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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

INDEX OF BRIDGE DRAWINGS

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: None Date: November 2020

SHEET No. S0.1 OF 12 SHEETS

ORIGINAL PLAN
NOTE BOOK
No.

SURVEY PLOTTED BY
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FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
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INDEX OF BRIDGE DRAWINGS

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: None Date: November 2020

SHEET No. S0.2 OF 12 SHEETS

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SYMBOLS AND ABBREVIATIONS

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∉	And
@	At
℄	Baseline
℄	Centerline
ø	Diameter
≥	Greater Than or Equal to
≤	Less Than or Equal to
#	Number
±	Plus or Minus
AB	Anchor Bolt
Abut.	Abutment
AC	Asphaltic Concrete
Add.	Additional, Added
Alt.	Alternate
Approx.	Approximate
Az.	Azimuth
B, Bot., Bott.	Bottom
Bal.	Balance
Bet.	Between
BF	Both Faces, Back Face
BFE	Bottom of Footing Elevation
Bk.	Back
Blt.	Bolt
Bm.	Beam
BOF	Bottom of Footing
Br.	Bridge
Brg., Brgs.	Bearing, Bearings
BVC	Beginning of Vertical Curve
BW	Both Ways
Cant.	Cantilever
CBW	Concrete Barrier Wall
cc	Center to Center
CF	Cubic Feet
CFCW	Continuous Flashing Compound Waterproofing
CG	Center of Gravity
cgs	Center to Gravity of Strands
CIP	Cast-in-Place
CJ	Control Joint
Cl.	Class
Clr.	Clearance
CLSM	Controlled Low Strength Material
CO	Clean Out
Col.	Column
Conc.	Concrete
Conn.	Connection
Const.	Construction
Const. Jt.	Construction Joint
Cont.	Continuous
CSL	Cross Hole Sonic Logging
CY, Cu. Yd.	Cubic Yard
Dbl.	Double
Det.	Detail
DI	Drain Inlet, Ductile Iron
Dia.	Diameter
Diaph.	Diaphragm
Dim.	Dimension
Dist.	Distance
Dn.	Down
DO	Ditto
DS	Drilled Shaft
Dwg., Dwgs.	Drawing, Drawings
Dwls.	Dowels
E	East
(E), Exp.	Expansion
EA, Ea., ea.	Each
EF	Each Face
EFH	Each Face Horizontal
EFV	Each Face Vertical
EJ	Expansion Joint
El., Elev.	Elevation
Elec.	Electrical
EMH	Electrical Manhole
Emb.	Embankment
Embed.	Embedded, Embedment
EP	Edge of Pavement
EPS	Expanded Polystyrene
Eq.	Equal
Est.	Estimated
EVC	End of Vertical Curve
EW	Each Way
Ex., Exist.	Existing
Exc.	Excavation
Excl.	Excluding
Ext.	Exterior
(F)	Fixed
FA	Force Account
FB	Flat Bar
F'c	Specified Strength of Concrete
F'ci	Strength of Concrete at Time of Initial Prestress
FF	Far Face. Front Face
Fig.	Figure
Fin. Gr.	Finish Grade
FRP	Fiber Reinforced Plastic
Ft.	Feet, Foot
Ftg.	Footing
Ga.	Gage, Gauge
Galv.	Galvanized
GFRP	Glass Fiber Reinforced Polymer
Gr.	Grade
Grd.	Ground
GRP	Grouted Rubble Pavement
(H)	Hinge
HECO	Hawaiian Electric Company
Horiz., H	Horizontal
HS	High strength
Ht.	Height
IB	Inbound
ID	Inside Diameter
I.F.	Inside Face
In.	Inch
Int.	Interior
Inv.	Invert
Jt.	Joint
K	Kips
KF	Kip Foot
KLF	Kips Per Linear Foot
KSF	Kips Per Square Foot
KSI	Kips Per Square Inch
L	Length
lb., lbs., LBS.	Pound, Pounds
LF, Lin. Ft.	Linear Feet/Foot
Longit.	Longitudinal
LS	Lump Sum
Ltg. Std.	Lighting Standard
M	Modified
Max.	Maximum
Mech.	Mechanical
MH	Manhole
Min.	Minimum
Misc.	Miscellaneous
MPH	Miles Per Hour
N	North
N/A	Not Applicable
NF	Near Face
NIC	Not in Contract
No.	Number
NTS	Not to Scale
OB	Outbound
oc	On Center
OD	Outside Diameter
O.F.	Outside Face
OG	Outside Girder, Outbound Girder
Opn'g	Opening
O/S	Offset
PB	Pull Box
P(e)	Effective Prestressing Force
PC	Point of Curvature
PCC	Portland Cement Concrete
PCF	Pounds per Cubic Foot
Perf.	Perforated
PI	Point of Intersection of Tangents
PIVC	Point of Intersection of Vertical Curve
PL	Plate
PLF	Pounds per Linear Foot
PP	Precast Plank
PRC	Point of Reverse Curvature
Prestr.	Prestressed
P/S	Prestressed Strands
PSF	Pounds per Square Foot
PSI	Pounds per Square Inch
Pt., Pts.	Point, Points
PT	Point of Tangency, Post Tensioned
PVC	Polyvinyl Chloride
Q	Flow Rate
R, Rad.	Radius
Rdwy.	Roadway
Rebar	Reinforcing Bar
Ref.	Reference
Reinf.	Reinforced, Reinforcing, Reinforcement
Req'd.	Required
Ret.	Retaining
RF	Rear Face
R/W, ROW	Right of Way
S	South
SDMH	Sewer Drain Manhole
SE	Super Elevation
Sect.	Section
SF	Square Feet
Sht.	Sheet
Sim.	Similar
Sl.	Slope
Spc., Spg.	Spaces, Spacing
Spec.	Specification
Sprd.	Spread
SS	Stainless Steel
Sta.	Station
Stagg.	Staggered
Std.	Standard
Stiff.	Stiffener
Stirr.	Stirrup
Stl.	Steel
Str.	Straight
Struct.	Structure
SY	Square Yard
Symm.	Symmetrical
T	Top
Tan.	Tangent
T∉B	Top and Bottom
Temp.	Temporary
Thk.	Thick
TFE	Top of Footing Elevation
TOD	Top of Deck
TOF	Top of Footing
Tot.	Total
TOW	Top of Wall Elevation
Transv.	Transverse
TS	Structural Tubing
Typ.	Typical
Undergrd.	Underground
UNO	Unless Noted Otherwise
V, Vert.	Vertical
Var.	Varies
VESLMC	Very Early Strength Latex Modified Concrete
VC	Vertical Curve
W	West
w/	With
W/C	Water/Cement Ratio
WP	Work Point, Working Point
WS	Water Surface
WW	Wing Wall
WWR	Welded Wire Reinforcing
Yr.	Year

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

SYMBOLS AND ABBREVIATIONS

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: None — Date: February 2021

SHEET No. S0.3 OF 12 SHEETS

ORIGINAL PLAN
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FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	ADD. 65	161

STRUCTURAL GENERAL NOTES

1. GENERAL SPECIFICATIONS:

(A) Hawaii Department of Transportation, Hawaii Standard Specifications for Road and Bridge Construction, 2005, together with Special Provisions prepared for this Contract.

2. DESIGN SPECIFICATIONS:

(A) AASHTO 2012 LRFD Bridge Design Specifications (Sixth Edition) and its subsequent interim specifications with interim supplements and modifications by the HDOT Highways Division.

(B) HDOT Document dated March 1, 2013 with subject title "Design Criteria for Bridges and Structures"

(C) AASHTO 2013 Standard Specifications for structural supports for Highways, Signs, Luminaires, and Traffic Signals (Sixth Edition) and its subsequent interim specifications with interim supplements and modifications by the HDOT Highways Division.

3. LOADS:

(A) Dead Load: A 25 psf allowance for future wearing surface of asphalt concrete has been included in Dead Load calculations. Concrete unit weight of 160 pcf has been assumed for Dead Load calculations. A future utilities load on each side of the Bridge of 150 plf has been included.

(B) Live Load: HL-93 Service and Strength Limit States

(C) Seismic: In accordance with AASHTO LRFD Bridge Design Specifications, 6th Edition, 2012:

Peak Ground Acceleration (PGA = 0.18g), modified by the Site Coefficient (F_{PGA} = 1.44) to give a spectrum acceleration, A_S = 0.26g

Short period acceleration at 0.2 seconds (S_S = 0.40g) modified by the Site Coefficient (F_a = 1.48) to give the short period spectrum acceleration, S_{DS} = 0.592g

Long Period acceleration at 1.0 seconds (S_1 = 0.11g) modified by the Site Coefficient (F_v = 2.36) to give the long period spectrum acceleration, S_{D1} = 0.260g

Site Class = D
Seismic Zone = 2
Operational Category = Essential

(D) Federal Emergency Management Agency (FEMA) -Flood Hazard Designation:

Zone: _____ AE
Base Flood Elevation: _____ El. = 14 (Upstream of Bridge)
Non-Bore Tsunami Run up: ____ El. = 10

3. LOADS (Cont):

(E) Combined Scour Elevations:

Abutment No. 1: _____ 100 year Scour El. = -8.0

Abutment No. 2: _____ 100 year Scour El. = -8.0

(F) Railing Test Level TL-3

(G) Seismic Parameters for Segmental Retaining Wall - Refer to S12.5.

4. MATERIALS:

(A) All concrete strengths shall be as noted below:

Item No.	Structural Parts	Compressive Strength f'c (28 Days)	Maximum Water Cement (W/C)	Maximum Cement Content (lbs/cyd)	Maximum Cementitious Material Content (lbs/cyd)
(1)	Drilled Shafts including Trial and Load Test Shafts See Note (E) in this section	4500 psi	0.45	720	720
(2)	Drilled Shaft Cap Beam, End Beam, Aesthetic Railing, End Post, Concrete Barrier, Corbel for Approach Slab, Corbel for Conc. Encased Ducts, Diaphragms, Girder Seats, Barrier Wall, Wing Walls and Wing Wall return See Notes (D), (E), and (F) in this section	5000 psi	0.40	670	670
(3)	Prestressed Girders See Note (E) in this section and Sheet S4.5	10000 psi (12000 psi at 56 days)	0.40	670	752
(4)	Precast Deck Form See Notes (D), (E) and (F)	6000 psi	0.40	670	670
(5)	Bridge Deck, Topping over End Beam, Approach Slabs, Concrete encasing ducts within bridge, and Sleeper Slab. See Notes (D), (E) and (F).	SBD (See Section 601)	--	--	--
(6)	Temporary Bridge Abutments, Piers, Footings, and Miscellaneous Concrete	4000 psi	0.45	670	670
(7)	Deck and End beam Closure Pours (Including Corbel), See Note (E)	VESLMC (See Section 540)	-	-	-
(8)	Concrete for Waterline:				
	a. Cradle See notes (D), (E), and (F)	5000 psi	0.40	670	670
	b. Curtain wall shall be light weight concrete (Density < 120 lbs/cu. ft.)	3000 psi (See Section 627)	-	-	-
(9)	All others, except as noted otherwise	4000 psi	0.45	670	670

4. MATERIALS (Cont.):

(B) Concrete mixes shall be designed to be pumpable and flowable with minimum segregation and separation.

(C) The use of calcium chloride in any concrete is prohibited.

(D) A shrinkage reducing admixture (SRA), such as Master Life SRA35 by BASF or Eclipse by W.R. Grace & Co., or accepted equal, shall be added to the concrete mix for Items No. (2), (4), (5) and (8)a, under note 4.(A). The minimum dosage requirement shall be 128 ounces per cubic yard of concrete. Include the weight of the SRA with the total water in computation of the Water to Cement Ratio.

(E) A migrating corrosion inhibitor amine carboxylate water-based admixture shall be added to the concrete mix for Item Nos. (1), (2), (3), (4), (5), (7) and (8). under Note 4.(A). The minimum dosage shall be 24 ounces per cubic yard of concrete.

