Bridge, Ninole, Hawaii. Prepared by EnviroQuest, Inc. for the Hawaii Department of Transportation. December 2023.

Fabian, Gene. 2008. Treatability Study Report for In SITU lead Immobilization Using Phosphate-Based Binders. U. S. Army Environmental Command Aberdeen Proving Ground.

Giambelluca, T.W., Q. Chen, A.G. Frazier, J.P. Price, Y.-L. Chen, P.-S. Chu, J.K. Eischeid, and D.M. Delparte. 2013. Online Rainfall Atlas of Hawai'i. Bull. Amer. Meteor. Soc. 94, 313-316, doi: 10.1175/BAMS-D-11-00228.1.

Honolulu Advertiser. 1953. Hakalau Bridge Rebuilt, Given New Paint Job. 05 July

Hawaii Department of Health (HDOH). 2007. Use of laboratory batch tests to evaluate potential leaching of contaminants from soil. Technical Memorandum, April 12.

———. 2008. Technical Guidance Manual for the Implementation of the Hawaii State Contingency Plan, State of Hawaii Department of Health Hazard Evaluation and Emergency Response Office, Interim Final-November 12, 2008.

———. 2011. Technical Guidance Manual Notes: Decision Unit and Multi-Increment Sample Investigations. HDOH, Environmental Management Division. March.

———. 2012a. Evaluation of Environmental Hazards at Sites with Contaminated Soil and Groundwater, Volume 1: User's Guide, Hawai'i Edition, Fall 2011. Hawaii Department of Health, Environmental Management Division. Fall 2011 (Revised Fall 2017).

———. 2012b. Evaluation of Environmental Hazards at Sites with Contaminated Soil and Groundwater, Volume 2: Background Documentation for the Development of Tier 1 Environmental Action Levels, Appendices 2-9. Fall 2011. Prepared by: Hawaii Department of Health, Environmental Management Division. Fall 2011 (Revised Fall 2017).

———. 2012c. EAL Surfer. Prepared by: Hawai'i Department of Health, Hazard Evaluation and Emergency Response. Fall 2011 (Revised Fall 2017).

———. 2022. STATE OF HAWAII WATER QUALITY MONITORING AND ASSESSMENT REPORT: Integrated Report to the U.S. Environmental Protection Agency and the U.S. Congress Pursuant to §303(d) and §305(b), Clean Water Act (P.L. 97-117). Hawaii Department of Health. April 6.

———. 2019. Safe Drinking Water Branch. Underground Injection Control. https://health.hawaii.gov/sdwb/underground-injection-control-program/. Accessed October 2019.

Hakalau Home. 2023. Honohina Hongwanji. https://www.hakalauhome.com/honohinahongwanji.html. Accessed May 10.

Hawaii Tribune-Herald. 1997. HDOT Lane Closure Notification. Nanue Bridge. March 2.

KPC (Kealamahi Pacific Consultants) 2023. Remedial Alternatives Analysis Report for Lead Impacted Soil at Hakalau Beach Park, Hakalau, HI. Final May.

National Oceanic and Atmospheric Administration (NOAA). 2019. Hamakua Coast. Accessed Oct 2019. https://www.ncdc.noaa.gov.

National Parks Services (NPS). 2009. US Dept. of the Interior. National Register of Historic Places. Nanue Stream Bridge. June.

Pinto, Patricio and Souhail Al-Abed. 2017. Assessing metal mobilization from industrial lead-contaminated soils in an urban site. Applied Geochemistry 83: 31 -40, August.

State of Hawaii Administrative Rules (HAR) 1995. State of Hawaii State Contingency Plan. [HAR 11-451-8(c)]

United States Environmental Protection Agency (US EPA). 1996. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846. 3rd ed. Final Update III. Washington. GPO. November.

———. 2000. Guidance for the Data Quality Objectives Process (EPA QA/G-4). EPA/600/R-96/055. Washington, D.C., August.

———. 2003. Guidance for Obtaining Representative Laboratory Analytical Subsamples from Particulate Laboratory Samples. October 27.

_____. 2019. Applicable or Relevant and Appropriate Requirements (ARARS). https://www.epa.gov/superfund/applicable-or-relevant-and-appropriate-requirements-arars.

United States Geological Survey (USGS). 2019. Papaaloa, HI Quad. HTMC, 1992 ed. USGS Topoviewer Accessed 2022. https://ngmdb.usgs.gov/topoview/viewer/#15/19.8861/-155.1273.

FIGURES

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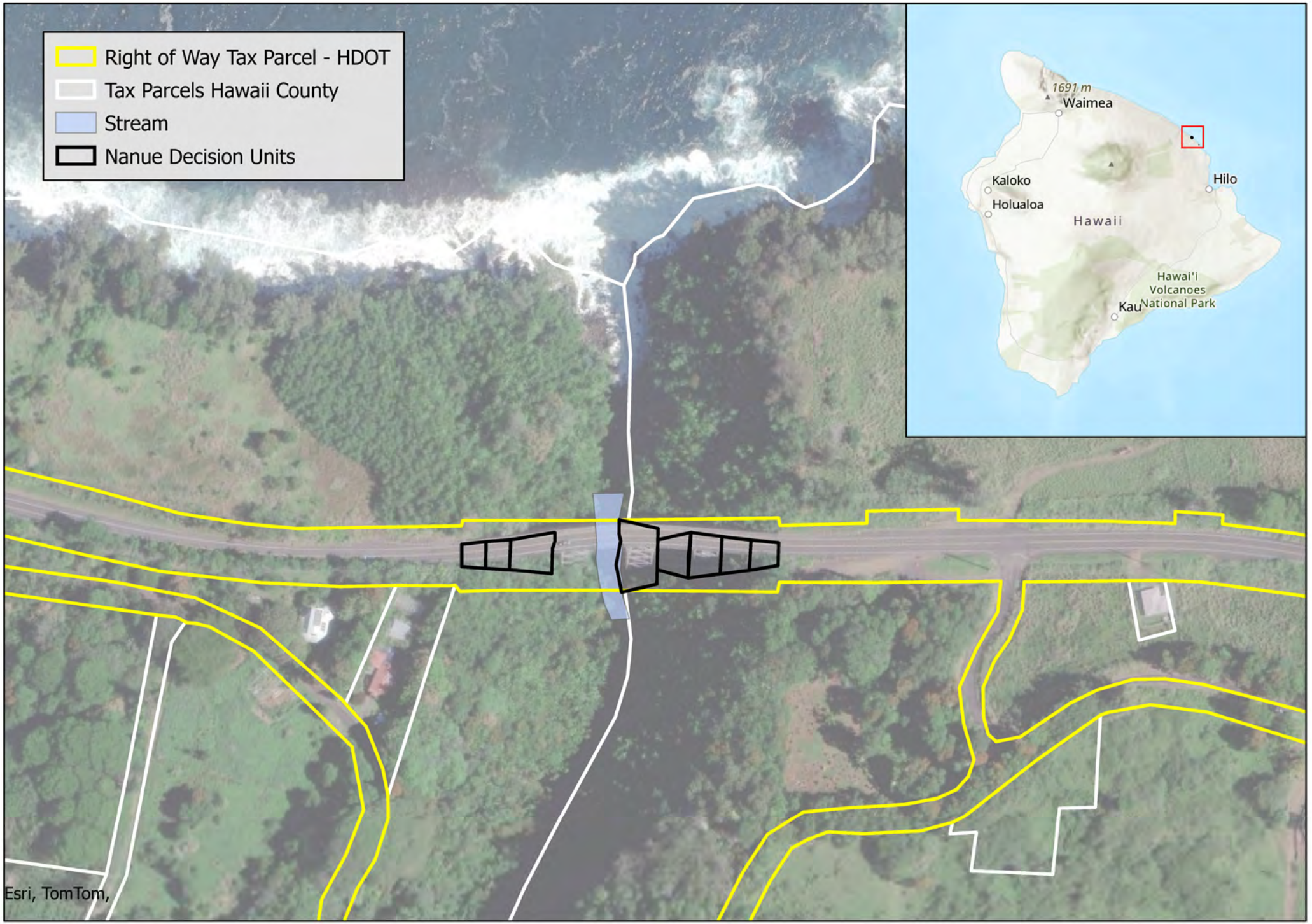


N

0 95 190 380 Feet

Map not to scale
Locations are approximate

Figure 1
Nanue Decision Units and Tax Map
Nanue Stream Bridge, Hawaii County, HI

N

0 25 50 100 Feet

Map not to scale
Locations are approximate

Figure 2a
Total Lead Results 0 - 3 Inches bgs
Nanue Stream Bridge, Hawaii County, HI

Map not to scale
Locations are approximate

Figure 2b
Total Lead Results 3 - 6 Inches bgs
Nanue Stream Bridge, Hawaii County, HI

N

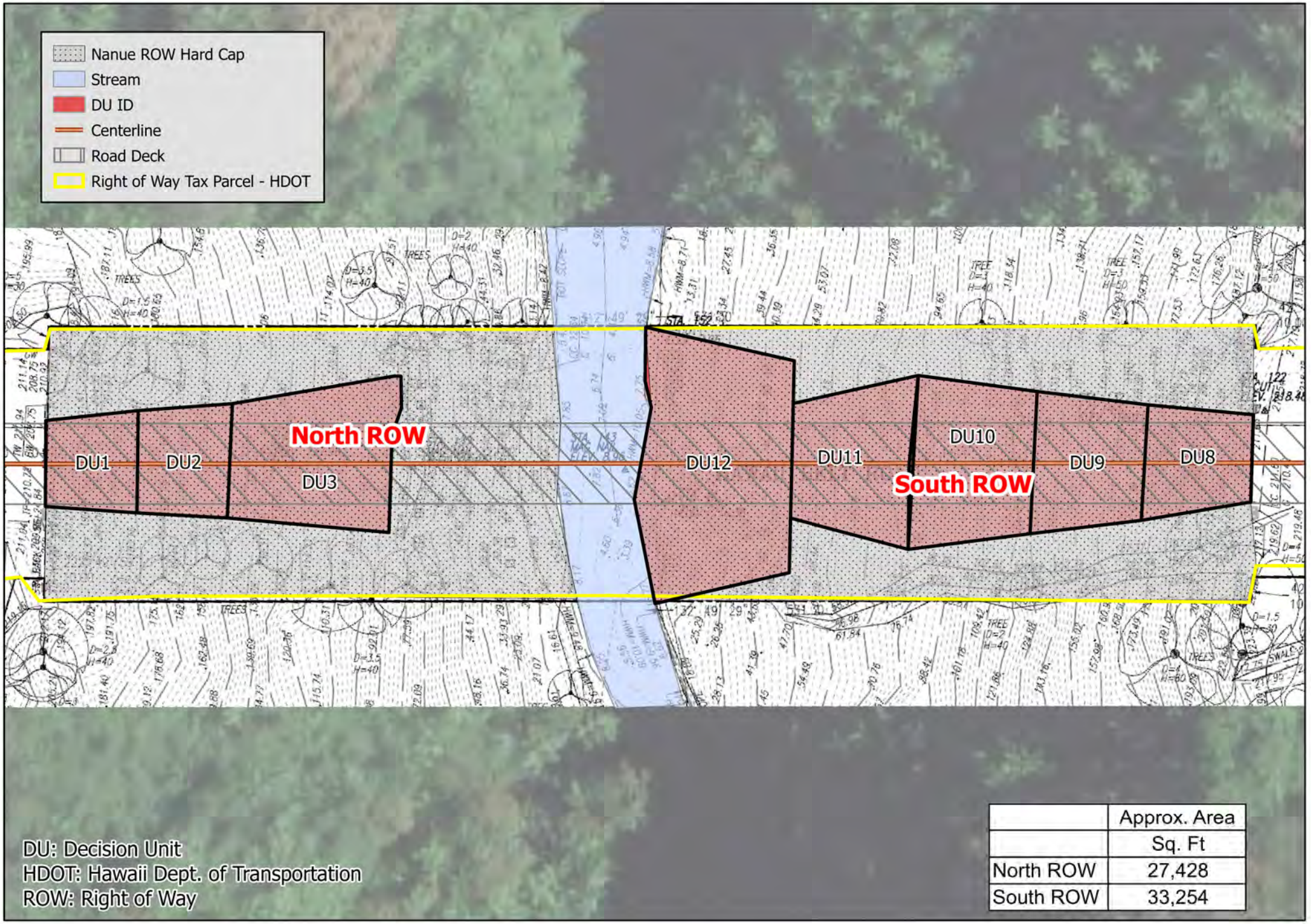
0 25 50 100 Feet

Map not to scale
Locations are approximate

Figure 2c
Total Lead Results 6 - 9 Inches bgs
Nanue Stream Bridge, Hawaii County, HI

Map not to scale
Locations are approximate

Figure 3
Total Arsenic Results 0 to 9 inches bgs
Nanue Stream Bridge, Hawaii County, HI



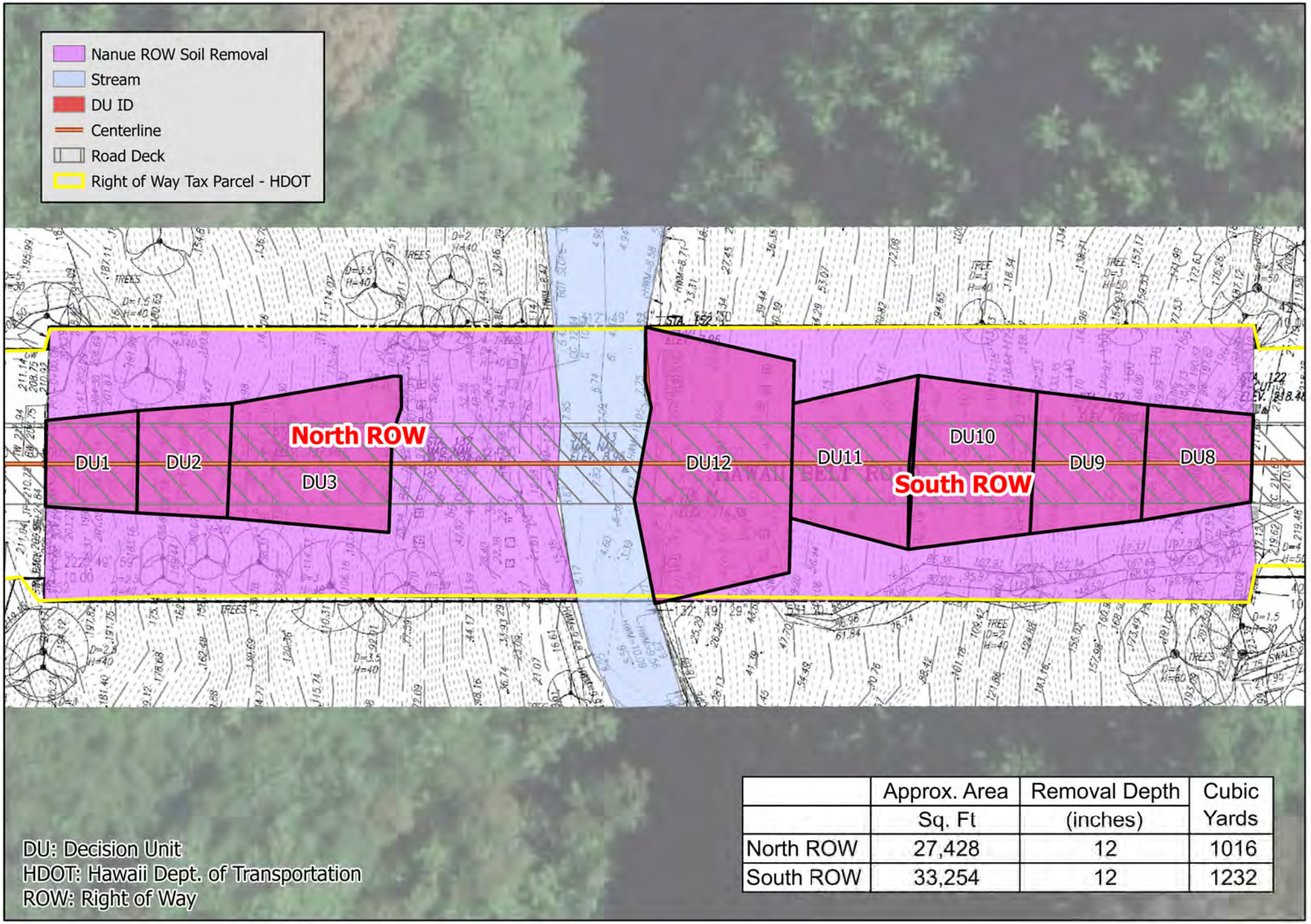
	Approx. Area
	Sq. Ft
North ROW	27,428
South ROW	33,254

N

0 25 50 100 Feet

Map not to scale
Locations are approximate

Figure 4
ROW Hard Cap Remedial Action
Nanue Stream Bridge, Hawaii County, HI



	Approx. Area Sq. Ft	Removal Depth (inches)	Cubic Yards
North ROW	27,428	12	1016
South ROW	33,254	12	1232

DU: Decision Unit
HDOT: Hawaii Dept. of Transportation
ROW: Right of Way

N

0 25 50 100 Feet

Map not to scale
Locations are approximate

Figure 5
ROW Soil Removal Remedial Action
Nanue Stream Bridge, Hawaii County, HI

	Approx. Area	Perimeter
	Sq. Ft	Feet
North ROW	27,428	704
South ROW	33,254	783

N

0 25 50 100 Feet

Map not to scale
Locations are approximate

Figure 6
ROW Fencing
Nanue Stream Bridge, Hawaii County, HI

APPENDIX A-1:

2024 SAMPLING RESULTS SUMMARY TABLES

RCRA8 and PCBs

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Table A-1a: Analytical Soil Profiling Results - Total RCRA Regulated Metals - Nanue Bridge (page 1 of 3)

								Sample Identifier	NAN_DU1_0-3			NAN_DU1_3-6			NAN_DU1_6-9			NAN_DU2_0-3		
								Sample Date	5-Mar-2024			5-Mar-2024			5-Mar-2024			6-Mar-2024		
								Sample Depth (inches bgs)	0-3			3-6			6-9			0-3		
Analyte	Analytical Method	Units	**20 x Regulatory Limits for TCLP Metals+**	**HDOH Tier 1 EALs* (Unrestricted Use)**	**HDOH Tier 1 EALs (Residential Direct-Exposure)1**	**HDOH Tier 1 EALs (Commercial / Industrial Direct-Exposure)2**	**HDOH Tier 1 EALs (Construction Worker Direct-Exposure)3**		**Results**	Q	RL	**Results**	Q	RL	**Results**	Q	RL	**Results**	Q	RL
Resource Conservation and Recovery Act (RCRA) Regulated Metals																				
Arsenic	EPA 6020B	mg/kg	**100**	**24**	**23**	**95**	**110**		**26**		0.47	**23**		0.49	**17**		0.48	**14**		0.47
Barium	EPA 6020B	mg/kg	**2000**	**1,000**	**3,100**	**4,300**	**4,300**		**263**		0.95	**287**		0.98	**307**		0.96	**200**		0.95
Cadmium	EPA 6020B	mg/kg	**20**	**14**	**14**	**72**	**72**		0.39	J	0.76	0.39	J	0.78	0.34	J	0.77	0.41	J	0.76
Chromium	EPA 6020B	mg/kg	**100**	**1,100**	**NS**	**NS**	**NS**		**190**		0.95	**190**		0.98	**187**		0.96	**180**		0.95
Lead	EPA 6020B	mg/kg	**100**	**200**	**200**	**800**	**800**		**1,133**		0.47	**840**		0.49	**577**		0.48	**1,200**		0.47
Mercury	EPA 7471A	mg/kg	**4**	**4.7**	**4.7**	**61**	**130**		**0.14**		0.020	**0.15**		0.021	**0.14**		0.021	**0.15**		0.022
Selenium	EPA 6020B	mg/kg	**20**	**78**	**78**	**1,000**	**2,200**		**7.7**		1.4	**8.9**		1.5	**9.4**		1.4	**8.3**		1.4
Silver	EPA 6020B	mg/kg	**100**	**78**	**78**	**1,000**	**2,200**		0.059	J	0.19	0.053	J	0.20	0.044	J	0.19	0.077	J	0.19

								Sample Identifier	NAN_DU2_3-6			NAN_DU2_6-9			NAN_DU3_0-3			NAN_DU3_3-6		
								Sample Date	6-Mar-2024			6-Mar-2024			6-Mar-2024			6-Mar-2024		
								Sample Depth (feet bgs)	3-6			6-9			0-3			3-6		
Analyte	Analytical Method	Units	**20 x Regulatory Limits for TCLP Metals+**	**HDOH Tier 1 EALs* (Unrestricted Use)**	**HDOH Tier 1 EALs (Residential Direct-Exposure)1**	**HDOH Tier 1 EALs (Commercial / Industrial Direct-Exposure)2**	**HDOH Tier 1 EALs (Construction Worker Direct-Exposure)3**		**Results**	Q	RL	**Results**	Q	RL	**Results**	Q	RL	**Results**	Q	RL
Resource Conservation and Recovery Act (RCRA) Regulated Metals																				
Arsenic	EPA 6020B	mg/kg	**100**	**24**	**23**	**95**	**110**		**12**		0.48	**14**		0.47	**13**		0.46	**15**		0.47
Barium	EPA 6020B	mg/kg	**2000**	**1,000**	**3,100**	**4,300**	**4,300**		**190**		0.95	**210**		0.95	**130**	J1	0.92	**140**		0.95
Cadmium	EPA 6020B	mg/kg	**20**	**14**	**14**	**72**	**72**		0.37	J	0.76	0.40	J	0.76	0.30	J	0.74	0.33	J	0.76
Chromium	EPA 6020B	mg/kg	**100**	**1,100**	**NS**	**NS**	**NS**		**170**		0.95	**190**		0.95	**130**	J1	0.92	**140**		0.95
Lead	EPA 6020B	mg/kg	**100**	**200**	**200**	**800**	**800**		**1,000**		0.48	**1,400**		0.47	**1,200**	J1	0.46	**1,200**		0.47
Mercury	EPA 7471A	mg/kg	**4**	**4.7**	**4.7**	**61**	**130**		**0.15**		0.021	**0.18**		0.020	**0.15**		0.024	**0.16**		0.022
Selenium	EPA 6020B	mg/kg	**20**	**78**	**78**	**1,000**	**2,200**		**7.8**		1.4	**9.2**		1.4	**6.6**		1.4	**6.8**		1.4
Silver	EPA 6020B	mg/kg	**100**	**78**	**78**	**1,000**	**2,200**		0.060	J	0.19	0.054	J	0.19	0.047	J	0.18	0.048	J	0.19

Notes:

+ If the total concentration of a RCRA metal exceeds 20 times the RCRA regulated toxicity characteristic concentrations then TCLP analysis is required for acceptance at a RCRA regulated waste disposal facility.

** This value represents the result of the Relative Percent Difference replicate comparison result (see Table 2-1a).

1 State of Hawaii Department of Health Tier I EALs, Residential Land-Use Scenario presented in Table I-1 of the Evaluation of Environmental Hazards at Sites with Contaminated Soil and Groundwater (Fall 2017 Edition).

2 State of Hawaii Department of Health Tier I EALs, Commercial / Industrial Land-Use Scenario presented in Table I-2 of the Evaluation of Environmental Hazards at Sites with Contaminated Soil and Groundwater (Fall 2017 Edition).

3 State of Hawaii Department of Health Tier I EALs, Construction/Trench Worker Exposure Scenario presented in Table I-3 of the Evaluation of Environmental Hazards at Sites with Contaminated Soil and Groundwater (Fall 2017 Edition).

bgs = below ground surface

mg/kg = milligram(s) per kilogram

RL = reporting limit

Q = qualifier

J = The analyte was positively identified; the quantitation is an estimation

J1 = The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria

Table A-1a: Analytical Soil Profiling Results - Total RCRA Regulated Metals - Nanue Bridge (page 2 of 3)

								Sample Identifier	NAN_DU3_6-9			NAN_DU8_0-3			NAN_DU8_3-6			NAN_DU8_6-9		
								Sample Date	6-Mar-2024			3-Mar-2024			3-Mar-2024			3-Mar-2024		
								Sample Depth (inches bgs)	6-9			0-3			3-6			6-9		
Analyte	Analytical Method	Units	**20 x Regulatory Limits for TCLP Metals+**	**HDOH Tier 1 EALs* (Unrestricted Use)**	**HDOH Tier 1 EALs (Residential Direct-Exposure)1**	**HDOH Tier 1 EALs (Commercial / Industrial Direct-Exposure)2**	**HDOH Tier 1 EALs (Construction Worker Direct-Exposure)3**		**Results**	Q	RL	**Results**	Q	RL	**Results**	Q	RL	**Results**	Q	RL
Resource Conservation and Recovery Act (RCRA) Regulated Metals																				
Arsenic	EPA 6020B	mg/kg	**100**	**24**	**23**	**95**	**110**		**14**		0.48	**20**		0.47	**20**		0.48	**32**		0.47
Barium	EPA 6020B	mg/kg	**2000**	**1,000**	**3,100**	**4,300**	**4,300**		**140**		0.96	**150**		0.95	**200**		0.95	**180**		0.95
Cadmium	EPA 6020B	mg/kg	**20**	**14**	**14**	**72**	**72**		0.28	J	0.77	0.56	J	0.76	0.62	J	0.76	0.66	J	0.76
Chromium	EPA 6020B	mg/kg	**100**	**1,100**	**NS**	**NS**	**NS**		**130**		0.96	**170**		0.95	**180**		0.95	**180**		0.95
Lead	EPA 6020B	mg/kg	**100**	**200**	**200**	**800**	**800**		**1,500**		0.48	**4,300**		0.47	**3,100**		0.48	**2,900**		0.47
Mercury	EPA 7471A	mg/kg	**4**	**4.7**	**4.7**	**61**	**130**		**0.16**		0.022	**0.31**		0.022	**0.30**		0.021	**0.34**		0.020
Selenium	EPA 6020B	mg/kg	**20**	**78**	**78**	**1,000**	**2,200**		**7.3**		1.4	**5.8**		1.4	**6.8**		1.4	**7.1**		1.4
Silver	EPA 6020B	mg/kg	**100**	**78**	**78**	**1,000**	**2,200**		0.053	J	0.19	0.088	J	0.19	0.072	J	0.19	0.073	J	0.19

								Sample Identifier	NAN_DU9_0-3			NAN_DU9_3-6			NAN_DU9_6-9			NAN_DU10_0-3		
								Sample Date	9-Mar-2024			9-Mar-2024			9-Mar-2024			9-Mar-2024		
								Sample Depth (feet bgs)	0-3			3-6			6-9			0-3		
Analyte	Analytical Method	Units	**20 x Regulatory Limits for TCLP Metals+**	**HDOH Tier 1 EALs* (Unrestricted Use)**	**HDOH Tier 1 EALs (Residential Direct-Exposure)1**	**HDOH Tier 1 EALs (Commercial / Industrial Direct-Exposure)2**	**HDOH Tier 1 EALs (Construction Worker Direct-Exposure)3**		**Results**	Q	RL	**Results**	Q	RL	**Results**	Q	RL	**Results**	Q	RL
Resource Conservation and Recovery Act (RCRA) Regulated Metals																				
Arsenic	EPA 6020B	mg/kg	**100**	**24**	**23**	**95**	**110**		**24**		0.48	**25**		0.48	**24**		0.48	**9.6**		0.46
Barium	EPA 6020B	mg/kg	**2000**	**1,000**	**3,100**	**4,300**	**4,300**		**100**		0.96	**110**		0.96	**110**		0.95	**120**	J1	0.92
Cadmium	EPA 6020B	mg/kg	**20**	**14**	**14**	**72**	**72**		0.67	J	0.77	0.67	J	0.77	0.59	J	0.76	0.4	J	0.74
Chromium	EPA 6020B	mg/kg	**100**	**1,100**	**NS**	**NS**	**NS**		**160**		0.96	**190**		0.96	**180**		0.95	**150**	J1	0.92
Lead	EPA 6020B	mg/kg	**100**	**200**	**200**	**800**	**800**		**6,400**		48	**6,200**		48	**6,000**		48	**8,500**	J1	46
Mercury	EPA 7471A	mg/kg	**4**	**4.7**	**4.7**	**61**	**130**		**0.28**		0.024	**0.26**		0.027	**0.26**		0.026	**0.12**		0.023
Selenium	EPA 6020B	mg/kg	**20**	**78**	**78**	**1,000**	**2,200**		**4.9**		1.4	**5.1**		1.4	**6.7**		1.4	**5.8**		1.4
Silver	EPA 6020B	mg/kg	**100**	**78**	**78**	**1,000**	**2,200**		0.085	J	0.19	0.089	J	0.19	0.095	J	0.19	0.088	J	0.18

Notes:

+ If the total concentration of a RCRA metal exceeds 20 times the RCRA regulated toxicity characteristic concentrations then TCLP analysis is required for acceptance at a RCRA regulated waste disposal facility.

** This value represents the result of the Relative Percent Difference replicate comparison result (see Table 2-1a).

1 State of Hawaii Department of Health Tier I EALs, Residential Land-Use Scenario presented in Table I-1 of the Evaluation of Environmental Hazards at Sites with Contaminated Soil and Groundwater (Fall 2017 Edition).

2 State of Hawaii Department of Health Tier I EALs, Commercial / Industrial Land-Use Scenario presented in Table I-2 of the Evaluation of Environmental Hazards at Sites with Contaminated Soil and Groundwater (Fall 2017 Edition).

3 State of Hawaii Department of Health Tier I EALs, Construction/Trench Worker Exposure Scenario presented in Table I-3 of the Evaluation of Environmental Hazards at Sites with Contaminated Soil and Groundwater (Fall 2017 Edition).

bgs = below ground surface

mg/kg = milligram(s) per kilogram

RL = reporting limit

Q = qualifier

J = The analyte was positively identified; the quantitation is an estimation

J1 = The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria

Table A-1a: Analytical Soil Profiling Results - Total RCRA Regulated Metals - Nanue Bridge (page 3 of 3)

								Sample Identifier	NAN_DU10_3-6			NAN_DU10_6-9			NAN_DU11_0-3			NAN_DU11_3-6		
								Sample Date	9-Mar-2024			9-Mar-2024			10-Mar-2024			10-Mar-2024		
								Sample Depth (inches bgs)	3-6			6-9			0-3			3-6		
Analyte	Analytical Method	Units	**20 x Regulatory Limits for TCLP Metals+**	**HDOH Tier 1 EALs* (Unrestricted Use)**	**HDOH Tier 1 EALs (Residential Direct-Exposure)1**	**HDOH Tier 1 EALs (Commercial / Industrial Direct-Exposure)2**	**HDOH Tier 1 EALs (Construction Worker Direct-Exposure)3**		**Results**	Q	RL	**Results**	Q	RL	**Results**	Q	RL	**Results**	Q	RL
Resource Conservation and Recovery Act (RCRA) Regulated Metals																				
Arsenic	EPA 6020B	mg/kg	**100**	**24**	**23**	**95**	**110**		**8.7**		0.47	**7.9**		0.47	**11**		0.47	**10.0**		0.48
Barium	EPA 6020B	mg/kg	**2000**	**1,000**	**3,100**	**4,300**	**4,300**		**130**		0.95	**160**		0.94	**110**		0.95	**100**		0.95
Cadmium	EPA 6020B	mg/kg	**20**	**14**	**14**	**72**	**72**		0.39	J	0.76	0.35	J	0.76	0.37	J	0.76	0.40	J	0.76
Chromium	EPA 6020B	mg/kg	**100**	**1,100**	**NS**	**NS**	**NS**		**160**		0.95	**170**		0.94	**130**		0.95	**150**		0.95
Lead	EPA 6020B	mg/kg	**100**	**200**	**200**	**800**	**800**		**9,700**		47	**8,100**		47	**4,300**		47	**6,400**		48
Mercury	EPA 7471A	mg/kg	**4**	**4.7**	**4.7**	**61**	**130**		**0.16**		0.007	**0.13**		0.024	**0.10**		0.025	**0.12**		0.027
Selenium	EPA 6020B	mg/kg	**20**	**78**	**78**	**1,000**	**2,200**		**6.9**		1.4	**7.8**		1.4	**4.8**		1.4	**6.2**		1.4
Silver	EPA 6020B	mg/kg	**100**	**78**	**78**	**1,000**	**2,200**		0.10	J	0.19	0.078	J	0.19	0.081	J	0.19	0.086	J	0.19

								Sample Identifier	NAN_DU11_6-9			NAN_DU12_0-3			NAN_DU12_3-6			NAN_DU12_6-9		
								Sample Date	10-Mar-2024			10-Mar-2024			10-Mar-2024			10-Mar-2024		
								Sample Depth (feet bgs)	6-9			0-3			3-6			6-9		
Analyte	Analytical Method	Units	**20 x Regulatory Limits for TCLP Metals+**	**HDOH Tier 1 EALs* (Unrestricted Use)**	**HDOH Tier 1 EALs (Residential Direct-Exposure)1**	**HDOH Tier 1 EALs (Commercial / Industrial Direct-Exposure)2**	**HDOH Tier 1 EALs (Construction Worker Direct-Exposure)3**		**Results**	Q	RL	**Results**	Q	RL	**Results**	Q	RL	**Results**	Q	RL
Resource Conservation and Recovery Act (RCRA) Regulated Metals																				
Arsenic	EPA 6020B	mg/kg	**100**	**24**	**23**	**95**	**110**		**8.7**		0.46	**16**		0.46	**11**		0.46	**10**		0.47
Barium	EPA 6020B	mg/kg	**2000**	**1,000**	**3,100**	**4,300**	**4,300**		**110**		0.92	**79**		0.92	**50**		0.92	**69**		0.94
Cadmium	EPA 6020B	mg/kg	**20**	**14**	**14**	**72**	**72**		0.39	J	0.74	0.4	J	0.74	0.29	J	0.74	0.30	J	0.75
Chromium	EPA 6020B	mg/kg	**100**	**1,100**	**NS**	**NS**	**NS**		**150**		0.92	**130**		0.92	**87**		0.92	**90**		0.94
Lead	EPA 6020B	mg/kg	**100**	**200**	**200**	**800**	**800**		**6,000**		0.46	**6,300**		0.46	**7,900**		0.46	**6,500**		0.47
Mercury	EPA 7471A	mg/kg	**4**	**4.7**	**4.7**	**61**	**130**		**0.16**		0.025	**0.09**		0.023	**0.12**		0.022	**0.12**		0.023
Selenium	EPA 6020B	mg/kg	**20**	**78**	**78**	**1,000**	**2,200**		**6.3**		1.4	**2.8**		1.4	**3.4**		1.4	**3.6**		1.4
Silver	EPA 6020B	mg/kg	**100**	**78**	**78**	**1,000**	**2,200**		0.083	J	0.18	0.088	J	0.18	0.086	J	0.18	0.068		0.19

Notes:

+ If the total concentration of a RCRA metal exceeds 20 times the RCRA regulated toxicity characteristic concentrations then TCLP analysis is required for acceptance at a RCRA regulated waste disposal facility.

** This value represents the result of the Relative Percent Difference replicate comparison result (see Table 2-1a).

1 State of Hawaii Department of Health Tier I EALs, Residential Land-Use Scenario presented in Table I-1 of the Evaluation of Environmental Hazards at Sites with Contaminated Soil and Groundwater (Fall 2017 Edition).

2 State of Hawaii Department of Health Tier I EALs, Commercial / Industrial Land-Use Scenario presented in Table I-2 of the Evaluation of Environmental Hazards at Sites with Contaminated Soil and Groundwater (Fall 2017 Edition).

3 State of Hawaii Department of Health Tier I EALs, Construction/Trench Worker Exposure Scenario presented in Table I-3 of the Evaluation of Environmental Hazards at Sites with Contaminated Soil and Groundwater (Fall 2017 Edition).

bgs = below ground surface

mg/kg = milligram(s) per kilogram

RL = reporting limit

Q = qualifier

J = The analyte was positively identified; the quantitation is an estimation

J1 = The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria

Table A-1b: Replicate Sample Results Comparison - Total RCRA Regulated Metals - Nanue Bridge (page 1 of 3)

Analyte	EPA Method	Sample Identification	Sample Type	Result (mg/kg)	Relative Percent Difference		Mean	Standard Deviation*	Relative Standard Deviation	Comment
					Primary and Duplicate	Primary and Triplicate				
Arsenic	EPA 6020B	NAN_DU1_0-3_A	Primary	28	0%	24%	26.0	3.5	13%	RSD is less than 50% so the mean concentration is used as the reported concentration. The result is less than 20 x regulatory limits for TCLP metals, but above HDOH Tier 1 EAL.
		NAN_DU1_0-3_B	Duplicate	28						
		NAN_DU1_0-3_C	Triplicate	22						
Barium	EPA 6020B	NAN_DU1_0-3_A	Primary	260	4%	7%	263.3	15.3	6%	RSD is less than 50% so the mean concentration is used as the reported concentration.The mean concentration is below HDOH Tier 1 EAL and less than 20x regulatory limits for TCLP metals.
		NAN_DU1_0-3_B	Duplicate	250						
		NAN_DU1_0-3_C	Triplicate	280						
Cadmium	EPA 6020B	NAN_DU1_0-3_A	Primary	0.37	13%	3%	0.390	0.026	7%	RSD is less than 50% so the mean concentration is used as the reported concentration.The mean concentration is below HDOH Tier 1 EAL and less than 20x regulatory limits for TCLP metals.
		NAN_DU1_0-3_B	Duplicate	0.42						
		NAN_DU1_0-3_C	Triplicate	0.38						
Chromium	EPA 6020B	NAN_DU1_0-3_A	Primary	180	5%	11%	190	10.0	5%	RSD is less than 50% so the mean concentration is used as the reported concentration. The result is above 20 x regulatory limits for TCLP metals. Mean concentration is below HDOH Tier 1 EAL.
		NAN_DU1_0-3_B	Duplicate	190						
		NAN_DU1_0-3_C	Triplicate	200						
Lead	EPA 6020B	NAN_DU1_0-3_A	Primary	1100	9%	0%	1,133	57.7	5%	RSD is less than 50% so the mean concentration is used as the reported concentration. The result is above 20 x regulatory limits for TCLP metal and above HDOH Tier 1 EAL.
		NAN_DU1_0-3_B	Duplicate	1200						
		NAN_DU1_0-3_C	Triplicate	1100						
Mercury	EPA 7471A	NAN_DU1_0-3_A	Primary	0.15	14%	0%	0.143	0.012	8%	RSD is less than 50% so the mean concentration is used as the reported concentration.The mean concentration is below HDOH Tier 1 EAL and less than 20x regulatory limits for TCLP metals.
		NAN_DU1_0-3_B	Duplicate	0.13						
		NAN_DU1_0-3_C	Triplicate	0.15						
Selenium	EPA 6020B	NAN_DU1_0-3_A	Primary	8.1	8%	9%	7.67	0.38	5%	RSD is less than 50% so the mean concentration is used as the reported concentration.The mean concentration is below HDOH Tier 1 EAL and less than 20x regulatory limits for TCLP metals.
		NAN_DU1_0-3_B	Duplicate	7.5						
		NAN_DU1_0-3_C	Triplicate	7.4						
Silver	EPA 6020B	NAN_DU1_0-3_A	Primary	0.064	17%	10%	0.0587	0.0050	9%	RSD is less than 50% so the mean concentration is used as the reported concentration.The mean concentration is below HDOH Tier 1 EAL and less than 20x regulatory limits for TCLP metals.
		NAN_DU1_0-3_B	Duplicate	0.054						
		NAN_DU1_0-3_C	Triplicate	0.058						

Notes:

* Standard Deviation: If < 50% use the arithmatic mean, if < 50% then use the max of the replicate group.

