STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S0.1

INDEX TO NANAHU BRIDGE DRAWINGS		
DRAWING NO.	SHEET	DESCRIPTION
RG3083-A	S0.1	INDEX TO BRIDGE DRAWINGS
RG3083-B	S0.2	STRUCTURAL GENERAL NOTES
RG3083-C	S0.3	QUANTITY SCHEDULE
RG3083-D	S0.4	EXISTING BRIDGE DEMOLITION PLAN
RG3083-E	S0.5	EXISTING BRIDGE ABUTMENT ELEVATIONS
RG3083-F	S1.1	BRIDGE LAYOUT PLAN
RG3083-G	S1.2	BRIDGE FOUNDATION PLAN
RG3083-H	S1.3	BRIDGE ABUTMENT PLAN
RG3083-I	S1.4	BRIDGE DECK FRAMING PLAN
RG3083-J	S2.1	LONGITUDINAL SECTION
RG3083-K	S2.2	TYPICAL CROSS SECTION
RG3083-L	S3.1	ABUTMENT NO. 1 ELEVATION
RG3083-M	S3.2	ABUTMENT NO. 2 ELEVATION
RG3083-N	S3.3	ABUTMENT NO. 1 DETAIL
RG3083-O	S3.4	ABUTMENT NO. 2 DETAIL
RG3083-P	S3.5	GRS ABUTMENT DETAILS - 2
RG3083-Q	S3.6	TYPICAL GRS ABUTMENT DETAILS
RG3083-R	S4.1	PRESTRESSED PLANK
RG3083-S	S4.2	PLANK SECTIONS
RG3083-T	S5.1	GUARDRAIL DETAILS
RG3083-U	S5.2	RAILING SECTION - 1
RG3083-V	S5.3	RAILING SECTION - 2
RG3083-W	S6.1	TYPICAL APPROACH SLAB SECTION
RG3083-X	S7.1	BYPASS BRIDGE FOUNDATION PLAN
RG3083-Y	S7.2	BYPASS BRIDGE ABUTMENT ELEVATIONS
RG3083-Z	S7.3	BYPASS BRIDGE ABUTMENT SECTION

NANAHU CONSTRUCTION AND CONCRETE PLACEMENT SEQUENCE:

1. *Abutment 2 Ecoblock Cap*
2. *Cantilever Beam Footing*
3. *Plank Seats and 6" Slab-On-Grade*
4. *Bridge Deck*
5. *Approach Slab*
6. *Barrier Railing (Mauka Abutment 2 and Makai Abutment 1)*
7. *Barrier Railing (Mauka Abutment 1 and Makai Abutment 2)*
8. *End Post*

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KEN KAZUO HAYASHIDA
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SIGNATURE — April 30, 2022 EXPIRATION DATE OF THE LICENSE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

NANAHU (HOOLAPA) STREAM BRIDGE

KAMEHAMEHA HIGHWAY

HONOLULU COUNTY, HAWAII

INDE□ TO BRIDGE DRA□INGS

AS-BUILT DRAWINGS

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	1 of 50	NOVEMBER 2018	RG3083-A

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S0.2

GENERAL:

A. Design standards: AASHTO LRFD Bridge Design Specification, 7th Edition, 2014 as amended by State of Hawaii Department of Transportation Highways Division Design Criteria for Bridges and Structures, August 8, 2014.
B. The Contractor shall compare all the contract documents with each other and report in writing to the Engineer all inconsistencies and omissions.
C. The contractor shall take field measurements and verify field conditions and shall compare such field measurements and conditions with the drawings. Report in writing to the Engineer all inconsistencies and omissions.
D. The contractor shall be responsible for coordinating the work of all trades.
E. The contractor shall be responsible for means and methods of construction, workmanship and job safety.
F. The contractor shall provide temporary shoring and bracing as required for stability of structural members and systems.
G. Construction loading shall not exceed design live load unless special shoring is provided. Permitted construction loads shall be properly reduced in areas where the structure has not attained full design strength.
H. The contractor shall be responsible for protection of the adjacent properties, structures, streets and utilities during the construction period. Any damaged or deteriorated property shall be restored to the condition prior to the beginning of work or better at no cost to the state.
I. Details noted as typical on the structural drawings shall apply in all conditions unless specifically shown or noted otherwise.

DESIGN CRITERIA:

A. Live loads
   1. Vehicular: HL-93
   2. Bridge railing: in accordance with AASHTO TL-3
B. Lateral loads
   1. Seismic
      a. Spectral response acceleration coefficients
         i) Short period, s_s: 0.363g
         ii) 1-sec period, s_1: 0.099g
      b. Site Class: D
      c. Seismic Zone: 2
C. Soils
   1. Strength limit state bearing capacity
      a. GRS abutments and approach slabs: 6,100 psf
      b. Bypass bridge abutments: 4,000 psf
   2. Earth pressure
      a. Active (level backfill):
         i) Unrestrained 53 pcf
         ii) Restrained: 74 pcf
      b. Passive:
         i) Strength limit state: 94 pcf
         ii) Extreme limit state: 188 pcf
   3. Coefficient of friction strength limit state: 0.44
   4. Coefficient of friction extreme event limit state: 0.55
D. Future wearing surface (curb to curb): 25 psf
E. Future utility line each side of bridge: 150 plf

FOUNDATION:

A. Foundation design is based on the Geotechnical Exploration and Evaluation Report, dated August 2019.
B. Contractor shall provide de-watering of excavated areas, as required.
C. Footings shall bear on undisturbed in-situ firm soils bottom of footings shall be compacted to provide a relatively firm and smooth bearing surface prior to placement of reinforcing steel and concrete. If soft and/or loose materials are encountered at the bottom of footing excavations, they shall be over-excavated to expose the underlying firm materials. The over-excavated area shall be backfilled with select granular material compacted to a minimum of 95% relative compaction or the footing bottom may be extended down to the underlying competent material. Contractor may substitute flowable concrete or the granular material upon approval from the Engineer.
D. Excavations for footings shall be approved by the Geotechnical Engineer of Record prior to placement of concrete and reinforcing.
E. Engineered fill and backfill shall be in accordance with FP-14 and associated SCR's.
F. Fill should be moisture conditioned to within two percent of the optimum moisture content and placed in horizontal lifts not to exceed six inches. Fill shall be compacted to minimum 95%relative density as measured by AASHTO T180.

CONCRETE:

A. Concrete construction shall conform to the FP-14 Specifications and associated SCR's.
B. Concrete shall be normal weight hard rock concrete and shall have the following minimum 28 day compressive strength or comply with class of concrete compressive strength listed in the FP-14 Specifications:

1. Pre-stressed piles	6000 psi
2. Pre-stressed planks	8000 psi
3. Abutment footings and pile caps	Class A
4. Slab topping, approach slabs, and railings	Class A
5. Abutment walls and wing walls	Class A
6. All other concrete	Class A

C. Concrete delivery tickets shall record all free water in the mix at batching plant, added for consistency by driver, and any additional request by contractor up to the maximum amount allowed by the mix design.
D. All inserts, anchor bolts, plates, and other items to be cast in the concrete shall be hot-dipped galvanized according to ASTM A153 unless otherwise noted.
E. Reinforcing bars, anchor bolts, inserts, and other items to be cast in the concrete shall be secured in position prior to placement of concrete.
F. Conduits, pipes, and sleeves passing through a slab or footing that do not conform to typical details shall be located and the proposed construction detail submitted to the Engineer for approval.
G. Conduits, pipes, and sleeves embedded within a slab or wall (other than those merely passing through) shall be:
   1. No larger in outside dimensions than one third the overall slab or wall thickness in which they are embedded.
   2. Placed in the middle one third of slab or wall thickness
   3. Spaced no closer than three diameters or widths on center.
H. Conduits, pipes, and sleeves shall not be placed through or embedded in a beam unless specifically detailed.
I. The contractor shall locate construction joints not shown on the drawings, so as not to impair the strength of the structure and to minimize shrinkage stresses. Submit proposed locations of construction joints to the Engineer for approval.
J. Non-shrink grout shall be a premixed non-metallic formula, shall be capable of developing a minimum compressive strength of 5,000 psi in 3 days and 8,900 psi in 28 days, and shall contain at least 10 grams of migrating amine carboxylate corrosion inhibitor when grout is in contact with steel appurtenances. Precast plank shear keys will not require corrosion inhibitor.
K. Joint filler shall conform to FP-14 section 712.01(b).
L. A shrinkage reducing admixture conforming to SCR section 711.03(b) shall be included in the concrete mix for all cast-in-place concrete.
M. A corrosion inhibiting admixture conforming to SCR section 711.03(a) shall be included in the concrete mix for all concrete.
N. Reinforcing fibers conforming to SCR section 725.17(b) shall be included in the concrete mix for members as specified in SCR section 552.03.

MASONRY:

A. Concrete masonry units shall conform to ASTM C90 for normal weight load-bearing concrete masonry units with a unit compressive strength of 3050 psi.
B. Second-hand masonry units shall not be reused unless they conform to the requirements of new units. The units shall be of whole, sound materials and free from cracks and other defects that will interfere with proper laying and use. Old mortar shall be cleaned from the unit before reuse.
C. All cells and bond courses with reinforcement and inserts shall be concrete filled.
D. When concrete filling is stopped for one hour or longer, horizontal construction joints shall be formed by stopping the concrete pour 1 1/2 inches below the top of the uppermost unit.
E. Walls shall be constructed in conventional running bond, unless otherwise noted.
F. Open-ended blocks shall not be substituted for standard concrete masonry units.

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NANAHU (HOOLAPA) STREAM BRIDGE

KAMEHAMEHA HIGHWAY

HONOLULU COUNTY, HAWAII

STRUCTURAL GENERAL NOTES

AS-BUILT DRAWINGS

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	2 of 50	NOVEMBER 2018	RG3083-B

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S0.3

REINFORCING STEEL:

A. Reinforcing steel shall be deformed bars conforming to AASHTO M31, Grade 60, unless otherwise noted.
B. Low alloy steel deformed bars shall conform to FP-14 section 709.01(i), Grade 60, unless otherwise noted.
C. Clear concrete cover for reinforcing bars shall be as follows, unless otherwise noted:
  1. Footings, slabs, etc. cast against earth: 3"
  2. Footings, walls, grade beams, etc. formed and exposed to earth or weather: 2"
  3. Bridge deck top reinforcement: 2-1/2"
  4. Other: 2"
D. Reinforcing steel shall be spliced where indicated on plans. Provide lap splice length per typical details and schedule, unless otherwise noted.
E. Mechanical splice connectors shall develop in tension 125 percent of the specified minimum yield strength of reinforcing bars.
F. Provide standard hooks conforming to ACI SP-66.
G. Fabricate reinforcing bars according to ACI SP-66, ACI Detailing Manual.
H. Reinforcing steel shall be placed and secured in conformance with crsi manual of standard practice with placement tolerances per ACI standard 117.

STRUCTURAL STEEL:

A. Fabrication and erection of structural steel shall conform to the american institute of steel construction manual of steel construction, thirteenth edition.
B. Structural steel shall conform to ASTM A36 unless otherwise noted.
C. Steel wide flange sections shall conform to ASTM A992.
D. Plates and bars shall conform to ASTM A36.
E. Welds and welding procedures shall conform to the structural welding code AWS D1.1 of the american welding society.
F. Welding shall be performed by welders prequalified for welding procedures to be used.
G. Welding electrodes shall be E70xx for carbon steel.
H. High-strength bolts shall conform to ASTM A325, type N. Installation shall be assured by any of the following methods:
  1. Turn of nut method
  2. Direct tension indicator
  3. Calibrated wrench
  4. Alternative design bolt
I. All anchor bolts, plates, and other items to be cast in concrete shall be hot-dip galvanized according to ASTM A153 unless otherwise noted.
J. Carbon steel bolts shall conform to ASTM A307, grade a unless otherwise noted, and shall be hot-dip galvanized according to ASTM A153.
K. All steel shall be hot-dip galvanized after fabrication according to ASTM A123.
L. Any damaged galvanized surface shall be repaired as follows:
  1. prepare surface per sspc-sp1, solvent cleaning.
  2. apply two coats of cold applied galvanizing compound containing 95% metallic zinc content by weight in dry film and 52% solids content by volume.
  3. application rate shall be 1.5 mils dry film thickness per coat.

LOAD RATING

	Rating Factor	Distribution Factor	Load Effect	Controlling Member
HL-93 Inventory	1.77	0.328	Positive Moment	Interior Girder
HL-93 Operating	2.29	0.328	Positive Moment	Interior Girder

ESTIMATE

Item No.	Description	Quantity	Unit	Notes
20304-1000	Removal of structures and obstructions	LPSM	LPSM	-
20435-2000	Backfill, Granular	40	CUYD	(1)
20720-0400	Reinforcement Geosynthetic, Type 4	2320	SQYD	-
20801-0000	Structure excavation	840	CUYD	(2)
20803-0000	Structure backfill (GRS)	550	CUYD	-
55201-1500	Structure Concrete	136	CUYD	(3)
55302-3500	Precast, prestressed concrete slab, 14" solid	500	LNFT	(4)
55401-1000	Reinforcing steel	45400	LB	-
55601-0500	Bridge railing, concrete	137	LNFT	-
61707-0000	Structure Transition Railing	100	LNFT	(5)

ESTIMATE NOTES:

(1) Includes cost of drain pipes, geocomposite drains, aggregate base course backfill and aggregate subbase course
(2) Includes cost of GRS backfill excavation
(3) Includes cost of bridge deck, approach slabs
(4) Includes cost of concrete, reinforcing steel, prestressing steel, inserts, plates, lifting devices, and other materials required for the manufacture and erection of the planks
(5) Includes cost of furnishing and installing posts, blocks, thrie and W-beam rail elements, anchor plates, and installation hardware

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NANAHU (HOOLAPA) STREAM BRIDGE

KAMEHAMEHA HIGHWAY

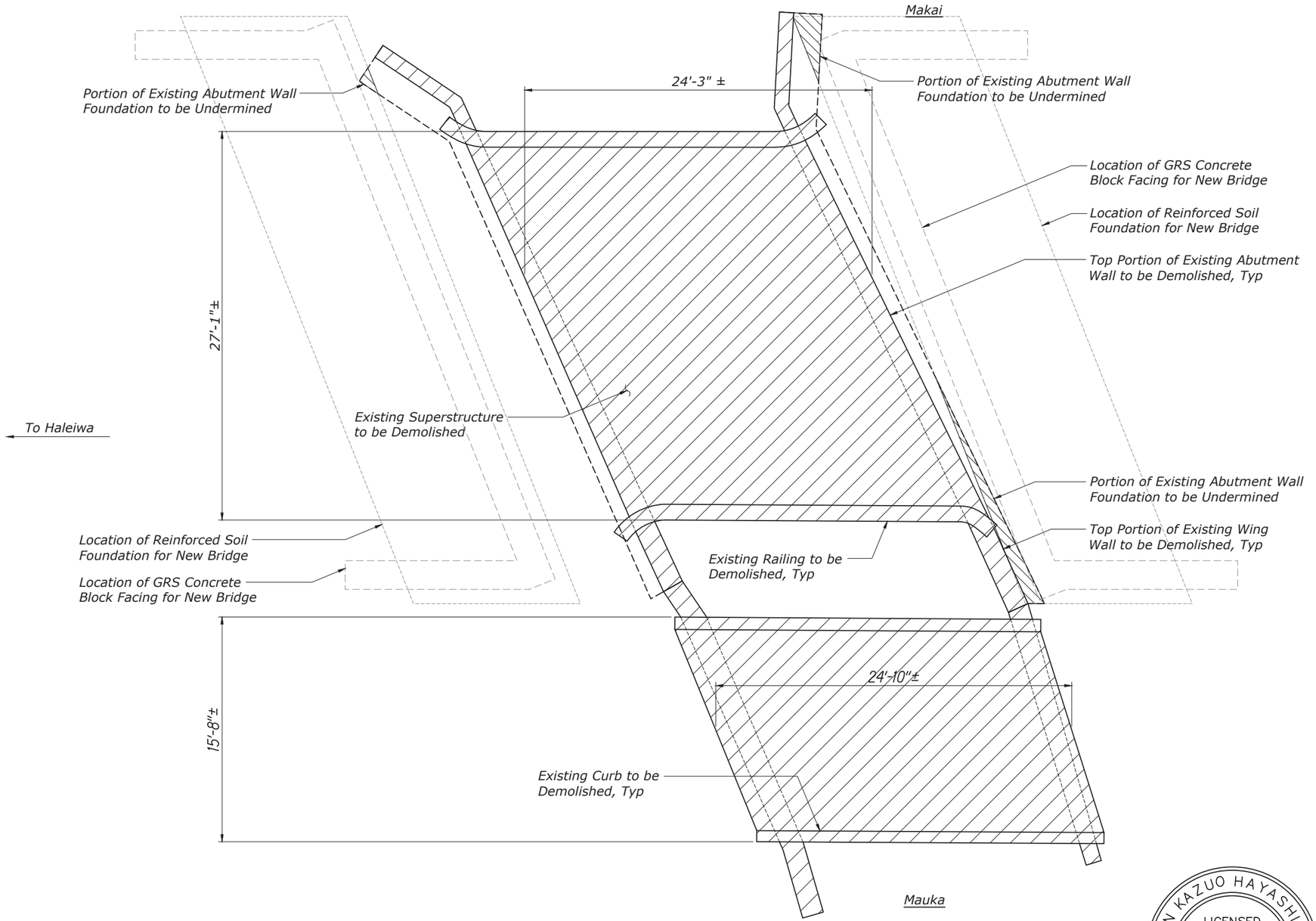
HONOLULU COUNTY, HAWAII

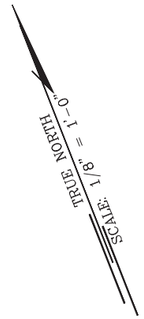
□UANTIT□ SC□EDULE

AS-BUILT DRAWINGS

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	3 of 50	NOVEMBER 2018	RG3083-C

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S0.4





EXISTING BRIDGE DEMOLITION PLAN

Scale: ⅛" = 1'-0"

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NANAHU (HOOLAPA) STREAM BRIDGE

KAMEHAMEHA HIGHWAY

HONOLULU COUNTY, HAWAII

EXISTING BRIDGE DEMOLITION PLAN

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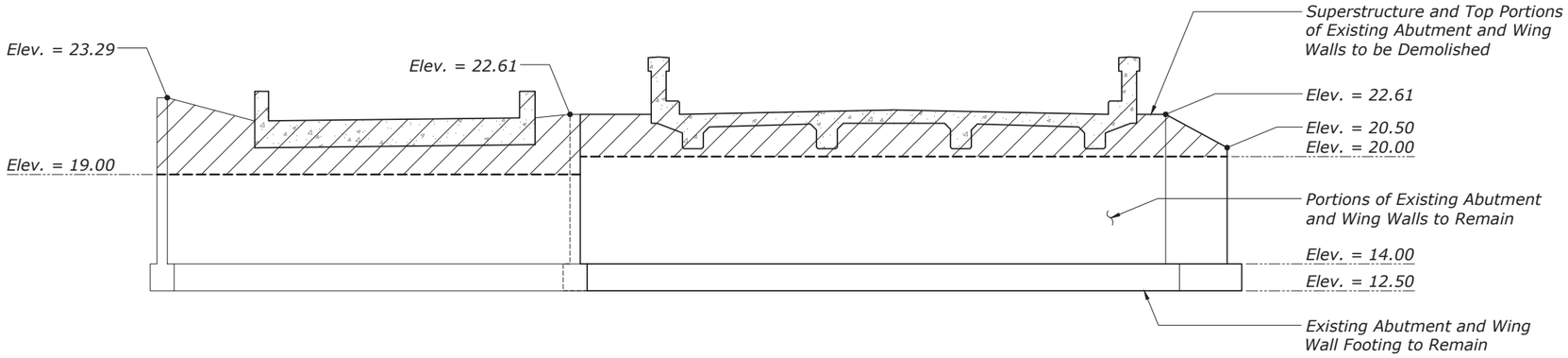
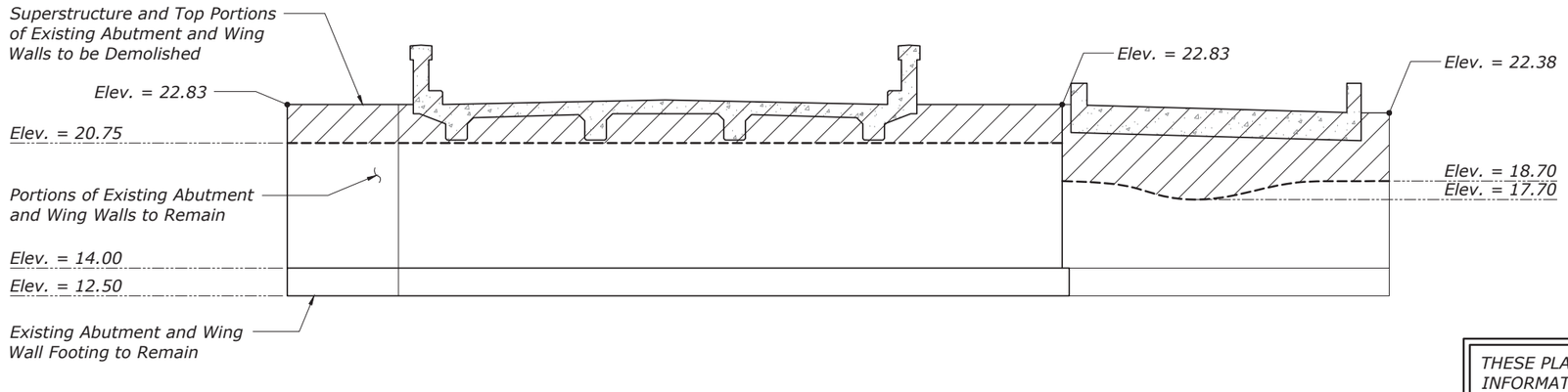
								BL & BC	CADD	MH		MH	4 of 50	NOVEMBER 2018	RG3083-D

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S0.5



EXISTING BRIDGE WEST ABUTMENT FRONT ELEVATION

Scale: ⅛" = 1'-0"



EXISTING BRIDGE EAST ABUTMENT FRONT ELEVATION

Scale: ⅛" = 1'-0"

NOTES:

1. *The orientations of the views are perpendicular to the baseline of the highway.*
2. *Temporary shoring shall be used as needed to maintain the integrity and stability of the existing abutment walls until the bridge concrete deck topping has been placed.*

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EXISTING BRIDGE ABUTMENT ELEVATIONS

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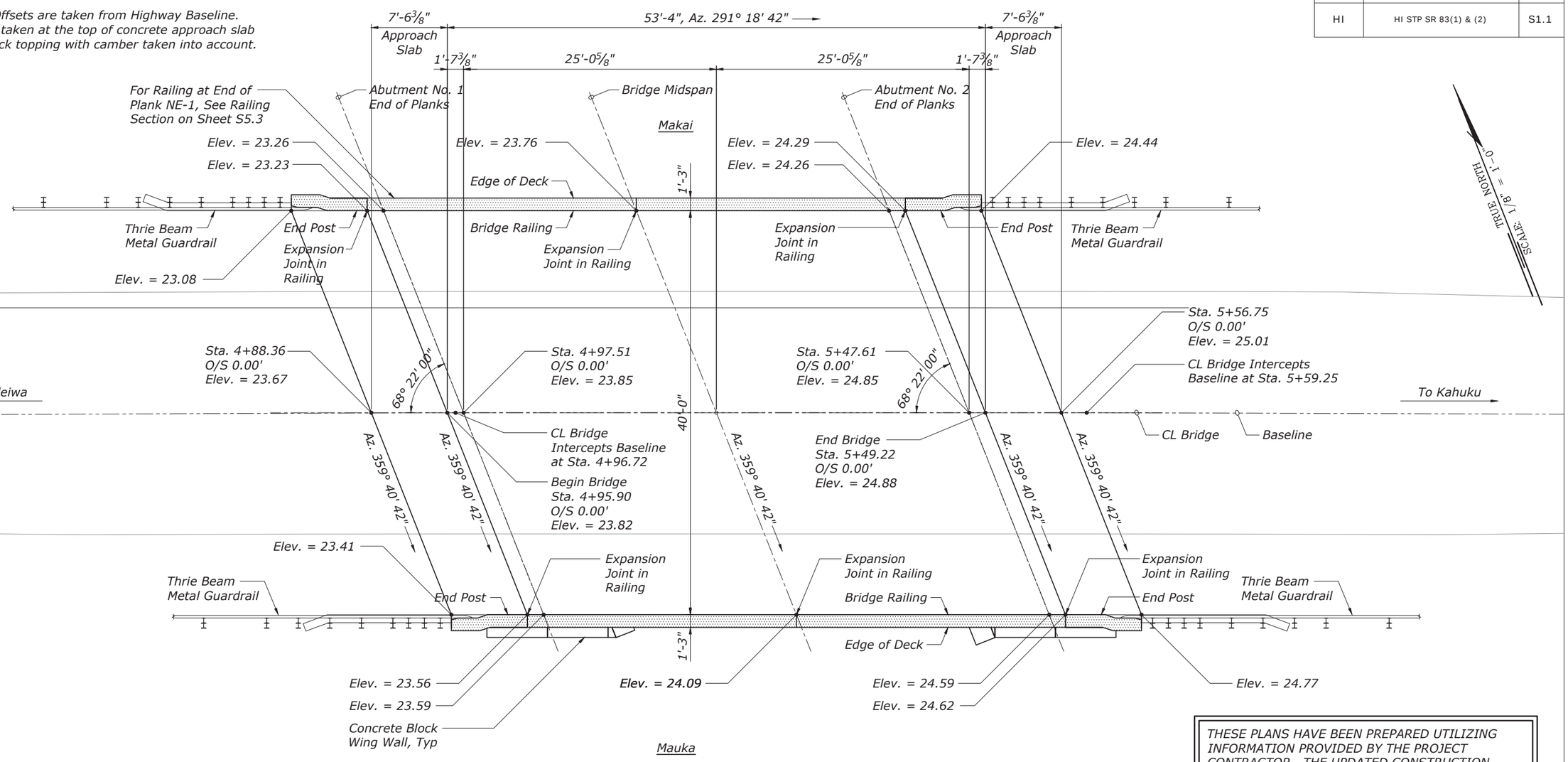
								BL & BC	CADD	MH		MH	5 of 50	NOVEMBER 2018	RG3083-E

AS-BUILT DRAWINGS

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S1.1

NOTES:

(1) Stations and Offsets are taken from Highway Baseline.
(2) Elevations are taken at the top of concrete approach slab or concrete deck topping with camber taken into account.



BRIDGE LAYOUT PLAN

Scale: 3/32" = 1'-0"

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HONOLULU COUNTY, HAWAII

BRIDGE LAYOUT PLAN

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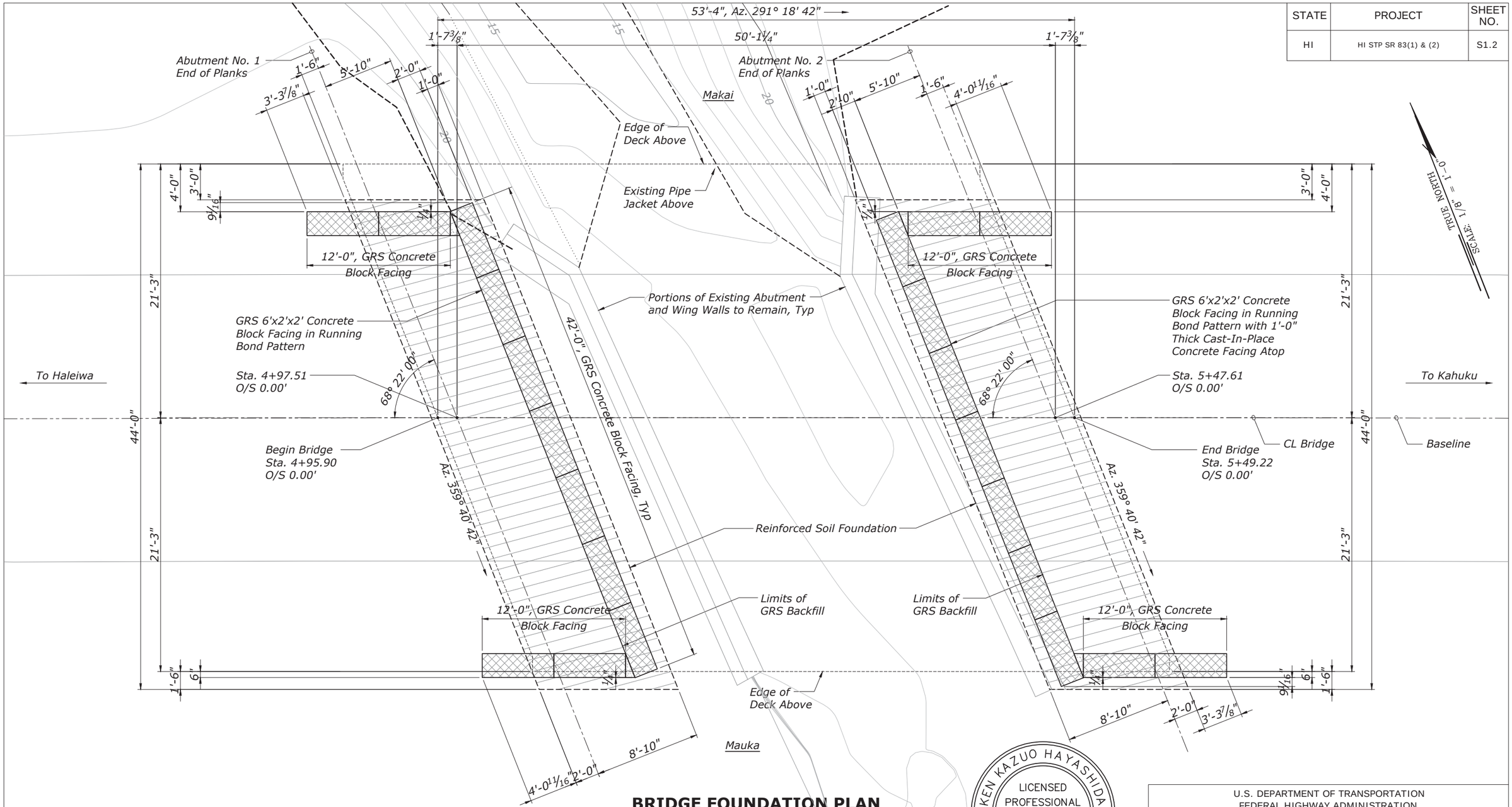
								BL & BC	CADD	MH		MH	6 of 50	NOVEMBER 2018	RG3083-F

AS-BUILT DRAWINGS

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S1.2



BRIDGE FOUNDATION PLAN

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NANAHU (HOOLAPA) STREAM BRIDGE

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HONOLULU COUNTY, HAWAII

BRIDGE FOUNDATION PLAN

AS-BUILT DRAWINGS

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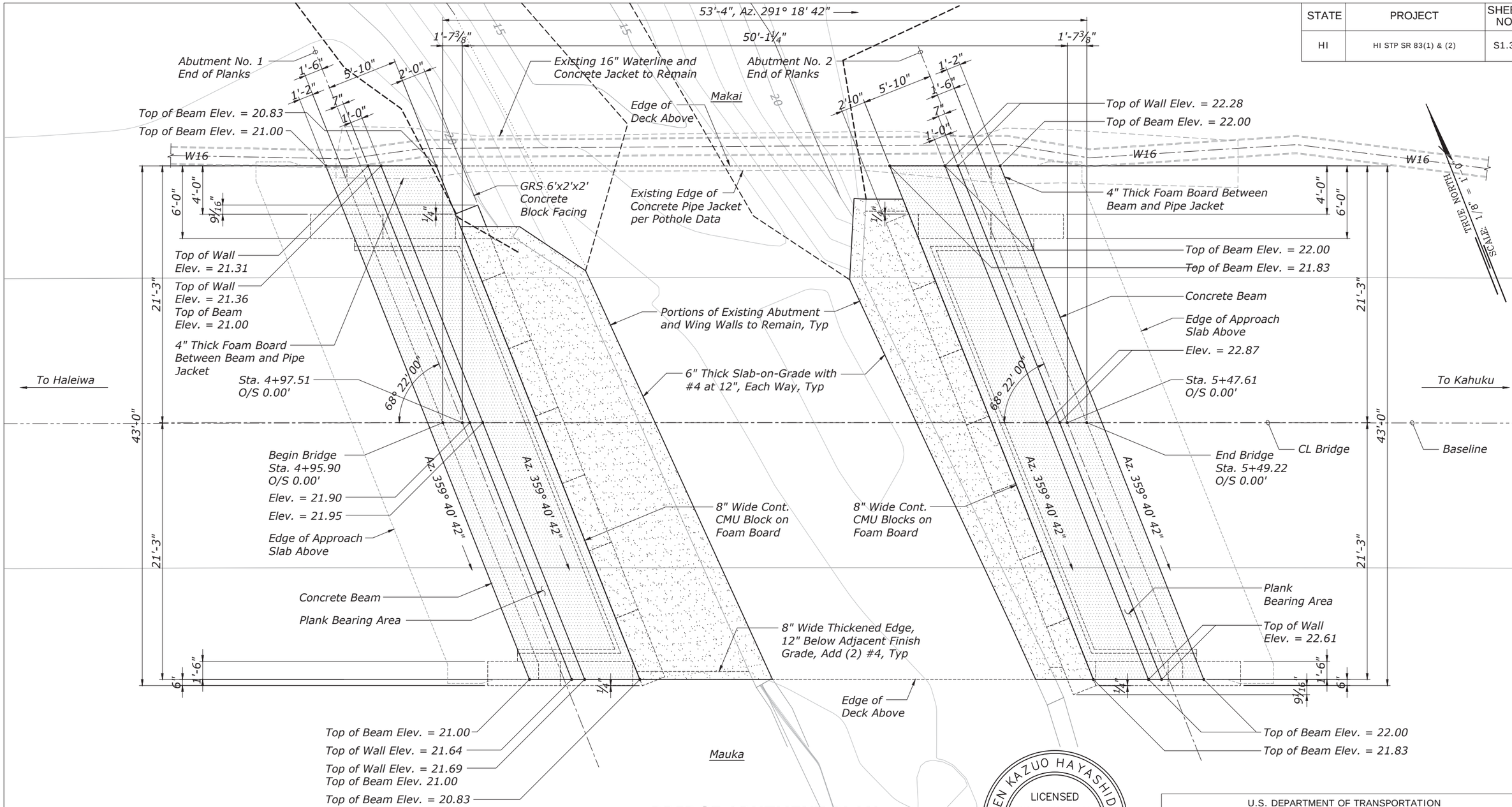
								BL & BC	CADD	MH		MH	7 of 50	NOVEMBER 2018	RG3083-G

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S1.3



BRIDGE ABUTMENT PLAN

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AS-BUILT DRAWINGS

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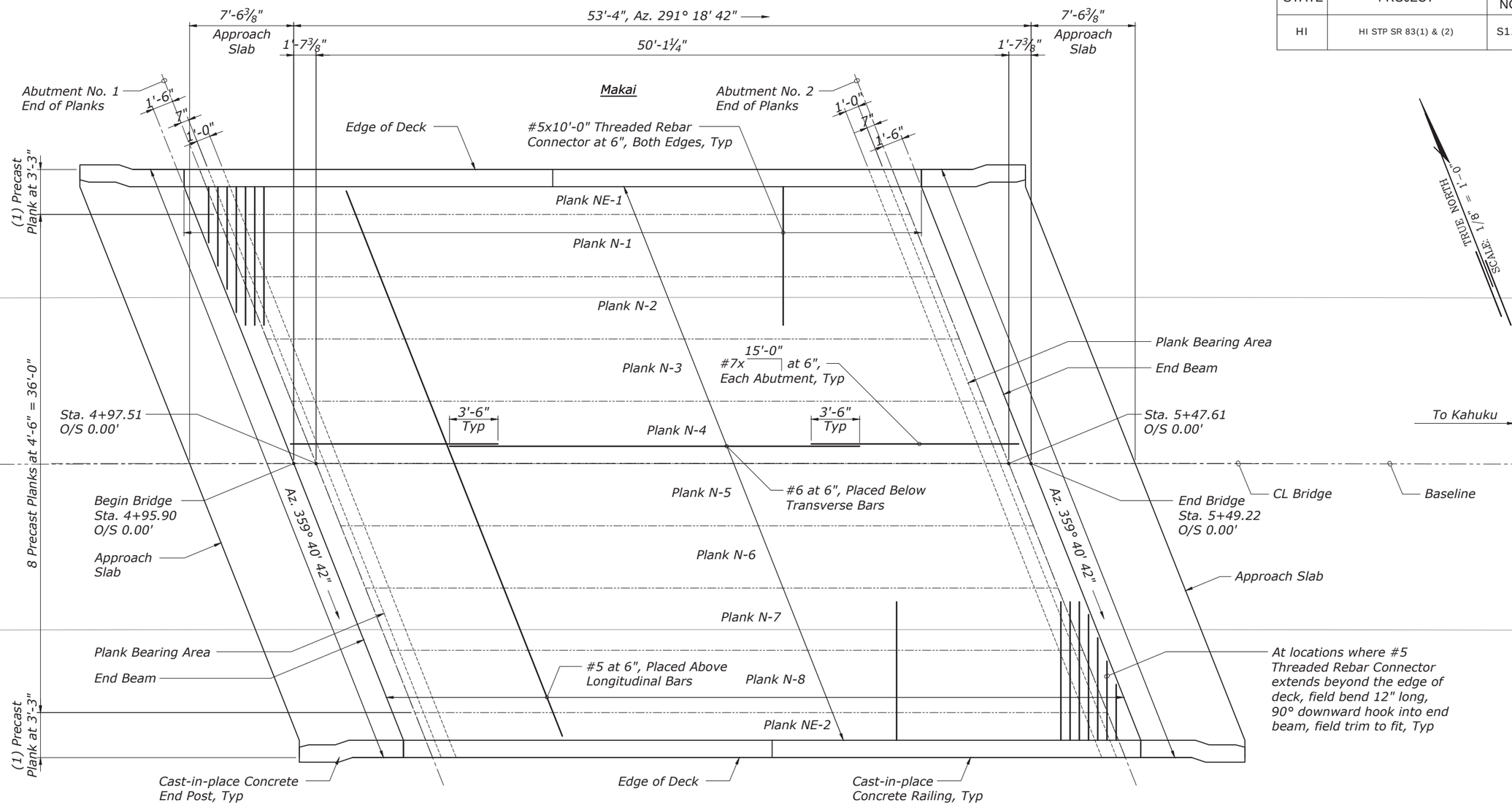

Mauka

DEC□ FRAMING PLAN

Scale: ⅛" = 1'-0"

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KEN KAZUO HAYASHIDA
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U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

NANAHU (HOOLAPA) STREAM BRIDGE

KAMEHAMEHA HIGHWAY

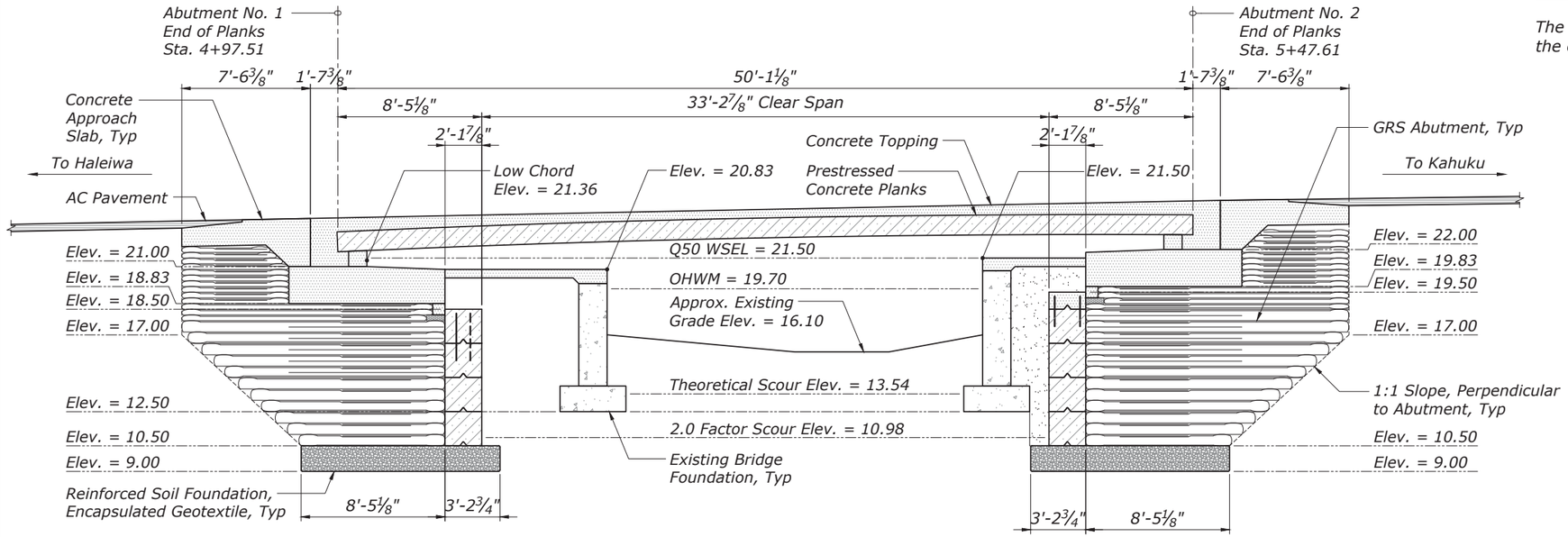
HONOLULU COUNTY, HAWAII

BRIDGE DEC□ FRAMING PLAN

AS-BUILT DRAWINGS

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	9 of 50	NOVEMBER 2018	RG3083-I

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S2.1

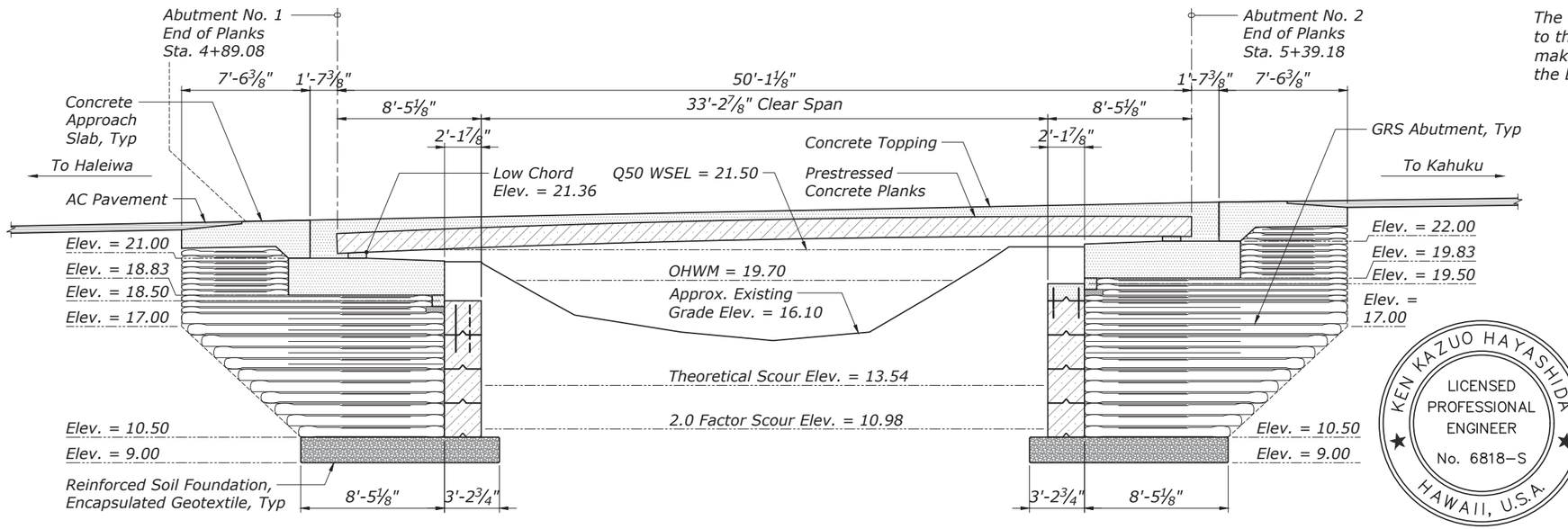


BRIDGE LONGITUDINAL SECTION

Scale: 1/8" = 1'-0"

NOTE:

The orientation of the view is along the centerline of the bridge.



BRIDGE LONGITUDINAL SECTION AT NORT□ EDGE OF DEC□

Scale: 1/8" = 1'-0"

NOTE:

The orientation of the view is parallel to the centerline of the bridge, looking makai, and at an offset 20' left from the baseline of the highway.

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NANAHU (HOOLAPA) STREAM BRIDGE

KAMEHAMEHA HIGHWAY

HONOLULU COUNTY, HAWAII

LONGITUDINAL SECTION

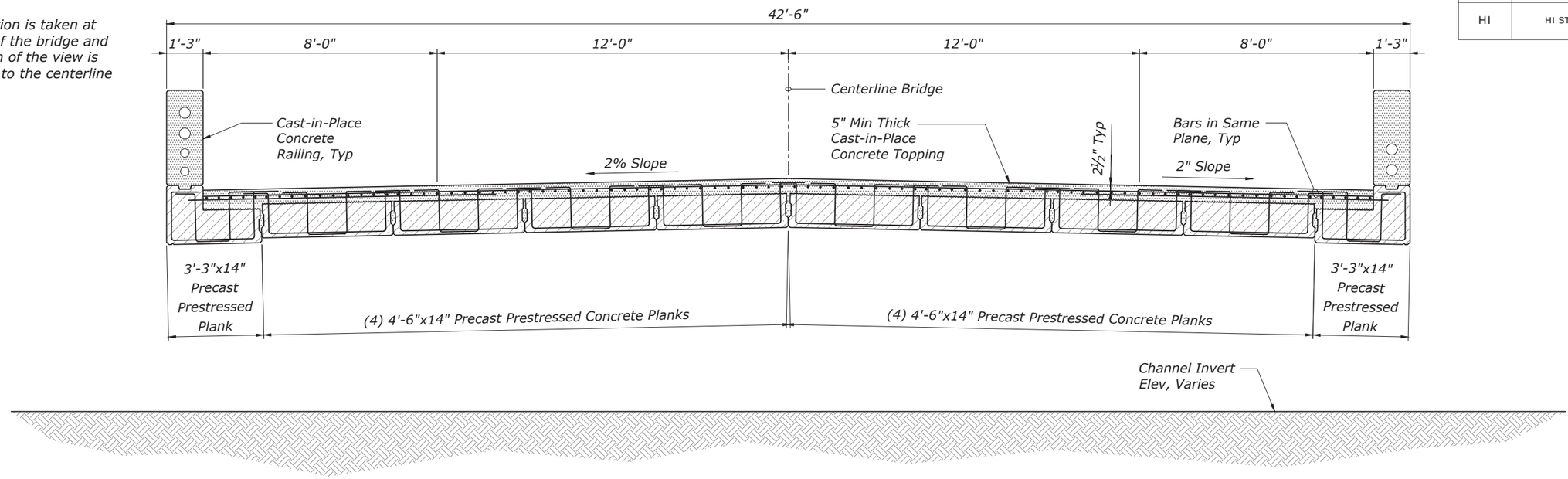
NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	10 of 50	NOVEMBER 2018	RG3083-J

AS-BUILT DRAWINGS

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S2.2

NOTE:

The cross section is taken at the midspan of the bridge and the oriantation of the view is perpendicular to the centerline of the bridge.



TYPICAL BRIDGE CROSS SECTION

Scale: ¼" = 1'-0"

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NANAHU (HOOLAPA) STREAM BRIDGE

KAMEHAMEHA HIGHWAY

HONOLULU COUNTY, HAWAII

TYPICAL CROSS SECTION

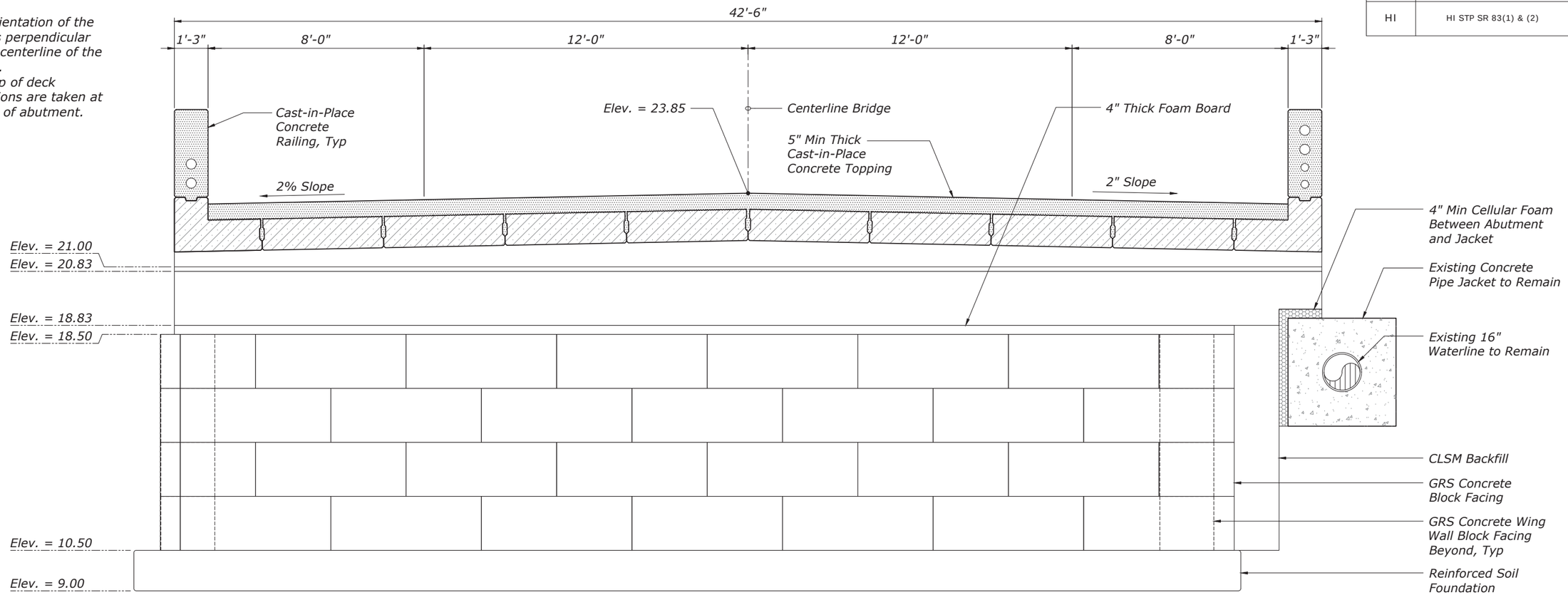
NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	11 of 50	NOVEMBER 2018	RG3083-K

AS-BUILT DRAWINGS

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S3.1

NOTES:

1. *The orientation of the view is perpendicular to the centerline of the bridge.*
2. *The top of deck elevations are taken at the CL of abutment.*



ABUTMENT NO□□ ELEVATION

Scale: ¼" = 1'-0"

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NANAHU (HOOLAPA) STREAM BRIDGE

KAMEHAMEHA HIGHWAY

HONOLULU COUNTY, HAWAII

ABUTMENT NO□□ ELEVATION

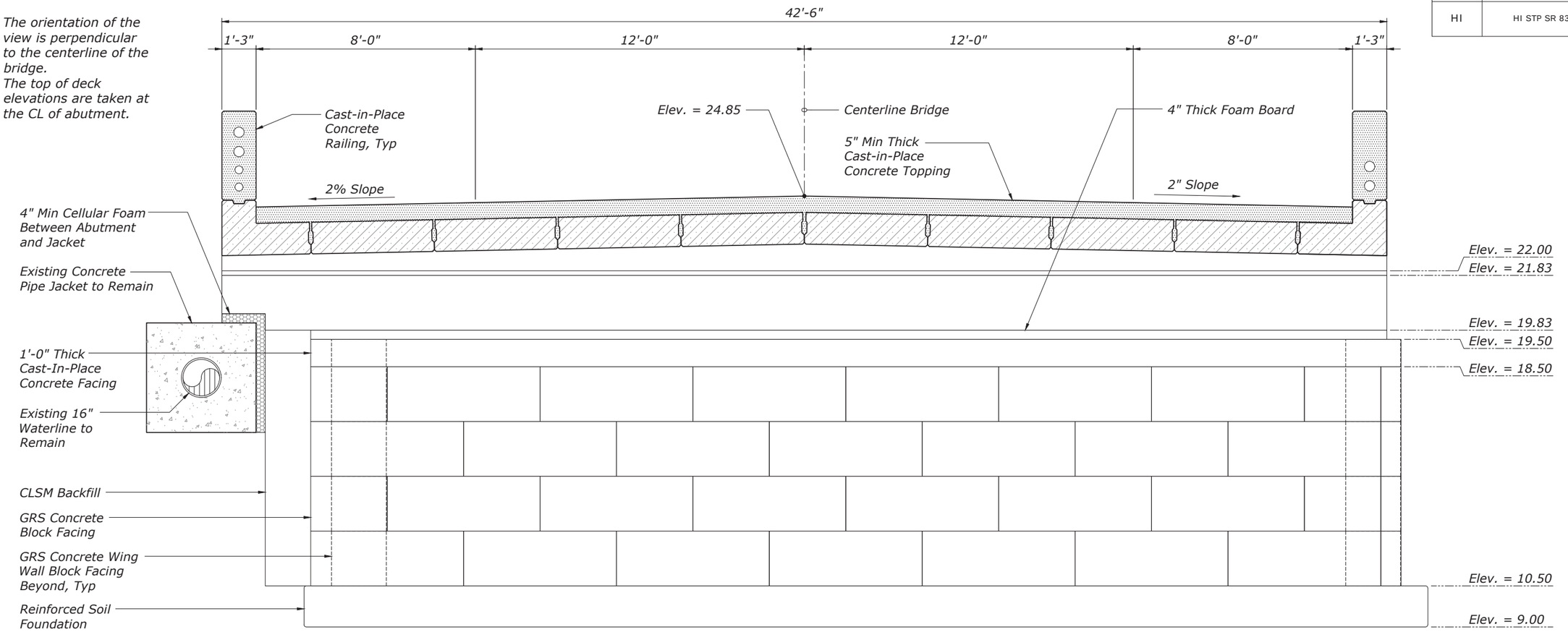
NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	12 of 50	NOVEMBER 2018	RG3083-L

AS-BUILT DRAWINGS

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S3.2

NOTES:

1. *The orientation of the view is perpendicular to the centerline of the bridge.*
2. *The top of deck elevations are taken at the CL of abutment.*



ABUTMENT NO□□ ELEVATION

Scale: ¼" = 1'-0"

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NANAHU (HOOLAPA) STREAM BRIDGE

KAMEHAMEHA HIGHWAY

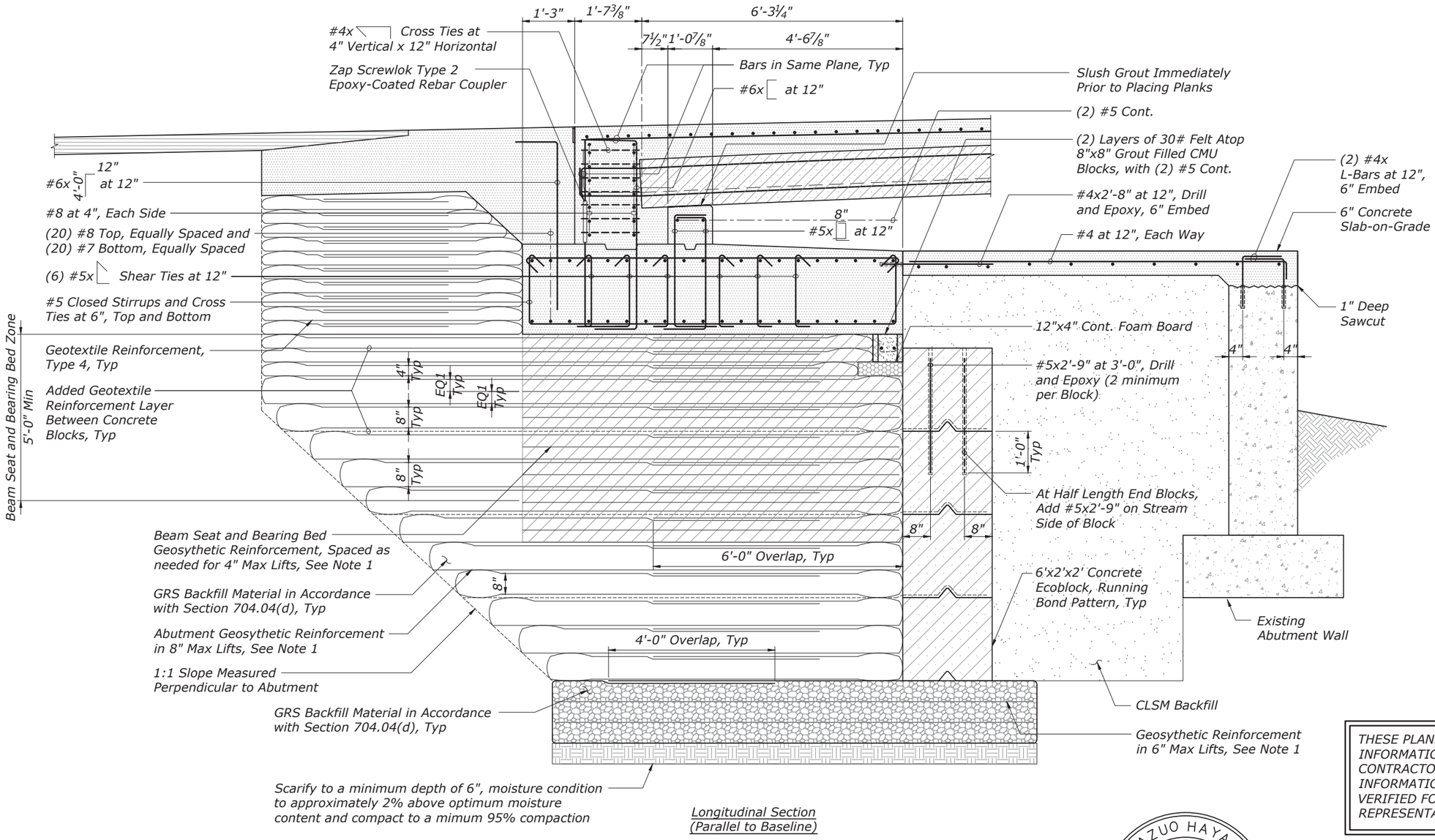
HONOLULU COUNTY, HAWAII

ABUTMENT NO□□ ELEVATION

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	13 of 50	NOVEMBER 2018	RG3083-M

AS-BUILT DRAWINGS

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S3.3



Longitudinal Section
(Parallel to Baseline)

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Notes:

1. Geotextile shall be biaxial, woven polypropylene, with a minimum ultimate tensile strength of 4,800 pounds per square foot, see FP-14 Section 714.04(c).
2. Geotextile fabric wrapped lifts may be be placed directly atop each other.
3. Prepare and compact foundation soils to conform to FP-14 Section 204.
4. Compact backfill to a minimum of 95 percent of the maximum dry density according to AASHTO T99 and ±2 percent of optimum moisture content. In the bearing reinforcement zone, compact to 100 percent of the maximum dry density according to AASHTO T99. Only hand-operated compaction equipment is allowed within 3 feet of the wall face. Reinforcement extends directly beneath each layer of CMU blocks, extending to 1 inch or less from the front face of the wall.
5. Temporary shoring shall be used as needed to maintain the integrity and stability of the existing abutment walls until the bridge concrete deck topping has been placed.
6. Slush grout shall be non-shrink grout shall be a premixed non-metallic formula, capable of developing a minimum compressive strength of 5,000 psi in 28 days, and will not require corrosion inhibitor.