(F) A 1 1/2" long macro synthetic fiber such as Forta Ferro, Strux 90/40, Max Matrix, or approved equal shall be added to the concrete mix for items No. (2), (4), (5) and (8)a. under note 4.(A). The minimum dosage shall be 7.5 pounds per cubic yard of concrete.

(G) Non-shrink Grout shall be a pre-mixed product consisting of non-staining, non-metallic aggregate cement, water reducing and plasticizing agents capable of developing a minimum compressive strength of 4000 psi in 3 days and 7000 psi in 28 days. The non-shrink grout shall contain at least 10 grams of migrating amine carboxylate corrosion inhibiting admixture per 0.4 to 0.5 cubic feet of non-shrink grout.

(H) Cure concrete as specified in the Contract documents. Remove curing that may affect binding from all areas requiring future bonding unless a curing agent such as SINAK Lithium Cure or accepted equal that does not affect bond and provide equal or better curing is used.

(I) All concrete shall include at least one of the three methods stated in Section 601 of the Special Provisions, or approved equal, to reduce the embodied carbon footprint in concrete.

DATE	REVISION
3 7/21/21	Revised Comp. Strength for Prestressed Girders

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STRUCTURAL GENERAL NOTES

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: None Date: February 2021

SHEET No. S0.4 OF 12 SHEETS

ADD. 65

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

DRAWING NAME: T:\PROJECTS\1-ACTIVE FILES\913-01_KAIPAPAU BRIDGE\INCOMING\072121_FROM_CHAD\KSB-S004 REV NOTE DELTA 3.DWG PLOT TIME: 07-21-21, 9:21 AM)

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	66	161

STRUCTURAL GENERAL NOTES

4. MATERIALS (Cont.):

(J) Unless otherwise noted, all reinforcing steel shall conform to the requirements of ASTM A615 and shall be deformed, Grade 60.

(1) The covering measured from the surface of the concrete to the face of any reinforcing bars shall be as follows, except as otherwise shown:

a. Deck Slabs
Top Bars = 2 3/4"
Bottom Bars = 2"

b. Prestressed Concrete Girders = Reference Sheet S4.2 & S4.4 for Girder Clearances

c. Drilled Shafts = 4"

d. Approach Slab and Sleeper Slab Top Bars = 2 3/4"
Approach Slab and Sleeper Slab Bottom Bars = 3"

e. Concrete Cast Against and Permanently Exposed to Earth = 3"

f. All Others Unless Otherwise Noted = 3"

(2) Minimum lap splice length for steel reinforcing shall be 40 bar diameters or 2'-0", whichever is greater, for #8 bars or smaller. Minimum lap splice length for #9 bars or larger shall be 50 bar diameters. Increase lap length by multiplying the minimum lap splice length by 1.3 for bars having more than 12" of fresh concrete below bars. Increase lap length by 1.25 for ASTM A1035 reinforcing. Lap splices for bundled bars shall consist of individual bar splices within a bundle that do not overlap. Entire bundles shall not be lap spliced.

(3) Unless otherwise noted, reinforcing splices shall be staggered. Minimum distance between staggered lap splice shall be equal to the length required for the lap splice. Number of bars spliced at sections normal to axis of member shall not exceed 50 percent of the total main reinforcing in the member.

(4) Minimum clear spacing between parallel bars shall be 1 1/2 times the diameter of bars (for non bundled bars). In no case shall the clear distance between the bars be less than 1 1/2 times the maximum size of the coarse aggregate or 1 1/2".

(5) Reinforcing bars shall be securely tied at all intersections and lap splices except where the spacing of intersections is less than 1 foot in each direction, in which case alternate intersections shall be tied.

(K) All anchor bolts, washers, and nuts shall be ASTM A 307, F844, and A563 respectively; and ASTM F2329 hot dip galvanized after fabrication, unless otherwise specified.

(L) Epoxy for anchoring threaded rods or deformed bars shall be HILTI-RE-500-SD or approved equal. Follow Manufacturer's recommendations for storage and use.

4. MATERIALS (Cont.):

(M) Stainless Steel Reinforcing shall be provided at the Aesthetic Bridge Railings. Stainless Steel reinforcing shall be deformed reinforcement conforming to ASTM A955/2205 or 316LN with a minimum yeild level of 60 ksi designated as Grade 60. See drawings for configuration, sizes, spacings, clearances and isolation details. All tie wire for Stainless Steel Reinforcing shall be 2205 Stainless. Place dielectric tape such as Teflon or polypropylene at all points where dissimilar metals are in contact.

(N) Stainless Steel Metal Rails, Plates, Anchor Bolts and Shapes shall conform to ASTM A269, ASTM A276 or A666 Type 316LN/ UNS designation S31653 or Type 2205/UNS designation S32205.

(P) For materials of prestressed concrete girders, see applicable prestressed concrete girder details and Special Provisions.

(Q) All dimensions relating to reinforcing bars, are to centers of bars unless noted otherwise.

(R) For concrete finish, see the Specifications.

(S) Glass Fiber Reinforced Polymer Bar (ASTM D7957)

(1) Glass Fiber Reinforced Polymer (GFRP) rebar shall have a minimum tensile force of 110 ksi for #4 bar. #5 bars shall have a minimum tensile force of 105 ksi.

(2) The modulus of elasticity of the GFRP bar shall be a minimum of 6,500,000 psi.

(3) Concrete cover for the GFRP bars shall be 2" unless otherwise noted.

(4) Minimum lap splice lengths for the GFRP bars shall be 42 bar diameters unless otherwise noted.

(5) All GFRP bars shall be securely tied in place. Tie wire shall be 2205 stainless steel or non-metallic.

(6) The GFRP bars may be cut in the field with a masonry or diamond blade.

(7) All work including materials and bends shall follow manufacturer's recommendations.

5. FOUNDATION NOTES:

(A) The Foundation Design is based upon recommendations contained in the Geotechnical Engineering Exploration report entitled "Geotechnical Exploration, Kamehameha Highway (Route 83), Kaipapau Stream Bridge Replacement, Koolauloa, Oahu, Hawaii, August 6, 2014. The Report shall be considered as a part of the contract documents and its recommendations shall be implemented unless otherwise directed by the Engineer. The Contractor may obtain a copy of the report at the State of Hawaii, Department of Transportation - Highways Division - upon written request to the Engineer.

5. FOUNDATION NOTES (Cont.):

(1) 4'-0" Diameter Drilled Shaft Foundations - See S8.1 for estimated shaft tip elevations.

a. The drilled shaft foundations will derive support principally from adhesion between the sides of the drilled shaft and the dense old alluvium, conglomerate and/or basalt formation encountered in the Geotechnical Engineering borings.

(2) Design Soil Parameters

a. Static Lateral Earth Pressures at Abutments and Wing Walls above ground water:

1. Active Condition, level backfill = 40 pcf
2. At-Rest Condition, level backfill = 58 pcf

b. Static Lateral Earth Pressures at Abutments and Wing Walls below ground water:

1. Active Condition, level backfill = 80 pcf
2. At-Rest Condition, level backfill = 88 pcf

c. Seismic

Dynamic Lateral Earth Forces for Retaining Structures	
Allowable Lateral Wall Movement (inches)	Dynamic Lateral Earth Forces (H^2 pounds per linear foot)
0.5	19.6
1.0	14.8
1.5	11.5
2.0	8.1
2.5	5.8

(B) For Drilled Shaft notes, see shts. S8.1 and S8.2.

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LICENSED PROFESSIONAL ENGINEER
No. 2422-S
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

4/30/22
SIGNATURE LIC. EXPIRATION
MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STRUCTURAL GENERAL NOTES

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: None Date: February 2021

SHEET No. S0.5 OF 12 SHEETS

ORIGINAL PLAN
NOTE BOOK
No.
SURVEY PLOTTED BY
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DATE

DRAWING NAME: T:\PROJECTS\1-ACTIVE FILES\913-01_KAIPAPAU BRIDGE\$$_REVISED_STRUCT\$$_051221\KSB-S004 SW FIX KSI R1.DWG PLOT TIME: 06-09-21, 2:55 PM)

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	67	161

STRUCTURAL GENERAL NOTES

6. CONSTRUCTION REQUIREMENTS:

(A) Exact location of bars shall be arranged so that no interference will occur between vertical reinforcement and foundation or drilled shaft cap horizontal reinforcements.

(B) Except as noted otherwise, all vertical dimensions are measured plumb.

(C) The Contractor shall verify all grades and dimensions before commencing with any work.

(D) The Contractor shall verify the locations of all existing utility lines near the bridge, abutments and retaining walls and notify their respective owners before commencing with the work of excavation, underpinning or drilling of shafts.

(E) Any damage to utility lines caused by the Contractor or his agents or Sub-Contractors, shall be repaired at his expense and to the satisfaction of the Engineer.

(F) Unless noted otherwise, all exposed concrete edges shall have a chamfer of 3/4 inch.

(G) Temporary shoring/under-pinning and dewatering may be required for foundation excavations.

(1) The Contractor shall refer to the Geotechnical Engineering Exporation Report Referenced at "FOUNDATION NOTES" above for recommendations.

(2) Vibratory shoring (such as interlocking Steel Sheetpiling) will not be allowed.

(3) Temporary shoring / under-pinning and dewatering shall be in accordance with the Specifications and shall not proceed without the Engineer's Review and Approval.

(4) Temporary Shoring / under-pinning and dewatering shall be considered incidental to Structural Excavation.

(5) All Temporary Shoring / under-pinning and dewatering specifications, working drawings and structural calculations shall be signed and sealed by Hawaii licensed professional engineers specializing in Geotechnical and Structural Engineering. This work shall be acceptable to the Engineer before the start of construction and shall be considered incidental to the related Contract item.

6. CONSTRUCTION REQUIREMENTS (Cont.):

(H) Bridge deck riding surface shall be longitudinally, mechanically ground a minimum of 1/8" over entire travel way and shoulder. The ground surface shall have a textured surface with peaks 1/16" above the bottom of the groove and 55 to 60 grooves per foot of width. After grinding, the deck shall also be longitudinally, mechanically grooved. See Section 503 of the specifications for additional information. The bridge shall not be open to public traffic until the mechanical grooving, all traffic safety devices and markers are complete and acceptable to the Engineer. Sidewalks on bridge shall receive a medium broom finish transverse to the sidewalk. Finish all other elements as directed in Section 503.

(J) Explosive blasting is prohibited for demolition or any other work on this project.

(K) Contractor's temporary shoring and falsework design and construction shall comply with the specifications, Special Provision 503.03 (B), AASHTO Guide Design Specifications for Bridge Temporary Work (latest edition) and AASHTO Construction Handbook for Bridge Temporary Works (latest edition). The most stringent requirements shall govern.

(L) Girders shall be rinsed with potable water to remove salt spray from ocean transport before arrival at jobsite. Notify Engineer for verification of rinsing operation.

7. PRESTRESSED GIRDER BEARING SURFACES:

(A) Prestressed girder bearing surface shall be smooth.

(B) Girders shall be set on fresh layers of slush grout to ensure full bearing.

(C) When a Girder is removed from its casting bed, all bars and strands projecting from the Girder shall be cleaned and painted with a miniumum dry film thickness of 1-mil galvanizing high zinc dust paint conforming to Federal Specification MIL-P-21035B. During handling and shipping, projecting reinforcement shall be protected from bending or breaking. Just before placing concrete around the painted projecting bars or strands, the Contractor shall remove from them all spattered concrete remaining from girder casting, dirt, oil, and other foreign matter.