Result below HDOH Tier 1 EAL

Result above 20 x Regulatory Limits for TCLP Metals

Table A-1b: Replicate Sample Results Comparison - Total RCRA Regulated Metals - Nanue Bridge (page 2 of 3)

Analyte	EPA Method	Sample Identification	Sample Type	Result (mg/kg)	Relative Percent Difference		Mean	Standard Deviation*	Relative Standard Deviation	Comment
					Primary and Duplicate	Primary and Triplicate				
Arsenic	EPA 6020B	NAN_DU1_3-6_A	Primary	24	4%	9%	23.0	1.0	4%	RSD is less than 50% so the mean concentration is used as the reported concentration. The result is less than 20 x regulatory limits for TCLP, but above HDOH Tier 1 EAL.
		NAN_DU1_3-6_B	Duplicate	23						
		NAN_DU1_3-6_C	Triplicate	22						
Barium	EPA 6020B	NAN_DU1_3-6_A	Primary	270	11%	7%	286.7	15.3	5%	RSD is less than 50% so the mean concentration is used as the reported concentration.The mean concentration is below HDOH Tier 1 EAL and less than 20x regulatory limits for TCLP metals.
		NAN_DU1_3-6_B	Duplicate	300						
		NAN_DU1_3-6_C	Triplicate	290						
Cadmium	EPA 6020B	NAN_DU1_3-6_A	Primary	0.42	13%	13%	0.387	0.029	7%	RSD is less than 50% so the mean concentration is used as the reported concentration.The mean concentration is below HDOH Tier 1 EAL and less than 20x regulatory limits for TCLP metals.
		NAN_DU1_3-6_B	Duplicate	0.37						
		NAN_DU1_3-6_C	Triplicate	0.37						
Chromium	EPA 6020B	NAN_DU1_3-6_A	Primary	190	0%	0%	190	0.0	0%	RSD is less than 50% so the mean concentration is used as the reported concentration. The result is above 20 x regulatory limits for TCLP metals. Mean concentration is below HDOH Tier 1 EAL.
		NAN_DU1_3-6_B	Duplicate	190						
		NAN_DU1_3-6_C	Triplicate	190						
Lead	EPA 6020B	NAN_DU1_3-6_A	Primary	980	2%	14%	930	70.0	8%	RSD is less than 50% so the mean concentration is used as the reported concentration. The result is above 20 x regulatory limits for TCLP metal and above HDOH Tier 1 EAL.
		NAN_DU1_3-6_B	Duplicate	960						
		NAN_DU1_3-6_C	Triplicate	850						
Mercury	EPA 7471A	NAN_DU1_3-6_A	Primary	0.16	0%	21%	0.150	0.017	12%	RSD is less than 50% so the mean concentration is used as the reported concentration.The mean concentration is below HDOH Tier 1 EAL and less than 20x regulatory limits for TCLP metals.
		NAN_DU1_3-6_B	Duplicate	0.16						
		NAN_DU1_3-6_C	Triplicate	0.13						
Selenium	EPA 6020B	NAN_DU1_3-6_A	Primary	9.6	11%	12%	8.90	0.61	7%	RSD is less than 50% so the mean concentration is used as the reported concentration.The mean concentration is below HDOH Tier 1 EAL and less than 20x regulatory limits for TCLP metals.
		NAN_DU1_3-6_B	Duplicate	8.6						
		NAN_DU1_3-6_C	Triplicate	8.5						
Silver	EPA 6020B	NAN_DU1_3-6_A	Primary	0.057	19%	4%	0.0530	0.0053	10%	RSD is less than 50% so the mean concentration is used as the reported concentration.The mean concentration is below HDOH Tier 1 EAL and less than 20x regulatory limits for TCLP metals.
		NAN_DU1_3-6_B	Duplicate	0.047						
		NAN_DU1_3-6_C	Triplicate	0.055						

Notes:

* Standard Deviation: If < 50% use the arithmatic mean, if < 50% then use the max of the replicate group.

Result below HDOH Tier 1 EAL

Result above 20 x Regulatory Limits for TCLP Metals

Table A-1b: Replicate Sample Results Comparison - Total RCRA Regulated Metals - Nanue Bridge (page 3 of 3)

Analyte	EPA Method	Sample Identification	Sample Type	Result (mg/kg)	Relative Percent Difference		Mean	Standard Deviation*	Relative Standard Deviation	Comment
					Primary and Duplicate	Primary and Triplicate				
Arsenic	EPA 6020B	NAN_DU1_6-9_A	Primary	17	0%	6%	17.3	0.6	3%	RSD is less than 50% so the mean concentration is used as the reported concentration.The mean concentration is below HDOH Tier 1 EAL and less than 20x regulatory limits for TCLP metals.
		NAN_DU1_6-9_B	Duplicate	17						
		NAN_DU1_6-9_C	Triplicate	18						
Barium	EPA 6020B	NAN_DU1_6-9_A	Primary	340	3%	31%	306.7	49.3	16%	RSD is less than 50% so the mean concentration is used as the reported concentration.The mean concentration is below HDOH Tier 1 EAL and less than 20x regulatory limits for TCLP metals.
		NAN_DU1_6-9_B	Duplicate	330						
		NAN_DU1_6-9_C	Triplicate	250						
Cadmium	EPA 6020B	NAN_DU1_6-9_A	Primary	0.32	14%	0%	0.337	0.029	9%	RSD is less than 50% so the mean concentration is used as the reported concentration.The mean concentration is below HDOH Tier 1 EAL and less than 20x regulatory limits for TCLP metals.
		NAN_DU1_6-9_B	Duplicate	0.37						
		NAN_DU1_6-9_C	Triplicate	0.32						
Chromium	EPA 6020B	NAN_DU1_6-9_A	Primary	190	5%	11%	186.7	15.3	8%	RSD is less than 50% so the mean concentration is used as the reported concentration. The result is above 20 x regulatory limits for TCLP metals. Mean concentration is below HDOH Tier 1 EAL.
		NAN_DU1_6-9_B	Duplicate	200						
		NAN_DU1_6-9_C	Triplicate	170						
Lead	EPA 6020B	NAN_DU1_6-9_A	Primary	640	3%	31%	576.7	92.9	16%	RSD is less than 50% so the mean concentration is used as the reported concentration. The result is above 20 x regulatory limits for TCLP metal and above HDOH Tier 1 EAL.
		NAN_DU1_6-9_B	Duplicate	620						
		NAN_DU1_6-9_C	Triplicate	470						
Mercury	EPA 7471A	NAN_DU1_6-9_A	Primary	0.15	6%	22%	0.143	0.021	15%	RSD is less than 50% so the mean concentration is used as the reported concentration.The mean concentration is below HDOH Tier 1 EAL and less than 20x regulatory limits for TCLP metals.
		NAN_DU1_6-9_B	Duplicate	0.16						
		NAN_DU1_6-9_C	Triplicate	0.12						
Selenium	EPA 6020B	NAN_DU1_6-9_A	Primary	10.0	3%	16%	9.40	0.79	8%	RSD is less than 50% so the mean concentration is used as the reported concentration.The mean concentration is below HDOH Tier 1 EAL and less than 20x regulatory limits for TCLP metals.
		NAN_DU1_6-9_B	Duplicate	9.7						
		NAN_DU1_6-9_C	Triplicate	8.5						
Silver	EPA 6020B	NAN_DU1_6-9_A	Primary	0.043	13%	5%	0.0443	0.0042	9%	RSD is less than 50% so the mean concentration is used as the reported concentration.The mean concentration is below HDOH Tier 1 EAL and less than 20x regulatory limits for TCLP metals.
		NAN_DU1_6-9_B	Duplicate	0.049						
		NAN_DU1_6-9_C	Triplicate	0.041						

Notes:

* Standard Deviation: If < 50% use the arithmatic mean, if < 50% then use the max of the replicate group.

Result below HDOH Tier 1 EAL

Result above 20 x Regulatory Limits for TCLP Metals

Table A-1c: Analytical Soil Profiling Results - Polychlorinated Biphenyls - Nanue Bridge (page 1 of 1)

							Sample Identifier			Sample Identifier			Sample Identifier		
							Sample Date			Sample Date			Sample Date		
							Sample Depth (inches bgs)			Sample Depth (inches bgs)			Sample Depth (inches bgs)		
Analyte	Analytical Method	Units	**HDOH Tier 1 EALs* (Unrestricted Use)**	**HDOH Tier 1 EALs (Residential Direct-Exposure)1**	**HDOH Tier 1 EALs (Commercial/Industrial Direct-Exposure)2**	**HDOH Tier 1 EALs (Construction Worker Direct-Exposure)3**	**Results**	Q	RL	**Results**	Q	RL	**Results**	Q	RL
Polychlorinated Biphenyls (PCBs)															
PCB-1016	EPA 8082A/3546	mg/kg	**1.2**	**1.2**	**8.6**	**25**	ND	M	0.019	ND		0.019	0.017	M	0.019
PCB-1221	EPA 8082A/3546	mg/kg	**1.2**	**1.2**	**8.6**	**25**	ND		0.019	ND		0.019	0.017		0.019
PCB-1232	EPA 8082A/3546	mg/kg	**1.2**	**1.2**	**8.6**	**25**	ND		0.019	ND		0.019	0.017		0.019
PCB-1242	EPA 8082A/3546	mg/kg	**1.2**	**1.2**	**8.6**	**25**	ND	M	0.019	ND		0.019	0.017	M	0.019
PCB-1248	EPA 8082A/3546	mg/kg	**1.2**	**1.2**	**8.6**	**25**	ND	M	0.019	ND		0.019	0.017	M	0.019
PCB-1254	EPA 8082A/3546	mg/kg	**1.2**	**1.2**	**8.6**	**25**	**0.055**	M	0.019	**0.037**	J1 M	0.019	**0.20**	M	0.019
PCB-1260	EPA 8082A/3546	mg/kg	**1.2**	**1.2**	**8.6**	**25**	ND	J1 M	0.019	ND	M	0.019	0.017	M	0.019

Notes:

* State of Hawaii Department of Health Tier I Environmental Action Levels (EALs), Groundwater is a Current or Potential Source of Drinking Water (<150 meter to surface water body) presented in Table A of the Evaluation of Environmental Hazards at Sites with Contaminated Soil and Groundwater (Fall 2017 Edition).

1 State of Hawaii Department of Health Tier I EALs, Residential Land-Use Scenario presented in Table I-1 of the Evaluation of Environmental Hazards at Sites with Contaminated Soil and Groundwater (Fall 2017 Edition).

2 State of Hawaii Department of Health Tier I EALs, Commercial / Industrial Land-Use Scenario presented in Table I-2 of the Evaluation of Environmental Hazards at Sites with Contaminated Soil and Groundwater (Fall 2017 Edition).

3 State of Hawaii Department of Health Tier I EALs, Construction/Trench Worker Exposure Scenario presented in Table I-3 of the Evaluation of Environmental Hazards at Sites with Contaminated Soil and Groundwater (Fall 2017 Edition).

M = Manual integrated compound.

mg/kg = milligram(s) per kilogram

ND = not detected in concentrations above the laboratories method reporting limit

RL = reporting limit

Q = qualifier

J1 = The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria

bgs = below ground surface

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APPENDIX A-2:

2024

LABORATORY ANALYTICAL REPORTS

J137730-1: RCRA8 Metals and PCBs

J137730-1: Revision 1 TCLP and SPLP

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ANALYTICAL REPORT

PREPARED FOR

Attn: Scott Moncrief
EnviroQuest, Inc.
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Aiea, Hawaii 96701

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JOB DESCRIPTION

Nanue Bridge

JOB NUMBER

580-137730-1

Eurofins Seattle
5755 8th Street East
Tacoma WA 98424

See page two for job notes and contact information.

Job Notes

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Table of Contents

Job Narrative
580-137730-1

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers are applied to indicate exceptions. Noncompliant quality control (QC) is further explained in narrative comments.

- Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Receipt
The samples were received on 3/14/2024 9:30 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 13.2°C and 13.3°C.

Note: All samples which require thermal preservation are considered acceptable if the arrival temperature is within 2C of the required temperature or method specified range. For samples with a specified temperature of 4C, samples with a temperature ranging from just above freezing temperature of water to 6C shall be acceptable. Samples that are hand delivered immediately following collection may not meet these criteria, however they will be deemed acceptable according to NELAC standards, if there is evidence that the chilling process has begun, such as arrival on ice, etc.

Receipt Exceptions
All samples contained in this login were delayed in shipment by Federal Express.

Method 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography
Samples NAN_DU10_0-3 (580-137730-22), NAN_DU10_3-6 (580-137730-23) and NAN_DU11_3-6 (580-137730-26) were analyzed for Polychlorinated Biphenyls (PCBs) by Gas Chromatography. The samples were composited on 3/18/2024, prepared on 3/20/2024 and analyzed on 4/1/2024.

The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 580-454054 and 580-454340 and analytical batch 580-455366 were outside control limits for one or more analytes. See QC Sample Results for detail. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery is within acceptance limits.

The %RPD between the primary and confirmation column exceeded 40% for PCB-1254 for the following sample: NAN_DU10_3-6 (580-137730-23). The lower value(s) has been reported and qualified in accordance with the laboratory's SOP.

The following samples required a TBA clean-up to reduce matrix interferences caused by sulfur TBA_00037: NAN_DU10_0-3 (580-137730-22), NAN_DU10_3-6 (580-137730-23), NAN_DU11_3-6 (580-137730-26), (LCS 580-454340/2-A), (LCSD 580-454340/3-A), (MB 580-454340/1-A), (580-137730-A-22-D MS) and (580-137730-A-22-E MSD)
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Method 6020B - Metals (ICP/MS)
Samples NAN_DU8_0-3 (580-137730-1), NAN_DU8_3-6 (580-137730-2), NAN_DU8_6-9 (580-137730-3), NAN_DU1_0-3_A (580-137730-4), NAN_DU1_3-6_A (580-137730-5), NAN_DU1_6-9_A (580-137730-6), NAN_DU1_0-3_B (580-137730-7), NAN_DU1_3-6_B (580-137730-8), NAN_DU1_6-9_B (580-137730-9), NAN_DU1_0-3_C (580-137730-10), NAN_DU1_3-6_C (580-137730-11), NAN_DU1_6-9_C (580-137730-12), NAN_DU3_0-3 (580-137730-13), NAN_DU3_3-6 (580-137730-14), NAN_DU3_6-9 (580-137730-15), NAN_DU2_0-3 (580-137730-16), NAN_DU2_3-6 (580-137730-17), NAN_DU2_6-9 (580-137730-18), NAN_DU9_0-3 (580-137730-19), NAN_DU9_3-6 (580-137730-20), NAN_DU9_6-9 (580-137730-21), NAN_DU10_0-3 (580-137730-22), NAN_DU10_3-6 (580-137730-23), NAN_DU10_6-9 (580-137730-24), NAN_DU11_0-3 (580-137730-25), NAN_DU11_3-6 (580-137730-26), NAN_DU11_6-9 (580-137730-27), NAN_DU12_0-3 (580-137730-28), NAN_DU12_3-6 (580-137730-29) and NAN_DU12_6-9 (580-137730-30) were analyzed for Metals (ICP/MS). The samples were composited on 3/18/2024, prepared on 3/28/2024 and 4/1/2024 and analyzed on 3/29/2024, 3/30/2024, 4/1/2024, 4/4/2024 and 4/5/2024.

Samples NAN_DU9_0-3 (580-137730-19)[2000x], NAN_DU9_3-6 (580-137730-20)[2000x], NAN_DU9_6-9 (580-137730-21)[2000x], NAN_DU10_0-3 (580-137730-22)[2000x], NAN_DU10_3-6 (580-137730-23)[2000x], NAN_DU10_6-9

(580-137730-24)[2000x], NAN_DU11_0-3 (580-137730-25)[2000x], NAN_DU11_3-6 (580-137730-26)[2000x], NAN_DU11_6-9 (580-137730-27)[2000x], NAN_DU12_0-3 (580-137730-28)[2000x], NAN_DU12_3-6 (580-137730-29)[2000x] and NAN_DU12_6-9 (580-137730-30)[2000x] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

Method 7471A - Mercury (CVAA)
Samples NAN_DU8_0-3 (580-137730-1), NAN_DU8_3-6 (580-137730-2), NAN_DU8_6-9 (580-137730-3), NAN_DU1_0-3_A (580-137730-4), NAN_DU1_3-6_A (580-137730-5), NAN_DU1_6-9_A (580-137730-6), NAN_DU1_0-3_B (580-137730-7), NAN_DU1_3-6_B (580-137730-8), NAN_DU1_6-9_B (580-137730-9), NAN_DU1_0-3_C (580-137730-10), NAN_DU1_3-6_C (580-137730-11), NAN_DU1_6-9_C (580-137730-12), NAN_DU3_0-3 (580-137730-13), NAN_DU3_3-6 (580-137730-14), NAN_DU3_6-9 (580-137730-15), NAN_DU2_0-3 (580-137730-16), NAN_DU2_3-6 (580-137730-17), NAN_DU2_6-9 (580-137730-18), NAN_DU9_0-3 (580-137730-19), NAN_DU9_3-6 (580-137730-20), NAN_DU9_6-9 (580-137730-21), NAN_DU10_0-3 (580-137730-22), NAN_DU10_3-6 (580-137730-23), NAN_DU10_6-9 (580-137730-24), NAN_DU11_0-3 (580-137730-25), NAN_DU11_3-6 (580-137730-26), NAN_DU11_6-9 (580-137730-27), NAN_DU12_0-3 (580-137730-28), NAN_DU12_3-6 (580-137730-29) and NAN_DU12_6-9 (580-137730-30) were analyzed for Mercury (CVAA). The samples were composited on 3/18/2024, prepared on 3/25/2024 and 4/2/2024 and analyzed on 3/26/2024 and 4/2/2024.

Method 2540G - SM 2540G
Samples NAN_DU8_0-3 (580-137730-1), NAN_DU8_3-6 (580-137730-2), NAN_DU8_6-9 (580-137730-3), NAN_DU1_0-3_A (580-137730-4), NAN_DU1_3-6_A (580-137730-5), NAN_DU1_6-9_A (580-137730-6), NAN_DU1_0-3_B (580-137730-7), NAN_DU1_3-6_B (580-137730-8), NAN_DU1_6-9_B (580-137730-9), NAN_DU1_0-3_C (580-137730-10), NAN_DU1_3-6_C (580-137730-11), NAN_DU1_6-9_C (580-137730-12), NAN_DU3_0-3 (580-137730-13), NAN_DU3_3-6 (580-137730-14), NAN_DU3_6-9 (580-137730-15), NAN_DU2_0-3 (580-137730-16), NAN_DU2_3-6 (580-137730-17), NAN_DU2_6-9 (580-137730-18), NAN_DU9_0-3 (580-137730-19), NAN_DU9_3-6 (580-137730-20), NAN_DU9_6-9 (580-137730-21), NAN_DU10_0-3 (580-137730-22), NAN_DU10_3-6 (580-137730-23), NAN_DU10_6-9 (580-137730-24), NAN_DU11_0-3 (580-137730-25), NAN_DU11_3-6 (580-137730-26), NAN_DU11_6-9 (580-137730-27), NAN_DU12_0-3 (580-137730-28), NAN_DU12_3-6 (580-137730-29) and NAN_DU12_6-9 (580-137730-30) were analyzed for SM 2540G. The samples were composited on 3/18/2024 and analyzed on 3/26/2024.

Definitions/Glossary

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Qualifiers

GC Semi VOA

Qualifier	Qualifier Description
J1	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
M	Manual integrated compound.
U	Undetected at the Limit of Detection.

Metals

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
J1	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
U	Undetected at the Limit of Detection.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU8_0-3

Date Collected: 03/03/24 10:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-1

Matrix: Solid

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	20		0.50	0.099	mg/Kg		03/28/24 09:38	03/29/24 06:51	20
Barium	150		0.99	0.23	mg/Kg		03/28/24 09:38	03/29/24 06:51	20
Cadmium	0.56	J	0.79	0.077	mg/Kg		03/28/24 09:38	03/29/24 06:51	20
Chromium	170		0.99	0.063	mg/Kg		03/28/24 09:38	03/29/24 06:51	20
Lead	4300		0.50	0.048	mg/Kg		03/28/24 09:38	03/29/24 06:51	20
Selenium	5.8		1.5	0.28	mg/Kg		03/28/24 09:38	03/29/24 06:51	20
Silver	0.088	J	0.20	0.020	mg/Kg		03/28/24 09:38	03/29/24 06:51	20

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	71.8		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	28.2		0.1	0.1	%			03/26/24 11:00	1

Client Sample Results

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU8_0-3
Date Collected: 03/03/24 10:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-1
Matrix: Solid
Percent Solids: 71.8

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.31		0.022	0.0067	mg/Kg	☼	03/25/24 10:07	03/26/24 14:21	1

Client Sample Results

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU8_3-6

Date Collected: 03/03/24 10:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-2

Matrix: Solid

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	20		0.50	0.099	mg/Kg		03/28/24 09:38	03/29/24 06:57	20
Barium	200		0.99	0.23	mg/Kg		03/28/24 09:38	03/29/24 06:57	20
Cadmium	0.62	J	0.80	0.077	mg/Kg		03/28/24 09:38	03/29/24 06:57	20
Chromium	180		0.99	0.063	mg/Kg		03/28/24 09:38	03/29/24 06:57	20
Lead	3100		0.50	0.048	mg/Kg		03/28/24 09:38	03/29/24 06:57	20
Selenium	6.8		1.5	0.28	mg/Kg		03/28/24 09:38	03/29/24 06:57	20
Silver	0.072	J	0.20	0.020	mg/Kg		03/28/24 09:38	03/29/24 06:57	20

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	70.8		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	29.2		0.1	0.1	%			03/26/24 11:00	1

Client Sample Results

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU8_3-6
Date Collected: 03/03/24 10:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-2
Matrix: Solid
Percent Solids: 70.8

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.30		0.024	0.0071	mg/Kg	☼	03/25/24 10:07	03/26/24 14:28	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU8_6-9

Date Collected: 03/03/24 10:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-3

Matrix: Solid

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	32		0.47	0.095	mg/Kg		03/28/24 09:38	03/29/24 06:54	20
Barium	180		0.95	0.22	mg/Kg		03/28/24 09:38	03/29/24 06:54	20
Cadmium	0.66	J	0.76	0.073	mg/Kg		03/28/24 09:38	03/29/24 06:54	20
Chromium	180		0.95	0.060	mg/Kg		03/28/24 09:38	03/29/24 06:54	20
Lead	2900		0.47	0.046	mg/Kg		03/28/24 09:38	03/29/24 06:54	20
Selenium	7.1		1.4	0.27	mg/Kg		03/28/24 09:38	03/29/24 06:54	20
Silver	0.073	J	0.19	0.019	mg/Kg		03/28/24 09:38	03/29/24 06:54	20

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	69.0		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	31.0		0.1	0.1	%			03/26/24 11:00	1

Client Sample Results

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU8_6-9
Date Collected: 03/03/24 10:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-3
Matrix: Solid
Percent Solids: 69.0

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.34		0.024	0.0072	mg/Kg	☼	03/25/24 10:07	03/26/24 14:31	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU1_0-3_A

Date Collected: 03/05/24 16:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-4

Matrix: Solid

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	28		0.47	0.095	mg/Kg		03/28/24 09:38	03/29/24 06:49	20
Barium	260		0.95	0.22	mg/Kg		03/28/24 09:38	03/29/24 06:49	20
Cadmium	0.37	J	0.76	0.073	mg/Kg		03/28/24 09:38	03/29/24 06:49	20
Chromium	180		0.95	0.060	mg/Kg		03/28/24 09:38	03/29/24 06:49	20
Lead	1100		0.47	0.046	mg/Kg		03/28/24 09:38	03/29/24 06:49	20
Selenium	8.1		1.4	0.27	mg/Kg		03/28/24 09:38	03/29/24 06:49	20
Silver	0.064	J	0.19	0.019	mg/Kg		03/28/24 09:38	03/29/24 06:49	20

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	82.3		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	17.7		0.1	0.1	%			03/26/24 11:00	1

Client Sample Results

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU1_0-3_A
Date Collected: 03/05/24 16:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-4
Matrix: Solid
Percent Solids: 82.3

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.15		0.020	0.0060	mg/Kg	☼	03/25/24 10:07	03/26/24 14:33	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU1_3-6_A

Date Collected: 03/05/24 16:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-5

Matrix: Solid

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	24		0.49	0.098	mg/Kg		03/28/24 09:38	03/29/24 06:23	20
Barium	270		0.98	0.22	mg/Kg		03/28/24 09:38	03/29/24 06:23	20
Cadmium	0.42	J	0.78	0.076	mg/Kg		03/28/24 09:38	03/29/24 06:23	20
Chromium	190		0.98	0.062	mg/Kg		03/28/24 09:38	03/29/24 06:23	20
Lead	980		0.49	0.047	mg/Kg		03/28/24 09:38	03/29/24 06:23	20
Selenium	9.6		1.5	0.28	mg/Kg		03/28/24 09:38	03/29/24 06:23	20
Silver	0.057	J	0.20	0.020	mg/Kg		03/28/24 09:38	03/29/24 06:23	20

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	78.6		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	21.4		0.1	0.1	%			03/26/24 11:00	1

Client Sample Results

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU1_3-6_A
Date Collected: 03/05/24 16:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-5
Matrix: Solid
Percent Solids: 78.6

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.16		0.021	0.0063	mg/Kg	☼	03/25/24 10:07	03/26/24 14:36	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU1_6-9_A

Date Collected: 03/05/24 16:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-6

Matrix: Solid

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	17		0.48	0.096	mg/Kg		03/28/24 09:38	03/29/24 07:37	20
Barium	340		0.96	0.22	mg/Kg		03/28/24 09:38	03/29/24 07:37	20
Cadmium	0.32	J	0.77	0.074	mg/Kg		03/28/24 09:38	03/29/24 07:37	20
Chromium	190		0.96	0.060	mg/Kg		03/28/24 09:38	03/29/24 07:37	20
Lead	640		0.48	0.046	mg/Kg		03/28/24 09:38	03/29/24 07:37	20
Selenium	10		1.4	0.27	mg/Kg		03/28/24 09:38	03/29/24 07:37	20
Silver	0.043	J	0.19	0.019	mg/Kg		03/28/24 09:38	03/29/24 07:37	20

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	75.2		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	24.8		0.1	0.1	%			03/26/24 11:00	1

Client Sample Results

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU1_6-9_A

Date Collected: 03/05/24 16:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-6

Matrix: Solid
Percent Solids: 75.2

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.15		0.021	0.0063	mg/Kg	☼	03/25/24 10:07	03/26/24 14:43	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU1_0-3_B

Date Collected: 03/05/24 16:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-7

Matrix: Solid

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	28		0.49	0.098	mg/Kg		03/28/24 09:38	03/29/24 07:40	20
Barium	250		0.98	0.22	mg/Kg		03/28/24 09:38	03/29/24 07:40	20
Cadmium	0.42	J	0.78	0.075	mg/Kg		03/28/24 09:38	03/29/24 07:40	20
Chromium	190		0.98	0.061	mg/Kg		03/28/24 09:38	03/29/24 07:40	20
Lead	1200		0.49	0.047	mg/Kg		03/28/24 09:38	03/29/24 07:40	20
Selenium	7.5		1.5	0.28	mg/Kg		03/28/24 09:38	03/29/24 07:40	20
Silver	0.054	J	0.20	0.020	mg/Kg		03/28/24 09:38	03/29/24 07:40	20

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	83.0		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	17.0		0.1	0.1	%			03/26/24 11:00	1

Client Sample Results

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU1_0-3_B
Date Collected: 03/05/24 16:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-7
Matrix: Solid
Percent Solids: 83.0

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.13		0.021	0.0062	mg/Kg	☼	03/25/24 10:07	03/26/24 14:45	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU1_3-6_B

Date Collected: 03/05/24 16:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-8

Matrix: Solid

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	23		0.49	0.099	mg/Kg		03/28/24 09:38	03/29/24 07:42	20
Barium	300		0.99	0.23	mg/Kg		03/28/24 09:38	03/29/24 07:42	20
Cadmium	0.37	J	0.79	0.076	mg/Kg		03/28/24 09:38	03/29/24 07:42	20
Chromium	190		0.99	0.062	mg/Kg		03/28/24 09:38	03/29/24 07:42	20
Lead	960		0.49	0.047	mg/Kg		03/28/24 09:38	03/29/24 07:42	20
Selenium	8.6		1.5	0.28	mg/Kg		03/28/24 09:38	03/29/24 07:42	20
Silver	0.047	J	0.20	0.020	mg/Kg		03/28/24 09:38	03/29/24 07:42	20

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	77.6		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	22.4		0.1	0.1	%			03/26/24 11:00	1

Client Sample Results

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU1_3-6_B
Date Collected: 03/05/24 16:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-8
Matrix: Solid
Percent Solids: 77.6

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.16		0.020	0.0061	mg/Kg	☼	03/25/24 10:07	03/26/24 14:48	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU1_6-9_B

Date Collected: 03/05/24 16:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-9

Matrix: Solid

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	17		0.47	0.095	mg/Kg		03/28/24 09:38	03/29/24 07:45	20
Barium	330		0.95	0.22	mg/Kg		03/28/24 09:38	03/29/24 07:45	20
Cadmium	0.37	J	0.76	0.073	mg/Kg		03/28/24 09:38	03/29/24 07:45	20
Chromium	200		0.95	0.060	mg/Kg		03/28/24 09:38	03/29/24 07:45	20
Lead	620		0.47	0.046	mg/Kg		03/28/24 09:38	03/29/24 07:45	20
Selenium	9.7		1.4	0.27	mg/Kg		03/28/24 09:38	03/29/24 07:45	20
Silver	0.049	J	0.19	0.019	mg/Kg		03/28/24 09:38	03/29/24 07:45	20

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	75.8		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	24.2		0.1	0.1	%			03/26/24 11:00	1

Client Sample Results

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU1_6-9_B
Date Collected: 03/05/24 16:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-9
Matrix: Solid
Percent Solids: 75.8

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.16		0.023	0.0068	mg/Kg	☼	03/25/24 10:07	03/26/24 14:50	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU1_0-3_C

Date Collected: 03/05/24 16:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-10

Matrix: Solid

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	22		0.46	0.091	mg/Kg		03/28/24 09:38	03/29/24 07:48	20
Barium	280		0.91	0.21	mg/Kg		03/28/24 09:38	03/29/24 07:48	20
Cadmium	0.38	J	0.73	0.070	mg/Kg		03/28/24 09:38	03/29/24 07:48	20
Chromium	200		0.91	0.058	mg/Kg		03/28/24 09:38	03/29/24 07:48	20
Lead	1100		0.46	0.044	mg/Kg		03/28/24 09:38	03/29/24 07:48	20
Selenium	7.4		1.4	0.26	mg/Kg		03/28/24 09:38	03/29/24 07:48	20
Silver	0.058	J	0.18	0.018	mg/Kg		03/28/24 09:38	03/29/24 07:48	20

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	80.0		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	20.0		0.1	0.1	%			03/26/24 11:00	1

Client Sample Results

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU1_0-3_C
Date Collected: 03/05/24 16:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-10
Matrix: Solid
Percent Solids: 80.0

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.15		0.022	0.0065	mg/Kg	☼	03/25/24 10:07	03/26/24 14:52	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU1_3-6_C

Date Collected: 03/05/24 16:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-11

Matrix: Solid

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	22		0.48	0.095	mg/Kg		03/28/24 09:38	03/29/24 07:08	20
Barium	290		0.95	0.22	mg/Kg		03/28/24 09:38	03/29/24 07:08	20
Cadmium	0.37	J	0.76	0.073	mg/Kg		03/28/24 09:38	03/29/24 07:08	20
Chromium	190		0.95	0.060	mg/Kg		03/28/24 09:38	03/29/24 07:08	20
Lead	850		0.48	0.046	mg/Kg		03/28/24 09:38	03/29/24 07:08	20
Selenium	8.5		1.4	0.27	mg/Kg		03/28/24 09:38	03/29/24 07:08	20
Silver	0.055	J	0.19	0.019	mg/Kg		03/28/24 09:38	03/29/24 07:08	20

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	77.6		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	22.4		0.1	0.1	%			03/26/24 11:00	1

Client Sample Results

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU1_3-6_C
Date Collected: 03/05/24 16:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-11
Matrix: Solid
Percent Solids: 77.6

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.13		0.021	0.0064	mg/Kg	☼	03/25/24 10:07	03/26/24 14:55	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU1_6-9_C

Date Collected: 03/05/24 16:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-12

Matrix: Solid

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	18		0.47	0.094	mg/Kg		03/28/24 13:37	03/30/24 01:09	20
Barium	250		0.94	0.22	mg/Kg		03/28/24 13:37	03/30/24 01:09	20
Cadmium	0.32	J	0.75	0.073	mg/Kg		03/28/24 13:37	03/30/24 01:09	20
Chromium	170		0.94	0.059	mg/Kg		03/28/24 13:37	03/30/24 01:09	20
Lead	470		0.47	0.045	mg/Kg		03/28/24 13:37	03/30/24 01:09	20
Selenium	8.5		1.4	0.27	mg/Kg		03/28/24 13:37	03/30/24 01:09	20
Silver	0.041	J	0.19	0.019	mg/Kg		03/28/24 13:37	03/30/24 01:09	20

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	73.7		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	26.3		0.1	0.1	%			03/26/24 11:00	1

Client Sample Results

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU1_6-9_C
Date Collected: 03/05/24 16:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-12
Matrix: Solid
Percent Solids: 73.7

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.12		0.022	0.0067	mg/Kg	☼	03/25/24 10:07	03/26/24 14:57	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU3_0-3

Date Collected: 03/06/24 12:30
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-13

Matrix: Solid

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	13		0.46	0.092	mg/Kg		03/28/24 13:37	03/30/24 00:46	20
Barium	130	J1	0.92	0.21	mg/Kg		03/28/24 13:37	03/30/24 00:46	20
Cadmium	0.30	J	0.74	0.071	mg/Kg		03/28/24 13:37	03/30/24 00:46	20
Chromium	130	J1	0.92	0.058	mg/Kg		03/28/24 13:37	03/30/24 00:46	20
Lead	1200	J1	0.46	0.044	mg/Kg		03/28/24 13:37	03/30/24 00:46	20
Selenium	6.6		1.4	0.26	mg/Kg		03/28/24 13:37	03/30/24 00:46	20
Silver	0.047	J	0.18	0.018	mg/Kg		03/28/24 13:37	03/30/24 00:46	20

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	69.3		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	30.7		0.1	0.1	%			03/26/24 11:00	1

Client Sample Results

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU3_0-3
Date Collected: 03/06/24 12:30
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-13
Matrix: Solid
Percent Solids: 69.3

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.15		0.024	0.0073	mg/Kg	☼	03/25/24 10:07	03/26/24 14:59	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU3_3-6

Date Collected: 03/06/24 12:30
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-14

Matrix: Solid

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	15		0.47	0.095	mg/Kg		03/28/24 13:37	03/30/24 02:33	20
Barium	140		0.95	0.22	mg/Kg		03/28/24 13:37	03/30/24 02:33	20
Cadmium	0.33	J	0.76	0.073	mg/Kg		03/28/24 13:37	03/30/24 02:33	20
Chromium	140		0.95	0.060	mg/Kg		03/28/24 13:37	03/30/24 02:33	20
Lead	1200		0.47	0.045	mg/Kg		03/28/24 13:37	03/30/24 02:33	20
Selenium	6.8		1.4	0.27	mg/Kg		03/28/24 13:37	03/30/24 02:33	20
Silver	0.048	J	0.19	0.019	mg/Kg		03/28/24 13:37	03/30/24 02:33	20

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	70.7		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	29.3		0.1	0.1	%			03/26/24 11:00	1

Client Sample Results

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU3_3-6
Date Collected: 03/06/24 12:30
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-14
Matrix: Solid
Percent Solids: 70.7

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.16		0.022	0.0067	mg/Kg	☼	03/25/24 10:07	03/26/24 15:02	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU3_6-9

Date Collected: 03/06/24 12:30
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-15

Matrix: Solid

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	14		0.48	0.096	mg/Kg		03/28/24 13:37	03/30/24 02:30	20
Barium	140		0.96	0.22	mg/Kg		03/28/24 13:37	03/30/24 02:30	20
Cadmium	0.28	J	0.77	0.074	mg/Kg		03/28/24 13:37	03/30/24 02:30	20
Chromium	130		0.96	0.060	mg/Kg		03/28/24 13:37	03/30/24 02:30	20
Lead	1500		0.48	0.046	mg/Kg		03/28/24 13:37	03/30/24 02:30	20
Selenium	7.3		1.4	0.27	mg/Kg		03/28/24 13:37	03/30/24 02:30	20
Silver	0.053	J	0.19	0.019	mg/Kg		03/28/24 13:37	03/30/24 02:30	20

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	72.9		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	27.1		0.1	0.1	%			03/26/24 11:00	1

Client Sample Results

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU3_6-9
Date Collected: 03/06/24 12:30
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-15
Matrix: Solid
Percent Solids: 72.9

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.16		0.022	0.0067	mg/Kg	☼	03/25/24 10:07	03/26/24 15:04	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU2_0-3

Date Collected: 03/06/24 15:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-16

Matrix: Solid

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	14		0.47	0.095	mg/Kg		03/28/24 13:37	03/30/24 01:34	20
Barium	200		0.95	0.22	mg/Kg		03/28/24 13:37	03/30/24 01:34	20
Cadmium	0.41	J	0.76	0.073	mg/Kg		03/28/24 13:37	03/30/24 01:34	20
Chromium	180		0.95	0.060	mg/Kg		03/28/24 13:37	03/30/24 01:34	20
Lead	1200		0.47	0.045	mg/Kg		03/28/24 13:37	03/30/24 01:34	20
Selenium	8.3		1.4	0.27	mg/Kg		03/28/24 13:37	03/30/24 01:34	20
Silver	0.077	J	0.19	0.019	mg/Kg		03/28/24 13:37	03/30/24 01:34	20

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	75.8		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	24.2		0.1	0.1	%			03/26/24 11:00	1

Client Sample Results

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU2_0-3
Date Collected: 03/06/24 15:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-16
Matrix: Solid
Percent Solids: 75.8

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.15		0.022	0.0067	mg/Kg	☼	03/25/24 10:07	03/26/24 15:11	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU2_3-6

Date Collected: 03/06/24 15:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-17