ABUTMENT NO☐☐ DETAIL

Scale: ⅜" = 1'-0"

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NANAHU (HOOLAPA) STREAM BRIDGE

KAMEHAMEHA HIGHWAY

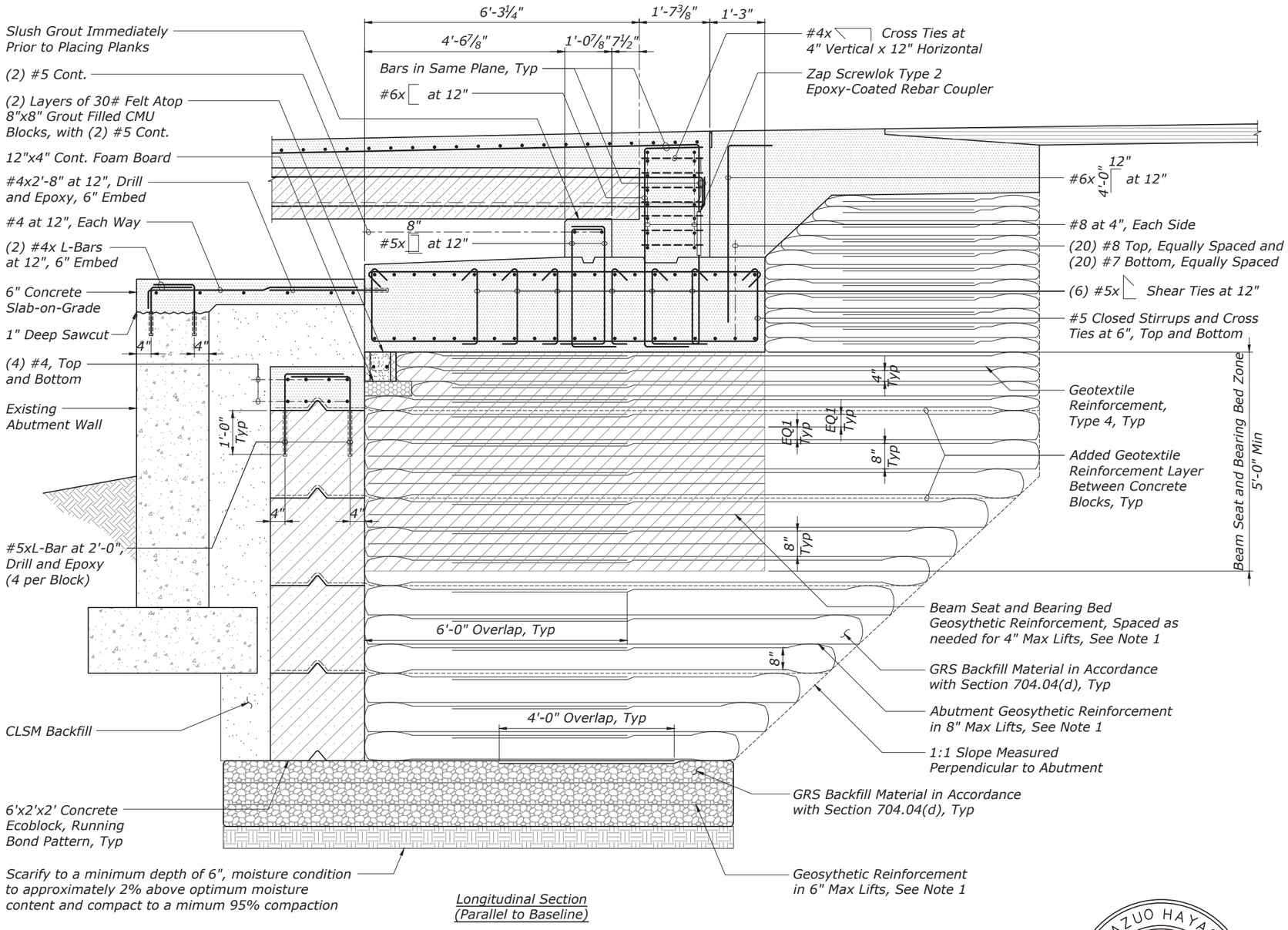
HONOLULU COUNTY, HAWAII

ABUTMENT NO☐☐ DETAIL

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	14 of 50	NOVEMBER 2018	RG3083-N

AS-BUILT DRAWINGS

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S3.4



Longitudinal Section
(Parallel to Baseline)

Notes:

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2. *Geotextile fabric wrapped lifts may be be placed directly atop each other.*
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ABUTMENT NO□□ DETAIL

Scale: ⅜" = 1'-0"

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NANAHU (HOOLAPA) STREAM BRIDGE

KAMEHAMEHA HIGHWAY

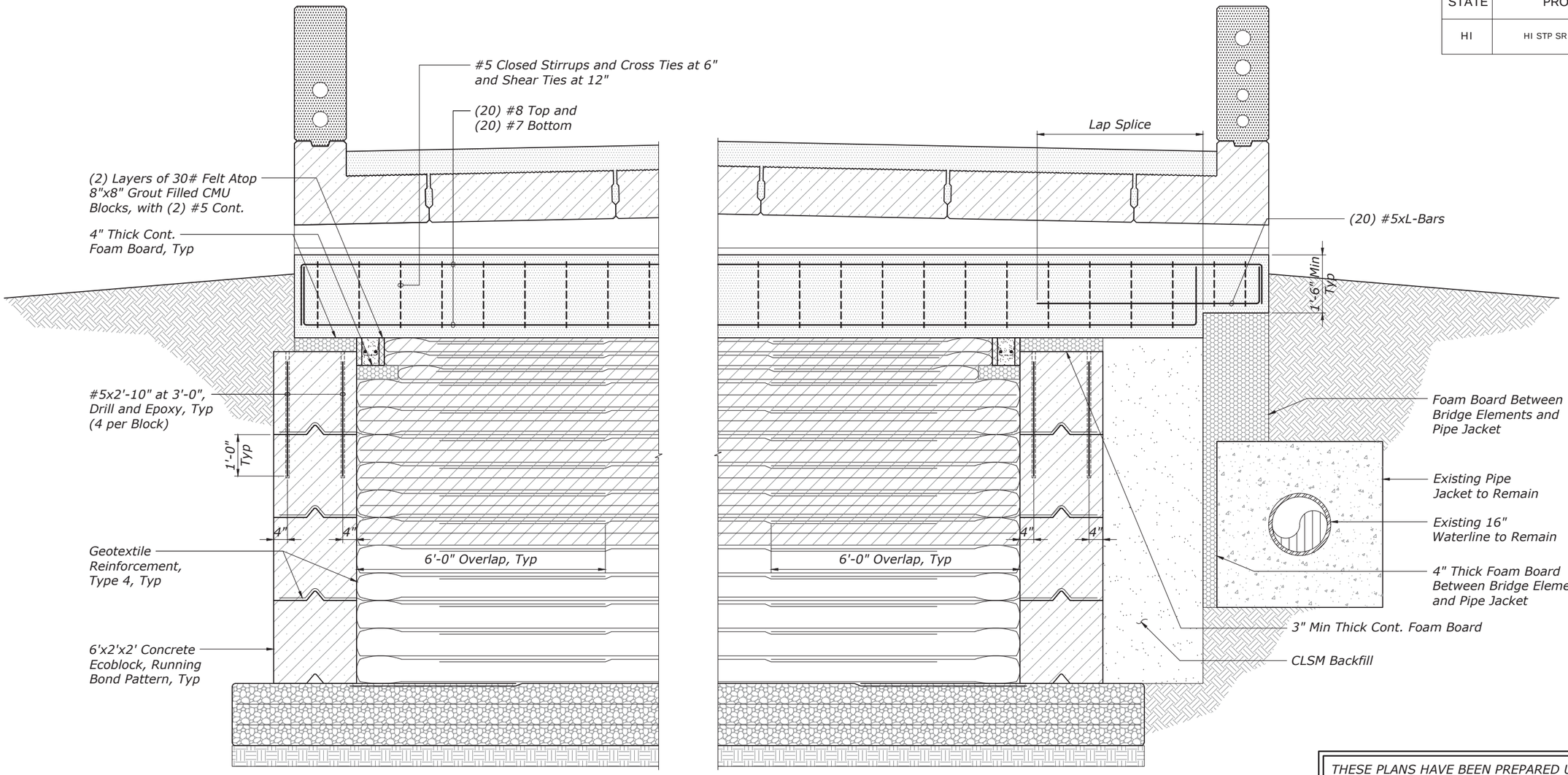
HONOLULU COUNTY, HAWAII

ABUTMENT NO□□ DETAIL

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	15 of 50	NOVEMBER 2018	RG3083-O

AS-BUILT DRAWINGS

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S3.5



Cross Section - Abutment No. 1 Shown
(Perpendicular to Baseline)

Notes:

1. *Geotextile shall be biaxial, woven polypropylene, with a minimum ultimate tensile strength of 4,800 pounds per square foot, see FP-14 Section 714.04(c).*
2. *Prepare and compact foundation soils to conform to FP-14 Section 204.*
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4. *Temporary shoring shall be used as needed to maintain the integrity and stability of the existing abutment walls until the bridge concrete deck topping has been placed.*

GRS ABUTMENT DETAIL □□

Scale: $\frac{3}{8}$" = 1'-0"

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NANAHU (HOOLAPA) STREAM BRIDGE

KAMEHAMEHA HIGHWAY

HONOLULU COUNTY, HAWAII

GRS ABUTMENT DETAIL □□

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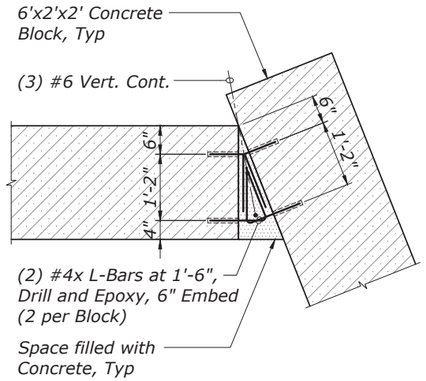
								BL & BC	CADD	MH		MH	16 of 50	NOVEMBER 2018	RG3083-P

AS-BUILT DRAWINGS

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S3.6



CONCRETE BLOC□ CORNER DETAIL

Scale: 3/8" = 1'-0"

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CENTRAL FEDERAL LANDS HIGHWAY DIVISION

NANAHU (HOOLAPA) STREAM BRIDGE

KAMEHAMEHA HIGHWAY

HONOLULU COUNTY, HAWAII

T□PICAL GRS ABUTMENT DETAILS

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	17 of 50	NOVEMBER 2018	RG3083-Q

AS-BUILT DRAWINGS

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S4.1

Prestressed Plank Notes:

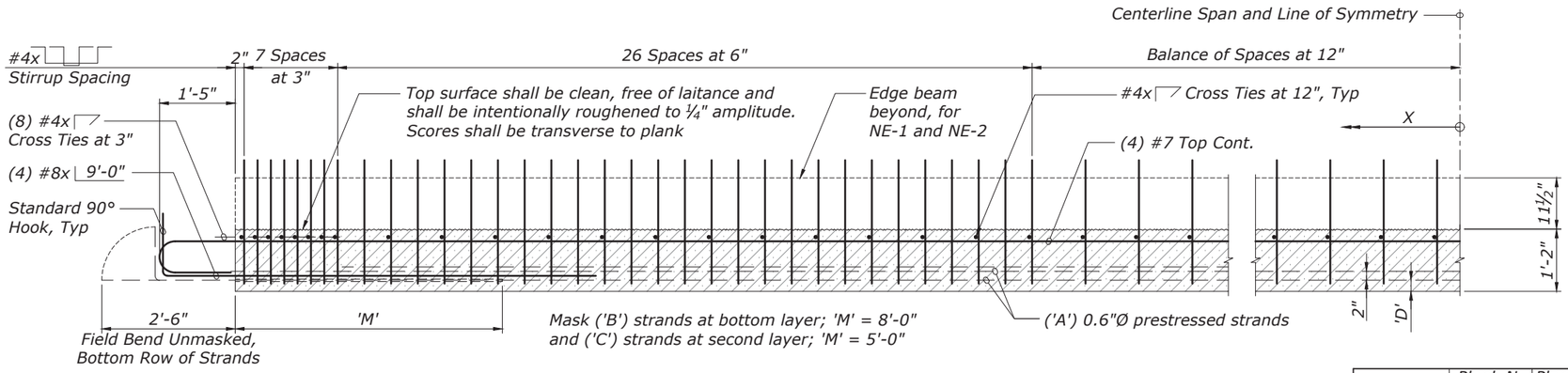
1. Prestressed concrete 28 day strength f'c = 8,000 psi. prestressed concrete strength at time of release fci = 6,400 psi.
2. Prestressing strands shall be (7) wire 0.6"Ø low relaxation steel strands (Area = 0.217 in^2) conforming to ASTM A416 with an ultimate tensile strength of 270 ksi. Initial strand stress (immediately prior to release of prestress) = 0.75 f_{pu} = 202.5 ksi.
3. Non-prestressed reinforcing steel shall be deformed bars conforming to ASTM A615 or A706, Grade 60, unless noted otherwise.
4. Strand pattern shall be symmetrical about the longitudinal centerline of the plank.
5. Strand release sequence shall not induce any lateral deflection of the plank.
6. Contractor shall submit shop drawings indicating proposed strand pattern, releasing sequence, reinforcing details and hold down device details to the engineer prior to fabrication.
7. During curing, care shall be taken to avoid any lateral deflection to the plank due to improper orientation. steam curing may be used to accelerate strength gain.
8. Lifting devices shall be placed as close as possible to the centerline of bearings of the plank. details and locations of lifting devices shall be submitted to the engineer for approval. such approval does not relieve the contractor of his responsibilities if plank is damaged due to failure of the lifting device.
9. $P_{(e)}$ = effective prestress force after all losses (kips)
10. Plank stirrups shall be placed parallel to the bridge skew.
11. Top row of unmasked strands shall be cut flush with the face of plank.
12. Where vertical #5 bars in curb section at the Abutment 1 end of plank NE-1 have been inadvertently omitted, drill and epoxy #5 bars at 6". The bars on interior side shall have a minimum embedment of 12½" and the bars on the exterior side shall have a minimum embedment of 6".
13. At Abutment 1 end of Plank NE-1 and Abutment 2 end of Plank NE-2, trim edge bars as needed to maintain clearance from construction joint

Required Actions:

1. Measure slab camber prior to setting deck forms. If the actual camber exceeds the estimated slab camber (3⅜" for interior planks and 1⅞" for exterior planks) by more than 1", the fillet will have to be increased by raising profile grade as directed by the owner.
2. Set the deck forms and camber the deck machine screed rails to offset the slab deflections (½") due to deck placement.
3. Bridge precast slab seat elevations were calculated using dead load deflections of the deck so that top of precast slab will be a minimum of 1" below bottom of deck at any point in the span, allowing for precast slab depth and slab camber tolerance.

Notes:

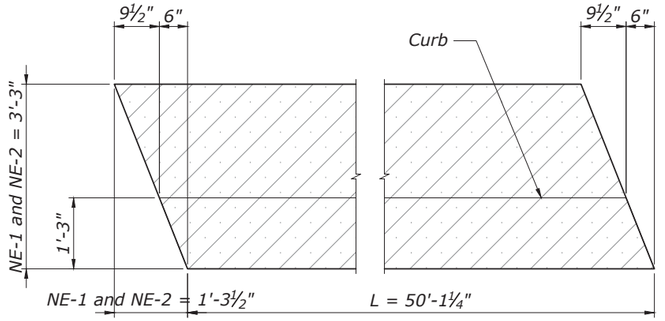
1. The plank lengths shown do not include changes in length increase due to elastic and time dependent shortening effects and longitudinal slope of the plank.
2. The unmasked strands shall have 2'-6" extension at both ends of each plank.

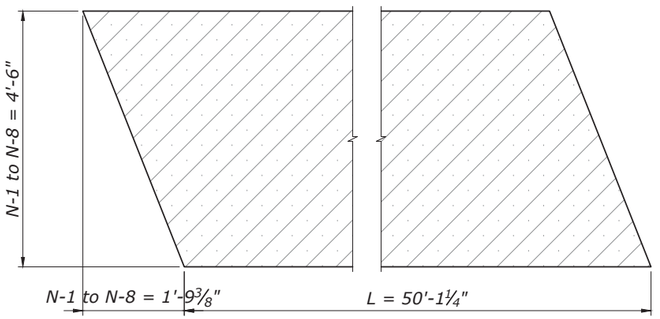


TYPICAL PRESTRESSED PLAN ELEVATION

Scale: ⅜" = 1'-0"

	Plank N-	Plank NE-
'A'	34	24
'B'	6	3
'C'	2	2
$P_{(e)}$ [kips]	1,198	864
C.G.S. [in]	3.32	4.42
'D' [in]	2.5	2.5





Deflection Equation:

$\Delta = ½" - X^2(1040.8^{-1})$

Where:

Δ = Deflection, in inches, of slab at any point caused by the weight of deck
X = Distance, in feet, measured from midspan (See diagram)

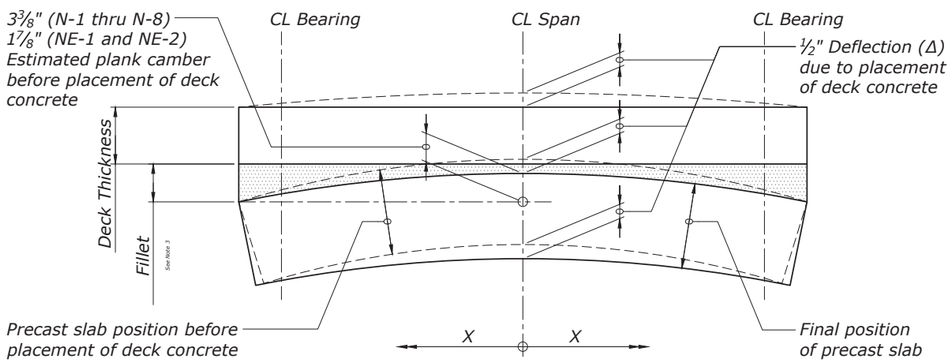
Note:

Δ max = ½" at X = 0' (Midspan)
Δ min = 0" at X = 22'-9¾" (CL Bearing)

Note:
Reinforcing not shown for clarity.

TYPICAL PRESTRESSED PLAN PLAN

Scale: ⅜" = 1'-0"



DECK FORM SETTING DIAGRAM

Not to Scale

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NANAHU (HOOLAPA) STREAM BRIDGE

KAMEHAMEHA HIGHWAY

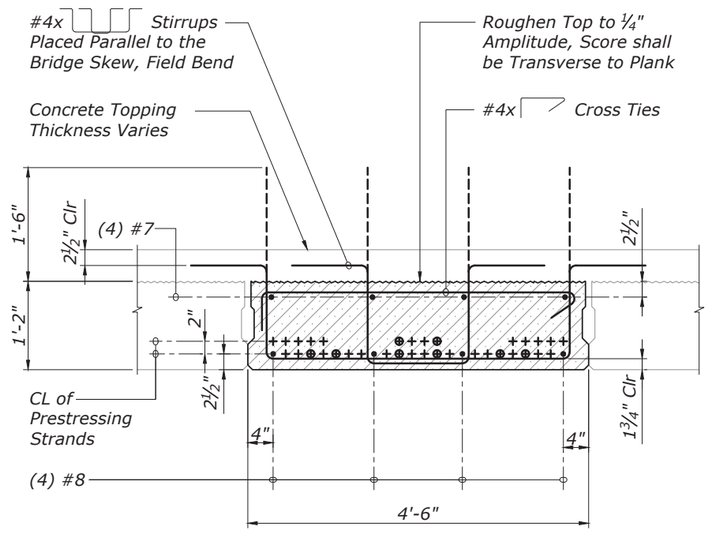
HONOLULU COUNTY, HAWAII

PRESTRESSED PLAN

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	18 of 50	NOVEMBER 2018	RG3083-R

AS-BUILT DRAWINGS

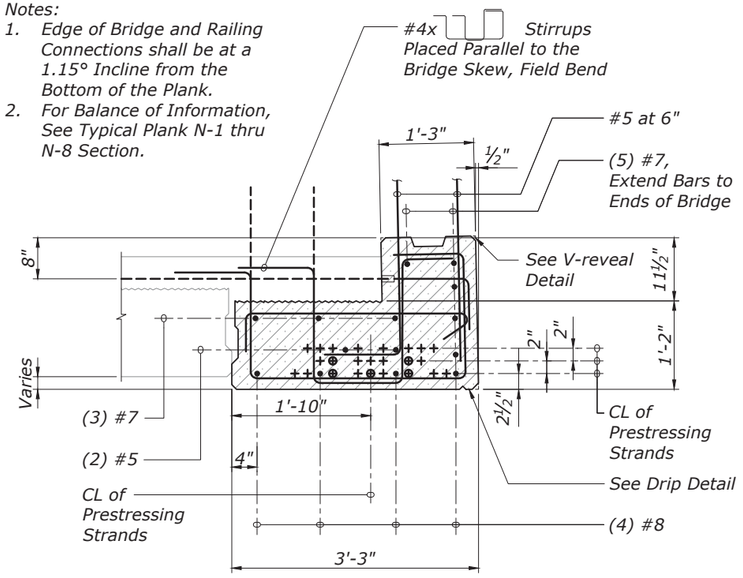
STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S4.2



Legend:
- + 0.6"Ø Strands
- ⊕ 0.6"Ø Strands Masked at Each End
- • Deformed Rebar

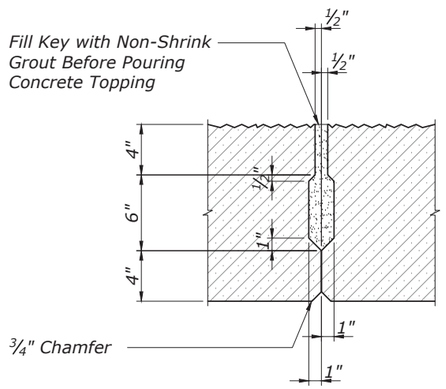
TYPICAL PLAN AND TRANSVERSE SECTION
Scale: ½" = 1'-0"

Notes:
1. Edge of Bridge and Railing Connections shall be at a 1.15° Incline from the Bottom of the Plank.
2. For Balance of Information, See Typical Plank N-1 thru N-8 Section.

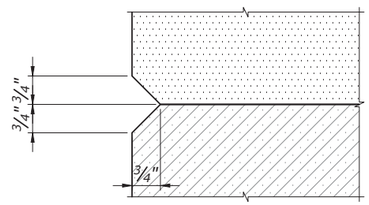


TYPICAL PLAN NEAR AND NEAR SECTION
Scale: ½" = 1'-0"

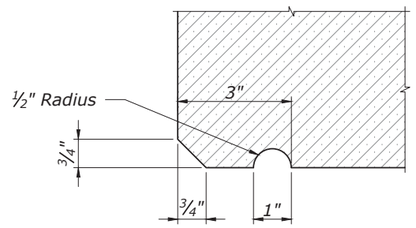
Note:
Non-Shrink Grout Shall have a 28-Day Compressive Strength of 8,900 psi.



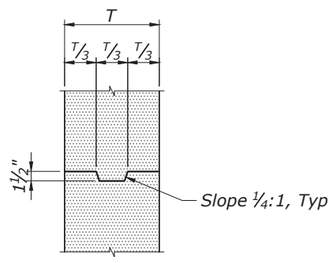
DETAIL
Scale: 1" = 1'-0"



V REVEAL DETAIL
Scale: 1" = 1'-0"



DRIP DETAIL
Scale: 1" = 1'-0"



CURB DETAIL
Scale: ½" = 1'-0"

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KEN KAZUO HAYASHIDA
LICENSED PROFESSIONAL ENGINEER
No. 6818–S
HAWAII, U.S.A.

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U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

NANAHU (HOOLAPA) STREAM BRIDGE

KAMEHAMEHA HIGHWAY

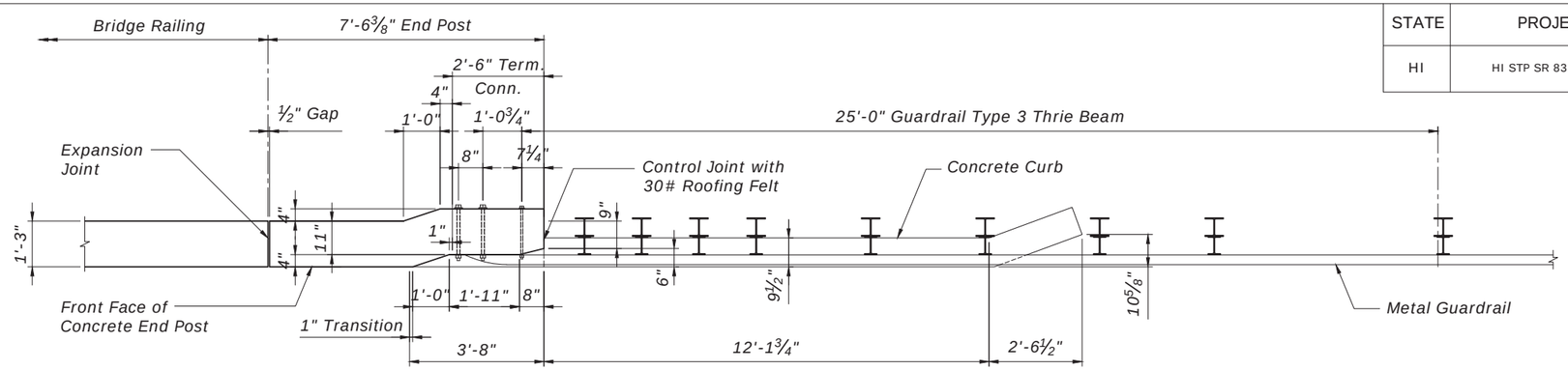
HONOLULU COUNTY, HAWAII

PLAN SECTIONS

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	19 of 50	NOVEMBER 2018	RG3083-S

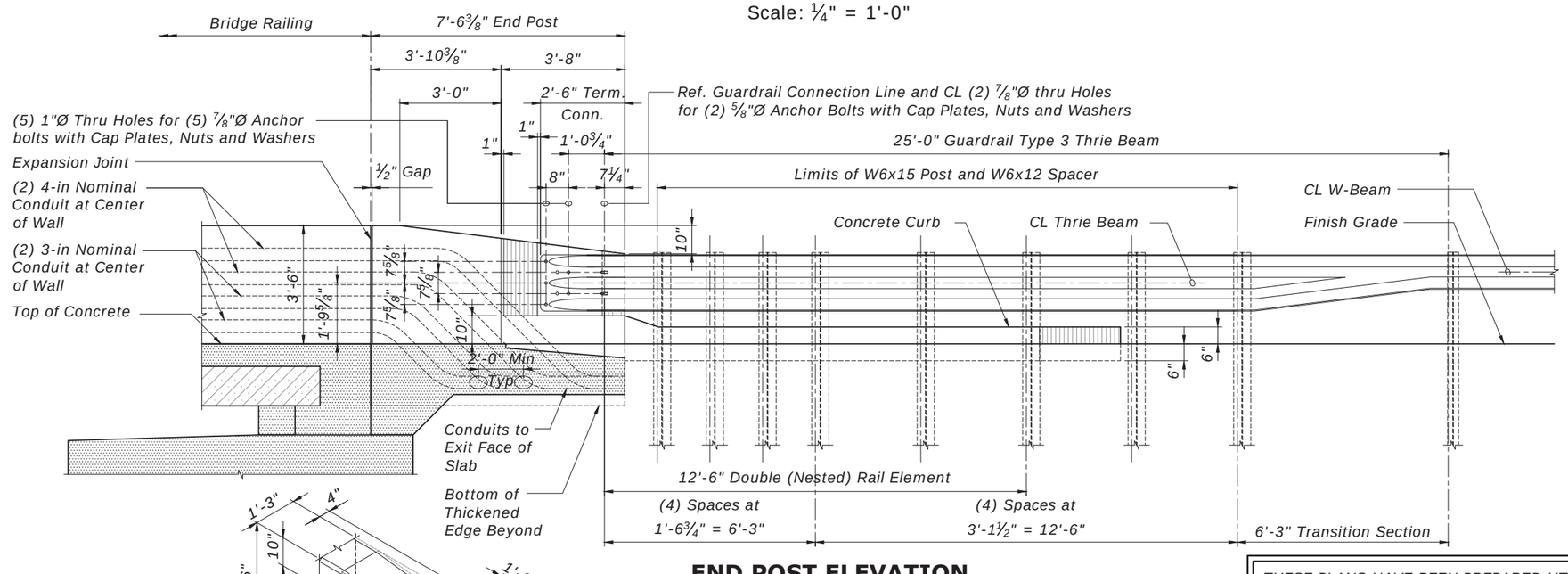
AS-BUILT DRAWINGS

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S5.1



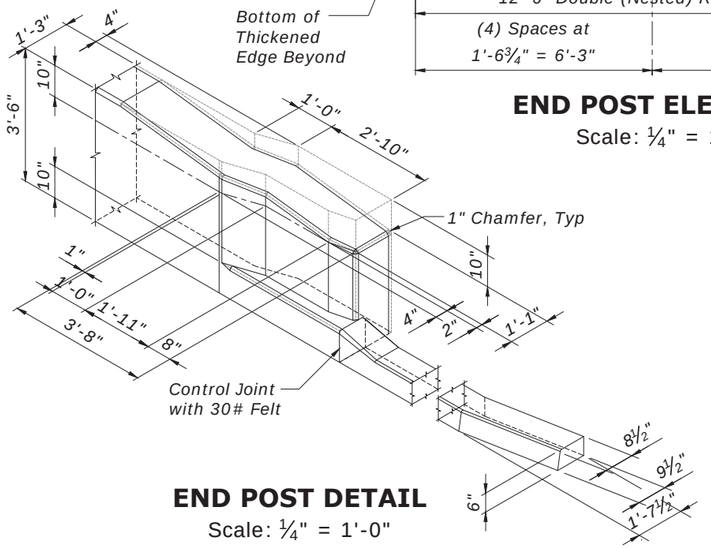
END POST PLAN

Scale: 1/4" = 1'-0"



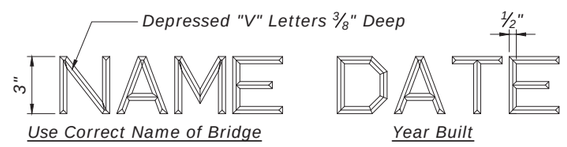
END POST ELEVATION

Scale: 1/4" = 1'-0"



END POST DETAIL

Scale: 1/4" = 1'-0"



BRIDGE IDENTIFICATION DETAIL

Not to Scale

Notes:

1. Unless otherwise directed by the engineer, the bridge name and date shall be placed at the "trailing" end post on each side of the roadway.
2. Exact details and spacing of letter and figures and location shall be as directed by the engineer. gothic letters and figures approximating dimensions shown will be acceptable if approved by the engineer.
3. Submit shop drawings for review.

Typical Detail of Letters and Figures at Concrete End Post

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NANAHU (HOOLAPA) STREAM BRIDGE

KAMEHAMEHA HIGHWAY

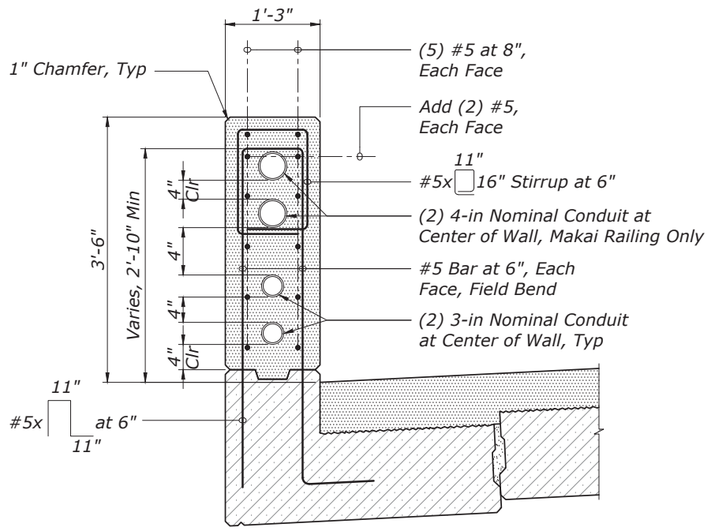
HONOLULU COUNTY, HAWAII

GUARDRAIL DETAILS

AS-BUILT DRAWINGS

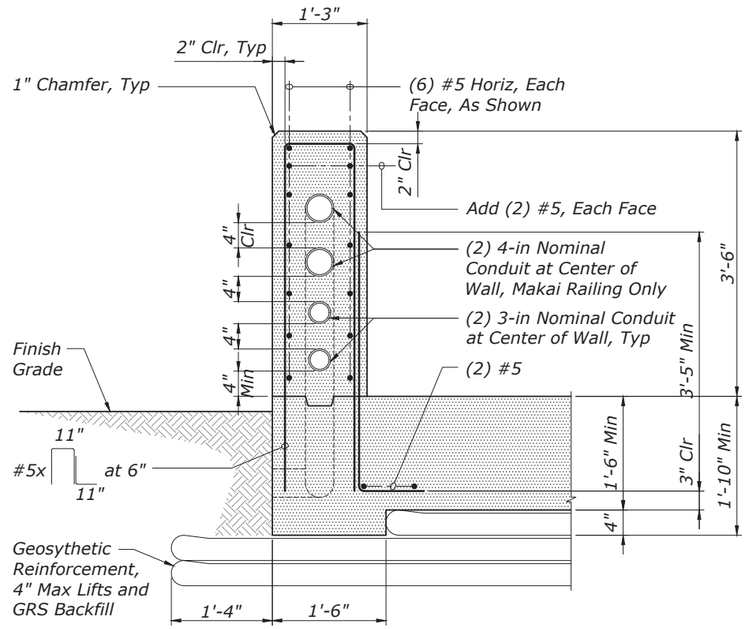
NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	20 of 50	NOVEMBER 2018	RG3083-T

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S5.2



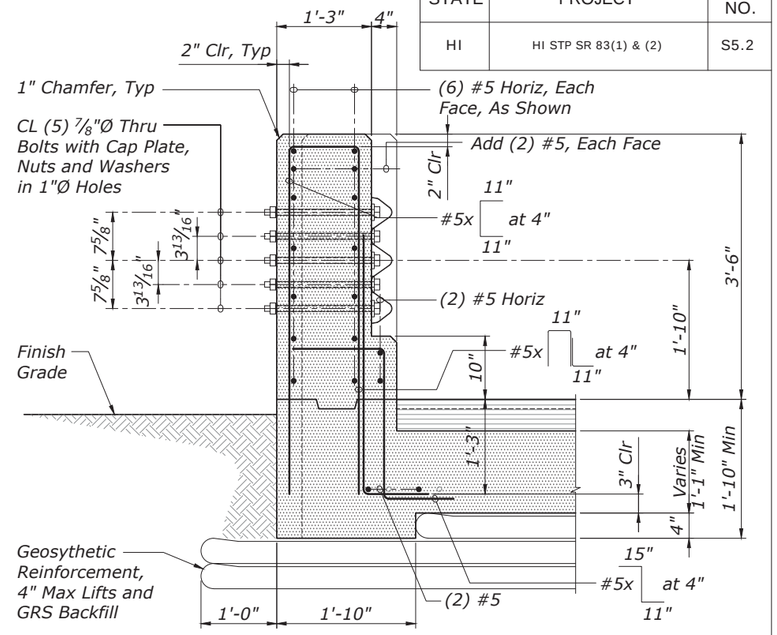
RAILING SECTION

Scale: ½" = 1'-0"



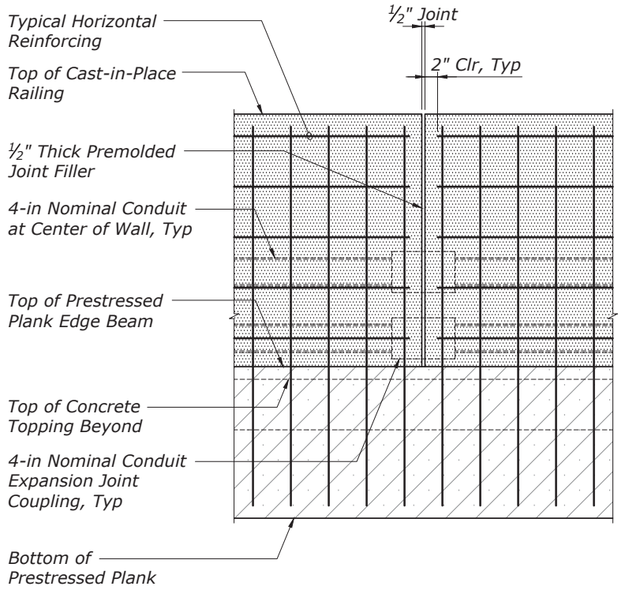
END POST SECTION ☐ALTERNATIVE ☐

Scale: ½" = 1'-0"



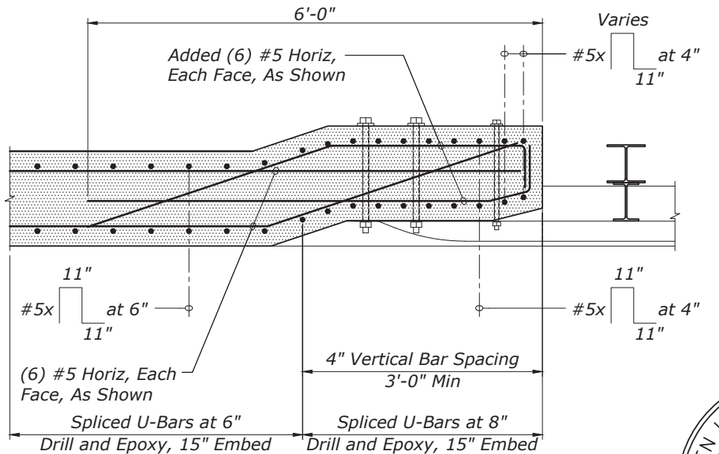
END POST TRANSITION SECTION ☐ALTERNATIVE ☐

Scale: ½" = 1'-0"



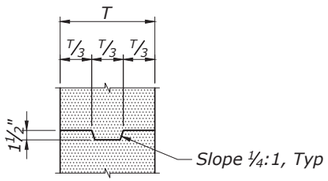
RAILING E☐PANSION ☐OINT DETAIL

Scale: ½" = 1'-0"



END POST TRANSITION PLAN SECTION

Scale: ½" = 1'-0"



S☐EAR ☐E☐ DETAIL

Scale: ½" = 1'-0"

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FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

NANAHU (HOOLAPA) STREAM BRIDGE

KAMEHAMEHA HIGHWAY

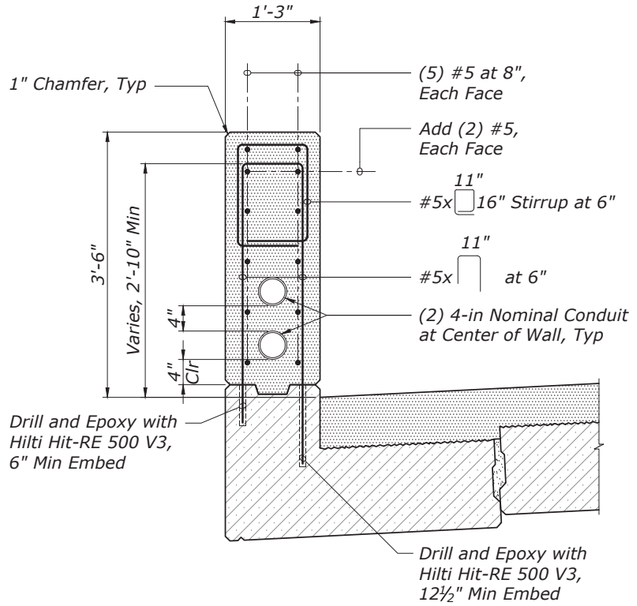
HONOLULU COUNTY, HAWAII

RAILING SECTION ☐☐

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	21 of 50	NOVEMBER 2018	RG3083-U

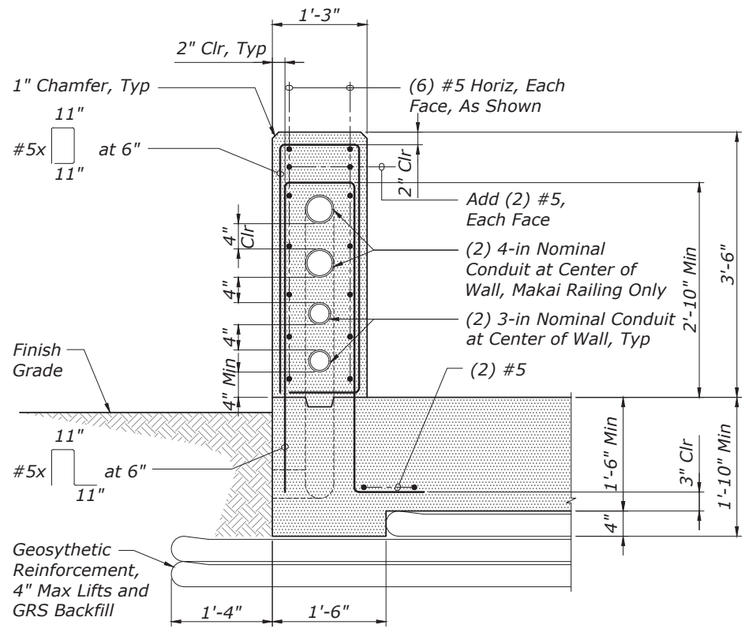
AS-BUILT DRAWINGS

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S5.3



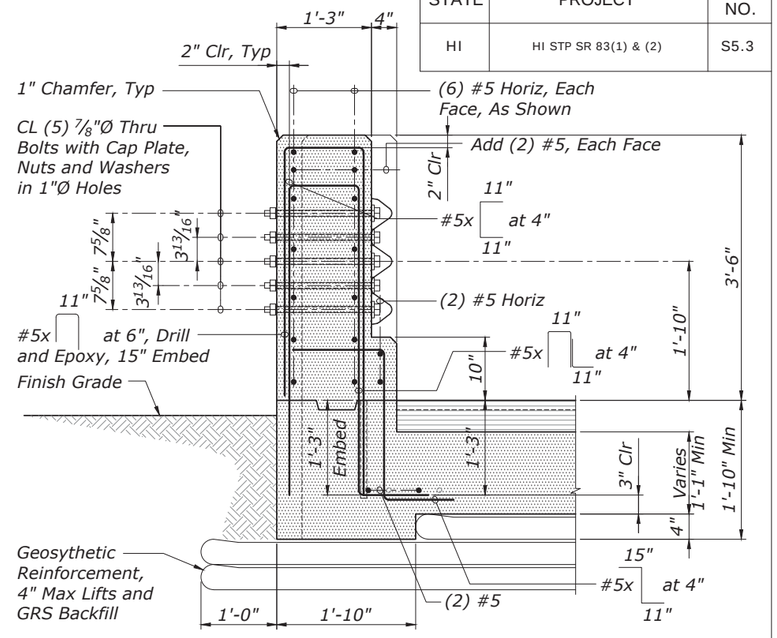
RAILING SECTION AT END OF PLAN□NE□□

Scale: ½" = 1'-0"



END POST SECTION □ALTERNATIVE □

Scale: ½" = 1'-0"



END POST TRANSITION SECTION □ALTERNATIVE □

Scale: ½" = 1'-0"

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NANAHU (HOOLAPA) STREAM BRIDGE

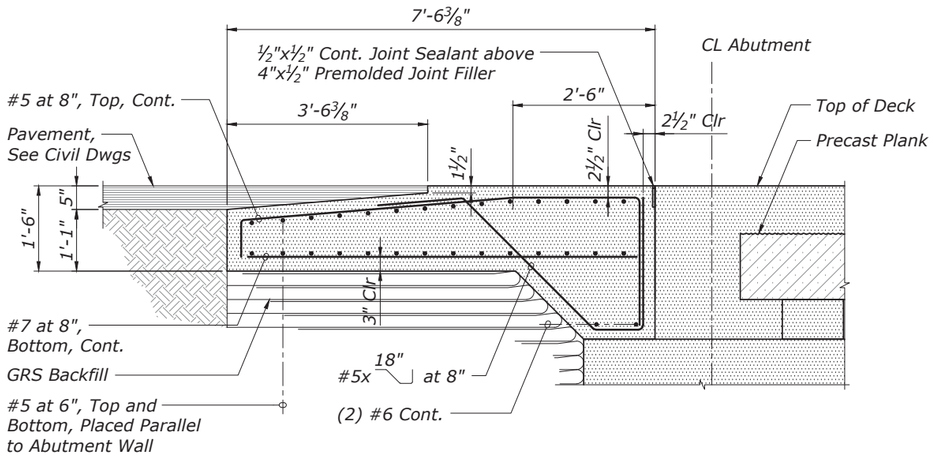
KAMEHAMEHA HIGHWAY

HONOLULU COUNTY, HAWAII

RAILING SECTION □□

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	22 of 50	NOVEMBER 2018	RG3083-V

AS-BUILT DRAWINGS



TYPICAL APPROACH SLAB SECTION

Scale: ⅜" = 1'-0"

NOTES:

1. *The orientation of the view is parallel to the centerline of the bridge.*
2. *Abutment and deck reinforcing not shown for clarity.*

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S6.1

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CENTRAL FEDERAL LANDS HIGHWAY DIVISION

NANAHU (HOOLAPA) STREAM BRIDGE

KAMEHAMEHA HIGHWAY

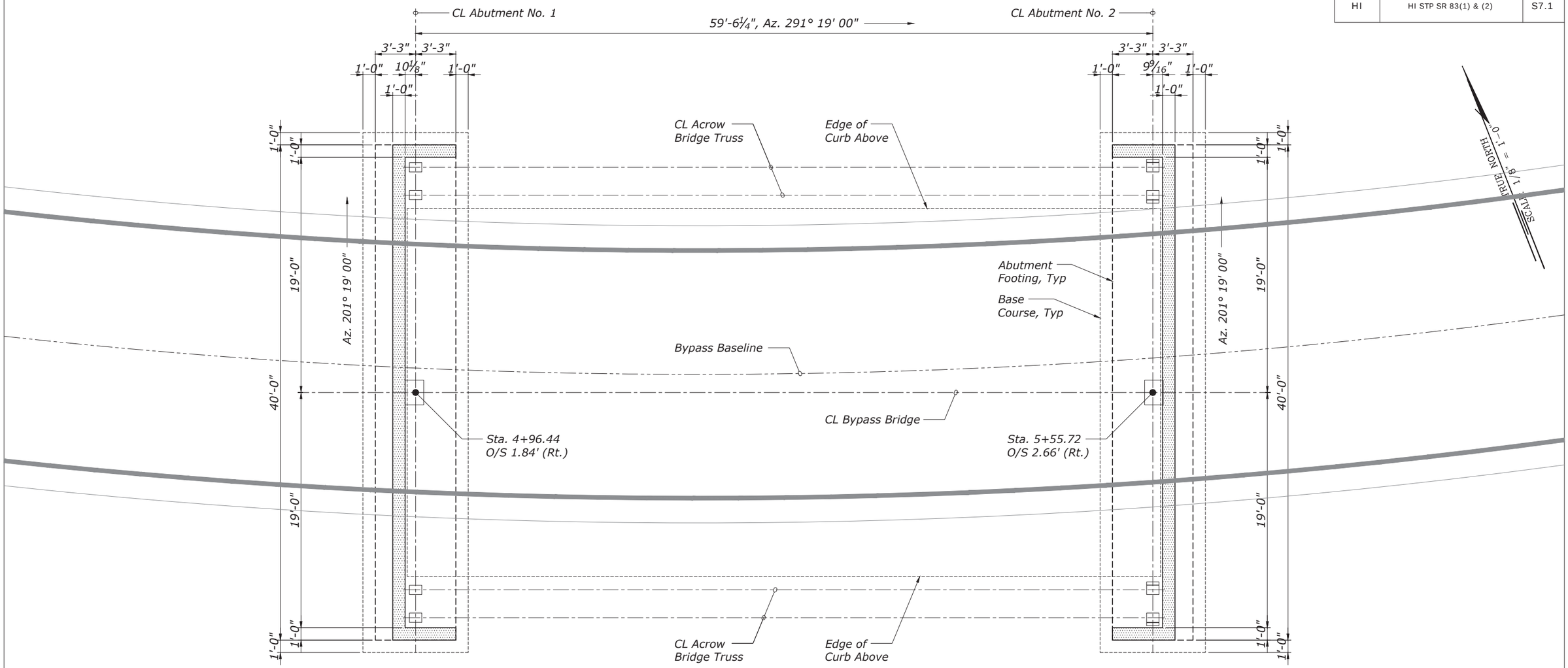
HONOLULU COUNTY, HAWAII

TYPICAL APPROACH SLAB SECTION

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	23 of 50	NOVEMBER 2018	RG3083-W

AS-BUILT DRAWINGS

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S7.1



B□PASS BRIDGE FOUNDATION PLAN

Scale: ⅛" = 1'-0"

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NANAHU (HOOLAPA) STREAM BRIDGE

KAMEHAMEHA HIGHWAY

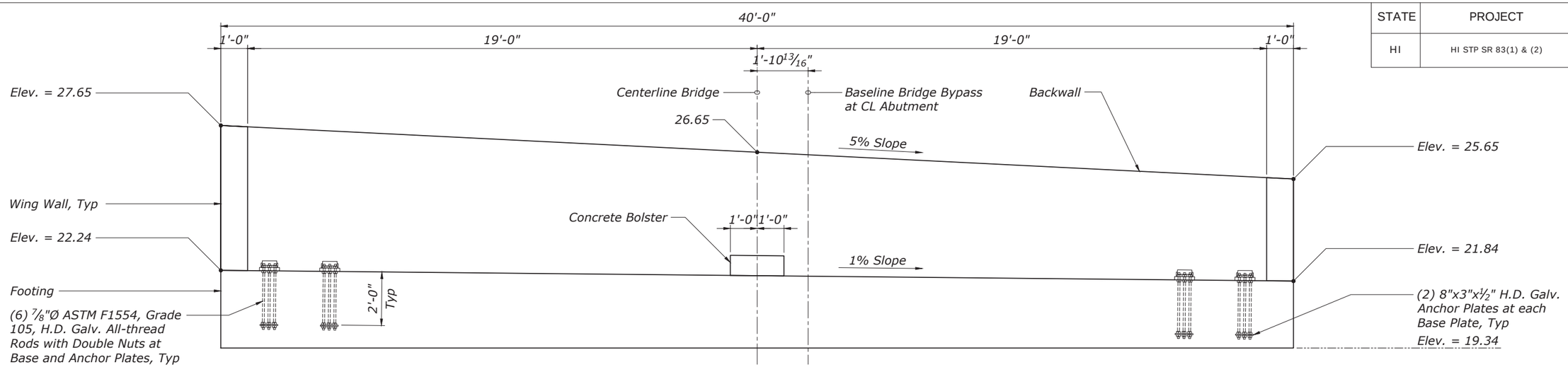
HONOLULU COUNTY, HAWAII

B□PASS BRIDGE FOUNDATION PLAN

AS-BUILT DRAWINGS

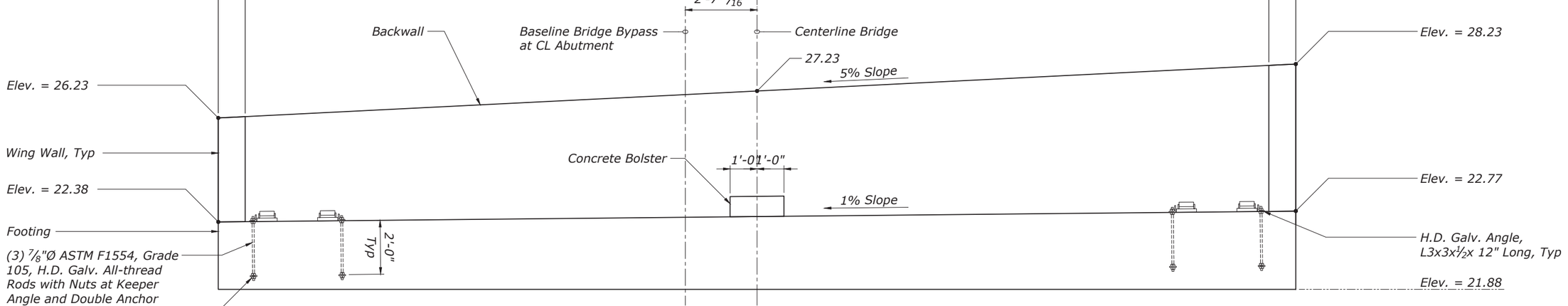
NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	24 of 50	NOVEMBER 2018	RG3083-X

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S7.2



ABUTMENT ☐ELEVATION

Scale: 1/4" = 1'-0"



ABUTMENT ☐ELEVATION

Scale: 1/4" = 1'-0"

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NANAHU (HOOLAPA) STREAM BRIDGE

KAMEHAMEHA HIGHWAY

HONOLULU COUNTY, HAWAII

B☐PASS BRIDGE ABUTMENT ELEVATIONS

AS-BUILT DRAWINGS

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	25 of 50	NOVEMBER 2018	RG3083-Y

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S7.3

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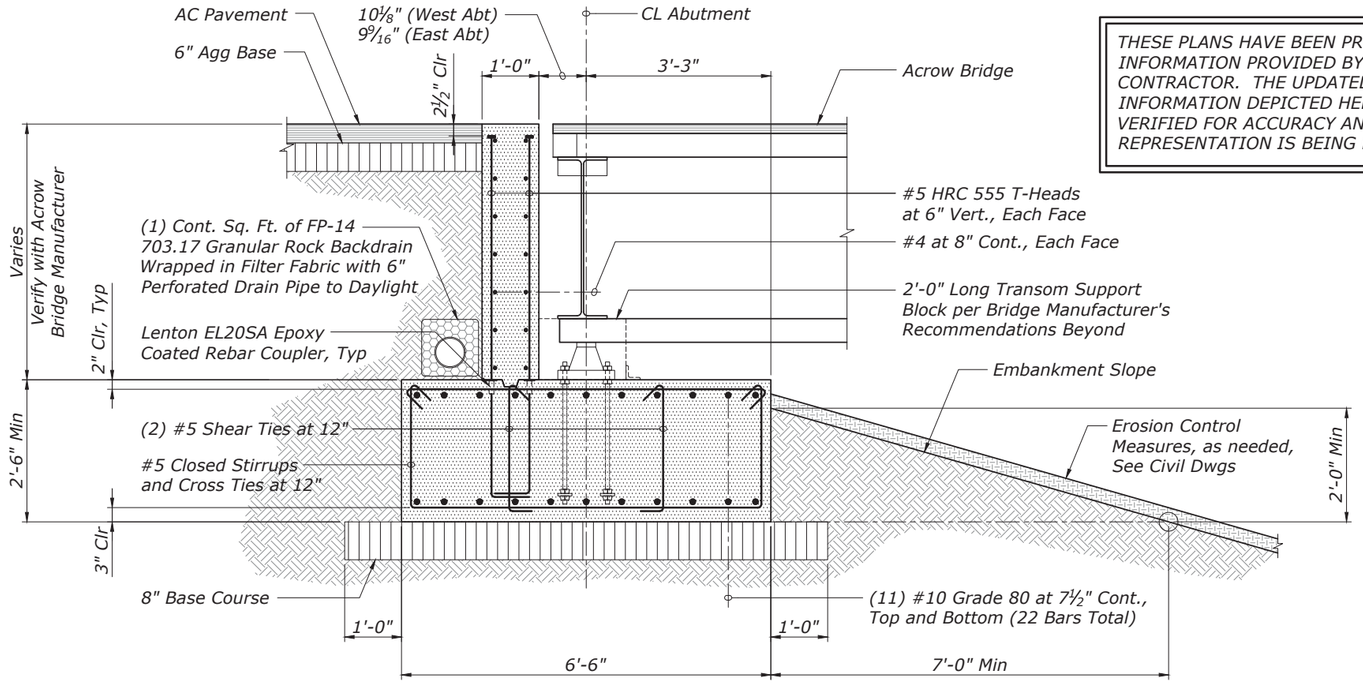
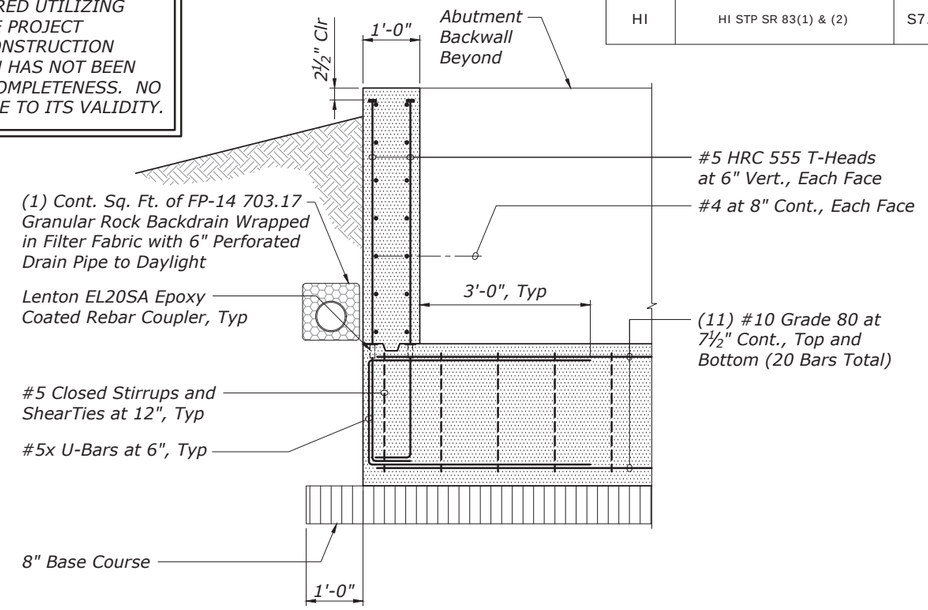


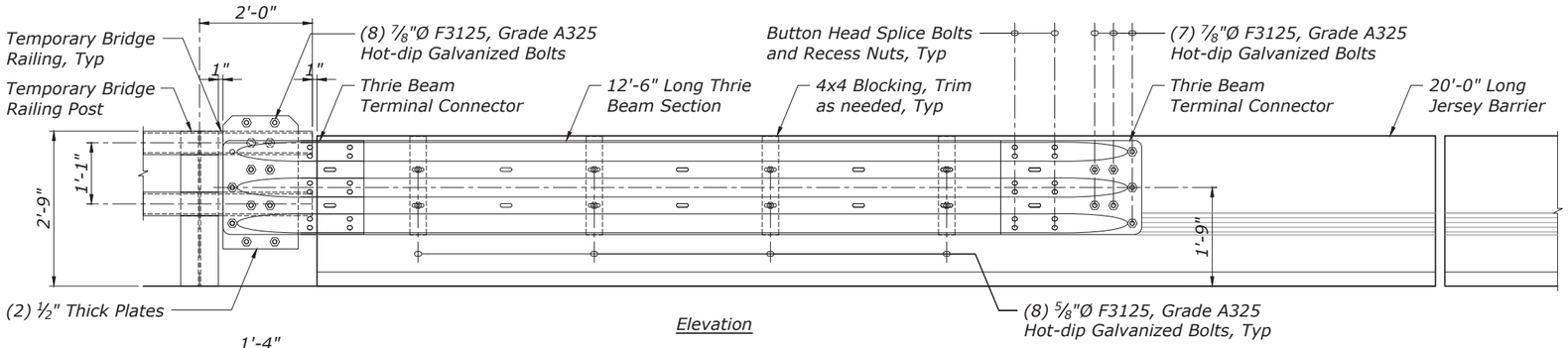
B□PASS BRIDGE ABUTMENT SECTION

Scale: ⅜" = 1'-0"



B□PASS BRIDGE □ING □ALL SECTION

Scale: ⅜" = 1'-0"



Elevation

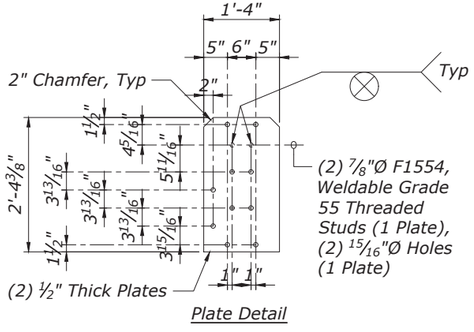
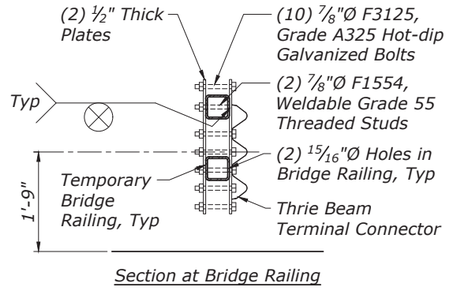
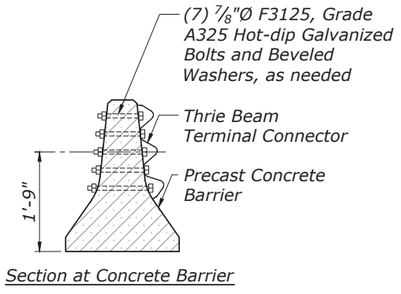


Plate Detail



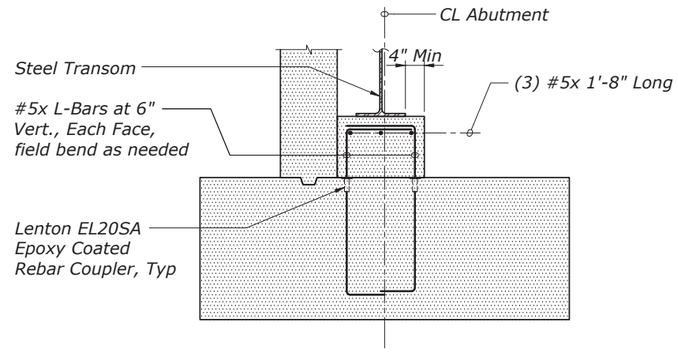
Section at Bridge Railing



Section at Concrete Barrier

GUARDRAIL ATTAC□MENT DETAILS

Scale: ⅜" = 1'-0"



B□PASS BRIDGE BOLSTER DETAIL

Scale: ⅜" = 1'-0"

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NANAHU (HOOLAPA) STREAM BRIDGE

KAMEHAMEHA HIGHWAY

HONOLULU COUNTY, HAWAII

B□PASS BRIDGE ABUTMENT SECTION

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	26 of 50	NOVEMBER 2018	RG3083-Z

AS-BUILT DRAWINGS

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S8.1

INDEX TO KAWELA BRIDGE DRAWINGS		
DRAWING NO.	SHEET	DESCRIPTION
RG3084-A	S8.1	INDEX TO BRIDGE DRAWINGS
RG3084-B	S8.2	STRUCTURAL GENERAL NOTES
RG3084-C	S8.3	QUANTITY SCHEDULE
RG3084-D	S8.4	EXISTING BRIDGE DEMOLITION PLAN
RG3084-E	S8.5	EXISTING BRIDGE ABUTMENT ELEVATIONS
RG3084-F	S9.1	BRIDGE LAYOUT PLAN
RG3084-G	S9.2	BRIDGE FOUNDATION PLAN
RG3084-H	S9.3	BRIDGE DECK FRAMING PLAN
RG3084-I	S10.1	LONGITUDINAL SECTION
RG3084-J	S10.2	TYPICAL CROSS SECTION
RG3084-K	S11.1	ABUTMENT NO. 1 ELEVATION
RG3084-L	S11.2	ABUTMENT NO. 2 ELEVATION
RG3084-M	S11.3	ABUTMENT NO. 1 SECTIONS
RG3084-N	S11.4	ABUTMENT NO. 2 SECTIONS
RG3084-O	S11.5	TYPICAL CONNECTING SLAB
RG3084-P	S12.1	PRESTRESSED PLANK
RG3084-Q	S12.2	PLANK SECTIONS
RG3084-R	S13.1	GUARDRAIL DETAILS
RG3084-S	S13.2	RAILING SECTION
RG3084-T	S14.1	TYPICAL APPROACH SLAB SECTIONS
RG3084-U	S15.1	TYPICAL PRESTRESSED PILE NOTES AND DETAILS
RG3084-V	S16.1	BYPASS BRIDGE FOUNDATION PLAN
RG3084-W	S16.2	BYPASS BRIDGE ABUTMENT ELEVATIONS
RG3084-X	S16.3	BYPASS BRIDGE ABUTMENT SECTION

KAWELA CONSTRUCTION AND CONCRETE PLACEMENT SEQUENCE:

1. *Pile Cap*
2. *Abutment Wall and 6" Slab-On-Grade*
3. *Bridge Deck*
4. *Approach Slab*
5. *Barrier Railing (Mauka Abutment 2 and Makai Abutment 1) and End Post (Mauka Abutment 1 and Makai Abutment 2)*
6. *Barrier Railing (Mauka Abutment 1 and Makai Abutment 2) and End Post (Mauka Abutment 2 and Makai Abutment 1)*

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KEN KAZUO HAYASHIDA
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No. 6818–S
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U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

KAWELA STREAM BRIDGE

KAMEHAMEHA HIGHWAY

HONOLULU COUNTY, HAWAII

INDE□ TO BRIDGE DRA□INGS

AS-BUILT DRAWINGS

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	27 of 50	NOVEMBER 2018	RG3084-A

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S8.2

GENERAL:

A. Design standards: AASHTO LRFD Bridge Design Specification, 7th Edition, 2014 as amended by State of Hawaii Department of Transportation Highways Division Design Criteria for Bridges and Structures, August 8, 2014.
B. The Contractor shall compare all the contract documents with each other and report in writing to the Engineer all inconsistencies and omissions.
C. The contractor shall take field measurements and verify field conditions and shall compare such field measurements and conditions with the drawings. Report in writing to the Engineer all inconsistencies and omissions.
D. The contractor shall be responsible for coordinating the work of all trades.
E. The contractor shall be responsible for means and methods of construction, workmanship and job safety.
F. The contractor shall provide temporary shoring and bracing as required for stability of structural members and systems.
G. Construction loading shall not exceed design live load unless special shoring is provided. Permitted construction loads shall be properly reduced in areas where the structure has not attained full design strength.
H. The contractor shall be responsible for protection of the adjacent properties, structures, streets and utilities during the construction period. Any damaged or deteriorated property shall be restored to the condition prior to the beginning of work or better at no cost to the state.
I. Details noted as typical on the structural drawings shall apply in all conditions unless specifically shown or noted otherwise.