8. LOAD RATING:

(A) New governing Load Rating results are as follows:

		RATING FACTOR	DISTRIBUTION FACTOR	LOAD EFFECT
DESIGN	HL-93 Inventory	1.28	0.378	Neg. Moment
	HL-93 Operating	1.66	0.378	Neg. Moment

DENNIS K. MITSUNAGA
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4/30/22
SIGNATURE LIC. EXPIRATION
MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STRUCTURAL GENERAL NOTES

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: None Date: February 2021

SHEET No. S0.6 OF 12 SHEETS

ORIGINAL PLAN
NOTE BOOK No.
SURVEY PLOTTED BY DATE
DRAWN BY "
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QUANTITIES BY "
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DRAWING NAME: T:\PROJECTS\1-ACTIVE FILES\913-01_KAIPAPAU BRIDGE\$$_REVISED_STRUCT\$$_051221\KSB-S004 SW FIX KSI R1.DWG PLOT TIME: 06-09-21, 2:56 PM)

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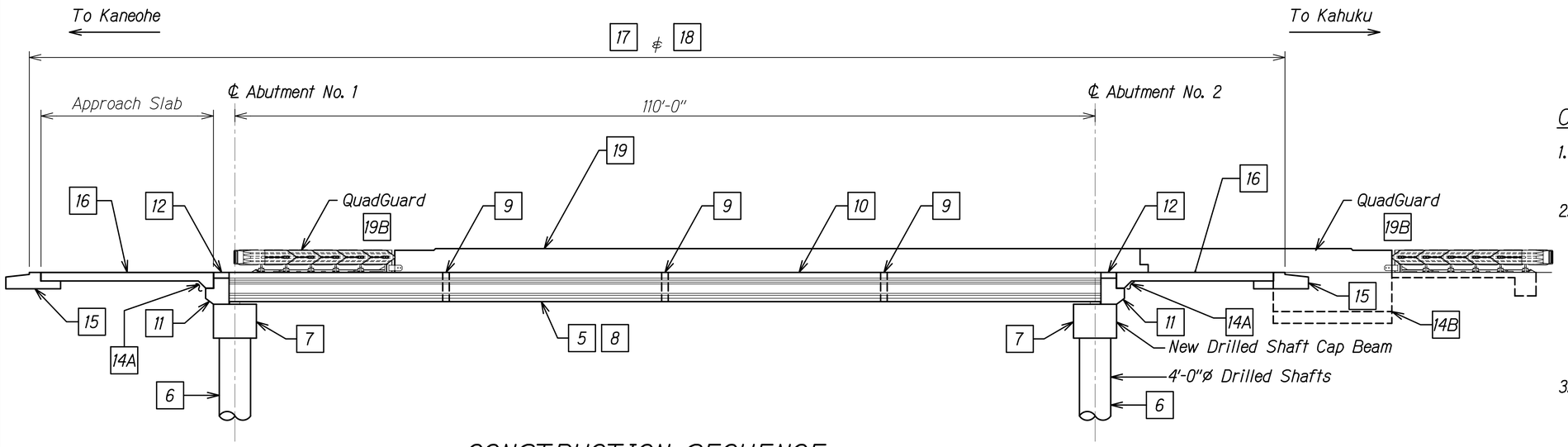
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	68	161



CONSTRUCTION SEQUENCE

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

CONSTRUCTION SEQUENCE NOTES:

1. Order of construction sequence shall not be changed.
2. Each sequence stage shall be completely finished before proceeding to the next stage unless otherwise noted. The Engineer will be the sole judge of whether the sequence stage is complete, and may direct the Contractor to stop work on a sequence stage to complete work on the preceeding sequence stage.
3. Contractor shall submit overweight vehicular details for approval prior to their use.

LEGEND:

[#] Phase 1 Stages

CONSTRUCTION SEQUENCE ELEVATION

[1] Relocate existing utility lines.

[2] Construct trial and load test shafts. Perform load test.

[3] Install detour road and temporary bridge.

[4] Demolish existing bridge after obtaining demolition plan acceptance.

[5] Construct precast girders. (May be done concurrently with Stages 1 through 4)

[6] Construct 4 ft diameter drilled shafts. Shaft numbers 1, 2, 3, 5, 6, 7.

[7] Cast Phase 1 drilled shaft cap beams, girder seats, and corbels for concrete encased ducts at least 7 days after the final drilled shaft concrete pour in Stage 6 or until the concrete in Stage 6 has attained a compressive strength of 4,500 psi, whichever occurs later.

[8] Erect Phase 1 precast girders at least 15 days after the concrete pour in Stage 7 or until the concrete in Stage 7 has attained a compressive strength of 5,000 psi, whichever occurs later. Place slush grout immediately prior to placement of precast girders.

[9] Construct Phase 1 diaphragm "A".

[9A] Set ducts and pour duct encasement in Bay 3.

[10] Pour Phase 1 cast-in-place deck except areas over end beams a minimum of 24 hours after the concrete pour in Stage 9A.

[11] Pour Phase 1 corbel and end beams to top of precast girder at least 30 days after the concrete pour in Stage 10. The concrete pour shall occur between midnight and 3:00 AM (3 hour window).

[12] Pour remainder of Phase 1 deck concrete a minimum of 24 hours after the concrete pour in Stage 11.

[13] Construct Phase 1 wing walls at least 8 days after the concrete pour in Stage 12 or after the concrete in Stage 12 has attained a compressive strength of 5,000 psi, whichever occurs later.

[14A] Backfill to Phase 1 limits and to bottom of approach slab at least 14 days after the concrete pour in Stage 13 or until the concrete in Stage 13 has attained a compressive strength of 5,000 psi, whichever occurs later. Maximum height difference of backfill between abutments shall not exceed 2 feet. Install concrete encased ducts behind abutments when backfill height is at the elevation of the bottom of the concrete encased electrical ducts. Continue backfilling after concrete for encased electrical ducts has attained its 28 day compressive strength.

[14B] Construct concrete barrier wall. (Coordinate construction of concrete barrier wall with stage 14A construction).

[15] Construct Phase 1 sleeper slabs.

[16] Construct Phase 1 approach slabs.

[17] Blanket grind deck, approach slabs, and sleeper slabs where traffic will be allowed during construction of phase 2.

[18] Mechanically groove deck, approach slabs, and sleeper slabs where traffic will be allowed during construction of phase 2.

[19A] Construct mauka aesthetic railing and concrete barrier.

[19B] Install mauka quadguards.

[19C] Install temporary barriers.

GRAPHIC SCALE:

8 6 4 2 0 8 16

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

DENNIS K. MITSUNAGA
LICENSED PROFESSIONAL ENGINEER
No. 2422-S
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

4/30/22
SIGNATURE LIC. EXPIRATION

MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CONSTRUCTION SEQUENCE
PHASE 1

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

SHEET No. S0.7 OF 12 SHEETS

ORIGINAL PLAN
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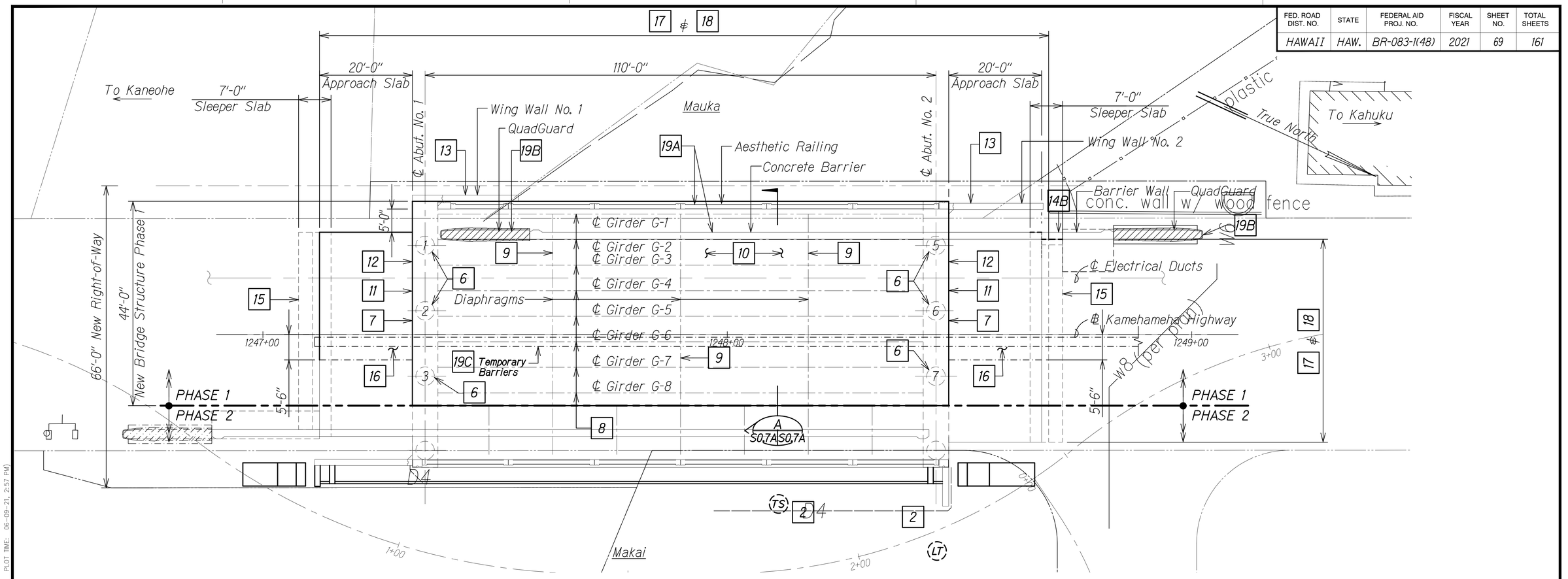
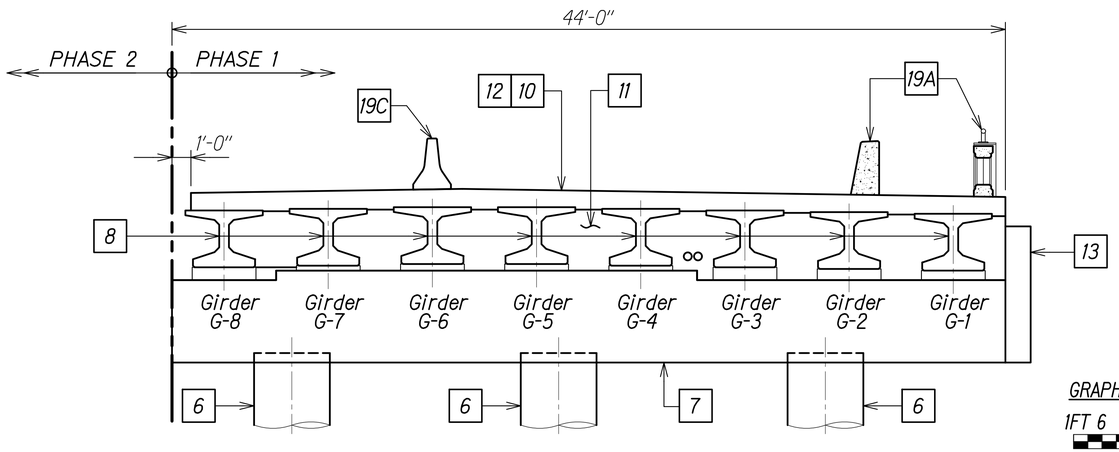
DRAWING NAME: T:\PROJECTS\1-ACTIVE FILES\913-01_KAIPAPAU BRIDGE\$$_REVISED_STRUCT\$$_051221\KSB-S007.DWG PLOT TIME: 06-14-21, 9:38 AM)

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	69	161



CONSTRUCTION SEQUENCE PLAN (PHASE 1)

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



CONSTRUCTION SEQUENCE (PHASE 1)

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

A
S0.7A S0.7A

LEGEND:

- # — Construction Sequence Stage
- (#) — Drilled Shaft ID
- (TS) — Trial Shaft
- (LT) — Load Test Shaft

GRAPHIC SCALES:

1FT 6 0 1FT 2FT
SCALE: 3/32"= 1'-0"

4 3 2 1 0 4 8
SCALE: 1/4"= 1'-0"