Matrix: Solid

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	12		0.48	0.095	mg/Kg		03/28/24 13:37	03/30/24 01:48	20
Barium	190		0.95	0.22	mg/Kg		03/28/24 13:37	03/30/24 01:48	20
Cadmium	0.37	J	0.76	0.073	mg/Kg		03/28/24 13:37	03/30/24 01:48	20
Chromium	170		0.95	0.060	mg/Kg		03/28/24 13:37	03/30/24 01:48	20
Lead	1000		0.48	0.046	mg/Kg		03/28/24 13:37	03/30/24 01:48	20
Selenium	7.8		1.4	0.27	mg/Kg		03/28/24 13:37	03/30/24 01:48	20
Silver	0.060	J	0.19	0.019	mg/Kg		03/28/24 13:37	03/30/24 01:48	20

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	77.2		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	22.8		0.1	0.1	%			03/26/24 11:00	1

Client Sample Results

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU2_3-6
Date Collected: 03/06/24 15:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-17
Matrix: Solid
Percent Solids: 77.2

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.15		0.021	0.0063	mg/Kg	☼	03/25/24 10:07	03/26/24 15:14	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU2_6-9

Date Collected: 03/06/24 15:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-18

Matrix: Solid

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	14		0.47	0.095	mg/Kg		03/28/24 13:37	03/30/24 02:22	20
Barium	210		0.95	0.22	mg/Kg		03/28/24 13:37	03/30/24 02:22	20
Cadmium	0.40	J	0.76	0.073	mg/Kg		03/28/24 13:37	03/30/24 02:22	20
Chromium	190		0.95	0.060	mg/Kg		03/28/24 13:37	03/30/24 02:22	20
Lead	1400		0.47	0.046	mg/Kg		03/28/24 13:37	03/30/24 02:22	20
Selenium	9.2		1.4	0.27	mg/Kg		03/28/24 13:37	03/30/24 02:22	20
Silver	0.054	J	0.19	0.019	mg/Kg		03/28/24 13:37	03/30/24 02:22	20

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	77.3		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	22.7		0.1	0.1	%			03/26/24 11:00	1

Client Sample Results

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU2_6-9
Date Collected: 03/06/24 15:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-18
Matrix: Solid
Percent Solids: 77.3

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.18		0.020	0.0060	mg/Kg	☼	03/25/24 10:07	03/26/24 15:16	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU9_0-3

Date Collected: 03/09/24 12:30
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-19

Matrix: Solid

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	24		0.48	0.096	mg/Kg		03/28/24 13:37	03/30/24 02:28	20
Barium	100		0.96	0.22	mg/Kg		03/28/24 13:37	03/30/24 02:28	20
Cadmium	0.67	J	0.77	0.074	mg/Kg		03/28/24 13:37	03/30/24 02:28	20
Chromium	160		0.96	0.060	mg/Kg		03/28/24 13:37	03/30/24 02:28	20
Lead	6400		48	4.6	mg/Kg		03/28/24 13:37	04/01/24 18:07	2000
Selenium	4.9		1.4	0.27	mg/Kg		03/28/24 13:37	03/30/24 02:28	20
Silver	0.085	J	0.19	0.019	mg/Kg		03/28/24 13:37	03/30/24 02:28	20

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	70.3		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	29.7		0.1	0.1	%			03/26/24 11:00	1

Client Sample Results

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU9_0-3

Date Collected: 03/09/24 12:30
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-19

Matrix: Solid
Percent Solids: 70.3

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.28		0.024	0.0071	mg/Kg	☼	03/25/24 10:09	03/26/24 15:19	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU9_3-6

Date Collected: 03/09/24 12:30
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-20

Matrix: Solid

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	25		0.48	0.096	mg/Kg		03/28/24 13:37	03/30/24 02:25	20
Barium	110		0.96	0.22	mg/Kg		03/28/24 13:37	03/30/24 02:25	20
Cadmium	0.67	J	0.77	0.074	mg/Kg		03/28/24 13:37	03/30/24 02:25	20
Chromium	190		0.96	0.060	mg/Kg		03/28/24 13:37	03/30/24 02:25	20
Lead	6200		48	4.6	mg/Kg		03/28/24 13:37	04/01/24 18:04	2000
Selenium	5.1		1.4	0.27	mg/Kg		03/28/24 13:37	03/30/24 02:25	20
Silver	0.089	J	0.19	0.019	mg/Kg		03/28/24 13:37	03/30/24 02:25	20

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	61.5		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	38.5		0.1	0.1	%			03/26/24 11:00	1

Client Sample Results

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU9_3-6
Date Collected: 03/09/24 12:30
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-20
Matrix: Solid
Percent Solids: 61.5

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.26		0.027	0.0082	mg/Kg	☼	03/25/24 10:09	03/26/24 15:21	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU9_6-9

Date Collected: 03/09/24 12:30
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-21

Matrix: Solid

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	24		0.48	0.095	mg/Kg		04/01/24 12:29	04/05/24 04:50	20
Barium	110		0.95	0.22	mg/Kg		04/01/24 12:29	04/05/24 04:50	20
Cadmium	0.59	J	0.76	0.073	mg/Kg		04/01/24 12:29	04/05/24 04:50	20
Chromium	180		0.95	0.060	mg/Kg		04/01/24 12:29	04/05/24 04:50	20
Lead	6000		48	4.6	mg/Kg		04/01/24 12:29	04/05/24 04:52	2000
Selenium	6.7		1.4	0.27	mg/Kg		04/01/24 12:29	04/05/24 04:50	20
Silver	0.095	J	0.19	0.019	mg/Kg		04/01/24 12:29	04/05/24 04:50	20

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	64.5		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	35.5		0.1	0.1	%			03/26/24 11:00	1

Client Sample Results

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU9_6-9
Date Collected: 03/09/24 12:30
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-21
Matrix: Solid
Percent Solids: 64.5

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.26		0.026	0.0079	mg/Kg	☼	04/02/24 13:03	04/02/24 16:10	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU10_0-3

Date Collected: 03/09/24 14:30
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-22

Matrix: Solid

Method: SW846 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
PCB-1016	0.017	U M	0.019	0.0070	mg/Kg		03/20/24 15:22	04/01/24 14:54	1
PCB-1221	0.017	U	0.019	0.011	mg/Kg		03/20/24 15:22	04/01/24 14:54	1
PCB-1232	0.017	U	0.019	0.0046	mg/Kg		03/20/24 15:22	04/01/24 14:54	1
PCB-1242	0.017	U M	0.019	0.0075	mg/Kg		03/20/24 15:22	04/01/24 14:54	1
PCB-1248	0.017	U M	0.019	0.0066	mg/Kg		03/20/24 15:22	04/01/24 14:54	1
PCB-1254	**0.055**	**M**	0.019	0.0085	mg/Kg		03/20/24 15:22	04/01/24 14:54	1
PCB-1260	0.017	U J1 M	0.019	0.0070	mg/Kg		03/20/24 15:22	04/01/24 14:54	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene	*89*		*44 - 130*	*03/20/24 15:22*	*04/01/24 14:54*	*1*
DCB Decachlorobiphenyl	*96*	*M*	*40 - 135*	*03/20/24 15:22*	*04/01/24 14:54*	*1*

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**9.6**		0.46	0.092	mg/Kg		04/01/24 12:29	04/04/24 17:39	20
Barium	**120**	**J1**	0.92	0.21	mg/Kg		04/01/24 12:29	04/04/24 17:39	20
Cadmium	**0.35**	**J**	0.74	0.071	mg/Kg		04/01/24 12:29	04/04/24 17:39	20
Chromium	**150**	**J1**	0.92	0.058	mg/Kg		04/01/24 12:29	04/04/24 17:39	20
Lead	**8500**	**J1**	46	4.4	mg/Kg		04/01/24 12:29	04/04/24 18:01	2000
Selenium	**5.8**		1.4	0.26	mg/Kg		04/01/24 12:29	04/04/24 17:39	20
Silver	**0.088**	**J**	0.18	0.018	mg/Kg		04/01/24 12:29	04/04/24 17:39	20

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	**71.0**		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	**29.0**		0.1	0.1	%			03/26/24 11:00	1

Client Sample Results

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU10_0-3
Date Collected: 03/09/24 14:30
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-22
Matrix: Solid
Percent Solids: 71.0

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.12		0.023	0.0070	mg/Kg	☼	04/02/24 13:03	04/02/24 16:13	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU10_3-6

Date Collected: 03/09/24 14:30
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-23

Matrix: Solid

Method: SW846 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
PCB-1016	0.017	U	0.019	0.0070	mg/Kg		03/20/24 15:22	04/01/24 15:47	1
PCB-1221	0.017	U	0.019	0.011	mg/Kg		03/20/24 15:22	04/01/24 15:47	1
PCB-1232	0.017	U	0.019	0.0046	mg/Kg		03/20/24 15:22	04/01/24 15:47	1
PCB-1242	0.017	U	0.019	0.0076	mg/Kg		03/20/24 15:22	04/01/24 15:47	1
PCB-1248	0.017	U	0.019	0.0066	mg/Kg		03/20/24 15:22	04/01/24 15:47	1
PCB-1254	**0.037**	**J1 M**	0.019	0.0085	mg/Kg		03/20/24 15:22	04/01/24 15:47	1
PCB-1260	0.017	U M	0.019	0.0070	mg/Kg		03/20/24 15:22	04/01/24 15:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene	*92*		*44 - 130*	*03/20/24 15:22*	*04/01/24 15:47*	*1*
DCB Decachlorobiphenyl	*98*	*M*	*40 - 135*	*03/20/24 15:22*	*04/01/24 15:47*	*1*

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**8.7**		0.47	0.095	mg/Kg		04/01/24 12:29	04/05/24 05:01	20
Barium	**130**		0.95	0.22	mg/Kg		04/01/24 12:29	04/05/24 05:01	20
Cadmium	**0.39**	**J**	0.76	0.073	mg/Kg		04/01/24 12:29	04/05/24 05:01	20
Chromium	**160**		0.95	0.060	mg/Kg		04/01/24 12:29	04/05/24 05:01	20
Lead	**9700**		47	4.5	mg/Kg		04/01/24 12:29	04/05/24 05:04	2000
Selenium	**6.9**		1.4	0.27	mg/Kg		04/01/24 12:29	04/05/24 05:01	20
Silver	**0.10**	**J**	0.19	0.019	mg/Kg		04/01/24 12:29	04/05/24 05:01	20

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	**70.8**		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	**29.2**		0.1	0.1	%			03/26/24 11:00	1

Client Sample Results

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU10_3-6
Date Collected: 03/09/24 14:30
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-23
Matrix: Solid
Percent Solids: 70.8

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.16		0.024	0.0071	mg/Kg	☼	04/02/24 13:03	04/02/24 15:45	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU10_6-9

Date Collected: 03/09/24 14:30
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-24

Matrix: Solid

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	7.9		0.47	0.094	mg/Kg		04/01/24 12:29	04/04/24 17:52	20
Barium	160		0.94	0.22	mg/Kg		04/01/24 12:29	04/04/24 17:52	20
Cadmium	0.35	J	0.76	0.073	mg/Kg		04/01/24 12:29	04/04/24 17:52	20
Chromium	170		0.94	0.060	mg/Kg		04/01/24 12:29	04/04/24 17:52	20
Lead	8100		47	4.5	mg/Kg		04/01/24 12:29	04/04/24 18:14	2000
Selenium	7.8		1.4	0.27	mg/Kg		04/01/24 12:29	04/04/24 17:52	20
Silver	0.078	J	0.19	0.019	mg/Kg		04/01/24 12:29	04/04/24 17:52	20

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	68.6		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	31.4		0.1	0.1	%			03/26/24 11:00	1

Client: EnviroQuest, Inc.
Job ID: 580-137730-1
Project/Site: Nanue Bridge

Client Sample ID: NAN_DU10_6-9
Lab Sample ID: 580-137730-24
Date Collected: 03/09/24 14:30
Matrix: Solid
Date Received: 03/14/24 09:30
Percent Solids: 68.6

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.13		0.024	0.0072	mg/Kg	☼	04/02/24 13:03	04/02/24 15:54	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU11_0-3

Date Collected: 03/10/24 12:20
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-25

Matrix: Solid

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	11		0.47	0.095	mg/Kg		04/01/24 12:29	04/05/24 05:47	20
Barium	110		0.95	0.22	mg/Kg		04/01/24 12:29	04/05/24 05:47	20
Cadmium	0.37	J	0.76	0.073	mg/Kg		04/01/24 12:29	04/05/24 05:47	20
Chromium	130		0.95	0.060	mg/Kg		04/01/24 12:29	04/05/24 05:47	20
Lead	4300		47	4.5	mg/Kg		04/01/24 12:29	04/05/24 05:50	2000
Selenium	4.8		1.4	0.27	mg/Kg		04/01/24 12:29	04/05/24 05:47	20
Silver	0.081	J	0.19	0.019	mg/Kg		04/01/24 12:29	04/05/24 05:47	20

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	62.7		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	37.3		0.1	0.1	%			03/26/24 11:00	1

Client Sample Results

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU11_0-3
Date Collected: 03/10/24 12:20
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-25
Matrix: Solid
Percent Solids: 62.7

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.10		0.025	0.0076	mg/Kg	☼	04/02/24 13:03	04/02/24 15:36	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU11_3-6

Date Collected: 03/10/24 12:20
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-26

Matrix: Solid

Method: SW846 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
PCB-1016	0.017	U M	0.019	0.0070	mg/Kg		03/20/24 15:22	04/01/24 16:04	1
PCB-1221	0.017	U	0.019	0.011	mg/Kg		03/20/24 15:22	04/01/24 16:04	1
PCB-1232	0.017	U	0.019	0.0047	mg/Kg		03/20/24 15:22	04/01/24 16:04	1
PCB-1242	0.017	U M	0.019	0.0076	mg/Kg		03/20/24 15:22	04/01/24 16:04	1
PCB-1248	0.017	U M	0.019	0.0067	mg/Kg		03/20/24 15:22	04/01/24 16:04	1
PCB-1254	**0.20**	**M**	0.019	0.0086	mg/Kg		03/20/24 15:22	04/01/24 16:04	1
PCB-1260	0.017	U M	0.019	0.0070	mg/Kg		03/20/24 15:22	04/01/24 16:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene	*85*		*44 - 130*	*03/20/24 15:22*	*04/01/24 16:04*	*1*
DCB Decachlorobiphenyl	*89*	*M*	*40 - 135*	*03/20/24 15:22*	*04/01/24 16:04*	*1*

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**10**		0.48	0.095	mg/Kg		04/01/24 12:29	04/05/24 04:44	20
Barium	**100**		0.95	0.22	mg/Kg		04/01/24 12:29	04/05/24 04:44	20
Cadmium	**0.40**	**J**	0.76	0.073	mg/Kg		04/01/24 12:29	04/05/24 04:44	20
Chromium	**150**		0.95	0.060	mg/Kg		04/01/24 12:29	04/05/24 04:44	20
Lead	**6400**		48	4.6	mg/Kg		04/01/24 12:29	04/05/24 04:47	2000
Selenium	**6.2**		1.4	0.27	mg/Kg		04/01/24 12:29	04/05/24 04:44	20
Silver	**0.086**	**J**	0.19	0.019	mg/Kg		04/01/24 12:29	04/05/24 04:44	20

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	**65.0**		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	**35.0**		0.1	0.1	%			03/26/24 11:00	1

Client Sample Results

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU11_3-6
Date Collected: 03/10/24 12:20
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-26
Matrix: Solid
Percent Solids: 65.0

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.12		0.027	0.0081	mg/Kg	☼	04/02/24 13:03	04/02/24 15:56	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU11_6-9

Date Collected: 03/10/24 12:20
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-27

Matrix: Solid

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	8.7		0.46	0.092	mg/Kg		04/01/24 12:29	04/05/24 05:41	20
Barium	110		0.92	0.21	mg/Kg		04/01/24 12:29	04/05/24 05:41	20
Cadmium	0.39	J	0.74	0.071	mg/Kg		04/01/24 12:29	04/05/24 05:41	20
Chromium	150		0.92	0.058	mg/Kg		04/01/24 12:29	04/05/24 05:41	20
Lead	6000		46	4.4	mg/Kg		04/01/24 12:29	04/05/24 05:44	2000
Selenium	6.3		1.4	0.26	mg/Kg		04/01/24 12:29	04/05/24 05:41	20
Silver	0.083	J	0.18	0.018	mg/Kg		04/01/24 12:29	04/05/24 05:41	20

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	66.2		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	33.8		0.1	0.1	%			03/26/24 11:00	1

Client Sample Results

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU11_6-9
Date Collected: 03/10/24 12:20
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-27
Matrix: Solid
Percent Solids: 66.2

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.16		0.025	0.0075	mg/Kg	☼	04/02/24 13:03	04/02/24 15:59	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU12_0-3

Date Collected: 03/10/24 13:10
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-28

Matrix: Solid

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	16		0.46	0.092	mg/Kg		04/01/24 12:29	04/05/24 04:55	20
Barium	79		0.92	0.21	mg/Kg		04/01/24 12:29	04/05/24 04:55	20
Cadmium	0.41	J	0.74	0.071	mg/Kg		04/01/24 12:29	04/05/24 04:55	20
Chromium	130		0.92	0.058	mg/Kg		04/01/24 12:29	04/05/24 04:55	20
Lead	6300		46	4.4	mg/Kg		04/01/24 12:29	04/05/24 04:58	2000
Selenium	2.8		1.4	0.26	mg/Kg		04/01/24 12:29	04/05/24 04:55	20
Silver	0.088	J	0.18	0.018	mg/Kg		04/01/24 12:29	04/05/24 04:55	20

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	68.0		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	32.0		0.1	0.1	%			03/26/24 11:00	1

Client Sample Results

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU12_0-3
Date Collected: 03/10/24 13:10
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-28
Matrix: Solid
Percent Solids: 68.0

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.086		0.023	0.0069	mg/Kg	☼	04/02/24 13:03	04/02/24 16:02	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU12_3-6

Date Collected: 03/10/24 13:10
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-29

Matrix: Solid

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	11		0.46	0.092	mg/Kg		04/01/24 12:29	04/05/24 05:35	20
Barium	50		0.92	0.21	mg/Kg		04/01/24 12:29	04/05/24 05:35	20
Cadmium	0.29	J	0.74	0.071	mg/Kg		04/01/24 12:29	04/05/24 05:35	20
Chromium	87		0.92	0.058	mg/Kg		04/01/24 12:29	04/05/24 05:35	20
Lead	7900		46	4.4	mg/Kg		04/01/24 12:29	04/05/24 05:38	2000
Selenium	3.4		1.4	0.26	mg/Kg		04/01/24 12:29	04/05/24 05:35	20
Silver	0.086	J	0.18	0.018	mg/Kg		04/01/24 12:29	04/05/24 05:35	20

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	75.6		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	24.4		0.1	0.1	%			03/26/24 11:00	1

Client Sample Results

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU12_3-6
Date Collected: 03/10/24 13:10
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-29
Matrix: Solid
Percent Solids: 75.6

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.12		0.022	0.0065	mg/Kg	☼	04/02/24 13:03	04/02/24 16:05	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU12_6-9

Date Collected: 03/10/24 13:10
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-30

Matrix: Solid

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	10		0.47	0.094	mg/Kg		04/01/24 12:29	04/05/24 05:52	20
Barium	69		0.94	0.21	mg/Kg		04/01/24 12:29	04/05/24 05:52	20
Cadmium	0.30	J	0.75	0.073	mg/Kg		04/01/24 12:29	04/05/24 05:52	20
Chromium	90		0.94	0.059	mg/Kg		04/01/24 12:29	04/05/24 05:52	20
Lead	6500		47	4.5	mg/Kg		04/01/24 12:29	04/05/24 05:55	2000
Selenium	3.6		1.4	0.27	mg/Kg		04/01/24 12:29	04/05/24 05:52	20
Silver	0.068	J	0.19	0.019	mg/Kg		04/01/24 12:29	04/05/24 05:52	20

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	72.9		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	27.1		0.1	0.1	%			03/26/24 11:00	1

Client Sample Results

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU12_6-9
Date Collected: 03/10/24 13:10
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-30
Matrix: Solid
Percent Solids: 72.9

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.12		0.023	0.0069	mg/Kg	☼	04/02/24 13:03	04/02/24 16:08	1

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Lab Sample ID: MB 580-454340/1-A
Matrix: Solid
Analysis Batch: 455366

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 454340

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
PCB-1016	0.018	U	0.020	0.0074	mg/Kg		03/20/24 15:22	04/01/24 14:01	1
PCB-1221	0.018	U	0.020	0.012	mg/Kg		03/20/24 15:22	04/01/24 14:01	1
PCB-1232	0.018	U	0.020	0.0049	mg/Kg		03/20/24 15:22	04/01/24 14:01	1
PCB-1242	0.018	U	0.020	0.0080	mg/Kg		03/20/24 15:22	04/01/24 14:01	1
PCB-1248	0.018	U	0.020	0.0070	mg/Kg		03/20/24 15:22	04/01/24 14:01	1
PCB-1254	0.018	U	0.020	0.0090	mg/Kg		03/20/24 15:22	04/01/24 14:01	1
PCB-1260	0.018	U	0.020	0.0074	mg/Kg		03/20/24 15:22	04/01/24 14:01	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene	*95*		*44 - 130*	*03/20/24 15:22*	*04/01/24 14:01*	*1*
DCB Decachlorobiphenyl	*85*	*M*	*40 - 135*	*03/20/24 15:22*	*04/01/24 14:01*	*1*

Lab Sample ID: LCS 580-454340/2-A
Matrix: Solid
Analysis Batch: 455366

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 454340

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
PCB-1016			0.100	0.102	M	mg/Kg		102	47 - 134		
PCB-1260			0.100	0.0955	M	mg/Kg		96	53 - 140		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Tetrachloro-m-xylene	*91*	*M*	*44 - 130*
DCB Decachlorobiphenyl	*102*	*M*	*40 - 135*

Lab Sample ID: LCSD 580-454340/3-A
Matrix: Solid
Analysis Batch: 455366

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 454340

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
PCB-1016			0.100	0.101	M	mg/Kg		101	47 - 134	7	30
PCB-1260			0.100	0.105	M	mg/Kg		105	53 - 140	10	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Tetrachloro-m-xylene	*99*		*44 - 130*
DCB Decachlorobiphenyl	*112*		*40 - 135*

Lab Sample ID: 580-137730-22 MS
Matrix: Solid
Analysis Batch: 455366

Client Sample ID: NAN_DU10_0-3
Prep Type: Total/NA
Prep Batch: 454340

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
PCB-1016	0.017	U M	0.0934	0.0948	M	mg/Kg		102	47 - 134		
PCB-1260	0.017	U J1 M	0.0934	0.171	J1 M	mg/Kg		183	53 - 140		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Tetrachloro-m-xylene	*94*		*44 - 130*
DCB Decachlorobiphenyl	*101*	*M*	*40 - 135*

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography (Continued)

Lab Sample ID: 580-137730-22 MSD
Matrix: Solid
Analysis Batch: 455366

Client Sample ID: NAN_DU10_0-3
Prep Type: Total/NA
Prep Batch: 454340

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
PCB-1016	0.017	U M	0.0943	0.0908	M	mg/Kg		96	47 - 134	4	30
PCB-1260	0.017	U J1 M	0.0943	0.162	J1 M	mg/Kg		172	53 - 140	5	30

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
Tetrachloro-m-xylene	*88*		*44 - 130*
DCB Decachlorobiphenyl	*94*	*M*	*40 - 135*

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 580-455023/23-A
Matrix: Solid
Analysis Batch: 455179

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 455023

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.40	U	0.50	0.10	mg/Kg		03/28/24 09:38	03/29/24 05:58	20
Barium	0.40	U	1.0	0.23	mg/Kg		03/28/24 09:38	03/29/24 05:58	20
Cadmium	0.20	U	0.80	0.077	mg/Kg		03/28/24 09:38	03/29/24 05:58	20
Chromium	0.25	U	1.0	0.063	mg/Kg		03/28/24 09:38	03/29/24 05:58	20
Lead	0.19	U	0.50	0.048	mg/Kg		03/28/24 09:38	03/29/24 05:58	20
Selenium	1.0	U	1.5	0.29	mg/Kg		03/28/24 09:38	03/29/24 05:58	20
Silver	0.050	U	0.20	0.020	mg/Kg		03/28/24 09:38	03/29/24 05:58	20

Lab Sample ID: LCS 580-455023/24-A
Matrix: Solid
Analysis Batch: 455179

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 455023

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	25.0	24.3		mg/Kg		97	82 - 118
Barium	25.0	26.5		mg/Kg		106	86 - 116
Cadmium	25.0	24.7		mg/Kg		99	84 - 116
Chromium	25.0	22.1		mg/Kg		89	83 - 119
Lead	25.0	22.1		mg/Kg		88	84 - 118
Selenium	25.0	24.3		mg/Kg		97	80 - 119
Silver	25.0	24.6		mg/Kg		98	83 - 118

Lab Sample ID: LCSD 580-455023/25-A
Matrix: Solid
Analysis Batch: 455179

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 455023

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Arsenic	25.0	24.4		mg/Kg		97	82 - 118	0	20
Barium	25.0	26.9		mg/Kg		108	86 - 116	1	20
Cadmium	25.0	25.2		mg/Kg		101	84 - 116	2	20
Chromium	25.0	22.3		mg/Kg		89	83 - 119	1	20
Lead	25.0	22.3		mg/Kg		89	84 - 118	1	20
Selenium	25.0	25.2		mg/Kg		101	80 - 119	3	20
Silver	25.0	25.1		mg/Kg		101	83 - 118	2	20

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: MB 580-455073/23-A
Matrix: Solid
Analysis Batch: 455285

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 455073

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.40	U	0.50	0.10	mg/Kg		03/28/24 13:37	03/30/24 00:43	20
Barium	0.40	U	1.0	0.23	mg/Kg		03/28/24 13:37	03/30/24 00:43	20
Cadmium	0.20	U	0.80	0.077	mg/Kg		03/28/24 13:37	03/30/24 00:43	20
Chromium	0.25	U	1.0	0.063	mg/Kg		03/28/24 13:37	03/30/24 00:43	20
Lead	0.19	U	0.50	0.048	mg/Kg		03/28/24 13:37	03/30/24 00:43	20
Selenium	1.0	U	1.5	0.29	mg/Kg		03/28/24 13:37	03/30/24 00:43	20
Silver	0.050	U	0.20	0.020	mg/Kg		03/28/24 13:37	03/30/24 00:43	20

Lab Sample ID: LCS 580-455073/24-A
Matrix: Solid
Analysis Batch: 455285

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 455073

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	25.0	24.2		mg/Kg		97	82 - 118
Barium	25.0	24.2		mg/Kg		97	86 - 116
Cadmium	25.0	24.4		mg/Kg		98	84 - 116
Chromium	25.0	24.9		mg/Kg		100	83 - 119
Lead	25.0	22.8		mg/Kg		91	84 - 118
Selenium	25.0	26.6		mg/Kg		106	80 - 119
Silver	25.0	25.0		mg/Kg		100	83 - 118

Lab Sample ID: LCSD 580-455073/25-A
Matrix: Solid
Analysis Batch: 455285

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 455073

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Arsenic	25.0	23.9		mg/Kg		96	82 - 118	1	20
Barium	25.0	23.9		mg/Kg		96	86 - 116	1	20
Cadmium	25.0	24.0		mg/Kg		96	84 - 116	2	20
Chromium	25.0	24.1		mg/Kg		96	83 - 119	3	20
Lead	25.0	22.6		mg/Kg		91	84 - 118	1	20
Selenium	25.0	26.0		mg/Kg		104	80 - 119	2	20
Silver	25.0	24.7		mg/Kg		99	83 - 118	2	20

Lab Sample ID: MB 580-455329/13-A
Matrix: Solid
Analysis Batch: 455760

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 455329

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.40	U	0.50	0.10	mg/Kg		04/01/24 12:29	04/04/24 17:08	20
Barium	0.40	U	1.0	0.23	mg/Kg		04/01/24 12:29	04/04/24 17:08	20
Cadmium	0.20	U	0.80	0.077	mg/Kg		04/01/24 12:29	04/04/24 17:08	20
Chromium	0.25	U	1.0	0.063	mg/Kg		04/01/24 12:29	04/04/24 17:08	20
Lead	0.19	U	0.50	0.048	mg/Kg		04/01/24 12:29	04/04/24 17:08	20
Selenium	1.0	U	1.5	0.29	mg/Kg		04/01/24 12:29	04/04/24 17:08	20
Silver	0.050	U	0.20	0.020	mg/Kg		04/01/24 12:29	04/04/24 17:08	20

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: MB 580-455329/18-A
Matrix: Solid
Analysis Batch: 455760

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 455329

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.40	U	0.50	0.10	mg/Kg		04/01/24 12:51	04/04/24 17:11	20
Barium	0.40	U	1.0	0.23	mg/Kg		04/01/24 12:51	04/04/24 17:11	20
Cadmium	0.20	U	0.80	0.077	mg/Kg		04/01/24 12:51	04/04/24 17:11	20
Chromium	0.25	U	1.0	0.063	mg/Kg		04/01/24 12:51	04/04/24 17:11	20
Lead	0.19	U	0.50	0.048	mg/Kg		04/01/24 12:51	04/04/24 17:11	20
Selenium	1.0	U	1.5	0.29	mg/Kg		04/01/24 12:51	04/04/24 17:11	20
Silver	0.050	U	0.20	0.020	mg/Kg		04/01/24 12:51	04/04/24 17:11	20

Lab Sample ID: MB 580-455329/19-A
Matrix: Solid
Analysis Batch: 455760

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 455329

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.40	U	0.50	0.10	mg/Kg		04/01/24 12:51	04/04/24 17:14	20
Barium	0.40	U	1.0	0.23	mg/Kg		04/01/24 12:51	04/04/24 17:14	20
Cadmium	0.20	U	0.80	0.077	mg/Kg		04/01/24 12:51	04/04/24 17:14	20
Chromium	0.25	U	1.0	0.063	mg/Kg		04/01/24 12:51	04/04/24 17:14	20
Lead	0.19	U	0.50	0.048	mg/Kg		04/01/24 12:51	04/04/24 17:14	20
Selenium	1.0	U	1.5	0.29	mg/Kg		04/01/24 12:51	04/04/24 17:14	20
Silver	0.050	U	0.20	0.020	mg/Kg		04/01/24 12:51	04/04/24 17:14	20

Lab Sample ID: LCS 580-455329/16-A
Matrix: Solid
Analysis Batch: 455760

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 455329

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Arsenic			25.0	24.9		mg/Kg		100	82 - 118		
Barium			25.0	23.9		mg/Kg		96	86 - 116		
Cadmium			25.0	23.9		mg/Kg		95	84 - 116		
Chromium			25.0	24.4		mg/Kg		98	83 - 119		
Lead			25.0	24.2		mg/Kg		97	84 - 118		
Selenium			25.0	25.6		mg/Kg		102	80 - 119		
Silver			25.0	24.4		mg/Kg		98	83 - 118		

Lab Sample ID: LCSD 580-455329/17-A
Matrix: Solid
Analysis Batch: 455760

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 455329

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Arsenic			25.0	24.8		mg/Kg		99	82 - 118	0	20
Barium			25.0	24.7		mg/Kg		99	86 - 116	3	20
Cadmium			25.0	24.8		mg/Kg		99	84 - 116	4	20
Chromium			25.0	24.7		mg/Kg		99	83 - 119	1	20
Lead			25.0	24.2		mg/Kg		97	84 - 118	0	20
Selenium			25.0	25.3		mg/Kg		101	80 - 119	1	20
Silver			25.0	24.9		mg/Kg		100	83 - 118	2	20

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: 580-137730-22 MS
Matrix: Solid
Analysis Batch: 455760

Client Sample ID: NAN_DU10_0-3
Prep Type: Total/NA
Prep Batch: 455329

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	9.6		23.5	30.0		mg/Kg		87	82 - 118
Barium	120	J1	23.5	145	4	mg/Kg		117	86 - 116
Cadmium	0.35	J	23.5	23.1		mg/Kg		97	84 - 116
Chromium	150	J1	23.5	178	4	mg/Kg		121	83 - 119
Selenium	5.8		23.5	24.6		mg/Kg		80	80 - 119
Silver	0.088	J	23.5	22.5		mg/Kg		95	83 - 118

Lab Sample ID: 580-137730-22 MS
Matrix: Solid
Analysis Batch: 455760

Client Sample ID: NAN_DU10_0-3
Prep Type: Total/NA
Prep Batch: 455329

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Lead	8500	J1	23.5	8620	4	mg/Kg		701	84 - 118

Lab Sample ID: 580-137730-22 MSD
Matrix: Solid
Analysis Batch: 455760

Client Sample ID: NAN_DU10_0-3
Prep Type: Total/NA
Prep Batch: 455329

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Arsenic	9.6		23.5	30.7		mg/Kg		90	82 - 118	2	20
Barium	120	J1	23.5	150	4	mg/Kg		140	86 - 116	4	20
Cadmium	0.35	J	23.5	22.6		mg/Kg		94	84 - 116	2	20
Chromium	150	J1	23.5	180	4	mg/Kg		127	83 - 119	1	20
Selenium	5.8		23.5	26.3		mg/Kg		87	80 - 119	7	20
Silver	0.088	J	23.5	22.6		mg/Kg		96	83 - 118	1	20

Lab Sample ID: 580-137730-22 MSD
Matrix: Solid
Analysis Batch: 455760

Client Sample ID: NAN_DU10_0-3
Prep Type: Total/NA
Prep Batch: 455329

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Lead	8500	J1	23.5	8090	4	mg/Kg		-1541	84 - 118	6	20

Method: 7471A - Mercury (CVAA)

Lab Sample ID: MB 580-454663/23-A
Matrix: Solid
Analysis Batch: 454854

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 454663

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.010	U	0.018	0.0054	mg/Kg		03/25/24 10:09	03/26/24 14:14	1

Lab Sample ID: LCS 580-454663/24-A
Matrix: Solid
Analysis Batch: 454854

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 454663

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.100	0.119		mg/Kg		119	80 - 124

Method: 7471A - Mercury (CVAA) (Continued)

Lab Sample ID: LCSD 580-454663/25-A
Matrix: Solid
Analysis Batch: 454854

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 454663

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Mercury			0.100	0.112		mg/Kg		112	80 - 124	6	20

Lab Sample ID: 580-137730-1 MS
Matrix: Solid
Analysis Batch: 454854

Client Sample ID: NAN_DU8_0-3
Prep Type: Total/NA
Prep Batch: 454663

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.31		0.127	0.431		mg/Kg	☼	97	80 - 124

Lab Sample ID: 580-137730-1 MSD
Matrix: Solid
Analysis Batch: 454854

Client Sample ID: NAN_DU8_0-3
Prep Type: Total/NA
Prep Batch: 454663

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Mercury	0.31		0.128	0.418		mg/Kg	☼	85	80 - 124	3	20

Lab Sample ID: MB 580-455462/13-A
Matrix: Solid
Analysis Batch: 455504

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 455462

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.010	U	0.018	0.0054	mg/Kg		04/02/24 13:03	04/02/24 15:27	1

Lab Sample ID: LCS 580-455462/14-A
Matrix: Solid
Analysis Batch: 455504

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 455462

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury			0.100	0.116		mg/Kg		116	80 - 124

Lab Sample ID: LCSD 580-455462/15-A
Matrix: Solid
Analysis Batch: 455504

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 455462

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Mercury			0.100	0.111		mg/Kg		111	80 - 124	5	20

Lab Sample ID: 580-137730-25 MS
Matrix: Solid
Analysis Batch: 455504

Client Sample ID: NAN_DU11_0-3
Prep Type: Total/NA
Prep Batch: 455462

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.10		0.140	0.257		mg/Kg	☼	109	80 - 124

Lab Sample ID: 580-137730-25 MSD
Matrix: Solid
Analysis Batch: 455504

Client Sample ID: NAN_DU11_0-3
Prep Type: Total/NA
Prep Batch: 455462

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Mercury	0.10		0.143	0.249		mg/Kg	☼	101	80 - 124	3	20

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Method: 2540G - SM 2540G

Lab Sample ID: 580-137730-1 DU
Matrix: Solid
Analysis Batch: 454764

Client Sample ID: NAN_DU8_0-3
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Percent Solids	71.8			76.4		%				6	20
Percent Moisture	28.2			23.6		%				18	20

Lab Chronicle

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU8_0-3
Date Collected: 03/03/24 10:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-1
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455023	AUA	EET SEA	03/28/24 09:38
Total/NA	Analysis	6020B		20	455179	FCW	EET SEA	03/29/24 06:51
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Client Sample ID: NAN_DU8_0-3
Date Collected: 03/03/24 10:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-1
Matrix: Solid
Percent Solids: 71.8

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			454663	JL	EET SEA	03/25/24 10:07
Total/NA	Analysis	7471A		1	454854	JL	EET SEA	03/26/24 14:21

Client Sample ID: NAN_DU8_3-6
Date Collected: 03/03/24 10:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-2
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455023	AUA	EET SEA	03/28/24 09:38
Total/NA	Analysis	6020B		20	455179	FCW	EET SEA	03/29/24 06:57
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Client Sample ID: NAN_DU8_3-6
Date Collected: 03/03/24 10:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-2
Matrix: Solid
Percent Solids: 70.8

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			454663	JL	EET SEA	03/25/24 10:07
Total/NA	Analysis	7471A		1	454854	JL	EET SEA	03/26/24 14:28

Client Sample ID: NAN_DU8_6-9
Date Collected: 03/03/24 10:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-3
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455023	AUA	EET SEA	03/28/24 09:38
Total/NA	Analysis	6020B		20	455179	FCW	EET SEA	03/29/24 06:54
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Lab Chronicle

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU8_6-9
Date Collected: 03/03/24 10:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-3
Matrix: Solid
Percent Solids: 69.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			454663	JL	EET SEA	03/25/24 10:07
Total/NA	Analysis	7471A		1	454854	JL	EET SEA	03/26/24 14:31

Client Sample ID: NAN_DU1_0-3_A
Date Collected: 03/05/24 16:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-4
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455023	AUA	EET SEA	03/28/24 09:38
Total/NA	Analysis	6020B		20	455179	FCW	EET SEA	03/29/24 06:49
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Client Sample ID: NAN_DU1_0-3_A
Date Collected: 03/05/24 16:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-4
Matrix: Solid
Percent Solids: 82.3

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			454663	JL	EET SEA	03/25/24 10:07
Total/NA	Analysis	7471A		1	454854	JL	EET SEA	03/26/24 14:33

Client Sample ID: NAN_DU1_3-6_A
Date Collected: 03/05/24 16:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-5
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455023	AUA	EET SEA	03/28/24 09:38
Total/NA	Analysis	6020B		20	455179	FCW	EET SEA	03/29/24 06:23
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Client Sample ID: NAN_DU1_3-6_A
Date Collected: 03/05/24 16:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-5
Matrix: Solid
Percent Solids: 78.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			454663	JL	EET SEA	03/25/24 10:07
Total/NA	Analysis	7471A		1	454854	JL	EET SEA	03/26/24 14:36