DESIGN CRITERIA:

A. Live loads
   1. Vehicular: HL-93
   2. Bridge railing: in accordance with AASHTO TL-3
B. Lateral loads
   1. Seismic
      a. Spectral response acceleration coefficients
         i) Short period, s_s : 0.366g
         ii) 1-sec period, s_1: 0.100g
      b. Site Class: E
      c. Seismic Zone: 3
C. Soils
   1. Strength limit state bearing capacity
      a. Approach slabs: 4,000 psf
      b. Bypass bridge abutments: 3,600 psf
   2. Earth pressure
      a. Active (level backfill)
         i) Unrestrained: 53 pcf
         ii) Restrained: 74 pcf
      b. Passive:
         i) Strength limit state: 221 pcf
         ii) Extreme limit state: 442 pcf
C. Future wearing surface (curb to curb): 25 psf
D. Future utility line each side of bridge: 150 plf

FOUNDATION:

A. Foundation design is based on the Geotechnical Exploration and Evaluation Report, dated August 2019.
B. Contractor shall provide de-watering of excavated areas, as required.
C. Footings shall bear on undisturbed in-situ firm soils bottom of footings shall be compacted to provide a relatively firm and smooth bearing surface prior to placement of reinforcing steel and concrete. If soft and/or loose materials are encountered at the bottom of footing excavations, they shall be over-excavated to expose the underlying firm materials. The over-excavated area shall be backfilled with select granular material compacted to a minimum of 95% relative compaction or the footing bottom may be extended down to the underlying competent material. Contractor may substitute flowable concrete or the granular material upon approval from the Engineer.
D. Excavations for footings shall be approved by the Geotechnical Engineer of Record prior to placement of concrete and reinforcing.
E. Engineered fill and backfill shall be in accordance with FP-14 Specifcations and associated SCR's.
F. Fill should be moisture conditioned to within two percent of the optimum moisture content and placed in horizontal lifts not to exceed six inches. Fill shall be compacted to minimum 95%relative density as measured by AASHTO T180.

CONCRETE:

A. Concrete construction shall conform to the FP-14 Specifications and associated SCR's.
B. Concrete shall be normal weight hard rock concrete and shall have the following minimum 28 day compressive strength or comply with class of concrete compressive strength listed in the FP-14 Specifications:

1. Pre-stressed piles	6000 psi
2. Pre-stressed planks	8000 psi
3. Abutment footings and pile caps	Class A
4. Slab topping, approach slabs, and railings	Class A
5. Abutment walls and wing walls	Class A
6. All other concrete	Class A

C. Concrete delivery tickets shall record all free water in the mix at batching plant, added for consistency by driver, and any additional request by contractor up to the maximum amount allowed by the mix design.
D. All inserts, anchor bolts, plates, and other items to be cast in the concrete shall be hot-dipped galvanized according to ASTM A153 unless otherwise noted.
E. Reinforcing bars, anchor bolts, inserts, and other items to be cast in the concrete shall be secured in position prior to placement of concrete.
F. Conduits, pipes, and sleeves passing through a slab or footing that do not conform to typical details shall be located and the proposed construction detail submitted to the Engineer for approval.
G. Conduits, pipes, and sleeves embedded within a slab or wall (other than those merely passing through) shall be:
   1. No larger in outside dimensions than one third the overall slab or wall thickness in which they are embedded.
   2. Placed in the middle one third of slab or wall thickness
   3. Spaced no closer than three diameters or widths on center.
H. Conduits, pipes, and sleeves shall not be placed through or embedded in a beam unless specifically detailed.
I. The contractor shall locate construction joints not shown on the drawings, so as not to impair the strength of the structure and to minimize shrinkage stresses. Submit proposed locations of construction joints to the Engineer for approval.
J. Non-shrink grout shall be a premixed non-metallic formula, shall be capable of developing a minimum compressive strength of 5,000 psi in 3 days and 8,900 psi in 28 days, and shall contain at least 10 grams of migrating amine carboxylate corrosion inhibitor when grout is in contact with steel appurtenances. Precast plank shear keys will not require corrosion inhibitor.
K. Joint filler shall conform to FP-14 section 712.01(b).
L. A shrinkage reducing admixture conforming to SCR section 711.03(b) shall be included in the concrete mix for all cast-in-place concrete.
M. A corrosion inhibiting admixture conforming to SCR section 711.03(a) shall be included in the concrete mix for all concrete.
N. Reinforcing fibers conforming to SCR section 725.17(b) shall be included in the concrete mix for members as specified in SCR section 552.03.

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CENTRAL FEDERAL LANDS HIGHWAY DIVISION

KAWELA STREAM BRIDGE

KAMEHAMEHA HIGHWAY

HONOLULU COUNTY, HAWAII

STRUCTURAL GENERAL NOTES

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	28 of 50	NOVEMBER 2018	RG3084-B

AS-BUILT DRAWINGS

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S8.3

REINFORCING STEEL:

A. Reinforcing steel shall be deformed bars conforming to AASHTO M31, Grade 60, unless otherwise noted.
B. Low alloy steel deformed bars shall conform to FP-14 section 709.01(i), Grade 60, unless otherwise noted.
C. Clear concrete cover for reinforcing bars shall be as follows, unless otherwise noted:
  1. Footings, slabs, etc. cast against earth: 3"
  2. Footings, walls, grade beams, etc. formed and exposed to earth or weather: 2"
  3. Bridge deck top reinforcement: 2-1/2"
  4. Other: 2"
D. Reinforcing steel shall be spliced where indicated on plans. Provide lap splice length per typical details and schedule, unless otherwise noted.
E. Mechanical splice connectors shall develop in tension 125 percent of the specified minimum yield strength of reinforcing bars.
F. Provide standard hooks conforming to ACI SP-66.
G. Fabricate reinforcing bars according to ACI SP-66, ACI Detailing Manual.
H. Reinforcing steel shall be placed and secured in conformance with crsi manual of standard practice with placement tolerances per ACI standard 117.

STRUCTURAL STEEL:

A. Fabrication and erection of structural steel shall conform to the american institute of steel construction manual of steel construction, thirteenth edition.
B. Structural steel shall conform to ASTM A36 unless otherwise noted.
C. Steel wide flange sections shall conform to ASTM A992.
D. Plates and bars shall conform to ASTM A36.
E. Welds and welding procedures shall conform to the structural welding code AWS D1.1 of the american welding society.
F. Welding shall be performed by welders prequalified for welding procedures to be used.
G. Welding electrodes shall be E70xx for carbon steel.
H. High-strength bolts shall conform to ASTM A325, type N. Installation shall be assured by any of the following methods:
  1. Turn of nut method
  2. Direct tension indicator
  3. Calibrated wrench
  4. Alternative design bolt
I. All anchor bolts, plates, and other items to be cast in concrete shall be hot-dip galvanized according to ASTM A153 unless otherwise noted.
J. Carbon steel bolts shall conform to ASTM A307, grade a unless otherwise noted, and shall be hot-dip galvanized according to ASTM A153.
K. All steel shall be hot-dip galvanized after fabrication according to ASTM A123.
L. Any damaged galvanized surface shall be repaired as follows:
  1. prepare surface per sspc-sp1, solvent cleaning.
  2. apply two coats of cold applied galvanizing compound containing 95% metallic zinc content by weight in dry film and 52% solids content by volume.
  3. application rate shall be 1.5 mils dry film thickness per coat.

LOAD RATING

	Rating Factor	Distribution Factor	Load Effect	Controlling Member
HL-93 Inventory	2.05	0.325	Positive Moment	Interior Girder
HL-93 Operating	2.66	0.325	Positive Moment	Interior Girder

ESTIMATE

Item No.	Description	Quantity	Unit	Notes
20304-1000	Removal of structures and obstructions	LPSM	LPSM	-
20435-2000	Backfill, Granular (beneath approach slabs)	25	CUYD	(1)
20801-0000	Structure excavation	214	CUYD	-
20803-0000	Structure backfill	18	CUYD	-
55101-0300	Precast prestressed concrete pile	864	LNFT	-
55201-1500	Structure Concrete	281	CUYD	(2)
55302-3500	Precast, prestressed concrete slab, 14" solid	460	LNFT	(3)
55401-1000	Reinforcing steel	94400	LB	-
55601-0500	Bridge railing, concrete	164	LNFT	-
61707-0000	Structure Transition Railing	100	LNFT	(4)

ESTIMATE NOTES:

(1) Includes cost of drain pipes, geocomposite drains, aggregate base course backfill and aggregate subbase course
(2) Includes cost of bridge deck, approach slabs
(3) Includes cost of concrete, reinforcing steel, prestressing steel, inserts, plates, lifting devices, and other materials required for the manufacture and erection of the planks
(4) Includes cost of furnishing and installing posts, blocks, thrie and W-beam rail elements, anchor plates, and installation hardware

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CENTRAL FEDERAL LANDS HIGHWAY DIVISION

KAWELA STREAM BRIDGE

KAMEHAMEHA HIGHWAY

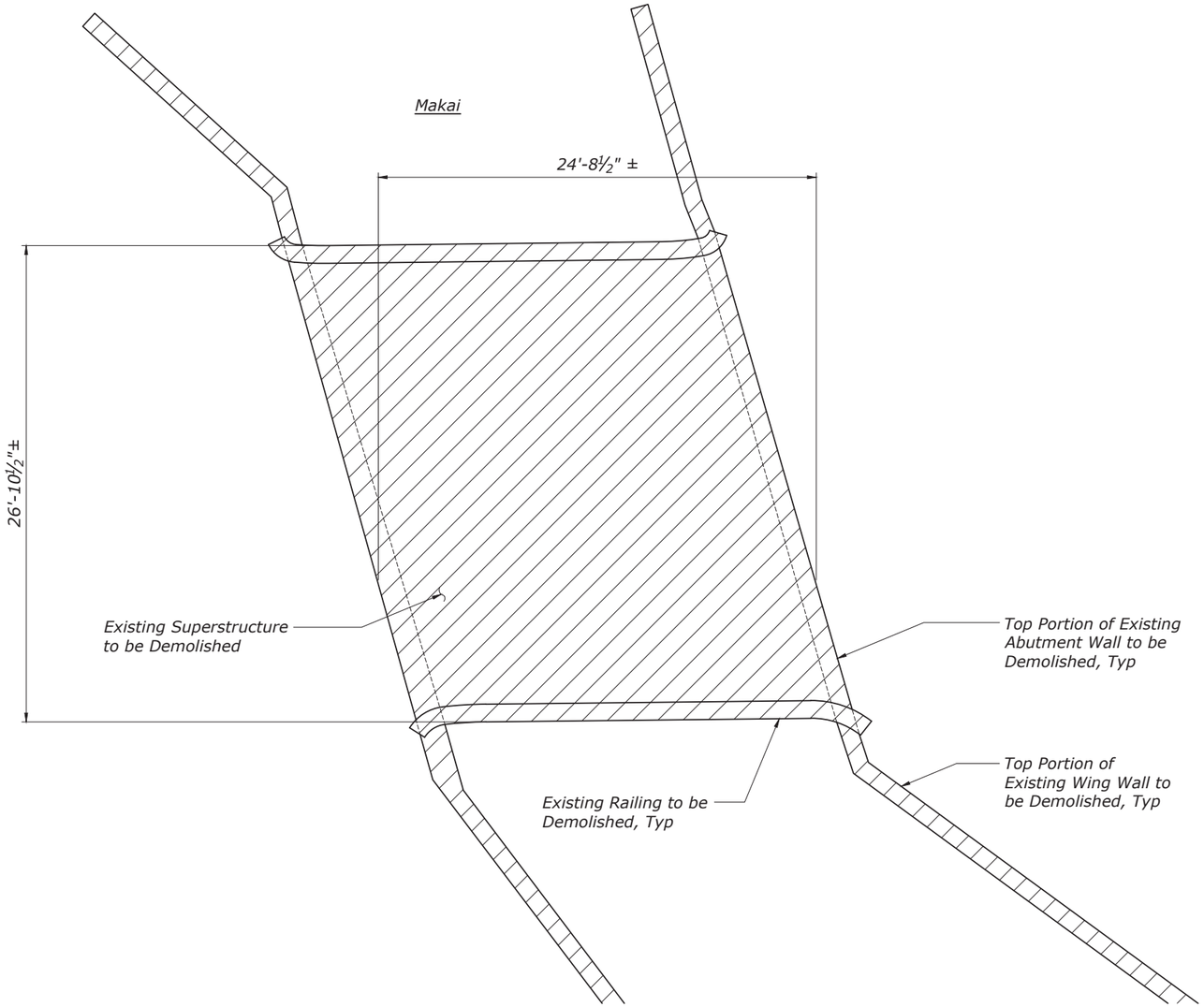
HONOLULU COUNTY, HAWAII

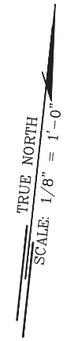
□UANTIT□ SC□EDULE

AS-BUILT DRAWINGS

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	29 of 50	NOVEMBER 2018	RG3084-C

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S8.4





BRIDGE FOUNDATION PLAN
Scale: ⅛" = 1'-0"

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KAWELA STREAM BRIDGE

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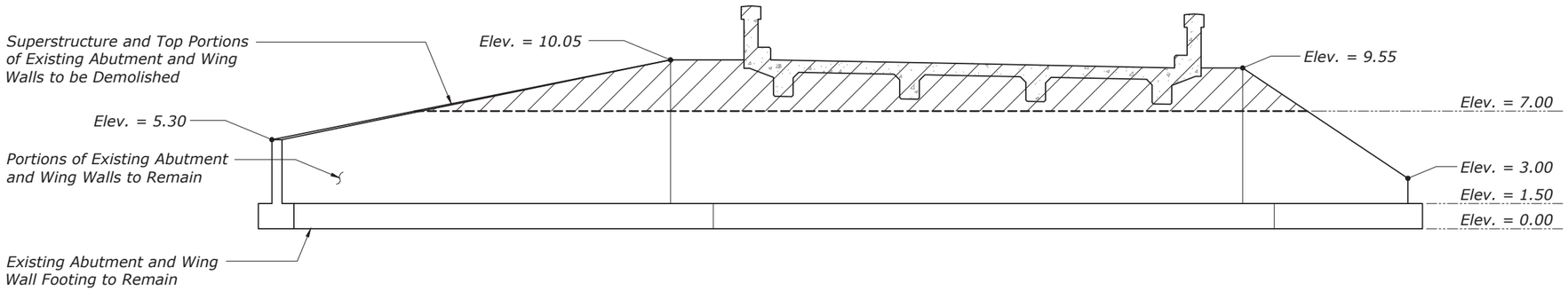
HONOLULU COUNTY, HAWAII

EXISTING BRIDGE DEMOLITION PLAN

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	30 of 50	NOVEMBER 2018	RG3084-D

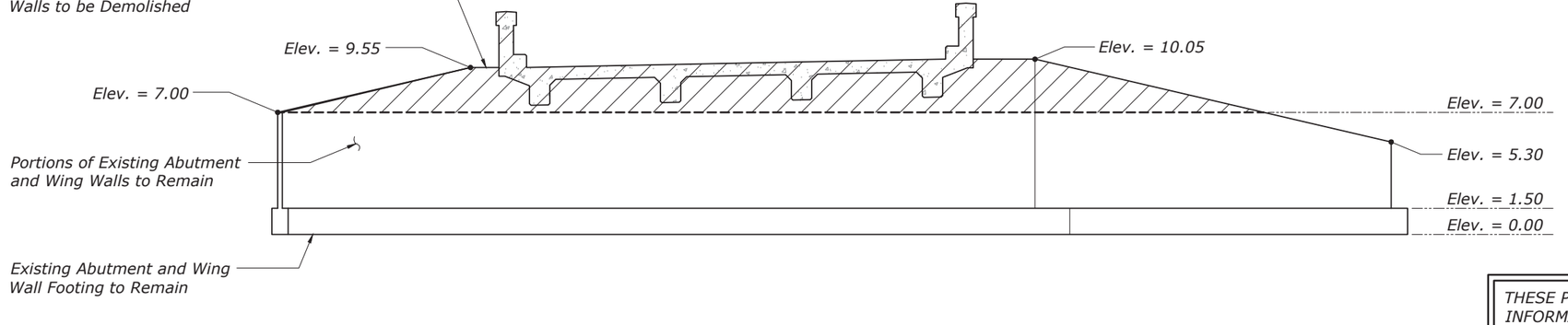
AS-BUILT DRAWINGS

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S8.5



EXISTING BRIDGE WEST ABUTMENT FRONT ELEVATION

Scale: ⅛" = 1'-0"



EXISTING BRIDGE EAST ABUTMENT FRONT ELEVATION

Scale: ⅛" = 1'-0"

NOTES:

1. *The orientations of the views are perpendicular to the baseline of the highway.*
2. *Temporary shoring shall be used as needed to maintain the integrity and stability of the existing abutment walls until the bridge concrete deck topping has been placed.*

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EXISTING BRIDGE ABUTMENT ELEVATIONS

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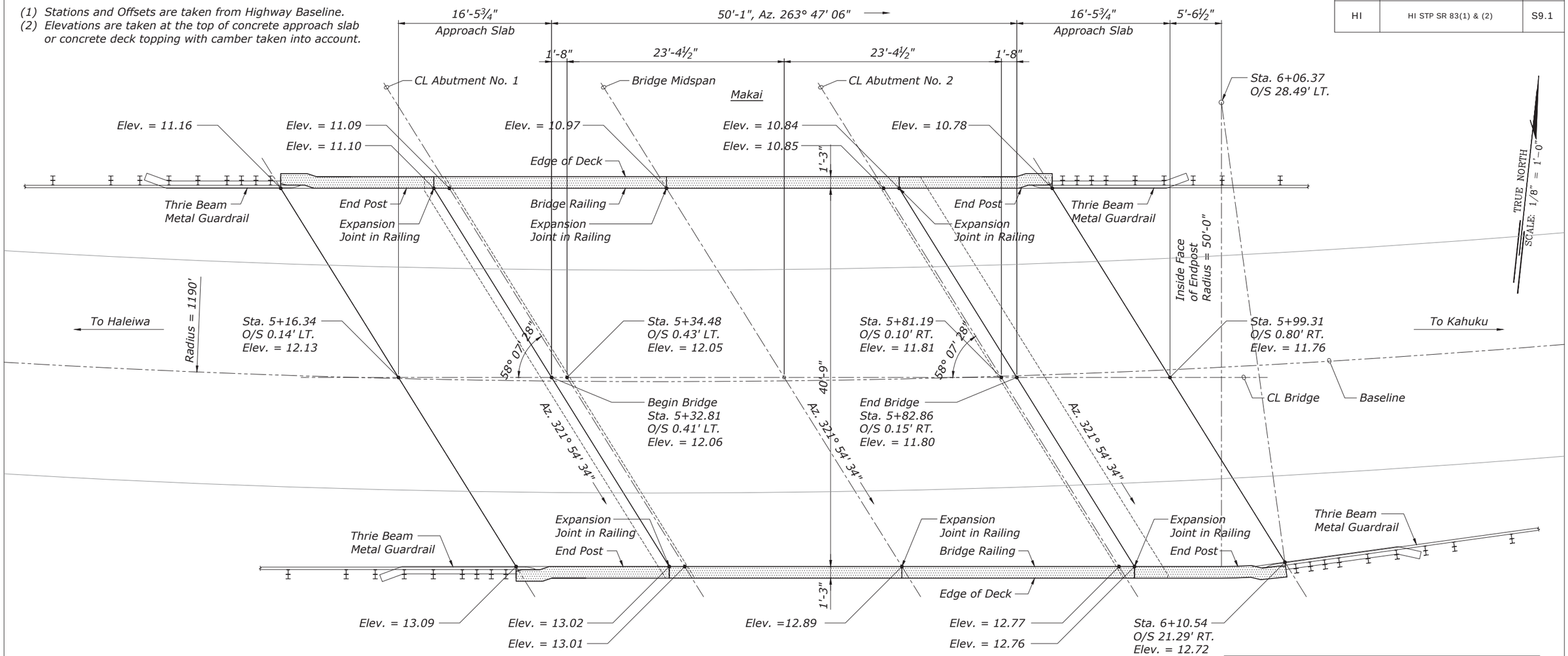
								BL & BC	CADD	MH		MH	31 of 50	NOVEMBER 2018	RG3084-E

AS-BUILT DRAWINGS

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S9.1

NOTES:

(1) *Stations and Offsets are taken from Highway Baseline.*
(2) *Elevations are taken at the top of concrete approach slab or concrete deck topping with camber taken into account.*



BRIDGE LAYOUT PLAN

Scale: 3/32" = 1'-0"

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BRIDGE LAYOUT PLAN

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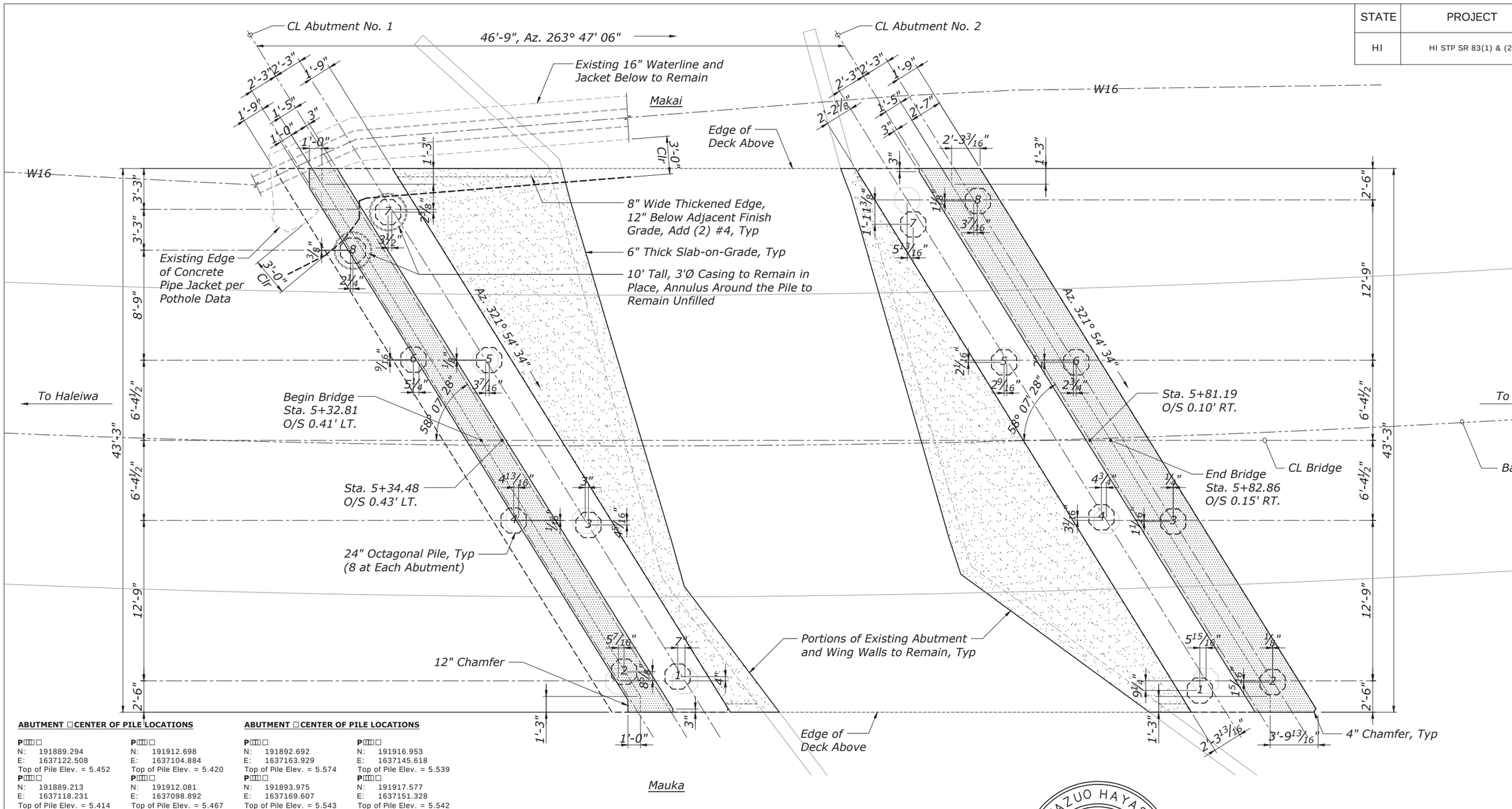
								BL & BC	CADD	MH		MH	32 of 50	NOVEMBER 2018	RG3084-F

AS-BUILT DRAWINGS

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S9.2



ABUTMENT □CENTER OF PILE LOCATIONS

P□□□□
N: 191889.294
E: 1637122.508
Top of Pile Elev. = 5.452

P□□□□
N: 191889.213
E: 1637118.231
Top of Pile Elev. = 5.414

P□□□□
N: 191900.565
E: 1637114.146
Top of Pile Elev. = 5.476

P□□□□
N: 191900.217
E: 1637108.198
Top of Pile Elev. = 5.400

P□□□□
N: 191912.698
E: 1637104.884
Top of Pile Elev. = 5.420

P□□□□
N: 191912.081
E: 1637098.892
Top of Pile Elev. = 5.467

P□□□□
N: 191923.529
E: 1637095.618
Top of Pile Elev. = 5.339

P□□□□
N: 191920.183
E: 1637093.167
Top of Pile Elev. = 5.426

ABUTMENT □CENTER OF PILE LOCATIONS

P□□□□
N: 191892.692
E: 1637163.929
Top of Pile Elev. = 5.574

P□□□□
N: 191893.975
E: 1637169.607
Top of Pile Elev. = 5.543

P□□□□
N: 191905.820
E: 1637160.373
Top of Pile Elev. = 5.545

P□□□□
N: 191905.541
E: 1637154.656
Top of Pile Elev. = 5.544

P□□□□
N: 191916.953
E: 1637145.618
Top of Pile Elev. = 5.539

P□□□□
N: 191917.577
E: 1637151.328
Top of Pile Elev. = 5.542

P□□□□
N: 191927.080
E: 1637137.244
Top of Pile Elev. = 5.368

P□□□□
N: 191929.481
E: 1637142.161
Top of Pile Elev. = 5.478

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BRIDGE FOUNDATION PLAN

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KAMEHAMEHA HIGHWAY

HONOLULU COUNTY, HAWAII

BRIDGE FOUNDATION PLAN

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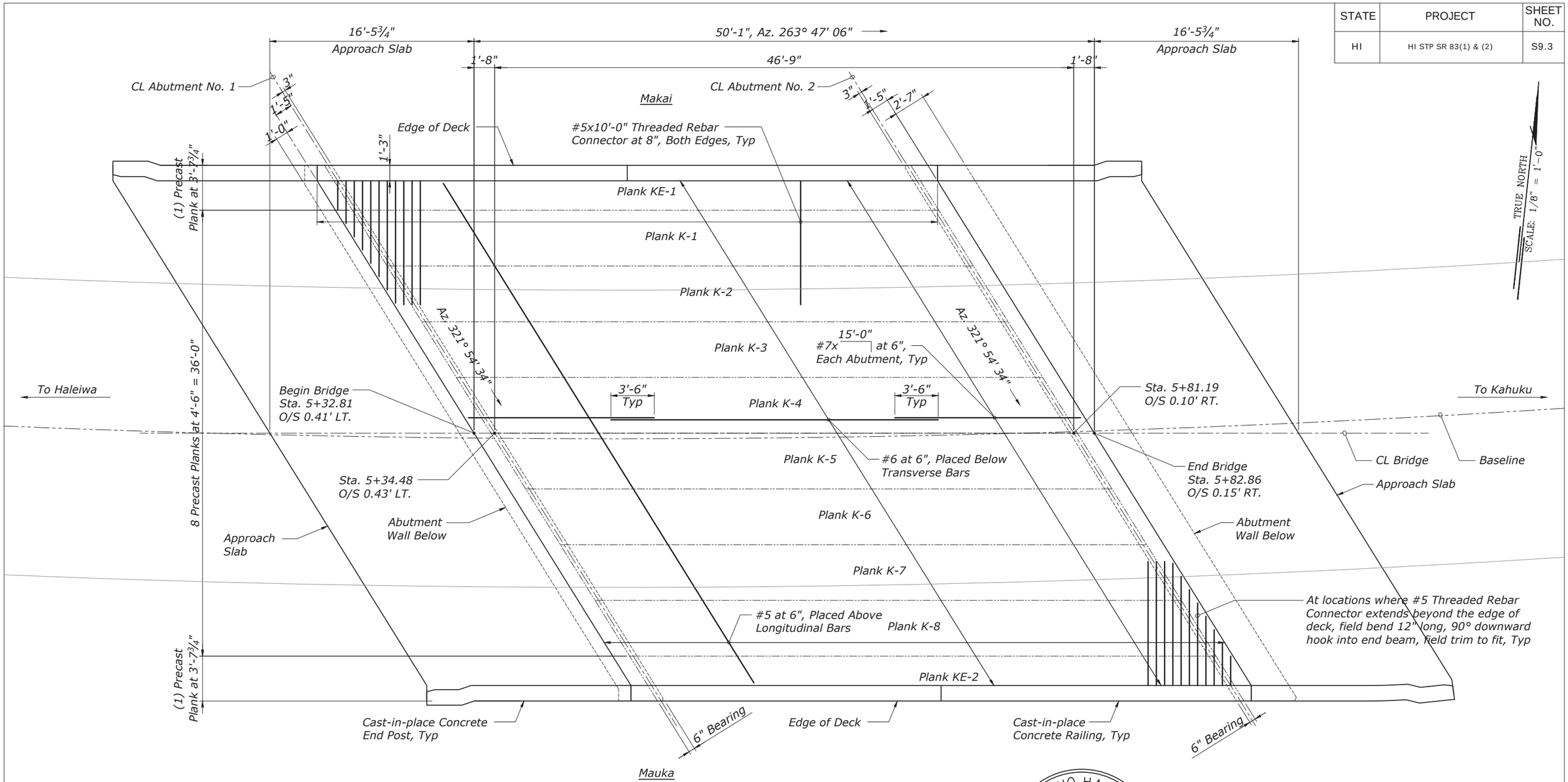
								BL & BC	CADD	MH		MH	33 of 50	NOVEMBER 2018	RG3084-G

AS-BUILT DRAWINGS

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S9.3



DEC□ FRAMING PLAN

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KAWELA STREAM BRIDGE

KAMEHAMEHA HIGHWAY

HONOLULU COUNTY, HAWAII

BRIDGE DEC□ FRAMING PLAN

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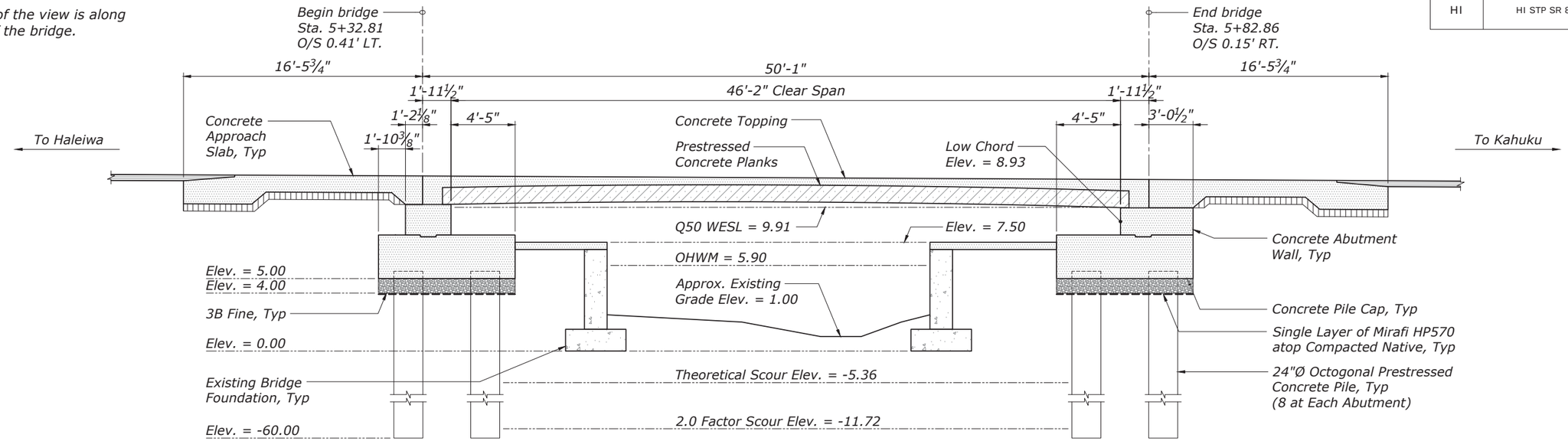
								BL & BC	CADD	MH		MH	34 of 50	NOVEMBER 2018	RG3084-H

AS-BUILT DRAWINGS

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S10.1

NOTE:

The orientation of the view is along the centerline of the bridge.



BRIDGE LONGITUDINAL SECTION

Scale: ⅛" = 1'-0"

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KEN KAZUO HAYASHIDA
LICENSED PROFESSIONAL ENGINEER
No. 6818–S
HAWAII, U.S.A.

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SIGNATURE — April 30, 2022 EXPIRATION DATE OF THE LICENSE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

KAWELA STREAM BRIDGE

KAMEHAMEHA HIGHWAY

HONOLULU COUNTY, HAWAII

LONGITUDINAL SECTION

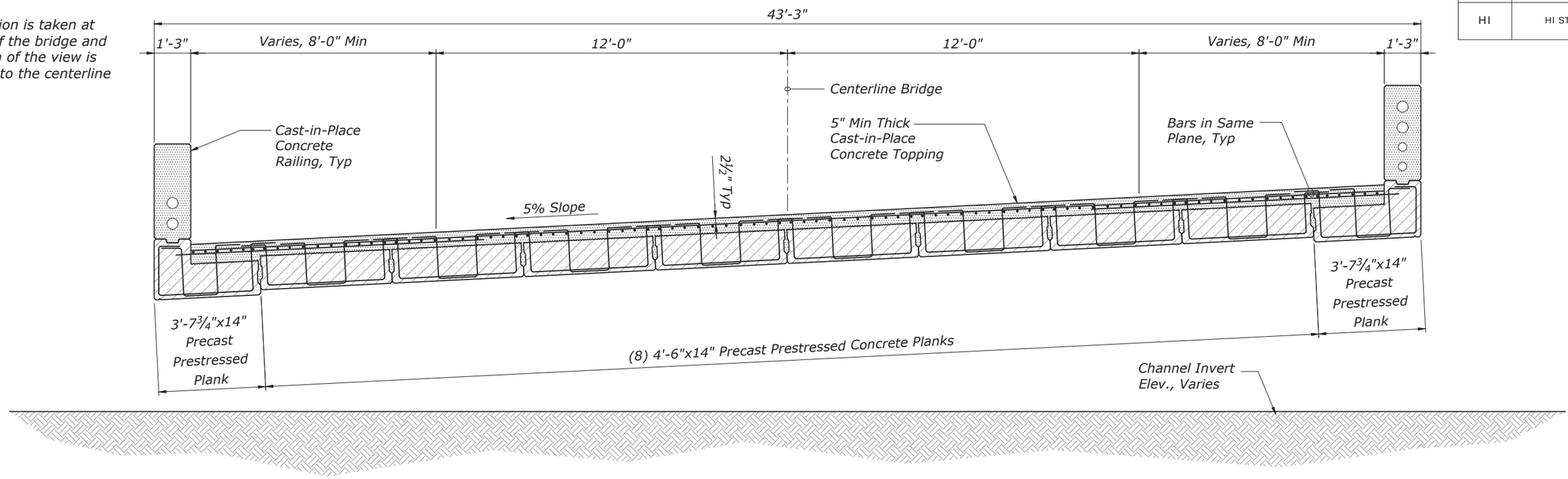
NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	35 of 50	NOVEMBER 2018	RG3084-I

AS-BUILT DRAWINGS

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S10.2

NOTE:

The cross section is taken at the midspan of the bridge and the oriantation of the view is perpendicular to the centerline of the bridge.



TYPICAL BRIDGE CROSS SECTION

Scale: ¼" = 1'-0"

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CENTRAL FEDERAL LANDS HIGHWAY DIVISION

KAWELA STREAM BRIDGE

KAMEHAMEHA HIGHWAY

HONOLULU COUNTY, HAWAII

TYPICAL CROSS SECTION

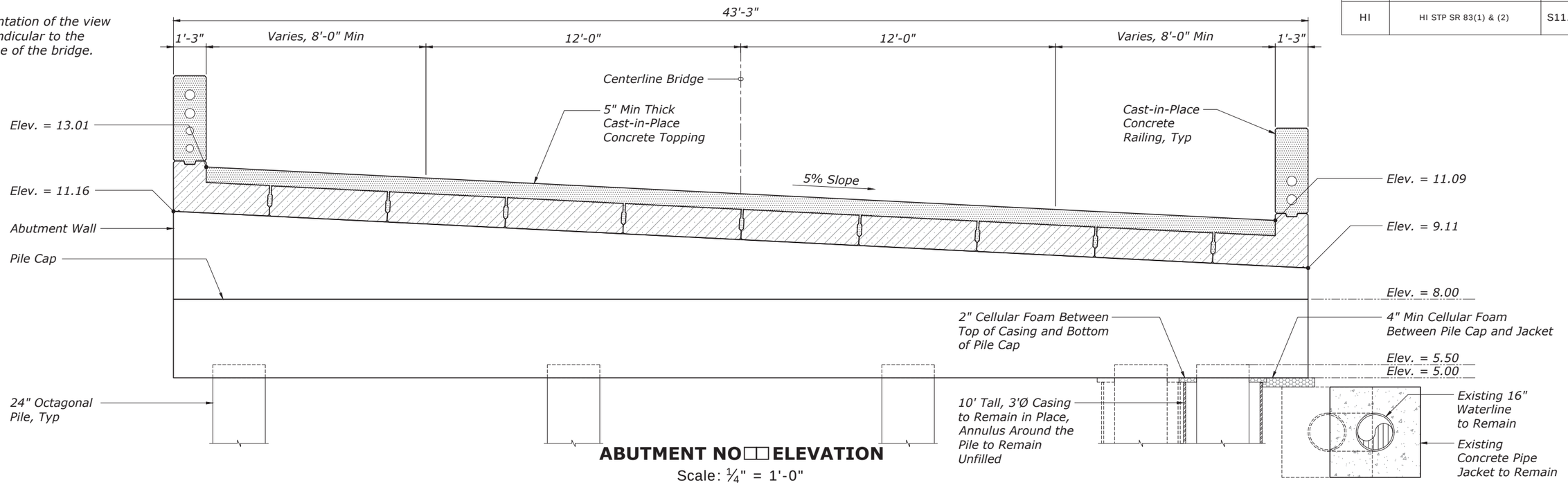
NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	36 of 50	NOVEMBER 2018	RG3084-J

AS-BUILT DRAWINGS

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S11.1

NOTE:

The orientation of the view is perpendicular to the centerline of the bridge.



ABUTMENT NO□□ ELEVATION

Scale: ¼" = 1'-0"

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KAWELA STREAM BRIDGE

KAMEHAMEHA HIGHWAY

HONOLULU COUNTY, HAWAII

ABUTMENT NO□□ ELEVATION

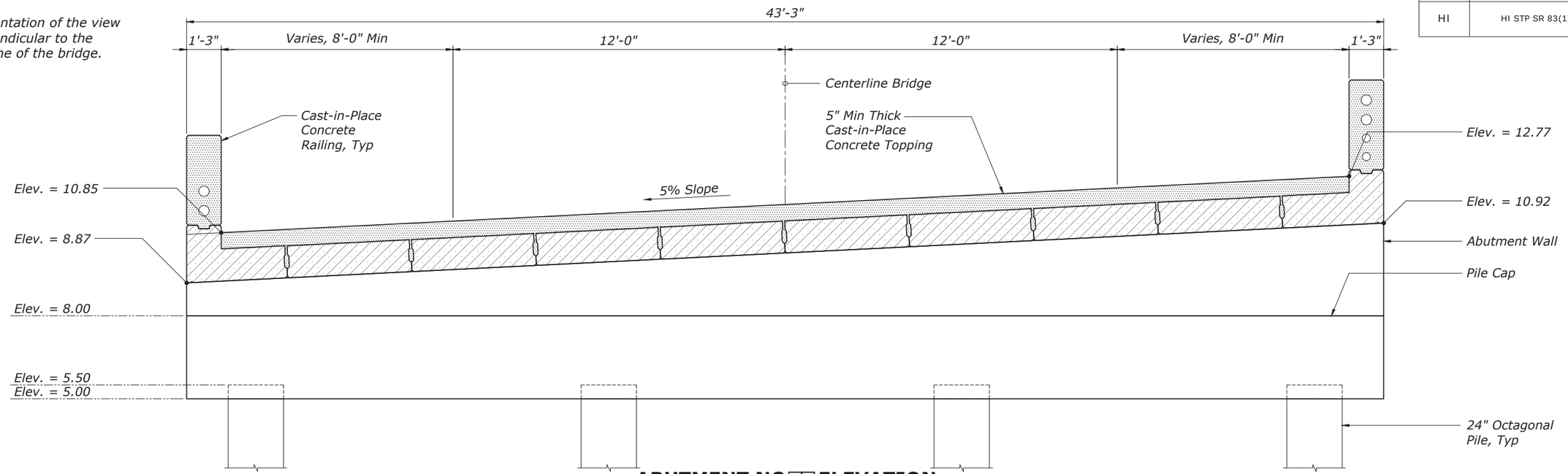
NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	37 of 50	NOVEMBER 2018	RG3084-K

AS-BUILT DRAWINGS

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S11.2

NOTE:

The orientation of the view is perpendicular to the centerline of the bridge.



ABUTMENT NO□□ ELEVATION

Scale: ¼" = 1'-0"

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CENTRAL FEDERAL LANDS HIGHWAY DIVISION

KAWELA STREAM BRIDGE

KAMEHAMEHA HIGHWAY

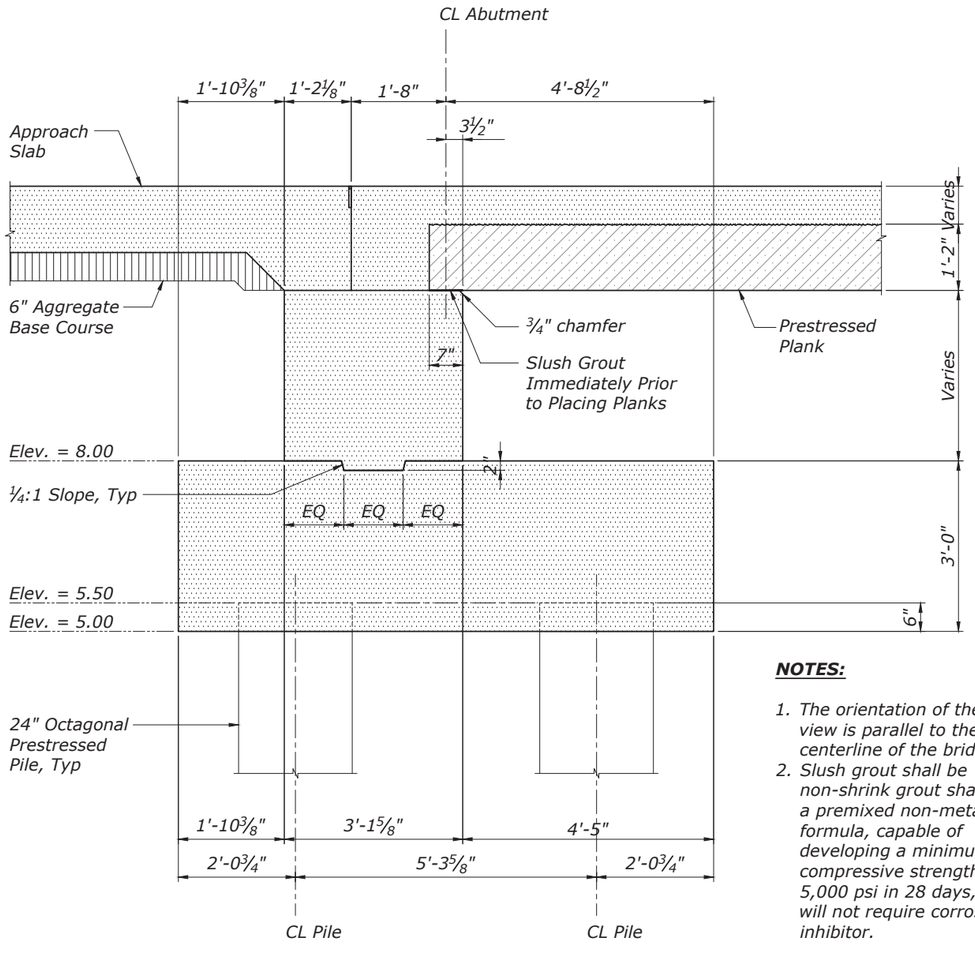
HONOLULU COUNTY, HAWAII

ABUTMENT NO□□ ELEVATION

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	38 of 50	NOVEMBER 2018	RG3084-L

AS-BUILT DRAWINGS

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S11.3

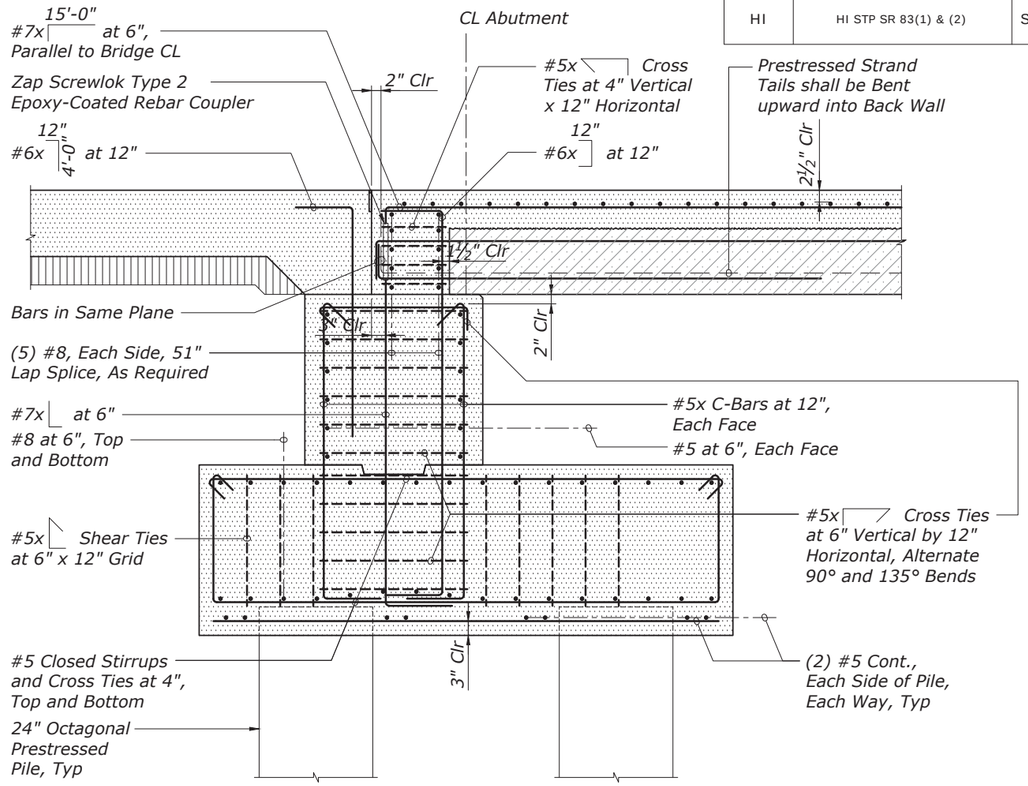


NOTES:

1. *The orientation of the view is parallel to the centerline of the bridge.*
2. *Slush grout shall be non-shrink grout shall be a premixed non-metallic formula, capable of developing a minimum compressive strength of 5,000 psi in 28 days, and will not require corrosion inhibitor.*

ABUTMENT NO□□ SECTION S□O□ING DIMENSIONS

Scale: 3/8" = 1'-0"



NOTE:

The orientation of the view is parallel to the centerline of the bridge.

ABUTMENT NO□□ SECTION S□O□ING REINFORCING

Scale: 3/8" = 1'-0"

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CENTRAL FEDERAL LANDS HIGHWAY DIVISION

KAWELA STREAM BRIDGE

KAMEHAMEHA HIGHWAY

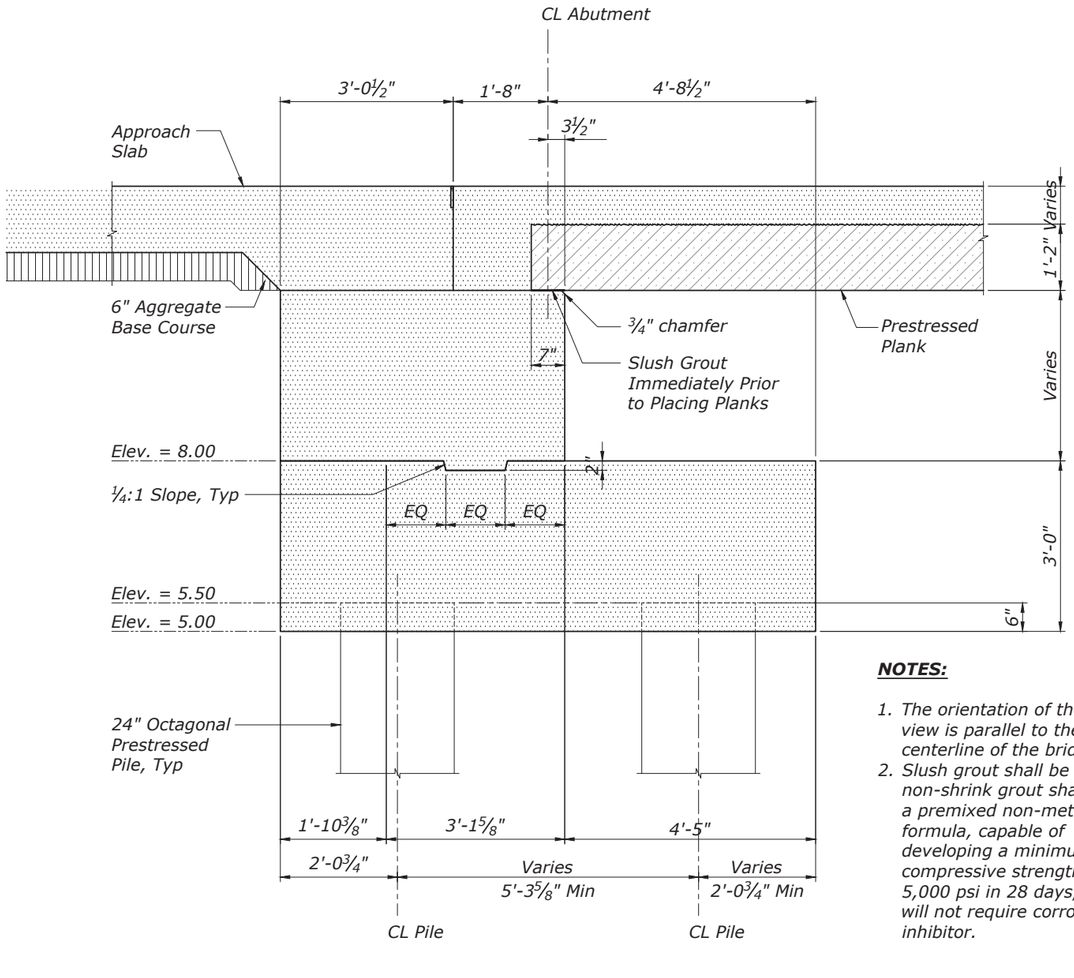
HONOLULU COUNTY, HAWAII

ABUTMENT NO□□ SECTIONS

AS-BUILT DRAWINGS

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	39 of 50	NOVEMBER 2018	RG3084-M

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S11.4

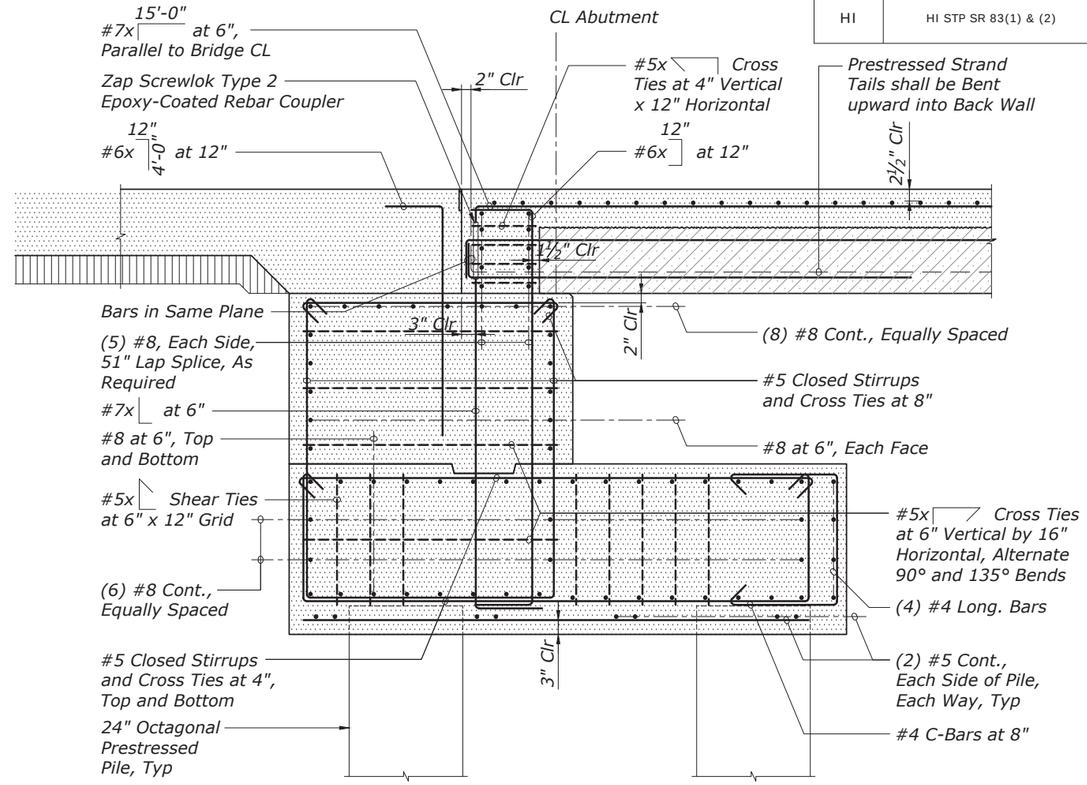


NOTES:

1. *The orientation of the view is parallel to the centerline of the bridge.*
2. *Slush grout shall be non-shrink grout shall be a premixed non-metallic formula, capable of developing a minimum compressive strength of 5,000 psi in 28 days, and will not require corrosion inhibitor.*

ABUTMENT NO□□ SECTION S□O□ING DIMENSIONS

Scale: ⅜" = 1'-0"



NOTE:

The orientation of the view is parallel to the centerline of the bridge.