DENNIS K. MITSUNAGA
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4/30/22
SIGNATURE LIC. EXPIRATION

MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CONSTRUCTION SEQUENCE PHASE 1

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

SHEET No. S0.7A OF 12 SHEETS

ORIGINAL PLAN
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KAIPAPAU STREAM BRIDGE REPLACEMENT – OVERALL CONSTRUCTION SEQUENCE

STRUCTURAL PHASE 1

Structural Construction Stage	Description	References: Civil	Electrical	Geotech.	Structural	Waterline Work	Exist Bridge Open	Detour Open	Detour Off Peak Lane Closures Anticipated	Remarks
Prior to Site Mobilization for Demolition	1. Prior to Site Mobilization, the Contractor shall submit required BMP's and other Municipal and National permit applications as indicated in the project Plans, Special Provisions and Specifications. 2. The Contractor shall submit Prefabricated Steel Beam Bridge Structural Computations and Erection drawings to the Owner for Review and Approval Prior to Fabrication.	Civil Sequence See C-11. See Civil 1 & Civil 3			Structural Sequence S0.7,S0.7A, S0.8,S0.8A		Exist Bridge Open to Traffic			
1	1. Install approved BMP measures. 2. Relocate Existing overhead utility lines.	C-18, C-21 to C-23	E-8, E-9, E-10, E-11							
2	1. Construct Trial and Load Test shafts * 2. Perform Load Test. Demobilize drilled shaft equipment off site.	See Civil 4		Special drilling equipment*	S1.1, S8.3					Special *Provisions Section 511
3	1. Install Detour Pier, Abutments and Temporary Bridge. Construct Civil temporary 16" on temporary bridge C-32; C-31. 2. Construct Detour Approach Retaining Wall, Fills and Roadway – chainlink fence see C-24. 3. Open Detour to vehicles and pedestrians. Close existing bridge. 4. Install temporary 12" fusible PVC waterline on existing (upstream) pedestrian walkway and relocate 12" waterline C-21 to C-23. 5. Connect temporary 16" waterline to existing 16" waterline, see C-31; C-33. See remark	See Civil 5 C-21 to C-24, C-31 to C-33. See Civil (5A), (5B), & (5C).	E-10, E-11, E-15	Excavation Bracing-Spec. Prov. 205*	S12.1, S12.2 S12.3, S12.4 S12.5	Phase 1 (W16) then Phase 1, 2, & 3 (W12), then Phase 2 (W16)		Detour Open to Traffic		Connection of the temp. 16" waterline to the existing 16" waterline cannot begin until after the permanent 12" waterline has been pressure tested, accepted by BWS and placed into service and the temp. 12" waterline has been removed.
4	1. Demolish existing bridge after obtaining demolition plan acceptance. 2. Demolish and remove portion of ex. 16" waterline and concrete support system as required to construct new bridge. See C-31, C-33.	C-16, C-31, C-33. See Civil 6		Excavation Bracing-Spec. Prov. 205*	S2.1, S2.2	Phase 2 (W16)	Exist Bridge Demolition			*Exc. Bracing upstream of existing.
5	Construct precast girders. (May be done concurrently with stages 1 through 4.)	See Civil 7			S4.x series					
6	Construct 4 ft. diameter drilled shafts. 1, 2, 3, 5, 6, 7. *			Special drilling equipment*	S1.1,S1.2,S6.1, S6.2,S8.1,S8.2					*Special Provisions Section 511
7	Cast phase 1 drilled shaft cap beams, girder seats, and corbels for concrete encased ducts at least 7 days after the final drilled shaft concrete pour in stage 6 or until the concrete in stage 6 has attained a compressive strength of 4,500 psi, whichever occurs later.			Structure – Excavation Bracing per Spec Prov 205 Required at Makai Limit	S0.7, S0.7A, S6.x series					Marks 7 through 18 are PHASE 1 Structural see 20 for PHASE 2
8	Erect phase 1 precast girders at least 15 days after the concrete pour in stage 7 or until the concrete in stage 7 has attained a compressive strength of 5,000 psi, whichever occurs later. Place slush grout immediately prior to placement of precast girders.				S0.7, S0.7A, S1.2, S1.3, S6.x series					
9	Construct phase 1 diaphragm "A".				S0.7,S0.7A, S5.x series					
9A	Set ducts and pour duct encasement in Bay 3				S0.7,S0.7A S1.6,S3.x series					
10	Pour phase 1 cast-in-place deck except areas over end beams.				S0.7,S0.7A, S6.x series					
11	Pour phase 1 end beams to top of precast girder and corbel at least 30 days after the concrete pour in Stage 10. The concrete pour shall occur between midnight and 3:00 AM (3 hours).									Concrete Placement At Night
12	Pour remainder of phase 1 deck concrete a minimum of 24 hours after the concrete pour in stage 11.									
13	Construct phase 1 wing walls at least 8 days after the concrete pour in stage 12 or after the concrete in stage 12 has attained a compressive strength of 5,000 psi, whichever occurs later.				S0.7,S0.7A, S7.x series				Lane Closure Duration Approx 3 weeks each abutment with Further Lane Closure Duration Approx 2 weeks each approach	
14A 14B	Backfill to phase 1 limits and to bottom of approach slab and at least 14 days after the concrete pour in Stage 13 or until the concrete in Stage 13 has attained a compressive strength of 5,000 psi; whichever occurs later. Maximum height difference of backfill between abutments shall not exceed 2 feet. Install concrete encased ducts when backfill height is at the elevation of bottom of concrete encased ducts. Continue backfilling after concrete for encased ducts has attained its 28 day compressive strength. Construct Barrier Wall. (Coordinate with 14A.)		Signal Corps Work E-1, E-5 E-12, E-13, E-16		S0.7,S0.7A,S6.x S9.x					
15	Construct phase 1 sleeper slabs.									
16	Construct phase 1 approach slabs.		Signal Corps Work E-1, E-5 E-12,E-13,E-16							
17	Blanket grind deck, approach slabs, and sleeper slabs where traffic will be allowed during construction of phase 2.									
18	Mechanically groove deck, approach slabs and sleeper slabs where traffic will be allowed during construction of phase 2									
19A	Construct mauka aesthetic railings and concrete barrier.									*Special Provisions Section 503
19B	Install mauka quadguards.									"
19C	Install Temporary Barriers and Temporary Striping on PHASE I of New Bridge.	See Civil for Barriers								

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	70	161

CONSTRUCTION SEQUENCE NOTES:

1. Order of construction sequence shall not be changed unless authorized in writing by the Engineer.
2. Each sequence stage shall be completely finished before proceeding to the next stage unless otherwise noted. The Engineer will be the sole judge of whether the sequence stage is complete, and may direct the Contractor to stop work on a sequence stage to complete work on the preceeding sequence stage.
3. Contractor shall submit overweight vehicular details for approval prior to their use.
4. Construction shall be conducted such that no construction debris, wash water or other contaminants shall enter the Stream Waters.
5. Closing of the Prefabricated Steel Beam Bridge Structure:
   (a) If for any reason or at any time, the Prefabricated Beam Bridge Structure's ability to safely carry traffic is in question, the Contractor shall be responsible for immediately taking the actions necessary to protect the public by closing, repairing and reopening the Prefabricated Steel Truss Bridge.
   (b) When the Contractor closes the Prefabricated Steel Beam Bridge Structure, the Contractor shall immediately notify the Engineer and the appropriate Law Enforcement Agency.
   (c) Closing of the Prefabricated Steel Beam Bridge shall be included as incidental to Maintenance of Traffic Control.
6. The Contractor shall phase 16 inch waterline (W16) to allow no more than 8 hours of down time. Liquidated Damages of $100,000 per day will be imposed if the Contractor exceeds the 8 hour restriction.

APPROVED:
MAY 24 2021
Manager and Chief Engineer, BWS (for work affecting BWS facilities State R/W & BWS easements only) — DATE

DENNIS K. MITSUNAGA LICENSED PROFESSIONAL ENGINEER No. 2422-S HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION
SIGNATURE — LIC. EXPIRATION 4/30/22
MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

OVERALL CONSTRUCTION SEQUENCE
STRUCTURAL PHASE 1
KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted — Date: February 2021

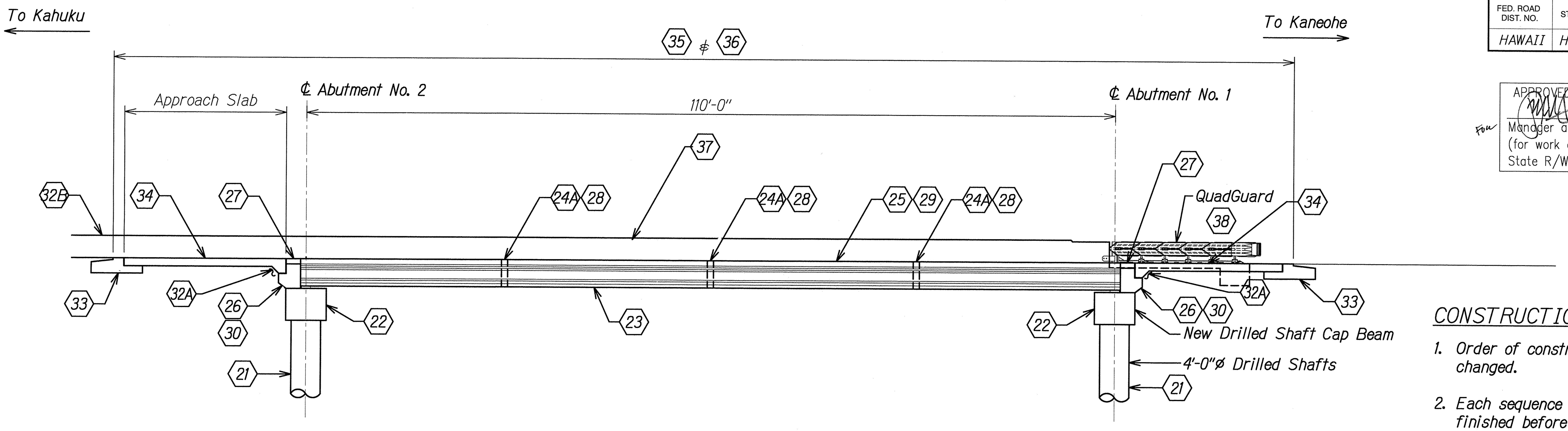
SHEET No. S0.7B OF 5 SHEETS

70

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

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	71	161

APPROVED: [signature] MAY 2 4 2021
For Manager and Chief Engineer, BWS (for work affecting BWS facilities State R/W & BWS easements only) DATE



CONSTRUCTION SEQUENCE

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

LEGEND:

⟨#⟩ Phase 2 Stages

CONSTRUCTION SEQUENCE NOTES:

1. Order of construction sequence shall not be changed.
2. Each sequence stage shall be completely finished before proceeding to the next stage unless otherwise noted. The Engineer will be the sole judge of whether the sequence stage is complete, and may direct the Contractor to stop work on a sequence stage to complete work on the preceeding sequence stage.
3. Contractor shall submit overweight vehicular details for approval prior to their use.

CONSTRUCTION SEQUENCE ELEVATION

⟨20⟩ Partially remove temporary bridge as required to construct Phase 2 of Kaipapau Stream Bridge

⟨21⟩ Construct 4 ft diameter shafts – Shaft nos. 4 and 8.

⟨22⟩ Cast Phase 2 drilled shaft cap beams and girder seats at least 7 days after the final drilled shaft concrete pour in Stage 21 or until the concrete in Stage 21 has attained a compressive strength of 4,500 psi, whichever occurs later.

⟨23⟩ Erect Phase 2 precast girders at least 15 days after the concrete pour in Stage 22 or until the concrete in Stage 22 has attained a compressive strength of 5,000 psi, whichever occurs later. Place slush grout immediately prior to placement of precast girders.

⟨24A⟩ Construct Phase 2 diaphragms "A" and "B", except diaphragms between girders G-8 and G-9.