Lab Chronicle

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU1_6-9_A
Lab Sample ID: 580-137730-6
Date Collected: 03/05/24 16:00
Matrix: Solid
Date Received: 03/14/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455023	AUA	EET SEA	03/28/24 09:38
Total/NA	Analysis	6020B		20	455179	FCW	EET SEA	03/29/24 07:37
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Client Sample ID: NAN_DU1_6-9_A
Lab Sample ID: 580-137730-6
Date Collected: 03/05/24 16:00
Matrix: Solid
Date Received: 03/14/24 09:30
Percent Solids: 75.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			454663	JL	EET SEA	03/25/24 10:07
Total/NA	Analysis	7471A		1	454854	JL	EET SEA	03/26/24 14:43

Client Sample ID: NAN_DU1_0-3_B
Lab Sample ID: 580-137730-7
Date Collected: 03/05/24 16:00
Matrix: Solid
Date Received: 03/14/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455023	AUA	EET SEA	03/28/24 09:38
Total/NA	Analysis	6020B		20	455179	FCW	EET SEA	03/29/24 07:40
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Client Sample ID: NAN_DU1_0-3_B
Lab Sample ID: 580-137730-7
Date Collected: 03/05/24 16:00
Matrix: Solid
Date Received: 03/14/24 09:30
Percent Solids: 83.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			454663	JL	EET SEA	03/25/24 10:07
Total/NA	Analysis	7471A		1	454854	JL	EET SEA	03/26/24 14:45

Client Sample ID: NAN_DU1_3-6_B
Lab Sample ID: 580-137730-8
Date Collected: 03/05/24 16:00
Matrix: Solid
Date Received: 03/14/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455023	AUA	EET SEA	03/28/24 09:38
Total/NA	Analysis	6020B		20	455179	FCW	EET SEA	03/29/24 07:42
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Lab Chronicle

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU1_3-6_B
Lab Sample ID: 580-137730-8
Date Collected: 03/05/24 16:00
Matrix: Solid
Date Received: 03/14/24 09:30
Percent Solids: 77.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			454663	JL	EET SEA	03/25/24 10:07
Total/NA	Analysis	7471A		1	454854	JL	EET SEA	03/26/24 14:48

Client Sample ID: NAN_DU1_6-9_B
Lab Sample ID: 580-137730-9
Date Collected: 03/05/24 16:00
Matrix: Solid
Date Received: 03/14/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455023	AUA	EET SEA	03/28/24 09:38
Total/NA	Analysis	6020B		20	455179	FCW	EET SEA	03/29/24 07:45
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Client Sample ID: NAN_DU1_6-9_B
Lab Sample ID: 580-137730-9
Date Collected: 03/05/24 16:00
Matrix: Solid
Date Received: 03/14/24 09:30
Percent Solids: 75.8

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			454663	JL	EET SEA	03/25/24 10:07
Total/NA	Analysis	7471A		1	454854	JL	EET SEA	03/26/24 14:50

Client Sample ID: NAN_DU1_0-3_C
Lab Sample ID: 580-137730-10
Date Collected: 03/05/24 16:00
Matrix: Solid
Date Received: 03/14/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455023	AUA	EET SEA	03/28/24 09:38
Total/NA	Analysis	6020B		20	455179	FCW	EET SEA	03/29/24 07:48
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Client Sample ID: NAN_DU1_0-3_C
Lab Sample ID: 580-137730-10
Date Collected: 03/05/24 16:00
Matrix: Solid
Date Received: 03/14/24 09:30
Percent Solids: 80.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			454663	JL	EET SEA	03/25/24 10:07
Total/NA	Analysis	7471A		1	454854	JL	EET SEA	03/26/24 14:52

Lab Chronicle

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU1_3-6_C
Lab Sample ID: 580-137730-11
Date Collected: 03/05/24 16:00
Matrix: Solid
Date Received: 03/14/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455023	AUA	EET SEA	03/28/24 09:38
Total/NA	Analysis	6020B		20	455179	FCW	EET SEA	03/29/24 07:08
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Client Sample ID: NAN_DU1_3-6_C
Lab Sample ID: 580-137730-11
Date Collected: 03/05/24 16:00
Matrix: Solid
Date Received: 03/14/24 09:30
Percent Solids: 77.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			454663	JL	EET SEA	03/25/24 10:07
Total/NA	Analysis	7471A		1	454854	JL	EET SEA	03/26/24 14:55

Client Sample ID: NAN_DU1_6-9_C
Lab Sample ID: 580-137730-12
Date Collected: 03/05/24 16:00
Matrix: Solid
Date Received: 03/14/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455073	CSS	EET SEA	03/28/24 13:37
Total/NA	Analysis	6020B		20	455285	FCW	EET SEA	03/30/24 01:09
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Client Sample ID: NAN_DU1_6-9_C
Lab Sample ID: 580-137730-12
Date Collected: 03/05/24 16:00
Matrix: Solid
Date Received: 03/14/24 09:30
Percent Solids: 73.7

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			454663	JL	EET SEA	03/25/24 10:07
Total/NA	Analysis	7471A		1	454854	JL	EET SEA	03/26/24 14:57

Client Sample ID: NAN_DU3_0-3
Lab Sample ID: 580-137730-13
Date Collected: 03/06/24 12:30
Matrix: Solid
Date Received: 03/14/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455073	CSS	EET SEA	03/28/24 13:37
Total/NA	Analysis	6020B		20	455285	FCW	EET SEA	03/30/24 00:46
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Lab Chronicle

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU3_0-3

Lab Sample ID: 580-137730-13
Date Collected: 03/06/24 12:30
Matrix: Solid
Date Received: 03/14/24 09:30
Percent Solids: 69.3

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			454663	JL	EET SEA	03/25/24 10:07
Total/NA	Analysis	7471A		1	454854	JL	EET SEA	03/26/24 14:59

Client Sample ID: NAN_DU3_3-6

Lab Sample ID: 580-137730-14
Date Collected: 03/06/24 12:30
Matrix: Solid
Date Received: 03/14/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455073	CSS	EET SEA	03/28/24 13:37
Total/NA	Analysis	6020B		20	455285	FCW	EET SEA	03/30/24 02:33
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Client Sample ID: NAN_DU3_3-6

Lab Sample ID: 580-137730-14
Date Collected: 03/06/24 12:30
Matrix: Solid
Date Received: 03/14/24 09:30
Percent Solids: 70.7

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			454663	JL	EET SEA	03/25/24 10:07
Total/NA	Analysis	7471A		1	454854	JL	EET SEA	03/26/24 15:02

Client Sample ID: NAN_DU3_6-9

Lab Sample ID: 580-137730-15
Date Collected: 03/06/24 12:30
Matrix: Solid
Date Received: 03/14/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455073	CSS	EET SEA	03/28/24 13:37
Total/NA	Analysis	6020B		20	455285	FCW	EET SEA	03/30/24 02:30
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Client Sample ID: NAN_DU3_6-9

Lab Sample ID: 580-137730-15
Date Collected: 03/06/24 12:30
Matrix: Solid
Date Received: 03/14/24 09:30
Percent Solids: 72.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			454663	JL	EET SEA	03/25/24 10:07
Total/NA	Analysis	7471A		1	454854	JL	EET SEA	03/26/24 15:04

Lab Chronicle

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU2_0-3
Date Collected: 03/06/24 15:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-16
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455073	CSS	EET SEA	03/28/24 13:37
Total/NA	Analysis	6020B		20	455285	FCW	EET SEA	03/30/24 01:34
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Client Sample ID: NAN_DU2_0-3
Date Collected: 03/06/24 15:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-16
Matrix: Solid
Percent Solids: 75.8

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			454663	JL	EET SEA	03/25/24 10:07
Total/NA	Analysis	7471A		1	454854	JL	EET SEA	03/26/24 15:11

Client Sample ID: NAN_DU2_3-6
Date Collected: 03/06/24 15:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-17
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455073	CSS	EET SEA	03/28/24 13:37
Total/NA	Analysis	6020B		20	455285	FCW	EET SEA	03/30/24 01:48
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Client Sample ID: NAN_DU2_3-6
Date Collected: 03/06/24 15:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-17
Matrix: Solid
Percent Solids: 77.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			454663	JL	EET SEA	03/25/24 10:07
Total/NA	Analysis	7471A		1	454854	JL	EET SEA	03/26/24 15:14

Client Sample ID: NAN_DU2_6-9
Date Collected: 03/06/24 15:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-18
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455073	CSS	EET SEA	03/28/24 13:37
Total/NA	Analysis	6020B		20	455285	FCW	EET SEA	03/30/24 02:22
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Lab Chronicle

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU2_6-9

Lab Sample ID: 580-137730-18
Date Collected: 03/06/24 15:00
Matrix: Solid
Date Received: 03/14/24 09:30
Percent Solids: 77.3

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			454663	JL	EET SEA	03/25/24 10:07
Total/NA	Analysis	7471A		1	454854	JL	EET SEA	03/26/24 15:16

Client Sample ID: NAN_DU9_0-3

Lab Sample ID: 580-137730-19
Date Collected: 03/09/24 12:30
Matrix: Solid
Date Received: 03/14/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455073	CSS	EET SEA	03/28/24 13:37
Total/NA	Analysis	6020B		20	455285	FCW	EET SEA	03/30/24 02:28
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455073	CSS	EET SEA	03/28/24 13:37
Total/NA	Analysis	6020B		2000	455425	FCW	EET SEA	04/01/24 18:07
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Client Sample ID: NAN_DU9_0-3

Lab Sample ID: 580-137730-19
Date Collected: 03/09/24 12:30
Matrix: Solid
Date Received: 03/14/24 09:30
Percent Solids: 70.3

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			454663	JL	EET SEA	03/25/24 10:09
Total/NA	Analysis	7471A		1	454854	JL	EET SEA	03/26/24 15:19

Client Sample ID: NAN_DU9_3-6

Lab Sample ID: 580-137730-20
Date Collected: 03/09/24 12:30
Matrix: Solid
Date Received: 03/14/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455073	CSS	EET SEA	03/28/24 13:37
Total/NA	Analysis	6020B		20	455285	FCW	EET SEA	03/30/24 02:25
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455073	CSS	EET SEA	03/28/24 13:37
Total/NA	Analysis	6020B		2000	455425	FCW	EET SEA	04/01/24 18:04
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Lab Chronicle

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU9_3-6

Lab Sample ID: 580-137730-20
Date Collected: 03/09/24 12:30
Matrix: Solid
Date Received: 03/14/24 09:30
Percent Solids: 61.5

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			454663	JL	EET SEA	03/25/24 10:09
Total/NA	Analysis	7471A		1	454854	JL	EET SEA	03/26/24 15:21

Client Sample ID: NAN_DU9_6-9

Lab Sample ID: 580-137730-21
Date Collected: 03/09/24 12:30
Matrix: Solid
Date Received: 03/14/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455329	CA	EET SEA	04/01/24 12:29
Total/NA	Analysis	6020B		20	455760	FCW	EET SEA	04/05/24 04:50
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455329	CA	EET SEA	04/01/24 12:29
Total/NA	Analysis	6020B		2000	455760	FCW	EET SEA	04/05/24 04:52
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Client Sample ID: NAN_DU9_6-9

Lab Sample ID: 580-137730-21
Date Collected: 03/09/24 12:30
Matrix: Solid
Date Received: 03/14/24 09:30
Percent Solids: 64.5

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			455462	JL	EET SEA	04/02/24 13:03
Total/NA	Analysis	7471A		1	455504	JL	EET SEA	04/02/24 16:10

Client Sample ID: NAN_DU10_0-3

Lab Sample ID: 580-137730-22
Date Collected: 03/09/24 14:30
Matrix: Solid
Date Received: 03/14/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3546			454340	E1W	EET SEA	03/20/24 15:22
Total/NA	Analysis	8082A		1	455366	TL1	EET SEA	04/01/24 14:54
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455329	CA	EET SEA	04/01/24 12:29
Total/NA	Analysis	6020B		20	455760	FCW	EET SEA	04/04/24 17:39
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455329	CA	EET SEA	04/01/24 12:29
Total/NA	Analysis	6020B		2000	455760	FCW	EET SEA	04/04/24 18:01
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Lab Chronicle

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU10_0-3

Lab Sample ID: 580-137730-22
Date Collected: 03/09/24 14:30
Matrix: Solid
Date Received: 03/14/24 09:30
Percent Solids: 71.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			455462	JL	EET SEA	04/02/24 13:03
Total/NA	Analysis	7471A		1	455504	JL	EET SEA	04/02/24 16:13

Client Sample ID: NAN_DU10_3-6

Lab Sample ID: 580-137730-23
Date Collected: 03/09/24 14:30
Matrix: Solid
Date Received: 03/14/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3546			454340	E1W	EET SEA	03/20/24 15:22
Total/NA	Analysis	8082A		1	455366	TL1	EET SEA	04/01/24 15:47
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455329	CA	EET SEA	04/01/24 12:29
Total/NA	Analysis	6020B		20	455760	FCW	EET SEA	04/05/24 05:01
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455329	CA	EET SEA	04/01/24 12:29
Total/NA	Analysis	6020B		2000	455760	FCW	EET SEA	04/05/24 05:04
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Client Sample ID: NAN_DU10_3-6

Lab Sample ID: 580-137730-23
Date Collected: 03/09/24 14:30
Matrix: Solid
Date Received: 03/14/24 09:30
Percent Solids: 70.8

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			455462	JL	EET SEA	04/02/24 13:03
Total/NA	Analysis	7471A		1	455504	JL	EET SEA	04/02/24 15:45

Client Sample ID: NAN_DU10_6-9

Lab Sample ID: 580-137730-24
Date Collected: 03/09/24 14:30
Matrix: Solid
Date Received: 03/14/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455329	CA	EET SEA	04/01/24 12:29
Total/NA	Analysis	6020B		20	455760	FCW	EET SEA	04/04/24 17:52
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455329	CA	EET SEA	04/01/24 12:29
Total/NA	Analysis	6020B		2000	455760	FCW	EET SEA	04/04/24 18:14
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Lab Chronicle

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU10_6-9

Lab Sample ID: 580-137730-24
Date Collected: 03/09/24 14:30
Matrix: Solid
Date Received: 03/14/24 09:30
Percent Solids: 68.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			455462	JL	EET SEA	04/02/24 13:03
Total/NA	Analysis	7471A		1	455504	JL	EET SEA	04/02/24 15:54

Client Sample ID: NAN_DU11_0-3

Lab Sample ID: 580-137730-25
Date Collected: 03/10/24 12:20
Matrix: Solid
Date Received: 03/14/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455329	CA	EET SEA	04/01/24 12:29
Total/NA	Analysis	6020B		20	455760	FCW	EET SEA	04/05/24 05:47
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455329	CA	EET SEA	04/01/24 12:29
Total/NA	Analysis	6020B		2000	455760	FCW	EET SEA	04/05/24 05:50
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Client Sample ID: NAN_DU11_0-3

Lab Sample ID: 580-137730-25
Date Collected: 03/10/24 12:20
Matrix: Solid
Date Received: 03/14/24 09:30
Percent Solids: 62.7

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			455462	JL	EET SEA	04/02/24 13:03
Total/NA	Analysis	7471A		1	455504	JL	EET SEA	04/02/24 15:36

Client Sample ID: NAN_DU11_3-6

Lab Sample ID: 580-137730-26
Date Collected: 03/10/24 12:20
Matrix: Solid
Date Received: 03/14/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3546			454340	E1W	EET SEA	03/20/24 15:22
Total/NA	Analysis	8082A		1	455366	TL1	EET SEA	04/01/24 16:04
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455329	CA	EET SEA	04/01/24 12:29
Total/NA	Analysis	6020B		20	455760	FCW	EET SEA	04/05/24 04:44
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455329	CA	EET SEA	04/01/24 12:29
Total/NA	Analysis	6020B		2000	455760	FCW	EET SEA	04/05/24 04:47
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Lab Chronicle

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU11_3-6

Lab Sample ID: 580-137730-26
Date Collected: 03/10/24 12:20
Matrix: Solid
Date Received: 03/14/24 09:30
Percent Solids: 65.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			455462	JL	EET SEA	04/02/24 13:03
Total/NA	Analysis	7471A		1	455504	JL	EET SEA	04/02/24 15:56

Client Sample ID: NAN_DU11_6-9

Lab Sample ID: 580-137730-27
Date Collected: 03/10/24 12:20
Matrix: Solid
Date Received: 03/14/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455329	CA	EET SEA	04/01/24 12:29
Total/NA	Analysis	6020B		20	455760	FCW	EET SEA	04/05/24 05:41
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455329	CA	EET SEA	04/01/24 12:29
Total/NA	Analysis	6020B		2000	455760	FCW	EET SEA	04/05/24 05:44
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Client Sample ID: NAN_DU11_6-9

Lab Sample ID: 580-137730-27
Date Collected: 03/10/24 12:20
Matrix: Solid
Date Received: 03/14/24 09:30
Percent Solids: 66.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			455462	JL	EET SEA	04/02/24 13:03
Total/NA	Analysis	7471A		1	455504	JL	EET SEA	04/02/24 15:59

Client Sample ID: NAN_DU12_0-3

Lab Sample ID: 580-137730-28
Date Collected: 03/10/24 13:10
Matrix: Solid
Date Received: 03/14/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455329	CA	EET SEA	04/01/24 12:29
Total/NA	Analysis	6020B		20	455760	FCW	EET SEA	04/05/24 04:55
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455329	CA	EET SEA	04/01/24 12:29
Total/NA	Analysis	6020B		2000	455760	FCW	EET SEA	04/05/24 04:58
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Lab Chronicle

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU12_0-3

Lab Sample ID: 580-137730-28
Date Collected: 03/10/24 13:10
Matrix: Solid
Date Received: 03/14/24 09:30
Percent Solids: 68.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			455462	JL	EET SEA	04/02/24 13:03
Total/NA	Analysis	7471A		1	455504	JL	EET SEA	04/02/24 16:02

Client Sample ID: NAN_DU12_3-6

Lab Sample ID: 580-137730-29
Date Collected: 03/10/24 13:10
Matrix: Solid
Date Received: 03/14/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455329	CA	EET SEA	04/01/24 12:29
Total/NA	Analysis	6020B		20	455760	FCW	EET SEA	04/05/24 05:35
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455329	CA	EET SEA	04/01/24 12:29
Total/NA	Analysis	6020B		2000	455760	FCW	EET SEA	04/05/24 05:38
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Client Sample ID: NAN_DU12_3-6

Lab Sample ID: 580-137730-29
Date Collected: 03/10/24 13:10
Matrix: Solid
Date Received: 03/14/24 09:30
Percent Solids: 75.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			455462	JL	EET SEA	04/02/24 13:03
Total/NA	Analysis	7471A		1	455504	JL	EET SEA	04/02/24 16:05

Client Sample ID: NAN_DU12_6-9

Lab Sample ID: 580-137730-30
Date Collected: 03/10/24 13:10
Matrix: Solid
Date Received: 03/14/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455329	CA	EET SEA	04/01/24 12:29
Total/NA	Analysis	6020B		20	455760	FCW	EET SEA	04/05/24 05:52
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455329	CA	EET SEA	04/01/24 12:29
Total/NA	Analysis	6020B		2000	455760	FCW	EET SEA	04/05/24 05:55
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Lab Chronicle

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU12_6-9

Date Collected: 03/10/24 13:10
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-30

Matrix: Solid
Percent Solids: 72.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			455462	JL	EET SEA	04/02/24 13:03
Total/NA	Analysis	7471A		1	455504	JL	EET SEA	04/02/24 16:08

Laboratory References:

EET SEA = Eurofins Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Accreditation/Certification Summary

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Laboratory: Eurofins Seattle

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2236	01-19-25

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
2540G		Solid	Percent Moisture
2540G		Solid	Percent Solids

Sample Summary

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-137730-1	NAN_DU8_0-3	Solid	03/03/24 10:00	03/14/24 09:30
580-137730-2	NAN_DU8_3-6	Solid	03/03/24 10:00	03/14/24 09:30
580-137730-3	NAN_DU8_6-9	Solid	03/03/24 10:00	03/14/24 09:30
580-137730-4	NAN_DU1_0-3_A	Solid	03/05/24 16:00	03/14/24 09:30
580-137730-5	NAN_DU1_3-6_A	Solid	03/05/24 16:00	03/14/24 09:30
580-137730-6	NAN_DU1_6-9_A	Solid	03/05/24 16:00	03/14/24 09:30
580-137730-7	NAN_DU1_0-3_B	Solid	03/05/24 16:00	03/14/24 09:30
580-137730-8	NAN_DU1_3-6_B	Solid	03/05/24 16:00	03/14/24 09:30
580-137730-9	NAN_DU1_6-9_B	Solid	03/05/24 16:00	03/14/24 09:30
580-137730-10	NAN_DU1_0-3_C	Solid	03/05/24 16:00	03/14/24 09:30
580-137730-11	NAN_DU1_3-6_C	Solid	03/05/24 16:00	03/14/24 09:30
580-137730-12	NAN_DU1_6-9_C	Solid	03/05/24 16:00	03/14/24 09:30
580-137730-13	NAN_DU3_0-3	Solid	03/06/24 12:30	03/14/24 09:30
580-137730-14	NAN_DU3_3-6	Solid	03/06/24 12:30	03/14/24 09:30
580-137730-15	NAN_DU3_6-9	Solid	03/06/24 12:30	03/14/24 09:30
580-137730-16	NAN_DU2_0-3	Solid	03/06/24 15:00	03/14/24 09:30
580-137730-17	NAN_DU2_3-6	Solid	03/06/24 15:00	03/14/24 09:30
580-137730-18	NAN_DU2_6-9	Solid	03/06/24 15:00	03/14/24 09:30
580-137730-19	NAN_DU9_0-3	Solid	03/09/24 12:30	03/14/24 09:30
580-137730-20	NAN_DU9_3-6	Solid	03/09/24 12:30	03/14/24 09:30
580-137730-21	NAN_DU9_6-9	Solid	03/09/24 12:30	03/14/24 09:30
580-137730-22	NAN_DU10_0-3	Solid	03/09/24 14:30	03/14/24 09:30
580-137730-23	NAN_DU10_3-6	Solid	03/09/24 14:30	03/14/24 09:30
580-137730-24	NAN_DU10_6-9	Solid	03/09/24 14:30	03/14/24 09:30
580-137730-25	NAN_DU11_0-3	Solid	03/10/24 12:20	03/14/24 09:30
580-137730-26	NAN_DU11_3-6	Solid	03/10/24 12:20	03/14/24 09:30
580-137730-27	NAN_DU11_6-9	Solid	03/10/24 12:20	03/14/24 09:30
580-137730-28	NAN_DU12_0-3	Solid	03/10/24 13:10	03/14/24 09:30
580-137730-29	NAN_DU12_3-6	Solid	03/10/24 13:10	03/14/24 09:30
580-137730-30	NAN_DU12_6-9	Solid	03/10/24 13:10	03/14/24 09:30

Eurofins Environmental Testing Northwest, LLC
5755 8th Street East
Tacoma, WA 98424

Chain of Custody Record

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Client Information	Sampler: KC, SM, RK	Lab PM: Tracy Dutton	Carrier Tracking No(s):	COC No:
Client Contact: Scott Moncrief	Phone: 808 2860222	E-Mail: scottmoncrief808@gmail.com	State of Origin: HI	Page: Page 1 of 3
Company: Kealamahi Pacific	PWSID:			Job #:
Address: 103 S Kalaheo Ave	Due Date Requested: std TAT			
City: Kailua	TAT Requested (days): std			
State, Zip: HI 96734	Compliance Project: Δ Yes Δ No			
Phone: 808 2860222	PO #: Purchase Order not required			
Email: scottmoncrief808@gmail.com	WO #:			
Project Name: Nanue Bridge	Project #:			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8 RCRA Metals	% moisture	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
NAN-DU8-0-3	3/3/24	1000	M/S	S			X	X		50 increment DU
NAN-DU8-3-6	↓	1000					X	X		
NAN-DU8-6-9	↓	1000					X	X		
NAN-DU1-0-3-A	3/5/24	1600					X	X		
NAN-DU9KC-3-6-A		1600					X	X		
NAN-DU9KC-6-9-A		1600					X	X		
NAN-DU9KC-0-3-B		1600					X	X		
NAN-DU9KC-3-6-B		1600					X	X		
NAN-DU9KC-6-9-B		1600					X	X		
NAN-DU9KC-0-3-C		1600					X	X		
NAN-DU9KC-3-6-C	↓	1600	↓	↓			X	X		

580-137730 Chain of Custody

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☒ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify) std

Special Instructions/QC Requirements:

Empty Kit Relinquished by: | Date: | Time: | Method of Shipment: FedEx

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Scott Moncrief	3/11/24 1100	KPC		3/14/24 0930	EETN
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks:

Eurofins Environmental Testing Northwest, LLC
5755 8th Street East
Tacoma, WA 98424

Chain of Custody Record

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Client Information	Sampler:	Lab PM:	Carrier Tracking No(s):	COC No:
Client Contact:	Phone:	E-Mail:	State of Origin:	Page: ~~Page 1 of 1~~ KC 2 of 3
Company: Kealamahi Pacific	PWSID:			Job #:

Address:	Due Date Requested:
City:	TAT Requested (days):
State, Zip:	Compliance Project: Δ Yes Δ No
Phone:	PO #: Purchase Order not required
Email:	WO #:
Project Name: Nanue Bridge	Project #:
Site:	SSOW#:

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8 RCRA Metals	% moisture	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
NAN-DU9-6-9-C	3/5/24	1600	MIS	S			X	X		50 increment DU
NAN-DU3-0-3	3/6/24	1230					X	X		
NAN-DU3-3-6		1230					X	X		
NAN-DU3-6-9		1230					X	X		
NAN-DU2-0-3		1500					X	X		
NAN-DU2-3-6		1500					X	X		
NAN-DU2-6-9		1500					X	X		
NAN-DU9-0-3	3/9/24	1230					X	X		
NAN-DU9-3-6		1230					X	X		
NAN-DU9-6-9		1230					X	X		
NAN-DU10-0-3		1430					X	X		

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☒ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify) std

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment: FedEx

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Scott Mencarick	3/11/24 11:00 HST			3/14/24 0930	EETN
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Eurofins Environmental Testing Northwest, LLC
5755 8th Street East
Tacoma, WA 98424

Chain of Custody Record

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Client Information	Sampler:	Lab PM:	Carrier Tracking No(s):	COC No:
Client Contact:	Phone:	E-Mail:	State of Origin:	Page: Page ~~1 of 1~~ KC 3 of 3
Company: Kealamahi Pacific	PWSID:			Job #:
Address:	Due Date Requested:			
City:	TAT Requested (days):			
State, Zip:	Compliance Project: Δ Yes Δ No			
Phone:	PO #: Purchase Order not required			
Email:	WO #:			
Project Name: Nanue Bridge	Project #:			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8 RCRA Metals	% moisture	PCBs	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
NAN_DU10_3-6	3/9/24	1430	MIS	S			X	X	X		50 increment DU
NAN_DU10_6-9	↓	1430	↓	↓			X	X			
NAN_DU11_0-3	3/10/24	1220					X	X			
NAN_DU11_3-6		1220					X	X	X		
NAN_DU11_6-9		1220					X	X			
NAN_DU12_0-3		1310					X	X			
NAN_DU12_3-6		1310					X	X			
NAN_DU12_6-9	↓	1310	↓	↓			X	X			
		LAST	ENTRY								

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☒ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify) std

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment: FedEx			
Relinquished by: Scott Moncrief	Date/Time: 3/11/24 1100 AM	Company	Received by:	Date/Time: 3/14/24 0930	Company: EETN	
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company	
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company	

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks:

#1 IBII 13.3/13.2 LB/Ice/NO/FPO

#2 IBII 13.2/13.1 LB/Ice/NO/FPO

Login Sample Receipt Checklist

Client: EnviroQuest, Inc.

Job Number: 580-137730-1

Login Number: 137730
List Number: 1
Creator: Groves, Elizabeth

List Source: Eurofins Seattle

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	Cooler temperature outside limits,acceptable per client data quality objectives
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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ANALYTICAL REPORT

PREPARED FOR

Attn: Scott Moncrief
EnviroQuest, Inc.
98-029 Hekaha Street
Suite 21
Aiea, Hawaii 96701

Generated 5/6/2024 6:48:09 PM Revision 1

JOB DESCRIPTION

Nanue Bridge

JOB NUMBER

580-137730-1

Eurofins Seattle
5755 8th Street East
Tacoma WA 98424

See page two for job notes and contact information.

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing Northwest, LLC Project Manager.

Authorization

Generated
5/6/2024 6:48:09 PM
Revision 1

Authorized for release by
Tracy Dutton, Client Relations Manager
Tracy.Dutton@et.eurofinsus.com
(253)248-4970

Table of Contents

Job Narrative
580-137730-1

REVISION
The report being provided is a revision of the original report sent on 4/8/2024. The report (revision 1) is being revised due to client added TCLP RCRA metals and SPLP Lead analyses to several samples in the job (see narrative notes below).

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers are applied to indicate exceptions. Noncompliant quality control (QC) is further explained in narrative comments.

- Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Receipt
The samples were received on 3/14/2024 9:30 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 13.2°C and 13.3°C.

Note: All samples which require thermal preservation are considered acceptable if the arrival temperature is within 2C of the required temperature or method specified range. For samples with a specified temperature of 4C, samples with a temperature ranging from just above freezing temperature of water to 6C shall be acceptable. Samples that are hand delivered immediately following collection may not meet these criteria, however they will be deemed acceptable according to NELAC standards, if there is evidence that the chilling process has begun, such as arrival on ice, etc.

Receipt Exceptions
All samples contained in this login were delayed in shipment.

NAN_DU8_0-3 (580-137730-1), NAN_DU8_3-6 (580-137730-2), NAN_DU8_6-9 (580-137730-3), NAN_DU1_0-3_A (580-137730-4), NAN_DU1_3-6_A (580-137730-5), NAN_DU1_6-9_A (580-137730-6), NAN_DU1_0-3_B (580-137730-7), NAN_DU1_3-6_B (580-137730-8), NAN_DU1_6-9_B (580-137730-9), NAN_DU1_0-3_C (580-137730-10), NAN_DU1_3-6_C (580-137730-11), NAN_DU1_6-9_C (580-137730-12), NAN_DU3_0-3 (580-137730-13), NAN_DU3_3-6 (580-137730-14), NAN_DU3_6-9 (580-137730-15), NAN_DU2_0-3 (580-137730-16), NAN_DU2_3-6 (580-137730-17), NAN_DU2_6-9 (580-137730-18), NAN_DU9_0-3 (580-137730-19), NAN_DU9_3-6 (580-137730-20), NAN_DU9_6-9 (580-137730-21), NAN_DU10_0-3 (580-137730-22), NAN_DU10_3-6 (580-137730-23), NAN_DU10_6-9 (580-137730-24), NAN_DU11_0-3 (580-137730-25), NAN_DU11_3-6 (580-137730-26), NAN_DU11_6-9 (580-137730-27), NAN_DU12_0-3 (580-137730-28), NAN_DU12_3-6 (580-137730-29) and NAN_DU12_6-9 (580-137730-30)

Method 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography
Samples NAN_DU10_0-3 (580-137730-22), NAN_DU10_3-6 (580-137730-23) and NAN_DU11_3-6 (580-137730-26) were analyzed for Polychlorinated Biphenyls (PCBs) by Gas Chromatography. The samples were composited on 3/18/2024, prepared on 3/20/2024 and analyzed on 4/1/2024.

The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 580-454054 and 580-454340 and analytical batch 580-455366 were outside control limits for one or more analytes. See QC Sample Results for detail. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery is within acceptance limits.

The %RPD between the primary and confirmation column exceeded 40% for PCB-1254 for the following sample: NAN_DU10_3-6 (580-137730-23). The lower value(s) has been reported and qualified in accordance with the laboratory's SOP.

The following samples required a TBA clean-up to reduce matrix interferences caused by sulfur TBA_00037: NAN_DU10_0-3 (580-137730-22), NAN_DU10_3-6 (580-137730-23), NAN_DU11_3-6 (580-137730-26), (LCS 580-454340/2-A), (LCSD 580-454340/3-A), (MB 580-454340/1-A), (580-137730-A-22-D MS) and (580-137730-A-22-E MSD)
.

Method 6010D - Metals (ICP) - TCLP

Samples NAN_DU8_0-3 (580-137730-1), NAN_DU1_0-3_B (580-137730-7), NAN_DU3_6-9 (580-137730-15), NAN_DU2_6-9 (580-137730-18), NAN_DU9_0-3 (580-137730-19), NAN_DU10_3-6 (580-137730-23), NAN_DU11_3-6 (580-137730-26) and NAN_DU12_3-6 (580-137730-29) were analyzed for Metals (ICP) - TCLP. The samples were leached on 4/23/2024, prepared on 4/25/2024 and 4/26/2024 and analyzed on 4/25/2024 and 5/1/2024.

The following samples were prepared outside of preparation holding time due to the client activating TCLP 7470 analysis on 04/24/2024 after receiving the total 7471 mercury results: NAN_DU8_0-3 (580-137730-1), NAN_DU1_0-3_B (580-137730-7), NAN_DU3_6-9 (580-137730-15), NAN_DU2_6-9 (580-137730-18), NAN_DU9_0-3 (580-137730-19), NAN_DU10_3-6 (580-137730-23), NAN_DU11_3-6 (580-137730-26) and NAN_DU12_3-6 (580-137730-29).

Because the client activated both TCLP and SPLP methods after receiving results for total metals and mercury, insufficient samples were provided by ISM to perform both leaching procedures with the required 100g for the following samples: NAN_DU8_0-3 (580-137730-1), NAN_DU1_0-3_B (580-137730-7), NAN_DU3_6-9 (580-137730-15), NAN_DU2_6-9 (580-137730-18), NAN_DU9_0-3 (580-137730-19), NAN_DU10_3-6 (580-137730-23), NAN_DU11_3-6 (580-137730-26) and NAN_DU12_3-6 (580-137730-29). The volume of leaching fluid was adjusted proportionally to maintain a 20:1 ratio of leaching fluid to weight of sample. Reporting limits (RLs) are not affected.

Method 6020B - Metals (ICP/MS)
Samples NAN_DU8_0-3 (580-137730-1), NAN_DU8_3-6 (580-137730-2), NAN_DU8_6-9 (580-137730-3), NAN_DU1_0-3_A (580-137730-4), NAN_DU1_3-6_A (580-137730-5), NAN_DU1_6-9_A (580-137730-6), NAN_DU1_0-3_B (580-137730-7), NAN_DU1_3-6_B (580-137730-8), NAN_DU1_6-9_B (580-137730-9), NAN_DU1_0-3_C (580-137730-10), NAN_DU1_3-6_C (580-137730-11), NAN_DU1_6-9_C (580-137730-12), NAN_DU3_0-3 (580-137730-13), NAN_DU3_3-6 (580-137730-14), NAN_DU3_6-9 (580-137730-15), NAN_DU2_0-3 (580-137730-16), NAN_DU2_3-6 (580-137730-17), NAN_DU2_6-9 (580-137730-18), NAN_DU9_0-3 (580-137730-19), NAN_DU9_3-6 (580-137730-20), NAN_DU9_6-9 (580-137730-21), NAN_DU10_0-3 (580-137730-22), NAN_DU10_3-6 (580-137730-23), NAN_DU10_6-9 (580-137730-24), NAN_DU11_0-3 (580-137730-25), NAN_DU11_3-6 (580-137730-26), NAN_DU11_6-9 (580-137730-27), NAN_DU12_0-3 (580-137730-28), NAN_DU12_3-6 (580-137730-29) and NAN_DU12_6-9 (580-137730-30) were analyzed for Metals (ICP/MS). The samples were composited on 3/18/2024, prepared on 3/28/2024 and 4/1/2024 and analyzed on 3/29/2024, 3/30/2024, 4/1/2024, 4/4/2024 and 4/5/2024.

Samples NAN_DU9_0-3 (580-137730-19)[2000x], NAN_DU9_3-6 (580-137730-20)[2000x], NAN_DU9_6-9 (580-137730-21)[2000x], NAN_DU10_0-3 (580-137730-22)[2000x], NAN_DU10_3-6 (580-137730-23)[2000x], NAN_DU10_6-9 (580-137730-24)[2000x], NAN_DU11_0-3 (580-137730-25)[2000x], NAN_DU11_3-6 (580-137730-26)[2000x], NAN_DU11_6-9 (580-137730-27)[2000x], NAN_DU12_0-3 (580-137730-28)[2000x], NAN_DU12_3-6 (580-137730-29)[2000x] and NAN_DU12_6-9 (580-137730-30)[2000x] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

Method 7470A - Mercury (CVAA) - TCLP
Samples NAN_DU8_0-3 (580-137730-1), NAN_DU1_0-3_B (580-137730-7), NAN_DU3_6-9 (580-137730-15), NAN_DU2_6-9 (580-137730-18), NAN_DU9_0-3 (580-137730-19), NAN_DU10_3-6 (580-137730-23), NAN_DU11_3-6 (580-137730-26) and NAN_DU12_3-6 (580-137730-29) were analyzed for Mercury (CVAA) - TCLP. The samples were leached on 4/23/2024, prepared on 4/25/2024 and analyzed on 4/30/2024.

The following samples were prepared outside of preparation holding time due to the client activating TCLP 7470 analysis on 04/24/2024 after receiving the total 7471 mercury results: NAN_DU8_0-3 (580-137730-1), NAN_DU1_0-3_B (580-137730-7), NAN_DU3_6-9 (580-137730-15), NAN_DU2_6-9 (580-137730-18), NAN_DU9_0-3 (580-137730-19), NAN_DU10_3-6 (580-137730-23), NAN_DU11_3-6 (580-137730-26) and NAN_DU12_3-6 (580-137730-29).

Because the client activated both TCLP and SPLP methods after receiving results for total metals and mercury, insufficient samples were provided by ISM to perform both leaching procedures with the required 100g for the following samples: NAN_DU8_0-3 (580-137730-1), NAN_DU1_0-3_B (580-137730-7), NAN_DU3_6-9 (580-137730-15), NAN_DU2_6-9 (580-137730-18), NAN_DU9_0-3 (580-137730-19), NAN_DU10_3-6 (580-137730-23), NAN_DU11_3-6 (580-137730-26) and NAN_DU12_3-6 (580-137730-29). The volume of leaching fluid was adjusted proportionally to maintain a 20:1 ratio of leaching fluid to weight of sample. Reporting limits (RLs) are not affected.

Method 7471A - Mercury (CVAA)
Samples NAN_DU8_0-3 (580-137730-1), NAN_DU8_3-6 (580-137730-2), NAN_DU8_6-9 (580-137730-3), NAN_DU1_0-3_A (580-137730-4), NAN_DU1_3-6_A (580-137730-5), NAN_DU1_6-9_A (580-137730-6), NAN_DU1_0-3_B (580-137730-7), NAN_DU1_3-6_B (580-137730-8), NAN_DU1_6-9_B (580-137730-9), NAN_DU1_0-3_C (580-137730-10), NAN_DU1_3-6_C (580-137730-11), NAN_DU1_6-9_C (580-137730-12), NAN_DU3_0-3 (580-137730-13), NAN_DU3_3-6 (580-137730-14), NAN_DU3_6-9 (580-137730-15), NAN_DU2_0-3 (580-137730-16), NAN_DU2_3-6 (580-137730-17), NAN_DU2_6-9 (580-137730-18), NAN_DU9_0-3 (580-137730-19), NAN_DU9_3-6 (580-137730-20), NAN_DU9_6-9 (580-137730-21),

NAN_DU10_0-3 (580-137730-22), NAN_DU10_3-6 (580-137730-23), NAN_DU10_6-9 (580-137730-24), NAN_DU11_0-3 (580-137730-25), NAN_DU11_3-6 (580-137730-26), NAN_DU11_6-9 (580-137730-27), NAN_DU12_0-3 (580-137730-28), NAN_DU12_3-6 (580-137730-29) and NAN_DU12_6-9 (580-137730-30) were analyzed for Mercury (CVAA). The samples were composited on 3/18/2024, prepared on 3/25/2024 and 4/2/2024 and analyzed on 3/26/2024 and 4/2/2024.