ABUTMENT NO□□ SECTION S□O□ING REINFORCING

Scale: ⅜" = 1'-0"

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KAWELA STREAM BRIDGE

KAMEHAMEHA HIGHWAY

HONOLULU COUNTY, HAWAII

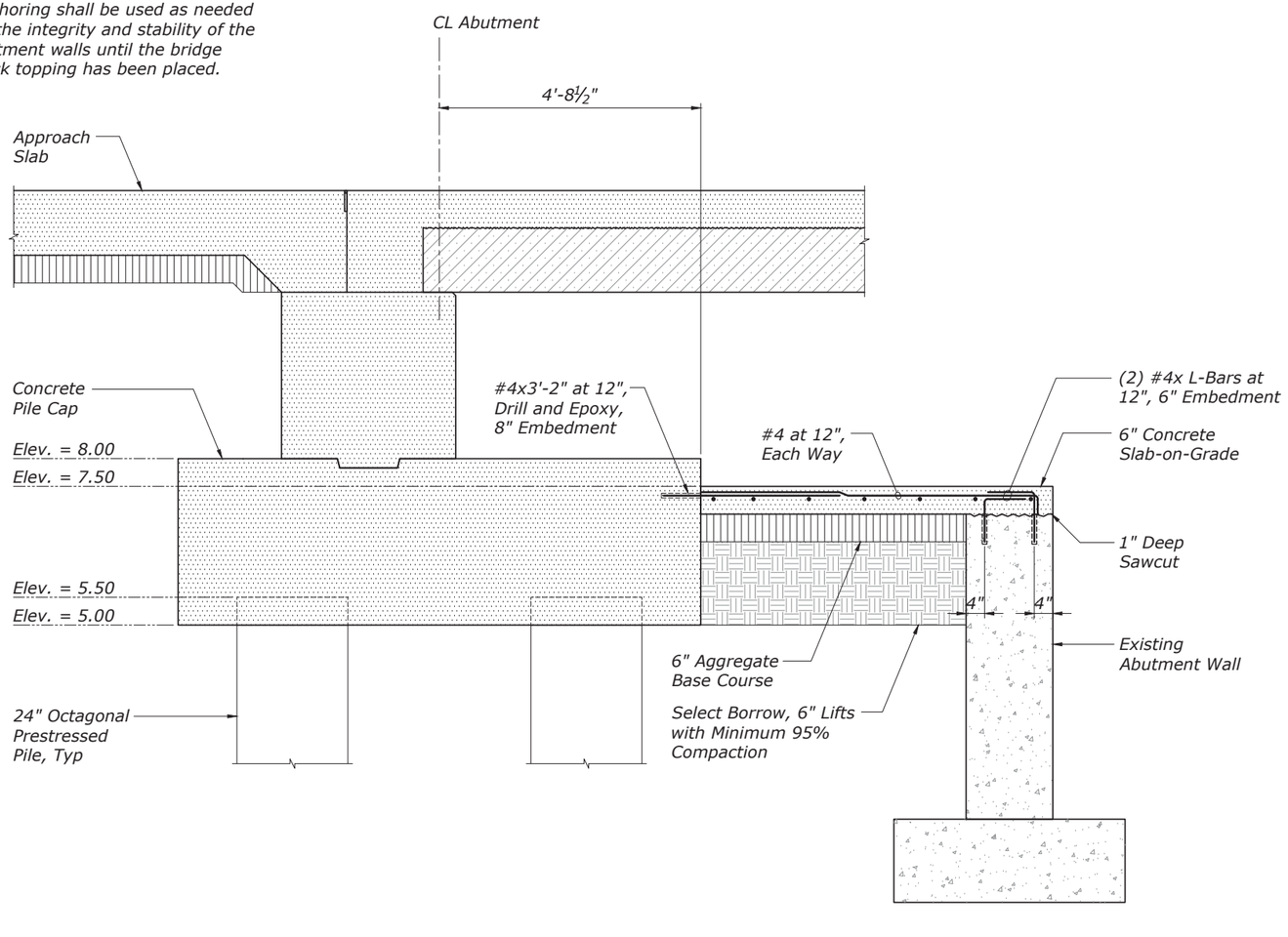
ABUTMENT NO□□ SECTIONS

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	40 of 50	NOVEMBER 2018	RG3084-N

AS-BUILT DRAWINGS

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S11.5

Note:
Temporary shoring shall be used as needed to maintain the integrity and stability of the existing abutment walls until the bridge concrete deck topping has been placed.



TYPICAL CONNECTING SLAB

Scale: ⅜" = 1'-0"

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KAMEHAMEHA HIGHWAY

HONOLULU COUNTY, HAWAII

TYPICAL CONNECTING SLAB

AS-BUILT DRAWINGS

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	41 of 50	NOVEMBER 2018	RG3084-O

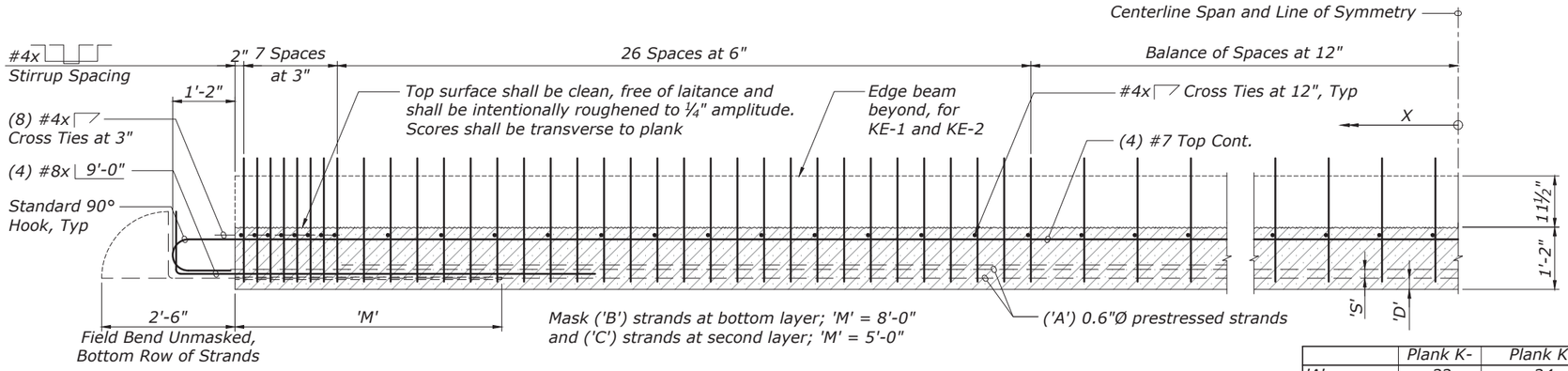
STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S12.1

Prestressed Plank Notes:

1. *Prestressed concrete 28 day strength f'c = 8,000 psi. prestressed concrete strength at time of release fci = 6,400 psi.*
2. *Prestressing strands shall be (7) wire 0.6"Ø low relaxation steel strands (Area = 0.217 in^2) conforming to ASTM A416 with an ultimate tensile strength of 270 ksi. Initial strand stress (immediately prior to release of prestress) = 0.75 f_{pu} = 202.5 ksi.*
3. *Non-prestressed reinforcing steel shall be deformed bars conforming to ASTM A615 or A706, Grade 60, unless noted otherwise.*
4. *Strand pattern shall be symmetrical about the longitudinal centerline of the plank.*
5. *Strand release sequence shall not induce any lateral deflection of the plank.*
6. *Contractor shall submit shop drawings indicating proposed strand pattern, releasing sequence, reinforcing details and hold down device details to the engineer prior to fabrication.*
7. *During curing, care shall be taken to avoid any lateral deflection to the plank due to improper orientation. steam curing may be used to accelerate strength gain.*
8. *Lifting devices shall be placed as close as possible to the centerline of bearings of the plank. details and locations of lifting devices shall be submitted to the engineer for approval. such approval does not relieve the contractor of his responsibilities if plank is damaged due to failure of the lifting device.*
9. *$P_{(e)}$ = effective prestress force after all losses (kips)*
10. *Plank stirrups shall be placed parallel to the bridge skew.*
11. *Top row of unmasked strands shall be cut flush with the face of plank.*

Notes:

1. *The plank lengths shown do not include changes in length increase due to elastic and time dependent shortening effects and longitudinal slope of the plank.*
2. *The unmasked strands shall have 2'-6" extension at both ends of each plank.*



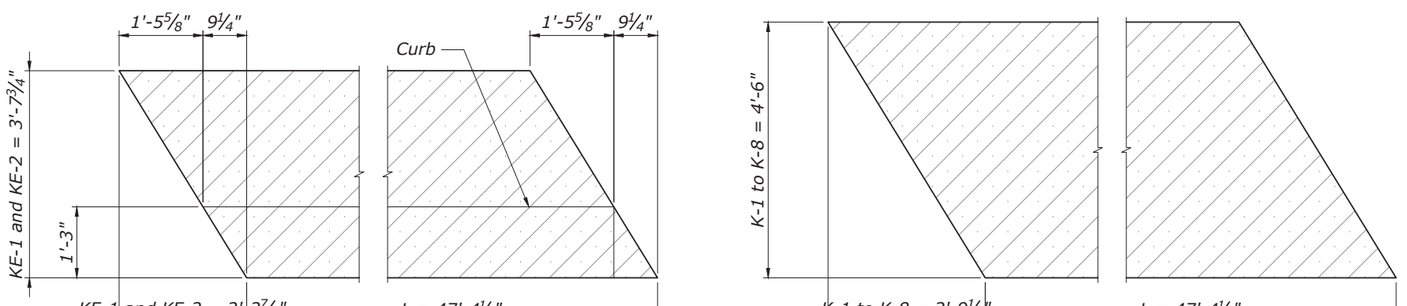
	Plank K-	Plank KE-
'A'	32	24
'B'	6	4
'C'	0	2
$P_{(e)}$ [kips]	1,144	880
C.G.S. [in]	3.25	4.25
'D' [in]	2.5	2.5
'S' [in]	2	3

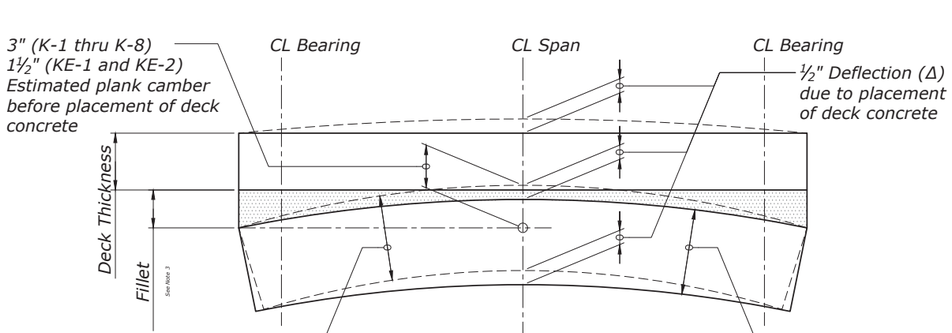
TYPICAL PRESTRESSED PLAN ELEVATION

Scale: ⅜" = 1'-0"

Required Actions:

1. *Measure slab camber prior to setting deck forms. If the actual camber exceeds the estimated slab camber (3" for interior planks and 1½" for exterior planks) by more than 1", the fillet will have to be increased by raising profile grade as directed by the owner.*
2. *Set the deck forms and camber the deck machine screed rails to offset the slab deflections (½") due to deck placement.*
3. *Bridge precast slab seat elevations were calculated using dead load deflections of the deck so that top of precast slab will be a minimum of 1" below bottom of deck at any point in the span, allowing for precast slab depth and slab camber tolerance.*





DECK FORM SETTING DIAGRAM

Not to Scale

Deflection Equation:

$\Delta = ½" - X^2(1092.8^{-1})$

Where:

Δ = Deflection, in inches, of slab at any point caused by the weight of deck
X = Distance, in feet, measured from midspan (See diagram)

Note:

Δ max = ½" at X = 0' (Midspan)
Δ min = 0" at X = 23'-4½" (CL Bearing)

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Note:
Reinforcing not shown for clarity.

TYPICAL PRESTRESSED PLAN PLAN

Scale: ⅜" = 1'-0"

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KAMEHAMEHA HIGHWAY

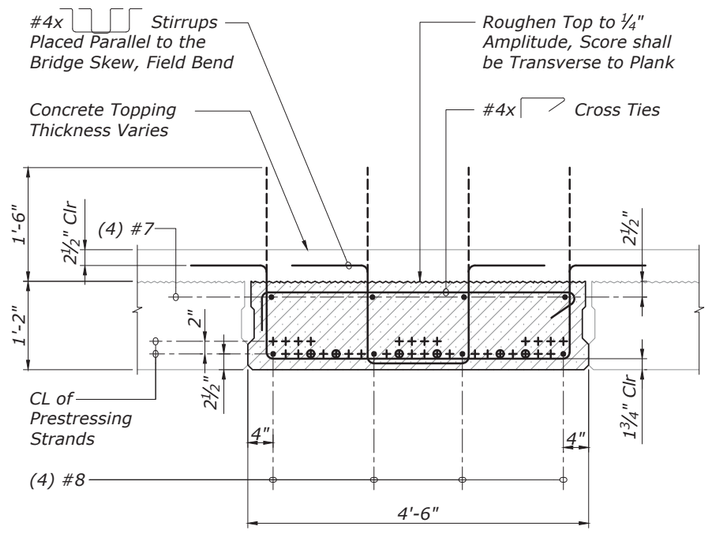
HONOLULU COUNTY, HAWAII

PRESTRESSED PLAN

AS-BUILT DRAWINGS

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	42 of 50	NOVEMBER 2018	RG3084-P

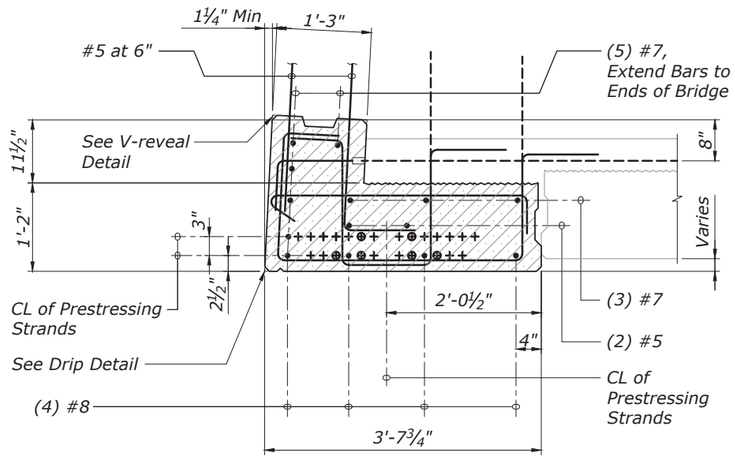
STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S12.2



Legend:
- \+ *0.6"Ø Strands*
- ⊕ *0.6"Ø Strands Masked at Each End*
- • *Deformed Rebar*

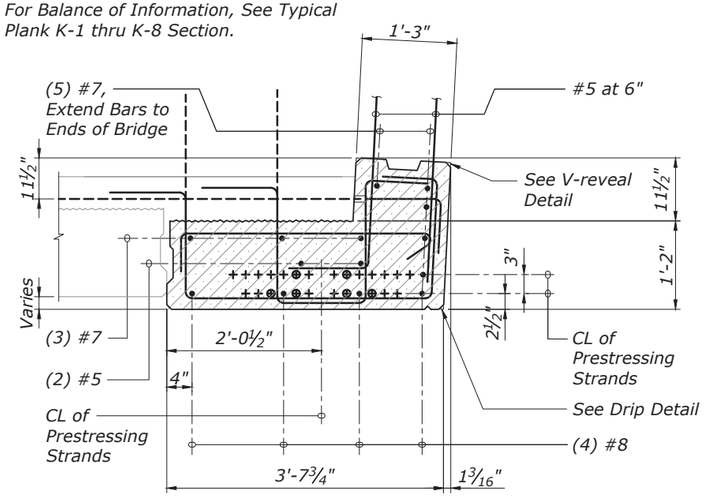
TYPICAL PLAN THRU SECTION
Scale: ½" = 1'-0"

Notes:
1. *Edge of Bridge and Railing Connections shall be at a 2.86° Incline from the Bottom of the Plank.*
2. *For Balance of Information, See Typical Plank K-1 thru K-8 Section.*



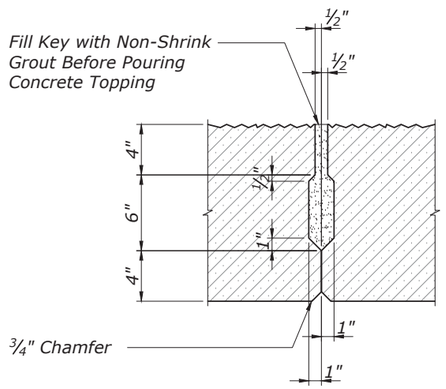
TYPICAL PLAN END SECTION
Scale: ½" = 1'-0"

Notes:
1. *Edge of Bridge and Railing Connections shall be at a 2.86° Incline from the Bottom of the Plank.*
2. *For Balance of Information, See Typical Plank K-1 thru K-8 Section.*

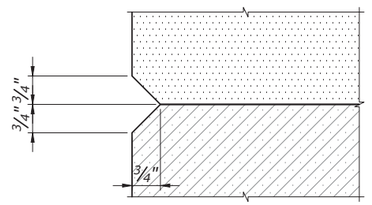


TYPICAL PLAN END SECTION
Scale: ½" = 1'-0"

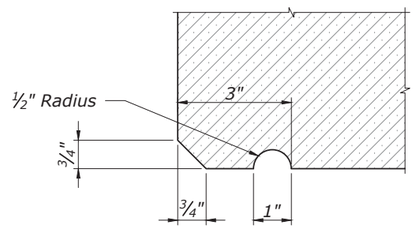
Note:
Non-Shrink Grout Shall have a 28-Day Compressive Strength of 8,900 psi.



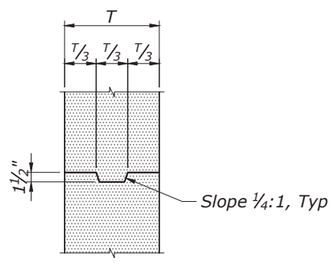
END DETAIL
Scale: 1" = 1'-0"



V REVEAL DETAIL
Scale: 1" = 1'-0"



DRIP DETAIL
Scale: 1" = 1'-0"



CURB END DETAIL
Scale: ½" = 1'-0"

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KAWELA STREAM BRIDGE

KAMEHAMEHA HIGHWAY

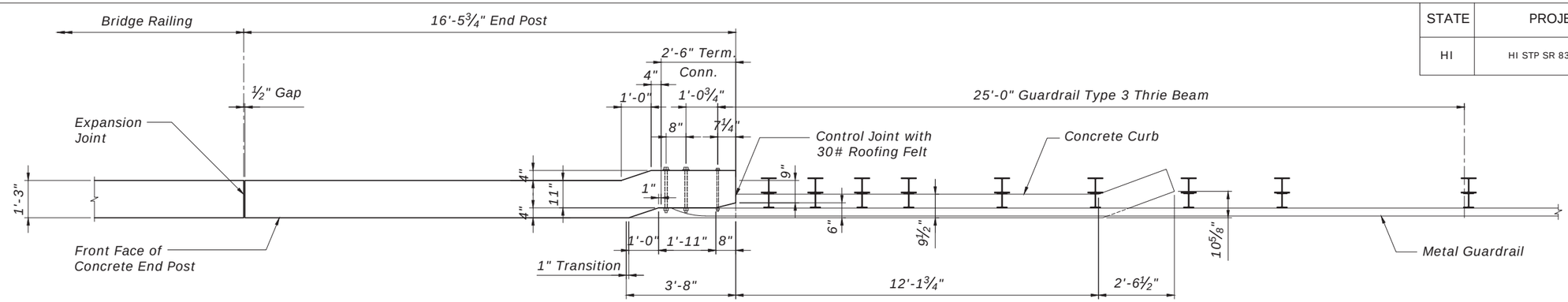
HONOLULU COUNTY, HAWAII

PLAN SECTIONS

AS-BUILT DRAWINGS

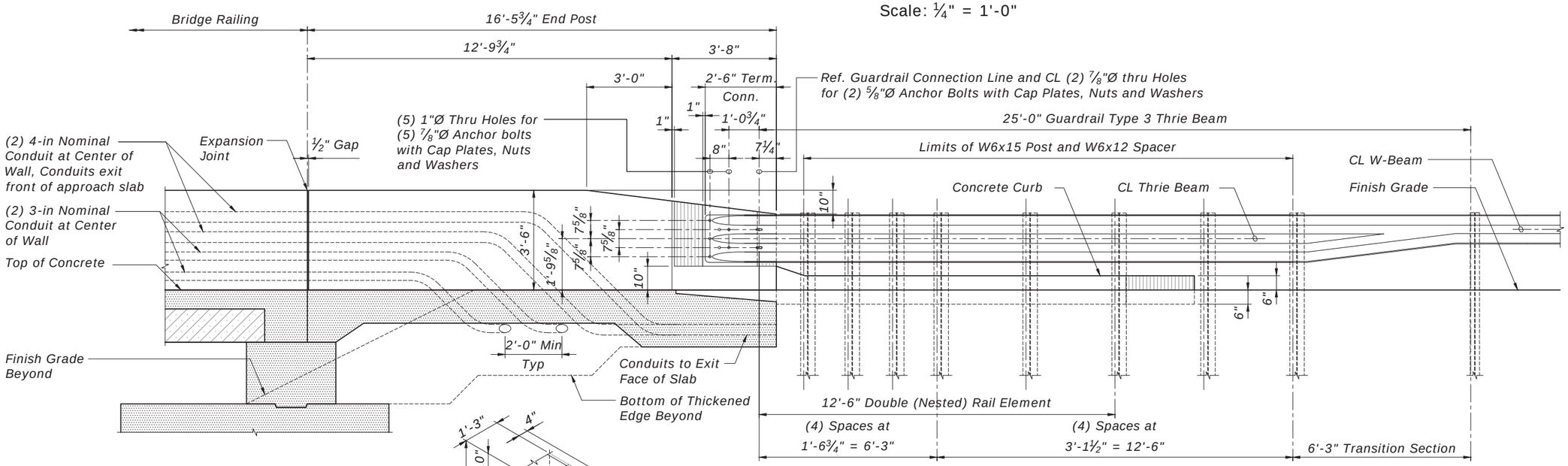
NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	43 of 50	NOVEMBER 2018	RG3084-Q

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S13.1



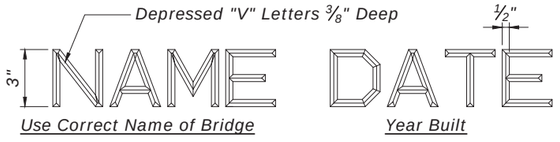
END POST PLAN

Scale: ¼" = 1'-0"



END POST ELEVATION

Scale: ¼" = 1'-0"



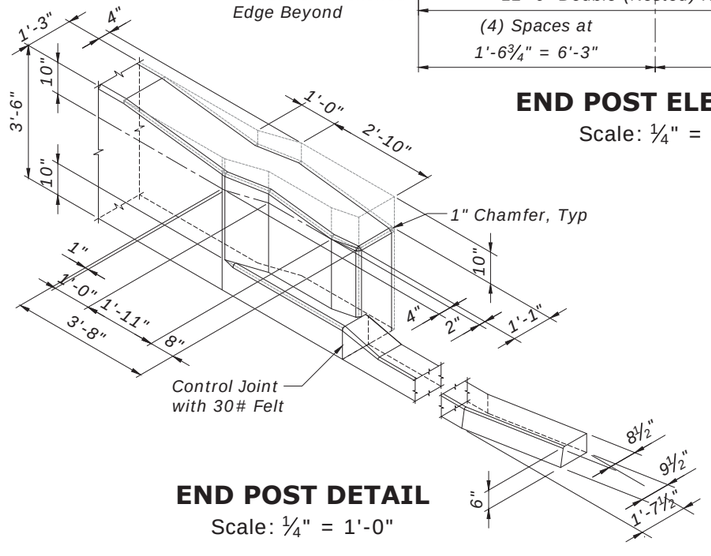
Notes:

1. Unless otherwise directed by the engineer, the bridge name and date shall be placed at the "trailing" end post on each side of the roadway.
2. Exact details and spacing of letter and figures and location shall be as directed by the engineer. gothic letters and figures approximating dimensions shown will be acceptable if approved by the engineer.
3. Submit shop drawings for review.

Typical Detail of Letters and Figures at Concrete End Post

BRIDGE IDENTIFICATION DETAIL

Not to Scale



END POST DETAIL

Scale: ¼" = 1'-0"

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KEN KAZUO HAYASHIDA
LICENSED PROFESSIONAL ENGINEER
No. 6818–S
HAWAII, U.S.A.

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SIGNATURE — April 30, 2022 EXPIRATION DATE OF THE LICENSE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

KAWELA STREAM BRIDGE

KAMEHAMEHA HIGHWAY

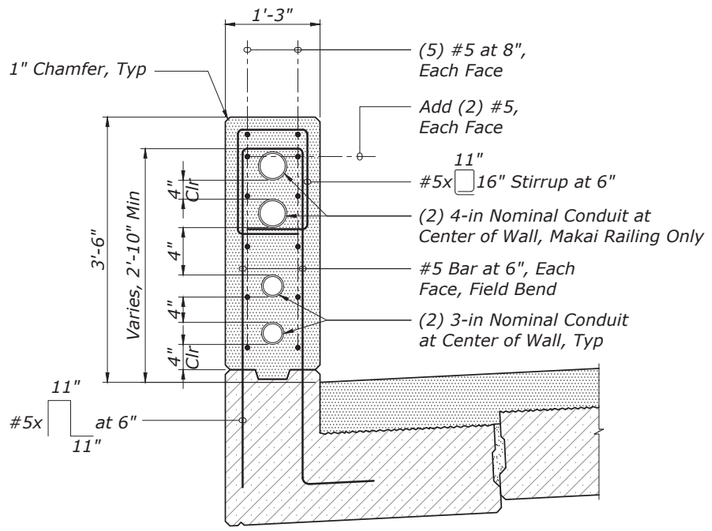
HONOLULU COUNTY, HAWAII

GUARDRAIL DETAILS

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	44 of 50	NOVEMBER 2018	RG3084-R

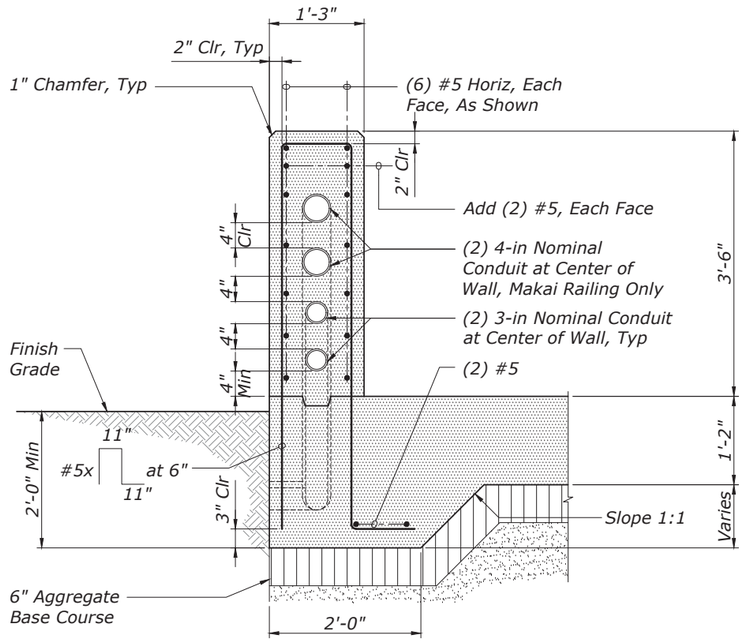
AS-BUILT DRAWINGS

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S13.2



RAILING SECTION

Scale: ½" = 1'-0"



END POST SECTION

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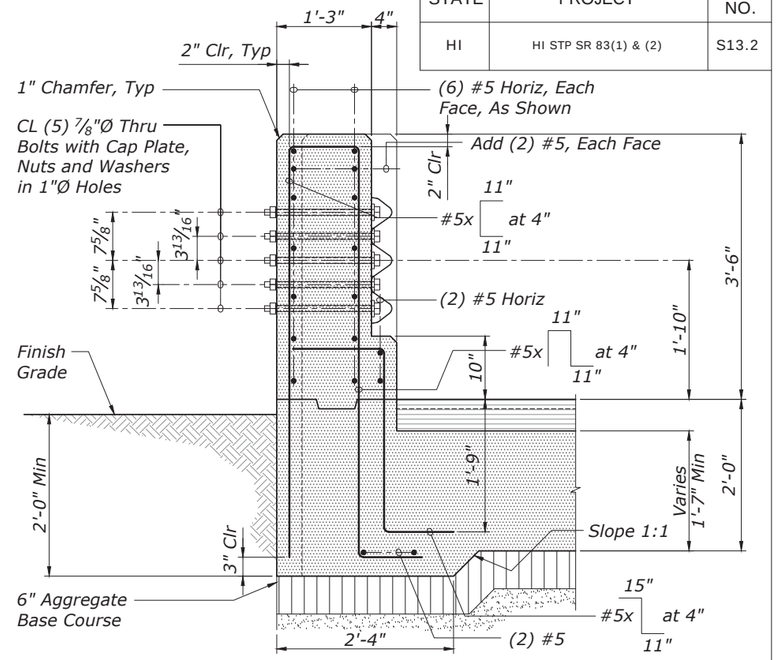
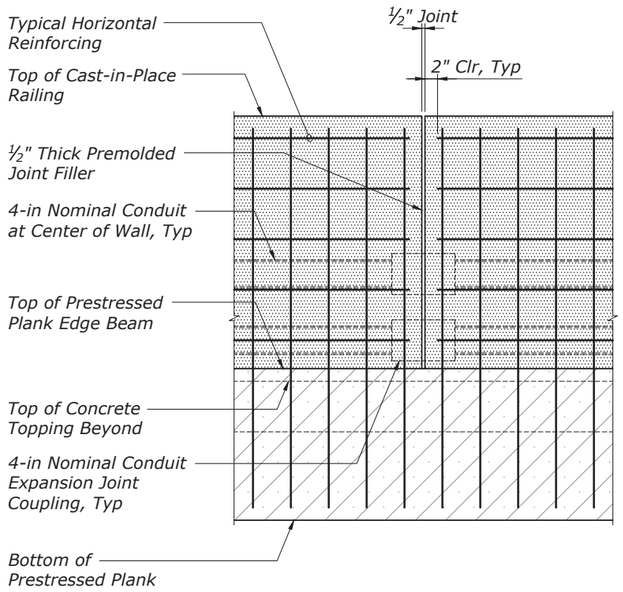


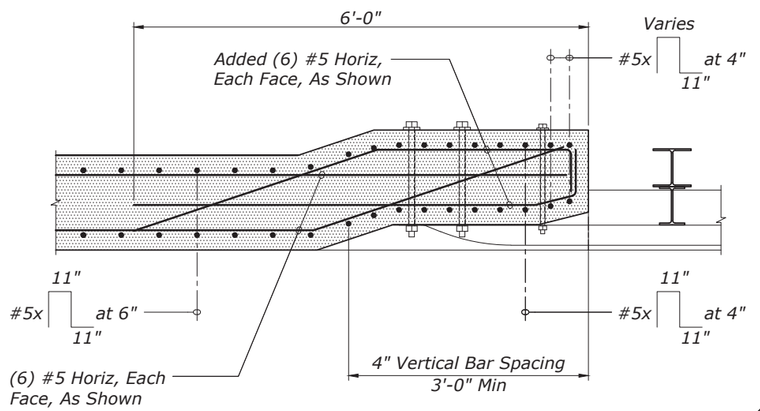
END POST TRANSITION SECTION

Scale: ½" = 1'-0"



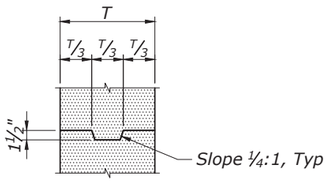
RAILING EXPANSION JOINT DETAIL

Scale: ½" = 1'-0"



END POST TRANSITION PLAN SECTION

Scale: ½" = 1'-0"



SHEAR KEY DETAIL

Scale: ½" = 1'-0"

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CENTRAL FEDERAL LANDS HIGHWAY DIVISION

KAWELA STREAM BRIDGE

KAMEHAMEHA HIGHWAY

HONOLULU COUNTY, HAWAII

RAILING SECTION

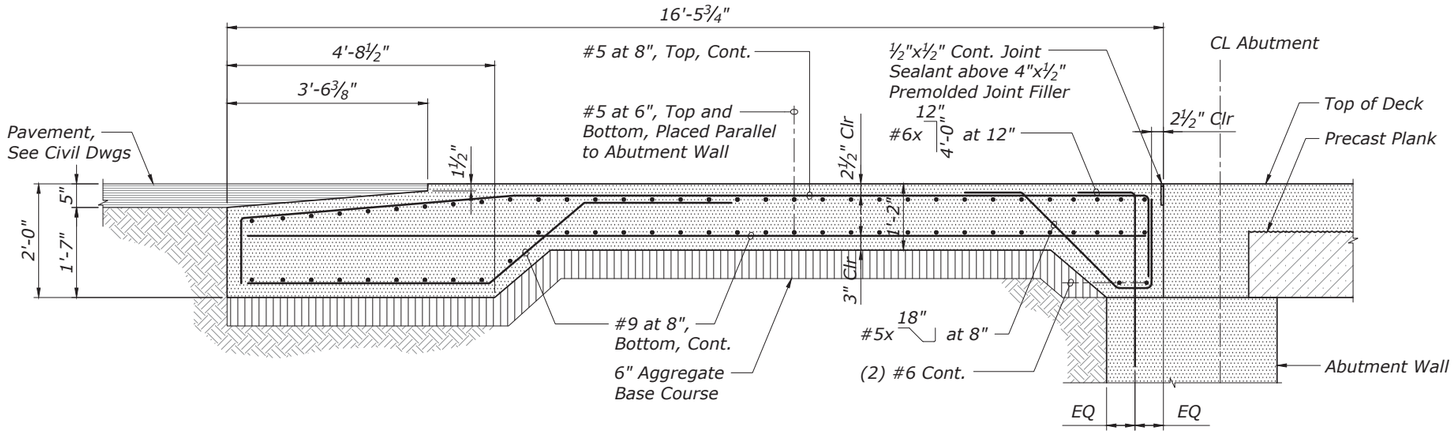
NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	45 of 50	NOVEMBER 2018	RG3084-S

AS-BUILT DRAWINGS

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S14.1

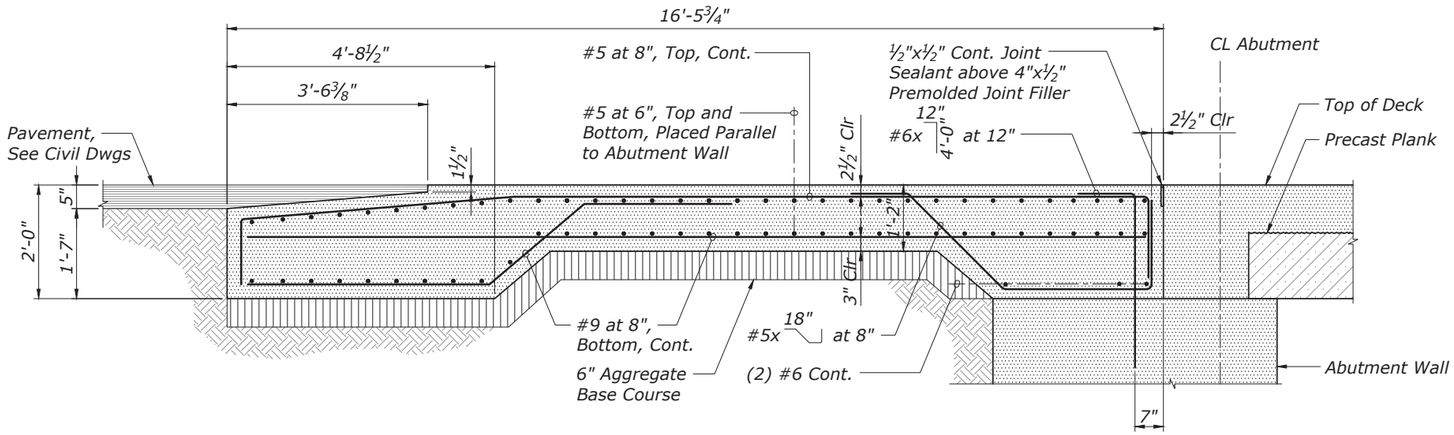
NOTES:

1. The orientation of the view is parallel to the centerline of the bridge.
2. Abutment and deck reinforcing not shown for clarity.



ABUTMENT NO□□ APPROAC□ SLAB SECTION

Scale: ⅜" = 1'-0"



ABUTMENT NO□□ APPROAC□ SLAB SECTION

Scale: ⅜" = 1'-0"

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KAWELA STREAM BRIDGE

KAMEHAMEHA HIGHWAY

HONOLULU COUNTY, HAWAII

T□PICAL APPROAC□ SLAB SECTIONS

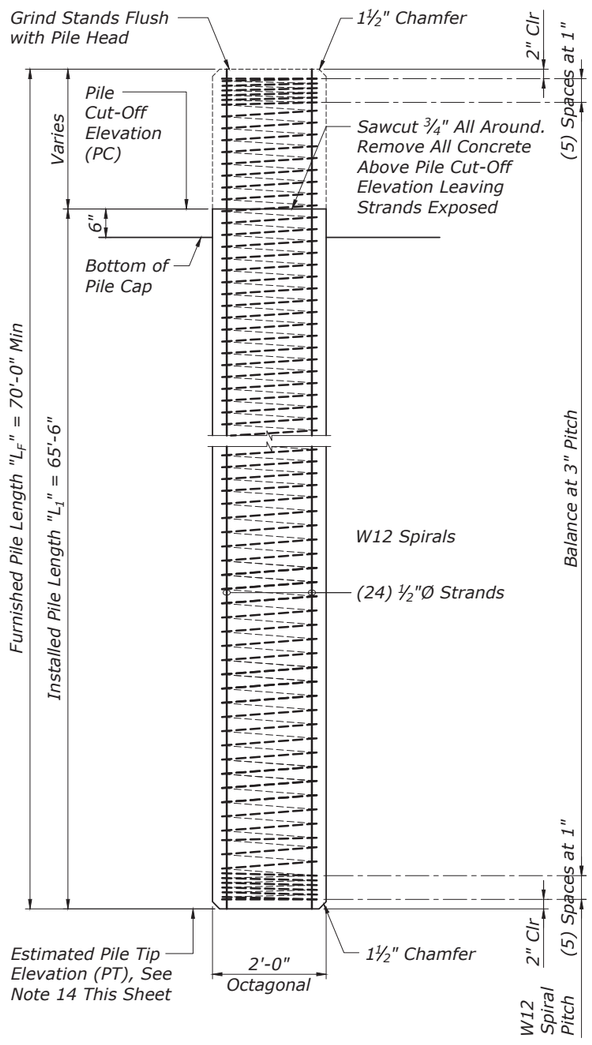
AS-BUILT DRAWINGS

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	46 of 50	NOVEMBER 2018	RG3084-T

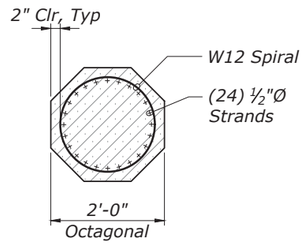
STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S15.1

Precast Prestressed Pile Notes:

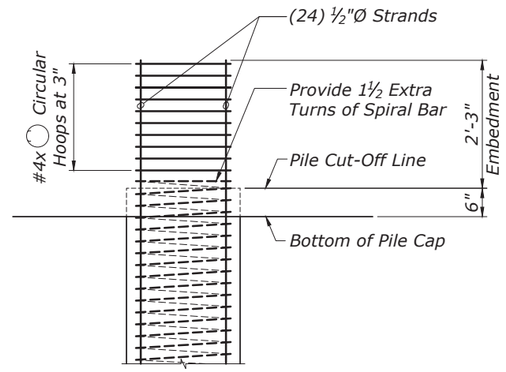
1. *Prestressed concrete 28 day compressive strength, f'c = 6,000 psi. Prestressed concrete strength at time of release, f'c = 4,500 psi.*
2. *Pile build-up concrete 28 day compressive strength (with and without driving), f'c = 6,000 psi.*
3. *Prestressing strands shall be 7 wire, ½"Ø low relaxation steel strands (area = 0.153 in^2) with an ultimate tensile strength of 270 ksi, initial strand stress (before any losses) = 202.5 ksi.*
4. *Non-prestressed reinforcing steel shall be deformed bars conforming to AASHTO M31, grade 60. spiral reinforcement shall conform to AASHTO M32.*
5. *The effective prestressing force in the pile after all losses shall be 595 kips.*
6. *Piles accepted by the engineer shall be of sound concrete. damaged piles shall be replaced or repaired as directed by the engineer at the contractor's expense.*
7. *Each pile location shall be predrilled to an elevation of -40.0 feet MSL. The diameter of the predrilled holes shall be limited to the diagonal dimension of the pile to provide the driven piles with sufficient soil/rock contact for lateral load resistance. The annular space between piles and predrilled holes shall be filled with sand. The predrilling depths shall be confirmed and/or modified by the geotechnichal engineer of record during construction.*
8. *Piles shall be driven with a hammer capable of delivering a minimum rated energy of approximately 60,000 foot pounds of energy. The hammer shall be equipped with energy control level. Prior to construction, pile and driving equipment data forms shall be reviewed and approved by the engineer.*
9. *Piles shall be driven continuously without interruption. Piles may be rejected when the driving resistance is interrupted for more than four hours and the pile cannot be driven to the required depth.*
10. *The geotechnical engineer should be present during all pile driving operations to observe the actual driving behavior and to further evaluate the field performance.*
11. *Work of cutting off prestressed concrete piles or concrete pile build-ups shall be performed in such a manner as to avoid spalling or damaging of the pile below cut off. Damaged portions shall be removed and pile cut-off elevation lowered as directed by the engineer.*
12. *Top of pile at cut-off line shall be prepared as required for construction joint in the specifications.*
13. *Pile splice will not be permitted.*
14. *Estimated Pile Tip Elevation (PT) is -60.0 feet MSL.*



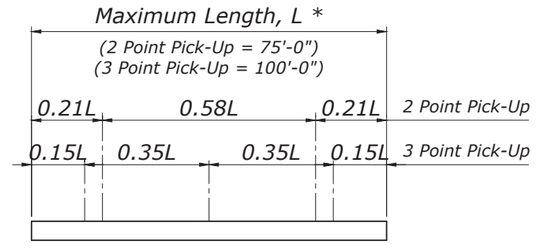
PRESTRESSED PILE DETAIL
Scale: ⅜" = 1'-0"



PILE CROSS SECTION
Scale: ⅜" = 1'-0"



PILE EMBEDMENT DETAIL
Scale: ⅜" = 1'-0"



** The length "L" is the distance end to end of pile.*

PILE PIC□UP POINTS
Not to Scale

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CENTRAL FEDERAL LANDS HIGHWAY DIVISION

KAWELA STREAM BRIDGE

KAMEHAMEHA HIGHWAY

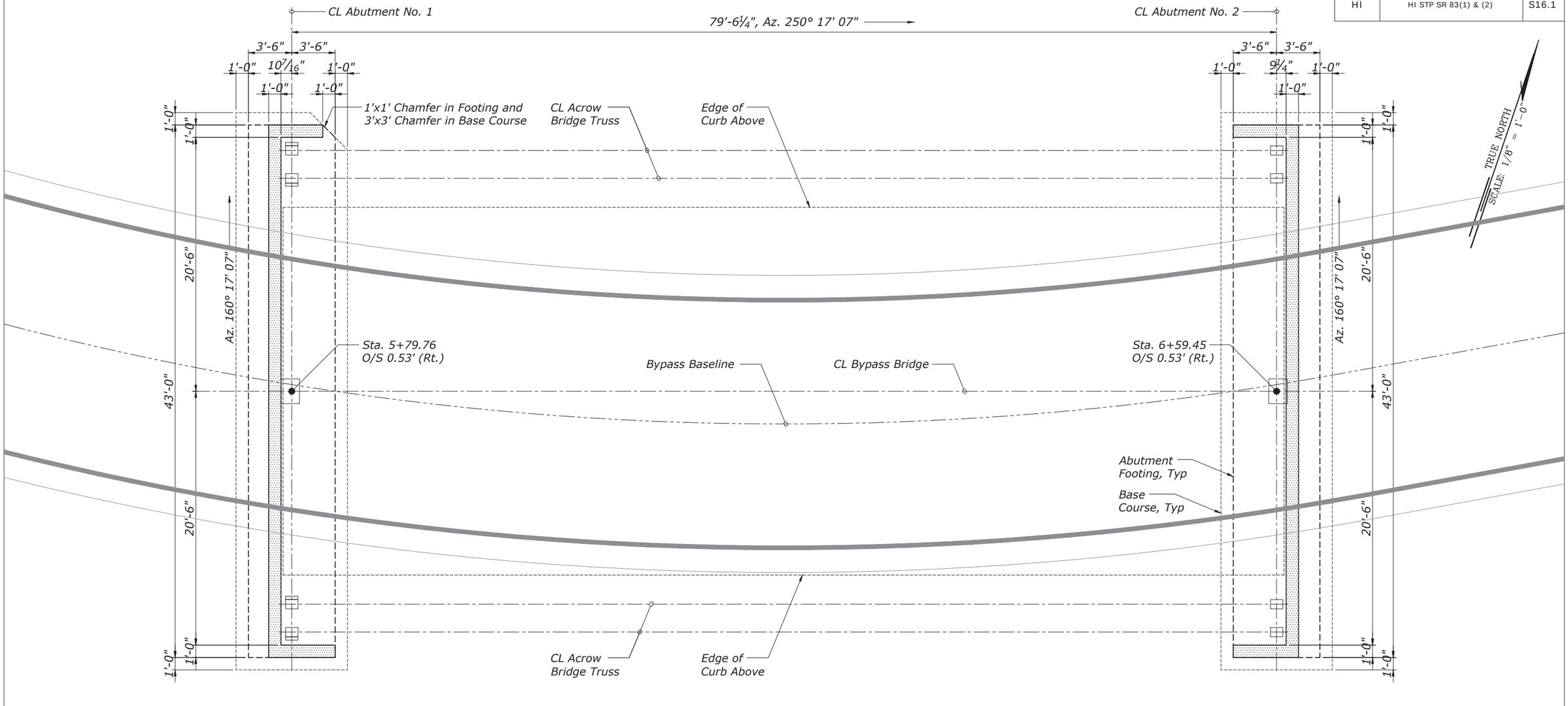
HONOLULU COUNTY, HAWAII

T□PICAL PRESTRESSED PILE NOTES AND DETAILS

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	47 of 50	NOVEMBER 2018	RG3084-U

AS-BUILT DRAWINGS

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S16.1



BYPASS BRIDGE FOUNDATION PLAN

Scale: ⅛" = 1'-0"

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KAMEHAMEHA HIGHWAY

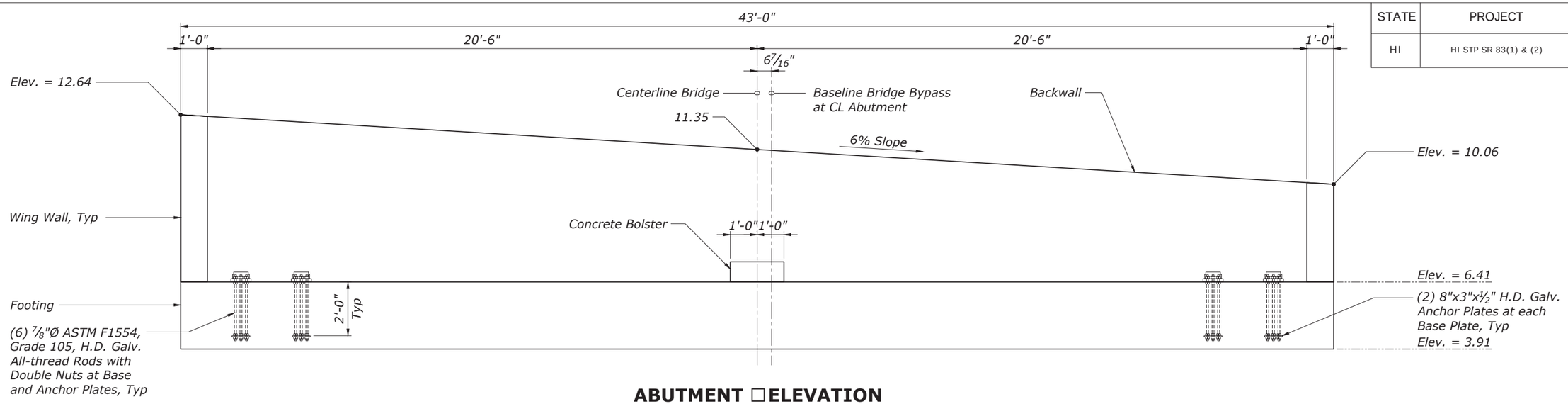
HONOLULU COUNTY, HAWAII

BYPASS BRIDGE FOUNDATION PLAN

AS-BUILT DRAWINGS

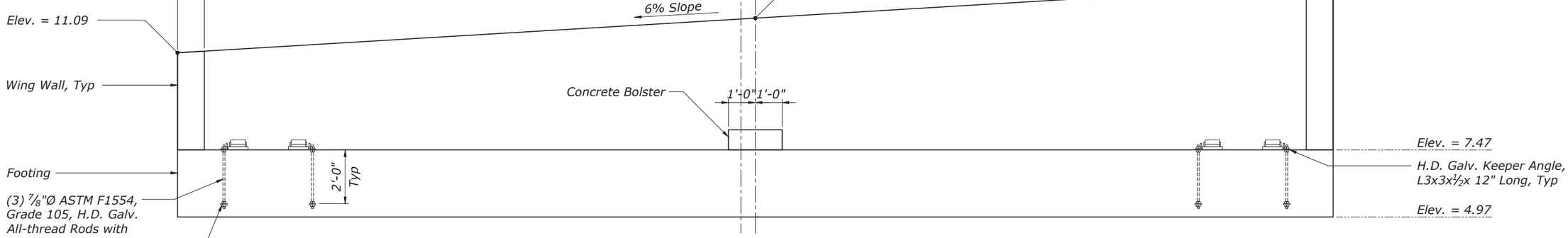
NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	48 of 50	NOVEMBER 2018	RG3084-V

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S16.2



ABUTMENT □ELEVATION

Scale: ¼" = 1'-0"



ABUTMENT □ELEVATION

Scale: ¼" = 1'-0"

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KAWELA STREAM BRIDGE

KAMEHAMEHA HIGHWAY

HONOLULU COUNTY, HAWAII

B□PASS BRIDGE ABUTMENT ELEVATIONS

AS-BUILT DRAWINGS

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	49 of 50	NOVEMBER 2018	RG3084-W

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S16.3

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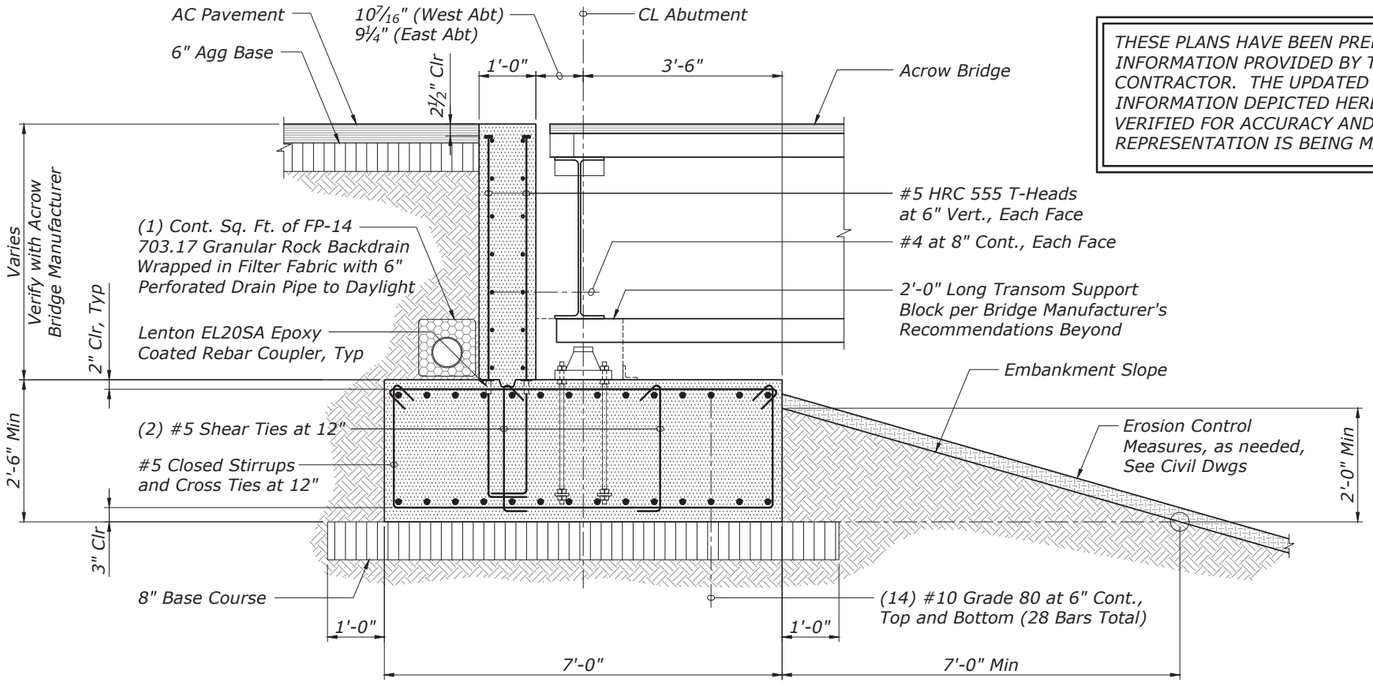
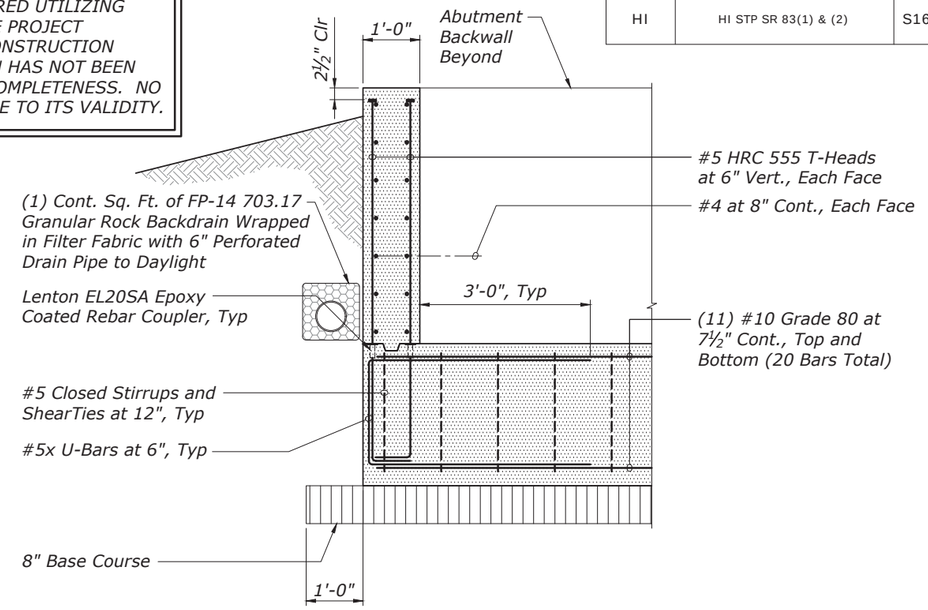


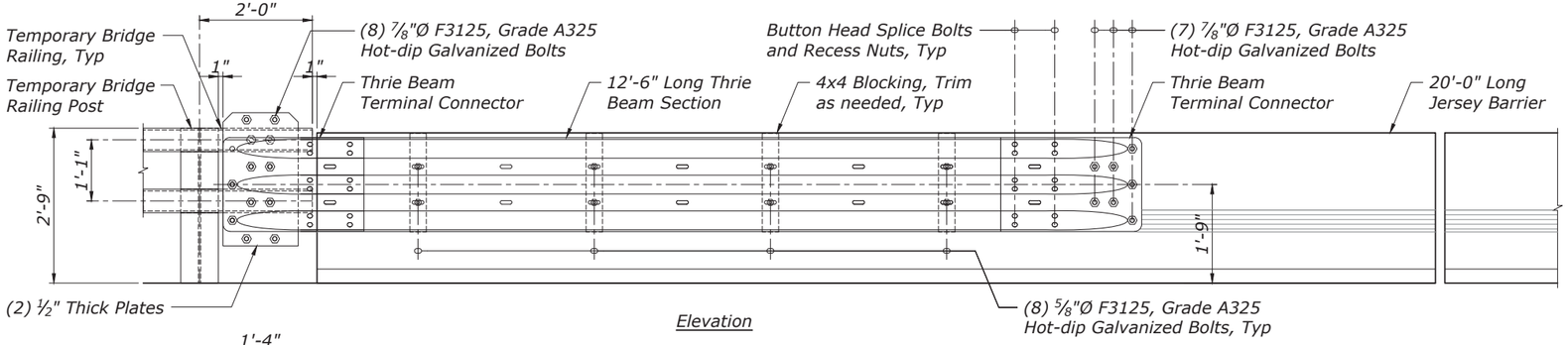
B□PASS BRIDGE ABUTMENT SECTION

Scale: ⅜" = 1'-0"



B□PASS BRIDGE □ING □ALL SECTION

Scale: ⅜" = 1'-0"



Elevation

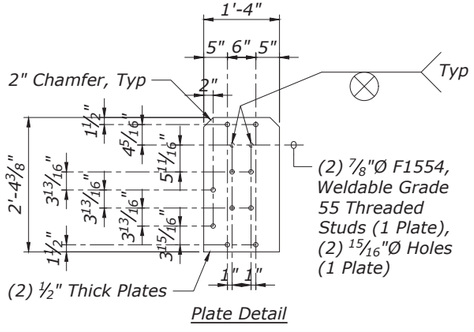
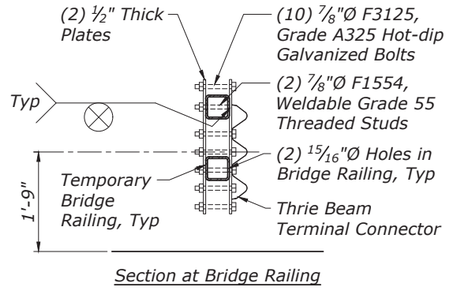
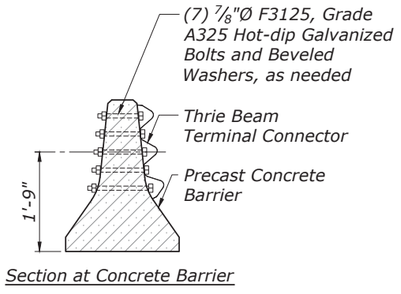


Plate Detail



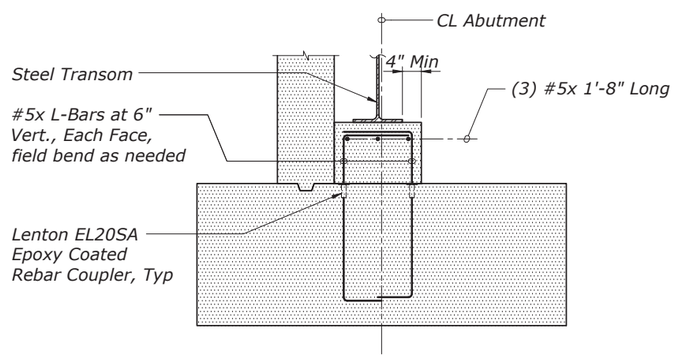
Section at Bridge Railing



Section at Concrete Barrier

GUARDRAIL ATTAC□MENT DETAILS

Scale: ⅜" = 1'-0"



B□PASS BRIDGE BOLSTER DETAIL

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KAWELA STREAM BRIDGE

KAMEHAMEHA HIGHWAY

HONOLULU COUNTY, HAWAII

B□PASS BRIDGE ABUTMENT SECTION

AS-BUILT DRAWINGS

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	50 of 50	NOVEMBER 2018	RG3084-X

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S0.1

INDEX TO NANAHU BRIDGE DRAWINGS		
DRAWING NO.	SHEET	DESCRIPTION
RG3083-A	S0.1	INDEX TO BRIDGE DRAWINGS
RG3083-B	S0.2	STRUCTURAL GENERAL NOTES
RG3083-C	S0.3	QUANTITY SCHEDULE
RG3083-D	S0.4	EXISTING BRIDGE DEMOLITION PLAN
RG3083-E	S0.5	EXISTING BRIDGE ABUTMENT ELEVATIONS
RG3083-F	S1.1	BRIDGE LAYOUT PLAN
RG3083-G	S1.2	BRIDGE FOUNDATION PLAN
RG3083-H	S1.3	BRIDGE ABUTMENT PLAN
RG3083-I	S1.4	BRIDGE DECK FRAMING PLAN
RG3083-J	S2.1	LONGITUDINAL SECTION
RG3083-K	S2.2	TYPICAL CROSS SECTION
RG3083-L	S3.1	ABUTMENT NO. 1 ELEVATION
RG3083-M	S3.2	ABUTMENT NO. 2 ELEVATION
RG3083-N	S3.3	ABUTMENT NO. 1 DETAIL
RG3083-O	S3.4	ABUTMENT NO. 2 DETAIL
RG3083-P	S3.5	GRS ABUTMENT DETAILS - 2
RG3083-Q	S3.6	TYPICAL GRS ABUTMENT DETAILS
RG3083-R	S4.1	PRESTRESSED PLANK
RG3083-S	S4.2	PLANK SECTIONS
RG3083-T	S5.1	GUARDRAIL DETAILS
RG3083-U	S5.2	RAILING SECTION - 1
RG3083-V	S5.3	RAILING SECTION - 2
RG3083-W	S6.1	TYPICAL APPROACH SLAB SECTION
RG3083-X	S7.1	BYPASS BRIDGE FOUNDATION PLAN
RG3083-Y	S7.2	BYPASS BRIDGE ABUTMENT ELEVATIONS
RG3083-Z	S7.3	BYPASS BRIDGE ABUTMENT SECTION

NANAHU CONSTRUCTION AND CONCRETE PLACEMENT SEQUENCE:

1. *Abutment 2 Ecoblock Cap*
2. *Cantilever Beam Footing*
3. *Plank Seats and 6" Slab-On-Grade*
4. *Bridge Deck*
5. *Approach Slab*
6. *Barrier Railing (Mauka Abutment 2 and Makai Abutment 1)*
7. *Barrier Railing (Mauka Abutment 1 and Makai Abutment 2)*
8. *End Post*

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CENTRAL FEDERAL LANDS HIGHWAY DIVISION

NANAHU (HOOLAPA) STREAM BRIDGE

KAMEHAMEHA HIGHWAY

HONOLULU COUNTY, HAWAII

INDE□ TO BRIDGE DRA□INGS

AS-BUILT DRAWINGS

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	1 of 50	NOVEMBER 2018	RG3083-A

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S0.2

GENERAL:

A. Design standards: AASHTO LRFD Bridge Design Specification, 7th Edition, 2014 as amended by State of Hawaii Department of Transportation Highways Division Design Criteria for Bridges and Structures, August 8, 2014.
B. The Contractor shall compare all the contract documents with each other and report in writing to the Engineer all inconsistencies and omissions.
C. The contractor shall take field measurements and verify field conditions and shall compare such field measurements and conditions with the drawings. Report in writing to the Engineer all inconsistencies and omissions.
D. The contractor shall be responsible for coordinating the work of all trades.
E. The contractor shall be responsible for means and methods of construction, workmanship and job safety.
F. The contractor shall provide temporary shoring and bracing as required for stability of structural members and systems.
G. Construction loading shall not exceed design live load unless special shoring is provided. Permitted construction loads shall be properly reduced in areas where the structure has not attained full design strength.
H. The contractor shall be responsible for protection of the adjacent properties, structures, streets and utilities during the construction period. Any damaged or deteriorated property shall be restored to the condition prior to the beginning of work or better at no cost to the state.
I. Details noted as typical on the structural drawings shall apply in all conditions unless specifically shown or noted otherwise.