⟨24B⟩ Construct waterline cradles.

⟨25⟩ Pour Phase 2 cast-in-place deck except areas over end beams and closure pour.

⟨26⟩ Pour Phase 2 corbel and end beams (except at closure pour) to top of precast girder at least 30 days after the concrete pour in Stage 25. The concrete pour shall occur between midnight and 3:00 AM (3 hour window).

⟨27⟩ Pour remainder of Phase 2 deck concrete (except at closure pour) a minimum of 24 hours after the concrete pour in Stage 26.

⟨28⟩ Pour Phase 2 diaphragm "A" between girders G-8 and G-9 at least 4 days after the concrete pour in Stage 27.

⟨29⟩ Pour Phase 2 cast-in-place deck closure except over end beams. Material for cast-in-place deck closure pour shall be VESLMC. (See Special Provisions).

⟨30⟩ Pour Phase 2 corbel and end beam closure from top of drilled shaft cap beam to top of deck. Material for end beam closure pour shall be VESLMC. (See Special Provisions).

⟨31A⟩ Construct Phase 2 wing walls and return wall at least 8 days after the concrete pour in Stage 30 or after the concrete in Stage 30 has attained a compressive strength of 5,000 psi, whichever occurs later.

⟨31B⟩ Install W16, W16 reaction blocks and W16 curtain wall.

⟨32A⟩ Backfill to bottom of approach slab at least 14 days after the concrete pour in Stage 31A or until the concrete in stage 31A has attained a compressive strength of 5,000 psi, whichever occurs later. Maximum height difference of backfill between abutments shall not exceed 2 feet.

⟨32B⟩ Construct Concrete Barrier Wall. (Coordinate construction of Concrete Barrier Wall with Stage 32A).

⟨33⟩ Construct Phase 2 sleeper slabs.

⟨34⟩ Construct Phase 2 approach slabs.

⟨35⟩ Blanket grind deck, approach slabs, and sleeper slabs.

⟨36⟩ Mechanically groove deck, approach slabs, and sleeper slabs.

⟨37⟩ Construct Makai aesthetic railing and concrete barrier.

⟨38⟩ Install Makai quadguards.

⟨39⟩ Remove remainder of temporary bridge.

GRAPHIC SCALE: 8 6 4 2 0 8 16 SCALE: 1/8"= 1'-0"

DENNIS K. MITSUNAGA LICENSED PROFESSIONAL ENGINEER No. 2422-S HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION
SIGNATURE 4/30/22 LIC. EXPIRATION
MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CONSTRUCTION SEQUENCE
PHASE 2

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

SHEET No. S0.8 OF 12 SHEETS

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
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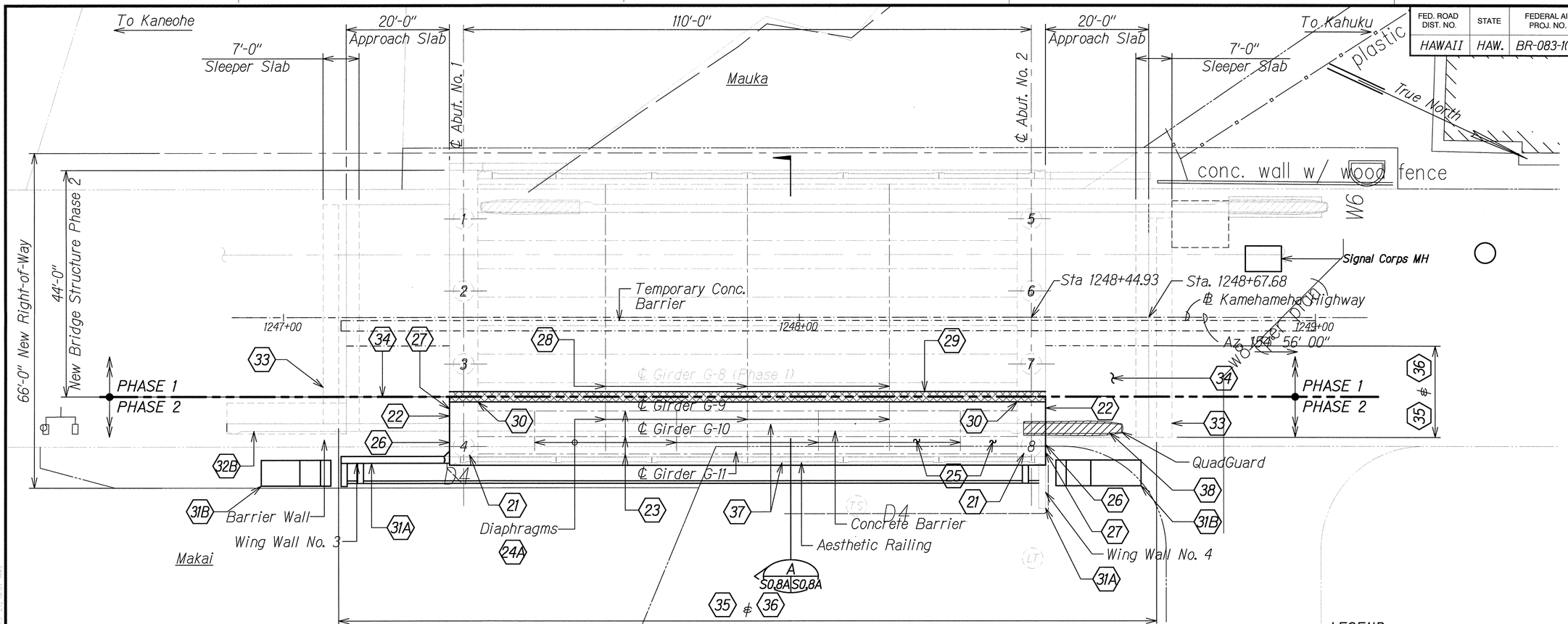
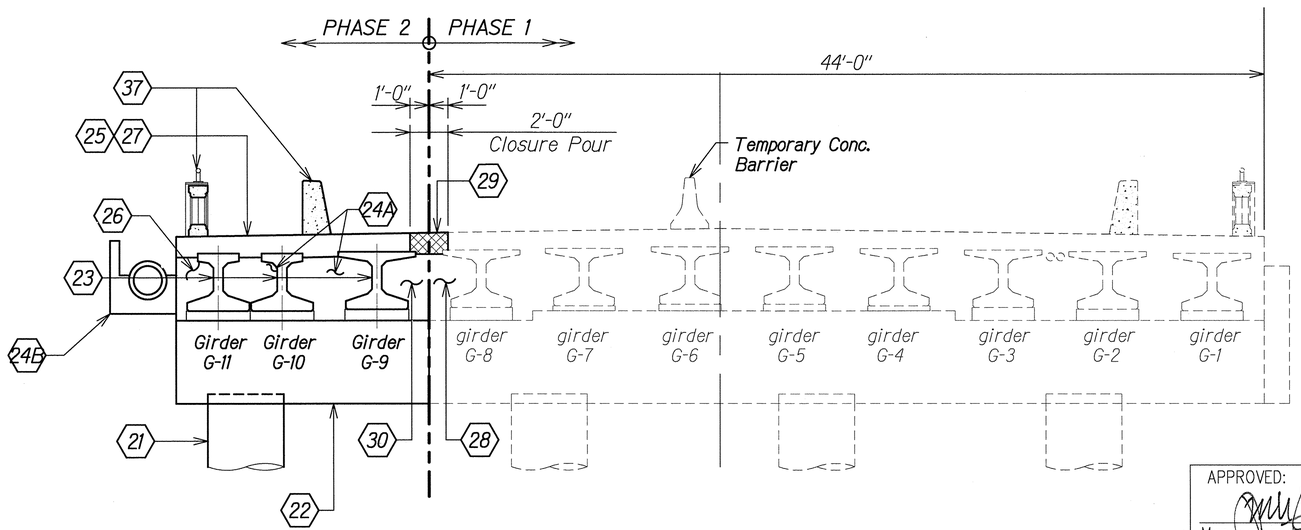
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	72	161



CONSTRUCTION SEQUENCE PLAN (PHASE 2)

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



CONSTRUCTION SEQUENCE (PHASE 2)

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

A S6.3 | S6.3

LEGEND:

- (#) Construction Sequence Stage
- (#) Drilled Shaft ID
- (TS) Trial Shaft
- (LT) Load Test Shaft
- Closure Pour

GRAPHIC SCALES:

1FT 6 0 1FT 2FT
SCALE: 3/32"= 1'-0"

4 3 2 1 0 4 8
SCALE: 1/4"= 1'-0"

APPROVED:

for Manager and Chief Engineer, BWS
(for work affecting BWS facilities
State R/W & BWS easements only)

MAY 24 2021
DATE

DENNIS K. MITSUNAGA
LICENSED PROFESSIONAL ENGINEER
No. 2422-S
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

SIGNATURE 4/30/22 LIC. EXPIRATION

MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CONSTRUCTION SEQUENCE PHASE 2

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

SHEET No. S0.8A OF 12 SHEETS

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

DRAWING NAME: T:\PROJECTS\13-01 KAIPAPAU BRIDGE\S\$ REVISED STRUCT\$_051221\KSR-S0.8A.DWG PLOT TIME: 05-13-21 8:07 AM

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	73	161

KAIPAPAU STREAM BRIDGE REPLACEMENT – OVERALL CONSTRUCTION SEQUENCE

Structural Construction Stage	Description	References: Civil	References: Electrical	References: Geotech.	References: Structural	Waterline Work	Exist Bridge Open	Detour Open	Detour Off Peak Lane Closures Anticipated	Remarks
20	1. Open PHASE I of New Bridge to traffic. Close Temporary Bridge and Detour Roadway to traffic. 2. Remove Mauka portion of Temporary Bridge Only (Remainder to remain in place to support construction equipment for construction of PHASE 2 portion of New Bridge and to support temporary W16 until Final W16 is constructed).	See Civil 8			S0.8, S0.8A		PHASE I of New Bridge Open to Traffic to allow Detour Closure	Close Detour and Remove Limited Portion of Temporary Bridge	Not Applicable	Close Detour; Open PHASE 1 of New Bridge: Start Construction of PHASE 2 of New Bridge
STRUCTURAL PHASE 2 — 21	Construct 4 ft. diameter drilled shafts – Shaft nos. 4 and 8.	See Civil 8		Special drilling equipment*	S1.1, S1.2, S6.1, S6.2, S8.1, S8.2			Detour Closed		*Special Provisions Section 511
22	Cast Phase 2 drilled shaft cap beams and girder seats at least 7 days after the final drilled shaft concrete pour in stage 21 or until the concrete in stage 21 has attained a compressive strength of 4,500 psi, whichever occurs later.			Structure Excavation Bracing per Spec for 205 Required at Approaches.	S0.8, S0.8A, S6.x series					Special Provisions Section 205
23	Erect Phase 2 precast girders at least 15 days after the concrete pour in stage 22 or until the concrete in stage 22 has attained a compressive strength of 5,000 psi, whichever occurs later. Place slush grout immediately prior to placement of precast girders.				S0.8, S0.8A, S1.2, S1.3, S6.x series	Civil Phase 3 (W16) waterline improvements seeC-30,C33				Connection of the temp. 16" waterline to the existing 16" waterline cannot begin until after the permanent 12" waterline has been pressure tested, accepted by BWS and placed into service and the temp. 12" waterline has been removed.
24A	Construct Phase 2 diaphragms "A" and "B", except diaphragms between girders G-8 and G-9.	C-34			S0.8,S0.8A, S5.x series					
24B	Construct Waterline cradles									
25	Pour Phase 2 cast-in-place deck except areas over end beams and closure pour.				S0.8,S0.8A S1.6,S3.x series					
26	Pour Phase 2 end beams (except at closure pour) to top of precast girder and corbel at least 30 days after the concrete pour in Stage 25. The concrete pour shall occur between midnight and 3:00 AM (3 hours).				S0.8,S0.8A, S6.x series					Concrete Placement At Night
27	Pour remainder of Phase 2 deck concrete (except at closure pour) a minimum of 24 hours after the concrete pour in stage 26.									
28	Pour Phase 2 diaphragm "A" between girders G-8 and G-9 at least 4 days after the concrete pour in stage 27.									
29	Pour Phase 2 cast-in-place deck closure except over end beams. Material for cast-in-place deck closure pour shall be VESLMC.									
30	Pour Phase 2 end beams closure from top of drilled shaft cap beam to top of deck. Material for end beam closure pour shall be VESLMC.									
31A	Construct Phase 2 wing walls and return wall at least 8 days after the concrete pour in stage 30 or after the concrete in stage 30 has attained a compressive strength of 5,000 psi, whichever occurs later.				S0.8,S0.8A, S7.x series					
31B	Install W16, W16 reaction blocks and W16 curtain wall.	C-34								
32A / 32B	Backfill to bottom of approach slab at least 14 days after the concrete pour in Stage 31A or until the concrete in Stage 31A has attained a compr. strength of 5,000 psi, whichever occurs later. Max. height difference of backfill between abutments shall not exceed 2 feet. Install jacketed waterline when backfill height is at the elevation of bot. of the jacketed waterline. Continue backfilling after concrete for jacketed waterline has attained its 28 day compr. strength. Construct Barrier Wall.				S0.8,S0.8A,S6.x S9.x					
33	Construct Phase 2 sleeper slabs.									
34	Construct Phase 2 approach slabs.									
35	Blanket grind deck, approach slabs and sleeper slabs									
36	Mechanically groove deck, approach slabs, and sleeper slabs									
37	Construct Makai aesthetic railings and concrete barrier.									
38	Install Makai guadguard. Remove Detour; construct stream hardening. Remove Temporary Barriers at New Bridge. Open Phase 1 and Phase 2 of New Bridge to traffic.	See Civil 8 thru 12	Permanent Electrical Plan See E-12,E-13, E-14			Remove temp W16 at Closed Detour	PHASE I and PHASE 2 of New Bridge Open	Remove Remainder of Detour		