Method 2540G - SM 2540G
Samples NAN_DU8_0-3 (580-137730-1), NAN_DU8_3-6 (580-137730-2), NAN_DU8_6-9 (580-137730-3), NAN_DU1_0-3_A (580-137730-4), NAN_DU1_3-6_A (580-137730-5), NAN_DU1_6-9_A (580-137730-6), NAN_DU1_0-3_B (580-137730-7), NAN_DU1_3-6_B (580-137730-8), NAN_DU1_6-9_B (580-137730-9), NAN_DU1_0-3_C (580-137730-10), NAN_DU1_3-6_C (580-137730-11), NAN_DU1_6-9_C (580-137730-12), NAN_DU3_0-3 (580-137730-13), NAN_DU3_3-6 (580-137730-14), NAN_DU3_6-9 (580-137730-15), NAN_DU2_0-3 (580-137730-16), NAN_DU2_3-6 (580-137730-17), NAN_DU2_6-9 (580-137730-18), NAN_DU9_0-3 (580-137730-19), NAN_DU9_3-6 (580-137730-20), NAN_DU9_6-9 (580-137730-21), NAN_DU10_0-3 (580-137730-22), NAN_DU10_3-6 (580-137730-23), NAN_DU10_6-9 (580-137730-24), NAN_DU11_0-3 (580-137730-25), NAN_DU11_3-6 (580-137730-26), NAN_DU11_6-9 (580-137730-27), NAN_DU12_0-3 (580-137730-28), NAN_DU12_3-6 (580-137730-29) and NAN_DU12_6-9 (580-137730-30) were analyzed for SM 2540G. The samples were composited on 3/18/2024 and analyzed on 3/26/2024.

Definitions/Glossary

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Qualifiers

GC Semi VOA

Qualifier	Qualifier Description
J1	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
M	Manual integrated compound.
U	Undetected at the Limit of Detection.

Metals

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
H	Sample was prepped or analyzed beyond the specified holding time. This does not meet regulatory requirements.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
J1	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
U	Undetected at the Limit of Detection.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU8_0-3

Date Collected: 03/03/24 10:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-1

Matrix: Solid

Method: SW846 6010D - Metals (ICP) - SPLP West

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	**0.59**		0.030	0.0027	mg/L		05/06/24 15:58	05/01/24 22:22	1

Method: SW846 6010D - TCLP Metals (ICP) - TCLP

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.029	U	0.060	0.0072	mg/L		04/25/24 11:48	04/25/24 19:56	1
Barium	**1.1**		0.020	0.0010	mg/L		04/25/24 11:48	04/25/24 19:56	1
Cadmium	**0.0025**	**J**	0.020	0.00090	mg/L		04/25/24 11:48	04/25/24 19:56	1
Chromium	0.0052	U	0.025	0.0027	mg/L		04/25/24 11:48	04/25/24 19:56	1
Lead	**3.7**		0.030	0.0027	mg/L		04/25/24 11:48	04/25/24 19:56	1
Selenium	0.035	U	0.10	0.0087	mg/L		04/25/24 11:48	04/25/24 19:56	1
Silver	0.034	U	0.050	0.0085	mg/L		04/25/24 11:48	04/25/24 19:56	1

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**20**		0.50	0.099	mg/Kg		03/28/24 09:38	03/29/24 06:51	20
Barium	**150**		0.99	0.23	mg/Kg		03/28/24 09:38	03/29/24 06:51	20
Cadmium	**0.56**	**J**	0.79	0.077	mg/Kg		03/28/24 09:38	03/29/24 06:51	20
Chromium	**170**		0.99	0.063	mg/Kg		03/28/24 09:38	03/29/24 06:51	20
Lead	**4300**		0.50	0.048	mg/Kg		03/28/24 09:38	03/29/24 06:51	20
Selenium	**5.8**		1.5	0.28	mg/Kg		03/28/24 09:38	03/29/24 06:51	20
Silver	**0.088**	**J**	0.20	0.020	mg/Kg		03/28/24 09:38	03/29/24 06:51	20

Method: SW846 7470A - TCLP Mercury (CVAA) - TCLP

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.0020	U H	0.0030	0.0015	mg/L		04/25/24 12:11	04/30/24 15:37	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	**71.8**		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	**28.2**		0.1	0.1	%			03/26/24 11:00	1

Client Sample Results

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU8_0-3
Date Collected: 03/03/24 10:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-1
Matrix: Solid
Percent Solids: 71.8

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.31		0.022	0.0067	mg/Kg	☼	03/25/24 10:07	03/26/24 14:21	1

Client Sample Results

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU8_3-6

Date Collected: 03/03/24 10:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-2

Matrix: Solid

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	20		0.50	0.099	mg/Kg		03/28/24 09:38	03/29/24 06:57	20
Barium	200		0.99	0.23	mg/Kg		03/28/24 09:38	03/29/24 06:57	20
Cadmium	0.62	J	0.80	0.077	mg/Kg		03/28/24 09:38	03/29/24 06:57	20
Chromium	180		0.99	0.063	mg/Kg		03/28/24 09:38	03/29/24 06:57	20
Lead	3100		0.50	0.048	mg/Kg		03/28/24 09:38	03/29/24 06:57	20
Selenium	6.8		1.5	0.28	mg/Kg		03/28/24 09:38	03/29/24 06:57	20
Silver	0.072	J	0.20	0.020	mg/Kg		03/28/24 09:38	03/29/24 06:57	20

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	70.8		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	29.2		0.1	0.1	%			03/26/24 11:00	1

Client Sample Results

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU8_3-6
Date Collected: 03/03/24 10:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-2
Matrix: Solid
Percent Solids: 70.8

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.30		0.024	0.0071	mg/Kg	☼	03/25/24 10:07	03/26/24 14:28	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU8_6-9

Date Collected: 03/03/24 10:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-3

Matrix: Solid

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	32		0.47	0.095	mg/Kg		03/28/24 09:38	03/29/24 06:54	20
Barium	180		0.95	0.22	mg/Kg		03/28/24 09:38	03/29/24 06:54	20
Cadmium	0.66	J	0.76	0.073	mg/Kg		03/28/24 09:38	03/29/24 06:54	20
Chromium	180		0.95	0.060	mg/Kg		03/28/24 09:38	03/29/24 06:54	20
Lead	2900		0.47	0.046	mg/Kg		03/28/24 09:38	03/29/24 06:54	20
Selenium	7.1		1.4	0.27	mg/Kg		03/28/24 09:38	03/29/24 06:54	20
Silver	0.073	J	0.19	0.019	mg/Kg		03/28/24 09:38	03/29/24 06:54	20

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	69.0		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	31.0		0.1	0.1	%			03/26/24 11:00	1

Client Sample Results

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU8_6-9

Date Collected: 03/03/24 10:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-3

Matrix: Solid
Percent Solids: 69.0

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.34		0.024	0.0072	mg/Kg	☼	03/25/24 10:07	03/26/24 14:31	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU1_0-3_A

Date Collected: 03/05/24 16:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-4

Matrix: Solid

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	28		0.47	0.095	mg/Kg		03/28/24 09:38	03/29/24 06:49	20
Barium	260		0.95	0.22	mg/Kg		03/28/24 09:38	03/29/24 06:49	20
Cadmium	0.37	J	0.76	0.073	mg/Kg		03/28/24 09:38	03/29/24 06:49	20
Chromium	180		0.95	0.060	mg/Kg		03/28/24 09:38	03/29/24 06:49	20
Lead	1100		0.47	0.046	mg/Kg		03/28/24 09:38	03/29/24 06:49	20
Selenium	8.1		1.4	0.27	mg/Kg		03/28/24 09:38	03/29/24 06:49	20
Silver	0.064	J	0.19	0.019	mg/Kg		03/28/24 09:38	03/29/24 06:49	20

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	82.3		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	17.7		0.1	0.1	%			03/26/24 11:00	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU1_0-3_A
Date Collected: 03/05/24 16:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-4
Matrix: Solid
Percent Solids: 82.3

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.15		0.020	0.0060	mg/Kg	☼	03/25/24 10:07	03/26/24 14:33	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU1_3-6_A

Date Collected: 03/05/24 16:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-5

Matrix: Solid

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	24		0.49	0.098	mg/Kg		03/28/24 09:38	03/29/24 06:23	20
Barium	270		0.98	0.22	mg/Kg		03/28/24 09:38	03/29/24 06:23	20
Cadmium	0.42	J	0.78	0.076	mg/Kg		03/28/24 09:38	03/29/24 06:23	20
Chromium	190		0.98	0.062	mg/Kg		03/28/24 09:38	03/29/24 06:23	20
Lead	980		0.49	0.047	mg/Kg		03/28/24 09:38	03/29/24 06:23	20
Selenium	9.6		1.5	0.28	mg/Kg		03/28/24 09:38	03/29/24 06:23	20
Silver	0.057	J	0.20	0.020	mg/Kg		03/28/24 09:38	03/29/24 06:23	20

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	78.6		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	21.4		0.1	0.1	%			03/26/24 11:00	1

Client Sample Results

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU1_3-6_A
Date Collected: 03/05/24 16:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-5
Matrix: Solid
Percent Solids: 78.6

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.16		0.021	0.0063	mg/Kg	☼	03/25/24 10:07	03/26/24 14:36	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU1_6-9_A

Date Collected: 03/05/24 16:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-6

Matrix: Solid

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	17		0.48	0.096	mg/Kg		03/28/24 09:38	03/29/24 07:37	20
Barium	340		0.96	0.22	mg/Kg		03/28/24 09:38	03/29/24 07:37	20
Cadmium	0.32	J	0.77	0.074	mg/Kg		03/28/24 09:38	03/29/24 07:37	20
Chromium	190		0.96	0.060	mg/Kg		03/28/24 09:38	03/29/24 07:37	20
Lead	640		0.48	0.046	mg/Kg		03/28/24 09:38	03/29/24 07:37	20
Selenium	10		1.4	0.27	mg/Kg		03/28/24 09:38	03/29/24 07:37	20
Silver	0.043	J	0.19	0.019	mg/Kg		03/28/24 09:38	03/29/24 07:37	20

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	75.2		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	24.8		0.1	0.1	%			03/26/24 11:00	1

Client Sample Results

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU1_6-9_A

Date Collected: 03/05/24 16:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-6

Matrix: Solid
Percent Solids: 75.2

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.15		0.021	0.0063	mg/Kg	☼	03/25/24 10:07	03/26/24 14:43	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU1_0-3_B

Date Collected: 03/05/24 16:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-7

Matrix: Solid

Method: SW846 6010D - Metals (ICP) - SPLP West

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	**0.080**		0.030	0.0027	mg/L		05/06/24 15:58	05/01/24 22:49	1

Method: SW846 6010D - TCLP Metals (ICP) - TCLP

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.029	U	0.060	0.0072	mg/L		04/25/24 11:48	04/25/24 20:00	1
Barium	**0.89**		0.020	0.0010	mg/L		04/25/24 11:48	04/25/24 20:00	1
Cadmium	0.0016	U	0.020	0.00090	mg/L		04/25/24 11:48	04/25/24 20:00	1
Chromium	0.0052	U	0.025	0.0027	mg/L		04/25/24 11:48	04/25/24 20:00	1
Lead	**0.60**		0.030	0.0027	mg/L		04/25/24 11:48	04/25/24 20:00	1
Selenium	0.035	U	0.10	0.0087	mg/L		04/25/24 11:48	04/25/24 20:00	1
Silver	0.034	U	0.050	0.0085	mg/L		04/25/24 11:48	04/25/24 20:00	1

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**28**		0.49	0.098	mg/Kg		03/28/24 09:38	03/29/24 07:40	20
Barium	**250**		0.98	0.22	mg/Kg		03/28/24 09:38	03/29/24 07:40	20
Cadmium	**0.42**	**J**	0.78	0.075	mg/Kg		03/28/24 09:38	03/29/24 07:40	20
Chromium	**190**		0.98	0.061	mg/Kg		03/28/24 09:38	03/29/24 07:40	20
Lead	**1200**		0.49	0.047	mg/Kg		03/28/24 09:38	03/29/24 07:40	20
Selenium	**7.5**		1.5	0.28	mg/Kg		03/28/24 09:38	03/29/24 07:40	20
Silver	**0.054**	**J**	0.20	0.020	mg/Kg		03/28/24 09:38	03/29/24 07:40	20

Method: SW846 7470A - TCLP Mercury (CVAA) - TCLP

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.0020	U H	0.0030	0.0015	mg/L		04/25/24 12:11	04/30/24 15:39	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	**83.0**		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	**17.0**		0.1	0.1	%			03/26/24 11:00	1

Client Sample Results

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU1_0-3_B

Date Collected: 03/05/24 16:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-7

Matrix: Solid
Percent Solids: 83.0

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.13		0.021	0.0062	mg/Kg	☼	03/25/24 10:07	03/26/24 14:45	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU1_3-6_B

Date Collected: 03/05/24 16:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-8

Matrix: Solid

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	23		0.49	0.099	mg/Kg		03/28/24 09:38	03/29/24 07:42	20
Barium	300		0.99	0.23	mg/Kg		03/28/24 09:38	03/29/24 07:42	20
Cadmium	0.37	J	0.79	0.076	mg/Kg		03/28/24 09:38	03/29/24 07:42	20
Chromium	190		0.99	0.062	mg/Kg		03/28/24 09:38	03/29/24 07:42	20
Lead	960		0.49	0.047	mg/Kg		03/28/24 09:38	03/29/24 07:42	20
Selenium	8.6		1.5	0.28	mg/Kg		03/28/24 09:38	03/29/24 07:42	20
Silver	0.047	J	0.20	0.020	mg/Kg		03/28/24 09:38	03/29/24 07:42	20

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	77.6		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	22.4		0.1	0.1	%			03/26/24 11:00	1

Client Sample Results

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU1_3-6_B
Date Collected: 03/05/24 16:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-8
Matrix: Solid
Percent Solids: 77.6

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.16		0.020	0.0061	mg/Kg	☼	03/25/24 10:07	03/26/24 14:48	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU1_6-9_B

Date Collected: 03/05/24 16:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-9

Matrix: Solid

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	17		0.47	0.095	mg/Kg		03/28/24 09:38	03/29/24 07:45	20
Barium	330		0.95	0.22	mg/Kg		03/28/24 09:38	03/29/24 07:45	20
Cadmium	0.37	J	0.76	0.073	mg/Kg		03/28/24 09:38	03/29/24 07:45	20
Chromium	200		0.95	0.060	mg/Kg		03/28/24 09:38	03/29/24 07:45	20
Lead	620		0.47	0.046	mg/Kg		03/28/24 09:38	03/29/24 07:45	20
Selenium	9.7		1.4	0.27	mg/Kg		03/28/24 09:38	03/29/24 07:45	20
Silver	0.049	J	0.19	0.019	mg/Kg		03/28/24 09:38	03/29/24 07:45	20

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	75.8		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	24.2		0.1	0.1	%			03/26/24 11:00	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU1_6-9_B
Date Collected: 03/05/24 16:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-9
Matrix: Solid
Percent Solids: 75.8

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.16		0.023	0.0068	mg/Kg	☼	03/25/24 10:07	03/26/24 14:50	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU1_0-3_C

Date Collected: 03/05/24 16:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-10

Matrix: Solid

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	22		0.46	0.091	mg/Kg		03/28/24 09:38	03/29/24 07:48	20
Barium	280		0.91	0.21	mg/Kg		03/28/24 09:38	03/29/24 07:48	20
Cadmium	0.38	J	0.73	0.070	mg/Kg		03/28/24 09:38	03/29/24 07:48	20
Chromium	200		0.91	0.058	mg/Kg		03/28/24 09:38	03/29/24 07:48	20
Lead	1100		0.46	0.044	mg/Kg		03/28/24 09:38	03/29/24 07:48	20
Selenium	7.4		1.4	0.26	mg/Kg		03/28/24 09:38	03/29/24 07:48	20
Silver	0.058	J	0.18	0.018	mg/Kg		03/28/24 09:38	03/29/24 07:48	20

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	80.0		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	20.0		0.1	0.1	%			03/26/24 11:00	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU1_0-3_C
Date Collected: 03/05/24 16:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-10
Matrix: Solid
Percent Solids: 80.0

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.15		0.022	0.0065	mg/Kg	☼	03/25/24 10:07	03/26/24 14:52	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU1_3-6_C

Date Collected: 03/05/24 16:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-11

Matrix: Solid

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	22		0.48	0.095	mg/Kg		03/28/24 09:38	03/29/24 07:08	20
Barium	290		0.95	0.22	mg/Kg		03/28/24 09:38	03/29/24 07:08	20
Cadmium	0.37	J	0.76	0.073	mg/Kg		03/28/24 09:38	03/29/24 07:08	20
Chromium	190		0.95	0.060	mg/Kg		03/28/24 09:38	03/29/24 07:08	20
Lead	850		0.48	0.046	mg/Kg		03/28/24 09:38	03/29/24 07:08	20
Selenium	8.5		1.4	0.27	mg/Kg		03/28/24 09:38	03/29/24 07:08	20
Silver	0.055	J	0.19	0.019	mg/Kg		03/28/24 09:38	03/29/24 07:08	20

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	77.6		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	22.4		0.1	0.1	%			03/26/24 11:00	1

Client Sample Results

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU1_3-6_C
Date Collected: 03/05/24 16:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-11
Matrix: Solid
Percent Solids: 77.6

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.13		0.021	0.0064	mg/Kg	☼	03/25/24 10:07	03/26/24 14:55	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU1_6-9_C

Date Collected: 03/05/24 16:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-12

Matrix: Solid

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	18		0.47	0.094	mg/Kg		03/28/24 13:37	03/30/24 01:09	20
Barium	250		0.94	0.22	mg/Kg		03/28/24 13:37	03/30/24 01:09	20
Cadmium	0.32	J	0.75	0.073	mg/Kg		03/28/24 13:37	03/30/24 01:09	20
Chromium	170		0.94	0.059	mg/Kg		03/28/24 13:37	03/30/24 01:09	20
Lead	470		0.47	0.045	mg/Kg		03/28/24 13:37	03/30/24 01:09	20
Selenium	8.5		1.4	0.27	mg/Kg		03/28/24 13:37	03/30/24 01:09	20
Silver	0.041	J	0.19	0.019	mg/Kg		03/28/24 13:37	03/30/24 01:09	20

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	73.7		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	26.3		0.1	0.1	%			03/26/24 11:00	1

Client Sample Results

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU1_6-9_C

Date Collected: 03/05/24 16:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-12

Matrix: Solid
Percent Solids: 73.7

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.12		0.022	0.0067	mg/Kg	☼	03/25/24 10:07	03/26/24 14:57	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU3_0-3

Date Collected: 03/06/24 12:30
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-13

Matrix: Solid

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	13		0.46	0.092	mg/Kg		03/28/24 13:37	03/30/24 00:46	20
Barium	130	J1	0.92	0.21	mg/Kg		03/28/24 13:37	03/30/24 00:46	20
Cadmium	0.30	J	0.74	0.071	mg/Kg		03/28/24 13:37	03/30/24 00:46	20
Chromium	130	J1	0.92	0.058	mg/Kg		03/28/24 13:37	03/30/24 00:46	20
Lead	1200	J1	0.46	0.044	mg/Kg		03/28/24 13:37	03/30/24 00:46	20
Selenium	6.6		1.4	0.26	mg/Kg		03/28/24 13:37	03/30/24 00:46	20
Silver	0.047	J	0.18	0.018	mg/Kg		03/28/24 13:37	03/30/24 00:46	20

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	69.3		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	30.7		0.1	0.1	%			03/26/24 11:00	1

Client Sample Results

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU3_0-3
Date Collected: 03/06/24 12:30
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-13
Matrix: Solid
Percent Solids: 69.3

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.15		0.024	0.0073	mg/Kg	☼	03/25/24 10:07	03/26/24 14:59	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU3_3-6

Date Collected: 03/06/24 12:30
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-14

Matrix: Solid

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	15		0.47	0.095	mg/Kg		03/28/24 13:37	03/30/24 02:33	20
Barium	140		0.95	0.22	mg/Kg		03/28/24 13:37	03/30/24 02:33	20
Cadmium	0.33	J	0.76	0.073	mg/Kg		03/28/24 13:37	03/30/24 02:33	20
Chromium	140		0.95	0.060	mg/Kg		03/28/24 13:37	03/30/24 02:33	20
Lead	1200		0.47	0.045	mg/Kg		03/28/24 13:37	03/30/24 02:33	20
Selenium	6.8		1.4	0.27	mg/Kg		03/28/24 13:37	03/30/24 02:33	20
Silver	0.048	J	0.19	0.019	mg/Kg		03/28/24 13:37	03/30/24 02:33	20

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	70.7		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	29.3		0.1	0.1	%			03/26/24 11:00	1

Client Sample Results

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU3_3-6

Date Collected: 03/06/24 12:30
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-14

Matrix: Solid
Percent Solids: 70.7

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.16		0.022	0.0067	mg/Kg	☼	03/25/24 10:07	03/26/24 15:02	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU3_6-9

Date Collected: 03/06/24 12:30
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-15

Matrix: Solid

Method: SW846 6010D - Metals (ICP) - SPLP West

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	**0.41**		0.030	0.0027	mg/L		05/06/24 15:58	05/01/24 22:53	1

Method: SW846 6010D - TCLP Metals (ICP) - TCLP

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.029	U	0.060	0.0072	mg/L		04/25/24 11:48	04/25/24 20:03	1
Barium	**1.0**		0.020	0.0010	mg/L		04/25/24 11:48	04/25/24 20:03	1
Cadmium	0.0016	U	0.020	0.00090	mg/L		04/25/24 11:48	04/25/24 20:03	1
Chromium	0.0052	U	0.025	0.0027	mg/L		04/25/24 11:48	04/25/24 20:03	1
Lead	**1.1**		0.030	0.0027	mg/L		04/25/24 11:48	04/25/24 20:03	1
Selenium	0.035	U	0.10	0.0087	mg/L		04/25/24 11:48	04/25/24 20:03	1
Silver	0.034	U	0.050	0.0085	mg/L		04/25/24 11:48	04/25/24 20:03	1

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**14**		0.48	0.096	mg/Kg		03/28/24 13:37	03/30/24 02:30	20
Barium	**140**		0.96	0.22	mg/Kg		03/28/24 13:37	03/30/24 02:30	20
Cadmium	**0.28**	**J**	0.77	0.074	mg/Kg		03/28/24 13:37	03/30/24 02:30	20
Chromium	**130**		0.96	0.060	mg/Kg		03/28/24 13:37	03/30/24 02:30	20
Lead	**1500**		0.48	0.046	mg/Kg		03/28/24 13:37	03/30/24 02:30	20
Selenium	**7.3**		1.4	0.27	mg/Kg		03/28/24 13:37	03/30/24 02:30	20
Silver	**0.053**	**J**	0.19	0.019	mg/Kg		03/28/24 13:37	03/30/24 02:30	20

Method: SW846 7470A - TCLP Mercury (CVAA) - TCLP

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.0020	U H	0.0030	0.0015	mg/L		04/25/24 12:11	04/30/24 15:42	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	**72.9**		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	**27.1**		0.1	0.1	%			03/26/24 11:00	1

Client Sample Results

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU3_6-9
Date Collected: 03/06/24 12:30
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-15
Matrix: Solid
Percent Solids: 72.9

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.16		0.022	0.0067	mg/Kg	☼	03/25/24 10:07	03/26/24 15:04	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU2_0-3

Date Collected: 03/06/24 15:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-16

Matrix: Solid

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	14		0.47	0.095	mg/Kg		03/28/24 13:37	03/30/24 01:34	20
Barium	200		0.95	0.22	mg/Kg		03/28/24 13:37	03/30/24 01:34	20
Cadmium	0.41	J	0.76	0.073	mg/Kg		03/28/24 13:37	03/30/24 01:34	20
Chromium	180		0.95	0.060	mg/Kg		03/28/24 13:37	03/30/24 01:34	20
Lead	1200		0.47	0.045	mg/Kg		03/28/24 13:37	03/30/24 01:34	20
Selenium	8.3		1.4	0.27	mg/Kg		03/28/24 13:37	03/30/24 01:34	20
Silver	0.077	J	0.19	0.019	mg/Kg		03/28/24 13:37	03/30/24 01:34	20

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	75.8		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	24.2		0.1	0.1	%			03/26/24 11:00	1

Client: EnviroQuest, Inc.
Job ID: 580-137730-1
Project/Site: Nanue Bridge

Client Sample ID: NAN_DU2_0-3
Lab Sample ID: 580-137730-16
Date Collected: 03/06/24 15:00
Matrix: Solid
Date Received: 03/14/24 09:30
Percent Solids: 75.8

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.15		0.022	0.0067	mg/Kg	☼	03/25/24 10:07	03/26/24 15:11	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU2_3-6

Date Collected: 03/06/24 15:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-17

Matrix: Solid

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	12		0.48	0.095	mg/Kg		03/28/24 13:37	03/30/24 01:48	20
Barium	190		0.95	0.22	mg/Kg		03/28/24 13:37	03/30/24 01:48	20
Cadmium	0.37	J	0.76	0.073	mg/Kg		03/28/24 13:37	03/30/24 01:48	20
Chromium	170		0.95	0.060	mg/Kg		03/28/24 13:37	03/30/24 01:48	20
Lead	1000		0.48	0.046	mg/Kg		03/28/24 13:37	03/30/24 01:48	20
Selenium	7.8		1.4	0.27	mg/Kg		03/28/24 13:37	03/30/24 01:48	20
Silver	0.060	J	0.19	0.019	mg/Kg		03/28/24 13:37	03/30/24 01:48	20

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	77.2		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	22.8		0.1	0.1	%			03/26/24 11:00	1

Client Sample Results

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU2_3-6

Date Collected: 03/06/24 15:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-17

Matrix: Solid
Percent Solids: 77.2

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.15		0.021	0.0063	mg/Kg	☼	03/25/24 10:07	03/26/24 15:14	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU2_6-9

Date Collected: 03/06/24 15:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-18

Matrix: Solid

Method: SW846 6010D - TCLP Metals (ICP) - TCLP

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.029	U	0.060	0.0072	mg/L		04/25/24 11:48	04/25/24 20:07	1
Barium	**0.98**		0.020	0.0010	mg/L		04/25/24 11:48	04/25/24 20:07	1
Cadmium	0.0016	U	0.020	0.00090	mg/L		04/25/24 11:48	04/25/24 20:07	1
Chromium	0.0052	U	0.025	0.0027	mg/L		04/25/24 11:48	04/25/24 20:07	1
Lead	**0.69**		0.030	0.0027	mg/L		04/25/24 11:48	04/25/24 20:07	1
Selenium	0.035	U	0.10	0.0087	mg/L		04/25/24 11:48	04/25/24 20:07	1
Silver	0.034	U	0.050	0.0085	mg/L		04/25/24 11:48	04/25/24 20:07	1

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**14**		0.47	0.095	mg/Kg		03/28/24 13:37	03/30/24 02:22	20
Barium	**210**		0.95	0.22	mg/Kg		03/28/24 13:37	03/30/24 02:22	20
Cadmium	**0.40**	**J**	0.76	0.073	mg/Kg		03/28/24 13:37	03/30/24 02:22	20
Chromium	**190**		0.95	0.060	mg/Kg		03/28/24 13:37	03/30/24 02:22	20
Lead	**1400**		0.47	0.046	mg/Kg		03/28/24 13:37	03/30/24 02:22	20
Selenium	**9.2**		1.4	0.27	mg/Kg		03/28/24 13:37	03/30/24 02:22	20
Silver	**0.054**	**J**	0.19	0.019	mg/Kg		03/28/24 13:37	03/30/24 02:22	20

Method: SW846 7470A - TCLP Mercury (CVAA) - TCLP

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.0020	U H	0.0030	0.0015	mg/L		04/25/24 12:11	04/30/24 15:45	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	**77.3**		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	**22.7**		0.1	0.1	%			03/26/24 11:00	1

Client Sample Results

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU2_6-9
Date Collected: 03/06/24 15:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-18
Matrix: Solid
Percent Solids: 77.3

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.18		0.020	0.0060	mg/Kg	☼	03/25/24 10:07	03/26/24 15:16	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU9_0-3

Date Collected: 03/09/24 12:30
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-19

Matrix: Solid

Method: SW846 6010D - TCLP Metals (ICP) - TCLP

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.029	U	0.060	0.0072	mg/L		04/25/24 11:48	04/25/24 20:10	1
Barium	**0.64**		0.020	0.0010	mg/L		04/25/24 11:48	04/25/24 20:10	1
Cadmium	**0.0015**	**J**	0.020	0.00090	mg/L		04/25/24 11:48	04/25/24 20:10	1
Chromium	**0.0034**	**J**	0.025	0.0027	mg/L		04/25/24 11:48	04/25/24 20:10	1
Lead	**2.8**		0.030	0.0027	mg/L		04/25/24 11:48	04/25/24 20:10	1
Selenium	0.035	U	0.10	0.0087	mg/L		04/25/24 11:48	04/25/24 20:10	1
Silver	0.034	U	0.050	0.0085	mg/L		04/25/24 11:48	04/25/24 20:10	1

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**24**		0.48	0.096	mg/Kg		03/28/24 13:37	03/30/24 02:28	20
Barium	**100**		0.96	0.22	mg/Kg		03/28/24 13:37	03/30/24 02:28	20
Cadmium	**0.67**	**J**	0.77	0.074	mg/Kg		03/28/24 13:37	03/30/24 02:28	20
Chromium	**160**		0.96	0.060	mg/Kg		03/28/24 13:37	03/30/24 02:28	20
Lead	**6400**		48	4.6	mg/Kg		03/28/24 13:37	04/01/24 18:07	2000
Selenium	**4.9**		1.4	0.27	mg/Kg		03/28/24 13:37	03/30/24 02:28	20
Silver	**0.085**	**J**	0.19	0.019	mg/Kg		03/28/24 13:37	03/30/24 02:28	20

Method: SW846 7470A - TCLP Mercury (CVAA) - TCLP

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.0020	U H	0.0030	0.0015	mg/L		04/25/24 12:11	04/30/24 15:47	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	**70.3**		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	**29.7**		0.1	0.1	%			03/26/24 11:00	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU9_0-3
Date Collected: 03/09/24 12:30
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-19
Matrix: Solid
Percent Solids: 70.3

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.28		0.024	0.0071	mg/Kg	☼	03/25/24 10:09	03/26/24 15:19	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU9_3-6

Date Collected: 03/09/24 12:30
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-20

Matrix: Solid

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	25		0.48	0.096	mg/Kg		03/28/24 13:37	03/30/24 02:25	20
Barium	110		0.96	0.22	mg/Kg		03/28/24 13:37	03/30/24 02:25	20
Cadmium	0.67	J	0.77	0.074	mg/Kg		03/28/24 13:37	03/30/24 02:25	20
Chromium	190		0.96	0.060	mg/Kg		03/28/24 13:37	03/30/24 02:25	20
Lead	6200		48	4.6	mg/Kg		03/28/24 13:37	04/01/24 18:04	2000
Selenium	5.1		1.4	0.27	mg/Kg		03/28/24 13:37	03/30/24 02:25	20
Silver	0.089	J	0.19	0.019	mg/Kg		03/28/24 13:37	03/30/24 02:25	20

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	61.5		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	38.5		0.1	0.1	%			03/26/24 11:00	1

Client Sample Results

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU9_3-6
Date Collected: 03/09/24 12:30
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-20
Matrix: Solid
Percent Solids: 61.5

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.26		0.027	0.0082	mg/Kg	☼	03/25/24 10:09	03/26/24 15:21	1

Client Sample Results

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU9_6-9

Date Collected: 03/09/24 12:30
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-21

Matrix: Solid

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	24		0.48	0.095	mg/Kg		04/01/24 12:29	04/05/24 04:50	20
Barium	110		0.95	0.22	mg/Kg		04/01/24 12:29	04/05/24 04:50	20
Cadmium	0.59	J	0.76	0.073	mg/Kg		04/01/24 12:29	04/05/24 04:50	20
Chromium	180		0.95	0.060	mg/Kg		04/01/24 12:29	04/05/24 04:50	20
Lead	6000		48	4.6	mg/Kg		04/01/24 12:29	04/05/24 04:52	2000
Selenium	6.7		1.4	0.27	mg/Kg		04/01/24 12:29	04/05/24 04:50	20
Silver	0.095	J	0.19	0.019	mg/Kg		04/01/24 12:29	04/05/24 04:50	20

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	64.5		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	35.5		0.1	0.1	%			03/26/24 11:00	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU9_6-9
Date Collected: 03/09/24 12:30
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-21
Matrix: Solid
Percent Solids: 64.5

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.26		0.026	0.0079	mg/Kg	☼	04/02/24 13:03	04/02/24 16:10	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU10_0-3

Date Collected: 03/09/24 14:30
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-22

Matrix: Solid

Method: SW846 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
PCB-1016	0.017	U M	0.019	0.0070	mg/Kg		03/20/24 15:22	04/01/24 14:54	1
PCB-1221	0.017	U	0.019	0.011	mg/Kg		03/20/24 15:22	04/01/24 14:54	1
PCB-1232	0.017	U	0.019	0.0046	mg/Kg		03/20/24 15:22	04/01/24 14:54	1
PCB-1242	0.017	U M	0.019	0.0075	mg/Kg		03/20/24 15:22	04/01/24 14:54	1
PCB-1248	0.017	U M	0.019	0.0066	mg/Kg		03/20/24 15:22	04/01/24 14:54	1
PCB-1254	**0.055**	**M**	0.019	0.0085	mg/Kg		03/20/24 15:22	04/01/24 14:54	1
PCB-1260	0.017	U J1 M	0.019	0.0070	mg/Kg		03/20/24 15:22	04/01/24 14:54	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene	*89*		*44 - 130*	*03/20/24 15:22*	*04/01/24 14:54*	*1*
DCB Decachlorobiphenyl	*96*	*M*	*40 - 135*	*03/20/24 15:22*	*04/01/24 14:54*	*1*

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**9.6**		0.46	0.092	mg/Kg		04/01/24 12:29	04/04/24 17:39	20
Barium	**120**	**J1**	0.92	0.21	mg/Kg		04/01/24 12:29	04/04/24 17:39	20
Cadmium	**0.35**	**J**	0.74	0.071	mg/Kg		04/01/24 12:29	04/04/24 17:39	20
Chromium	**150**	**J1**	0.92	0.058	mg/Kg		04/01/24 12:29	04/04/24 17:39	20
Lead	**8500**	**J1**	46	4.4	mg/Kg		04/01/24 12:29	04/04/24 18:01	2000
Selenium	**5.8**		1.4	0.26	mg/Kg		04/01/24 12:29	04/04/24 17:39	20
Silver	**0.088**	**J**	0.18	0.018	mg/Kg		04/01/24 12:29	04/04/24 17:39	20

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	**71.0**		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	**29.0**		0.1	0.1	%			03/26/24 11:00	1

Client Sample Results

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU10_0-3
Date Collected: 03/09/24 14:30
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-22
Matrix: Solid
Percent Solids: 71.0

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.12		0.023	0.0070	mg/Kg	☼	04/02/24 13:03	04/02/24 16:13	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU10_3-6

Date Collected: 03/09/24 14:30
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-23

Matrix: Solid

Method: SW846 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
PCB-1016	0.017	U	0.019	0.0070	mg/Kg		03/20/24 15:22	04/01/24 15:47	1
PCB-1221	0.017	U	0.019	0.011	mg/Kg		03/20/24 15:22	04/01/24 15:47	1
PCB-1232	0.017	U	0.019	0.0046	mg/Kg		03/20/24 15:22	04/01/24 15:47	1
PCB-1242	0.017	U	0.019	0.0076	mg/Kg		03/20/24 15:22	04/01/24 15:47	1
PCB-1248	0.017	U	0.019	0.0066	mg/Kg		03/20/24 15:22	04/01/24 15:47	1
PCB-1254	**0.037**	**J1 M**	0.019	0.0085	mg/Kg		03/20/24 15:22	04/01/24 15:47	1
PCB-1260	0.017	U M	0.019	0.0070	mg/Kg		03/20/24 15:22	04/01/24 15:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene	*92*		*44 - 130*	*03/20/24 15:22*	*04/01/24 15:47*	*1*
DCB Decachlorobiphenyl	*98*	*M*	*40 - 135*	*03/20/24 15:22*	*04/01/24 15:47*	*1*

Method: SW846 6010D - Metals (ICP) - SPLP West

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	**8.0**		0.030	0.0027	mg/L		05/06/24 15:58	05/01/24 22:56	1

Method: SW846 6010D - TCLP Metals (ICP) - TCLP

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.029	U	0.060	0.0072	mg/L		04/25/24 11:48	04/25/24 20:14	1
Barium	**1.1**		0.020	0.0010	mg/L		04/25/24 11:48	04/25/24 20:14	1
Cadmium	**0.0018**	**J**	0.020	0.00090	mg/L		04/25/24 11:48	04/25/24 20:14	1
Chromium	0.0052	U	0.025	0.0027	mg/L		04/25/24 11:48	04/25/24 20:14	1
Lead	**17**		0.030	0.0027	mg/L		04/25/24 11:48	04/25/24 20:14	1
Selenium	0.035	U	0.10	0.0087	mg/L		04/25/24 11:48	04/25/24 20:14	1
Silver	0.034	U	0.050	0.0085	mg/L		04/25/24 11:48	04/25/24 20:14	1

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**8.7**		0.47	0.095	mg/Kg		04/01/24 12:29	04/05/24 05:01	20
Barium	**130**		0.95	0.22	mg/Kg		04/01/24 12:29	04/05/24 05:01	20
Cadmium	**0.39**	**J**	0.76	0.073	mg/Kg		04/01/24 12:29	04/05/24 05:01	20
Chromium	**160**		0.95	0.060	mg/Kg		04/01/24 12:29	04/05/24 05:01	20
Lead	**9700**		47	4.5	mg/Kg		04/01/24 12:29	04/05/24 05:04	2000
Selenium	**6.9**		1.4	0.27	mg/Kg		04/01/24 12:29	04/05/24 05:01	20
Silver	**0.10**	**J**	0.19	0.019	mg/Kg		04/01/24 12:29	04/05/24 05:01	20

Method: SW846 7470A - TCLP Mercury (CVAA) - TCLP

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.0020	U H	0.0030	0.0015	mg/L		04/25/24 12:11	04/30/24 15:50	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	**70.8**		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	**29.2**		0.1	0.1	%			03/26/24 11:00	1

Client Sample Results

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU10_3-6
Date Collected: 03/09/24 14:30
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-23
Matrix: Solid
Percent Solids: 70.8