DESIGN CRITERIA:

A. Live loads
   1. Vehicular: HL-93
   2. Bridge railing: in accordance with AASHTO TL-3
B. Lateral loads
   1. Seismic
      a. Spectral response acceleration coefficients
         i) Short period, s_s: 0.363g
         ii) 1-sec period, s_1: 0.099g
      b. Site Class: D
      c. Seismic Zone: 2
C. Soils
   1. Strength limit state bearing capacity
      a. GRS abutments and approach slabs: 6,100 psf
      b. Bypass bridge abutments: 4,000 psf
   2. Earth pressure
      a. Active (level backfill):
         i) Unrestrained 53 pcf
         ii) Restrained: 74 pcf
      b. Passive:
         i) Strength limit state: 94 pcf
         ii) Extreme limit state: 188 pcf
   3. Coefficient of friction strength limit state: 0.44
   4. Coefficient of friction extreme event limit state: 0.55
D. Future wearing surface (curb to curb): 25 psf
E. Future utility line each side of bridge: 150 plf

FOUNDATION:

A. Foundation design is based on the Geotechnical Exploration and Evaluation Report, dated August 2019.
B. Contractor shall provide de-watering of excavated areas, as required.
C. Footings shall bear on undisturbed in-situ firm soils bottom of footings shall be compacted to provide a relatively firm and smooth bearing surface prior to placement of reinforcing steel and concrete. If soft and/or loose materials are encountered at the bottom of footing excavations, they shall be over-excavated to expose the underlying firm materials. The over-excavated area shall be backfilled with select granular material compacted to a minimum of 95% relative compaction or the footing bottom may be extended down to the underlying competent material. Contractor may substitute flowable concrete or the granular material upon approval from the Engineer.
D. Excavations for footings shall be approved by the Geotechnical Engineer of Record prior to placement of concrete and reinforcing.
E. Engineered fill and backfill shall be in accordance with FP-14 and associated SCR's.
F. Fill should be moisture conditioned to within two percent of the optimum moisture content and placed in horizontal lifts not to exceed six inches. Fill shall be compacted to minimum 95%relative density as measured by AASHTO T180.

CONCRETE:

A. Concrete construction shall conform to the FP-14 Specifications and associated SCR's.
B. Concrete shall be normal weight hard rock concrete and shall have the following minimum 28 day compressive strength or comply with class of concrete compressive strength listed in the FP-14 Specifications:

1. Pre-stressed piles	6000 psi
2. Pre-stressed planks	8000 psi
3. Abutment footings and pile caps	Class A
4. Slab topping, approach slabs, and railings	Class A
5. Abutment walls and wing walls	Class A
6. All other concrete	Class A

C. Concrete delivery tickets shall record all free water in the mix at batching plant, added for consistency by driver, and any additional request by contractor up to the maximum amount allowed by the mix design.
D. All inserts, anchor bolts, plates, and other items to be cast in the concrete shall be hot-dipped galvanized according to ASTM A153 unless otherwise noted.
E. Reinforcing bars, anchor bolts, inserts, and other items to be cast in the concrete shall be secured in position prior to placement of concrete.
F. Conduits, pipes, and sleeves passing through a slab or footing that do not conform to typical details shall be located and the proposed construction detail submitted to the Engineer for approval.
G. Conduits, pipes, and sleeves embedded within a slab or wall (other than those merely passing through) shall be:
   1. No larger in outside dimensions than one third the overall slab or wall thickness in which they are embedded.
   2. Placed in the middle one third of slab or wall thickness
   3. Spaced no closer than three diameters or widths on center.
H. Conduits, pipes, and sleeves shall not be placed through or embedded in a beam unless specifically detailed.
I. The contractor shall locate construction joints not shown on the drawings, so as not to impair the strength of the structure and to minimize shrinkage stresses. Submit proposed locations of construction joints to the Engineer for approval.
J. Non-shrink grout shall be a premixed non-metallic formula, shall be capable of developing a minimum compressive strength of 5,000 psi in 3 days and 8,900 psi in 28 days, and shall contain at least 10 grams of migrating amine carboxylate corrosion inhibitor when grout is in contact with steel appurtenances. Precast plank shear keys will not require corrosion inhibitor.
K. Joint filler shall conform to FP-14 section 712.01(b).
L. A shrinkage reducing admixture conforming to SCR section 711.03(b) shall be included in the concrete mix for all cast-in-place concrete.
M. A corrosion inhibiting admixture conforming to SCR section 711.03(a) shall be included in the concrete mix for all concrete.
N. Reinforcing fibers conforming to SCR section 725.17(b) shall be included in the concrete mix for members as specified in SCR section 552.03.

MASONRY:

A. Concrete masonry units shall conform to ASTM C90 for normal weight load-bearing concrete masonry units with a unit compressive strength of 3050 psi.
B. Second-hand masonry units shall not be reused unless they conform to the requirements of new units. The units shall be of whole, sound materials and free from cracks and other defects that will interfere with proper laying and use. Old mortar shall be cleaned from the unit before reuse.
C. All cells and bond courses with reinforcement and inserts shall be concrete filled.
D. When concrete filling is stopped for one hour or longer, horizontal construction joints shall be formed by stopping the concrete pour 1 1/2 inches below the top of the uppermost unit.
E. Walls shall be constructed in conventional running bond, unless otherwise noted.
F. Open-ended blocks shall not be substituted for standard concrete masonry units.

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FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

NANAHU (HOOLAPA) STREAM BRIDGE

KAMEHAMEHA HIGHWAY

HONOLULU COUNTY, HAWAII

STRUCTURAL GENERAL NOTES

AS-BUILT DRAWINGS

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	2 of 50	NOVEMBER 2018	RG3083-B

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S0.3

REINFORCING STEEL:

A. Reinforcing steel shall be deformed bars conforming to AASHTO M31, Grade 60, unless otherwise noted.
B. Low alloy steel deformed bars shall conform to FP-14 section 709.01(i), Grade 60, unless otherwise noted.
C. Clear concrete cover for reinforcing bars shall be as follows, unless otherwise noted:
  1. Footings, slabs, etc. cast against earth: 3"
  2. Footings, walls, grade beams, etc. formed and exposed to earth or weather: 2"
  3. Bridge deck top reinforcement: 2-1/2"
  4. Other: 2"
D. Reinforcing steel shall be spliced where indicated on plans. Provide lap splice length per typical details and schedule, unless otherwise noted.
E. Mechanical splice connectors shall develop in tension 125 percent of the specified minimum yield strength of reinforcing bars.
F. Provide standard hooks conforming to ACI SP-66.
G. Fabricate reinforcing bars according to ACI SP-66, ACI Detailing Manual.
H. Reinforcing steel shall be placed and secured in conformance with crsi manual of standard practice with placement tolerances per ACI standard 117.

STRUCTURAL STEEL:

A. Fabrication and erection of structural steel shall conform to the american institute of steel construction manual of steel construction, thirteenth edition.
B. Structural steel shall conform to ASTM A36 unless otherwise noted.
C. Steel wide flange sections shall conform to ASTM A992.
D. Plates and bars shall conform to ASTM A36.
E. Welds and welding procedures shall conform to the structural welding code AWS D1.1 of the american welding society.
F. Welding shall be performed by welders prequalified for welding procedures to be used.
G. Welding electrodes shall be E70xx for carbon steel.
H. High-strength bolts shall conform to ASTM A325, type N. Installation shall be assured by any of the following methods:
  1. Turn of nut method
  2. Direct tension indicator
  3. Calibrated wrench
  4. Alternative design bolt
I. All anchor bolts, plates, and other items to be cast in concrete shall be hot-dip galvanized according to ASTM A153 unless otherwise noted.
J. Carbon steel bolts shall conform to ASTM A307, grade a unless otherwise noted, and shall be hot-dip galvanized according to ASTM A153.
K. All steel shall be hot-dip galvanized after fabrication according to ASTM A123.
L. Any damaged galvanized surface shall be repaired as follows:
  1. prepare surface per sspc-sp1, solvent cleaning.
  2. apply two coats of cold applied galvanizing compound containing 95% metallic zinc content by weight in dry film and 52% solids content by volume.
  3. application rate shall be 1.5 mils dry film thickness per coat.

LOAD RATING

	Rating Factor	Distribution Factor	Load Effect	Controlling Member
HL-93 Inventory	1.77	0.328	Positive Moment	Interior Girder
HL-93 Operating	2.29	0.328	Positive Moment	Interior Girder

ESTIMATE

Item No.	Description	Quantity	Unit	Notes
20304-1000	Removal of structures and obstructions	LPSM	LPSM	-
20435-2000	Backfill, Granular	40	CUYD	(1)
20720-0400	Reinforcement Geosynthetic, Type 4	2320	SQYD	-
20801-0000	Structure excavation	840	CUYD	(2)
20803-0000	Structure backfill (GRS)	550	CUYD	-
55201-1500	Structure Concrete	136	CUYD	(3)
55302-3500	Precast, prestressed concrete slab, 14" solid	500	LNFT	(4)
55401-1000	Reinforcing steel	45400	LB	-
55601-0500	Bridge railing, concrete	137	LNFT	-
61707-0000	Structure Transition Railing	100	LNFT	(5)

ESTIMATE NOTES:

(1) Includes cost of drain pipes, geocomposite drains, aggregate base course backfill and aggregate subbase course
(2) Includes cost of GRS backfill excavation
(3) Includes cost of bridge deck, approach slabs
(4) Includes cost of concrete, reinforcing steel, prestressing steel, inserts, plates, lifting devices, and other materials required for the manufacture and erection of the planks
(5) Includes cost of furnishing and installing posts, blocks, thrie and W-beam rail elements, anchor plates, and installation hardware

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CENTRAL FEDERAL LANDS HIGHWAY DIVISION

NANAHU (HOOLAPA) STREAM BRIDGE

KAMEHAMEHA HIGHWAY

HONOLULU COUNTY, HAWAII

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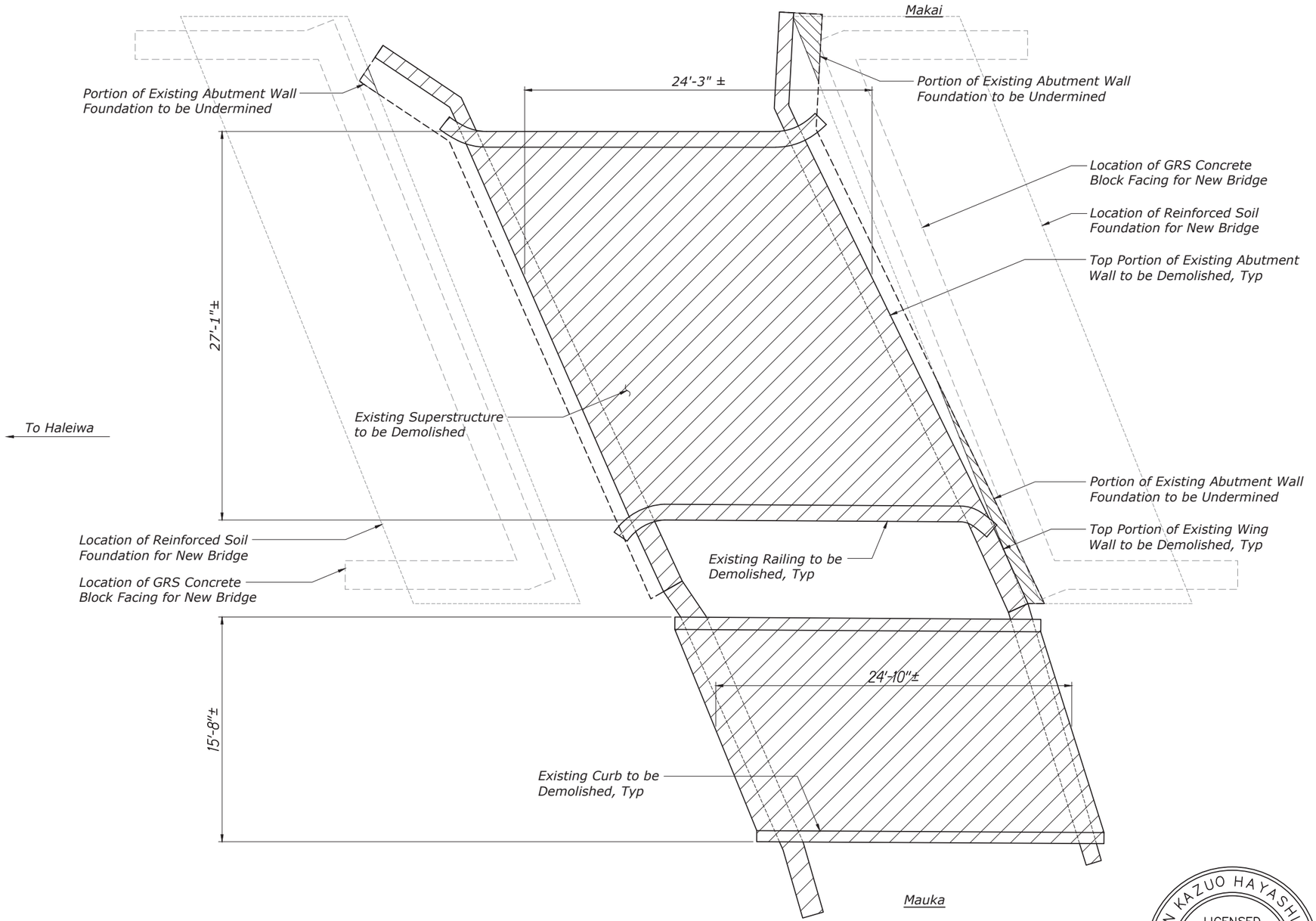
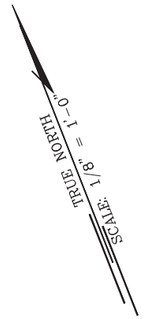
AS-BUILT DRAWINGS

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	3 of 50	NOVEMBER 2018	RG3083-C

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S0.4





EXISTING BRIDGE DEMOLITION PLAN

Scale: ⅛" = 1'-0"

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NANAHU (HOOLAPA) STREAM BRIDGE

KAMEHAMEHA HIGHWAY

HONOLULU COUNTY, HAWAII

EXISTING BRIDGE DEMOLITION PLAN

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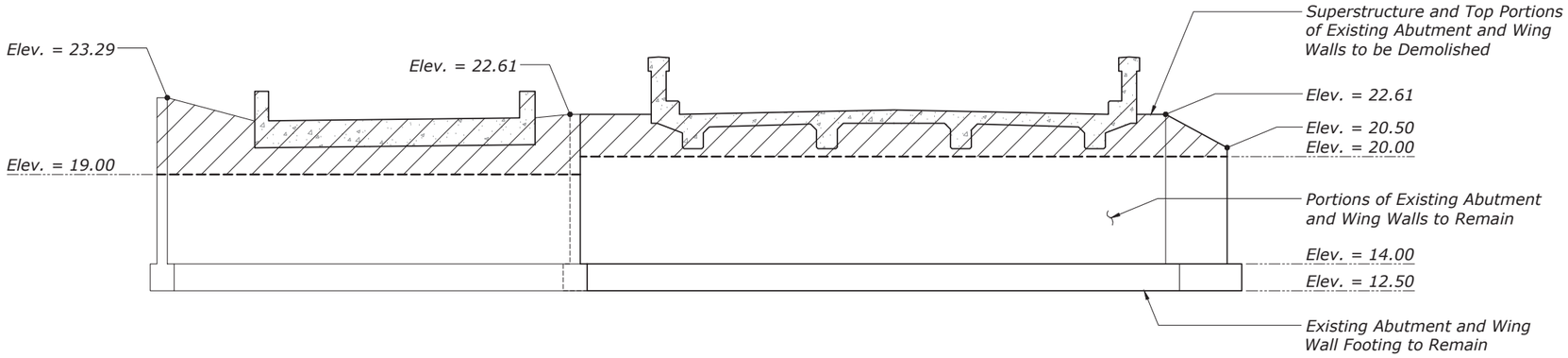
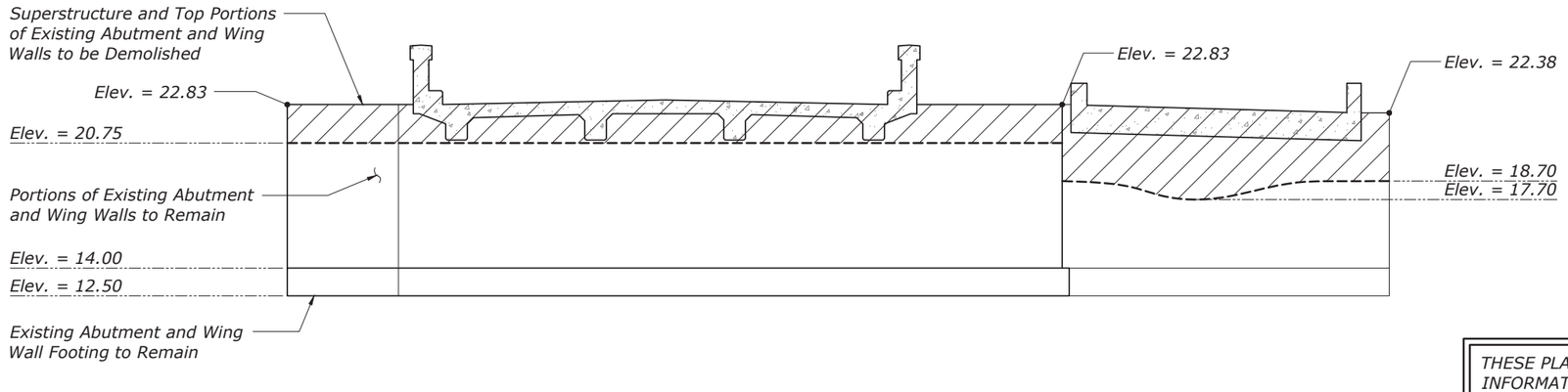
								BL & BC	CADD	MH		MH	4 of 50	NOVEMBER 2018	RG3083-D

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S0.5



EXISTING BRIDGE WEST ABUTMENT FRONT ELEVATION

Scale: ⅛" = 1'-0"



EXISTING BRIDGE EAST ABUTMENT FRONT ELEVATION

Scale: ⅛" = 1'-0"

NOTES:

1. *The orientations of the views are perpendicular to the baseline of the highway.*
2. *Temporary shoring shall be used as needed to maintain the integrity and stability of the existing abutment walls until the bridge concrete deck topping has been placed.*

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NANAHU (HOOLAPA) STREAM BRIDGE

KAMEHAMEHA HIGHWAY

HONOLULU COUNTY, HAWAII

EXISTING BRIDGE ABUTMENT ELEVATIONS

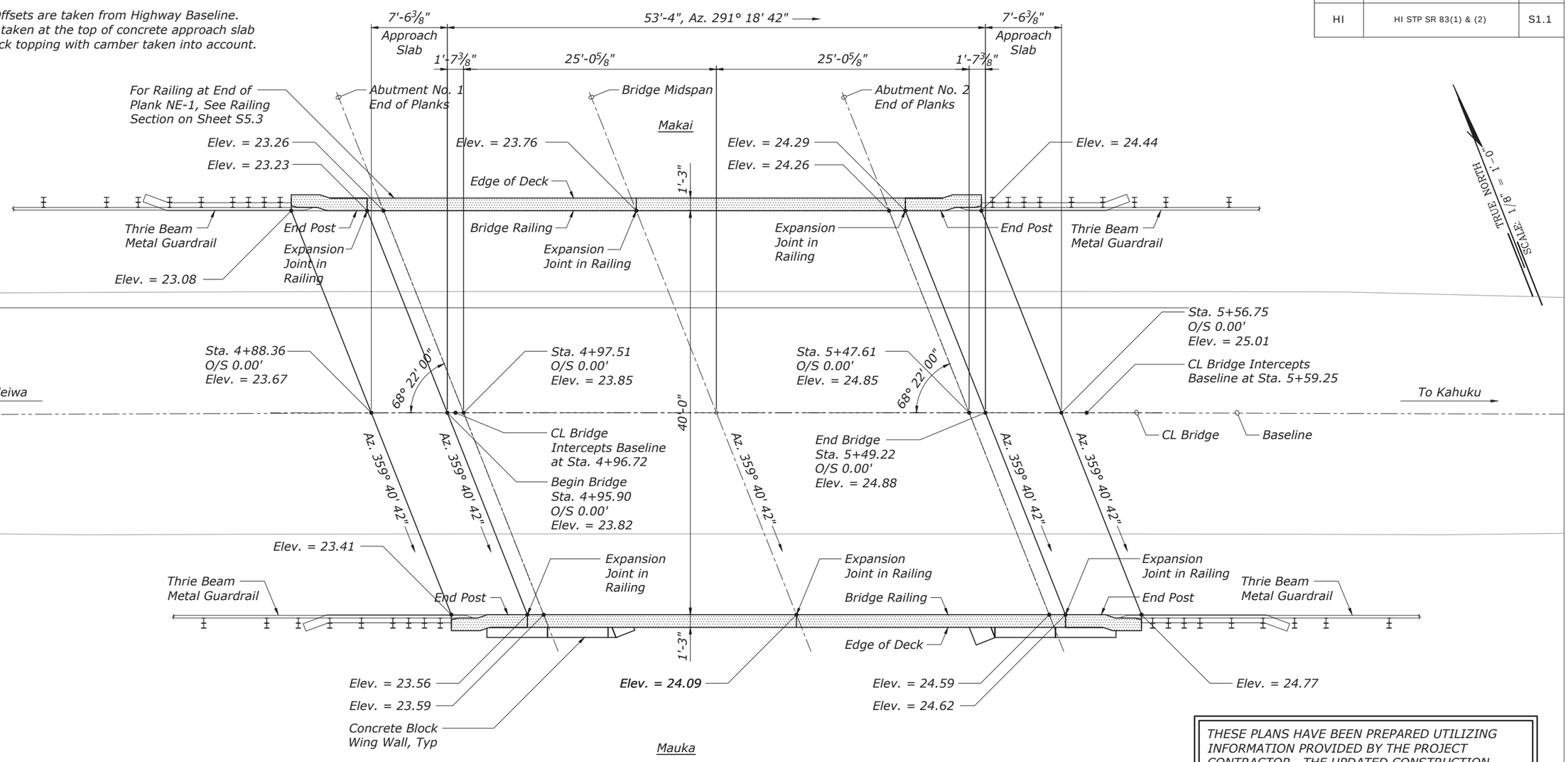
NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	5 of 50	NOVEMBER 2018	RG3083-E

AS-BUILT DRAWINGS

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S1.1

NOTES:

(1) Stations and Offsets are taken from Highway Baseline.
(2) Elevations are taken at the top of concrete approach slab or concrete deck topping with camber taken into account.



BRIDGE LAYOUT PLAN

Scale: 3/32" = 1'-0"

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HONOLULU COUNTY, HAWAII

BRIDGE LAYOUT PLAN

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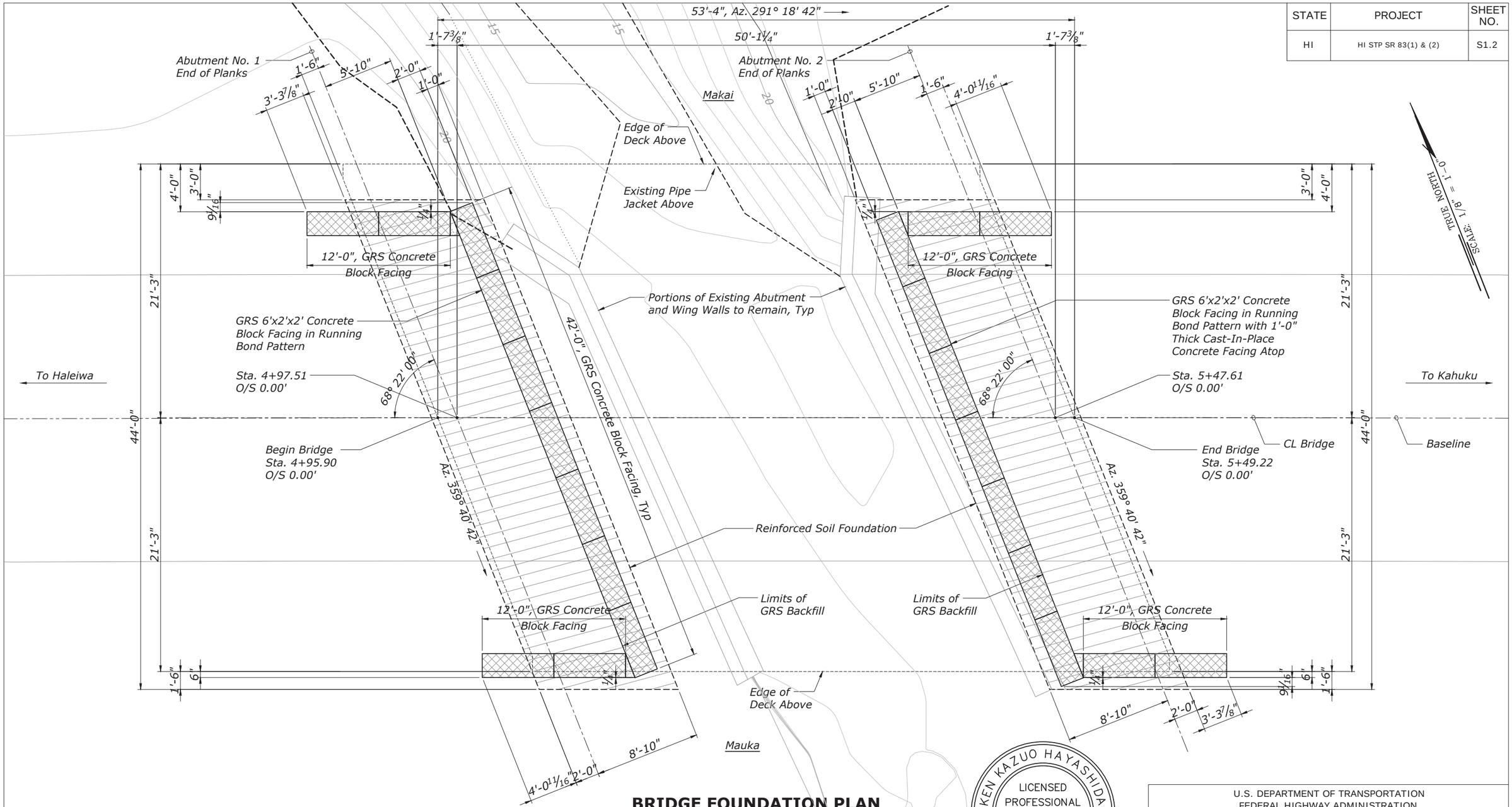
								BL & BC	CADD	MH		MH	6 of 50	NOVEMBER 2018	RG3083-F

AS-BUILT DRAWINGS

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S1.2



BRIDGE FOUNDATION PLAN

Scale: ⅛" = 1'-0"

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NANAHU (HOOLAPA) STREAM BRIDGE

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BRIDGE FOUNDATION PLAN

AS-BUILT DRAWINGS

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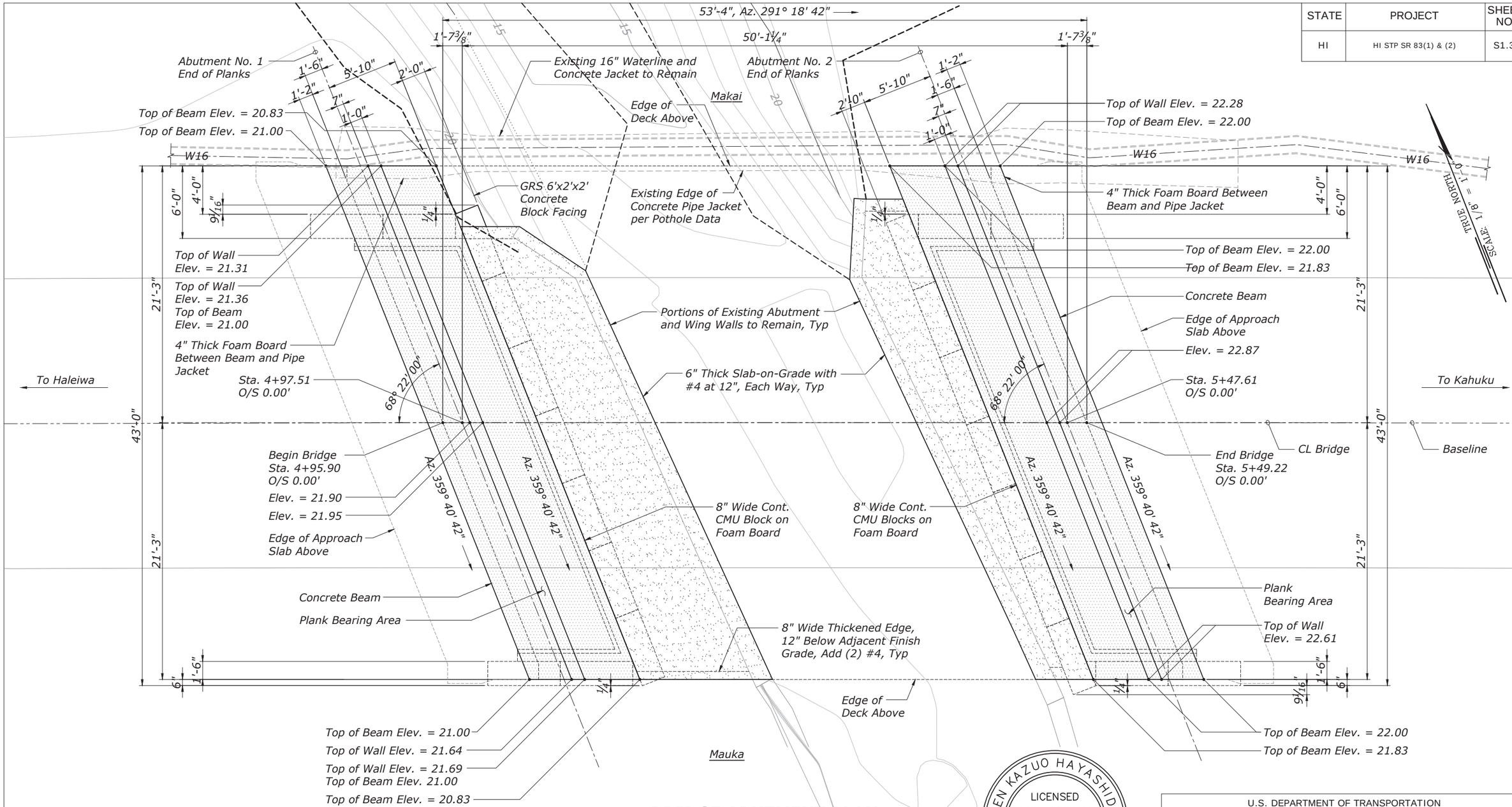
								BL & BC	CADD	MH		MH	7 of 50	NOVEMBER 2018	RG3083-G

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S1.3



BRIDGE ABUTMENT PLAN

Scale: ⅛" = 1'-0"

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BRIDGE ABUTMENT PLAN

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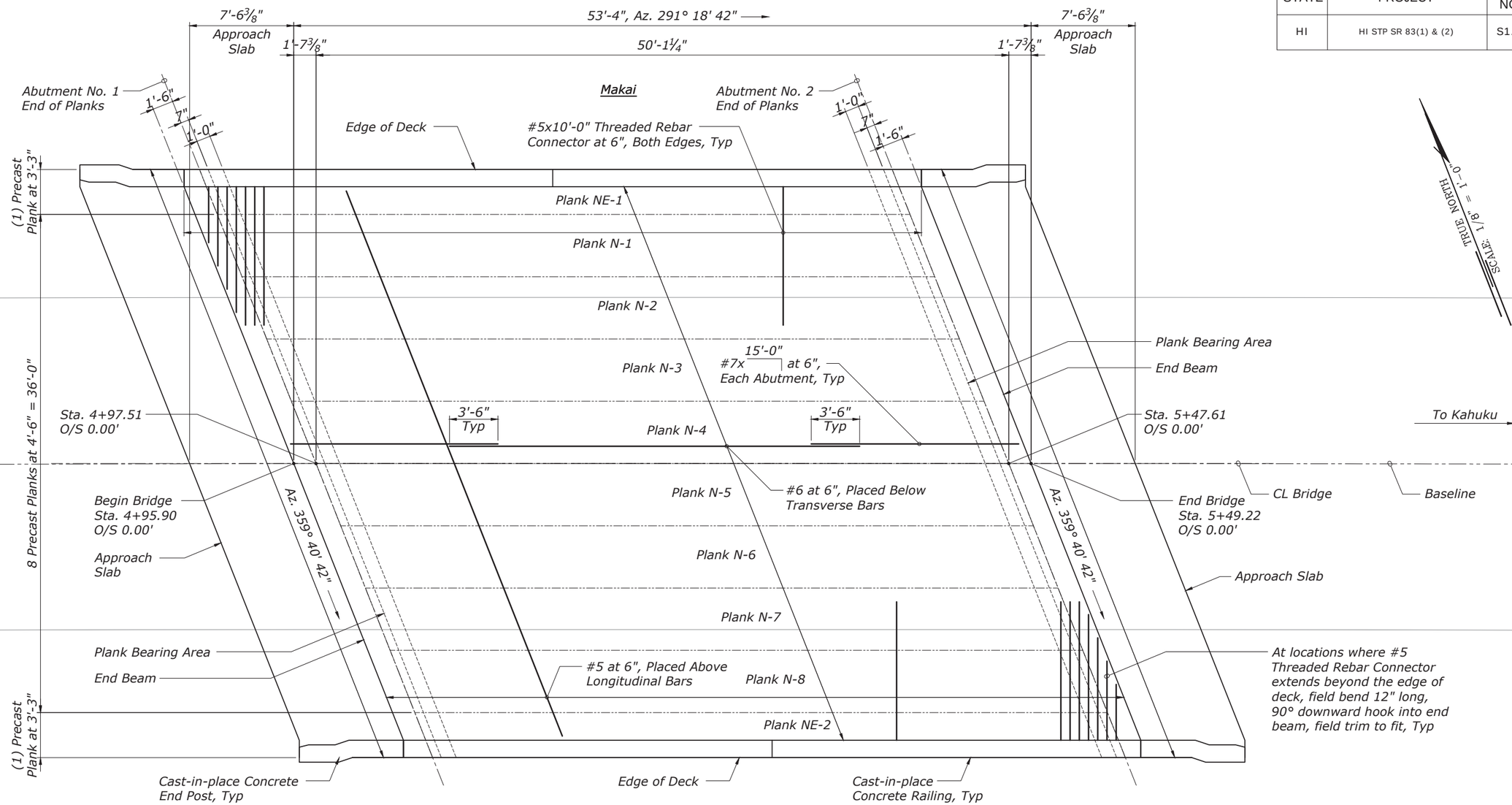
								BL & BC	CADD	MH		MH	8 of 50	NOVEMBER 2018	RG3083-H

AS-BUILT DRAWINGS

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S1.4



Mauka

DEC□ FRAMING PLAN

Scale: ⅛" = 1'-0"

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NANAHU (HOOLAPA) STREAM BRIDGE

KAMEHAMEHA HIGHWAY

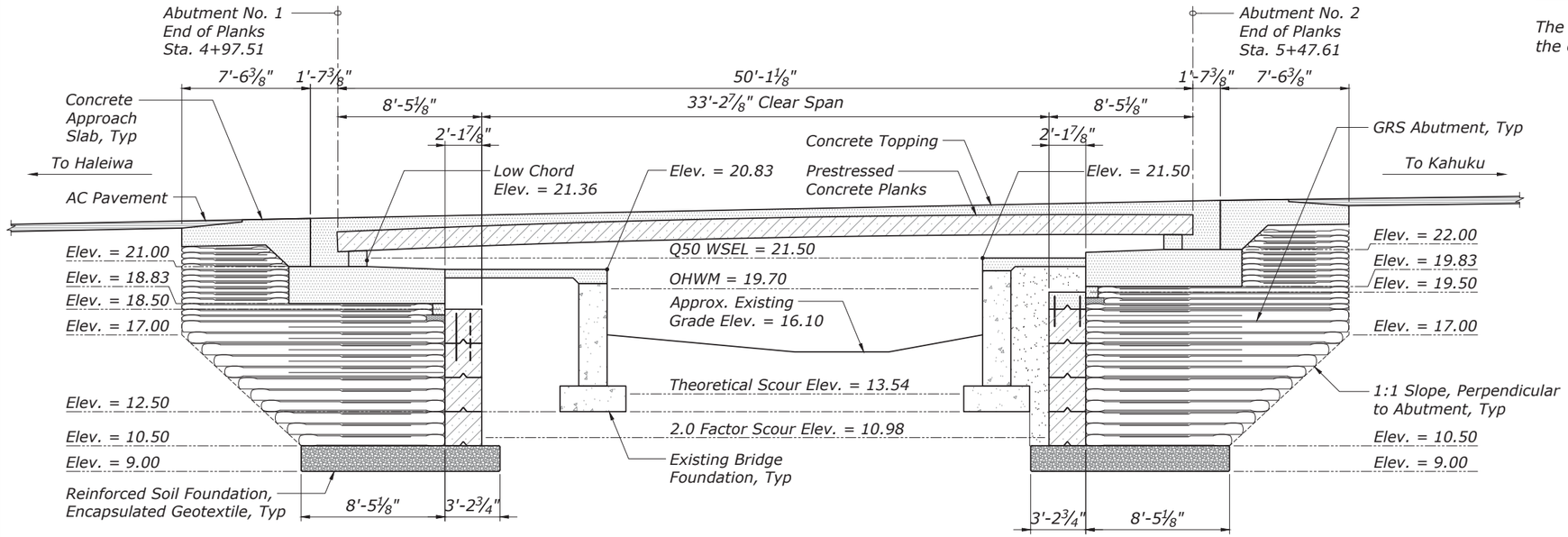
HONOLULU COUNTY, HAWAII

BRIDGE DEC□ FRAMING PLAN

AS-BUILT DRAWINGS

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	9 of 50	NOVEMBER 2018	RG3083-I

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S2.1

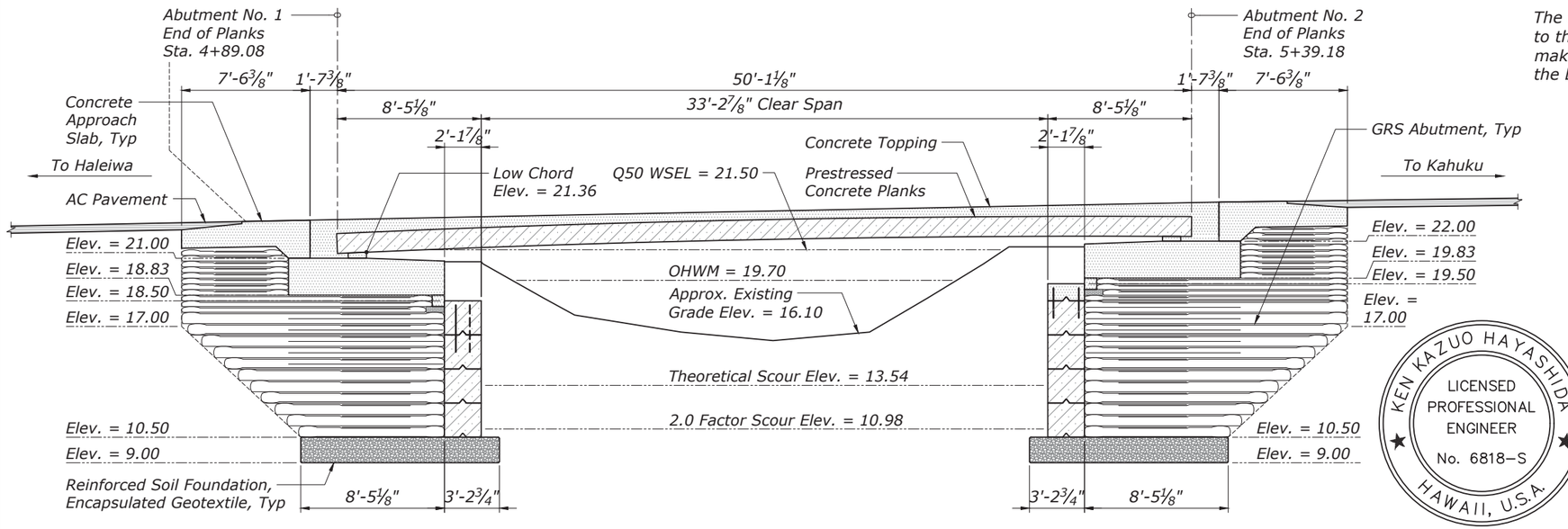


BRIDGE LONGITUDINAL SECTION

Scale: 1/8" = 1'-0"

NOTE:

The orientation of the view is along the centerline of the bridge.



BRIDGE LONGITUDINAL SECTION AT NORT□ EDGE OF DEC□

Scale: 1/8" = 1'-0"

NOTE:

The orientation of the view is parallel to the centerline of the bridge, looking makai, and at an offset 20' left from the baseline of the highway.

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NANAHU (HOOLAPA) STREAM BRIDGE

KAMEHAMEHA HIGHWAY

HONOLULU COUNTY, HAWAII

LONGITUDINAL SECTION

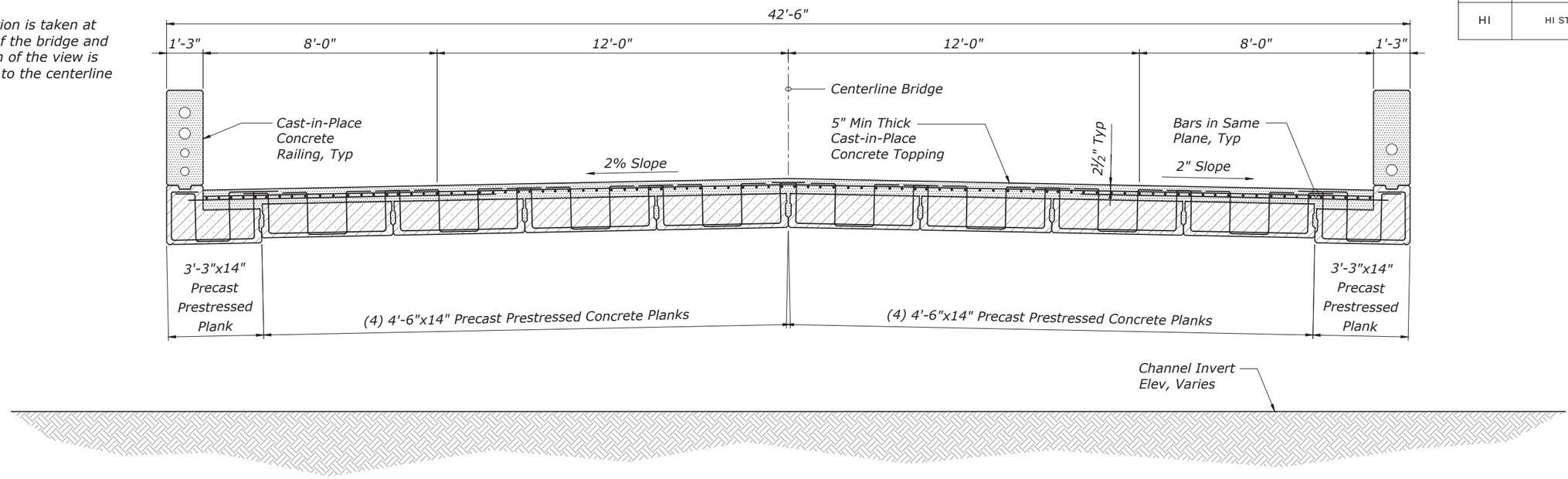
NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	10 of 50	NOVEMBER 2018	RG3083-J

AS-BUILT DRAWINGS

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S2.2

NOTE:

The cross section is taken at the midspan of the bridge and the oriantation of the view is perpendicular to the centerline of the bridge.



TYPICAL BRIDGE CROSS SECTION

Scale: ¼" = 1'-0"

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KEN KAZUO HAYASHIDA
LICENSED PROFESSIONAL ENGINEER
No. 6818–S
HAWAII, U.S.A.

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SIGNATURE — April 30, 2022 EXPIRATION DATE OF THE LICENSE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

NANAHU (HOOLAPA) STREAM BRIDGE

KAMEHAMEHA HIGHWAY

HONOLULU COUNTY, HAWAII

TYPICAL CROSS SECTION

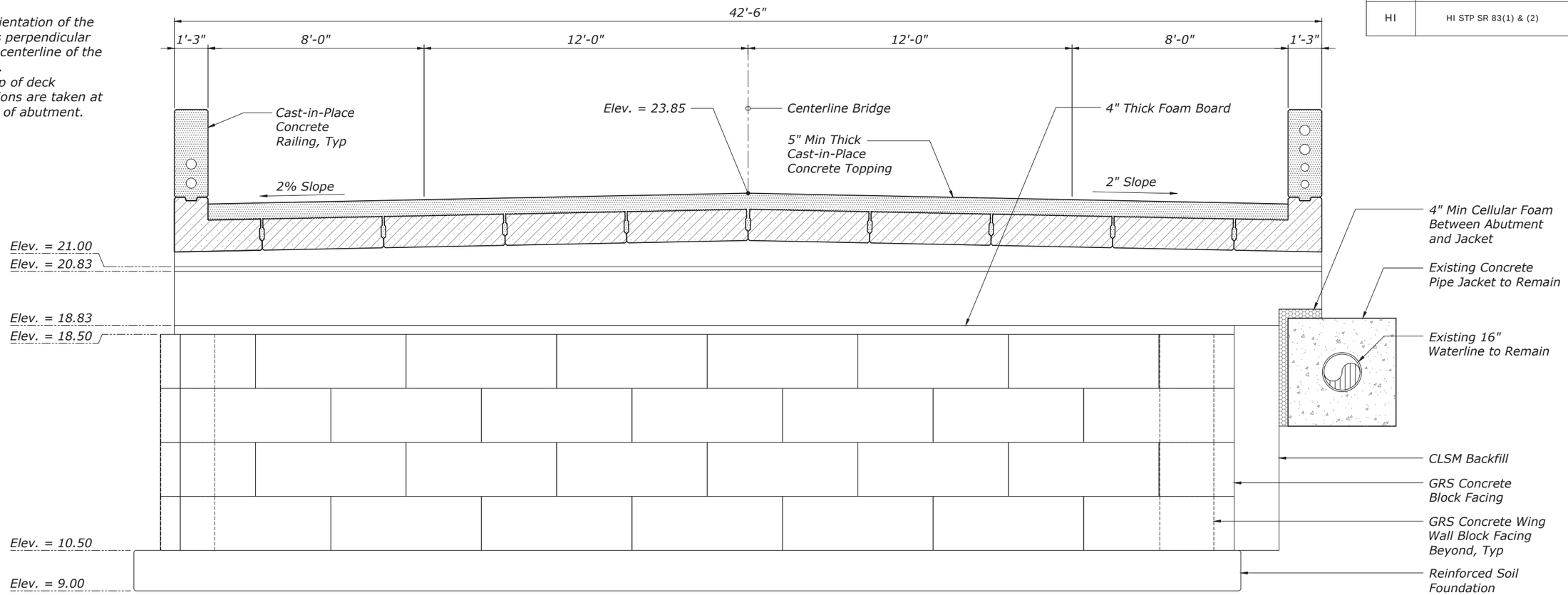
NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	11 of 50	NOVEMBER 2018	RG3083-K

AS-BUILT DRAWINGS

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S3.1

NOTES:

1. *The orientation of the view is perpendicular to the centerline of the bridge.*
2. *The top of deck elevations are taken at the CL of abutment.*



ABUTMENT NO□□ ELEVATION

Scale: ¼" = 1'-0"

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NANAHU (HOOLAPA) STREAM BRIDGE

KAMEHAMEHA HIGHWAY

HONOLULU COUNTY, HAWAII

ABUTMENT NO□□ ELEVATION

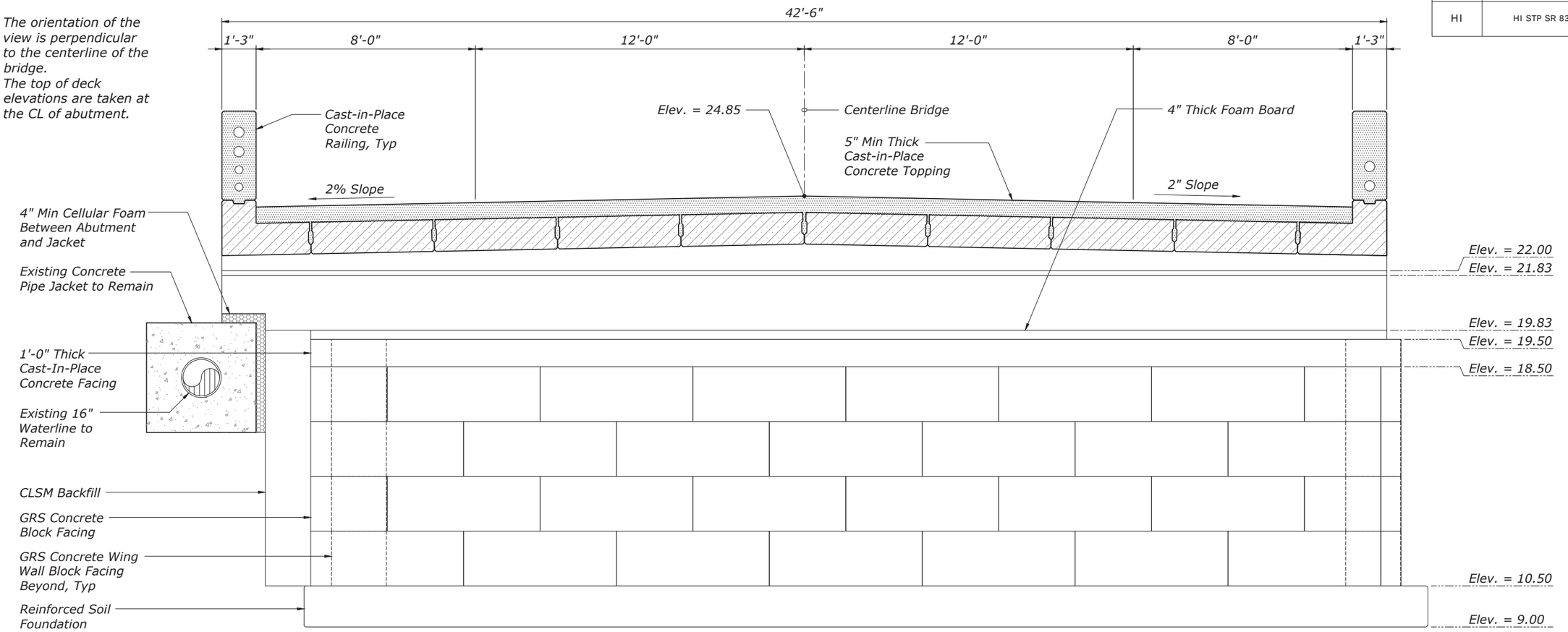
NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	12 of 50	NOVEMBER 2018	RG3083-L

AS-BUILT DRAWINGS

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S3.2

NOTES:

1. *The orientation of the view is perpendicular to the centerline of the bridge.*
2. *The top of deck elevations are taken at the CL of abutment.*



ABUTMENT NO□□ ELEVATION

Scale: ¼" = 1'-0"

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NANAHU (HOOLAPA) STREAM BRIDGE

KAMEHAMEHA HIGHWAY

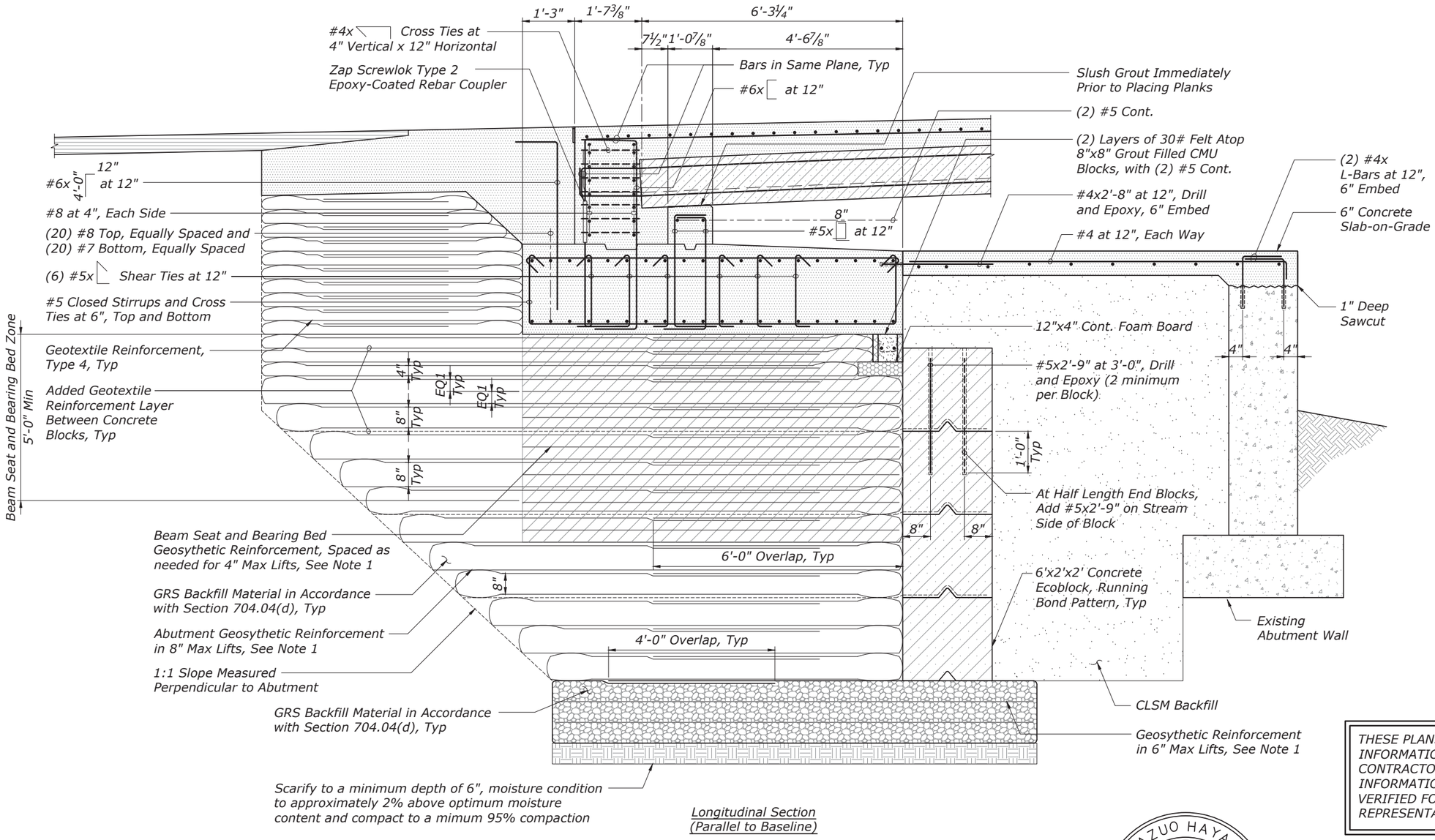
HONOLULU COUNTY, HAWAII

ABUTMENT NO□□ ELEVATION

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	13 of 50	NOVEMBER 2018	RG3083-M

AS-BUILT DRAWINGS

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S3.3



Longitudinal Section
(Parallel to Baseline)

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Notes:

1. Geotextile shall be biaxial, woven polypropylene, with a minimum ultimate tensile strength of 4,800 pounds per square foot, see FP-14 Section 714.04(c).
2. Geotextile fabric wrapped lifts may be be placed directly atop each other.
3. Prepare and compact foundation soils to conform to FP-14 Section 204.
4. Compact backfill to a minimum of 95 percent of the maximum dry density according to AASHTO T99 and ±2 percent of optimum moisture content. In the bearing reinforcement zone, compact to 100 percent of the maximum dry density according to AASHTO T99. Only hand-operated compaction equipment is allowed within 3 feet of the wall face. Reinforcement extends directly beneath each layer of CMU blocks, extending to 1 inch or less from the front face of the wall.
5. Temporary shoring shall be used as needed to maintain the integrity and stability of the existing abutment walls until the bridge concrete deck topping has been placed.
6. Slush grout shall be non-shrink grout shall be a premixed non-metallic formula, capable of developing a minimum compressive strength of 5,000 psi in 28 days, and will not require corrosion inhibitor.