CONSTRUCTION SEQUENCE NOTES:

1. Order of construction sequence shall not be changed unless authorized in writing by the Engineer.
2. Each sequence stage shall be completely finished before proceeding to the next stage unless otherwise noted. The Engineer will be the sole judge of whether the sequence stage is complete, and may direct the Contractor to stop work on a sequence stage to complete work on the preceeding sequence stage.
3. Contractor shall submit overweight vehicular details for approval prior to their use.
4. Construction shall be conducted such that no construction debris, wash water or other contaminants shall enter the Stream Waters.
5. Closing of the Prefabricated Steel Beam Bridge Structure:
   (a) If for any reason or at any time, the Prefabricated Beam Bridge Structure's ability to safely carry traffic is in question, the Contractor shall be responsible for immediately taking the actions necessary to protect the public by closing, repairing and reopening the Prefabricated Steel Truss Bridge.
   (b) When the Contractor closes the Prefabricated Steel Beam Bridge Structure, the Contractor shall immediately notify the Engineer and the appropriate Law Enforcement Agency.
   (c) Closing of the Prefabricated Steel Beam Bridge shall be included as incidental to Maintenance of Traffic Control.

   The Contractor shall phase 16 inch waterline (W16) to allow no more than 8 hours of down time. Liquidated Damages of $100,000 per day will be imposed if the Contractor exceeds the 8 hour restriction.
6. APPROVED: [signature] MAY 24 2021
   For Manager and Chief Engineer, BWS DATE
   (for work affecting BWS facilities State R/W & BWS easements only)

DENNIS K. MITSUNAGA LICENSED PROFESSIONAL ENGINEER No. 2422-S HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION
[signature] 4/30/22
SIGNATURE LIC. EXPIRATION
MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

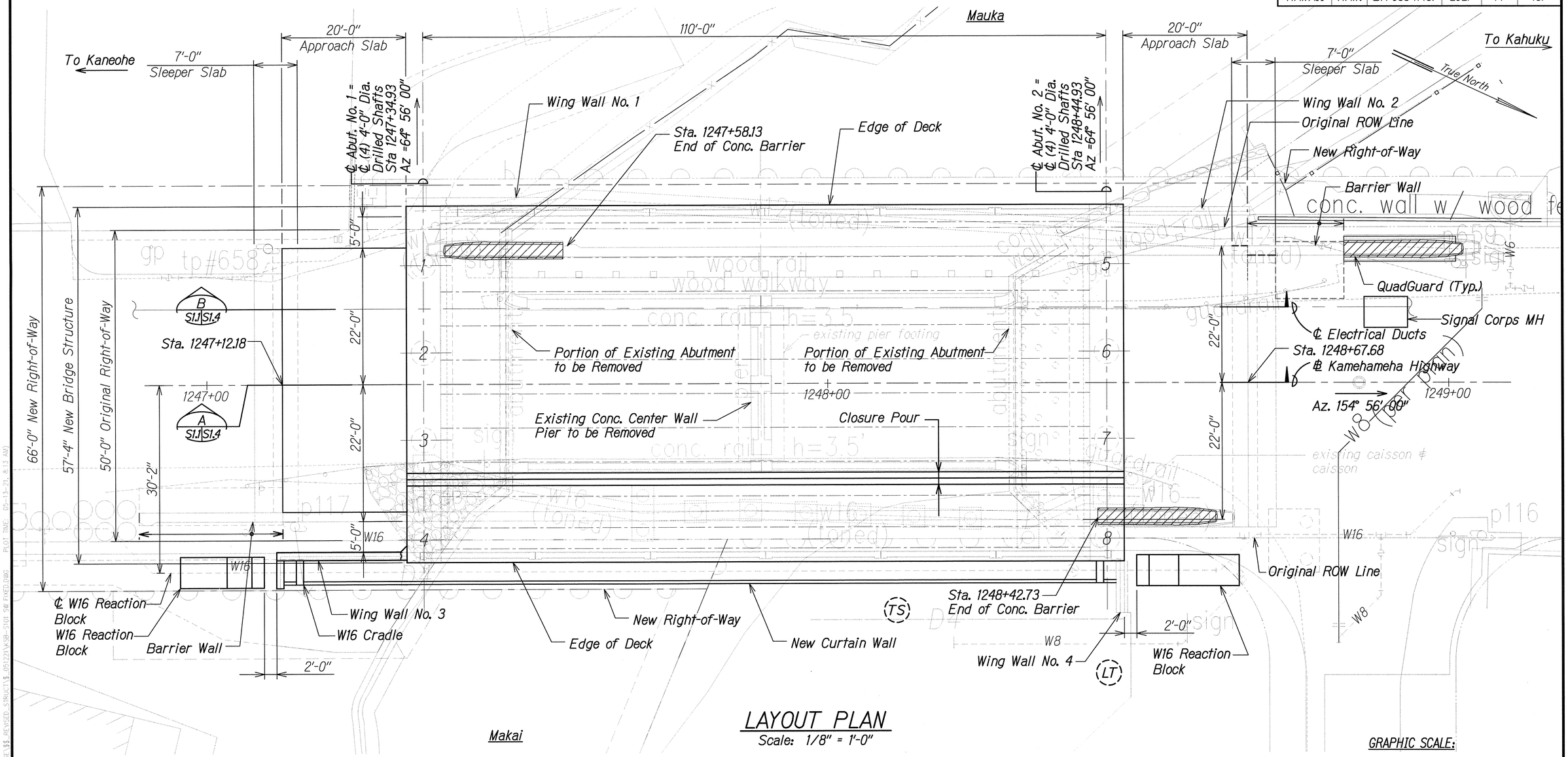
OVERALL CONSTRUCTION SEQUENCE
STRUCTURAL PHASE 2
KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

SHEET No. S0.8B OF 5 SHEETS

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

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	74	161



Makai

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

GRAPHIC SCALE:
8 6 4 2 0 8 16
SCALE: 1/8"= 1'-0"

LEGEND:

(#) Drilled Shaft ID

(TS) Trial Shaft

(LT) Load Test Shaft

Note:

Balance of W16 cradles are not shown for clarity. See sheet S11.1 and S11.1A for details.

APPROVED:
For Manager and Chief Engineer, BWS
(for work affecting BWS facilities State R/W & BWS easements only)
MAY 2 4 2021
DATE

DENNIS K. MITSUNAGA
LICENSED PROFESSIONAL ENGINEER
No. 2422-S
HAWAII, U.S.A.
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION
SIGNATURE 4/30/22 LIC. EXPIRATION
MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

LAYOUT PLAN

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

SHEET No. S1.1 OF 6 SHEETS

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

DRAWING NAME: T:\PROJECTS\1-ACTIVE FILES\913-01 KAIPAPAU BRIDGE $$ REVISED STRUCT\$ 051221\KS8-S101 SW FIXED.DWG PLOT TIME: 05-13-21, 8:13 AM

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	75	161

FOUNDATION PLAN

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

GRAPHIC SCALE:

8 6 4 2 0 8 16

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

LEGEND:

(#) Drilled Shaft ID

(TS) Trial Shaft

(LT) Load Test Shaft

References:

1. See Sheet S6.1 for Abutment No. 1 Plan.
2. See Sheet S6.2 for Abutment No. 2 Plan.
3. See Sheets S8.1 through S8.3 for Drilled Shaft Details (Including Load Test Shaft)

APPROVED:

MAY 2 4 2021

Manager and Chief Engineer, BWS DATE

(for work affecting BWS facilities State R/W & BWS easements only)

DENNIS K. MITSUNAGA LICENSED PROFESSIONAL ENGINEER No. 2422-S HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

SIGNATURE 4/30/22 LIC. EXPIRATION

MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

FOUNDATION PLAN

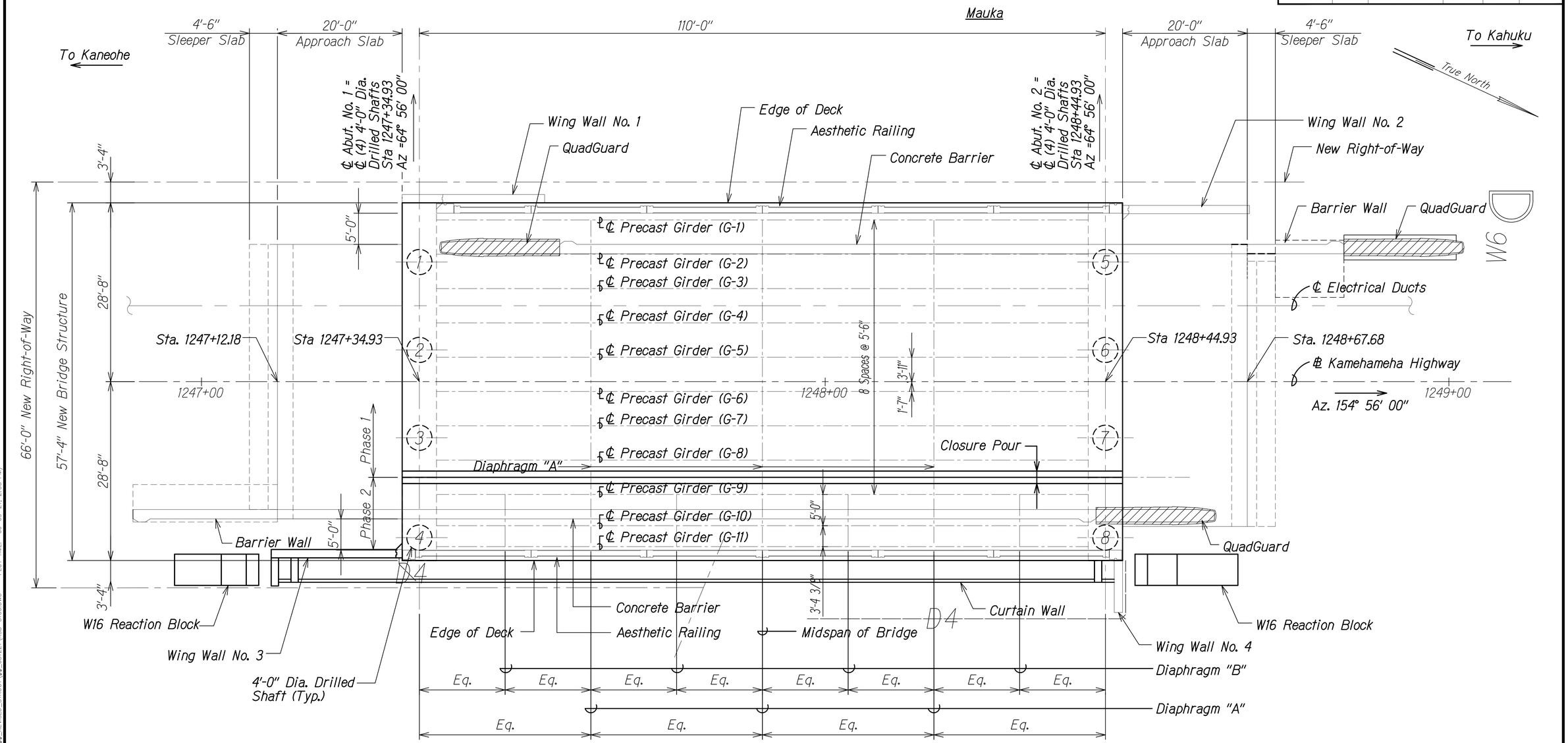
KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