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.16		0.024	0.0071	mg/Kg	☼	04/02/24 13:03	04/02/24 15:45	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU10_6-9

Date Collected: 03/09/24 14:30
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-24

Matrix: Solid

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	7.9		0.47	0.094	mg/Kg		04/01/24 12:29	04/04/24 17:52	20
Barium	160		0.94	0.22	mg/Kg		04/01/24 12:29	04/04/24 17:52	20
Cadmium	0.35	J	0.76	0.073	mg/Kg		04/01/24 12:29	04/04/24 17:52	20
Chromium	170		0.94	0.060	mg/Kg		04/01/24 12:29	04/04/24 17:52	20
Lead	8100		47	4.5	mg/Kg		04/01/24 12:29	04/04/24 18:14	2000
Selenium	7.8		1.4	0.27	mg/Kg		04/01/24 12:29	04/04/24 17:52	20
Silver	0.078	J	0.19	0.019	mg/Kg		04/01/24 12:29	04/04/24 17:52	20

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	68.6		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	31.4		0.1	0.1	%			03/26/24 11:00	1

Client Sample Results

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU10_6-9
Date Collected: 03/09/24 14:30
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-24
Matrix: Solid
Percent Solids: 68.6

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.13		0.024	0.0072	mg/Kg	☼	04/02/24 13:03	04/02/24 15:54	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU11_0-3

Date Collected: 03/10/24 12:20
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-25

Matrix: Solid

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	11		0.47	0.095	mg/Kg		04/01/24 12:29	04/05/24 05:47	20
Barium	110		0.95	0.22	mg/Kg		04/01/24 12:29	04/05/24 05:47	20
Cadmium	0.37	J	0.76	0.073	mg/Kg		04/01/24 12:29	04/05/24 05:47	20
Chromium	130		0.95	0.060	mg/Kg		04/01/24 12:29	04/05/24 05:47	20
Lead	4300		47	4.5	mg/Kg		04/01/24 12:29	04/05/24 05:50	2000
Selenium	4.8		1.4	0.27	mg/Kg		04/01/24 12:29	04/05/24 05:47	20
Silver	0.081	J	0.19	0.019	mg/Kg		04/01/24 12:29	04/05/24 05:47	20

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	62.7		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	37.3		0.1	0.1	%			03/26/24 11:00	1

Client Sample Results

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU11_0-3
Date Collected: 03/10/24 12:20
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-25
Matrix: Solid
Percent Solids: 62.7

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.10		0.025	0.0076	mg/Kg	☼	04/02/24 13:03	04/02/24 15:36	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU11_3-6

Date Collected: 03/10/24 12:20
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-26

Matrix: Solid

Method: SW846 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
PCB-1016	0.017	U M	0.019	0.0070	mg/Kg		03/20/24 15:22	04/01/24 16:04	1
PCB-1221	0.017	U	0.019	0.011	mg/Kg		03/20/24 15:22	04/01/24 16:04	1
PCB-1232	0.017	U	0.019	0.0047	mg/Kg		03/20/24 15:22	04/01/24 16:04	1
PCB-1242	0.017	U M	0.019	0.0076	mg/Kg		03/20/24 15:22	04/01/24 16:04	1
PCB-1248	0.017	U M	0.019	0.0067	mg/Kg		03/20/24 15:22	04/01/24 16:04	1
PCB-1254	**0.20**	**M**	0.019	0.0086	mg/Kg		03/20/24 15:22	04/01/24 16:04	1
PCB-1260	0.017	U M	0.019	0.0070	mg/Kg		03/20/24 15:22	04/01/24 16:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene	*85*		*44 - 130*	*03/20/24 15:22*	*04/01/24 16:04*	*1*
DCB Decachlorobiphenyl	*89*	*M*	*40 - 135*	*03/20/24 15:22*	*04/01/24 16:04*	*1*

Method: SW846 6010D - Metals (ICP) - SPLP West

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	**3.5**		0.030	0.0027	mg/L		05/06/24 15:58	05/01/24 22:59	1

Method: SW846 6010D - TCLP Metals (ICP) - TCLP

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.029	U	0.060	0.0072	mg/L		04/25/24 11:48	04/25/24 20:17	1
Barium	**0.92**		0.020	0.0010	mg/L		04/25/24 11:48	04/25/24 20:17	1
Cadmium	**0.0021**	**J**	0.020	0.00090	mg/L		04/25/24 11:48	04/25/24 20:17	1
Chromium	0.0052	U	0.025	0.0027	mg/L		04/25/24 11:48	04/25/24 20:17	1
Lead	**12**		0.030	0.0027	mg/L		04/25/24 11:48	04/25/24 20:17	1
Selenium	0.035	U	0.10	0.0087	mg/L		04/25/24 11:48	04/25/24 20:17	1
Silver	0.034	U	0.050	0.0085	mg/L		04/25/24 11:48	04/25/24 20:17	1

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**10**		0.48	0.095	mg/Kg		04/01/24 12:29	04/05/24 04:44	20
Barium	**100**		0.95	0.22	mg/Kg		04/01/24 12:29	04/05/24 04:44	20
Cadmium	**0.40**	**J**	0.76	0.073	mg/Kg		04/01/24 12:29	04/05/24 04:44	20
Chromium	**150**		0.95	0.060	mg/Kg		04/01/24 12:29	04/05/24 04:44	20
Lead	**6400**		48	4.6	mg/Kg		04/01/24 12:29	04/05/24 04:47	2000
Selenium	**6.2**		1.4	0.27	mg/Kg		04/01/24 12:29	04/05/24 04:44	20
Silver	**0.086**	**J**	0.19	0.019	mg/Kg		04/01/24 12:29	04/05/24 04:44	20

Method: SW846 7470A - TCLP Mercury (CVAA) - TCLP

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.0020	U H	0.0030	0.0015	mg/L		04/25/24 12:11	04/30/24 15:59	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	**65.0**		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	**35.0**		0.1	0.1	%			03/26/24 11:00	1

Client Sample Results

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU11_3-6
Date Collected: 03/10/24 12:20
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-26
Matrix: Solid
Percent Solids: 65.0

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.12		0.027	0.0081	mg/Kg	☼	04/02/24 13:03	04/02/24 15:56	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU11_6-9

Date Collected: 03/10/24 12:20
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-27

Matrix: Solid

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	8.7		0.46	0.092	mg/Kg		04/01/24 12:29	04/05/24 05:41	20
Barium	110		0.92	0.21	mg/Kg		04/01/24 12:29	04/05/24 05:41	20
Cadmium	0.39	J	0.74	0.071	mg/Kg		04/01/24 12:29	04/05/24 05:41	20
Chromium	150		0.92	0.058	mg/Kg		04/01/24 12:29	04/05/24 05:41	20
Lead	6000		46	4.4	mg/Kg		04/01/24 12:29	04/05/24 05:44	2000
Selenium	6.3		1.4	0.26	mg/Kg		04/01/24 12:29	04/05/24 05:41	20
Silver	0.083	J	0.18	0.018	mg/Kg		04/01/24 12:29	04/05/24 05:41	20

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	66.2		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	33.8		0.1	0.1	%			03/26/24 11:00	1

Client Sample Results

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU11_6-9
Date Collected: 03/10/24 12:20
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-27
Matrix: Solid
Percent Solids: 66.2

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.16		0.025	0.0075	mg/Kg	☼	04/02/24 13:03	04/02/24 15:59	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU12_0-3

Date Collected: 03/10/24 13:10
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-28

Matrix: Solid

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	16		0.46	0.092	mg/Kg		04/01/24 12:29	04/05/24 04:55	20
Barium	79		0.92	0.21	mg/Kg		04/01/24 12:29	04/05/24 04:55	20
Cadmium	0.41	J	0.74	0.071	mg/Kg		04/01/24 12:29	04/05/24 04:55	20
Chromium	130		0.92	0.058	mg/Kg		04/01/24 12:29	04/05/24 04:55	20
Lead	6300		46	4.4	mg/Kg		04/01/24 12:29	04/05/24 04:58	2000
Selenium	2.8		1.4	0.26	mg/Kg		04/01/24 12:29	04/05/24 04:55	20
Silver	0.088	J	0.18	0.018	mg/Kg		04/01/24 12:29	04/05/24 04:55	20

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	68.0		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	32.0		0.1	0.1	%			03/26/24 11:00	1

Client Sample Results

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU12_0-3
Date Collected: 03/10/24 13:10
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-28
Matrix: Solid
Percent Solids: 68.0

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.086		0.023	0.0069	mg/Kg	☼	04/02/24 13:03	04/02/24 16:02	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU12_3-6

Date Collected: 03/10/24 13:10
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-29

Matrix: Solid

Method: SW846 6010D - Metals (ICP) - SPLP West

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	**5.0**		0.030	0.0027	mg/L		05/06/24 15:58	05/01/24 23:03	1

Method: SW846 6010D - TCLP Metals (ICP) - TCLP

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.029	U	0.060	0.0072	mg/L		04/25/24 11:48	04/25/24 20:21	1
Barium	**0.86**		0.020	0.0010	mg/L		04/25/24 11:48	04/25/24 20:21	1
Cadmium	**0.0026**	**J**	0.020	0.00090	mg/L		04/25/24 11:48	04/25/24 20:21	1
Chromium	0.0052	U	0.025	0.0027	mg/L		04/25/24 11:48	04/25/24 20:21	1
Lead	**23**		0.030	0.0027	mg/L		04/25/24 11:48	04/25/24 20:21	1
Selenium	0.035	U	0.10	0.0087	mg/L		04/25/24 11:48	04/25/24 20:21	1
Silver	0.034	U	0.050	0.0085	mg/L		04/25/24 11:48	04/25/24 20:21	1

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**11**		0.46	0.092	mg/Kg		04/01/24 12:29	04/05/24 05:35	20
Barium	**50**		0.92	0.21	mg/Kg		04/01/24 12:29	04/05/24 05:35	20
Cadmium	**0.29**	**J**	0.74	0.071	mg/Kg		04/01/24 12:29	04/05/24 05:35	20
Chromium	**87**		0.92	0.058	mg/Kg		04/01/24 12:29	04/05/24 05:35	20
Lead	**7900**		46	4.4	mg/Kg		04/01/24 12:29	04/05/24 05:38	2000
Selenium	**3.4**		1.4	0.26	mg/Kg		04/01/24 12:29	04/05/24 05:35	20
Silver	**0.086**	**J**	0.18	0.018	mg/Kg		04/01/24 12:29	04/05/24 05:35	20

Method: SW846 7470A - TCLP Mercury (CVAA) - TCLP

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.0020	U H	0.0030	0.0015	mg/L		04/25/24 12:11	04/30/24 16:02	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	**75.6**		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	**24.4**		0.1	0.1	%			03/26/24 11:00	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU12_3-6
Date Collected: 03/10/24 13:10
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-29
Matrix: Solid
Percent Solids: 75.6

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.12		0.022	0.0065	mg/Kg	☼	04/02/24 13:03	04/02/24 16:05	1

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU12_6-9

Date Collected: 03/10/24 13:10
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-30

Matrix: Solid

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	10		0.47	0.094	mg/Kg		04/01/24 12:29	04/05/24 05:52	20
Barium	69		0.94	0.21	mg/Kg		04/01/24 12:29	04/05/24 05:52	20
Cadmium	0.30	J	0.75	0.073	mg/Kg		04/01/24 12:29	04/05/24 05:52	20
Chromium	90		0.94	0.059	mg/Kg		04/01/24 12:29	04/05/24 05:52	20
Lead	6500		47	4.5	mg/Kg		04/01/24 12:29	04/05/24 05:55	2000
Selenium	3.6		1.4	0.27	mg/Kg		04/01/24 12:29	04/05/24 05:52	20
Silver	0.068	J	0.19	0.019	mg/Kg		04/01/24 12:29	04/05/24 05:52	20

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	72.9		0.1	0.1	%			03/26/24 11:00	1
Percent Moisture (SM22 2540G)	27.1		0.1	0.1	%			03/26/24 11:00	1

Client Sample Results

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU12_6-9
Date Collected: 03/10/24 13:10
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-30
Matrix: Solid
Percent Solids: 72.9

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.12		0.023	0.0069	mg/Kg	☼	04/02/24 13:03	04/02/24 16:08	1

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Lab Sample ID: MB 580-454340/1-A
Matrix: Solid
Analysis Batch: 455366

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 454340

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
PCB-1016	0.018	U	0.020	0.0074	mg/Kg		03/20/24 15:22	04/01/24 14:01	1
PCB-1221	0.018	U	0.020	0.012	mg/Kg		03/20/24 15:22	04/01/24 14:01	1
PCB-1232	0.018	U	0.020	0.0049	mg/Kg		03/20/24 15:22	04/01/24 14:01	1
PCB-1242	0.018	U	0.020	0.0080	mg/Kg		03/20/24 15:22	04/01/24 14:01	1
PCB-1248	0.018	U	0.020	0.0070	mg/Kg		03/20/24 15:22	04/01/24 14:01	1
PCB-1254	0.018	U	0.020	0.0090	mg/Kg		03/20/24 15:22	04/01/24 14:01	1
PCB-1260	0.018	U	0.020	0.0074	mg/Kg		03/20/24 15:22	04/01/24 14:01	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene	*95*		*44 - 130*	*03/20/24 15:22*	*04/01/24 14:01*	*1*
DCB Decachlorobiphenyl	*85*	*M*	*40 - 135*	*03/20/24 15:22*	*04/01/24 14:01*	*1*

Lab Sample ID: LCS 580-454340/2-A
Matrix: Solid
Analysis Batch: 455366

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 454340

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
PCB-1016			0.100	0.102	M	mg/Kg		102	47 - 134		
PCB-1260			0.100	0.0955	M	mg/Kg		96	53 - 140		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Tetrachloro-m-xylene	*91*	*M*	*44 - 130*
DCB Decachlorobiphenyl	*102*	*M*	*40 - 135*

Lab Sample ID: LCSD 580-454340/3-A
Matrix: Solid
Analysis Batch: 455366

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 454340

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
PCB-1016			0.100	0.101	M	mg/Kg		101	47 - 134	7	30
PCB-1260			0.100	0.105	M	mg/Kg		105	53 - 140	10	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Tetrachloro-m-xylene	*99*		*44 - 130*
DCB Decachlorobiphenyl	*112*		*40 - 135*

Lab Sample ID: 580-137730-22 MS
Matrix: Solid
Analysis Batch: 455366

Client Sample ID: NAN_DU10_0-3
Prep Type: Total/NA
Prep Batch: 454340

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
PCB-1016	0.017	U M	0.0934	0.0948	M	mg/Kg		102	47 - 134		
PCB-1260	0.017	U J1 M	0.0934	0.171	J1 M	mg/Kg		183	53 - 140		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Tetrachloro-m-xylene	*94*		*44 - 130*
DCB Decachlorobiphenyl	*101*	*M*	*40 - 135*

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography (Continued)

Lab Sample ID: 580-137730-22 MSD
Matrix: Solid
Analysis Batch: 455366

Client Sample ID: NAN_DU10_0-3
Prep Type: Total/NA
Prep Batch: 454340

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
PCB-1016	0.017	U M	0.0943	0.0908	M	mg/Kg		96	47 - 134	4	30
PCB-1260	0.017	U J1 M	0.0943	0.162	J1 M	mg/Kg		172	53 - 140	5	30

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
Tetrachloro-m-xylene	*88*		*44 - 130*
DCB Decachlorobiphenyl	*94*	*M*	*40 - 135*

Method: 6010D - Metals (ICP)

Lab Sample ID: MB 580-458590/7-B
Matrix: Solid
Analysis Batch: 458233

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 458592

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	0.011	U	0.030	0.0027	mg/L		05/06/24 15:58	05/01/24 22:12	1

Lab Sample ID: LCS 580-458590/8-B
Matrix: Solid
Analysis Batch: 458233

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 458592

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Lead	1.00	1.00		mg/L		100	86 - 113

Lab Sample ID: LCSD 580-458590/9-B
Matrix: Solid
Analysis Batch: 458233

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 458592

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Lead	1.00	0.998		mg/L		100	86 - 113	1	20

Lab Sample ID: 580-137730-1 MS
Matrix: Solid
Analysis Batch: 458233

Client Sample ID: NAN_DU8_0-3
Prep Type: SPLP West
Prep Batch: 458592

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Lead	0.59		1.00	1.65		mg/L		106	86 - 113

Lab Sample ID: 580-137730-1 MSD
Matrix: Solid
Analysis Batch: 458233

Client Sample ID: NAN_DU8_0-3
Prep Type: SPLP West
Prep Batch: 458592

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Lead	0.59		1.00	1.63		mg/L		104	86 - 113	1	20

Lab Sample ID: 580-137730-1 DU
Matrix: Solid
Analysis Batch: 458233

Client Sample ID: NAN_DU8_0-3
Prep Type: SPLP West
Prep Batch: 458592

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Lead	0.59		0.613		mg/L		4	20

Method: 6010D - TCLP Metals (ICP)

Lab Sample ID: MB 580-457398/15-B
Matrix: Solid
Analysis Batch: 457695

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 457588

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.029	U	0.060	0.0072	mg/L		04/25/24 11:48	04/25/24 18:49	1
Barium	0.00690	J	0.020	0.0010	mg/L		04/25/24 11:48	04/25/24 18:49	1
Cadmium	0.0016	U	0.020	0.00090	mg/L		04/25/24 11:48	04/25/24 18:49	1
Chromium	0.0052	U	0.025	0.0027	mg/L		04/25/24 11:48	04/25/24 18:49	1
Lead	0.011	U	0.030	0.0027	mg/L		04/25/24 11:48	04/25/24 18:49	1
Selenium	0.035	U	0.10	0.0087	mg/L		04/25/24 11:48	04/25/24 18:49	1
Silver	0.034	U	0.050	0.0085	mg/L		04/25/24 11:48	04/25/24 18:49	1

Lab Sample ID: MB 580-457398/16-B
Matrix: Solid
Analysis Batch: 457695

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 457588

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.029	U	0.060	0.0072	mg/L		04/25/24 11:48	04/25/24 18:52	1
Barium	0.00850	J	0.020	0.0010	mg/L		04/25/24 11:48	04/25/24 18:52	1
Cadmium	0.0016	U	0.020	0.00090	mg/L		04/25/24 11:48	04/25/24 18:52	1
Chromium	0.0052	U	0.025	0.0027	mg/L		04/25/24 11:48	04/25/24 18:52	1
Lead	0.011	U	0.030	0.0027	mg/L		04/25/24 11:48	04/25/24 18:52	1
Selenium	0.035	U	0.10	0.0087	mg/L		04/25/24 11:48	04/25/24 18:52	1
Silver	0.034	U	0.050	0.0085	mg/L		04/25/24 11:48	04/25/24 18:52	1

Lab Sample ID: LCS 580-457398/17-B
Matrix: Solid
Analysis Batch: 457695

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 457588

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Arsenic			1.00	1.06		mg/L		106	87 - 113		
Barium			1.00	1.01		mg/L		101	88 - 113		
Cadmium			1.00	1.07		mg/L		107	88 - 113		
Chromium			1.00	1.05		mg/L		105	90 - 113		
Lead			1.00	1.03		mg/L		103	86 - 113		
Selenium			1.00	1.11		mg/L		111	83 - 114		
Silver			1.00	1.00		mg/L		100	84 - 115		

Lab Sample ID: LCSD 580-457398/18-B
Matrix: Solid
Analysis Batch: 457695

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 457588

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Arsenic			1.00	1.04		mg/L		104	87 - 113	2	20
Barium			1.00	0.999		mg/L		100	88 - 113	1	20
Cadmium			1.00	1.05		mg/L		105	88 - 113	1	20
Chromium			1.00	1.03		mg/L		103	90 - 113	2	20
Lead			1.00	1.02		mg/L		102	86 - 113	2	20
Selenium			1.00	1.09		mg/L		109	83 - 114	2	20
Silver			1.00	1.00		mg/L		100	84 - 115	0	20

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 580-455023/23-A
Matrix: Solid
Analysis Batch: 455179

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 455023

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.40	U	0.50	0.10	mg/Kg		03/28/24 09:38	03/29/24 05:58	20
Barium	0.40	U	1.0	0.23	mg/Kg		03/28/24 09:38	03/29/24 05:58	20
Cadmium	0.20	U	0.80	0.077	mg/Kg		03/28/24 09:38	03/29/24 05:58	20
Chromium	0.25	U	1.0	0.063	mg/Kg		03/28/24 09:38	03/29/24 05:58	20
Lead	0.19	U	0.50	0.048	mg/Kg		03/28/24 09:38	03/29/24 05:58	20
Selenium	1.0	U	1.5	0.29	mg/Kg		03/28/24 09:38	03/29/24 05:58	20
Silver	0.050	U	0.20	0.020	mg/Kg		03/28/24 09:38	03/29/24 05:58	20

Lab Sample ID: LCS 580-455023/24-A
Matrix: Solid
Analysis Batch: 455179

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 455023

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	25.0	24.3		mg/Kg		97	82 - 118
Barium	25.0	26.5		mg/Kg		106	86 - 116
Cadmium	25.0	24.7		mg/Kg		99	84 - 116
Chromium	25.0	22.1		mg/Kg		89	83 - 119
Lead	25.0	22.1		mg/Kg		88	84 - 118
Selenium	25.0	24.3		mg/Kg		97	80 - 119
Silver	25.0	24.6		mg/Kg		98	83 - 118

Lab Sample ID: LCSD 580-455023/25-A
Matrix: Solid
Analysis Batch: 455179

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 455023

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Arsenic	25.0	24.4		mg/Kg		97	82 - 118	0	20
Barium	25.0	26.9		mg/Kg		108	86 - 116	1	20
Cadmium	25.0	25.2		mg/Kg		101	84 - 116	2	20
Chromium	25.0	22.3		mg/Kg		89	83 - 119	1	20
Lead	25.0	22.3		mg/Kg		89	84 - 118	1	20
Selenium	25.0	25.2		mg/Kg		101	80 - 119	3	20
Silver	25.0	25.1		mg/Kg		101	83 - 118	2	20

Lab Sample ID: MB 580-455073/23-A
Matrix: Solid
Analysis Batch: 455285

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 455073

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.40	U	0.50	0.10	mg/Kg		03/28/24 13:37	03/30/24 00:43	20
Barium	0.40	U	1.0	0.23	mg/Kg		03/28/24 13:37	03/30/24 00:43	20
Cadmium	0.20	U	0.80	0.077	mg/Kg		03/28/24 13:37	03/30/24 00:43	20
Chromium	0.25	U	1.0	0.063	mg/Kg		03/28/24 13:37	03/30/24 00:43	20
Lead	0.19	U	0.50	0.048	mg/Kg		03/28/24 13:37	03/30/24 00:43	20
Selenium	1.0	U	1.5	0.29	mg/Kg		03/28/24 13:37	03/30/24 00:43	20
Silver	0.050	U	0.20	0.020	mg/Kg		03/28/24 13:37	03/30/24 00:43	20

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 580-455073/24-A
Matrix: Solid
Analysis Batch: 455285

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 455073

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Arsenic			25.0	24.2		mg/Kg		97	82 - 118		
Barium			25.0	24.2		mg/Kg		97	86 - 116		
Cadmium			25.0	24.4		mg/Kg		98	84 - 116		
Chromium			25.0	24.9		mg/Kg		100	83 - 119		
Lead			25.0	22.8		mg/Kg		91	84 - 118		
Selenium			25.0	26.6		mg/Kg		106	80 - 119		
Silver			25.0	25.0		mg/Kg		100	83 - 118		

Lab Sample ID: LCSD 580-455073/25-A
Matrix: Solid
Analysis Batch: 455285

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 455073

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Arsenic			25.0	23.9		mg/Kg		96	82 - 118	1	20
Barium			25.0	23.9		mg/Kg		96	86 - 116	1	20
Cadmium			25.0	24.0		mg/Kg		96	84 - 116	2	20
Chromium			25.0	24.1		mg/Kg		96	83 - 119	3	20
Lead			25.0	22.6		mg/Kg		91	84 - 118	1	20
Selenium			25.0	26.0		mg/Kg		104	80 - 119	2	20
Silver			25.0	24.7		mg/Kg		99	83 - 118	2	20

Lab Sample ID: MB 580-455329/13-A
Matrix: Solid
Analysis Batch: 455760

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 455329

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.40	U	0.50	0.10	mg/Kg		04/01/24 12:29	04/04/24 17:08	20
Barium	0.40	U	1.0	0.23	mg/Kg		04/01/24 12:29	04/04/24 17:08	20
Cadmium	0.20	U	0.80	0.077	mg/Kg		04/01/24 12:29	04/04/24 17:08	20
Chromium	0.25	U	1.0	0.063	mg/Kg		04/01/24 12:29	04/04/24 17:08	20
Lead	0.19	U	0.50	0.048	mg/Kg		04/01/24 12:29	04/04/24 17:08	20
Selenium	1.0	U	1.5	0.29	mg/Kg		04/01/24 12:29	04/04/24 17:08	20
Silver	0.050	U	0.20	0.020	mg/Kg		04/01/24 12:29	04/04/24 17:08	20

Lab Sample ID: MB 580-455329/18-A
Matrix: Solid
Analysis Batch: 455760

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 455329

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.40	U	0.50	0.10	mg/Kg		04/01/24 12:51	04/04/24 17:11	20
Barium	0.40	U	1.0	0.23	mg/Kg		04/01/24 12:51	04/04/24 17:11	20
Cadmium	0.20	U	0.80	0.077	mg/Kg		04/01/24 12:51	04/04/24 17:11	20
Chromium	0.25	U	1.0	0.063	mg/Kg		04/01/24 12:51	04/04/24 17:11	20
Lead	0.19	U	0.50	0.048	mg/Kg		04/01/24 12:51	04/04/24 17:11	20
Selenium	1.0	U	1.5	0.29	mg/Kg		04/01/24 12:51	04/04/24 17:11	20
Silver	0.050	U	0.20	0.020	mg/Kg		04/01/24 12:51	04/04/24 17:11	20

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: MB 580-455329/19-A
Matrix: Solid
Analysis Batch: 455760

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 455329

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.40	U	0.50	0.10	mg/Kg		04/01/24 12:51	04/04/24 17:14	20
Barium	0.40	U	1.0	0.23	mg/Kg		04/01/24 12:51	04/04/24 17:14	20
Cadmium	0.20	U	0.80	0.077	mg/Kg		04/01/24 12:51	04/04/24 17:14	20
Chromium	0.25	U	1.0	0.063	mg/Kg		04/01/24 12:51	04/04/24 17:14	20
Lead	0.19	U	0.50	0.048	mg/Kg		04/01/24 12:51	04/04/24 17:14	20
Selenium	1.0	U	1.5	0.29	mg/Kg		04/01/24 12:51	04/04/24 17:14	20
Silver	0.050	U	0.20	0.020	mg/Kg		04/01/24 12:51	04/04/24 17:14	20

Lab Sample ID: LCS 580-455329/16-A
Matrix: Solid
Analysis Batch: 455760

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 455329

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	25.0	24.9		mg/Kg		100	82 - 118
Barium	25.0	23.9		mg/Kg		96	86 - 116
Cadmium	25.0	23.9		mg/Kg		95	84 - 116
Chromium	25.0	24.4		mg/Kg		98	83 - 119
Lead	25.0	24.2		mg/Kg		97	84 - 118
Selenium	25.0	25.6		mg/Kg		102	80 - 119
Silver	25.0	24.4		mg/Kg		98	83 - 118

Lab Sample ID: LCSD 580-455329/17-A
Matrix: Solid
Analysis Batch: 455760

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 455329

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Arsenic	25.0	24.8		mg/Kg		99	82 - 118	0	20
Barium	25.0	24.7		mg/Kg		99	86 - 116	3	20
Cadmium	25.0	24.8		mg/Kg		99	84 - 116	4	20
Chromium	25.0	24.7		mg/Kg		99	83 - 119	1	20
Lead	25.0	24.2		mg/Kg		97	84 - 118	0	20
Selenium	25.0	25.3		mg/Kg		101	80 - 119	1	20
Silver	25.0	24.9		mg/Kg		100	83 - 118	2	20

Lab Sample ID: 580-137730-22 MS
Matrix: Solid
Analysis Batch: 455760

Client Sample ID: NAN_DU10_0-3
Prep Type: Total/NA
Prep Batch: 455329

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	9.6		23.5	30.0		mg/Kg		87	82 - 118
Barium	120	J1	23.5	145	4	mg/Kg		117	86 - 116
Cadmium	0.35	J	23.5	23.1		mg/Kg		97	84 - 116
Chromium	150	J1	23.5	178	4	mg/Kg		121	83 - 119
Selenium	5.8		23.5	24.6		mg/Kg		80	80 - 119
Silver	0.088	J	23.5	22.5		mg/Kg		95	83 - 118

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: 580-137730-22 MS
Matrix: Solid
Analysis Batch: 455760

Client Sample ID: NAN_DU10_0-3
Prep Type: Total/NA
Prep Batch: 455329

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Lead	8500	J1	23.5	8620	4	mg/Kg		701	84 - 118

Lab Sample ID: 580-137730-22 MSD
Matrix: Solid
Analysis Batch: 455760

Client Sample ID: NAN_DU10_0-3
Prep Type: Total/NA
Prep Batch: 455329

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Arsenic	9.6		23.5	30.7		mg/Kg		90	82 - 118	2	20
Barium	120	J1	23.5	150	4	mg/Kg		140	86 - 116	4	20
Cadmium	0.35	J	23.5	22.6		mg/Kg		94	84 - 116	2	20
Chromium	150	J1	23.5	180	4	mg/Kg		127	83 - 119	1	20
Selenium	5.8		23.5	26.3		mg/Kg		87	80 - 119	7	20
Silver	0.088	J	23.5	22.6		mg/Kg		96	83 - 118	1	20

Lab Sample ID: 580-137730-22 MSD
Matrix: Solid
Analysis Batch: 455760

Client Sample ID: NAN_DU10_0-3
Prep Type: Total/NA
Prep Batch: 455329

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Lead	8500	J1	23.5	8090	4	mg/Kg		-1541	84 - 118	6	20

Method: 7470A - TCLP Mercury (CVAA)

Lab Sample ID: MB 580-457398/15-C
Matrix: Solid
Analysis Batch: 458032

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 457590

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.0020	U	0.0030	0.0015	mg/L		04/25/24 12:11	04/30/24 15:04	1

Lab Sample ID: MB 580-457398/16-C
Matrix: Solid
Analysis Batch: 458032

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 457590

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.0020	U	0.0030	0.0015	mg/L		04/25/24 12:11	04/30/24 15:07	1

Lab Sample ID: LCS 580-457398/17-C
Matrix: Solid
Analysis Batch: 458032

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 457590

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.0200	0.0214		mg/L		107	82 - 119

Lab Sample ID: LCSD 580-457398/18-C
Matrix: Solid
Analysis Batch: 458032

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 457590

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Mercury	0.0200	0.0223		mg/L		111	82 - 119	4	20

Method: 7471A - Mercury (CVAA)

Lab Sample ID: MB 580-454663/23-A
Matrix: Solid
Analysis Batch: 454854

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 454663

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.010	U	0.018	0.0054	mg/Kg		03/25/24 10:09	03/26/24 14:14	1

Lab Sample ID: LCS 580-454663/24-A
Matrix: Solid
Analysis Batch: 454854

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 454663

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.100	0.119		mg/Kg		119	80 - 124

Lab Sample ID: LCSD 580-454663/25-A
Matrix: Solid
Analysis Batch: 454854

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 454663

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Mercury	0.100	0.112		mg/Kg		112	80 - 124	6	20

Lab Sample ID: 580-137730-1 MS
Matrix: Solid
Analysis Batch: 454854

Client Sample ID: NAN_DU8_0-3
Prep Type: Total/NA
Prep Batch: 454663

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.31		0.127	0.431		mg/Kg	☼	97	80 - 124

Lab Sample ID: 580-137730-1 MSD
Matrix: Solid
Analysis Batch: 454854

Client Sample ID: NAN_DU8_0-3
Prep Type: Total/NA
Prep Batch: 454663

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Mercury	0.31		0.128	0.418		mg/Kg	☼	85	80 - 124	3	20

Lab Sample ID: MB 580-455462/13-A
Matrix: Solid
Analysis Batch: 455504

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 455462

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.010	U	0.018	0.0054	mg/Kg		04/02/24 13:03	04/02/24 15:27	1

Lab Sample ID: LCS 580-455462/14-A
Matrix: Solid
Analysis Batch: 455504

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 455462

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.100	0.116		mg/Kg		116	80 - 124

Lab Sample ID: LCSD 580-455462/15-A
Matrix: Solid
Analysis Batch: 455504

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 455462

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Mercury	0.100	0.111		mg/Kg		111	80 - 124	5	20

Method: 7471A - Mercury (CVAA)

Lab Sample ID: 580-137730-25 MS
Matrix: Solid
Analysis Batch: 455504

Client Sample ID: NAN_DU11_0-3
Prep Type: Total/NA
Prep Batch: 455462

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.10		0.140	0.257		mg/Kg	☼	109	80 - 124

Lab Sample ID: 580-137730-25 MSD
Matrix: Solid
Analysis Batch: 455504

Client Sample ID: NAN_DU11_0-3
Prep Type: Total/NA
Prep Batch: 455462

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Mercury	0.10		0.143	0.249		mg/Kg	☼	101	80 - 124	3	20

Method: 2540G - SM 2540G

Lab Sample ID: 580-137730-1 DU
Matrix: Solid
Analysis Batch: 454764

Client Sample ID: NAN_DU8_0-3
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Percent Solids	71.8		76.4		%		6	20
Percent Moisture	28.2		23.6		%		18	20

Client Sample ID: NAN_DU8_0-3
Date Collected: 03/03/24 10:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-1
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
SPLP West	Analysis	6010D		1	458233	JLS	EET SEA	05/01/24 22:22
SPLP West	ISM Prep	Increment, prep			458588	JLS	EET SEA	05/06/24 15:49
SPLP West	Leach	1312			458590	JLS	EET SEA	05/06/24 15:52 - 05/06/24 15:53 [1]
SPLP West	Prep	3010A			458592	JLS	EET SEA	05/06/24 15:58
TCLP	ISM Prep	Increment, prep			457395	JL	EET SEA	04/23/24 17:04
TCLP	Leach	1311			457398	JL	EET SEA	04/23/24 17:24 - 04/25/24 11:45 [1]
TCLP	Prep	3010A			457588	JL	EET SEA	04/25/24 11:48
TCLP	Analysis	6010D		1	457695	JLS	EET SEA	04/25/24 19:56
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455023	AUA	EET SEA	03/28/24 09:38
Total/NA	Analysis	6020B		20	455179	FCW	EET SEA	03/29/24 06:51
TCLP	ISM Prep	Increment, prep			457395	JL	EET SEA	04/23/24 17:04
TCLP	Leach	1311			457398	JL	EET SEA	04/23/24 17:24 - 04/25/24 11:45 [1]
TCLP	Prep	7470A			457590	JL	EET SEA	04/25/24 12:11
TCLP	Analysis	7470A		1	458032	JL	EET SEA	04/30/24 15:37
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Client Sample ID: NAN_DU8_0-3
Date Collected: 03/03/24 10:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-1
Matrix: Solid
Percent Solids: 71.8

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			454663	JL	EET SEA	03/25/24 10:07
Total/NA	Analysis	7471A		1	454854	JL	EET SEA	03/26/24 14:21

Client Sample ID: NAN_DU8_3-6
Date Collected: 03/03/24 10:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-2
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455023	AUA	EET SEA	03/28/24 09:38
Total/NA	Analysis	6020B		20	455179	FCW	EET SEA	03/29/24 06:57
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Client Sample ID: NAN_DU8_3-6
Date Collected: 03/03/24 10:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-2
Matrix: Solid
Percent Solids: 70.8

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			454663	JL	EET SEA	03/25/24 10:07
Total/NA	Analysis	7471A		1	454854	JL	EET SEA	03/26/24 14:28

Lab Chronicle

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU8_6-9
Date Collected: 03/03/24 10:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-3
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455023	AUA	EET SEA	03/28/24 09:38
Total/NA	Analysis	6020B		20	455179	FCW	EET SEA	03/29/24 06:54
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Client Sample ID: NAN_DU8_6-9
Date Collected: 03/03/24 10:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-3
Matrix: Solid
Percent Solids: 69.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			454663	JL	EET SEA	03/25/24 10:07
Total/NA	Analysis	7471A		1	454854	JL	EET SEA	03/26/24 14:31

Client Sample ID: NAN_DU1_0-3_A
Date Collected: 03/05/24 16:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-4
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455023	AUA	EET SEA	03/28/24 09:38
Total/NA	Analysis	6020B		20	455179	FCW	EET SEA	03/29/24 06:49
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Client Sample ID: NAN_DU1_0-3_A
Date Collected: 03/05/24 16:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-4
Matrix: Solid
Percent Solids: 82.3

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			454663	JL	EET SEA	03/25/24 10:07
Total/NA	Analysis	7471A		1	454854	JL	EET SEA	03/26/24 14:33

Client Sample ID: NAN_DU1_3-6_A
Date Collected: 03/05/24 16:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-5
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455023	AUA	EET SEA	03/28/24 09:38
Total/NA	Analysis	6020B		20	455179	FCW	EET SEA	03/29/24 06:23
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Client Sample ID: NAN_DU1_3-6_A
Lab Sample ID: 580-137730-5

Date Collected: 03/05/24 16:00
Matrix: Solid
Date Received: 03/14/24 09:30
Percent Solids: 78.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			454663	JL	EET SEA	03/25/24 10:07
Total/NA	Analysis	7471A		1	454854	JL	EET SEA	03/26/24 14:36

Client Sample ID: NAN_DU1_6-9_A
Lab Sample ID: 580-137730-6

Date Collected: 03/05/24 16:00
Matrix: Solid
Date Received: 03/14/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455023	AUA	EET SEA	03/28/24 09:38
Total/NA	Analysis	6020B		20	455179	FCW	EET SEA	03/29/24 07:37
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Client Sample ID: NAN_DU1_6-9_A
Lab Sample ID: 580-137730-6

Date Collected: 03/05/24 16:00
Matrix: Solid
Date Received: 03/14/24 09:30
Percent Solids: 75.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			454663	JL	EET SEA	03/25/24 10:07
Total/NA	Analysis	7471A		1	454854	JL	EET SEA	03/26/24 14:43

Client Sample ID: NAN_DU1_0-3_B
Lab Sample ID: 580-137730-7

Date Collected: 03/05/24 16:00
Matrix: Solid
Date Received: 03/14/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
SPLP West	Analysis	6010D		1	458233	JLS	EET SEA	05/01/24 22:49
SPLP West	ISM Prep	Increment, prep			458588	JLS	EET SEA	05/06/24 15:49
SPLP West	Leach	1312			458590	JLS	EET SEA	05/06/24 15:52 - 05/06/24 15:53 [1]
SPLP West	Prep	3010A			458592	JLS	EET SEA	05/06/24 15:58
TCLP	Leach	1311			457398	JL	EET SEA	04/23/24 17:24 - 04/25/24 11:45 [1]
TCLP	ISM Prep	Increment, prep			457484	AUA	EET SEA	04/24/24 11:30
TCLP	Prep	3010A			457588	JL	EET SEA	04/25/24 11:48
TCLP	Analysis	6010D		1	457695	JLS	EET SEA	04/25/24 20:00
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455023	AUA	EET SEA	03/28/24 09:38
Total/NA	Analysis	6020B		20	455179	FCW	EET SEA	03/29/24 07:40
TCLP	Leach	1311			457398	JL	EET SEA	04/23/24 17:24 - 04/25/24 11:45 [1]
TCLP	ISM Prep	Increment, prep			457484	AUA	EET SEA	04/24/24 11:30
TCLP	Prep	7470A			457590	JL	EET SEA	04/25/24 12:11
TCLP	Analysis	7470A		1	458032	JL	EET SEA	04/30/24 15:39
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Lab Chronicle