ABUTMENT NO☐☐ DETAIL

Scale: ⅜" = 1'-0"

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NANAHU (HOOLAPA) STREAM BRIDGE

KAMEHAMEHA HIGHWAY

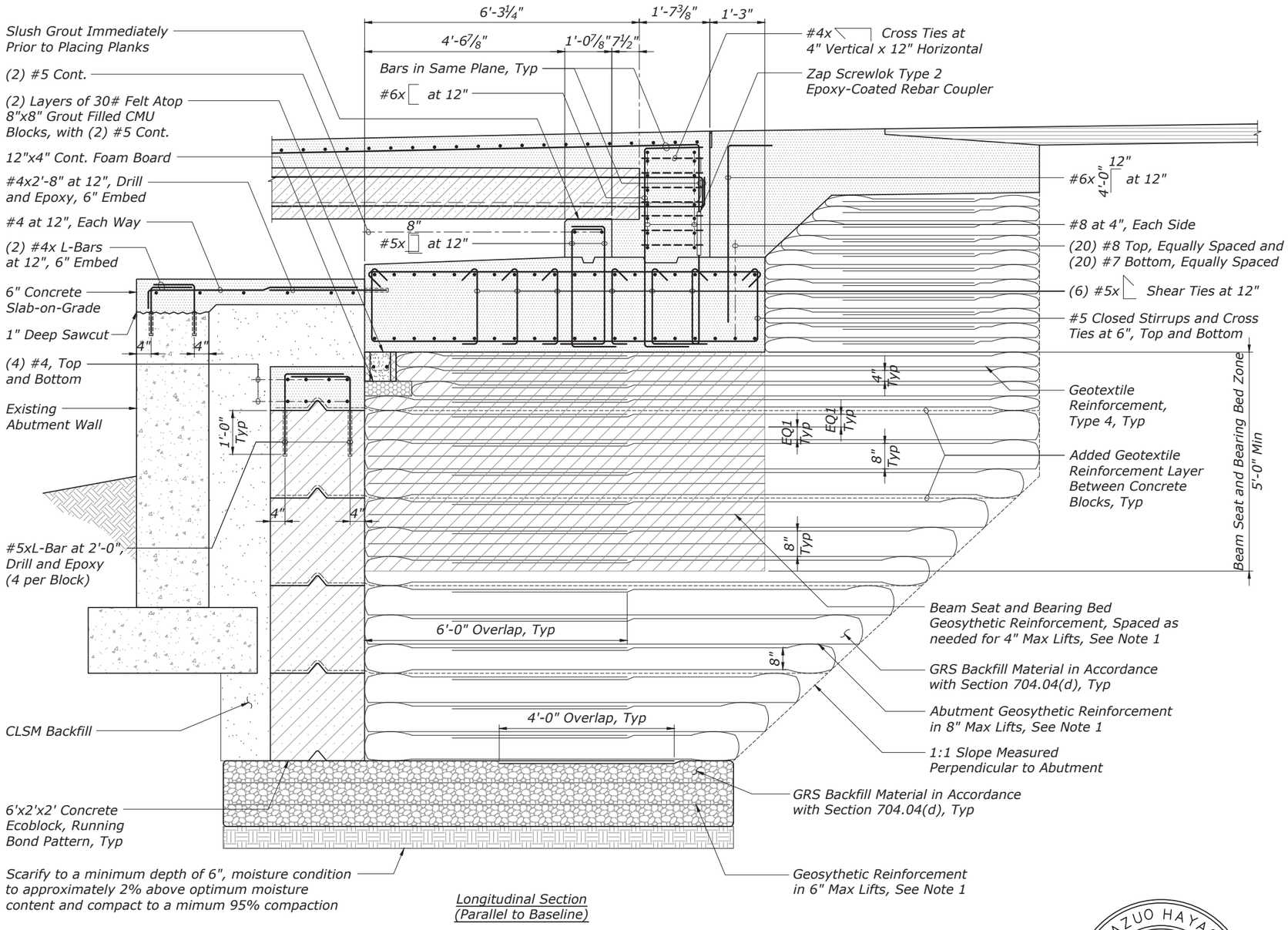
HONOLULU COUNTY, HAWAII

ABUTMENT NO☐☐ DETAIL

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	14 of 50	NOVEMBER 2018	RG3083-N

AS-BUILT DRAWINGS

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S3.4



Longitudinal Section
(Parallel to Baseline)

Notes:

1. *Geotextile shall be biaxial, woven polypropylene, with a minimum ultimate tensile strength of 4,800 pounds per square foot, see FP-14 Section 714.04(c).*
2. *Geotextile fabric wrapped lifts may be be placed directly atop each other.*
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6. *Slush grout shall be non-shrink grout shall be a premixed non-metallic formula, capable of developing a minimum compressive strength of 5,000 psi in 28 days, and will not require corrosion inhibitor.*

ABUTMENT NO□□ DETAIL

Scale: ⅜" = 1'-0"

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NANAHU (HOOLAPA) STREAM BRIDGE

KAMEHAMEHA HIGHWAY

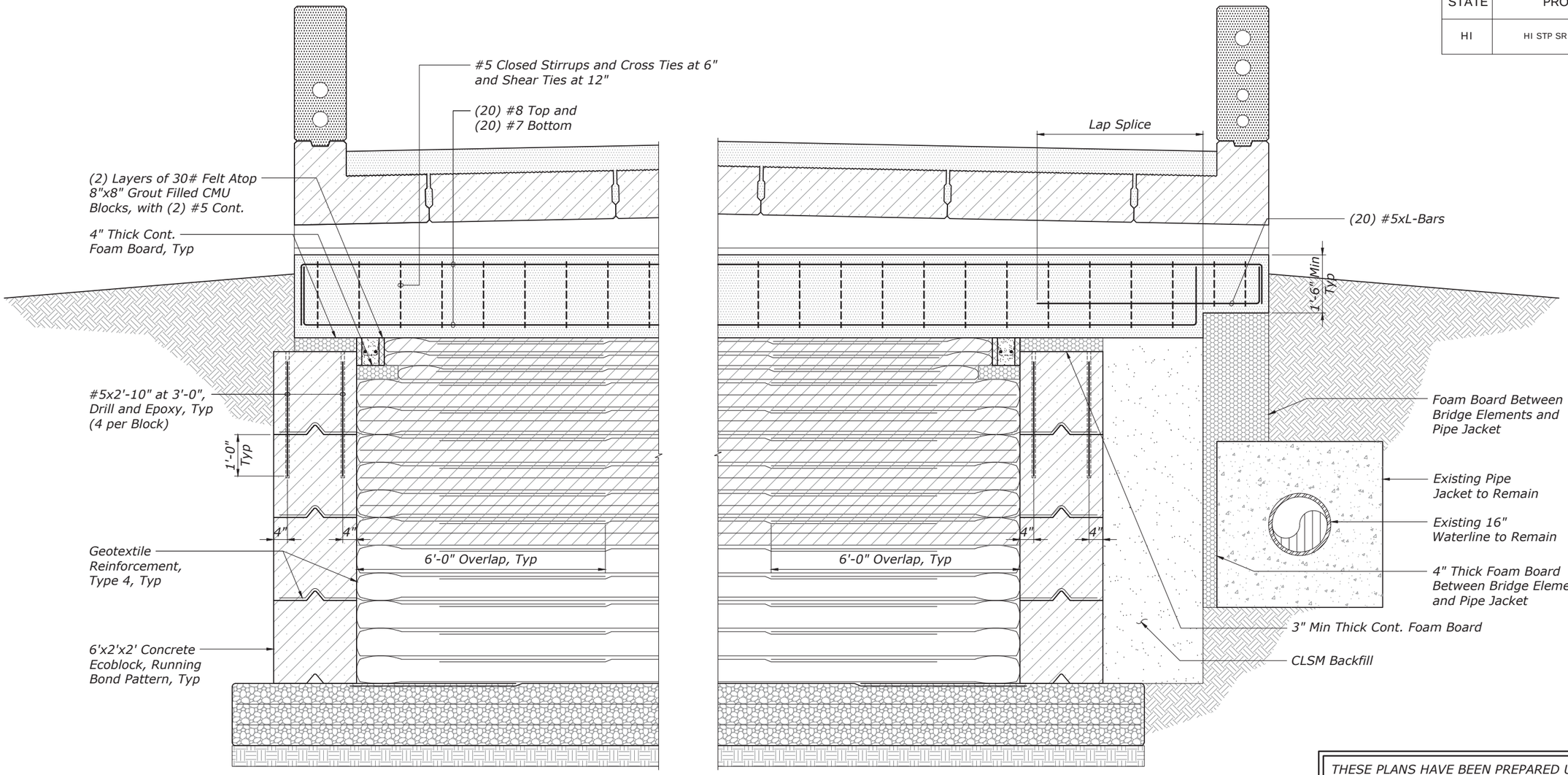
HONOLULU COUNTY, HAWAII

ABUTMENT NO□□ DETAIL

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	15 of 50	NOVEMBER 2018	RG3083-O

AS-BUILT DRAWINGS

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S3.5



Cross Section - Abutment No. 1 Shown
(Perpendicular to Baseline)

Notes:

1. *Geotextile shall be biaxial, woven polypropylene, with a minimum ultimate tensile strength of 4,800 pounds per square foot, see FP-14 Section 714.04(c).*
2. *Prepare and compact foundation soils to conform to FP-14 Section 204.*
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4. *Temporary shoring shall be used as needed to maintain the integrity and stability of the existing abutment walls until the bridge concrete deck topping has been placed.*

GRS ABUTMENT DETAIL □□

Scale: $\frac{3}{8}$" = 1'-0"

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NANAHU (HOOLAPA) STREAM BRIDGE

KAMEHAMEHA HIGHWAY

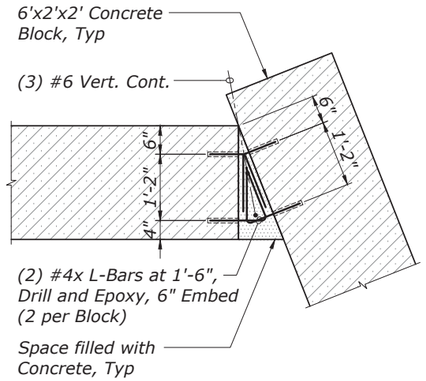
HONOLULU COUNTY, HAWAII

GRS ABUTMENT DETAIL □□

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	16 of 50	NOVEMBER 2018	RG3083-P

AS-BUILT DRAWINGS

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S3.6



CONCRETE BLOC□ CORNER DETAIL

Scale: 3/8" = 1'-0"

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NANAHU (HOOLAPA) STREAM BRIDGE

KAMEHAMEHA HIGHWAY

HONOLULU COUNTY, HAWAII

T□PICAL GRS ABUTMENT DETAILS

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	17 of 50	NOVEMBER 2018	RG3083-Q

AS-BUILT DRAWINGS

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S4.1

Prestressed Plank Notes:

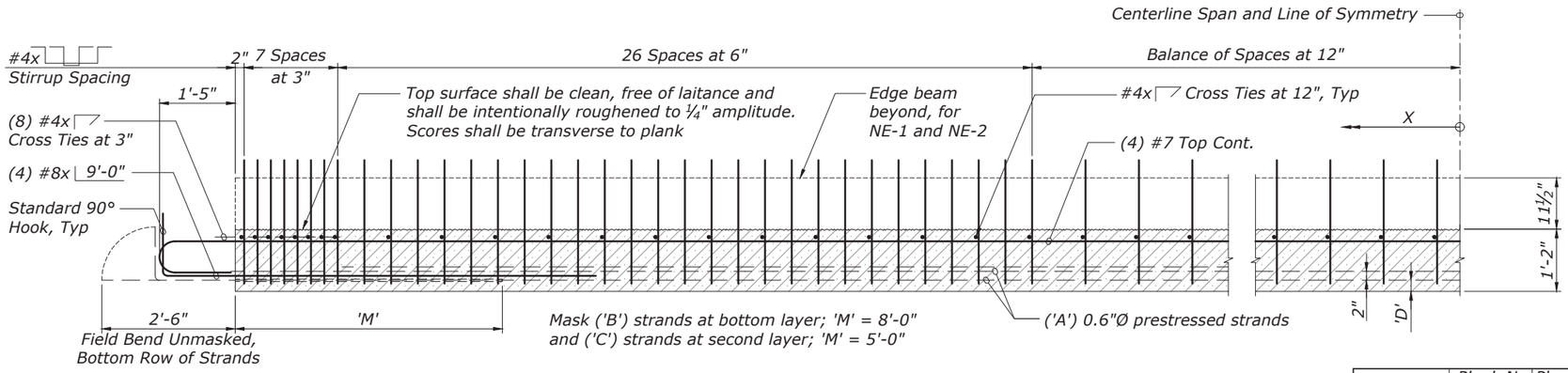
1. Prestressed concrete 28 day strength f'c = 8,000 psi. prestressed concrete strength at time of release fci = 6,400 psi.
2. Prestressing strands shall be (7) wire 0.6"Ø low relaxation steel strands (Area = 0.217 in^2) conforming to ASTM A416 with an ultimate tensile strength of 270 ksi. Initial strand stress (immediately prior to release of prestress) = 0.75 f_{pu} = 202.5 ksi.
3. Non-prestressed reinforcing steel shall be deformed bars conforming to ASTM A615 or A706, Grade 60, unless noted otherwise.
4. Strand pattern shall be symmetrical about the longitudinal centerline of the plank.
5. Strand release sequence shall not induce any lateral deflection of the plank.
6. Contractor shall submit shop drawings indicating proposed strand pattern, releasing sequence, reinforcing details and hold down device details to the engineer prior to fabrication.
7. During curing, care shall be taken to avoid any lateral deflection to the plank due to improper orientation. steam curing may be used to accelerate strength gain.
8. Lifting devices shall be placed as close as possible to the centerline of bearings of the plank. details and locations of lifting devices shall be submitted to the engineer for approval. such approval does not relieve the contractor of his responsibilities if plank is damaged due to failure of the lifting device.
9. $P_{(e)}$ = effective prestress force after all losses (kips)
10. Plank stirrups shall be placed parallel to the bridge skew.
11. Top row of unmasked strands shall be cut flush with the face of plank.
12. Where vertical #5 bars in curb section at the Abutment 1 end of plank NE-1 have been inadvertently omitted, drill and epoxy #5 bars at 6". The bars on interior side shall have a minimum embedment of 12½" and the bars on the exterior side shall have a minimum embedment of 6".
13. At Abutment 1 end of Plank NE-1 and Abutment 2 end of Plank NE-2, trim edge bars as needed to maintain clearance from construction joint

Required Actions:

1. Measure slab camber prior to setting deck forms. If the actual camber exceeds the estimated slab camber (3⅜" for interior planks and 1⅞" for exterior planks) by more than 1", the fillet will have to be increased by raising profile grade as directed by the owner.
2. Set the deck forms and camber the deck machine screed rails to offset the slab deflections (½") due to deck placement.
3. Bridge precast slab seat elevations were calculated using dead load deflections of the deck so that top of precast slab will be a minimum of 1" below bottom of deck at any point in the span, allowing for precast slab depth and slab camber tolerance.

Notes:

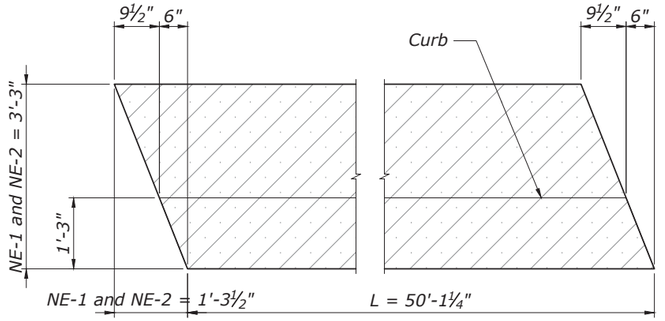
1. The plank lengths shown do not include changes in length increase due to elastic and time dependent shortening effects and longitudinal slope of the plank.
2. The unmasked strands shall have 2'-6" extension at both ends of each plank.

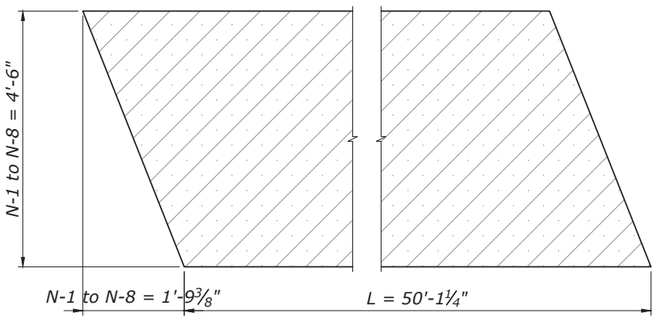


TYPICAL PRESTRESSED PLAN ELEVATION

Scale: ⅜" = 1'-0"

	Plank N-	Plank NE-
'A'	34	24
'B'	6	3
'C'	2	2
$P_{(e)}$ [kips]	1,198	864
C.G.S. [in]	3.32	4.42
'D' [in]	2.5	2.5





Deflection Equation:

$\Delta = ½" - X^2(1040.8^{-1})$

Where:

Δ = Deflection, in inches, of slab at any point caused by the weight of deck
X = Distance, in feet, measured from midspan (See diagram)

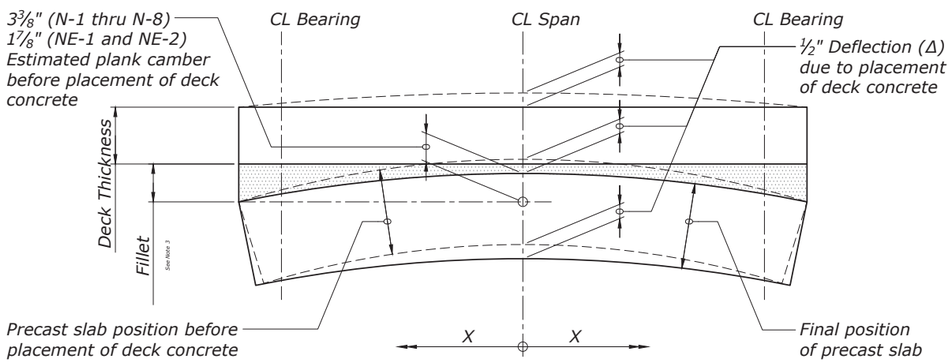
Note:

Δ max = ½" at X = 0' (Midspan)
Δ min = 0" at X = 22'-9¾" (CL Bearing)

Note:
Reinforcing not shown for clarity.

TYPICAL PRESTRESSED PLAN PLAN

Scale: ⅜" = 1'-0"



DECK FORM SETTING DIAGRAM

Not to Scale

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NANAHU (HOOLAPA) STREAM BRIDGE

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HONOLULU COUNTY, HAWAII

PRESTRESSED PLAN

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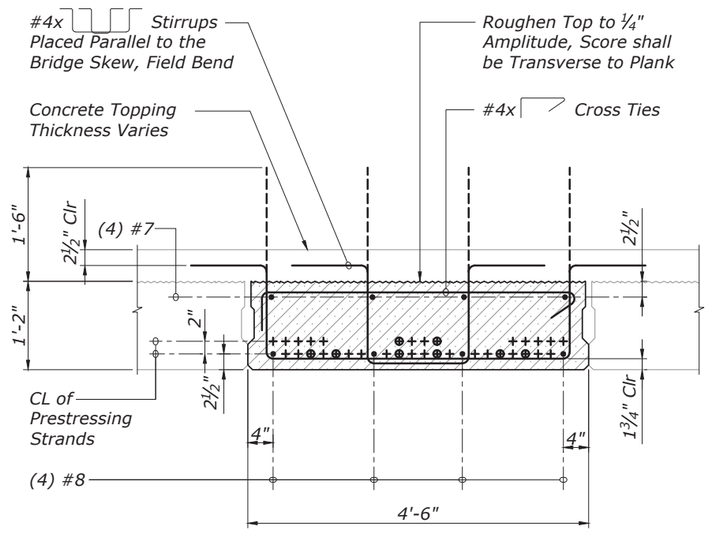
								BL & BC	CADD	MH		MH	18 of 50	NOVEMBER 2018	RG3083-R

AS-BUILT DRAWINGS

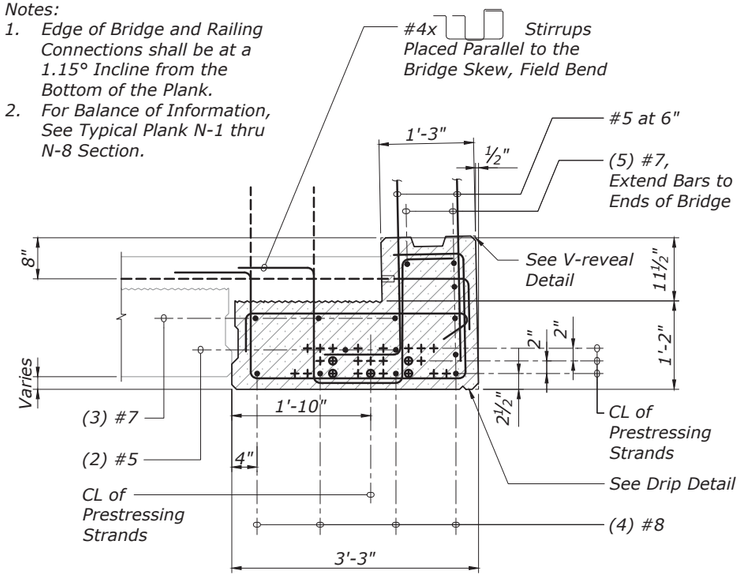
STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S4.2



Legend:
- + 0.6"Ø Strands
- ⊕ 0.6"Ø Strands Masked at Each End
- • Deformed Rebar

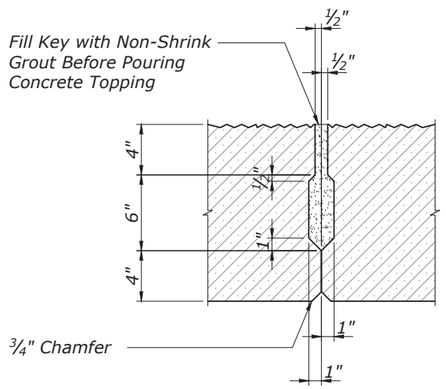
TYPICAL PLAN AND TRANSVERSE SECTION
Scale: ½" = 1'-0"

Notes:
1. Edge of Bridge and Railing Connections shall be at a 1.15° Incline from the Bottom of the Plank.
2. For Balance of Information, See Typical Plank N-1 thru N-8 Section.

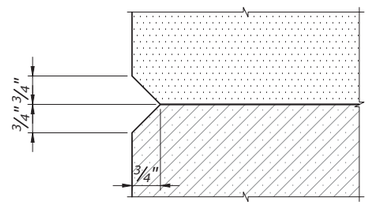


TYPICAL PLAN NEAR AND NEAR SECTION
Scale: ½" = 1'-0"

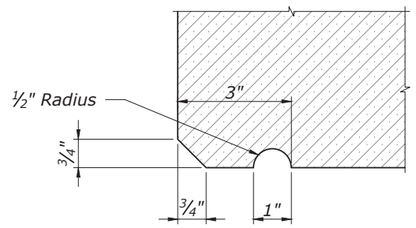
Note:
Non-Shrink Grout Shall have a 28-Day Compressive Strength of 8,900 psi.



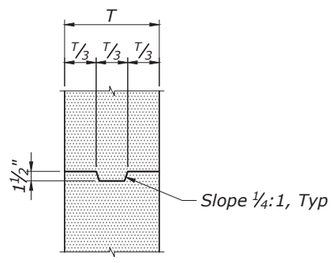
DETAIL
Scale: 1" = 1'-0"



V REVEAL DETAIL
Scale: 1" = 1'-0"



DRIP DETAIL
Scale: 1" = 1'-0"



CURB DETAIL
Scale: ½" = 1'-0"

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CENTRAL FEDERAL LANDS HIGHWAY DIVISION

NANAHU (HOOLAPA) STREAM BRIDGE

KAMEHAMEHA HIGHWAY

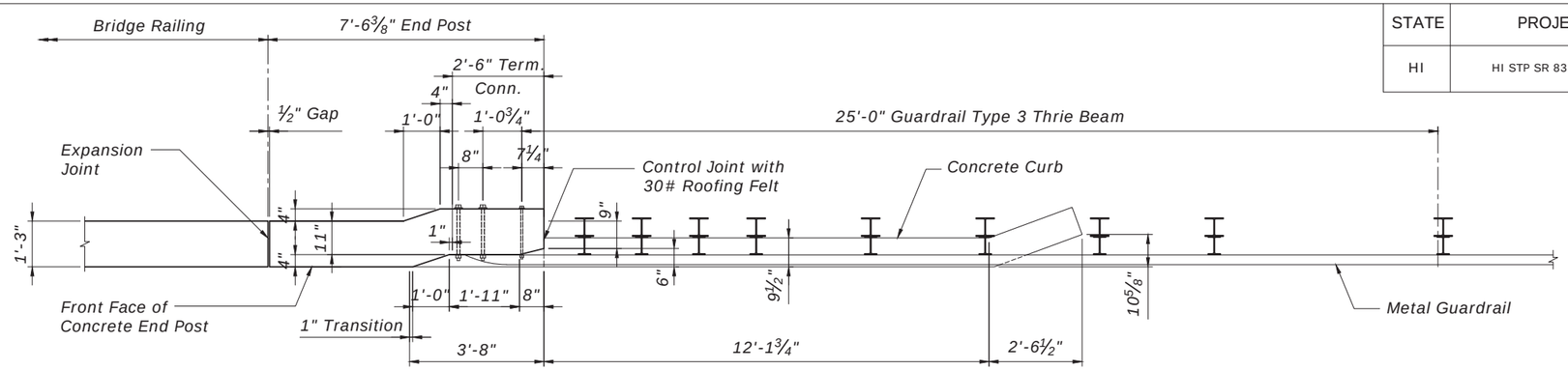
HONOLULU COUNTY, HAWAII

PLAN SECTIONS

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	19 of 50	NOVEMBER 2018	RG3083-S

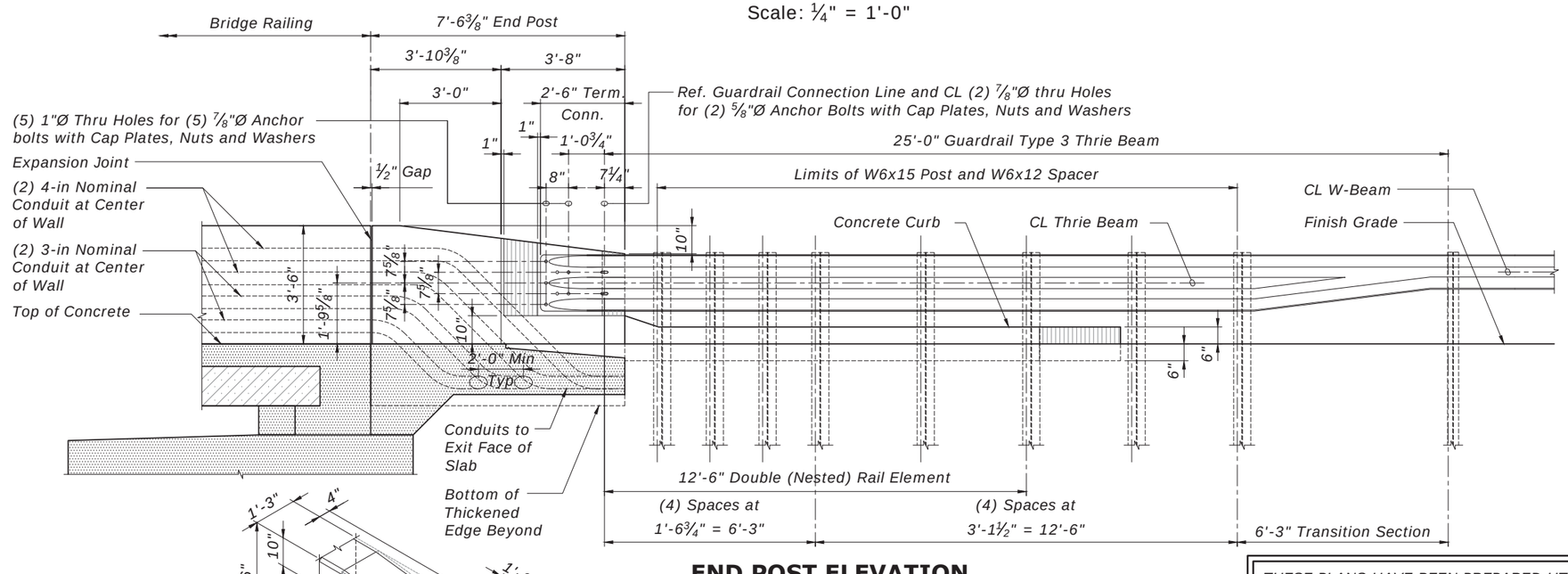
AS-BUILT DRAWINGS

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S5.1



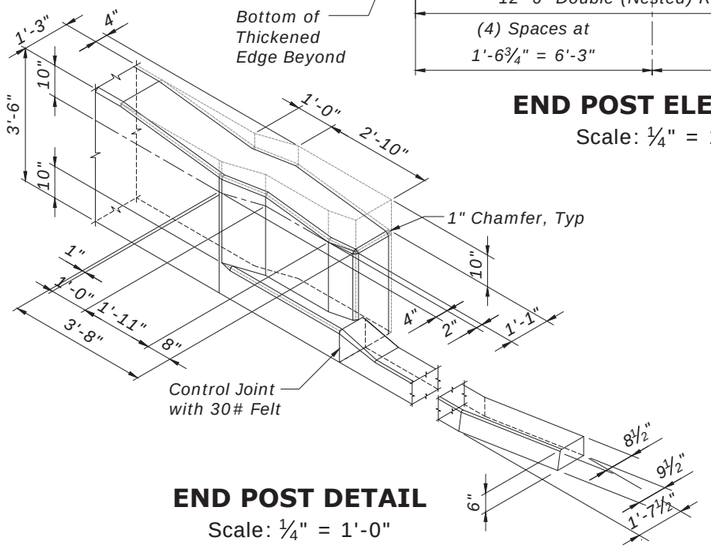
END POST PLAN

Scale: 1/4" = 1'-0"



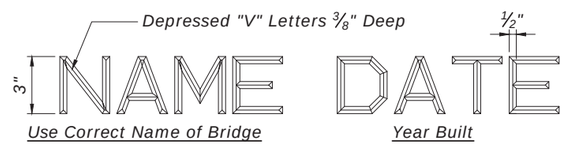
END POST ELEVATION

Scale: 1/4" = 1'-0"



END POST DETAIL

Scale: 1/4" = 1'-0"



BRIDGE IDENTIFICATION DETAIL

Not to Scale

Notes:

1. Unless otherwise directed by the engineer, the bridge name and date shall be placed at the "trailing" end post on each side of the roadway.
2. Exact details and spacing of letter and figures and location shall be as directed by the engineer. gothic letters and figures approximating dimensions shown will be acceptable if approved by the engineer.
3. Submit shop drawings for review.

Typical Detail of Letters and Figures at Concrete End Post

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KEN KAZUO HAYASHIDA
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No. 6818–S
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April 30, 2022
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U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

NANAHU (HOOLAPA) STREAM BRIDGE

KAMEHAMEHA HIGHWAY

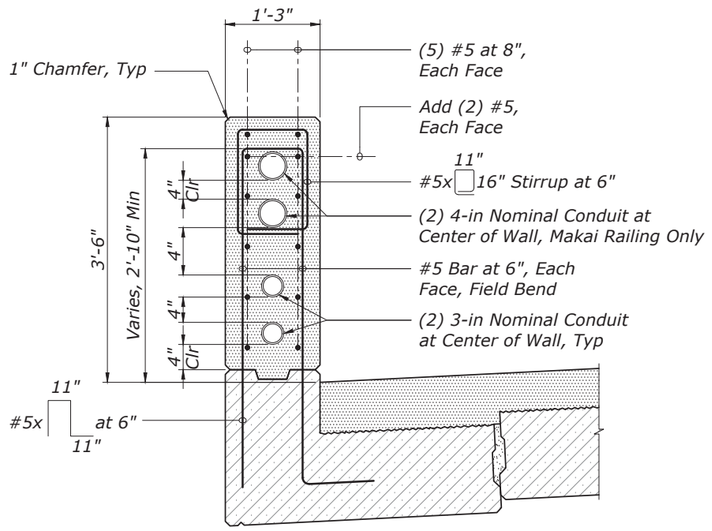
HONOLULU COUNTY, HAWAII

GUARDRAIL DETAILS

AS-BUILT DRAWINGS

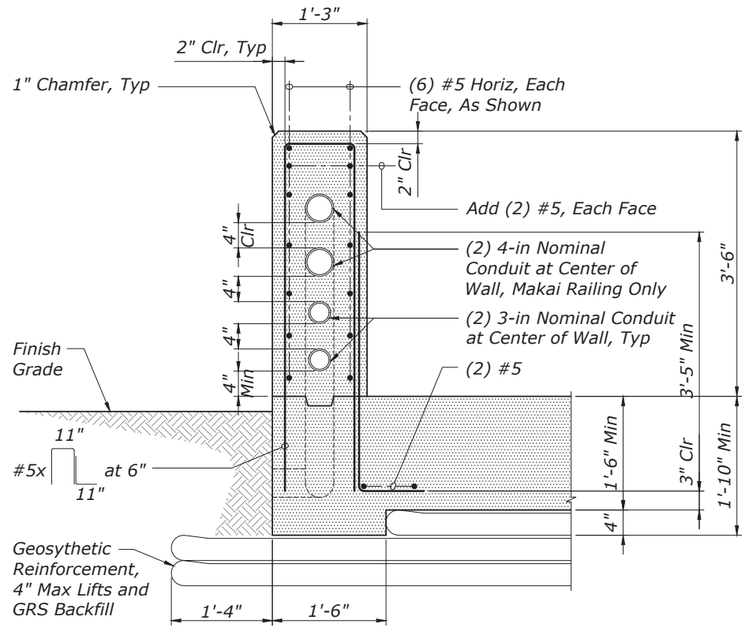
NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	20 of 50	NOVEMBER 2018	RG3083-T

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S5.2



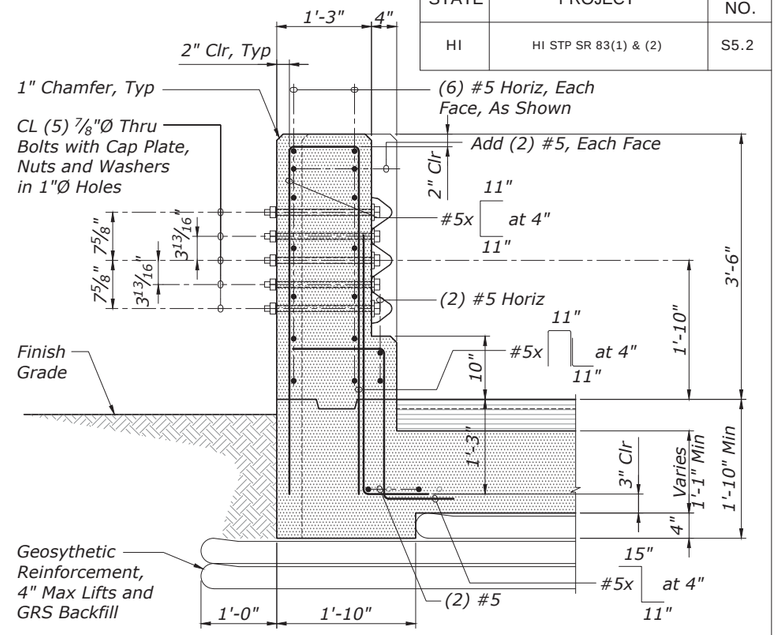
RAILING SECTION

Scale: ½" = 1'-0"



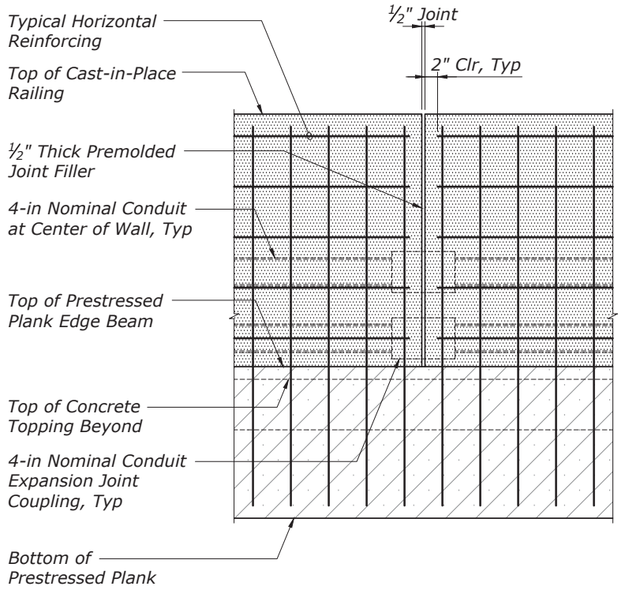
END POST SECTION ☐ALTERNATIVE ☐

Scale: ½" = 1'-0"



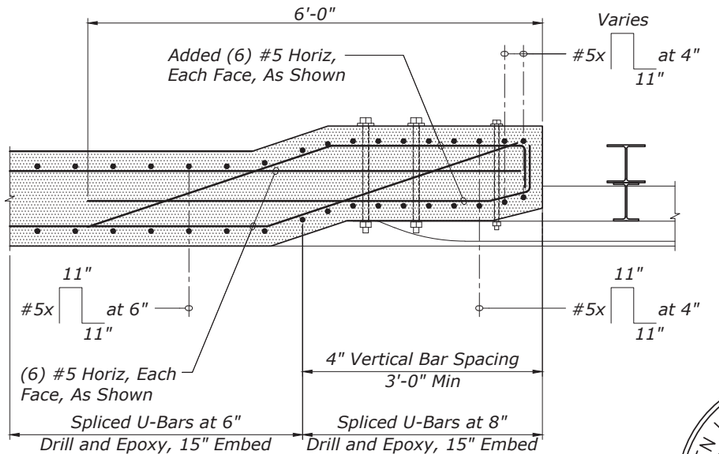
END POST TRANSITION SECTION ☐ALTERNATIVE ☐

Scale: ½" = 1'-0"



RAILING E☐PANSION ☐OINT DETAIL

Scale: ½" = 1'-0"



END POST TRANSITION PLAN SECTION

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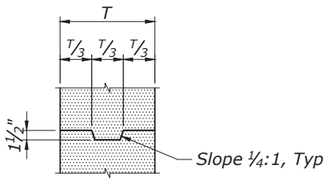

S☐EAR ☐E☐ DETAIL

Scale: ½" = 1'-0"

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CENTRAL FEDERAL LANDS HIGHWAY DIVISION

NANAHU (HOOLAPA) STREAM BRIDGE

KAMEHAMEHA HIGHWAY

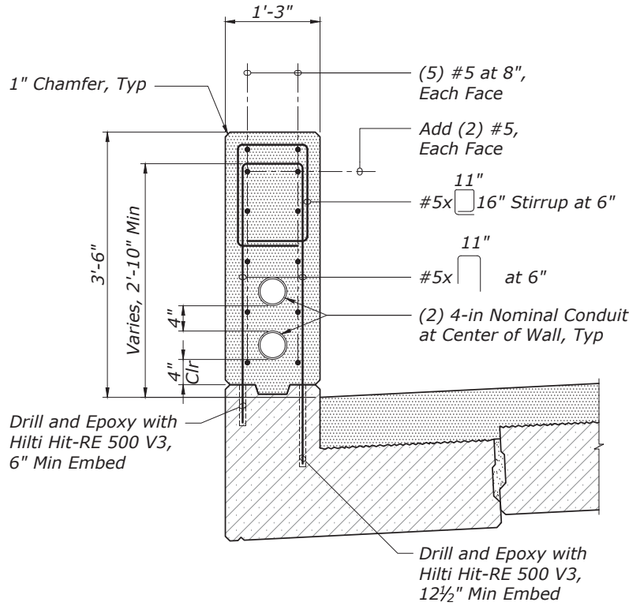
HONOLULU COUNTY, HAWAII

RAILING SECTION ☐☐

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	21 of 50	NOVEMBER 2018	RG3083-U

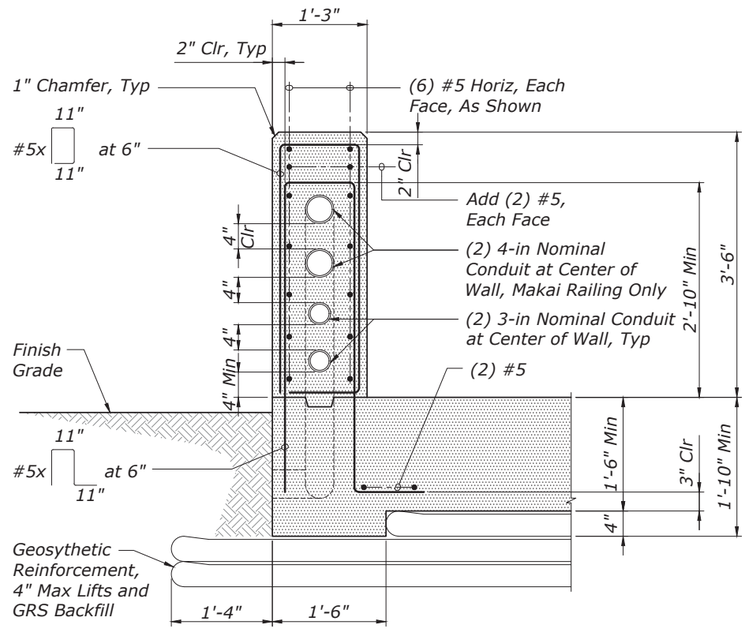
AS-BUILT DRAWINGS

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S5.3



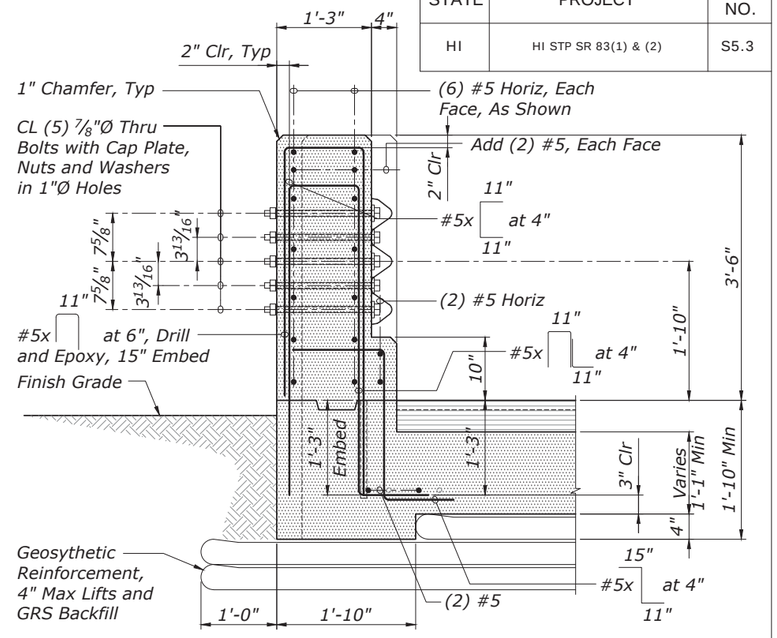
RAILING SECTION AT END OF PLAN□NE□□

Scale: ½" = 1'-0"



END POST SECTION □ALTERNATIVE □

Scale: ½" = 1'-0"



END POST TRANSITION SECTION □ALTERNATIVE □

Scale: ½" = 1'-0"

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NANAHU (HOOLAPA) STREAM BRIDGE

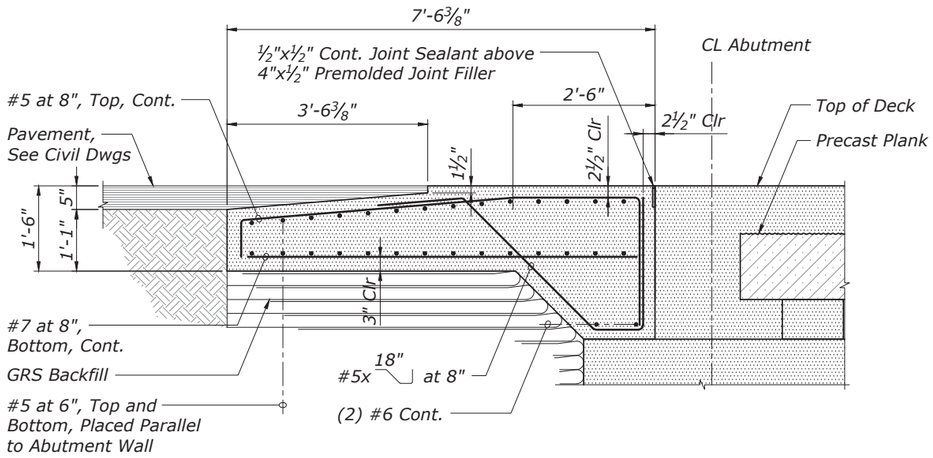
KAMEHAMEHA HIGHWAY

HONOLULU COUNTY, HAWAII

RAILING SECTION □□

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	22 of 50	NOVEMBER 2018	RG3083-V

AS-BUILT DRAWINGS



TYPICAL APPROACH SLAB SECTION

Scale: ⅜" = 1'-0"

NOTES:

1. *The orientation of the view is parallel to the centerline of the bridge.*
2. *Abutment and deck reinforcing not shown for clarity.*

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S6.1

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CENTRAL FEDERAL LANDS HIGHWAY DIVISION

NANAHU (HOOLAPA) STREAM BRIDGE

KAMEHAMEHA HIGHWAY

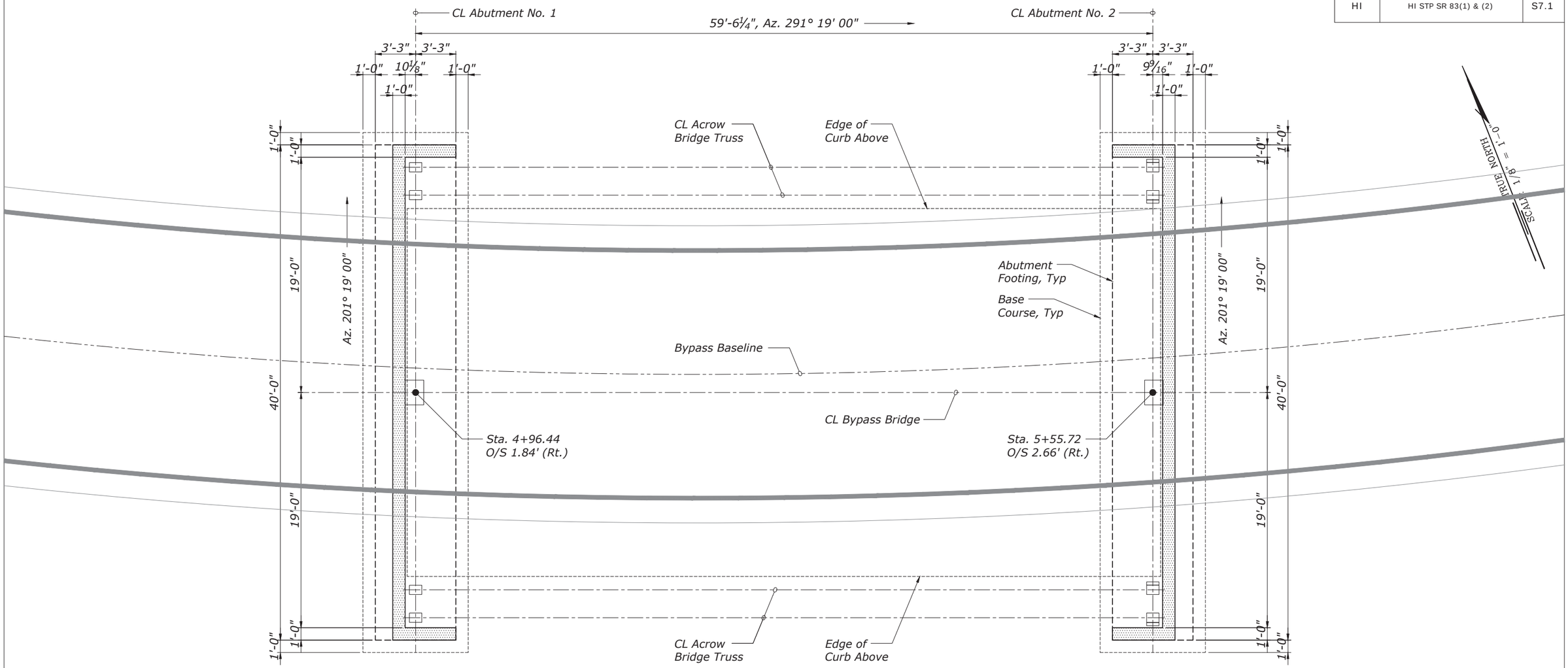
HONOLULU COUNTY, HAWAII

TYPICAL APPROACH SLAB SECTION

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	23 of 50	NOVEMBER 2018	RG3083-W

AS-BUILT DRAWINGS

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S7.1



B□PASS BRIDGE FOUNDATION PLAN

Scale: ⅛" = 1'-0"

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NANAHU (HOOLAPA) STREAM BRIDGE

KAMEHAMEHA HIGHWAY

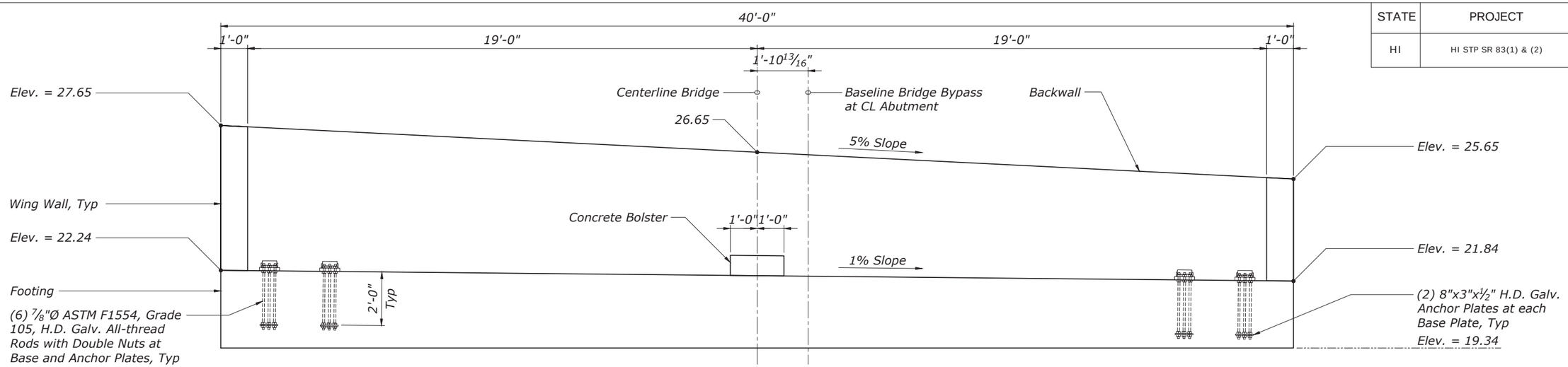
HONOLULU COUNTY, HAWAII

B□PASS BRIDGE FOUNDATION PLAN

AS-BUILT DRAWINGS

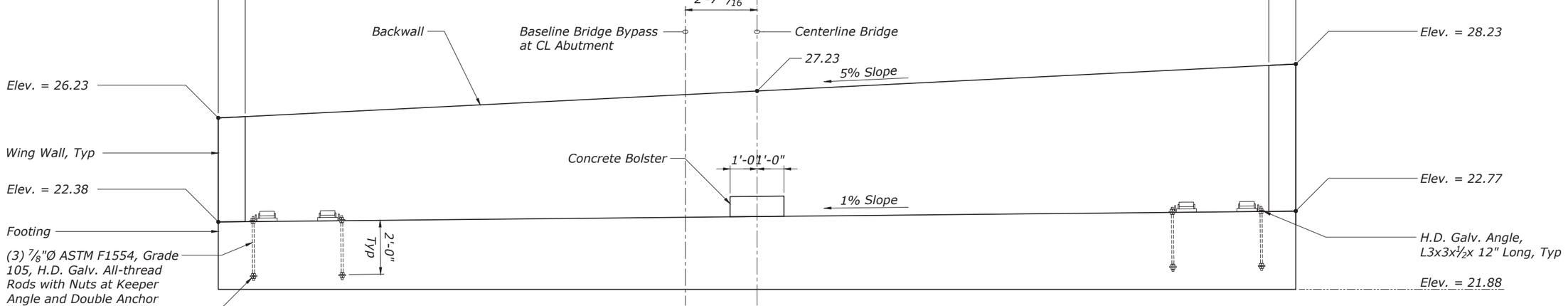
NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	24 of 50	NOVEMBER 2018	RG3083-X

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S7.2



ABUTMENT ☐ELEVATION

Scale: 1/4" = 1'-0"



ABUTMENT ☐ELEVATION

Scale: 1/4" = 1'-0"

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NANAHU (HOOLAPA) STREAM BRIDGE

KAMEHAMEHA HIGHWAY

HONOLULU COUNTY, HAWAII

B☐PASS BRIDGE ABUTMENT ELEVATIONS

AS-BUILT DRAWINGS

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	25 of 50	NOVEMBER 2018	RG3083-Y

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S7.3

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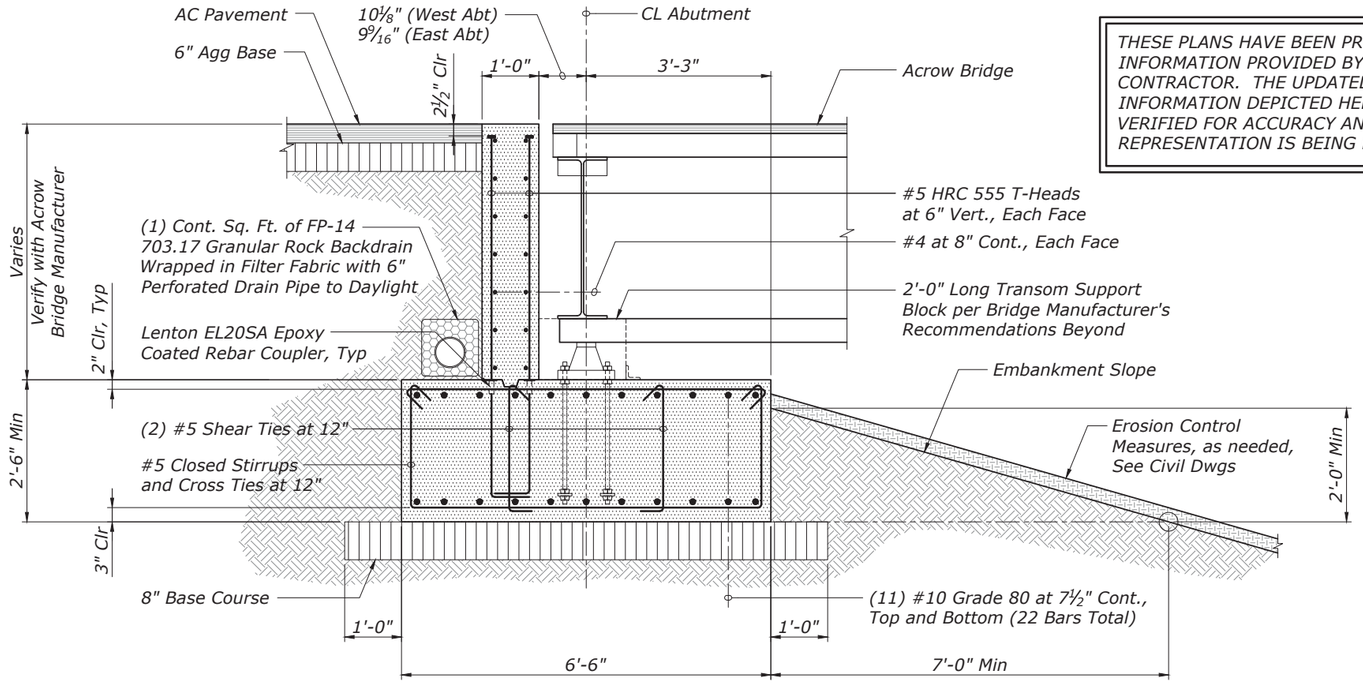
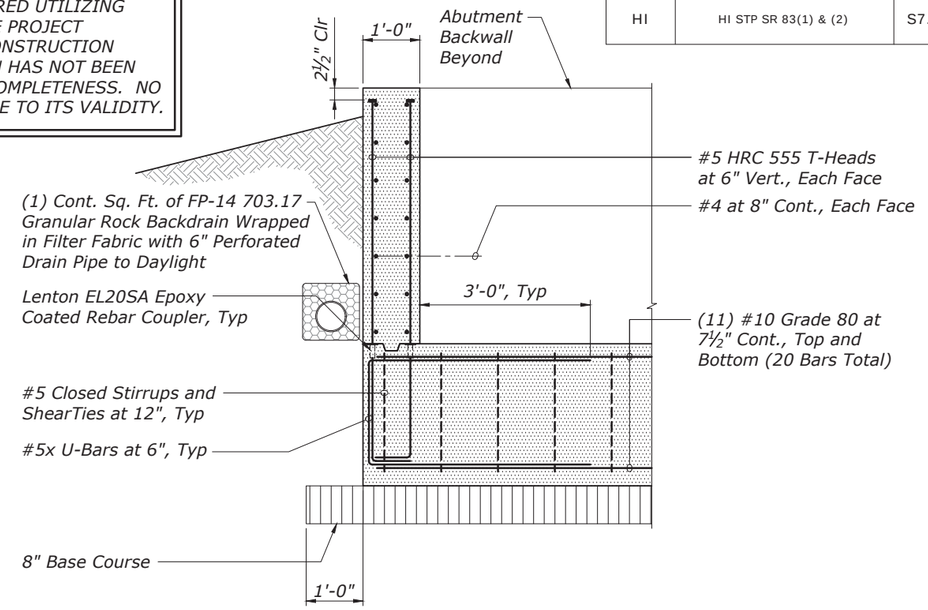


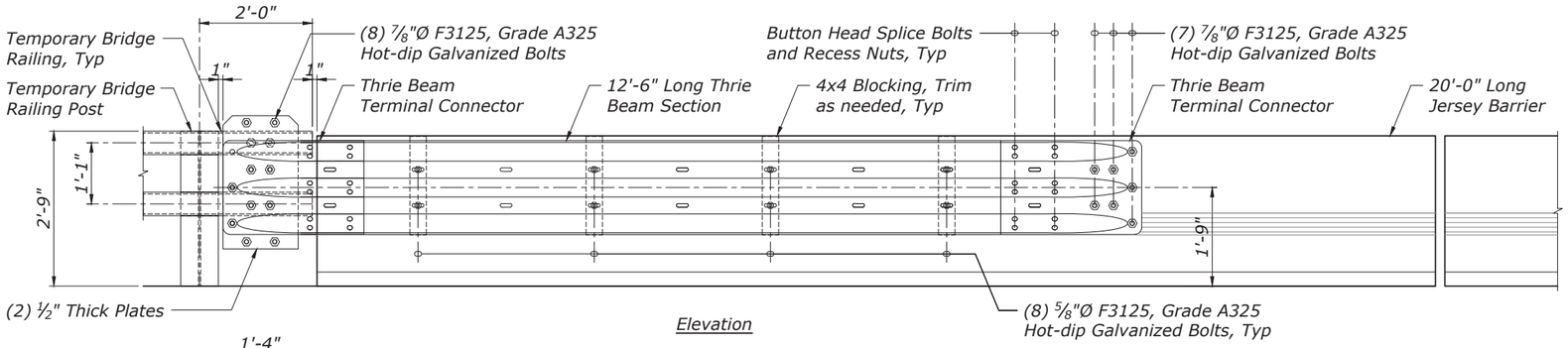
B□PASS BRIDGE ABUTMENT SECTION

Scale: ⅜" = 1'-0"



B□PASS BRIDGE □ING □ALL SECTION

Scale: ⅜" = 1'-0"



Elevation

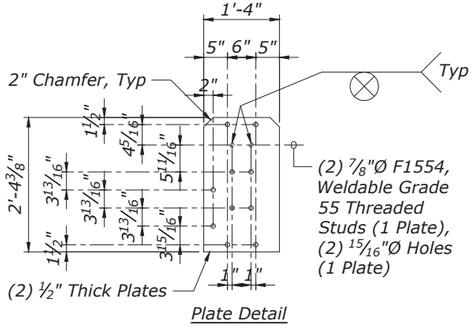
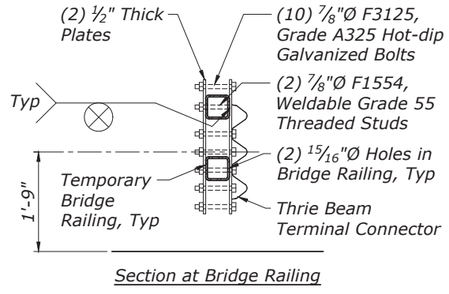
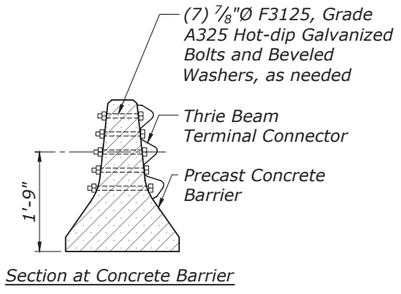


Plate Detail



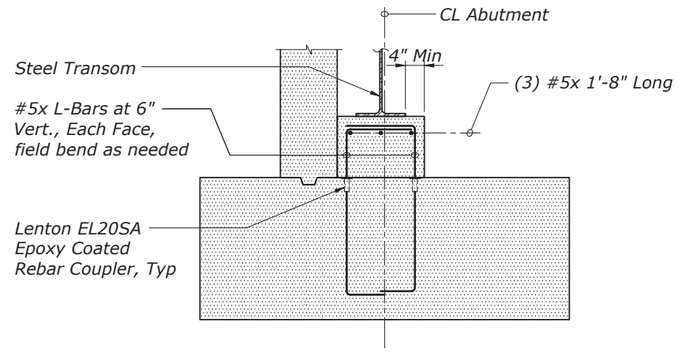
Section at Bridge Railing



Section at Concrete Barrier

GUARDRAIL ATTAC□MENT DETAILS

Scale: ⅜" = 1'-0"



B□PASS BRIDGE BOLSTER DETAIL

Scale: ⅜" = 1'-0"

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NANAHU (HOOLAPA) STREAM BRIDGE

KAMEHAMEHA HIGHWAY

HONOLULU COUNTY, HAWAII

B□PASS BRIDGE ABUTMENT SECTION

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	26 of 50	NOVEMBER 2018	RG3083-Z

AS-BUILT DRAWINGS

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S8.1

INDEX TO KAWELA BRIDGE DRAWINGS		
DRAWING NO.	SHEET	DESCRIPTION
RG3084-A	S8.1	INDEX TO BRIDGE DRAWINGS
RG3084-B	S8.2	STRUCTURAL GENERAL NOTES
RG3084-C	S8.3	QUANTITY SCHEDULE
RG3084-D	S8.4	EXISTING BRIDGE DEMOLITION PLAN
RG3084-E	S8.5	EXISTING BRIDGE ABUTMENT ELEVATIONS
RG3084-F	S9.1	BRIDGE LAYOUT PLAN
RG3084-G	S9.2	BRIDGE FOUNDATION PLAN
RG3084-H	S9.3	BRIDGE DECK FRAMING PLAN
RG3084-I	S10.1	LONGITUDINAL SECTION
RG3084-J	S10.2	TYPICAL CROSS SECTION
RG3084-K	S11.1	ABUTMENT NO. 1 ELEVATION
RG3084-L	S11.2	ABUTMENT NO. 2 ELEVATION
RG3084-M	S11.3	ABUTMENT NO. 1 SECTIONS
RG3084-N	S11.4	ABUTMENT NO. 2 SECTIONS
RG3084-O	S11.5	TYPICAL CONNECTING SLAB
RG3084-P	S12.1	PRESTRESSED PLANK
RG3084-Q	S12.2	PLANK SECTIONS
RG3084-R	S13.1	GUARDRAIL DETAILS
RG3084-S	S13.2	RAILING SECTION
RG3084-T	S14.1	TYPICAL APPROACH SLAB SECTIONS
RG3084-U	S15.1	TYPICAL PRESTRESSED PILE NOTES AND DETAILS
RG3084-V	S16.1	BYPASS BRIDGE FOUNDATION PLAN
RG3084-W	S16.2	BYPASS BRIDGE ABUTMENT ELEVATIONS
RG3084-X	S16.3	BYPASS BRIDGE ABUTMENT SECTION

KAWELA CONSTRUCTION AND CONCRETE PLACEMENT SEQUENCE:

1. *Pile Cap*
2. *Abutment Wall and 6" Slab-On-Grade*
3. *Bridge Deck*
4. *Approach Slab*
5. *Barrier Railing (Mauka Abutment 2 and Makai Abutment 1) and End Post (Mauka Abutment 1 and Makai Abutment 2)*
6. *Barrier Railing (Mauka Abutment 1 and Makai Abutment 2) and End Post (Mauka Abutment 2 and Makai Abutment 1)*

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KAWELA STREAM BRIDGE

KAMEHAMEHA HIGHWAY

HONOLULU COUNTY, HAWAII

INDE□ TO BRIDGE DRA□INGS

AS-BUILT DRAWINGS

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	27 of 50	NOVEMBER 2018	RG3084-A

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S8.2

GENERAL:

A. Design standards: AASHTO LRFD Bridge Design Specification, 7th Edition, 2014 as amended by State of Hawaii Department of Transportation Highways Division Design Criteria for Bridges and Structures, August 8, 2014.
B. The Contractor shall compare all the contract documents with each other and report in writing to the Engineer all inconsistencies and omissions.
C. The contractor shall take field measurements and verify field conditions and shall compare such field measurements and conditions with the drawings. Report in writing to the Engineer all inconsistencies and omissions.
D. The contractor shall be responsible for coordinating the work of all trades.
E. The contractor shall be responsible for means and methods of construction, workmanship and job safety.
F. The contractor shall provide temporary shoring and bracing as required for stability of structural members and systems.
G. Construction loading shall not exceed design live load unless special shoring is provided. Permitted construction loads shall be properly reduced in areas where the structure has not attained full design strength.
H. The contractor shall be responsible for protection of the adjacent properties, structures, streets and utilities during the construction period. Any damaged or deteriorated property shall be restored to the condition prior to the beginning of work or better at no cost to the state.
I. Details noted as typical on the structural drawings shall apply in all conditions unless specifically shown or noted otherwise.