SHEET No. S1.2 OF 6 SHEETS

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

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	76	161



Makai

DECK FRAMING PLAN

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

LEGEND:

(#) Drilled Shaft ID

References:

1. See Sheets S4.1 through S4.5 for Precast Girder Details.
2. See Sheets S5.1 through S5.2 for Diaphragm Details.
3. W16 Cradles are not shown for clarity. See Sheet S11.1 for Details.

GRAPHIC SCALE:

8 6 4 2 0 8 16

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

DENNIS K. MITSUNAGA ★ LICENSED PROFESSIONAL ENGINEER ★ No. 2422-S ★ HAWAII, U.S.A.

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4/30/22

SIGNATURE LIC. EXPIRATION

MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DECK FRAMING PLAN

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

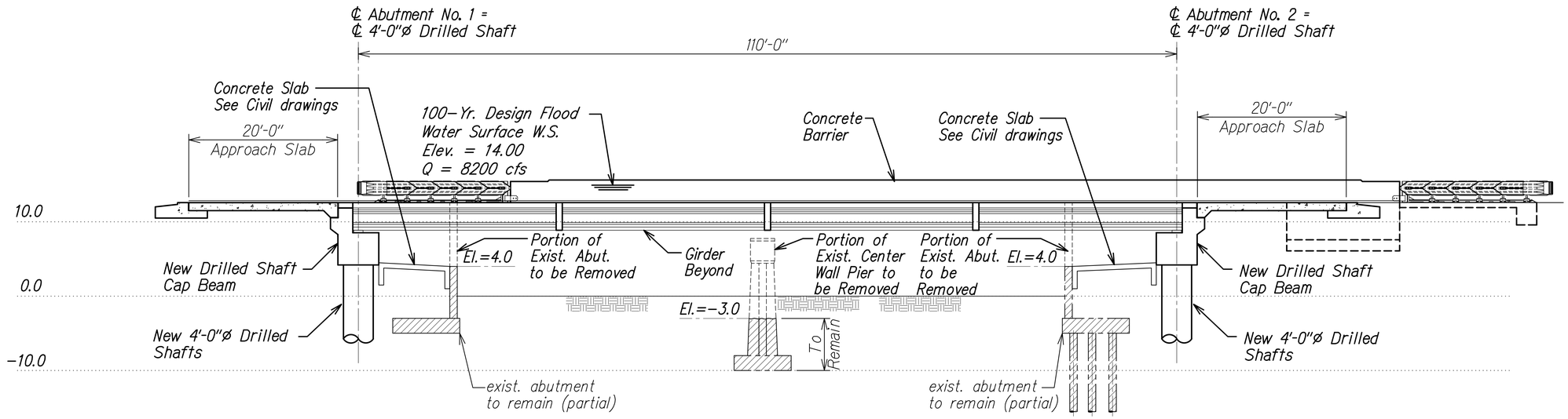
SHEET No. S1.3 OF 6 SHEETS

ORIGINAL PLAN | NOTE BOOK | No.

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

DRAWING NAME: T:\PROJECTS\1-ACTIVE FILES\913-01_KAIPAPAU BRIDGE\$$_REVISED_STRUCT\$$_051221\KSB-S103.DWG PLOT TIME: 06-09-21, 2:58 PM)

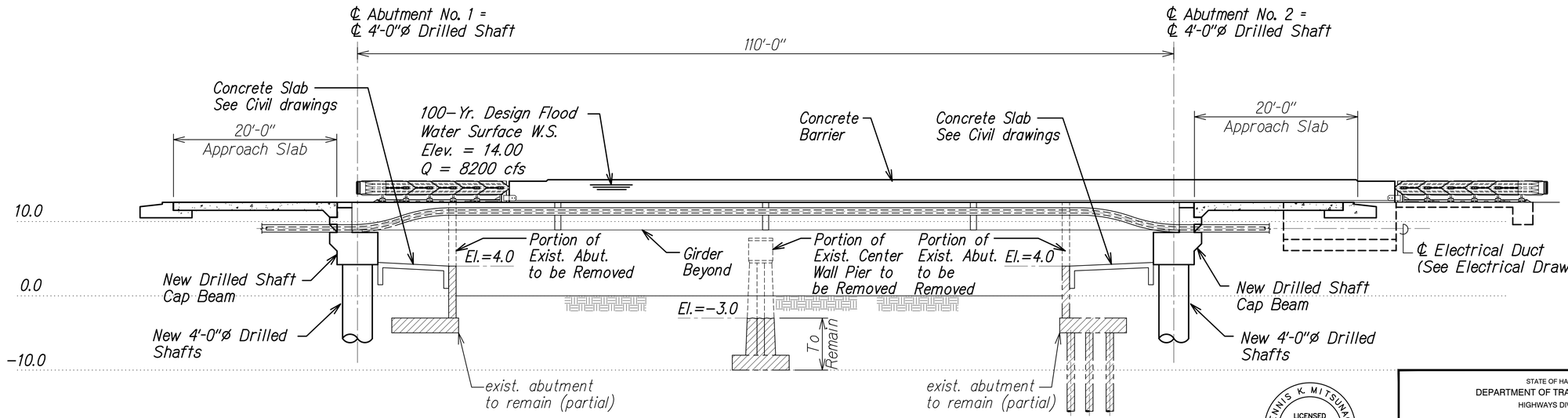
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	77	161



LONGITUDINAL SECTION AT BASELINE (A)

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

S1.1 | S1.4



LONGITUDINAL SECTION AT ELECTRICAL DUCTS (B)

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

S1.1 | S1.4

GRAPHIC SCALE:

8 6 4 2 0 8 16

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

DENNIS K. MITSUNAGA
LICENSED PROFESSIONAL ENGINEER
No. 2422-S
HAWAII, U.S.A.

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SIGNATURE — 4/30/22 LIC. EXPIRATION

MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

LONGITUDINAL SECTION

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

SHEET No. S1.4 OF 6 SHEETS

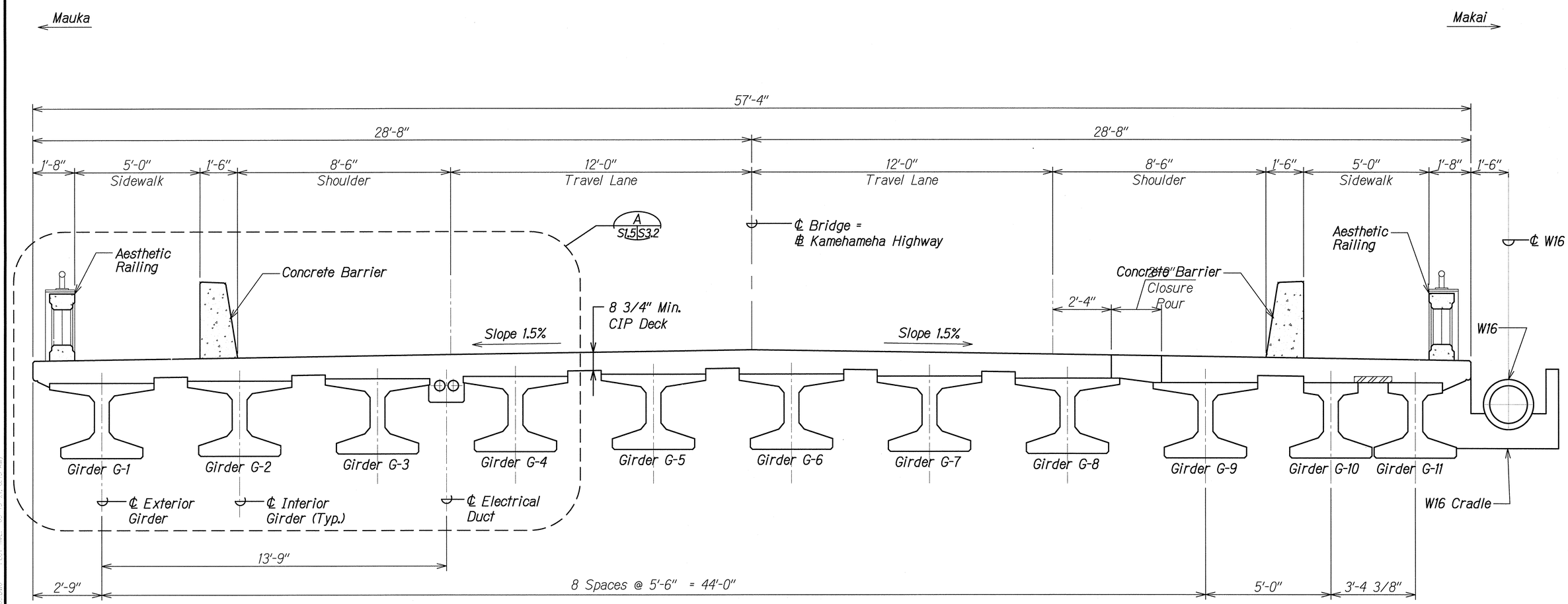
77

ORIGINAL PLAN
NOTE BOOK
No.