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU1_0-3_B
Lab Sample ID: 580-137730-7
Date Collected: 03/05/24 16:00
Matrix: Solid
Date Received: 03/14/24 09:30
Percent Solids: 83.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			454663	JL	EET SEA	03/25/24 10:07
Total/NA	Analysis	7471A		1	454854	JL	EET SEA	03/26/24 14:45

Client Sample ID: NAN_DU1_3-6_B
Lab Sample ID: 580-137730-8
Date Collected: 03/05/24 16:00
Matrix: Solid
Date Received: 03/14/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455023	AUA	EET SEA	03/28/24 09:38
Total/NA	Analysis	6020B		20	455179	FCW	EET SEA	03/29/24 07:42
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Client Sample ID: NAN_DU1_3-6_B
Lab Sample ID: 580-137730-8
Date Collected: 03/05/24 16:00
Matrix: Solid
Date Received: 03/14/24 09:30
Percent Solids: 77.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			454663	JL	EET SEA	03/25/24 10:07
Total/NA	Analysis	7471A		1	454854	JL	EET SEA	03/26/24 14:48

Client Sample ID: NAN_DU1_6-9_B
Lab Sample ID: 580-137730-9
Date Collected: 03/05/24 16:00
Matrix: Solid
Date Received: 03/14/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455023	AUA	EET SEA	03/28/24 09:38
Total/NA	Analysis	6020B		20	455179	FCW	EET SEA	03/29/24 07:45
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Client Sample ID: NAN_DU1_6-9_B
Lab Sample ID: 580-137730-9
Date Collected: 03/05/24 16:00
Matrix: Solid
Date Received: 03/14/24 09:30
Percent Solids: 75.8

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			454663	JL	EET SEA	03/25/24 10:07
Total/NA	Analysis	7471A		1	454854	JL	EET SEA	03/26/24 14:50

Lab Chronicle

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU1_0-3_C
Lab Sample ID: 580-137730-10
Date Collected: 03/05/24 16:00
Matrix: Solid
Date Received: 03/14/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455023	AUA	EET SEA	03/28/24 09:38
Total/NA	Analysis	6020B		20	455179	FCW	EET SEA	03/29/24 07:48
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Client Sample ID: NAN_DU1_0-3_C
Lab Sample ID: 580-137730-10
Date Collected: 03/05/24 16:00
Matrix: Solid
Date Received: 03/14/24 09:30
Percent Solids: 80.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			454663	JL	EET SEA	03/25/24 10:07
Total/NA	Analysis	7471A		1	454854	JL	EET SEA	03/26/24 14:52

Client Sample ID: NAN_DU1_3-6_C
Lab Sample ID: 580-137730-11
Date Collected: 03/05/24 16:00
Matrix: Solid
Date Received: 03/14/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455023	AUA	EET SEA	03/28/24 09:38
Total/NA	Analysis	6020B		20	455179	FCW	EET SEA	03/29/24 07:08
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Client Sample ID: NAN_DU1_3-6_C
Lab Sample ID: 580-137730-11
Date Collected: 03/05/24 16:00
Matrix: Solid
Date Received: 03/14/24 09:30
Percent Solids: 77.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			454663	JL	EET SEA	03/25/24 10:07
Total/NA	Analysis	7471A		1	454854	JL	EET SEA	03/26/24 14:55

Client Sample ID: NAN_DU1_6-9_C
Lab Sample ID: 580-137730-12
Date Collected: 03/05/24 16:00
Matrix: Solid
Date Received: 03/14/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455073	CSS	EET SEA	03/28/24 13:37
Total/NA	Analysis	6020B		20	455285	FCW	EET SEA	03/30/24 01:09
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Lab Chronicle

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU1_6-9_C
Lab Sample ID: 580-137730-12
Date Collected: 03/05/24 16:00
Matrix: Solid
Date Received: 03/14/24 09:30
Percent Solids: 73.7

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			454663	JL	EET SEA	03/25/24 10:07
Total/NA	Analysis	7471A		1	454854	JL	EET SEA	03/26/24 14:57

Client Sample ID: NAN_DU3_0-3
Lab Sample ID: 580-137730-13
Date Collected: 03/06/24 12:30
Matrix: Solid
Date Received: 03/14/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455073	CSS	EET SEA	03/28/24 13:37
Total/NA	Analysis	6020B		20	455285	FCW	EET SEA	03/30/24 00:46
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Client Sample ID: NAN_DU3_0-3
Lab Sample ID: 580-137730-13
Date Collected: 03/06/24 12:30
Matrix: Solid
Date Received: 03/14/24 09:30
Percent Solids: 69.3

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			454663	JL	EET SEA	03/25/24 10:07
Total/NA	Analysis	7471A		1	454854	JL	EET SEA	03/26/24 14:59

Client Sample ID: NAN_DU3_3-6
Lab Sample ID: 580-137730-14
Date Collected: 03/06/24 12:30
Matrix: Solid
Date Received: 03/14/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455073	CSS	EET SEA	03/28/24 13:37
Total/NA	Analysis	6020B		20	455285	FCW	EET SEA	03/30/24 02:33
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Client Sample ID: NAN_DU3_3-6
Lab Sample ID: 580-137730-14
Date Collected: 03/06/24 12:30
Matrix: Solid
Date Received: 03/14/24 09:30
Percent Solids: 70.7

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			454663	JL	EET SEA	03/25/24 10:07
Total/NA	Analysis	7471A		1	454854	JL	EET SEA	03/26/24 15:02

Client Sample ID: NAN_DU3_6-9

Date Collected: 03/06/24 12:30
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-15

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
SPLP West	Analysis	6010D		1	458233	JLS	EET SEA	05/01/24 22:53
SPLP West	ISM Prep	Increment, prep			458588	JLS	EET SEA	05/06/24 15:49
SPLP West	Leach	1312			458590	JLS	EET SEA	05/06/24 15:52 - 05/06/24 15:53 [1]
SPLP West	Prep	3010A			458592	JLS	EET SEA	05/06/24 15:58
TCLP	ISM Prep	Increment, prep			457395	JL	EET SEA	04/23/24 17:04
TCLP	Leach	1311			457398	JL	EET SEA	04/23/24 17:24 - 04/25/24 11:45 [1]
TCLP	Prep	3010A			457588	JL	EET SEA	04/25/24 11:48
TCLP	Analysis	6010D		1	457695	JLS	EET SEA	04/25/24 20:03
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455073	CSS	EET SEA	03/28/24 13:37
Total/NA	Analysis	6020B		20	455285	FCW	EET SEA	03/30/24 02:30
TCLP	ISM Prep	Increment, prep			457395	JL	EET SEA	04/23/24 17:04
TCLP	Leach	1311			457398	JL	EET SEA	04/23/24 17:24 - 04/25/24 11:45 [1]
TCLP	Prep	7470A			457590	JL	EET SEA	04/25/24 12:11
TCLP	Analysis	7470A		1	458032	JL	EET SEA	04/30/24 15:42
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Client Sample ID: NAN_DU3_6-9

Date Collected: 03/06/24 12:30
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-15

Matrix: Solid
Percent Solids: 72.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			454663	JL	EET SEA	03/25/24 10:07
Total/NA	Analysis	7471A		1	454854	JL	EET SEA	03/26/24 15:04

Client Sample ID: NAN_DU2_0-3

Date Collected: 03/06/24 15:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-16

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455073	CSS	EET SEA	03/28/24 13:37
Total/NA	Analysis	6020B		20	455285	FCW	EET SEA	03/30/24 01:34
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Client Sample ID: NAN_DU2_0-3

Date Collected: 03/06/24 15:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-16

Matrix: Solid
Percent Solids: 75.8

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			454663	JL	EET SEA	03/25/24 10:07
Total/NA	Analysis	7471A		1	454854	JL	EET SEA	03/26/24 15:11

Lab Chronicle

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU2_3-6
Date Collected: 03/06/24 15:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-17
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455073	CSS	EET SEA	03/28/24 13:37
Total/NA	Analysis	6020B		20	455285	FCW	EET SEA	03/30/24 01:48
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Client Sample ID: NAN_DU2_3-6
Date Collected: 03/06/24 15:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-17
Matrix: Solid
Percent Solids: 77.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			454663	JL	EET SEA	03/25/24 10:07
Total/NA	Analysis	7471A		1	454854	JL	EET SEA	03/26/24 15:14

Client Sample ID: NAN_DU2_6-9
Date Collected: 03/06/24 15:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-18
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
TCLP	ISM Prep	Increment, prep			457395	JL	EET SEA	04/23/24 17:04
TCLP	Leach	1311			457398	JL	EET SEA	04/23/24 17:24 - 04/25/24 11:45 [1]
TCLP	Prep	3010A			457588	JL	EET SEA	04/25/24 11:48
TCLP	Analysis	6010D		1	457695	JLS	EET SEA	04/25/24 20:07
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455073	CSS	EET SEA	03/28/24 13:37
Total/NA	Analysis	6020B		20	455285	FCW	EET SEA	03/30/24 02:22
TCLP	ISM Prep	Increment, prep			457395	JL	EET SEA	04/23/24 17:04
TCLP	Leach	1311			457398	JL	EET SEA	04/23/24 17:24 - 04/25/24 11:45 [1]
TCLP	Prep	7470A			457590	JL	EET SEA	04/25/24 12:11
TCLP	Analysis	7470A		1	458032	JL	EET SEA	04/30/24 15:45
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Client Sample ID: NAN_DU2_6-9
Date Collected: 03/06/24 15:00
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-18
Matrix: Solid
Percent Solids: 77.3

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			454663	JL	EET SEA	03/25/24 10:07
Total/NA	Analysis	7471A		1	454854	JL	EET SEA	03/26/24 15:16

Client Sample ID: NAN_DU9_0-3

Lab Sample ID: 580-137730-19

Date Collected: 03/09/24 12:30

Matrix: Solid

Date Received: 03/14/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
TCLP	ISM Prep	Increment, prep			457395	JL	EET SEA	04/23/24 17:04
TCLP	Leach	1311			457398	JL	EET SEA	04/23/24 17:24 - 04/25/24 11:45 [1]
TCLP	Prep	3010A			457588	JL	EET SEA	04/25/24 11:48
TCLP	Analysis	6010D		1	457695	JLS	EET SEA	04/25/24 20:10
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455073	CSS	EET SEA	03/28/24 13:37
Total/NA	Analysis	6020B		20	455285	FCW	EET SEA	03/30/24 02:28
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455073	CSS	EET SEA	03/28/24 13:37
Total/NA	Analysis	6020B		2000	455425	FCW	EET SEA	04/01/24 18:07
TCLP	ISM Prep	Increment, prep			457395	JL	EET SEA	04/23/24 17:04
TCLP	Leach	1311			457398	JL	EET SEA	04/23/24 17:24 - 04/25/24 11:45 [1]
TCLP	Prep	7470A			457590	JL	EET SEA	04/25/24 12:11
TCLP	Analysis	7470A		1	458032	JL	EET SEA	04/30/24 15:47
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Client Sample ID: NAN_DU9_0-3

Lab Sample ID: 580-137730-19

Date Collected: 03/09/24 12:30

Matrix: Solid

Date Received: 03/14/24 09:30

Percent Solids: 70.3

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			454663	JL	EET SEA	03/25/24 10:09
Total/NA	Analysis	7471A		1	454854	JL	EET SEA	03/26/24 15:19

Client Sample ID: NAN_DU9_3-6

Lab Sample ID: 580-137730-20

Date Collected: 03/09/24 12:30

Matrix: Solid

Date Received: 03/14/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455073	CSS	EET SEA	03/28/24 13:37
Total/NA	Analysis	6020B		20	455285	FCW	EET SEA	03/30/24 02:25
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455073	CSS	EET SEA	03/28/24 13:37
Total/NA	Analysis	6020B		2000	455425	FCW	EET SEA	04/01/24 18:04
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Lab Chronicle

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU9_3-6

Lab Sample ID: 580-137730-20
Date Collected: 03/09/24 12:30
Matrix: Solid
Date Received: 03/14/24 09:30
Percent Solids: 61.5

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			454663	JL	EET SEA	03/25/24 10:09
Total/NA	Analysis	7471A		1	454854	JL	EET SEA	03/26/24 15:21

Client Sample ID: NAN_DU9_6-9

Lab Sample ID: 580-137730-21
Date Collected: 03/09/24 12:30
Matrix: Solid
Date Received: 03/14/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455329	CA	EET SEA	04/01/24 12:29
Total/NA	Analysis	6020B		20	455760	FCW	EET SEA	04/05/24 04:50
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455329	CA	EET SEA	04/01/24 12:29
Total/NA	Analysis	6020B		2000	455760	FCW	EET SEA	04/05/24 04:52
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Client Sample ID: NAN_DU9_6-9

Lab Sample ID: 580-137730-21
Date Collected: 03/09/24 12:30
Matrix: Solid
Date Received: 03/14/24 09:30
Percent Solids: 64.5

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			455462	JL	EET SEA	04/02/24 13:03
Total/NA	Analysis	7471A		1	455504	JL	EET SEA	04/02/24 16:10

Client Sample ID: NAN_DU10_0-3

Lab Sample ID: 580-137730-22
Date Collected: 03/09/24 14:30
Matrix: Solid
Date Received: 03/14/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3546			454340	E1W	EET SEA	03/20/24 15:22
Total/NA	Analysis	8082A		1	455366	TL1	EET SEA	04/01/24 14:54
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455329	CA	EET SEA	04/01/24 12:29
Total/NA	Analysis	6020B		20	455760	FCW	EET SEA	04/04/24 17:39
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455329	CA	EET SEA	04/01/24 12:29
Total/NA	Analysis	6020B		2000	455760	FCW	EET SEA	04/04/24 18:01
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Lab Chronicle

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU10_0-3

Lab Sample ID: 580-137730-22
Date Collected: 03/09/24 14:30
Matrix: Solid
Date Received: 03/14/24 09:30
Percent Solids: 71.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			455462	JL	EET SEA	04/02/24 13:03
Total/NA	Analysis	7471A		1	455504	JL	EET SEA	04/02/24 16:13

Client Sample ID: NAN_DU10_3-6

Lab Sample ID: 580-137730-23
Date Collected: 03/09/24 14:30
Matrix: Solid
Date Received: 03/14/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3546			454340	E1W	EET SEA	03/20/24 15:22
Total/NA	Analysis	8082A		1	455366	TL1	EET SEA	04/01/24 15:47
SPLP West	Analysis	6010D		1	458233	JLS	EET SEA	05/01/24 22:56
SPLP West	ISM Prep	Increment, prep			458588	JLS	EET SEA	05/06/24 15:49
SPLP West	Leach	1312			458590	JLS	EET SEA	05/06/24 15:52 - 05/06/24 15:53 [1]
SPLP West	Prep	3010A			458592	JLS	EET SEA	05/06/24 15:58
TCLP	ISM Prep	Increment, prep			457395	JL	EET SEA	04/23/24 17:04
TCLP	Leach	1311			457398	JL	EET SEA	04/23/24 17:24 - 04/25/24 11:45 [1]
TCLP	Prep	3010A			457588	JL	EET SEA	04/25/24 11:48
TCLP	Analysis	6010D		1	457695	JLS	EET SEA	04/25/24 20:14
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455329	CA	EET SEA	04/01/24 12:29
Total/NA	Analysis	6020B		20	455760	FCW	EET SEA	04/05/24 05:01
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455329	CA	EET SEA	04/01/24 12:29
Total/NA	Analysis	6020B		2000	455760	FCW	EET SEA	04/05/24 05:04
TCLP	ISM Prep	Increment, prep			457395	JL	EET SEA	04/23/24 17:04
TCLP	Leach	1311			457398	JL	EET SEA	04/23/24 17:24 - 04/25/24 11:45 [1]
TCLP	Prep	7470A			457590	JL	EET SEA	04/25/24 12:11
TCLP	Analysis	7470A		1	458032	JL	EET SEA	04/30/24 15:50
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Client Sample ID: NAN_DU10_3-6

Lab Sample ID: 580-137730-23
Date Collected: 03/09/24 14:30
Matrix: Solid
Date Received: 03/14/24 09:30
Percent Solids: 70.8

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			455462	JL	EET SEA	04/02/24 13:03
Total/NA	Analysis	7471A		1	455504	JL	EET SEA	04/02/24 15:45

Lab Chronicle

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU10_6-9

Lab Sample ID: 580-137730-24

Date Collected: 03/09/24 14:30

Matrix: Solid

Date Received: 03/14/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455329	CA	EET SEA	04/01/24 12:29
Total/NA	Analysis	6020B		20	455760	FCW	EET SEA	04/04/24 17:52
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455329	CA	EET SEA	04/01/24 12:29
Total/NA	Analysis	6020B		2000	455760	FCW	EET SEA	04/04/24 18:14
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Client Sample ID: NAN_DU10_6-9

Lab Sample ID: 580-137730-24

Date Collected: 03/09/24 14:30

Matrix: Solid

Date Received: 03/14/24 09:30

Percent Solids: 68.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			455462	JL	EET SEA	04/02/24 13:03
Total/NA	Analysis	7471A		1	455504	JL	EET SEA	04/02/24 15:54

Client Sample ID: NAN_DU11_0-3

Lab Sample ID: 580-137730-25

Date Collected: 03/10/24 12:20

Matrix: Solid

Date Received: 03/14/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455329	CA	EET SEA	04/01/24 12:29
Total/NA	Analysis	6020B		20	455760	FCW	EET SEA	04/05/24 05:47
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455329	CA	EET SEA	04/01/24 12:29
Total/NA	Analysis	6020B		2000	455760	FCW	EET SEA	04/05/24 05:50
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Client Sample ID: NAN_DU11_0-3

Lab Sample ID: 580-137730-25

Date Collected: 03/10/24 12:20

Matrix: Solid

Date Received: 03/14/24 09:30

Percent Solids: 62.7

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			455462	JL	EET SEA	04/02/24 13:03
Total/NA	Analysis	7471A		1	455504	JL	EET SEA	04/02/24 15:36

Client Sample ID: NAN_DU11_3-6

Lab Sample ID: 580-137730-26

Date Collected: 03/10/24 12:20

Matrix: Solid

Date Received: 03/14/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3546			454340	E1W	EET SEA	03/20/24 15:22
Total/NA	Analysis	8082A		1	455366	TL1	EET SEA	04/01/24 16:04
SPLP West	Analysis	6010D		1	458233	JLS	EET SEA	05/01/24 22:59
SPLP West	ISM Prep	Increment, prep			458588	JLS	EET SEA	05/06/24 15:49
SPLP West	Leach	1312			458590	JLS	EET SEA	05/06/24 15:52 - 05/06/24 15:53 [1]
SPLP West	Prep	3010A			458592	JLS	EET SEA	05/06/24 15:58
TCLP	ISM Prep	Increment, prep			457395	JL	EET SEA	04/23/24 17:04
TCLP	Leach	1311			457398	JL	EET SEA	04/23/24 17:24 - 04/25/24 11:45 [1]
TCLP	Prep	3010A			457588	JL	EET SEA	04/25/24 11:48
TCLP	Analysis	6010D		1	457695	JLS	EET SEA	04/25/24 20:17
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455329	CA	EET SEA	04/01/24 12:29
Total/NA	Analysis	6020B		20	455760	FCW	EET SEA	04/05/24 04:44
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455329	CA	EET SEA	04/01/24 12:29
Total/NA	Analysis	6020B		2000	455760	FCW	EET SEA	04/05/24 04:47
TCLP	ISM Prep	Increment, prep			457395	JL	EET SEA	04/23/24 17:04
TCLP	Leach	1311			457398	JL	EET SEA	04/23/24 17:24 - 04/25/24 11:45 [1]
TCLP	Prep	7470A			457590	JL	EET SEA	04/25/24 12:11
TCLP	Analysis	7470A		1	458032	JL	EET SEA	04/30/24 15:59
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Client Sample ID: NAN_DU11_3-6

Lab Sample ID: 580-137730-26

Date Collected: 03/10/24 12:20

Matrix: Solid

Date Received: 03/14/24 09:30

Percent Solids: 65.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			455462	JL	EET SEA	04/02/24 13:03
Total/NA	Analysis	7471A		1	455504	JL	EET SEA	04/02/24 15:56

Client Sample ID: NAN_DU11_6-9

Lab Sample ID: 580-137730-27

Date Collected: 03/10/24 12:20

Matrix: Solid

Date Received: 03/14/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455329	CA	EET SEA	04/01/24 12:29
Total/NA	Analysis	6020B		20	455760	FCW	EET SEA	04/05/24 05:41
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455329	CA	EET SEA	04/01/24 12:29
Total/NA	Analysis	6020B		2000	455760	FCW	EET SEA	04/05/24 05:44
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Client Sample ID: NAN_DU11_6-9

Lab Sample ID: 580-137730-27

Date Collected: 03/10/24 12:20

Matrix: Solid

Date Received: 03/14/24 09:30

Percent Solids: 66.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			455462	JL	EET SEA	04/02/24 13:03
Total/NA	Analysis	7471A		1	455504	JL	EET SEA	04/02/24 15:59

Client Sample ID: NAN_DU12_0-3

Lab Sample ID: 580-137730-28

Date Collected: 03/10/24 13:10

Matrix: Solid

Date Received: 03/14/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455329	CA	EET SEA	04/01/24 12:29
Total/NA	Analysis	6020B		20	455760	FCW	EET SEA	04/05/24 04:55
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455329	CA	EET SEA	04/01/24 12:29
Total/NA	Analysis	6020B		2000	455760	FCW	EET SEA	04/05/24 04:58
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Client Sample ID: NAN_DU12_0-3

Lab Sample ID: 580-137730-28

Date Collected: 03/10/24 13:10

Matrix: Solid

Date Received: 03/14/24 09:30

Percent Solids: 68.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			455462	JL	EET SEA	04/02/24 13:03
Total/NA	Analysis	7471A		1	455504	JL	EET SEA	04/02/24 16:02

Client Sample ID: NAN_DU12_3-6

Lab Sample ID: 580-137730-29

Date Collected: 03/10/24 13:10

Matrix: Solid

Date Received: 03/14/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
SPLP West	Analysis	6010D		1	458233	JLS	EET SEA	05/01/24 23:03
SPLP West	ISM Prep	Increment, prep			458588	JLS	EET SEA	05/06/24 15:49
SPLP West	Leach	1312			458590	JLS	EET SEA	05/06/24 15:52 - 05/06/24 15:53 [1]
SPLP West	Prep	3010A			458592	JLS	EET SEA	05/06/24 15:58
TCLP	ISM Prep	Increment, prep			457395	JL	EET SEA	04/23/24 17:04
TCLP	Leach	1311			457398	JL	EET SEA	04/23/24 17:24 - 04/25/24 11:45 [1]
TCLP	Prep	3010A			457588	JL	EET SEA	04/25/24 11:48
TCLP	Analysis	6010D		1	457695	JLS	EET SEA	04/25/24 20:21
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455329	CA	EET SEA	04/01/24 12:29
Total/NA	Analysis	6020B		20	455760	FCW	EET SEA	04/05/24 05:35
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455329	CA	EET SEA	04/01/24 12:29
Total/NA	Analysis	6020B		2000	455760	FCW	EET SEA	04/05/24 05:38

Lab Chronicle

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Client Sample ID: NAN_DU12_3-6
Date Collected: 03/10/24 13:10
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-29
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
TCLP	ISM Prep	Increment, prep			457395	JL	EET SEA	04/23/24 17:04
TCLP	Leach	1311			457398	JL	EET SEA	04/23/24 17:24 - 04/25/24 11:45 [1]
TCLP	Prep	7470A			457590	JL	EET SEA	04/25/24 12:11
TCLP	Analysis	7470A		1	458032	JL	EET SEA	04/30/24 16:02
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Client Sample ID: NAN_DU12_3-6
Date Collected: 03/10/24 13:10
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-29
Matrix: Solid
Percent Solids: 75.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			455462	JL	EET SEA	04/02/24 13:03
Total/NA	Analysis	7471A		1	455504	JL	EET SEA	04/02/24 16:05

Client Sample ID: NAN_DU12_6-9
Date Collected: 03/10/24 13:10
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-30
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455329	CA	EET SEA	04/01/24 12:29
Total/NA	Analysis	6020B		20	455760	FCW	EET SEA	04/05/24 05:52
Total/NA	ISM Prep	Increment, prep			454054	MR	EET SEA	03/18/24 14:14
Total/NA	Prep	3050B			455329	CA	EET SEA	04/01/24 12:29
Total/NA	Analysis	6020B		2000	455760	FCW	EET SEA	04/05/24 05:55
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Analysis	2540G		1	454764	AUA	EET SEA	03/26/24 11:00

Client Sample ID: NAN_DU12_6-9
Date Collected: 03/10/24 13:10
Date Received: 03/14/24 09:30

Lab Sample ID: 580-137730-30
Matrix: Solid
Percent Solids: 72.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	ISM Prep	Increment, prep			454052	MR	EET SEA	03/18/24 13:58
Total/NA	Prep	7471A			455462	JL	EET SEA	04/02/24 13:03
Total/NA	Analysis	7471A		1	455504	JL	EET SEA	04/02/24 16:08

[1] This procedure uses a method stipulated length of time for the process. Both start and end times are displayed.

Laboratory References:
EET SEA = Eurofins Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Accreditation/Certification Summary

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Laboratory: Eurofins Seattle

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2236	01-19-25

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
2540G		Solid	Percent Moisture
2540G		Solid	Percent Solids
7470A	7470A	Solid	Mercury

Sample Summary

Client: EnviroQuest, Inc.
Project/Site: Nanue Bridge

Job ID: 580-137730-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-137730-1	NAN_DU8_0-3	Solid	03/03/24 10:00	03/14/24 09:30
580-137730-2	NAN_DU8_3-6	Solid	03/03/24 10:00	03/14/24 09:30
580-137730-3	NAN_DU8_6-9	Solid	03/03/24 10:00	03/14/24 09:30
580-137730-4	NAN_DU1_0-3_A	Solid	03/05/24 16:00	03/14/24 09:30
580-137730-5	NAN_DU1_3-6_A	Solid	03/05/24 16:00	03/14/24 09:30
580-137730-6	NAN_DU1_6-9_A	Solid	03/05/24 16:00	03/14/24 09:30
580-137730-7	NAN_DU1_0-3_B	Solid	03/05/24 16:00	03/14/24 09:30
580-137730-8	NAN_DU1_3-6_B	Solid	03/05/24 16:00	03/14/24 09:30
580-137730-9	NAN_DU1_6-9_B	Solid	03/05/24 16:00	03/14/24 09:30
580-137730-10	NAN_DU1_0-3_C	Solid	03/05/24 16:00	03/14/24 09:30
580-137730-11	NAN_DU1_3-6_C	Solid	03/05/24 16:00	03/14/24 09:30
580-137730-12	NAN_DU1_6-9_C	Solid	03/05/24 16:00	03/14/24 09:30
580-137730-13	NAN_DU3_0-3	Solid	03/06/24 12:30	03/14/24 09:30
580-137730-14	NAN_DU3_3-6	Solid	03/06/24 12:30	03/14/24 09:30
580-137730-15	NAN_DU3_6-9	Solid	03/06/24 12:30	03/14/24 09:30
580-137730-16	NAN_DU2_0-3	Solid	03/06/24 15:00	03/14/24 09:30
580-137730-17	NAN_DU2_3-6	Solid	03/06/24 15:00	03/14/24 09:30
580-137730-18	NAN_DU2_6-9	Solid	03/06/24 15:00	03/14/24 09:30
580-137730-19	NAN_DU9_0-3	Solid	03/09/24 12:30	03/14/24 09:30
580-137730-20	NAN_DU9_3-6	Solid	03/09/24 12:30	03/14/24 09:30
580-137730-21	NAN_DU9_6-9	Solid	03/09/24 12:30	03/14/24 09:30
580-137730-22	NAN_DU10_0-3	Solid	03/09/24 14:30	03/14/24 09:30
580-137730-23	NAN_DU10_3-6	Solid	03/09/24 14:30	03/14/24 09:30
580-137730-24	NAN_DU10_6-9	Solid	03/09/24 14:30	03/14/24 09:30
580-137730-25	NAN_DU11_0-3	Solid	03/10/24 12:20	03/14/24 09:30
580-137730-26	NAN_DU11_3-6	Solid	03/10/24 12:20	03/14/24 09:30
580-137730-27	NAN_DU11_6-9	Solid	03/10/24 12:20	03/14/24 09:30
580-137730-28	NAN_DU12_0-3	Solid	03/10/24 13:10	03/14/24 09:30
580-137730-29	NAN_DU12_3-6	Solid	03/10/24 13:10	03/14/24 09:30
580-137730-30	NAN_DU12_6-9	Solid	03/10/24 13:10	03/14/24 09:30

Eurofins Environmental Testing Northwest, LLC
5755 8th Street East
Tacoma, WA 98424

Chain of Custody Record

eurofins | Environment Testing

Client Information	Sampler: KC, SM, RK	Lab PM: Tracy Dutton	Carrier Tracking No(s):	COC No:
Client Contact: Scott Moncrief	Phone: 808 2860222	E-Mail: scottmoncrief808@gmail.com	State of Origin: HI	Page: Page 1 of 3
Company: Kealamahi Pacific	PWSID:			Job #:
Address: 103 S Kalaheo Ave	Due Date Requested: std TAT			
City: Kailua	TAT Requested (days): std			
State, Zip: HI 96734	Compliance Project: Δ Yes Δ No			
Phone: 808 2860222	PO #: Purchase Order not required			
Email: scottmoncrief808@gmail.com	WO #:			
Project Name: Nanue Bridge	Project #:			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8 RCRA Metals	% moisture	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
NAN-DU8-0-3	3/3/24	1000	M/S	S			X	X		50 increment DU
NAN-DU8-3-6	↓	1000					X	X		
NAN-DU8-6-9	↓	1000					X	X		
NAN-DU1-0-3-A	3/5/24	1600					X	X		
NAN-DU9KC-3-6-A		1600					X	X		
NAN-DU9KC-6-9-A		1600					X	X		
NAN-DU9KC-0-3-B		1600					X	X		
NAN-DU9KC-3-6-B		1600					X	X		
NAN-DU9KC-6-9-B		1600					X	X		
NAN-DU9KC-0-3-C		1600					X	X		
NAN-DU9KC-3-6-C	↓	1600	↓	↓			X	X		

580-137730 Chain of Custody

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☒ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify) std

Special Instructions/QC Requirements:

Empty Kit Relinquished by: | Date: | Time: | Method of Shipment: FedEx

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Scott Moncrief	3/11/24 1100 Am	KPC		3/14/24 0930	EETN
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks:

Eurofins Environmental Testing Northwest, LLC
5755 8th Street East
Tacoma, WA 98424

Chain of Custody Record

eurofins | Environment Testing

Client Information	Sampler:	Lab PM:	Carrier Tracking No(s):	COC No:
Client Contact:	Phone:	E-Mail:	State of Origin:	Page: ~~Page 1 of 1~~ KC 2 of 3
Company: Kealamahi Pacific	PWSID:			Job #:

Address:	Due Date Requested:
City:	TAT Requested (days):
State, Zip:	Compliance Project: Δ Yes Δ No
Phone:	PO #: Purchase Order not required
Email:	WO #:
Project Name: Nanue Bridge	Project #:
Site:	SSOW#:

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8 RCRA Metals	% moisture	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
NAN-DU9-6-9-C	3/5/24	1600	MIS	S			X	X		50 increment DU
NAN-DU3-0-3	3/6/24	1230					X	X		
NAN-DU3-3-6		1230					X	X		
NAN-DU3-6-9		1230					X	X		
NAN-DU2-0-3		1500					X	X		
NAN-DU2-3-6		1500					X	X		
NAN-DU2-6-9		1500					X	X		
NAN-DU9-0-3	3/9/24	1230					X	X		
NAN-DU9-3-6		1230					X	X		
NAN-DU9-6-9		1230					X	X		
NAN-DU10-0-3		1430					X	X		

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☒ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify) std

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment: FedEx

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Scott Mencarick	3/11/24 11:00 HST			3/14/24 0930	EETN
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Eurofins Environmental Testing Northwest, LLC
5755 8th Street East
Tacoma, WA 98424

Chain of Custody Record

eurofins | Environment Testing

Client Information	Sampler:	Lab PM:	Carrier Tracking No(s):	COC No:
Client Contact:	Phone:	E-Mail:	State of Origin:	Page: Page 3 of 3

Company: Kealamahi Pacific | PWSID:

Job #:

Address:	Due Date Requested:
City:	TAT Requested (days):
State, Zip:	Compliance Project: Δ Yes Δ No
Phone:	PO #: Purchase Order not required
Email:	WO #:
Project Name: Nanue Bridge	Project #:
Site:	SSOW#:

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8 RCRA Metals	% moisture	PCBs	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
NAN_DU10_3-6	3/9/24	1430	MIS	S			X	X	X		50 increment DU
NAN_DU10_6-9	↓	1430	↓	↓			X	X			
NAN_DU11_0-3	3/10/24	1220					X	X			
NAN_DU11_3-6		1220					X	X	X		
NAN_DU11_6-9		1220					X	X			
NAN_DU12_0-3		1310					X	X			
NAN_DU12_3-6		1310					X	X			
NAN_DU12_6-9	↓	1310	↓	↓			X	X			
		LAST	ENTRY								

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☒ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify) std

Special Instructions/QC Requirements:

Empty Kit Relinquished by: | Date: | Time: | Method of Shipment: FedEx

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Scott Muncrief	3/11/24 1100 AM			3/14/24 0930	EETN
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks:

#1 IBII 13.3/13.2 LB/Ice/NO/FPO

#2 IBII 13.2/13.1 LB/Ice/NO/FPO

Login Sample Receipt Checklist

Client: EnviroQuest, Inc.

Job Number: 580-137730-1

Login Number: 137730
List Number: 1
Creator: Groves, Elizabeth

List Source: Eurofins Seattle

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	Cooler temperature outside limits,acceptable per client data quality objectives
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

APPENDIX B-1:

Synthetic Precipitation Leaching Procedure (SPLP)

Batch Test Leaching Method Results

Lab Report Available in Appendix A-2

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Table B-1: Analytical Soil Profiling Results - SPLP Pb - Nanue Bridge

			NAN_DU1_0-3_B 5-Mar-2024 0-3 inches bgs				NAN_DU3_6-9 6-Mar-2024 6-9 inches bgs				NAN_DU8_0-3 3-Mar-2024 0-3 inches bgs			
Analyte	Analytical Method	Units	**Results**	Q	RL	LOQ	**Results**	Q	RL	LOQ	**Results**	Q	RL	LOQ
Synthetic Precipitation Leaching Procedure (SPLP) Resource Conservation and Recovery Act (RCRA) Regulated Metals														
Total Lead	EPA 6020B	mg/kg	1133		0.47		1500		0.47		4300		0.47	
SPLP Lead	EPA 6010D	mg/L	0.080			0.030	0.41			0.030	0.59			0.030
SPLP Lead	EPA 6010D	ug/L	80				410			0.030	590			0.030
Kd Coefficient			**14,143**				**3,636**				**7,268**			

			NAN_DU10_3-6 9-Mar-2024 3-6 inches bgs				NAN_DU11_3-6 10-Mar-2024 3-6 inches bgs				NAN_DU12_3-6 10-Mar-2024 3-6 inches bgs			
Analyte	Analytical Method	Units	**Results**	Q	RL	LOQ	**Results**	Q	RL	LOQ	**Results**	Q	RL	LOQ
Synthetic Precipitation Leaching Procedure (SPLP) Resource Conservation and Recovery Act (RCRA) Regulated Metals														
Total Lead	EPA 6020B	mg/kg	9700		0.47		6400		0.48		7900		0.46	
SPLP Lead	EPA 6010D	mg/L	8.0			0.030	3.5			0.030	5.0			0.030
SPLP Lead	EPA 6010D	ug/L	8,000				3,500				5,000			
Kd Coefficient			**1193**				**1809**				**1560**			

Note: Kd Coefficient is greater than 20. Contaminant is not significantly mobile for concentration and soil type tested.

Notes:

bgs = below ground surface

mg/kg = miligram(s) per kilogram

mg/L = milligram(s) per liter

Kd = desorption coefficient

LOQ = Limit of quantification

Q = qualifier

Pb = lead

RL = reporting limit

SPLP = Synthetic Precipitation Leaching Procedure

ug/L = micrograms per liter

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Batch Test Leaching Model
Version: Fall 2011
Hawai'i Department of Health
Hazard Evaluation and Emergency Response Office

-Refer to accompanying technical memorandum for background and use of this spreadsheet (HDOH 2007).
-Physiochemical constants updated in Fall 2011 (refer to HDOH 2011).
-Spreadsheet calculates Kd desorption coefficient based on input contaminant concentration in soil and Batch Test data.
-Correlative concentration of contaminant in leachate calculated based on estimated Kd value (may differ from batch test data).
-Future impacts to groundwater estimated using simple groundwater/leachate dilution factor.
-Alternative model based on soil gas data provided in accompanying worksheet.
-Possibility of past impacts to groundwater not considered and must be evaluated separately.
-Check to ensure that this is an up-to-date version of the spreadsheet.
-Remove write protection if problems occur in selection of contaminant. Password to unprotect worksheet is "EAL" (under Tools menu).

STEPS:

1. Select chemical from pulldown list (unlisted chemicals - unprotect spreadsheet and input chemical name and chemical constants).
2. Input total contaminant concentration and SPLP (or other applicable batch test) concentration.
3. Input sample properties. Use default values if sample-specific data are not available.
4. Input Batch Test method information. Default SPLP method parameter values noted.
5. Input groundwater:leachate dilution factor (DF of 1.0 = no dilution; USEPA default = 20, USEPA 2002).
6. Input target groundwater action level for comparison to model calculation of groundwater impacts (optional).
7. Input chemical-specific Henry's Law Constant (Kh) and solubility if "Generic (Volatile)" or "Generic (Nonvolatile)" selected from pulldown list. Input "0" if values not available.
8. Spreadsheet calculates sample-specific Kd value and dissolved-phase concentration of contaminant in saturated sample.
9. Spreadsheet calculates concentration of contaminant in groundwater following impact by leachate.