DESIGN CRITERIA:

A. Live loads
   1. Vehicular: HL-93
   2. Bridge railing: in accordance with AASHTO TL-3
B. Lateral loads
   1. Seismic
      a. Spectral response acceleration coefficients
         i) Short period, s_s : 0.366g
         ii) 1-sec period, s_1: 0.100g
      b. Site Class: E
      c. Seismic Zone: 3
C. Soils
   1. Strength limit state bearing capacity
      a. Approach slabs: 4,000 psf
      b. Bypass bridge abutments: 3,600 psf
   2. Earth pressure
      a. Active (level backfill)
         i) Unrestrained: 53 pcf
         ii) Restrained: 74 pcf
      b. Passive:
         i) Strength limit state: 221 pcf
         ii) Extreme limit state: 442 pcf
C. Future wearing surface (curb to curb): 25 psf
D. Future utility line each side of bridge: 150 plf

FOUNDATION:

A. Foundation design is based on the Geotechnical Exploration and Evaluation Report, dated August 2019.
B. Contractor shall provide de-watering of excavated areas, as required.
C. Footings shall bear on undisturbed in-situ firm soils bottom of footings shall be compacted to provide a relatively firm and smooth bearing surface prior to placement of reinforcing steel and concrete. If soft and/or loose materials are encountered at the bottom of footing excavations, they shall be over-excavated to expose the underlying firm materials. The over-excavated area shall be backfilled with select granular material compacted to a minimum of 95% relative compaction or the footing bottom may be extended down to the underlying competent material. Contractor may substitute flowable concrete or the granular material upon approval from the Engineer.
D. Excavations for footings shall be approved by the Geotechnical Engineer of Record prior to placement of concrete and reinforcing.
E. Engineered fill and backfill shall be in accordance with FP-14 Specifcations and associated SCR's.
F. Fill should be moisture conditioned to within two percent of the optimum moisture content and placed in horizontal lifts not to exceed six inches. Fill shall be compacted to minimum 95%relative density as measured by AASHTO T180.

CONCRETE:

A. Concrete construction shall conform to the FP-14 Specifications and associated SCR's.
B. Concrete shall be normal weight hard rock concrete and shall have the following minimum 28 day compressive strength or comply with class of concrete compressive strength listed in the FP-14 Specifications:

1. Pre-stressed piles	6000 psi
2. Pre-stressed planks	8000 psi
3. Abutment footings and pile caps	Class A
4. Slab topping, approach slabs, and railings	Class A
5. Abutment walls and wing walls	Class A
6. All other concrete	Class A

C. Concrete delivery tickets shall record all free water in the mix at batching plant, added for consistency by driver, and any additional request by contractor up to the maximum amount allowed by the mix design.
D. All inserts, anchor bolts, plates, and other items to be cast in the concrete shall be hot-dipped galvanized according to ASTM A153 unless otherwise noted.
E. Reinforcing bars, anchor bolts, inserts, and other items to be cast in the concrete shall be secured in position prior to placement of concrete.
F. Conduits, pipes, and sleeves passing through a slab or footing that do not conform to typical details shall be located and the proposed construction detail submitted to the Engineer for approval.
G. Conduits, pipes, and sleeves embedded within a slab or wall (other than those merely passing through) shall be:
   1. No larger in outside dimensions than one third the overall slab or wall thickness in which they are embedded.
   2. Placed in the middle one third of slab or wall thickness
   3. Spaced no closer than three diameters or widths on center.
H. Conduits, pipes, and sleeves shall not be placed through or embedded in a beam unless specifically detailed.
I. The contractor shall locate construction joints not shown on the drawings, so as not to impair the strength of the structure and to minimize shrinkage stresses. Submit proposed locations of construction joints to the Engineer for approval.
J. Non-shrink grout shall be a premixed non-metallic formula, shall be capable of developing a minimum compressive strength of 5,000 psi in 3 days and 8,900 psi in 28 days, and shall contain at least 10 grams of migrating amine carboxylate corrosion inhibitor when grout is in contact with steel appurtenances. Precast plank shear keys will not require corrosion inhibitor.
K. Joint filler shall conform to FP-14 section 712.01(b).
L. A shrinkage reducing admixture conforming to SCR section 711.03(b) shall be included in the concrete mix for all cast-in-place concrete.
M. A corrosion inhibiting admixture conforming to SCR section 711.03(a) shall be included in the concrete mix for all concrete.
N. Reinforcing fibers conforming to SCR section 725.17(b) shall be included in the concrete mix for members as specified in SCR section 552.03.

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SIGNATURE — April 30, 2022 EXPIRATION DATE OF THE LICENSE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

KAWELA STREAM BRIDGE

KAMEHAMEHA HIGHWAY

HONOLULU COUNTY, HAWAII

STRUCTURAL GENERAL NOTES

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	28 of 50	NOVEMBER 2018	RG3084-B

AS-BUILT DRAWINGS

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S8.3

REINFORCING STEEL:

A. Reinforcing steel shall be deformed bars conforming to AASHTO M31, Grade 60, unless otherwise noted.
B. Low alloy steel deformed bars shall conform to FP-14 section 709.01(i), Grade 60, unless otherwise noted.
C. Clear concrete cover for reinforcing bars shall be as follows, unless otherwise noted:
  1. Footings, slabs, etc. cast against earth: 3"
  2. Footings, walls, grade beams, etc. formed and exposed to earth or weather: 2"
  3. Bridge deck top reinforcement: 2-1/2"
  4. Other: 2"
D. Reinforcing steel shall be spliced where indicated on plans. Provide lap splice length per typical details and schedule, unless otherwise noted.
E. Mechanical splice connectors shall develop in tension 125 percent of the specified minimum yield strength of reinforcing bars.
F. Provide standard hooks conforming to ACI SP-66.
G. Fabricate reinforcing bars according to ACI SP-66, ACI Detailing Manual.
H. Reinforcing steel shall be placed and secured in conformance with crsi manual of standard practice with placement tolerances per ACI standard 117.

STRUCTURAL STEEL:

A. Fabrication and erection of structural steel shall conform to the american institute of steel construction manual of steel construction, thirteenth edition.
B. Structural steel shall conform to ASTM A36 unless otherwise noted.
C. Steel wide flange sections shall conform to ASTM A992.
D. Plates and bars shall conform to ASTM A36.
E. Welds and welding procedures shall conform to the structural welding code AWS D1.1 of the american welding society.
F. Welding shall be performed by welders prequalified for welding procedures to be used.
G. Welding electrodes shall be E70xx for carbon steel.
H. High-strength bolts shall conform to ASTM A325, type N. Installation shall be assured by any of the following methods:
  1. Turn of nut method
  2. Direct tension indicator
  3. Calibrated wrench
  4. Alternative design bolt
I. All anchor bolts, plates, and other items to be cast in concrete shall be hot-dip galvanized according to ASTM A153 unless otherwise noted.
J. Carbon steel bolts shall conform to ASTM A307, grade a unless otherwise noted, and shall be hot-dip galvanized according to ASTM A153.
K. All steel shall be hot-dip galvanized after fabrication according to ASTM A123.
L. Any damaged galvanized surface shall be repaired as follows:
  1. prepare surface per sspc-sp1, solvent cleaning.
  2. apply two coats of cold applied galvanizing compound containing 95% metallic zinc content by weight in dry film and 52% solids content by volume.
  3. application rate shall be 1.5 mils dry film thickness per coat.

LOAD RATING

	Rating Factor	Distribution Factor	Load Effect	Controlling Member
HL-93 Inventory	2.05	0.325	Positive Moment	Interior Girder
HL-93 Operating	2.66	0.325	Positive Moment	Interior Girder

ESTIMATE

Item No.	Description	Quantity	Unit	Notes
20304-1000	Removal of structures and obstructions	LPSM	LPSM	-
20435-2000	Backfill, Granular (beneath approach slabs)	25	CUYD	(1)
20801-0000	Structure excavation	214	CUYD	-
20803-0000	Structure backfill	18	CUYD	-
55101-0300	Precast prestressed concrete pile	864	LNFT	-
55201-1500	Structure Concrete	281	CUYD	(2)
55302-3500	Precast, prestressed concrete slab, 14" solid	460	LNFT	(3)
55401-1000	Reinforcing steel	94400	LB	-
55601-0500	Bridge railing, concrete	164	LNFT	-
61707-0000	Structure Transition Railing	100	LNFT	(4)

ESTIMATE NOTES:

(1) Includes cost of drain pipes, geocomposite drains, aggregate base course backfill and aggregate subbase course
(2) Includes cost of bridge deck, approach slabs
(3) Includes cost of concrete, reinforcing steel, prestressing steel, inserts, plates, lifting devices, and other materials required for the manufacture and erection of the planks
(4) Includes cost of furnishing and installing posts, blocks, thrie and W-beam rail elements, anchor plates, and installation hardware

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CENTRAL FEDERAL LANDS HIGHWAY DIVISION

KAWELA STREAM BRIDGE

KAMEHAMEHA HIGHWAY

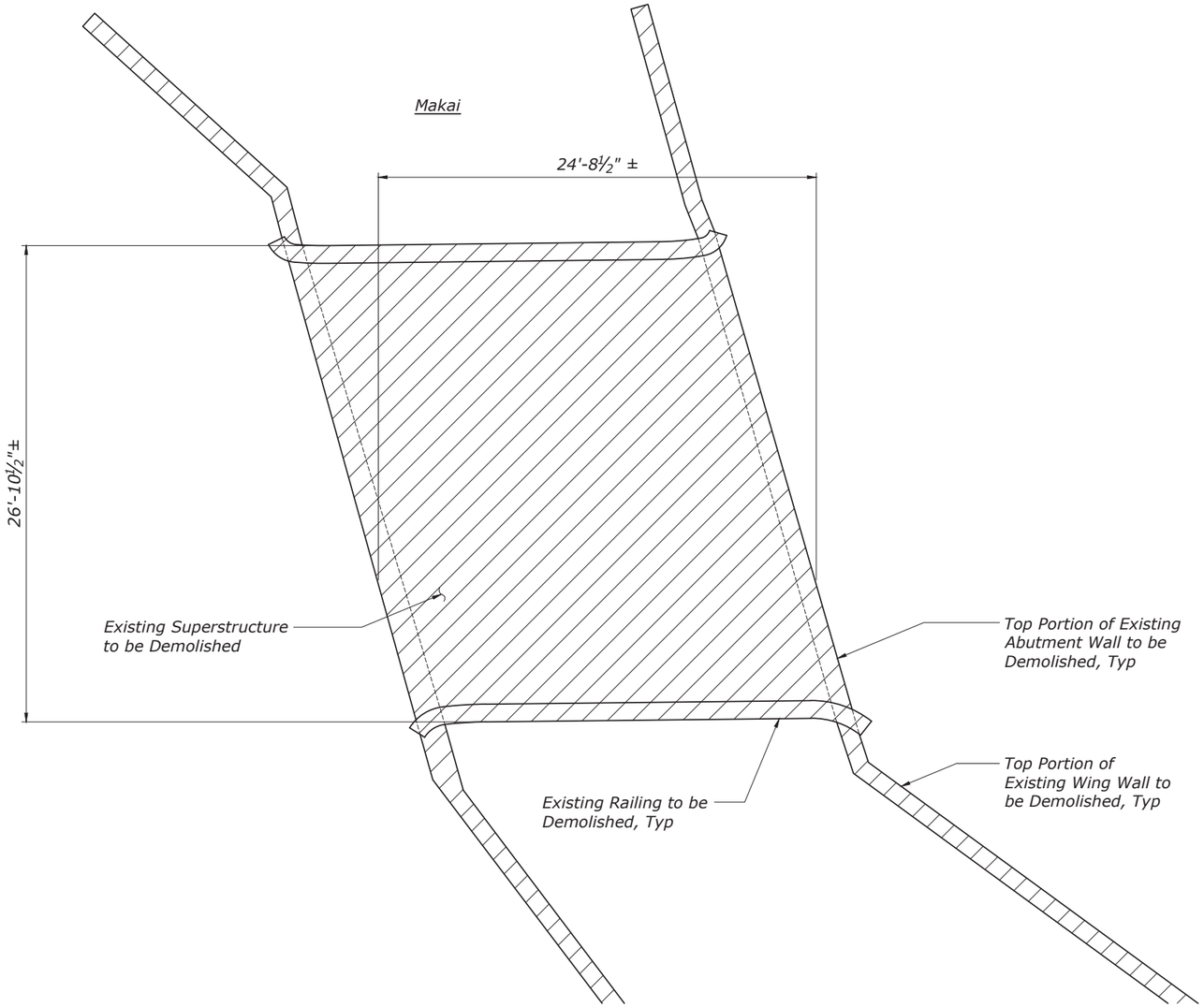
HONOLULU COUNTY, HAWAII

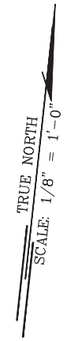
□UANTIT□ SC□EDULE

AS-BUILT DRAWINGS

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	29 of 50	NOVEMBER 2018	RG3084-C

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S8.4





BRIDGE FOUNDATION PLAN
Scale: ⅛" = 1'-0"

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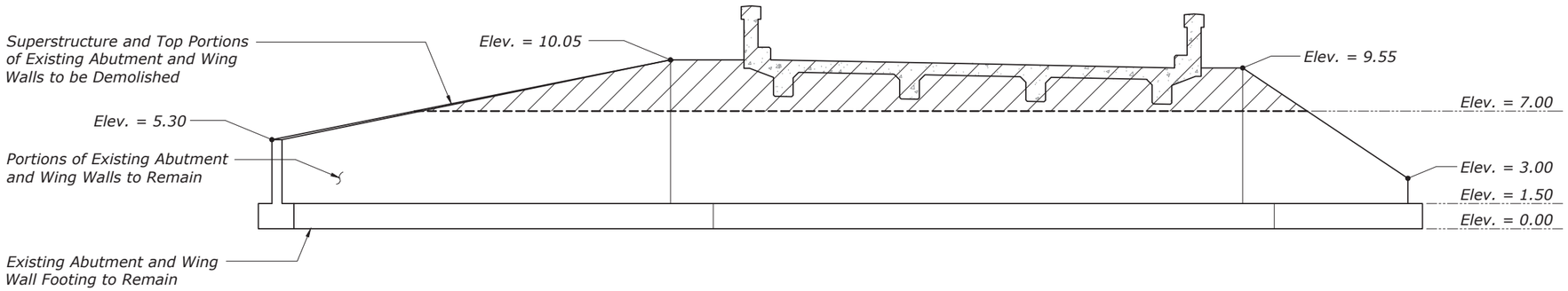
HONOLULU COUNTY, HAWAII

EXISTING BRIDGE DEMOLITION PLAN

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	30 of 50	NOVEMBER 2018	RG3084-D

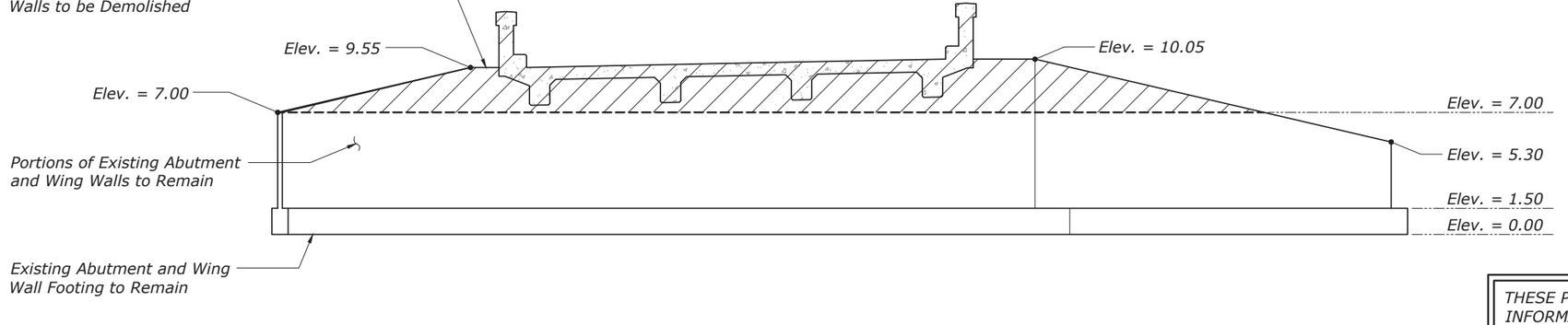
AS-BUILT DRAWINGS

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S8.5



EXISTING BRIDGE WEST ABUTMENT FRONT ELEVATION

Scale: ⅛" = 1'-0"



EXISTING BRIDGE EAST ABUTMENT FRONT ELEVATION

Scale: ⅛" = 1'-0"

NOTES:

1. *The orientations of the views are perpendicular to the baseline of the highway.*
2. *Temporary shoring shall be used as needed to maintain the integrity and stability of the existing abutment walls until the bridge concrete deck topping has been placed.*

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HONOLULU COUNTY, HAWAII

EXISTING BRIDGE ABUTMENT ELEVATIONS

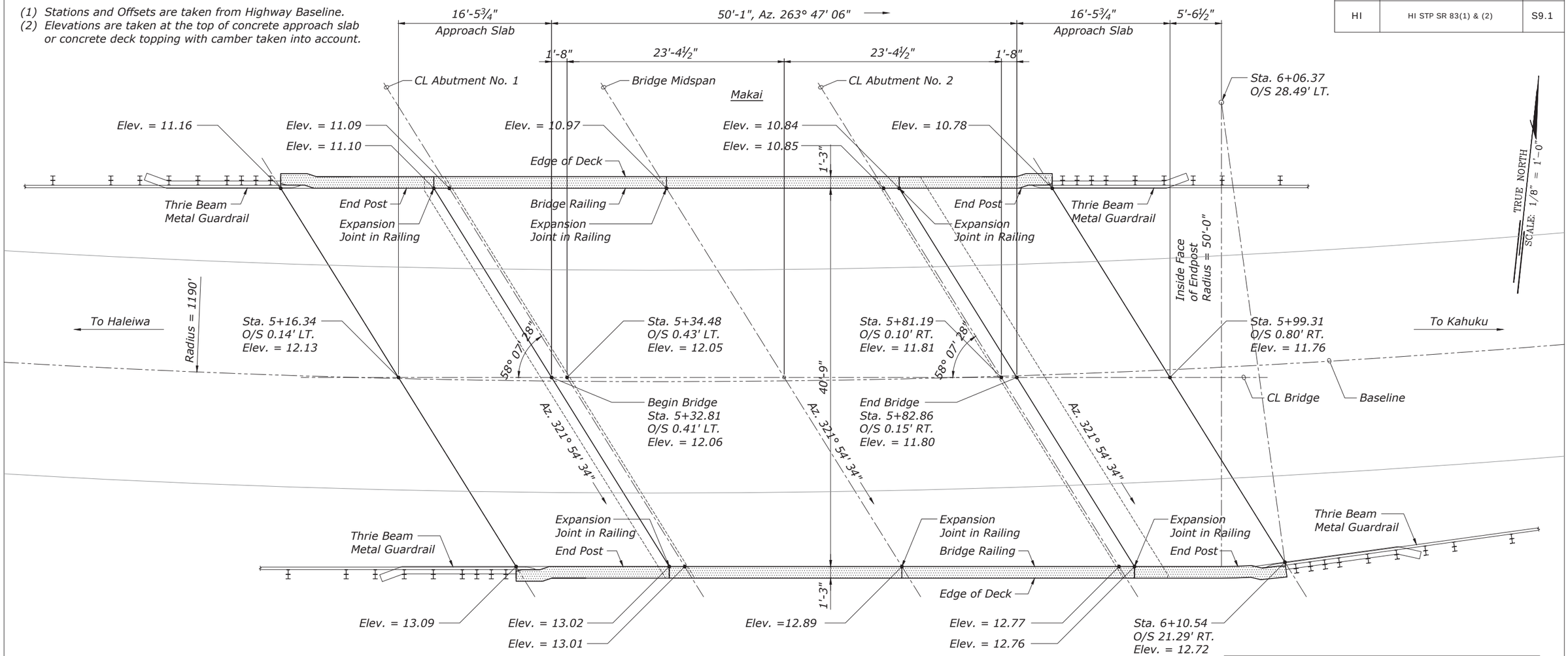
NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	31 of 50	NOVEMBER 2018	RG3084-E

AS-BUILT DRAWINGS

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S9.1

NOTES:

(1) *Stations and Offsets are taken from Highway Baseline.*
(2) *Elevations are taken at the top of concrete approach slab or concrete deck topping with camber taken into account.*



BRIDGE LAYOUT PLAN

Scale: 3/32" = 1'-0"

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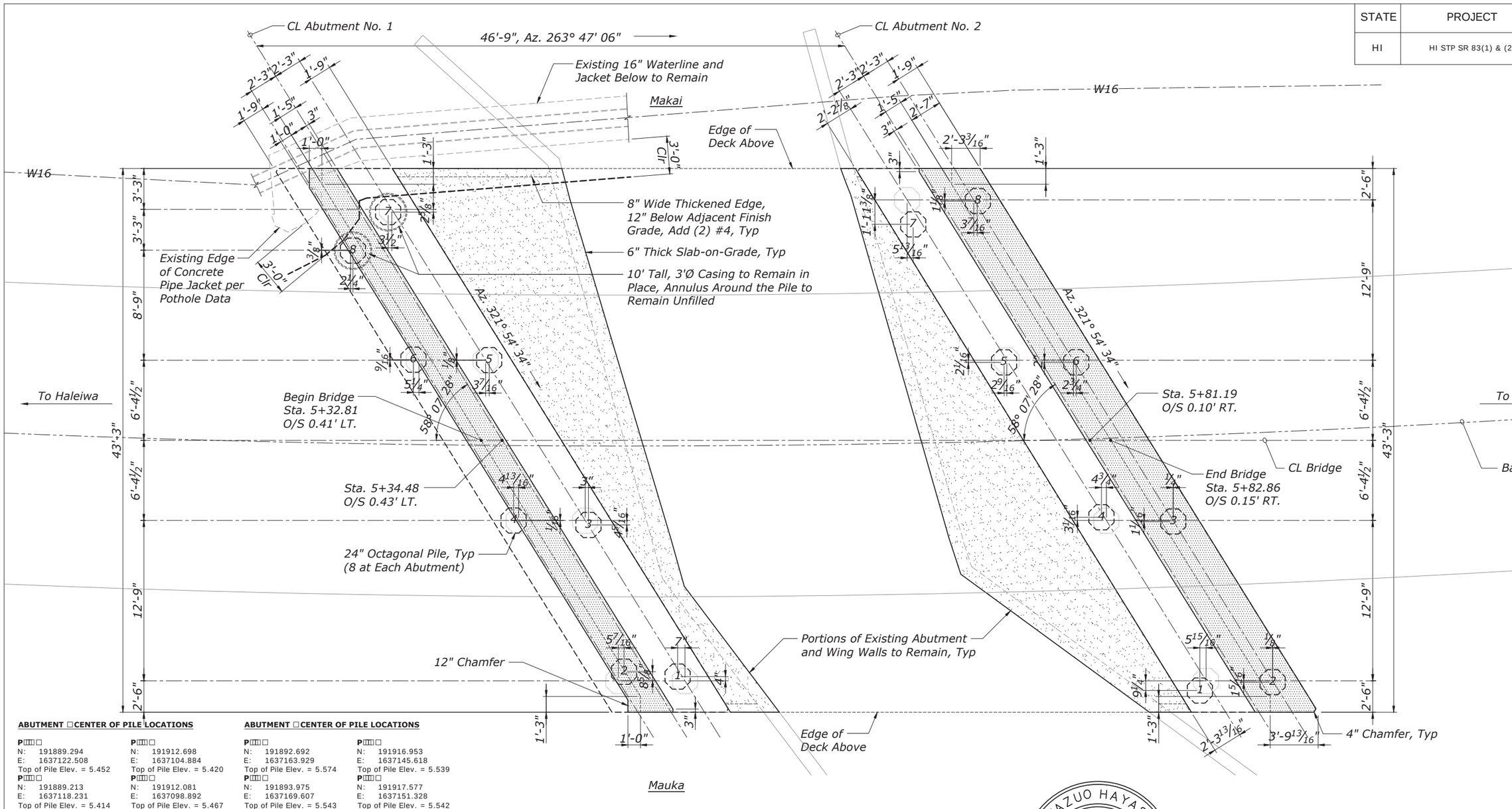
HONOLULU COUNTY, HAWAII

BRIDGE LAYOUT PLAN

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	32 of 50	NOVEMBER 2018	RG3084-F

AS-BUILT DRAWINGS

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S9.2



ABUTMENT □CENTER OF PILE LOCATIONS

P□□□□
N: 191889.294
E: 1637122.508
Top of Pile Elev. = 5.452

P□□□□
N: 191889.213
E: 1637118.231
Top of Pile Elev. = 5.414

P□□□□
N: 191900.565
E: 1637114.146
Top of Pile Elev. = 5.476

P□□□□
N: 191900.217
E: 1637108.198
Top of Pile Elev. = 5.400

P□□□□
N: 191912.698
E: 1637104.884
Top of Pile Elev. = 5.420

P□□□□
N: 191912.081
E: 1637098.892
Top of Pile Elev. = 5.467

P□□□□
N: 191923.529
E: 1637095.618
Top of Pile Elev. = 5.339

P□□□□
N: 191920.183
E: 1637093.167
Top of Pile Elev. = 5.426

ABUTMENT □CENTER OF PILE LOCATIONS

P□□□□
N: 191892.692
E: 1637163.929
Top of Pile Elev. = 5.574

P□□□□
N: 191893.975
E: 1637169.607
Top of Pile Elev. = 5.543

P□□□□
N: 191905.820
E: 1637160.373
Top of Pile Elev. = 5.545

P□□□□
N: 191905.541
E: 1637154.656
Top of Pile Elev. = 5.544

P□□□□
N: 191916.953
E: 1637145.618
Top of Pile Elev. = 5.539

P□□□□
N: 191917.577
E: 1637151.328
Top of Pile Elev. = 5.542

P□□□□
N: 191927.080
E: 1637137.244
Top of Pile Elev. = 5.368

P□□□□
N: 191929.481
E: 1637142.161
Top of Pile Elev. = 5.478

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BRIDGE FOUNDATION PLAN

Scale: ⅛" = 1'-0"

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KAWELA STREAM BRIDGE

KAMEHAMEHA HIGHWAY

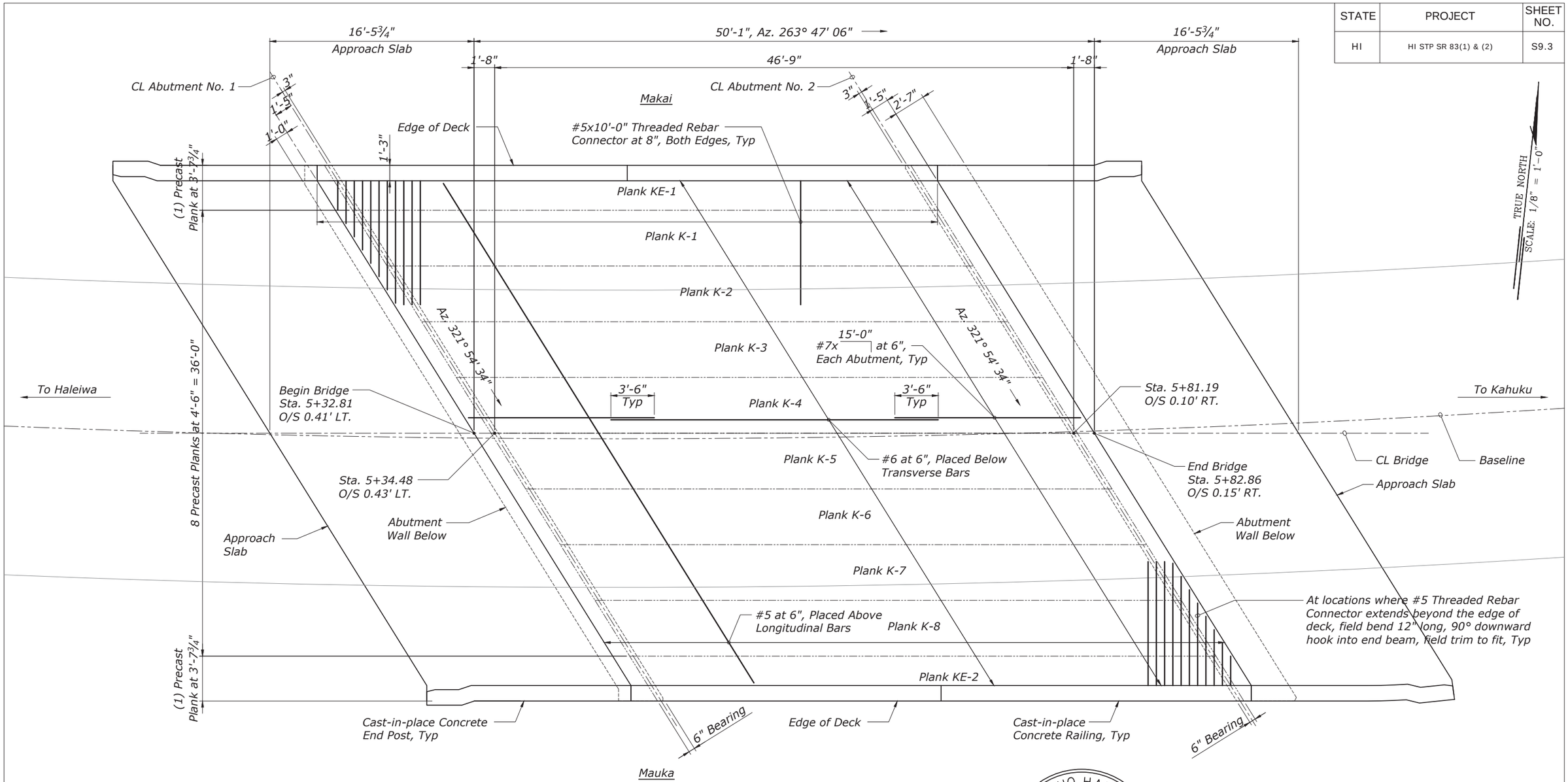
HONOLULU COUNTY, HAWAII

BRIDGE FOUNDATION PLAN

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	33 of 50	NOVEMBER 2018	RG3084-G

AS-BUILT DRAWINGS

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S9.3



DEC□ FRAMING PLAN

Scale: ⅛" = 1'-0"

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HONOLULU COUNTY, HAWAII

BRIDGE DEC□ FRAMING PLAN

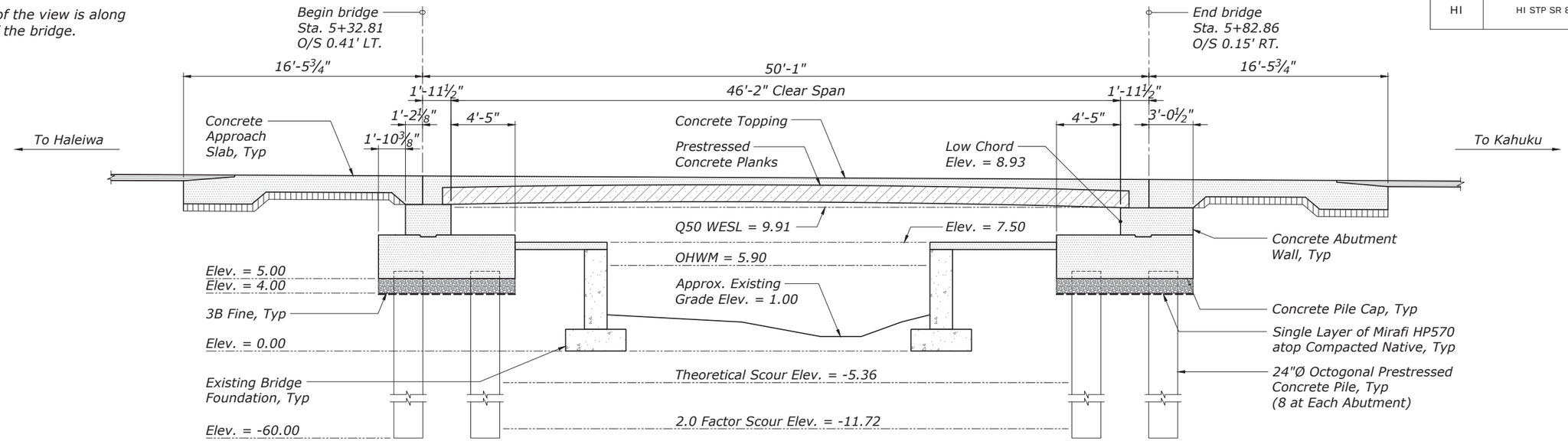
NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	34 of 50	NOVEMBER 2018	RG3084-H

AS-BUILT DRAWINGS

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S10.1

NOTE:

The orientation of the view is along the centerline of the bridge.



BRIDGE LONGITUDINAL SECTION

Scale: ⅛" = 1'-0"

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HONOLULU COUNTY, HAWAII

LONGITUDINAL SECTION

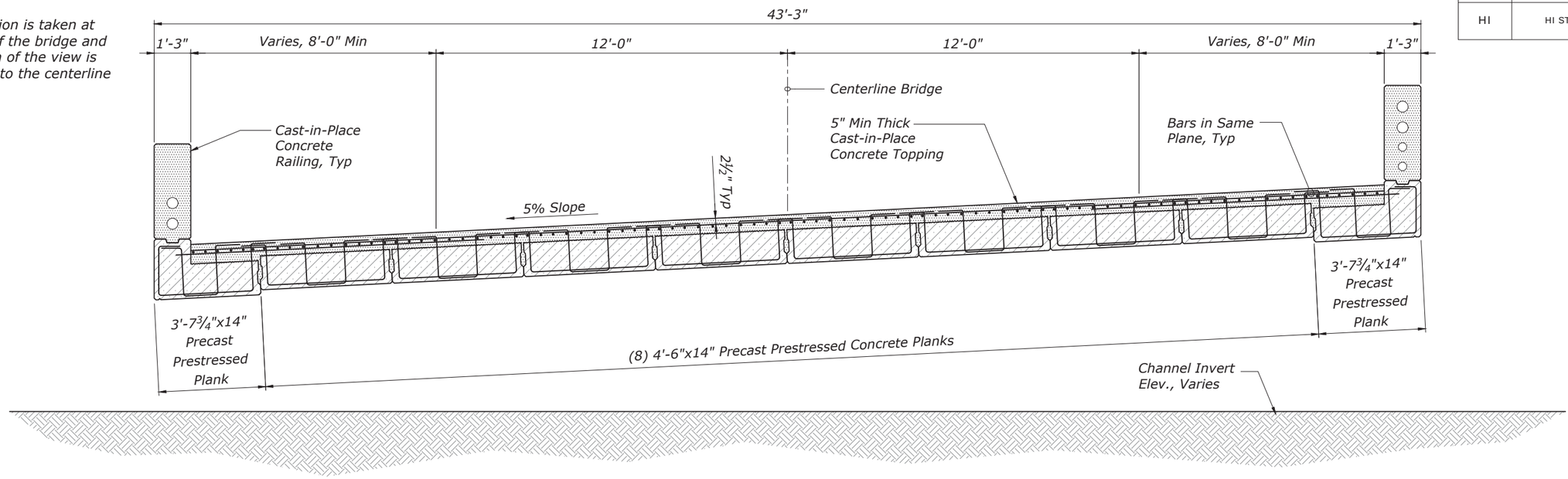
NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	35 of 50	NOVEMBER 2018	RG3084-I

AS-BUILT DRAWINGS

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S10.2

NOTE:

The cross section is taken at the midspan of the bridge and the oriantation of the view is perpendicular to the centerline of the bridge.



TYPICAL BRIDGE CROSS SECTION

Scale: ¼" = 1'-0"

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KAWELA STREAM BRIDGE

KAMEHAMEHA HIGHWAY

HONOLULU COUNTY, HAWAII

TYPICAL CROSS SECTION

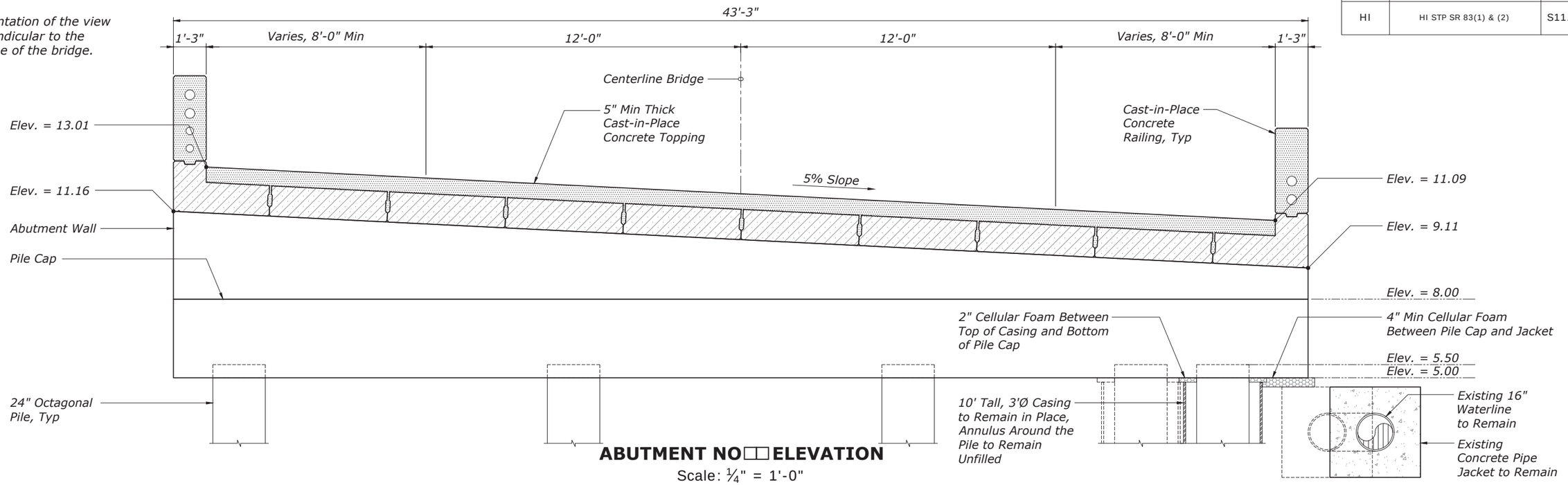
NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	36 of 50	NOVEMBER 2018	RG3084-J

AS-BUILT DRAWINGS

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S11.1

NOTE:

The orientation of the view is perpendicular to the centerline of the bridge.



ABUTMENT NO□□ ELEVATION

Scale: ¼" = 1'-0"

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KAMEHAMEHA HIGHWAY

HONOLULU COUNTY, HAWAII

ABUTMENT NO□□ ELEVATION

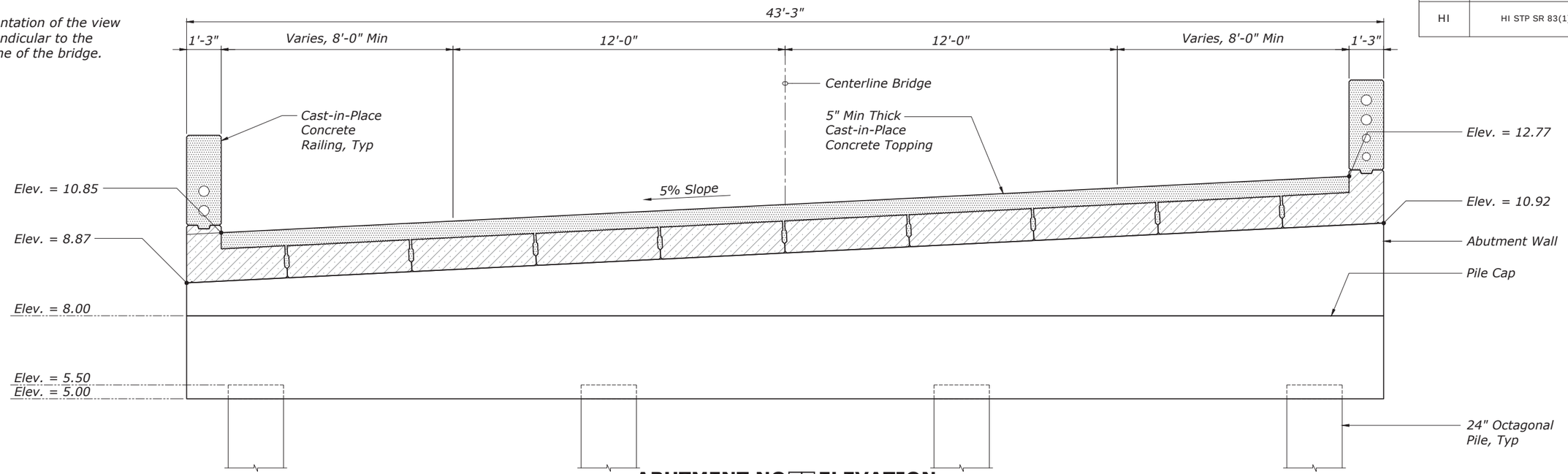
NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	37 of 50	NOVEMBER 2018	RG3084-K

AS-BUILT DRAWINGS

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S11.2

NOTE:

The orientation of the view is perpendicular to the centerline of the bridge.



ABUTMENT NO□□ ELEVATION

Scale: ¼" = 1'-0"

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KEN KAZUO HAYASHIDA
LICENSED PROFESSIONAL ENGINEER
No. 6818–S
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

SIGNATURE — April 30, 2022 EXPIRATION DATE OF THE LICENSE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

KAWELA STREAM BRIDGE

KAMEHAMEHA HIGHWAY

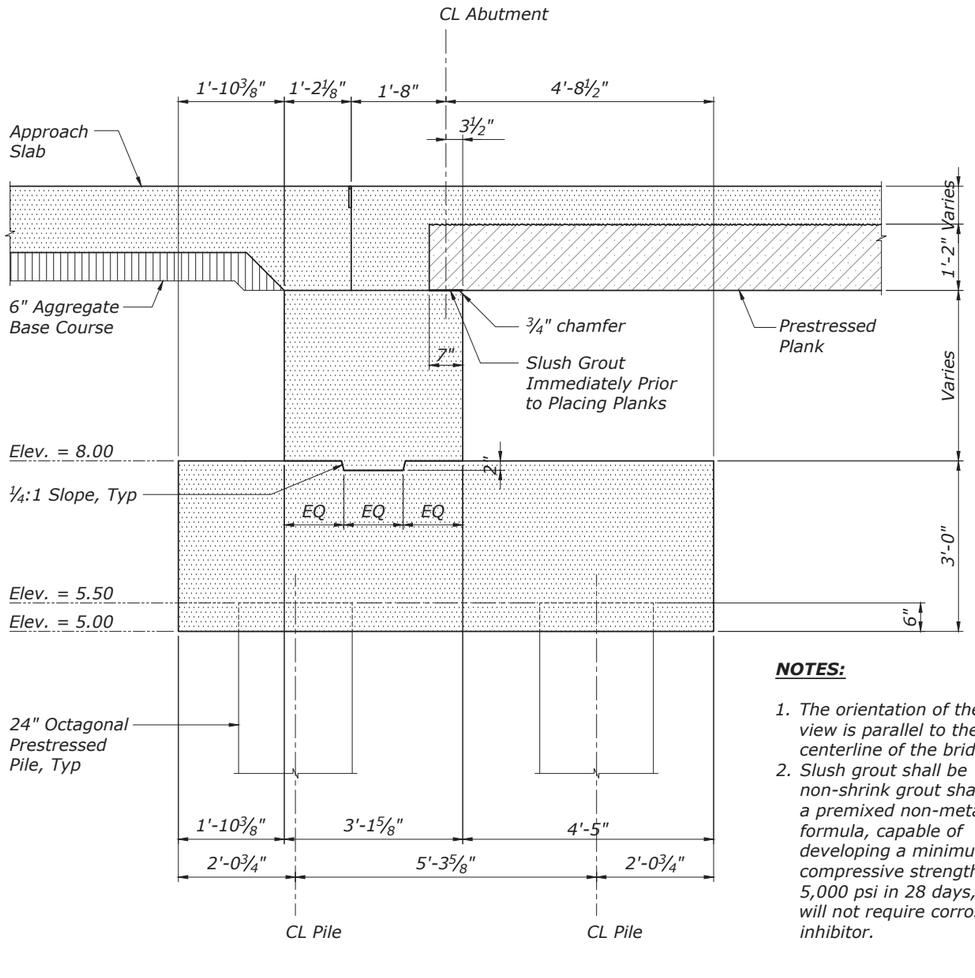
HONOLULU COUNTY, HAWAII

ABUTMENT NO□□ ELEVATION

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	38 of 50	NOVEMBER 2018	RG3084-L

AS-BUILT DRAWINGS

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S11.3

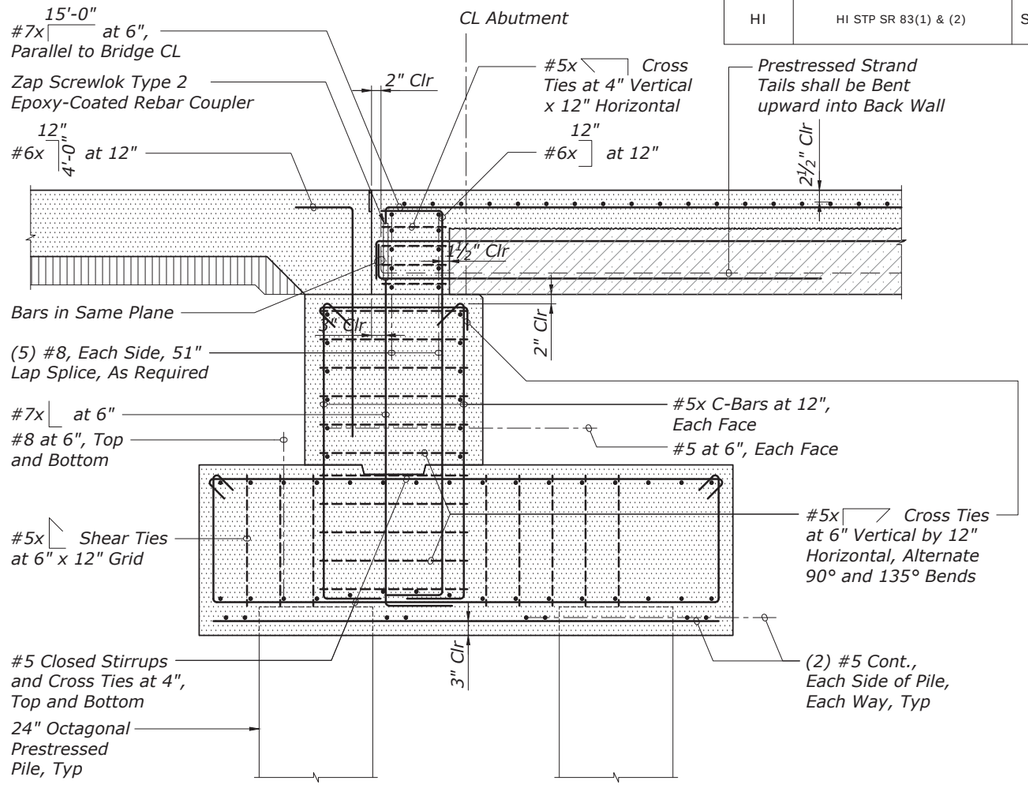


NOTES:

1. *The orientation of the view is parallel to the centerline of the bridge.*
2. *Slush grout shall be non-shrink grout shall be a premixed non-metallic formula, capable of developing a minimum compressive strength of 5,000 psi in 28 days, and will not require corrosion inhibitor.*

ABUTMENT NO□□ SECTION S□O□ING DIMENSIONS

Scale: 3/8" = 1'-0"



NOTE:

The orientation of the view is parallel to the centerline of the bridge.

ABUTMENT NO□□ SECTION S□O□ING REINFORCING

Scale: 3/8" = 1'-0"

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CENTRAL FEDERAL LANDS HIGHWAY DIVISION

KAWELA STREAM BRIDGE

KAMEHAMEHA HIGHWAY

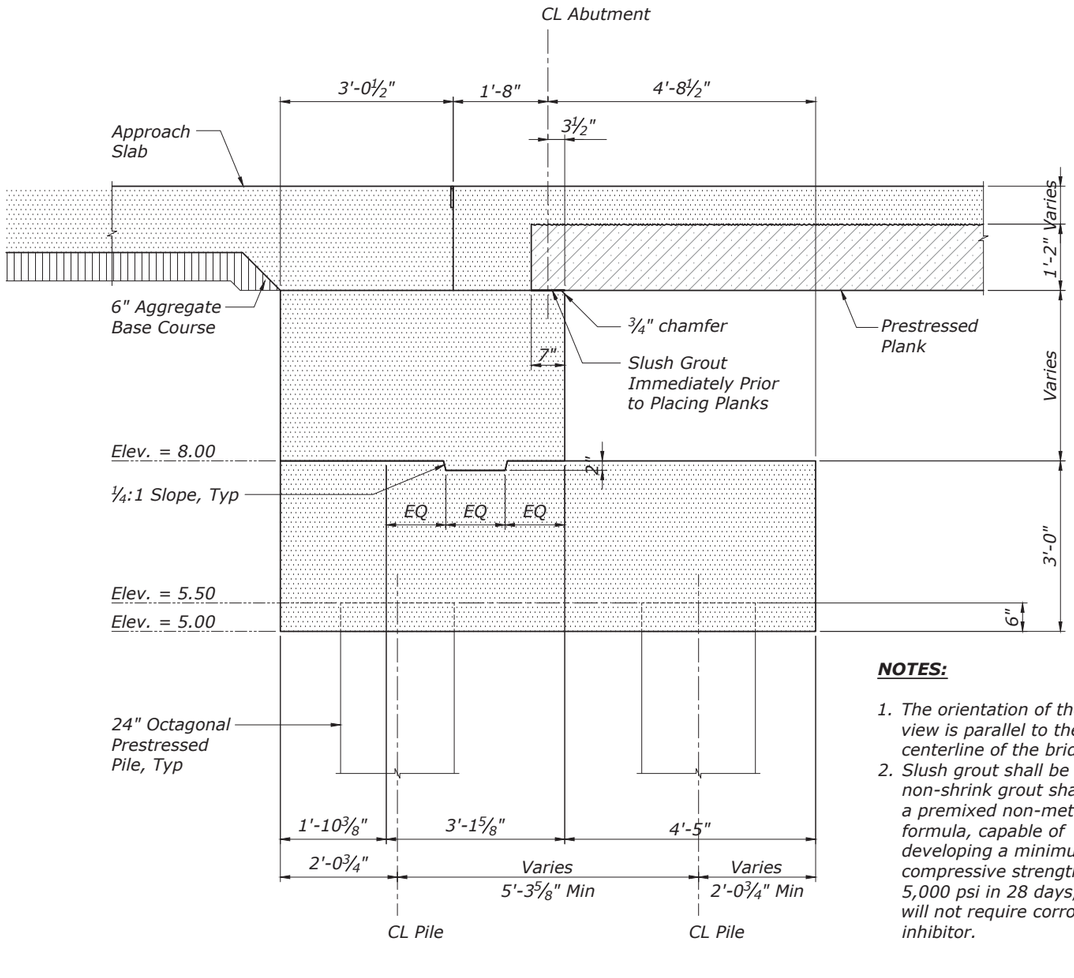
HONOLULU COUNTY, HAWAII

ABUTMENT NO□□ SECTIONS

AS-BUILT DRAWINGS

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	39 of 50	NOVEMBER 2018	RG3084-M

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S11.4

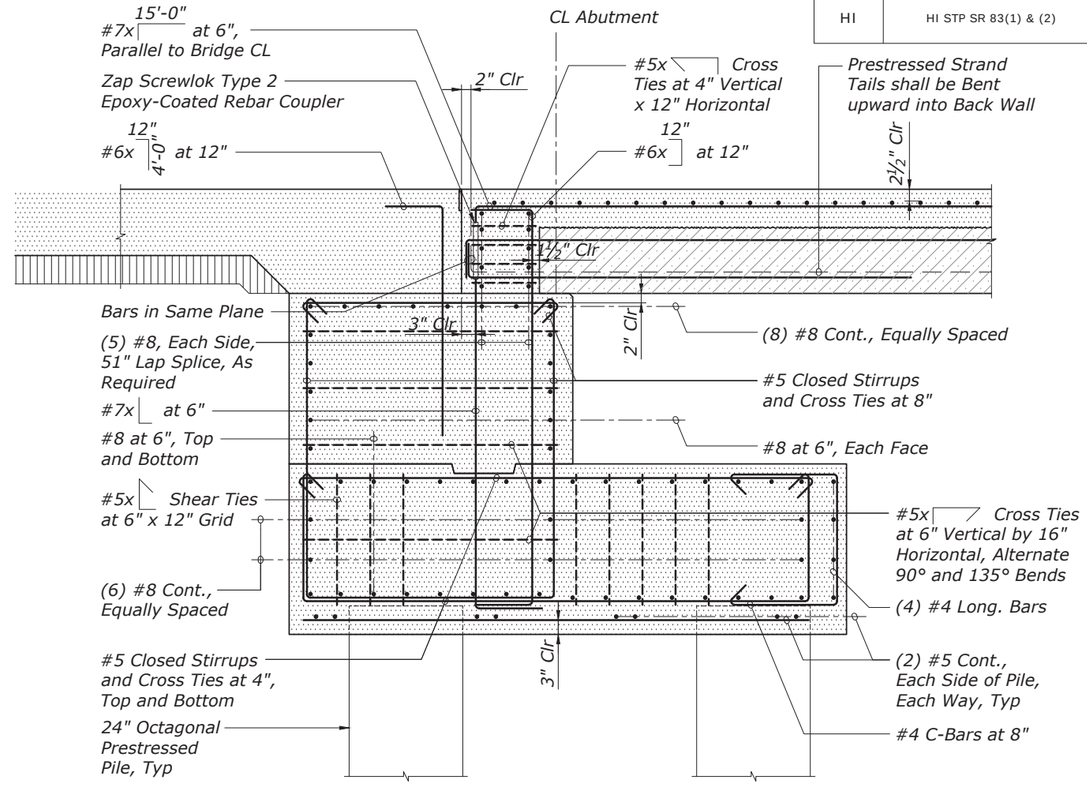


NOTES:

1. *The orientation of the view is parallel to the centerline of the bridge.*
2. *Slush grout shall be non-shrink grout shall be a premixed non-metallic formula, capable of developing a minimum compressive strength of 5,000 psi in 28 days, and will not require corrosion inhibitor.*

ABUTMENT NO□□ SECTION S□O□ING DIMENSIONS

Scale: ⅜" = 1'-0"



NOTE:

The orientation of the view is parallel to the centerline of the bridge.

ABUTMENT NO□□ SECTION S□O□ING REINFORCING

Scale: ⅜" = 1'-0"

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CENTRAL FEDERAL LANDS HIGHWAY DIVISION

KAWELA STREAM BRIDGE

KAMEHAMEHA HIGHWAY

HONOLULU COUNTY, HAWAII

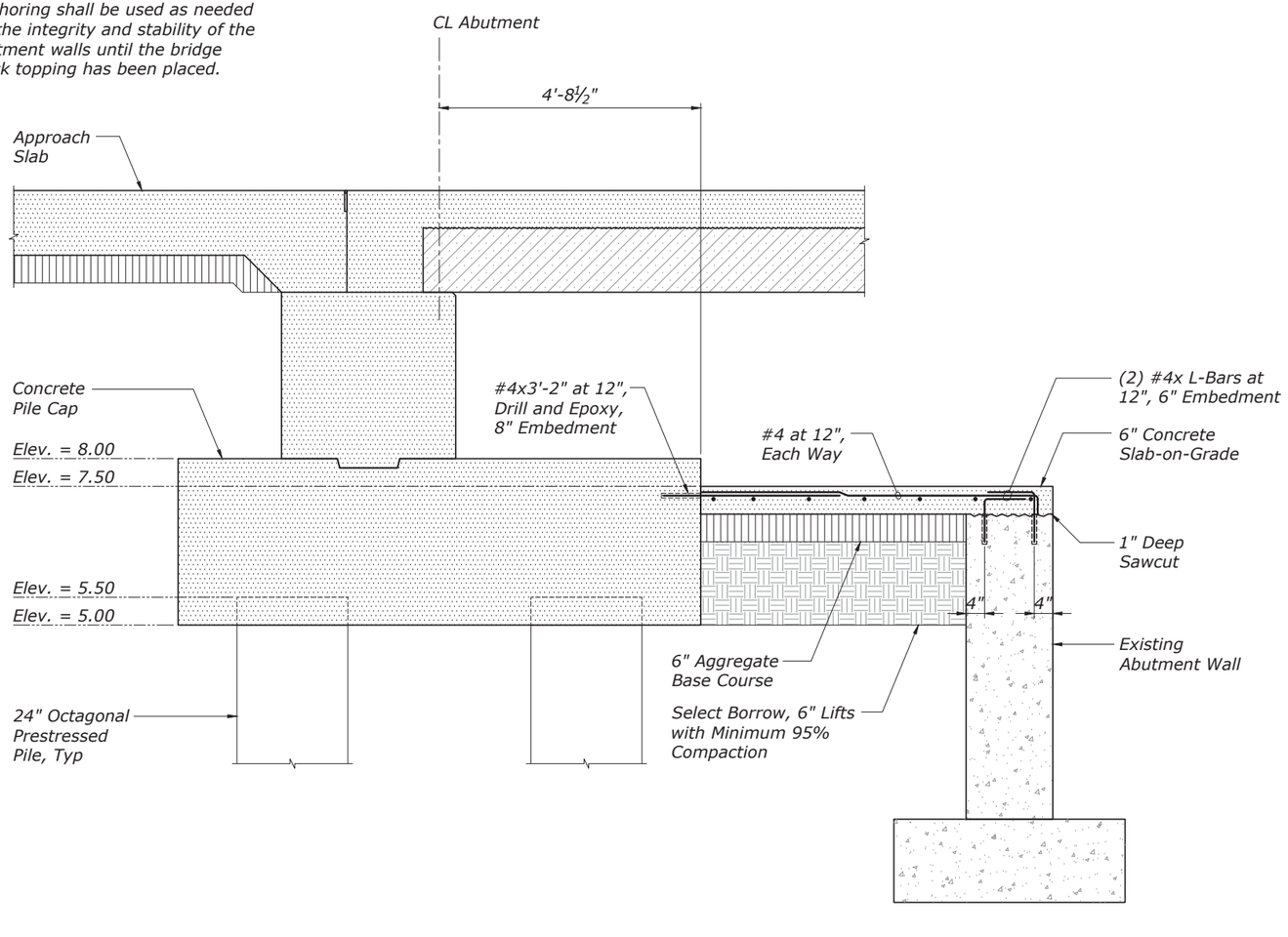
ABUTMENT NO□□ SECTIONS

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	40 of 50	NOVEMBER 2018	RG3084-N

AS-BUILT DRAWINGS

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S11.5

Note:
Temporary shoring shall be used as needed to maintain the integrity and stability of the existing abutment walls until the bridge concrete deck topping has been placed.



TYPICAL CONNECTING SLAB

Scale: ⅜" = 1'-0"

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CENTRAL FEDERAL LANDS HIGHWAY DIVISION

KAWELA STREAM BRIDGE

KAMEHAMEHA HIGHWAY

HONOLULU COUNTY, HAWAII

TYPICAL CONNECTING SLAB

AS-BUILT DRAWINGS

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	41 of 50	NOVEMBER 2018	RG3084-O

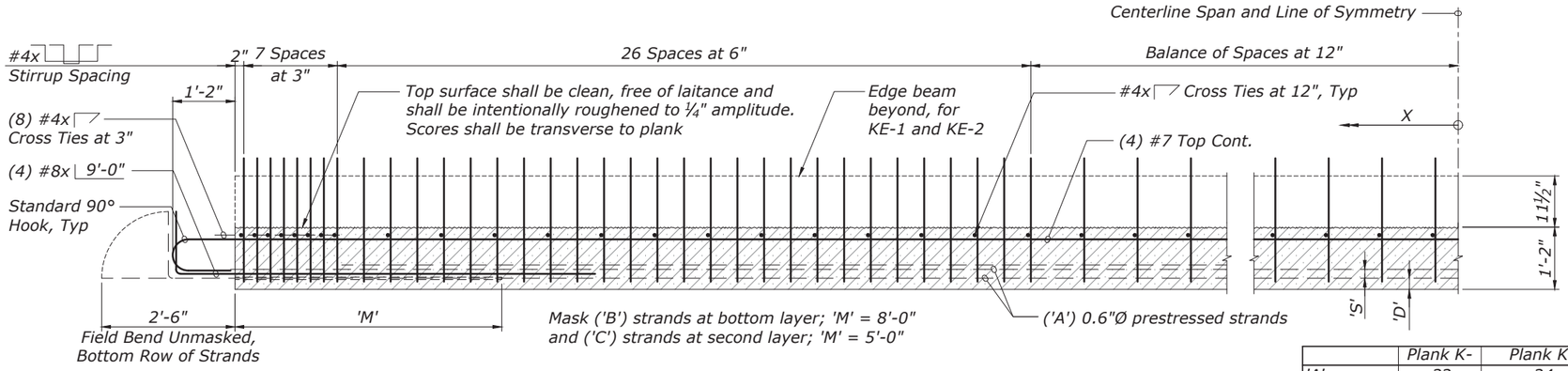
STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S12.1

Prestressed Plank Notes:

1. *Prestressed concrete 28 day strength f'c = 8,000 psi. prestressed concrete strength at time of release fci = 6,400 psi.*
2. *Prestressing strands shall be (7) wire 0.6"Ø low relaxation steel strands (Area = 0.217 in^2) conforming to ASTM A416 with an ultimate tensile strength of 270 ksi. Initial strand stress (immediately prior to release of prestress) = 0.75 f_{pu} = 202.5 ksi.*
3. *Non-prestressed reinforcing steel shall be deformed bars conforming to ASTM A615 or A706, Grade 60, unless noted otherwise.*
4. *Strand pattern shall be symmetrical about the longitudinal centerline of the plank.*
5. *Strand release sequence shall not induce any lateral deflection of the plank.*
6. *Contractor shall submit shop drawings indicating proposed strand pattern, releasing sequence, reinforcing details and hold down device details to the engineer prior to fabrication.*
7. *During curing, care shall be taken to avoid any lateral deflection to the plank due to improper orientation. steam curing may be used to accelerate strength gain.*
8. *Lifting devices shall be placed as close as possible to the centerline of bearings of the plank. details and locations of lifting devices shall be submitted to the engineer for approval. such approval does not relieve the contractor of his responsibilities if plank is damaged due to failure of the lifting device.*
9. *$P_{(e)}$ = effective prestress force after all losses (kips)*
10. *Plank stirrups shall be placed parallel to the bridge skew.*
11. *Top row of unmasked strands shall be cut flush with the face of plank.*

Notes:

1. *The plank lengths shown do not include changes in length increase due to elastic and time dependent shortening effects and longitudinal slope of the plank.*
2. *The unmasked strands shall have 2'-6" extension at both ends of each plank.*



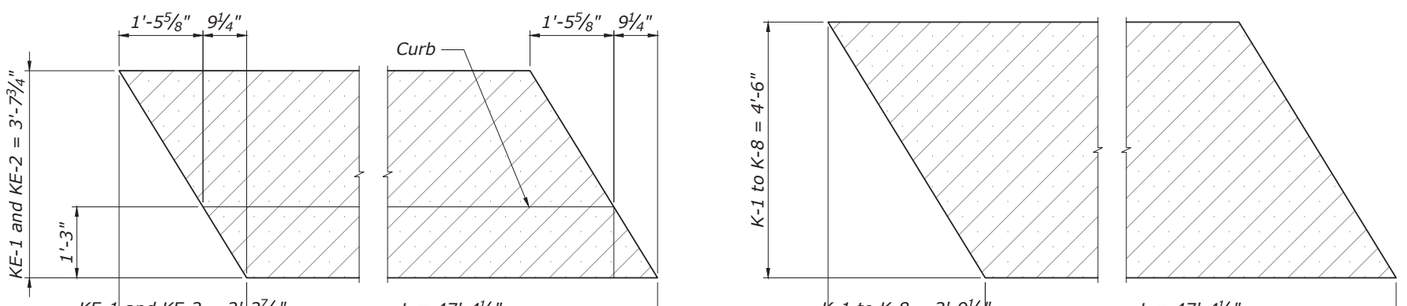
	Plank K-	Plank KE-
'A'	32	24
'B'	6	4
'C'	0	2
$P_{(e)}$ [kips]	1,144	880
C.G.S. [in]	3.25	4.25
'D' [in]	2.5	2.5
'S' [in]	2	3

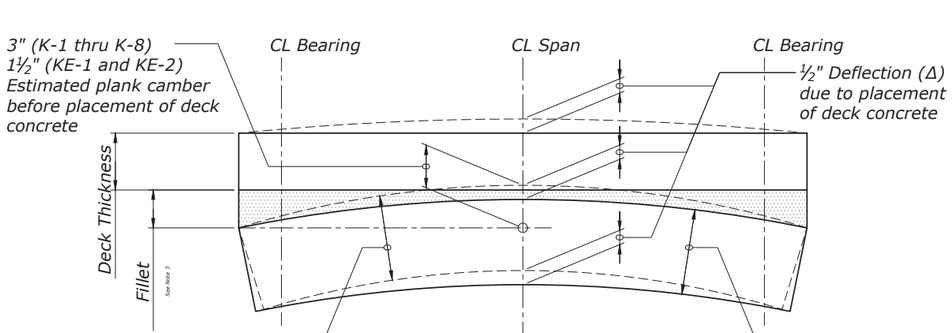
TYPICAL PRESTRESSED PLAN ELEVATION

Scale: ⅜" = 1'-0"

Required Actions:

1. *Measure slab camber prior to setting deck forms. If the actual camber exceeds the estimated slab camber (3" for interior planks and 1½" for exterior planks) by more than 1", the fillet will have to be increased by raising profile grade as directed by the owner.*
2. *Set the deck forms and camber the deck machine screed rails to offset the slab deflections (½") due to deck placement.*
3. *Bridge precast slab seat elevations were calculated using dead load deflections of the deck so that top of precast slab will be a minimum of 1" below bottom of deck at any point in the span, allowing for precast slab depth and slab camber tolerance.*





DECK FORM SETTING DIAGRAM

Not to Scale

Deflection Equation:

$\Delta = ½" - X^2(1092.8^{-1})$

Where:

Δ = Deflection, in inches, of slab at any point caused by the weight of deck
X = Distance, in feet, measured from midspan (See diagram)

Note:

Δ max = ½" at X = 0' (Midspan)
Δ min = 0" at X = 23'-4½" (CL Bearing)

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Note:
Reinforcing not shown for clarity.

TYPICAL PRESTRESSED PLAN PLAN

Scale: ⅜" = 1'-0"

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KAMEHAMEHA HIGHWAY

HONOLULU COUNTY, HAWAII

PRESTRESSED PLAN

AS-BUILT DRAWINGS

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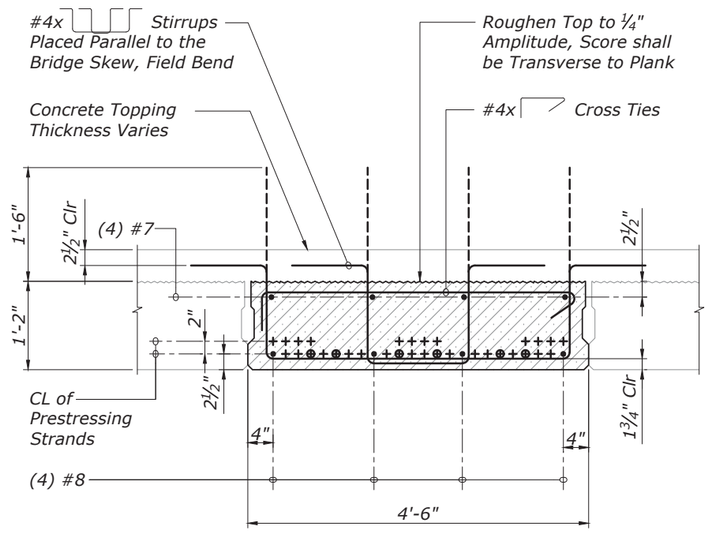
								BL & BC	CADD	MH		MH	42 of 50	NOVEMBER 2018	RG3084-P

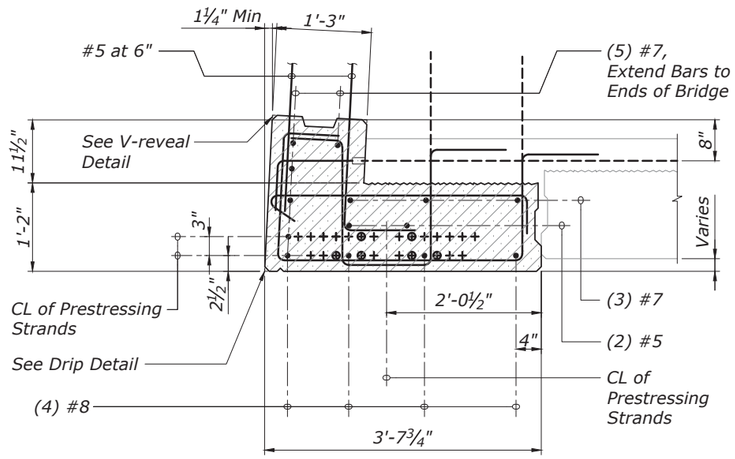
STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S12.2



Legend:
- \+ *0.6"Ø Strands*
- ⊕ *0.6"Ø Strands Masked at Each End*
- • *Deformed Rebar*

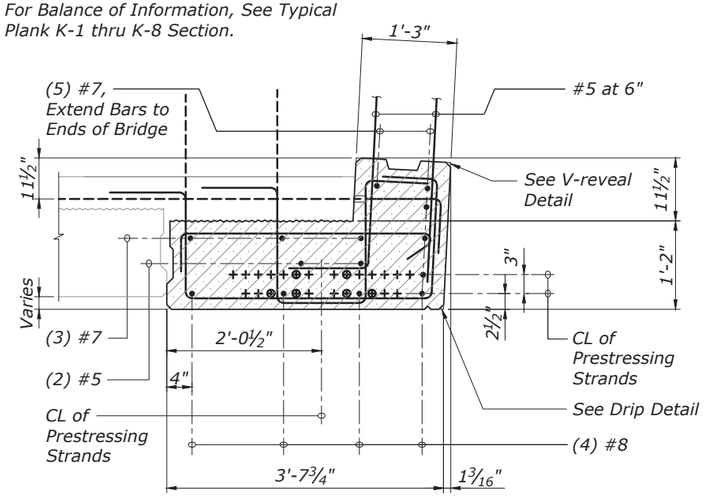
TYPICAL PLAN THRU SECTION
Scale: ½" = 1'-0"

Notes:
1. *Edge of Bridge and Railing Connections shall be at a 2.86° Incline from the Bottom of the Plank.*
2. *For Balance of Information, See Typical Plank K-1 thru K-8 Section.*



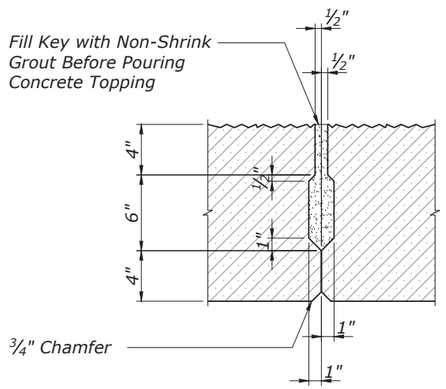
TYPICAL PLAN END SECTION
Scale: ½" = 1'-0"

Notes:
1. *Edge of Bridge and Railing Connections shall be at a 2.86° Incline from the Bottom of the Plank.*
2. *For Balance of Information, See Typical Plank K-1 thru K-8 Section.*

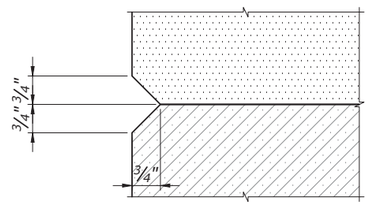


TYPICAL PLAN END SECTION
Scale: ½" = 1'-0"

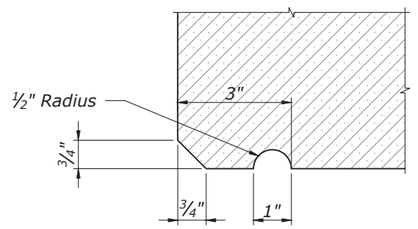
Note:
Non-Shrink Grout Shall have a 28-Day Compressive Strength of 8,900 psi.



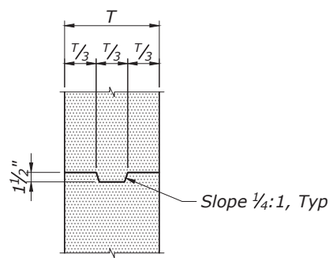
END DETAIL
Scale: 1" = 1'-0"



V REVEAL DETAIL
Scale: 1" = 1'-0"



DRIP DETAIL
Scale: 1" = 1'-0"



CURB END DETAIL
Scale: ½" = 1'-0"

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KAWELA STREAM BRIDGE

KAMEHAMEHA HIGHWAY

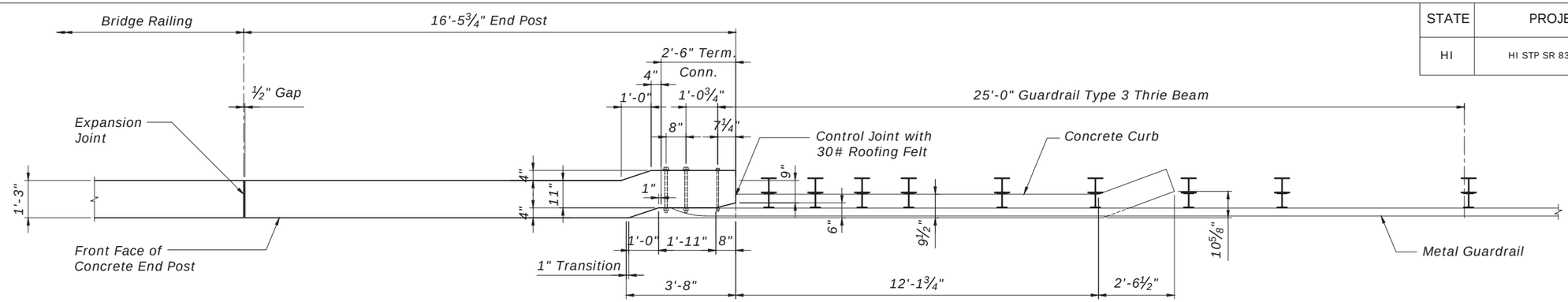
HONOLULU COUNTY, HAWAII

PLAN SECTIONS

AS-BUILT DRAWINGS

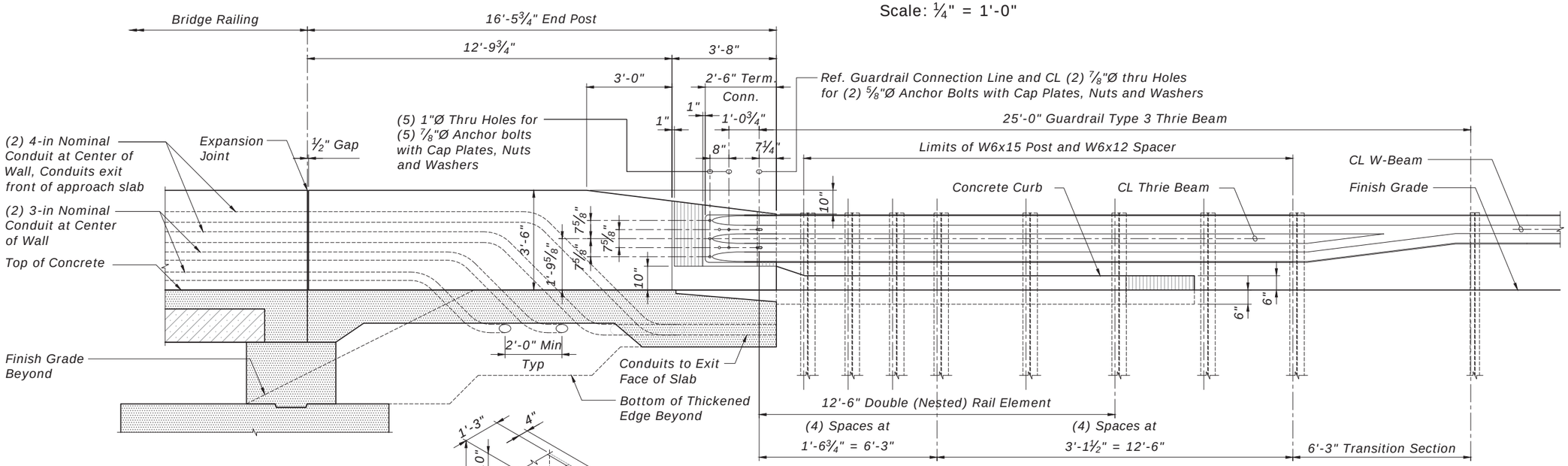
NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	43 of 50	NOVEMBER 2018	RG3084-Q

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S13.1



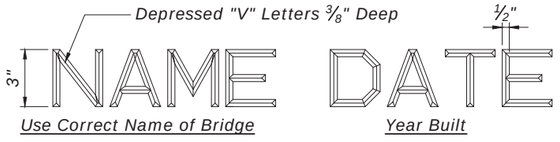
END POST PLAN

Scale: ¼" = 1'-0"



END POST ELEVATION

Scale: ¼" = 1'-0"



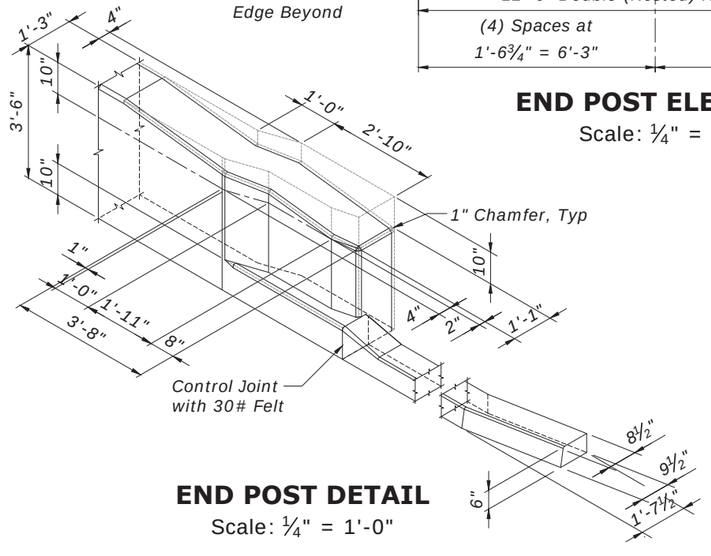
Notes:

1. Unless otherwise directed by the engineer, the bridge name and date shall be placed at the "trailing" end post on each side of the roadway.
2. Exact details and spacing of letter and figures and location shall be as directed by the engineer. gothic letters and figures approximating dimensions shown will be acceptable if approved by the engineer.
3. Submit shop drawings for review.

Typical Detail of Letters and Figures at Concrete End Post

BRIDGE IDENTIFICATION DETAIL

Not to Scale



END POST DETAIL

Scale: ¼" = 1'-0"

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KAWELA STREAM BRIDGE

KAMEHAMEHA HIGHWAY

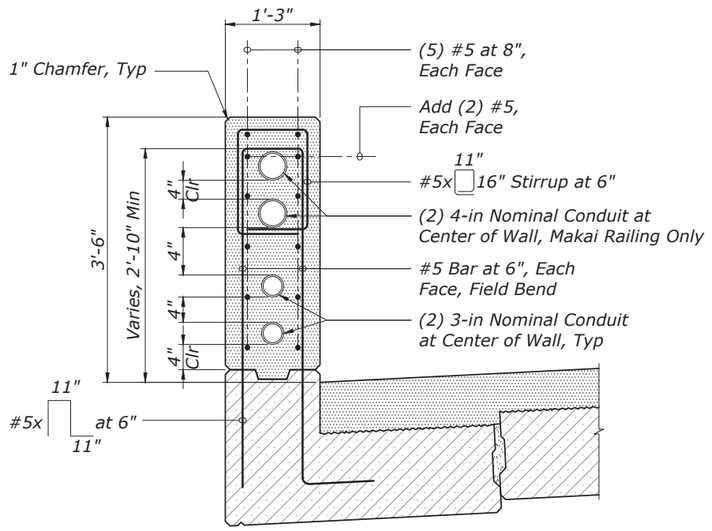
HONOLULU COUNTY, HAWAII

GUARDRAIL DETAILS

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	44 of 50	NOVEMBER 2018	RG3084-R

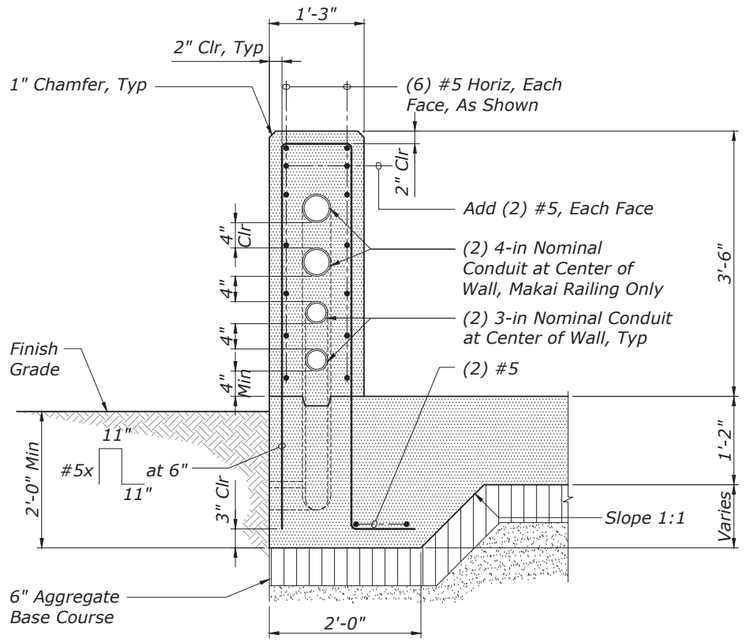
AS-BUILT DRAWINGS

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S13.2



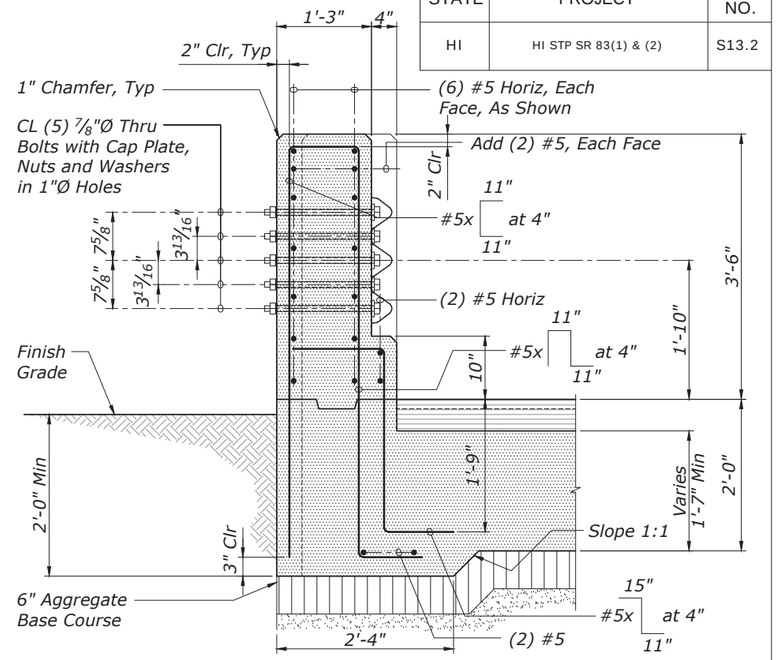
RAILING SECTION

Scale: ½" = 1'-0"



END POST SECTION

Scale: ½" = 1'-0"



END POST TRANSITION SECTION

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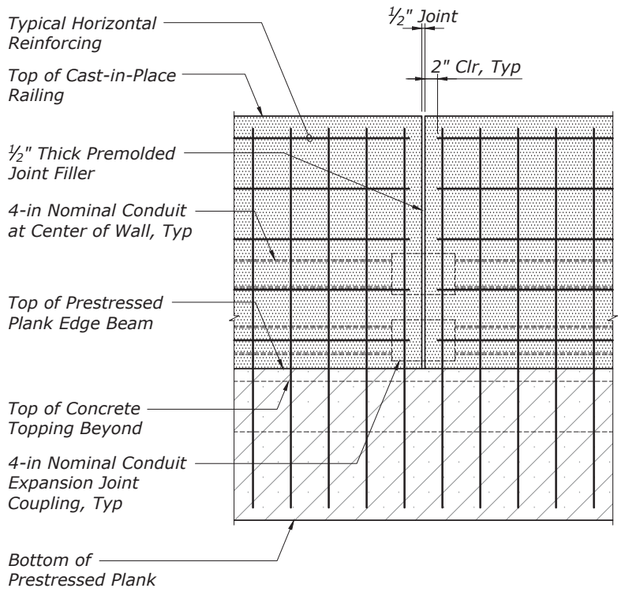
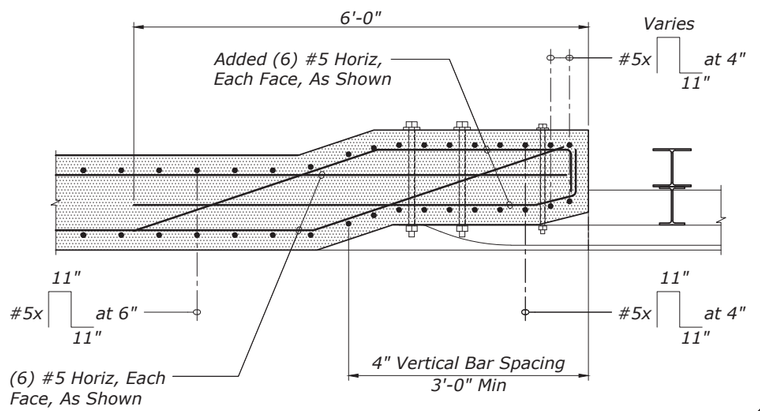


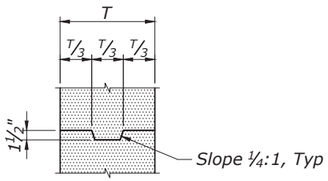
RAILING EXPANSION JOINT DETAIL

Scale: ½" = 1'-0"



END POST TRANSITION PLAN SECTION

Scale: ½" = 1'-0"



SHEAR KEY DETAIL

Scale: ½" = 1'-0"

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KEN KAZUO HAYASHIDA
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HAWAII, U.S.A.

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SIGNATURE — April 30, 2022 EXPIRATION DATE OF THE LICENSE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

KAWELA STREAM BRIDGE

KAMEHAMEHA HIGHWAY

HONOLULU COUNTY, HAWAII

RAILING SECTION

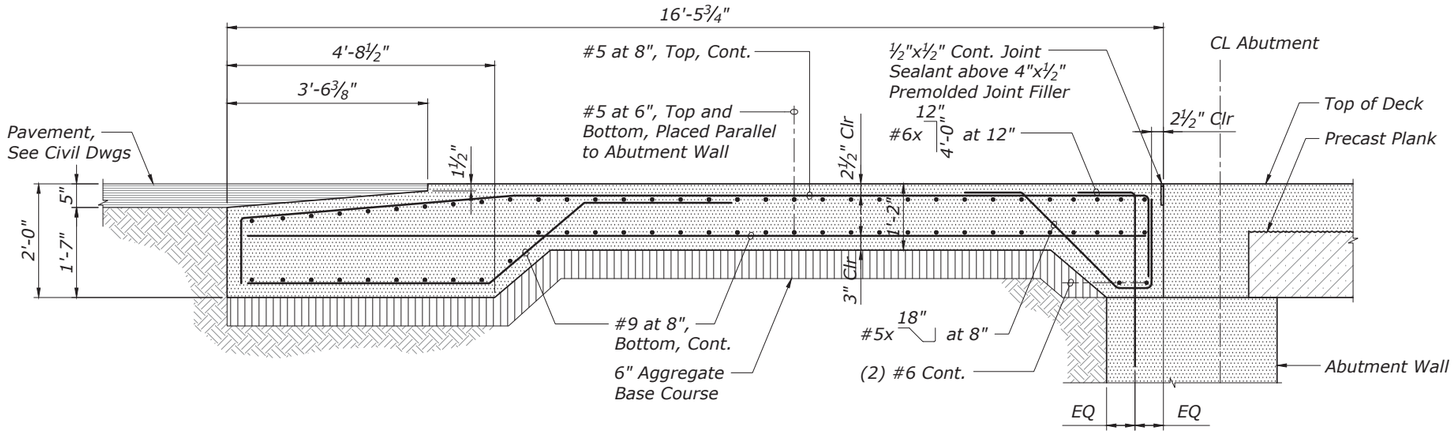
NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	45 of 50	NOVEMBER 2018	RG3084-S

AS-BUILT DRAWINGS

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S14.1

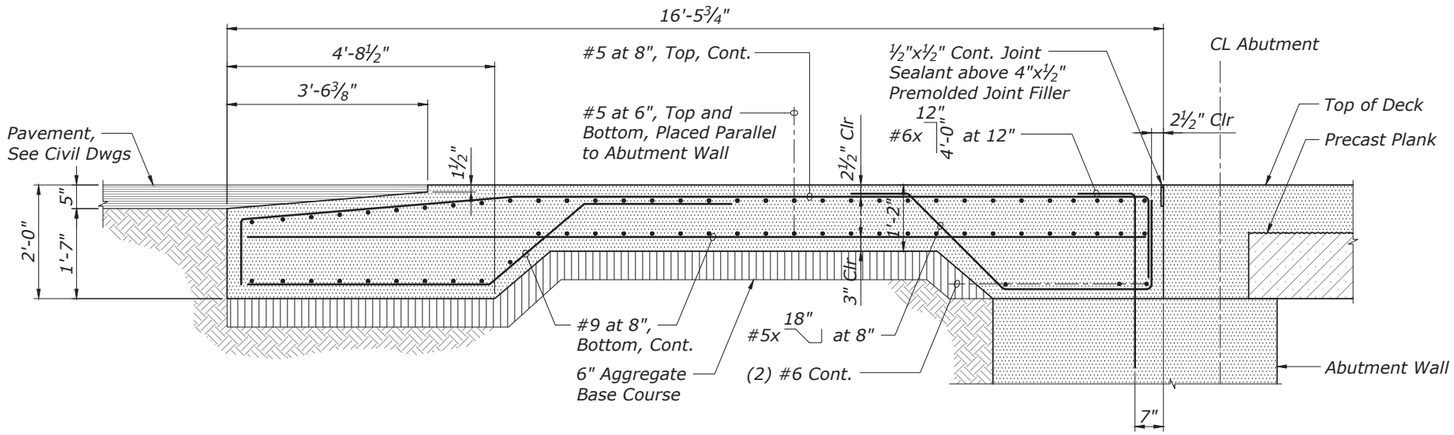
NOTES:

1. The orientation of the view is parallel to the centerline of the bridge.
2. Abutment and deck reinforcing not shown for clarity.



ABUTMENT NO□□ APPROAC□ SLAB SECTION

Scale: ⅜" = 1'-0"



ABUTMENT NO□□ APPROAC□ SLAB SECTION

Scale: ⅜" = 1'-0"

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KAWELA STREAM BRIDGE

KAMEHAMEHA HIGHWAY

HONOLULU COUNTY, HAWAII

T□PICAL APPROAC□ SLAB SECTIONS

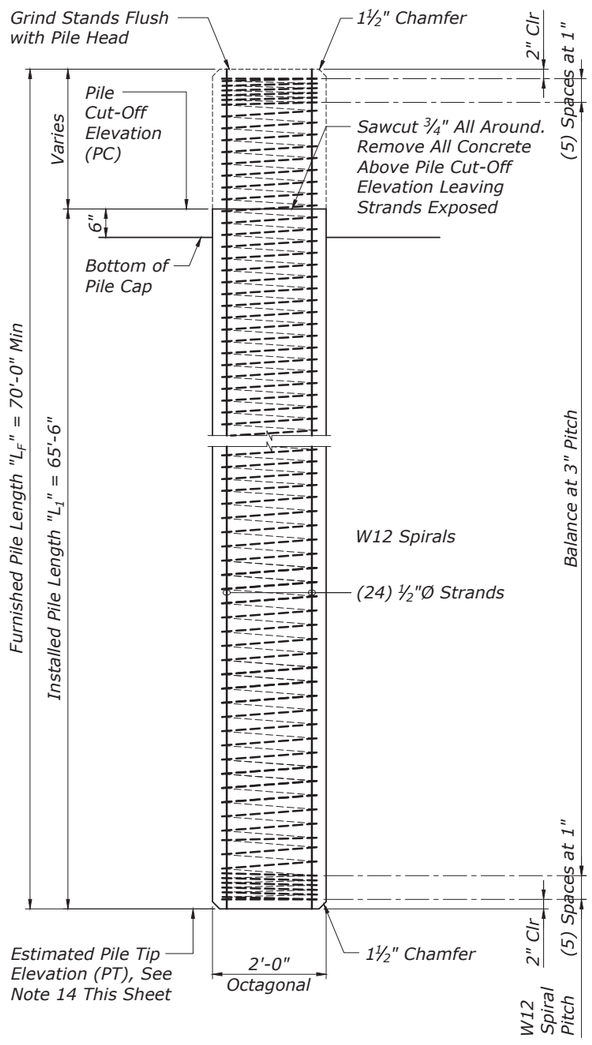
AS-BUILT DRAWINGS

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	46 of 50	NOVEMBER 2018	RG3084-T

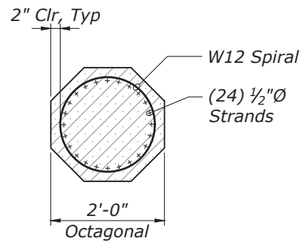
STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S15.1

Precast Prestressed Pile Notes:

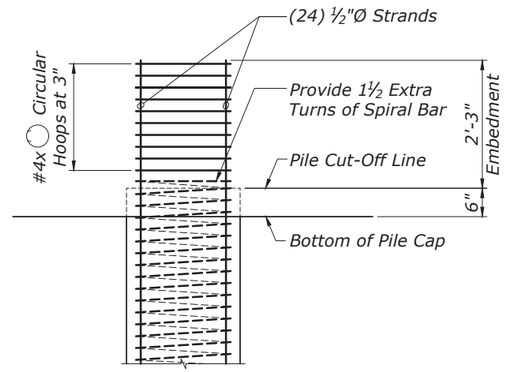
1. *Prestressed concrete 28 day compressive strength, f'c = 6,000 psi. Prestressed concrete strength at time of release, f'c = 4,500 psi.*
2. *Pile build-up concrete 28 day compressive strength (with and without driving), f'c = 6,000 psi.*
3. *Prestressing strands shall be 7 wire, ½"Ø low relaxation steel strands (area = 0.153 in^2) with an ultimate tensile strength of 270 ksi, initial strand stress (before any losses) = 202.5 ksi.*
4. *Non-prestressed reinforcing steel shall be deformed bars conforming to AASHTO M31, grade 60. spiral reinforcement shall conform to AASHTO M32.*
5. *The effective prestressing force in the pile after all losses shall be 595 kips.*
6. *Piles accepted by the engineer shall be of sound concrete. damaged piles shall be replaced or repaired as directed by the engineer at the contractor's expense.*
7. *Each pile location shall be predrilled to an elevation of -40.0 feet MSL. The diameter of the predrilled holes shall be limited to the diagonal dimension of the pile to provide the driven piles with sufficient soil/rock contact for lateral load resistance. The annular space between piles and predrilled holes shall be filled with sand. The predrilling depths shall be confirmed and/or modified by the geotechnichal engineer of record during construction.*
8. *Piles shall be driven with a hammer capable of delivering a minimum rated energy of approximately 60,000 foot pounds of energy. The hammer shall be equipped with energy control level. Prior to construction, pile and driving equipment data forms shall be reviewed and approved by the engineer.*
9. *Piles shall be driven continuously without interruption. Piles may be rejected when the driving resistance is interrupted for more than four hours and the pile cannot be driven to the required depth.*
10. *The geotechnical engineer should be present during all pile driving operations to observe the actual driving behavior and to further evaluate the field performance.*
11. *Work of cutting off prestressed concrete piles or concrete pile build-ups shall be performed in such a manner as to avoid spalling or damaging of the pile below cut off. Damaged portions shall be removed and pile cut-off elevation lowered as directed by the engineer.*
12. *Top of pile at cut-off line shall be prepared as required for construction joint in the specifications.*
13. *Pile splice will not be permitted.*
14. *Estimated Pile Tip Elevation (PT) is -60.0 feet MSL.*



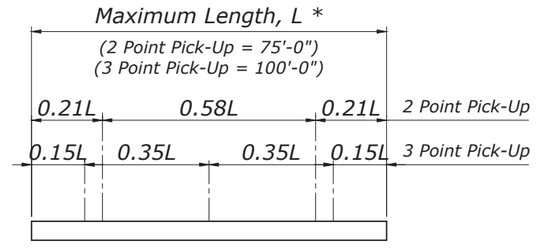
PRESTRESSED PILE DETAIL
Scale: ⅜" = 1'-0"



PILE CROSS SECTION
Scale: ⅜" = 1'-0"



PILE EMBEDMENT DETAIL
Scale: ⅜" = 1'-0"



** The length "L" is the distance end to end of pile.*

PILE PIC□UP POINTS
Not to Scale

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KAWELA STREAM BRIDGE

KAMEHAMEHA HIGHWAY

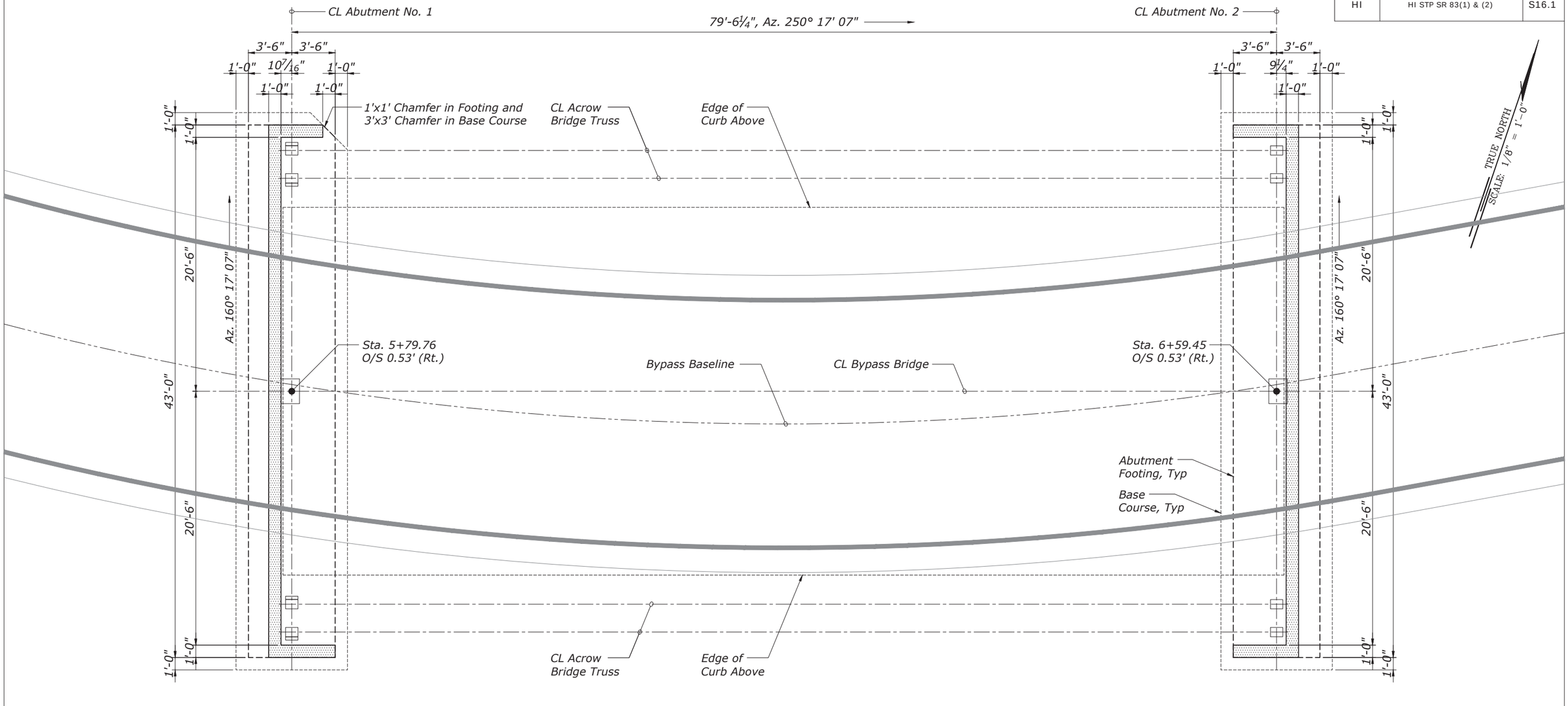
HONOLULU COUNTY, HAWAII

T□PICAL PRESTRESSED PILE NOTES AND DETAILS

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	47 of 50	NOVEMBER 2018	RG3084-U

AS-BUILT DRAWINGS

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S16.1



BYPASS BRIDGE FOUNDATION PLAN

Scale: ⅛" = 1'-0"

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KAWELA STREAM BRIDGE

KAMEHAMEHA HIGHWAY

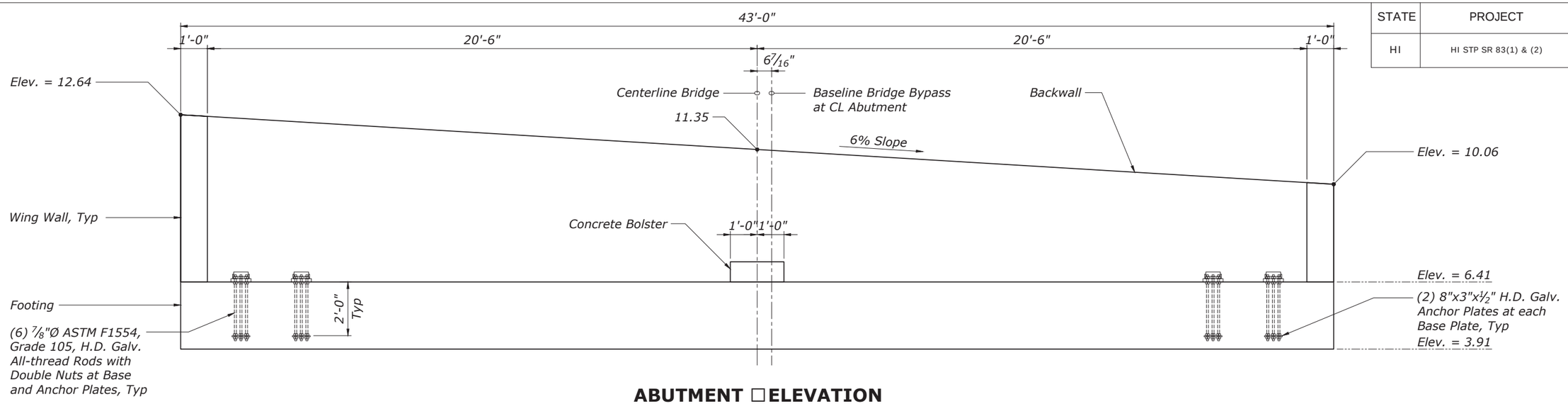
HONOLULU COUNTY, HAWAII

BYPASS BRIDGE FOUNDATION PLAN

AS-BUILT DRAWINGS

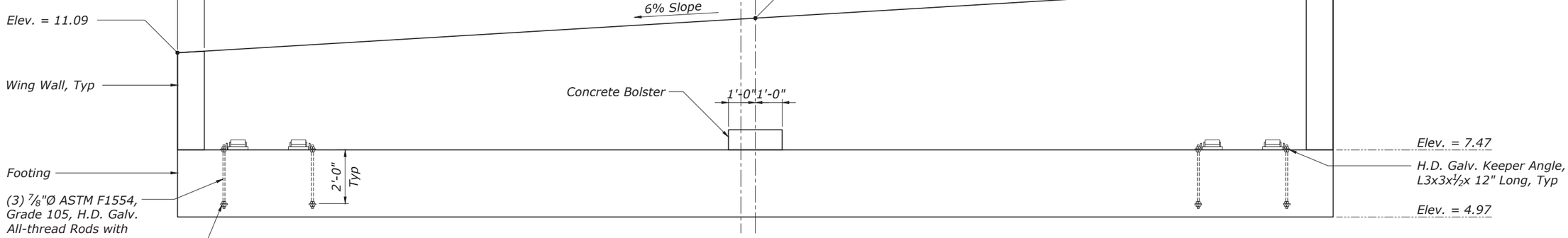
NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	48 of 50	NOVEMBER 2018	RG3084-V

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S16.2



ABUTMENT □ELEVATION

Scale: ¼" = 1'-0"



ABUTMENT □ELEVATION

Scale: ¼" = 1'-0"

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HONOLULU COUNTY, HAWAII

B□PASS BRIDGE ABUTMENT ELEVATIONS

AS-BUILT DRAWINGS

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								BL & BC	CADD	MH		MH	49 of 50	NOVEMBER 2018	RG3084-W

STATE	PROJECT	SHEET NO.
HI	HI STP SR 83(1) & (2)	S16.3

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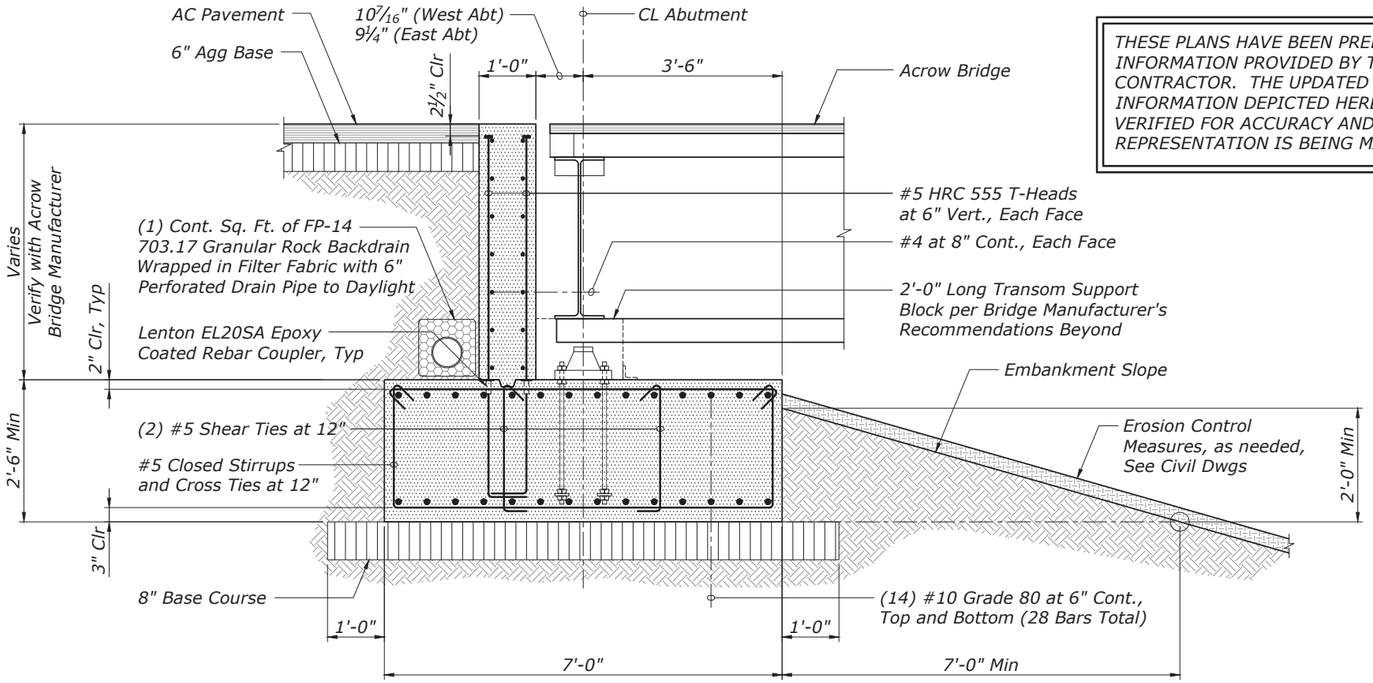
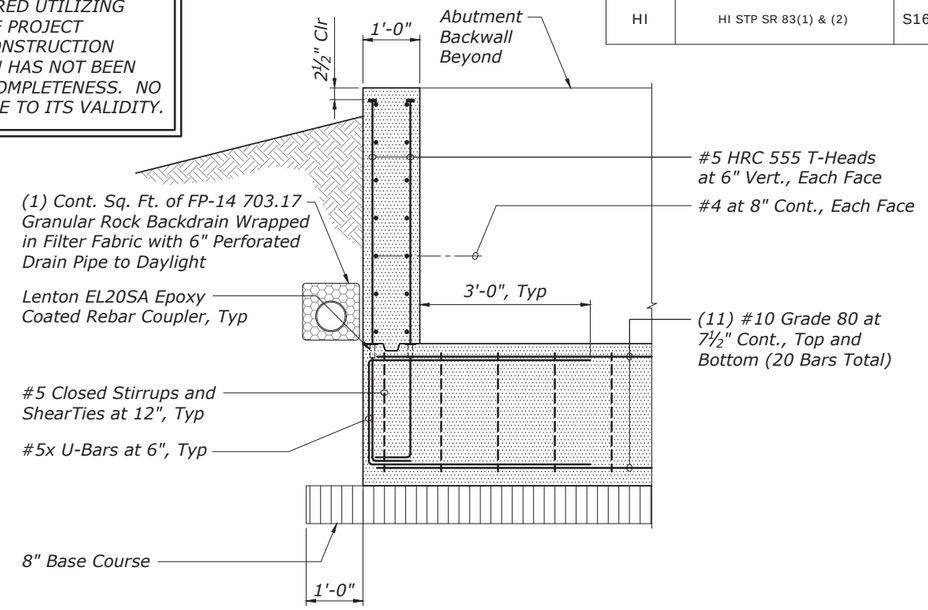


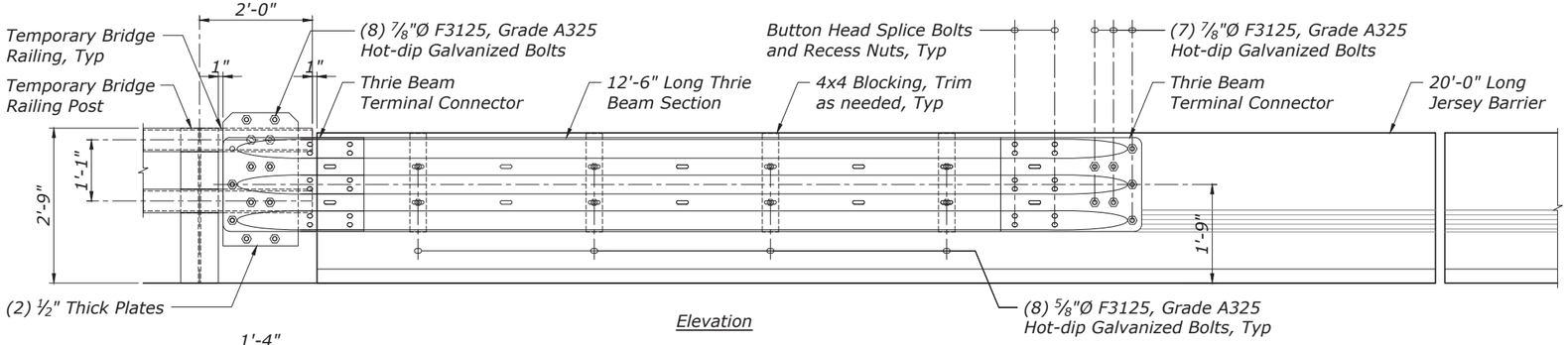
B□PASS BRIDGE ABUTMENT SECTION

Scale: ⅜" = 1'-0"



B□PASS BRIDGE □ING □ALL SECTION

Scale: ⅜" = 1'-0"



Elevation

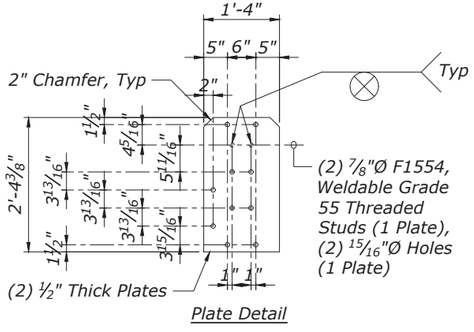
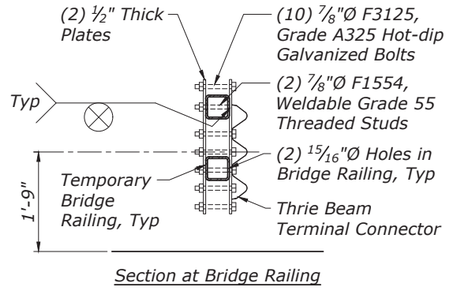
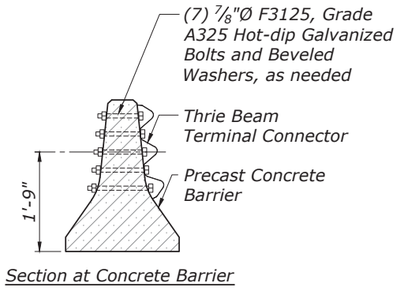


Plate Detail



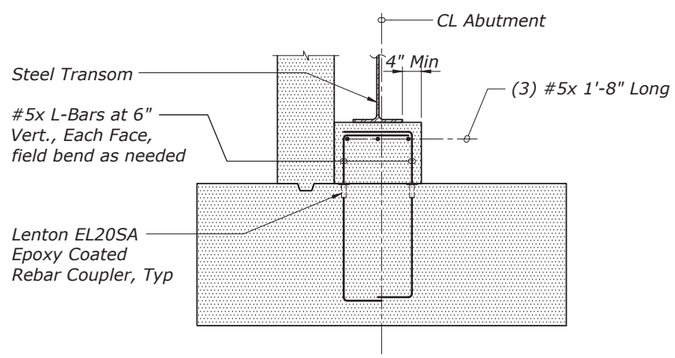
Section at Bridge Railing



Section at Concrete Barrier

GUARDRAIL ATTAC□MENT DETAILS

Scale: ⅜" = 1'-0"



B□PASS BRIDGE BOLSTER DETAIL

Scale: ⅜" = 1'-0"

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KAWELA STREAM BRIDGE

KAMEHAMEHA HIGHWAY

HONOLULU COUNTY, HAWAII

B□PASS BRIDGE ABUTMENT SECTION

AS-BUILT DRAWINGS

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								BL & BC	CADD	MH		MH	50 of 50	NOVEMBER 2018	RG3084-X