Step 1: [10]Select Contaminant (use pulldown list)	LEAD

Step 2: Input Sample Data	DEFAULT	INPUT
[1]Concentration in soil sample (mg/kg)	N/A	1.2E+03
[1]Concentration in Batch Test solution (ug/L)	N/A	8.0E-02
Step 3: Input Sample Properties ([5]USEPA soil defaults noted)		
Sample density (g/cm^3)	1.50	1.50
Particle density (g/cm^3)	2.65	2.65
Fraction air-filled porosity (assume saturated soil)	0.00	0.00
Step 4: Batch Test Method Data (SPLP defaults noted)		
[2]Batch Test Solution Volume (ml):	2,000	2,000
[2]Batch Test Solution Density (g/cm^3):	1.0	1.0
[2]Batch Test Sample Weight (grams)	100	100

[3]Step 5: Input Groundwater/ Leachate Dilution Factor	DEFAULT	INPUT
	20	20
[4]Step 6 (optional): Input Target Groundwater Concentration (ug/L)		

Model Results	
[5]Kd partition Coefficient (cm^3/g):	1.5E+07
[6]Estimated Concentration in Source Area Leachate (ug/L):	-
[7]Estimated Concentration in Groundwater (ug/L):	-

Step 7: [10]Chemical Constants [Generic Chemical only]	

Kd >20. Contaminant not significantly mobile for concentration and soil type tested. Do not place below water table without further evaluation. Address other potential environmental concerns as needed (direct exposure, gross contamination, etc.).

Calculations:	
Sample porosity - total	0.43
Sample porosity - air-filled	0.00
Sample porosity - water-filled	0.43
Batch Test Solution Mass (grams)	2.0E+03
Batch Test Sample Mass (grams)	1.0E+02
Sample Mass:Solution Mass Ratio (gm/gm)	5.0E-02
Total Mass of Contaminant (ug)	1.2E+05
Mass Contaminant in Batch Test Solution (ug)	1.6E-01
Mass Contaminant Sorbed to Soil (ug)	1.2E+05
Concentration Sorbed (ug/kg)	1.2E+06
Batch Test Percent Solid Phase	100.0%
Batch Test Percent Dissolved Phase	0.0%
Batch Test Solid-Phase Contaminant Conc. (mg/kg)	1.2E+03
Batch Test Solution Contaminant Conc. (ug/L)	8.0E-02

Batch Test Leaching Model
Version: Fall 2011
Hawai'i Department of Health
Hazard Evaluation and Emergency Response Office

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-Spreadsheet calculates Kd desorption coefficient based on input contaminant concentration in soil and Batch Test data.
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-Future impacts to groundwater estimated using simple groundwater/leachate dilution factor.
-Alternative model based on soil gas data provided in accompanying worksheet.
-Possibility of past impacts to groundwater not considered and must be evaluated separately.
-Check to ensure that this is an up-to-date version of the spreadsheet.
-Remove write protection if problems occur in selection of contaminant. Password to unprotect worksheet is "EAL" (under Tools menu).

STEPS:

1. Select chemical from pulldown list (unlisted chemicals - unprotect spreadsheet and input chemical name and chemical constants).
2. Input total contaminant concentration and SPLP (or other applicable batch test) concentration.
3. Input sample properties. Use default values if sample-specific data are not available.
4. Input Batch Test method information. Default SPLP method parameter values noted.
5. Input groundwater:leachate dilution factor (DF of 1.0 = no dilution; USEPA default = 20, USEPA 2002).
6. Input target groundwater action level for comparison to model calculation of groundwater impacts (optional).
7. Input chemical-specific Henry's Law Constant (Kh) and solubility if "Generic (Volatile)" or "Generic (Nonvolatile)" selected from pulldown list. Input "0" if values not available.
8. Spreadsheet calculates sample-specific Kd value and dissolved-phase concentration of contaminant in saturated sample.
9. Spreadsheet calculates concentration of contaminant in groundwater following impact by leachate.

Step 1: [10]Select Contaminant (use pulldown list)	LEAD

Step 2: Input Sample Data	DEFAULT	INPUT
[1]Concentration in soil sample (mg/kg)	N/A	1.5E+03
[1]Concentration in Batch Test solution (ug/L)	N/A	4.1E-01
Step 3: Input Sample Properties ([5]USEPA soil defaults noted)		
Sample density (g/cm^3)	1.50	1.50
Particle density (g/cm^3)	2.65	2.65
Fraction air-filled porosity (assume saturated soil)	0.00	0.00
Step 4: Batch Test Method Data (SPLP defaults noted)		
[2]Batch Test Solution Volume (ml):	2,000	2,000
[2]Batch Test Solution Density (g/cm^3):	1.0	1.0
[2]Batch Test Sample Weight (grams)	100	100

[3]Step 5: Input Groundwater/ Leachate Dilution Factor	DEFAULT	INPUT
	20	20
[4]Step 6 (optional): Input Target Groundwater Concentration (ug/L)		

Model Results	
[5]Kd partition Coefficient (cm^3/g):	3.7E+06
[6]Estimated Concentration in Source Area Leachate (ug/L):	-
[7]Estimated Concentration in Groundwater (ug/L):	-

Step 7: [10]Chemical Constants [Generic Chemical only]	

Kd >20. Contaminant not significantly mobile for concentration and soil type tested. Do not place below water table without further evaluation. Address other potential environmental concerns as needed (direct exposure, gross contamination, etc.).

Calculations:	
Sample porosity - total	0.43
Sample porosity - air-filled	0.00
Sample porosity - water-filled	0.43
Batch Test Solution Mass (grams)	2.0E+03
Batch Test Sample Mass (grams)	1.0E+02
Sample Mass:Solution Mass Ratio (gm/gm)	5.0E-02
Total Mass of Contaminant (ug)	1.5E+05
Mass Contaminant in Batch Test Solution (ug)	8.2E-01
Mass Contaminant Sorbed to Soil (ug)	1.5E+05
Concentration Sorbed (ug/kg)	1.5E+06
Batch Test Percent Solid Phase	100.0%
Batch Test Percent Dissolved Phase	0.0%
Batch Test Solid-Phase Contaminant Conc. (mg/kg)	1.5E+03
Batch Test Solution Contaminant Conc. (ug/L)	4.1E-01

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-Spreadsheet calculates Kd desorption coefficient based on input contaminant concentration in soil and Batch Test data.
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-Future impacts to groundwater estimated using simple groundwater/leachate dilution factor.
-Alternative model based on soil gas data provided in accompanying worksheet.
-Possibility of past impacts to groundwater not considered and must be evaluated separately.
-Check to ensure that this is an up-to-date version of the spreadsheet.
-Remove write protection if problems occur in selection of contaminant. Password to unprotect worksheet is "EAL" (under Tools menu).

STEPS:

1. Select chemical from pulldown list (unlisted chemicals - unprotect spreadsheet and input chemical name and chemical constants).
2. Input total contaminant concentration and SPLP (or other applicable batch test) concentration.
3. Input sample properties. Use default values if sample-specific data are not available.
4. Input Batch Test method information. Default SPLP method parameter values noted.
5. Input groundwater:leachate dilution factor (DF of 1.0 = no dilution; USEPA default = 20, USEPA 2002).
6. Input target groundwater action level for comparison to model calculation of groundwater impacts (optional).
7. Input chemical-specific Henry's Law Constant (Kh) and solubility if "Generic (Volatile)" or "Generic (Nonvolatile)" selected from pulldown list. Input "0" if values not available.
8. Spreadsheet calculates sample-specific Kd value and dissolved-phase concentration of contaminant in saturated sample.
9. Spreadsheet calculates concentration of contaminant in groundwater following impact by leachate.

Step 1: [10]Select Contaminant (use pulldown list)	LEAD

Step 2: Input Sample Data	DEFAULT	INPUT
[1]Concentration in soil sample (mg/kg)	N/A	4.3E+03
[1]Concentration in Batch Test solution (ug/L)	N/A	5.9E-01
Step 3: Input Sample Properties ([5]USEPA soil defaults noted)		
Sample density (g/cm^3)	1.50	1.50
Particle density (g/cm^3)	2.65	2.65
Fraction air-filled porosity (assume saturated soil)	0.00	0.00
Step 4: Batch Test Method Data (SPLP defaults noted)		
[2]Batch Test Solution Volume (ml):	2,000	2,000
[2]Batch Test Solution Density (g/cm^3):	1.0	1.0
[2]Batch Test Sample Weight (grams)	100	100

[3]Step 5: Input Groundwater/ Leachate Dilution Factor	DEFAULT	INPUT
	20	20
[4]Step 6 (optional): Input Target Groundwater Concentration (ug/L)		

Model Results	
[5]Kd partition Coefficient (cm^3/g):	7.3E+06
[6]Estimated Concentration in Source Area Leachate (ug/L):	-
[7]Estimated Concentration in Groundwater (ug/L):	-

Step 7: [10]Chemical Constants [Generic Chemical only]	

Kd >20. Contaminant not significantly mobile for concentration and soil type tested. Do not place below water table without further evaluation. Address other potential environmental concerns as needed (direct exposure, gross contamination, etc.).

Calculations:	
Sample porosity - total	0.43
Sample porosity - air-filled	0.00
Sample porosity - water-filled	0.43
Batch Test Solution Mass (grams)	2.0E+03
Batch Test Sample Mass (grams)	1.0E+02
Sample Mass:Solution Mass Ratio (gm/gm)	5.0E-02
Total Mass of Contaminant (ug)	4.3E+05
Mass Contaminant in Batch Test Solution (ug)	1.2E+00
Mass Contaminant Sorbed to Soil (ug)	4.3E+05
Concentration Sorbed (ug/kg)	4.3E+06
Batch Test Percent Solid Phase	100.0%
Batch Test Percent Dissolved Phase	0.0%
Batch Test Solid-Phase Contaminant Conc. (mg/kg)	4.3E+03
Batch Test Solution Contaminant Conc. (ug/L)	5.9E-01

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-Future impacts to groundwater estimated using simple groundwater/leachate dilution factor.
-Alternative model based on soil gas data provided in accompanying worksheet.
-Possibility of past impacts to groundwater not considered and must be evaluated separately.
-Check to ensure that this is an up-to-date version of the spreadsheet.
-Remove write protection if problems occur in selection of contaminant. Password to unprotect worksheet is "EAL" (under Tools menu).

STEPS:

1. Select chemical from pulldown list (unlisted chemicals - unprotect spreadsheet and input chemical name and chemical constants).
2. Input total contaminant concentration and SPLP (or other applicable batch test) concentration.
3. Input sample properties. Use default values if sample-specific data are not available.
4. Input Batch Test method information. Default SPLP method parameter values noted.
5. Input groundwater:leachate dilution factor (DF of 1.0 = no dilution; USEPA default = 20, USEPA 2002).
6. Input target groundwater action level for comparison to model calculation of groundwater impacts (optional).
7. Input chemical-specific Henry's Law Constant (Kh) and solubility if "Generic (Volatile)" or "Generic (Nonvolatile)" selected from pulldown list. Input "0" if values not available.
8. Spreadsheet calculates sample-specific Kd value and dissolved-phase concentration of contaminant in saturated sample.
9. Spreadsheet calculates concentration of contaminant in groundwater following impact by leachate.

Step 1: [10]Select Contaminant (use pulldown list)	LEAD

Step 2: Input Sample Data	DEFAULT	INPUT
[1]Concentration in soil sample (mg/kg)	N/A	9.7E+03
[1]Concentration in Batch Test solution (ug/L)	N/A	8.0E+00
Step 3: Input Sample Properties ([5]USEPA soil defaults noted)		
Sample density (g/cm^3)	1.50	1.50
Particle density (g/cm^3)	2.65	2.65
Fraction air-filled porosity (assume saturated soil)	0.00	0.00
Step 4: Batch Test Method Data (SPLP defaults noted)		
[2]Batch Test Solution Volume (ml):	2,000	2,000
[2]Batch Test Solution Density (g/cm^3):	1.0	1.0
[2]Batch Test Sample Weight (grams)	100	100

[3]Step 5: Input Groundwater/ Leachate Dilution Factor	DEFAULT	INPUT
	20	20
[4]Step 6 (optional): Input Target Groundwater Concentration (ug/L)		

Model Results	
[5]Kd partition Coefficient (cm^3/g):	1.2E+06
[6]Estimated Concentration in Source Area Leachate (ug/L):	-
[7]Estimated Concentration in Groundwater (ug/L):	-

Step 7: [10]Chemical Constants [Generic Chemical only]	

Kd >20. Contaminant not significantly mobile for concentration and soil type tested. Do not place below water table without further evaluation. Address other potential environmental concerns as needed (direct exposure, gross contamination, etc.).

Calculations:	
Sample porosity - total	0.43
Sample porosity - air-filled	0.00
Sample porosity - water-filled	0.43
Batch Test Solution Mass (grams)	2.0E+03
Batch Test Sample Mass (grams)	1.0E+02
Sample Mass:Solution Mass Ratio (gm/gm)	5.0E-02
Total Mass of Contaminant (ug)	9.7E+05
Mass Contaminant in Batch Test Solution (ug)	1.6E+01
Mass Contaminant Sorbed to Soil (ug)	9.7E+05
Concentration Sorbed (ug/kg)	9.7E+06
Batch Test Percent Solid Phase	100.0%
Batch Test Percent Dissolved Phase	0.0%
Batch Test Solid-Phase Contaminant Conc. (mg/kg)	9.7E+03
Batch Test Solution Contaminant Conc. (ug/L)	8.0E+00

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-Check to ensure that this is an up-to-date version of the spreadsheet.
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STEPS:

1. Select chemical from pulldown list (unlisted chemicals - unprotect spreadsheet and input chemical name and chemical constants).
2. Input total contaminant concentration and SPLP (or other applicable batch test) concentration.
3. Input sample properties. Use default values if sample-specific data are not available.
4. Input Batch Test method information. Default SPLP method parameter values noted.
5. Input groundwater:leachate dilution factor (DF of 1.0 = no dilution; USEPA default = 20, USEPA 2002).
6. Input target groundwater action level for comparison to model calculation of groundwater impacts (optional).
7. Input chemical-specific Henry's Law Constant (Kh) and solubility if "Generic (Volatile)" or "Generic (Nonvolatile)" selected from pulldown list. Input "0" if values not available.
8. Spreadsheet calculates sample-specific Kd value and dissolved-phase concentration of contaminant in saturated sample.
9. Spreadsheet calculates concentration of contaminant in groundwater following impact by leachate.

Step 1: [10]Select Contaminant (use pulldown list)	LEAD

Step 2: Input Sample Data	DEFAULT	INPUT
[1]Concentration in soil sample (mg/kg)	N/A	6.4E+03
[1]Concentration in Batch Test solution (ug/L)	N/A	3.5E+00
Step 3: Input Sample Properties ([5]USEPA soil defaults noted)		
Sample density (g/cm^3)	1.50	1.50
Particle density (g/cm^3)	2.65	2.65
Fraction air-filled porosity (assume saturated soil)	0.00	0.00
Step 4: Batch Test Method Data (SPLP defaults noted)		
[2]Batch Test Solution Volume (ml):	2,000	2,000
[2]Batch Test Solution Density (g/cm^3):	1.0	1.0
[2]Batch Test Sample Weight (grams)	100	100

[3]Step 5: Input Groundwater/ Leachate Dilution Factor	DEFAULT	INPUT
	20	20
[4]Step 6 (optional): Input Target Groundwater Concentration (ug/L)		

Model Results	
[5]Kd partition Coefficient (cm^3/g):	1.8E+06
[6]Estimated Concentration in Source Area Leachate (ug/L):	-
[7]Estimated Concentration in Groundwater (ug/L):	-

Step 7: [10]Chemical Constants [Generic Chemical only]	

Kd >20. Contaminant not significantly mobile for concentration and soil type tested. Do not place below water table without further evaluation. Address other potential environmental concerns as needed (direct exposure, gross contamination, etc.).

Calculations:	
Sample porosity - total	0.43
Sample porosity - air-filled	0.00
Sample porosity - water-filled	0.43
Batch Test Solution Mass (grams)	2.0E+03
Batch Test Sample Mass (grams)	1.0E+02
Sample Mass:Solution Mass Ratio (gm/gm)	5.0E-02
Total Mass of Contaminant (ug)	6.4E+05
Mass Contaminant in Batch Test Solution (ug)	7.0E+00
Mass Contaminant Sorbed to Soil (ug)	6.4E+05
Concentration Sorbed (ug/kg)	6.4E+06
Batch Test Percent Solid Phase	100.0%
Batch Test Percent Dissolved Phase	0.0%
Batch Test Solid-Phase Contaminant Conc. (mg/kg)	6.4E+03
Batch Test Solution Contaminant Conc. (ug/L)	3.5E+00

Batch Test Leaching Model
Version: Fall 2011
Hawai'i Department of Health
Hazard Evaluation and Emergency Response Office

-Refer to accompanying technical memorandum for background and use of this spreadsheet (HDOH 2007).
-Physiochemical constants updated in Fall 2011 (refer to HDOH 2011).
-Spreadsheet calculates Kd desorption coefficient based on input contaminant concentration in soil and Batch Test data.
-Correlative concentration of contaminant in leachate calculated based on estimated Kd value (may differ from batch test data).
-Future impacts to groundwater estimated using simple groundwater/leachate dilution factor.
-Alternative model based on soil gas data provided in accompanying worksheet.
-Possibility of past impacts to groundwater not considered and must be evaluated separately.
-Check to ensure that this is an up-to-date version of the spreadsheet.
-Remove write protection if problems occur in selection of contaminant. Password to unprotect worksheet is "EAL" (under Tools menu).

STEPS:

1. Select chemical from pulldown list (unlisted chemicals - unprotect spreadsheet and input chemical name and chemical constants).
2. Input total contaminant concentration and SPLP (or other applicable batch test) concentration.
3. Input sample properties. Use default values if sample-specific data are not available.
4. Input Batch Test method information. Default SPLP method parameter values noted.
5. Input groundwater:leachate dilution factor (DF of 1.0 = no dilution; USEPA default = 20, USEPA 2002).
6. Input target groundwater action level for comparison to model calculation of groundwater impacts (optional).
7. Input chemical-specific Henry's Law Constant (Kh) and solubility if "Generic (Volatile)" or "Generic (Nonvolatile)" selected from pulldown list. Input "0" if values not available.
8. Spreadsheet calculates sample-specific Kd value and dissolved-phase concentration of contaminant in saturated sample.
9. Spreadsheet calculates concentration of contaminant in groundwater following impact by leachate.

Step 1: [10]Select Contaminant (use pulldown list)	LEAD

Step 2: Input Sample Data	DEFAULT	INPUT
[1]Concentration in soil sample (mg/kg)	N/A	7.9E+03
[1]Concentration in Batch Test solution (ug/L)	N/A	5.0E+00
Step 3: Input Sample Properties ([5]USEPA soil defaults noted)		
Sample density (g/cm^3)	1.50	1.50
Particle density (g/cm^3)	2.65	2.65
Fraction air-filled porosity (assume saturated soil)	0.00	0.00
Step 4: Batch Test Method Data (SPLP defaults noted)		
[2]Batch Test Solution Volume (ml):	2,000	2,000
[2]Batch Test Solution Density (g/cm^3):	1.0	1.0
[2]Batch Test Sample Weight (grams)	100	100

[3]Step 5: Input Groundwater/ Leachate Dilution Factor	DEFAULT	INPUT
	20	20
[4]Step 6 (optional): Input Target Groundwater Concentration (ug/L)		

Model Results	
[5]Kd partition Coefficient (cm^3/g):	1.6E+06
[6]Estimated Concentration in Source Area Leachate (ug/L):	-
[7]Estimated Concentration in Groundwater (ug/L):	-

Step 7: [10]Chemical Constants [Generic Chemical only]	

Kd >20. Contaminant not significantly mobile for concentration and soil type tested. Do not place below water table without further evaluation. Address other potential environmental concerns as needed (direct exposure, gross contamination, etc.).

Calculations:	
Sample porosity - total	0.43
Sample porosity - air-filled	0.00
Sample porosity - water-filled	0.43
Batch Test Solution Mass (grams)	2.0E+03
Batch Test Sample Mass (grams)	1.0E+02
Sample Mass:Solution Mass Ratio (gm/gm)	5.0E-02
Total Mass of Contaminant (ug)	7.9E+05
Mass Contaminant in Batch Test Solution (ug)	1.0E+01
Mass Contaminant Sorbed to Soil (ug)	7.9E+05
Concentration Sorbed (ug/kg)	7.9E+06
Batch Test Percent Solid Phase	100.0%
Batch Test Percent Dissolved Phase	0.0%
Batch Test Solid-Phase Contaminant Conc. (mg/kg)	7.9E+03
Batch Test Solution Contaminant Conc. (ug/L)	5.0E+00

Notes (refer also to accompanying memo).

1. Total contaminant concentration measured in soil sample and results of Batch Test analysis (e.g., SPLP).
2. Batch Test: Default SPLP method calls for 100 grams of sample and 2 liters of solution with a density of approximately 1.0
3. Site-specific or default groundwater/leachate dilution factor (default = 20, USEPA 2002).
4. Target groundwater action level. Refer to HDOH EAL document and appropriate groundwater category.
5. Partition Coefficient (Kd) = $Concentration_{sorbed}/Concentration_{solution}$ (after Roy et al 1992).
   Partition Coefficient units in L/Kg [(ug/Kg)/ug/L)] or cm^3/g [(ug/g)/ug/cm^3)]
   and assumed equilibrium partitioning (USEPA 2002). Refer to discussion and equations presented in accompanying HDOH
   contaminant concentration in leachate during transport through vadose zone not considered. Refer to Tier 2 concentration
8. Caution Message: A caution message will appear if the input batch test concentration is greater than 75% of the assumed contaminant solubility and a Kd value will not be generated (refer to "Leaching Evaluation of Heavily Contaminated Soils" in text). Model assumes that free product is present in the batch test solution and a Kd cannot be calculated (see text).
9. Error Message: The batch test data are not valid if the contaminant mass calculated for solute exceeds total mass calculated for sample (based on sample mass and input total contaminant concentration). This may not be uncommon given the potential for lab error at very low concentrations of contaminants.
10. "GENERIC CHEMICAL" can be selected from pulldown menu an used to model of any chemical, including chemicals not listed. Selection requires input of Kh (atm m3/mole) and Solubility constants in Step 7 if available. Note that a chemicals physiochemcial constants affect results for VOCs only if input Fraction Air-Filled Porosity is >0% (model considers partitioning into pore space air for VOCs as well as leachate).

References:

HDOH, 2007, Use of laboratory batch tests to evaluate potential leaching of contaminants from soil (updated April 2007): Hawai'i Dept. of Health, Hazard Evaluation and Emergency Response, http://hawaii.gov/health/environmental/hazard/index.html

HDOH, 2011, Evaluation of Environmental Hazards at Sites with Contaminated Soil and Groundwater: Hawai'i Department of Health, Office of Hazard Evaluation and Emergency Response, Fall 2011, www.hawaii.gov/health/environmental/hazard/eal2005.html.

USEPA, 1994, Synthetic Precipitation Leaching Procedure: U.S. Environmental Protection Agency, Office of Solid Waste, SW-846 Method 1312, September 1994, www.epa.gov/epaoswer/hazwaste/test/main.htm.

USEPA, 1999, Understanding Variation in Partition Coefficient, Kd, Values: Office of Air and Radiation, August 1999, EPA/402/R/99/004A, http://www.epa.gov/radiation/docs/kdreport/

USEPA, 2002, Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites: U.S. Environmental Protection Agency, Solid Waste and Emergency Response, OSWER 9355.4-24, December 2002, http://www.epa.gov/superfund/resources/soil/ssg_main.pdf

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APPENDIX B-2:

Toxicity Characteristic Leaching Procedure (TCLP) Results

Lab Report Available in Appendix A-2

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Table B-2: Analytical Soil Profiling Results - TCLP RCRA Regulated Metals - Nanue Bridge (Page 1 of 3)

				Sample Identifier	NAN_DU1_0-3_B			NAN_DU2_6-9			NAN_DU3_6-9		
				Sample Date	5-Mar-2024			6-Mar-2024			6-Mar-2024		
				Sample Depth (inches bgs)	0-3			6-9			6-9		
Analyte	Analytical Method	Units	Regulatory Limits for TCLP Metals	**Results**	Q	RL	**Results**	Q	RL	**Results**	Q	RL
Toxic Characteristic Leaching Procedure (TCLP) Resource Conservation and Recovery Act (RCRA) Regulated Metals												
Arsenic	EPA 6010D	mg/L	5.0	ND		0.060	ND		0.060	ND		0.060
Barium	EPA 6010D	mg/L	100	**0.89**		0.020	**0.98**		0.020	**1.0**		0.020
Cadmium	EPA 6010D	mg/L	1.0	ND		0.020	ND		0.020	ND		0.020
Chromium	EPA 6010D	mg/L	5.0	ND		0.025	ND		0.025	ND		0.025
Lead	EPA 6010D	mg/L	5.0	**0.60**		0.030	**0.69**		0.030	**1.1**		0.030
Mercury	EPA 7470A	mg/L	0.2	ND	H	0.0030	ND	H	0.0030	ND	H	0.0030
Selenium	EPA 6010D	mg/L	1.0	ND		0.10	ND		0.10	ND		0.10
Silver	EPA 6010D	mg/L	5.0	ND		0.050	ND		0.050	ND		0.050

Notes:

BGS = below ground surface

mg/L = milligram(s) per liter

ND = not detected in concentrations above the laboratories method reporting limit

RL = reporting limit

Q = qualifier

H = Sample was prepped or analyzed beyond the specified holding time. This does not meet regulatory requirements.

Table B-2: Analytical Soil Profiling Results - TCLP RCRA Regulated Metals - Nanue Bridge (Page 2 of 3)

				Sample Identifier			Sample Identifier			Sample Identifier		
				Sample Date			Sample Date			Sample Date		
				Sample Depth (inches bgs)			Sample Depth (inches bgs)			Sample Depth (inches bgs)		
Analyte	Analytical Method	Units	Regulatory Limits for TCLP Metals	NAN_DU8_0-3 3-Mar-2024 0-3 **Results**	Q	RL	NAN_DU9_0-3 9-Mar-2024 0-3 **Results**	Q	RL	NAN_DU10_3-6 9-Mar-2024 3-6 **Results**	Q	RL
Toxic Characteristic Leaching Procedure (TCLP) Resource Conservation and Recovery Act (RCRA) Regulated Metals												
Arsenic	EPA 6010D	mg/L	5.0	ND		0.060	ND		0.060	ND		0.060
Barium	EPA 6010D	mg/L	100	**1.1**		0.020	**0.64**		0.020	**1.1**		0.020
Cadmium	EPA 6010D	mg/L	1.0	ND		0.020	ND		0.020	ND		0.020
Chromium	EPA 6010D	mg/L	5.0	ND		0.025	ND		0.025	ND		0.025
Lead	EPA 6010D	mg/L	5.0	**3.7**		0.030	**2.8**		0.030	**17 ****		0.030
Mercury	EPA 7470A	mg/L	0.2	ND	H	0.0030	ND	H	0.0030	ND	H	0.0030
Selenium	EPA 6010D	mg/L	1.0	ND		0.10	ND		0.10	ND		0.10
Silver	EPA 6010D	mg/L	5.0	ND		0.050	ND		0.050	ND		0.050

Notes:

BGS = below ground surface

mg/L = milligram(s) per liter

ND = not detected in concentrations above the laboratories method reporting limit

RL = reporting limit

Q = qualifier

H = Sample was prepped or analyzed beyond the specified holding time. This does not meet regulatory requirements.

** = above regulatory limits

Table B-2: Analytical Soil Profiling Results - TCLP RCRA Regulated Metals - Nanue Bridge (Page 3 of 3)

				Sample Identifier					
				Sample Date	10-Mar-2024			10-Mar-2024	
				Sample Depth (inches bgs)	6-Mar			3-6	
Analyte	Analytical Method	Units	Regulatory Limits for TCLP Metals	**Results**	Q	RL	**Results**	Q	RL
Toxic Characteristic Leaching Procedure (TCLP) Resource Conservation and Recovery Act (RCRA) Regulated Metals									
Arsenic	EPA 6010D	mg/L	5.0	ND		0.060	ND		0.060
Barium	EPA 6010D	mg/L	100	**0.92**		0.020	**0.86**		0.020
Cadmium	EPA 6010D	mg/L	1.0	ND		0.020	ND		0.020
Chromium	EPA 6010D	mg/L	5.0	ND		0.025	ND		0.025
Lead	EPA 6010D	mg/L	5.0	**12 ****		0.030	**23 ****		0.030
Mercury	EPA 7470A	mg/L	0.2	ND	H	0.0030	ND	H	0.0030
Selenium	EPA 6010D	mg/L	1.0	ND		0.10	ND		0.10
Silver	EPA 6010D	mg/L	5.0	ND		0.050	ND		0.050

Notes:

BGS = below ground surface

mg/L = milligram(s) per liter

ND = not detected in concentrations above the laboratories method reporting limit

RL = reporting limit

Q = qualifier

H = Sample was prepped or analyzed beyond the specified holding time. This does not meet regulatory requirements.

** = above regulatory limits

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APPENDIX C:

Applicable or Relevant and Appropriate Requirements (ARARs) and To-Be-Considered (TBC) Criteria

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Appendix C: Preliminary Applicable or Relevant and Appropriate Requirements (ARAR) and Guidance to be Considered.

Requirement	Citation	Description	Governmental Authority	ARAR/TBC Information Type	Applicability to Site	Determination
Removal or Remedial Action						
EPA RSLs	EPA RSL Tables (November 2019)	Predetermined risk-based criteria used as a screening tool to determine the presence of pollutants, trigger investigation, and identify initial cleanup goals.	Federal	Chemical-Specific	Lead is present in site soil at concentrations exceeding **EPA** RSLs for residential land use.	TBC Information. EPA RSLs are not promulgated.
HDOH EALs	HDOH EAL Tables (November 2017)	Predetermined risk-based criteria used as a screening tool to determine the presence of pollutants, trigger investigation, and identify initial cleanup goals.	State	Chemical-Specific	Lead is present in site soil at concentrations exceeding HDOH **EALs.**	TBC Information. HDOH EALs are not promulgated. Relevant to lead as the state recommended clean-up levels for parks is more stringent than the RSLs for residential land use.
Excavation and/or Earth Moving Activities						
Discharge of Dredged or Fill Material to Waters of the U.S.	33 use§ 1344; CWA § 404; 33 USC§ 1311(a)	Requires permits for the discharge of dredged or fill materials to into waters of the United States, including wetlands.	Federal	Action-Specific	The site is adjacent to Nanue Stream.	Potentially applicable. The site is adjacent to Nanue Stream. The National Wetland Inventory classifies the stream channel and banks as riverine upper perennial, unconsolidated bottom, permanently flooded. If a survey determines that the wetland is jurisdictional, then compliance with the substantive requirements of the CWA and § 404 Permit process may be required for any response action that includes excavation of soil and installation of clean fill material in the wetland area.
Coastal Zones	HRS Title 13, Chapter 205A: Coastal Zone Management. S	Provides for the protection of coastal resources.	State	Location-Specific	The majority of the site is located within a Special Management Area as designated by the State of Hawaii.	Potentially applicable. Excavation activities that alter coastal vegetation and landforms will comply with substantive requirements to minimize effects on coastal resources.
Coastal Zones	16 USC §-1455 (c); 15 CFR § 930.30-33, 36(a}, and 39(b-d)	Requires federal actions or activities conducted within or affecting a coastal zone be consistent with the State's coastal program. Also requires protection of valuable coastal ecosystems and minimization of adverse impacts on coastal ecosystems.	Federal	Location-Specific	The majority of the site falls within a Special Management Area as designated by the State of Hawaii.	Potentially applicable. The selected response action will comply with this regulation because the site location is within the coastal zone.
NPDES	CWA§ 402; 33 USC§ 1311(a): 40 CFR Parts 122 and 125	Regulates the discharge of treated effluent and storm water runoff to waters of the United States.	Federal	Action-Specific	The site is adjacent to Nanue Stream.	Applicable if the selected response action disturbs more than 1 acre (Current potential remedial action area is more than 1 acre). Response activities will comply with the **ARARs** to prevent discharge to the adjacent stream. BMPs will be implemented. Although administrative requirements do not qualify as **ARARs,** a stormwater pollution prevention plan will be prepared to demonstrate compliance with the substantive requirements of this regulation.
Soil Erosion and Sediment Control, Grading Excavation, Clearing and Grubbing.	HRS Title 12, Chapter 180C, Soil Erosion and Sediment Control. Hawaii County Code (1983, 2016 Amended) Chapter 10, Section 10-26	Regulates grading, excavation, clearing and grubbing activities for management of soil erosion and sediment control.	State County	Action-Specific	Response actions that include grading or excavation.	Applicable. Any grading, grubbing, stockpiling activities will require a permit and BMPs to manage soil erosion and sediment control. Any removed vegetation should not be stored along the banks of Nanue Stream. Grading activities will result in positive drainage to prevent the accumulation or retention of surface water in depressions. Hazardous conditions will not be created by fill.

Appendix C: Preliminary Applicable or Relevant and Appropriate Requirements (ARAR) and Guidance to be Considered.

Requirement	Citation	Description	Governmental Authority	ARAR/TBC Information Type	Applicability to Site	Determination
Excavation and/or Earth Moving Activities *(continued)*						
Control of Fugitive Dust	HRS 19 342B-11; 34 HAR Title 11, Chapter 60.1-33: Air Pollution Control	Requires mitigation of fugitive dust visible beyond the property line through implementation of best practical operation or treatment.	State	Action-Specific	Response actions that include excavation.	Potentially applicable. Response actions will not cause or permit the discharge of visible fugitive dust beyond the site perimeter. Dust may be controlled by screen or limited application of water spraying over disturbed area to prevent the discharge of fugitive dust. Runoff from dust control is not permitted.
Control of Noise	HRS Title 19, Chapter 342F-30; HAR Title 11, Chapter 46: Noise Pollution Control	Defines maximum permissible sound levels to prevent, control, and abate noise pollution from stationary noise sources and equipment related to agricultural, construction, and industrial activities.	State	Action-Specific	Response actions that include the use of heavy machinery and trucks.	Potentially applicable. Response actions will not cause excessive noise beyond the exclusion zone outside of the hours of 0700 and 2200. Permissible sound outside of the exclusion zone for multifamily residential, commercial, and resort areas shall not exceed 60 decibels. Outside of the hours of 0700 and 2200, permissible sound levels shall not exceed 50 decibels. Site is located within an isolated gulch. Residential housing is above the site.
Waste Disposal						
Identification of Hazardous Waste	40 CFR Part 261	Identifies solid wastes subject to regulation as hazardous wastes under **RCRA.** Identifies chemical characteristics of hazardous waste for comparison with site-specific waste data.	Federal	Chemical-Specific	Lead is present in site soil.	Relevant and appropriate for excavation activities because the regulation establishes procedures and numeric limits for the identification and management of listed and characteristic hazardous waste. Sample results in the bridge area are below the US EPA TCLP standard for Hazardous Waste.
Storage, Handling, and Pre-Transportation Requirements for Hazardous Waste	40 CFR Part 262	Specifies hazardous waste storage, handling, labeling, record keeping, manifesting, and all pre-transport requirements.	Federal	Action-Specific	Lead is are present in site soil.	Potentially Applicable for excavation activities because the regulation establishes procedures for the storing and handling listed and characteristic hazardous waste. Sample results from the DUs in the bridge area are above the standards for TCLP identified hazardous waste.
Conservation and Protection of Ecological and Cultural Resources						
Migratory Bird Treaty Act	16 USC §703(a)	Prohibits the taking, possessing, buying, selling, or bartering of any migratory bird, including feathers or other parts, nest eggs, or products, except as allowed by regulations.	Federal	Location-Specific	Potential for migratory birds to loaf/nest on site.	Potentially applicable. Survey site and follow guidelines for disturbance of migratory bird species. Potential for habitat for the indigenous, Black-crowned Night-Heron (*Nycticorax nycticorax*) based on 2018 Kapue Bridge Survey.
Native American Graves Protection and Repatriation Regulations	43 CFR 10, § 3c and 3d	Requires coordination with Native Hawaiian organization to determine disposition of human remains and cultural artifacts. Requires protection of said items when	Federal	Location-Specific	No identified archaeological sites. Additional review will be conducted. Site has been highly disturbed due to bridge construction, tsunami impacts, and flooding.	Potentially relevant and appropriate. Comply with substantive requirements excavation, removal. and preservation of human remains and artifacts if selected response action includes excavation and human remains, burial sites, or cultural artifacts are encountered.

Appendix C: Preliminary Applicable or Relevant and Appropriate Requirements (ARAR) and Guidance to be Considered.

Requirement	Citation	Description	Governmental Authority	ARAR/TBC Information Type	Applicability to Site	Determination
Conservation and Protection of Ecological and Cultural Resources *(continued)*						
Burial Sites and Human Remains	HAR Title 13, Chapter 300: Rules of Practice and Procedures Relating to Burial Sites and Human Remains	Governs practices and procedures relating to the proper care and protection of burial sites and human skeletal remains 50 years or older.	State	Location-Specific		Potentially applicable. Comply with the substantive requirements for the excavation, removal, and preservation of humans remains if selected response action includes excavation and human remains or burial sites are encountered.
Protection of Archaeological Resources	43 CFR § 7.4(a) and 7.5(b)(1)	Requires protection of archaeological resources if discovered.	Federal	Location-Specific		Potentially applicable. Comply with substantive requirements to prevent irreparable damage to or destruction of human remains and artifacts and to preserve archaeological and scientific data if selected response action includes excavation and human remains, burial sites, or cultural artifacts are encountered.
National Archaeological and Historical Preservation Act; National Historic Preservation Act	16 USC 469; 16 USC§ 470; 36 CFR Part 800	Alteration of terrain that threatens significant scientific, prehistoric, historic, or archeological data may require actions to recover and preserve artifacts. Includes coordination with federal and state officials to determine proposed site activities have the potential to cause adverse effects on historic properties.	Federal	Action-Specific and Location-Specific		Potentially applicable. Comply with the substantive requirements to provide for data recovery and preservation activities if selected response action includes terrain alterations that result in irreparable loss or destruction of significant scientific, prehistoric, historical, or archaeological data.
Historic Preservation	HRS Chapter 6E.	Requires action to be taken to locate, identify, evaluate, and protect cultural resources.	State	Location-Specific		Potentially applicable. Comply with substantive requirements to prevent the irreparable damage and destruction of human remains or artifacts and to preserve the archaeological and scientific data if selected response action includes excavation and human remains. burial sites, or cultural artifacts are encountered.
Endangered Species Act	16 USC§ 1538(a)(1)(B); 50 CFR § 17.21	Requires action to conserve endangered or threatened species, including coordination with the Department of the Interior and the U.S. Fish and Wildlife Service.	Federal	Location-Specific	The site has potential habitat for the Hawaiian stilt (*Himantopus mexicanus knudseni*). Potential for Hawaiian Hoary bat (*Aeorestes semotus*), or Hawaiian Hawk (*Buteo solitarius*), however no trees will be removed or disturbed during site work, minimizing potential impacts. Construction will take place during daylight hours and will not use nocturnal lights. Vegetation is non-native or common species and consists of maintained landscaping (grass).	Potentially relevant and appropriate. No designated critical habitat is at the site. Comply with requirements to protect rare/threatened and endagered species and their habitat if documented or if they appear at the site.

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APPENDIX D:

REMEDIAL ALTERNATIVE COST COMPARISON: TBD

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