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

DRAWING NAME: T:\PROJECTS\1-ACTIVE FILES\913-01_KAIPAPAU BRIDGE\$$_REVISED_STRUCT\$$_051221\KSB-S104.DWG PLOT TIME: 06-09-21, 2:59 PM)

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	78	161



TYPICAL SECTION A S1.5 S1.5

Scale: 1/2" = 1'-0"

GRAPHIC SCALE:

2 1 0 2 4

SCALE: 1/2"= 1'-0"

APPROVED:

MAY 2 4 2021

for Manager and Chief Engineer, BWS DATE

(for work affecting BWS facilities State R/W & BWS easements only)

DENNIS K MITSUNAGA LICENSED PROFESSIONAL ENGINEER No. 2422-S HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

4/30/22

SIGNATURE LIC. EXPIRATION

MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPICAL SECTION

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

SHEET No. S1.5 OF 6 SHEETS

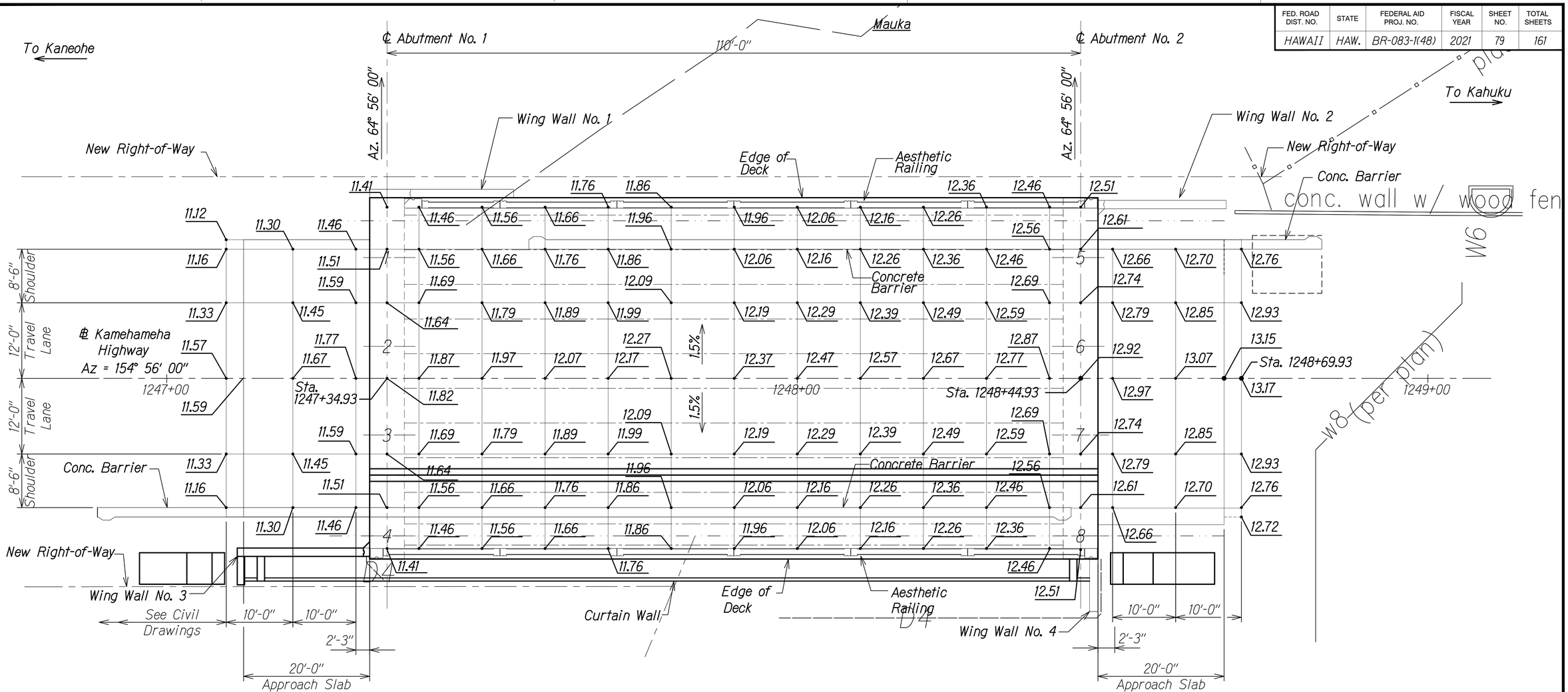
78

ORIGINAL PLAN
NOTE BOOK
No.

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

DRAWING NAME: T:\PROJECTS\1-ACTIVE FILES\913-01_KAIPAPAU BRIDGE\S\S_REVISED_STRUCT\S_051121\KSB-S105.DWG PLOT TIME: 05-13-21, 8:15 AM

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	79	161



Makai

LEGEND:

(#) *Drilled Shaft ID*

0.00 *Denotes Finish Deck Elevation at 10 ft. Intervals. See Civil Drawings for Baseline Profile*

FINAL DECK ELEVATION PLAN

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

A S1.6 | S1.6

GRAPHIC SCALE:

8 6 4 2 0 8 16

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

DENNIS K. MITSUNAGA — LICENSED PROFESSIONAL ENGINEER — No. 2422-S — HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

4/30/22

SIGNATURE LIC. EXPIRATION

MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

FINAL DECK ELEVATION PLAN

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

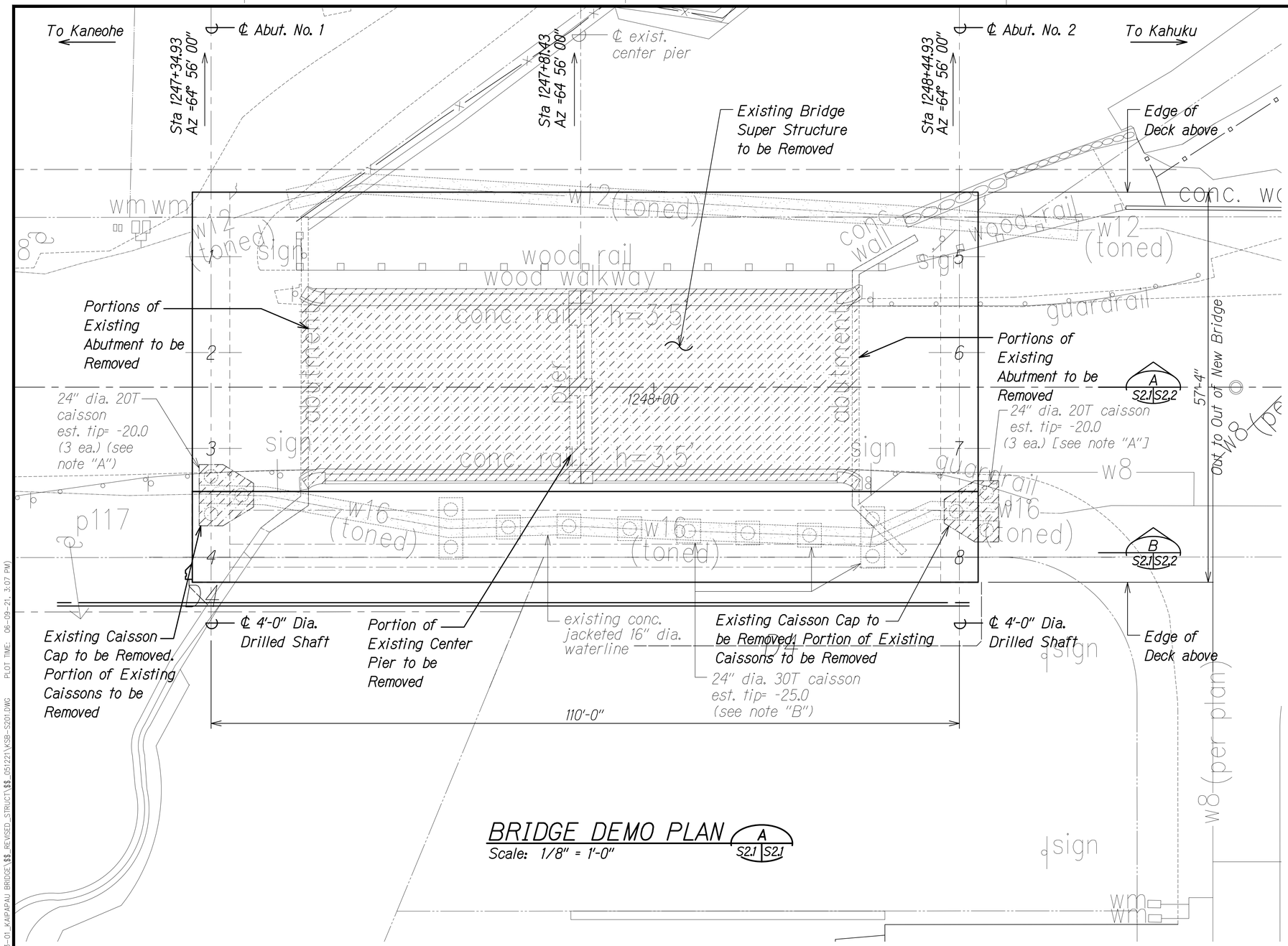
SHEET No. S1.6 OF 6 SHEETS

ORIGINAL PLAN | NOTE BOOK | No.

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

DRAWING NAME: T:\PROJECTS\1-ACTIVE FILES\913-01_KAIPAPAU BRIDGE\$$_REVISED_STRUCT\$$_051221\KSB-S106.DWG PLOT TIME: 06-09-21, 3:00 PM)

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	80	161



BRIDGE DEMO PLAN (A S2.1 | S2.1)

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

Note:

Load test shaft and trial shaft not shown for clarity.

Notes to Demolition Plan:

1. Structure backfill after removal shall comply with Special Provisions Section 205 and shall be incidental to Removal of Existing Concrete Bridge.
2. Removal of Existing End Posts and End Post Footings shall be incidental to Removal of Existing Concrete Bridge.
3. Explosive blasting is prohibited.
4. Demolition work Shall Comply with the specifications, Special Provision Section 202; AASHTO Guide Design Specification for Bridge Temporary Works and AASHTO Construction Handbook for Bridge Temporary Works; Including all subsequent interim revisions. The most stringent requirements shall govern.
5. The Demolition work shall:
   a. Facilitate Removal of Existing Concrete Bridge and Drilled Shaft Work.
   b. Promote/ensure Best Management Practices Required for Construction.
   c. Be incidental to Removal of Existing Concrete Bridge.

Note "A"

24" dia. 20T Caisson estimated to be embedded 5 ft. into mudrock. Approx. Tip Elev.= -20.0

Note "B"

24" dia. 30T Caisson estimated to be embedded 10 ft. into hardrock. Approx. Tip Elev.= -25.0

GRAPHIC SCALE:

8 6 4 2 0 8 16

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

DENNIS K. MITSUNAGA LICENSED PROFESSIONAL ENGINEER No. 2422-S HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

SIGNATURE 4/30/22 LIC. EXPIRATION

MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

EXISTING BRIDGE DEMOLITION PLAN

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

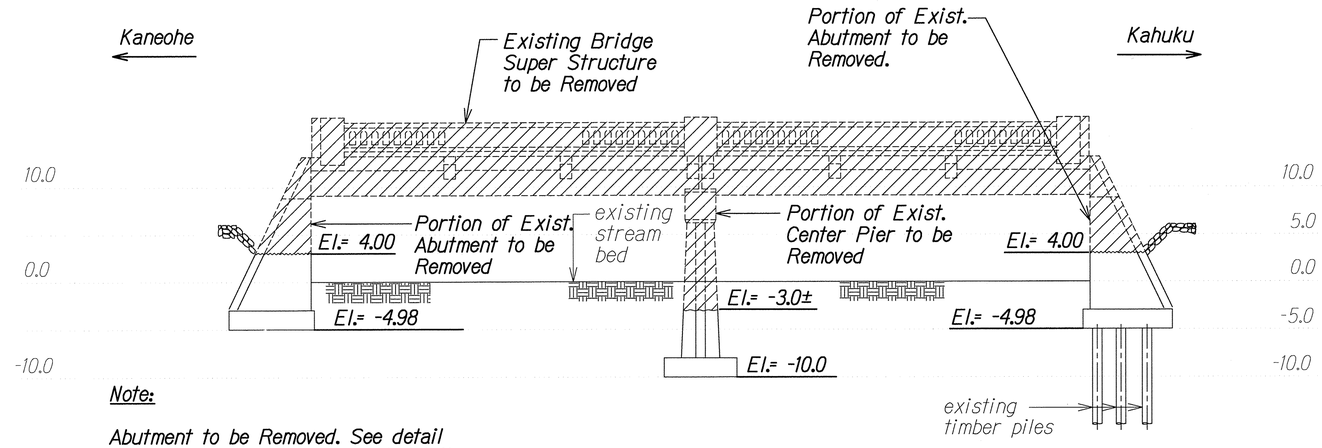
Scale: As Noted Date: February 2021

SHEET No. S2.1 OF 2 SHEETS

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

DRAWING NAME: T:\PROJECTS\1-ACTIVE FILES\913-01_KAIPAPAU BRIDGE\$$_REVISED_STRUCT\$$_051221\KSB-S201.DWG PLOT TIME: 06-09-21, 3:07 PM)

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	81	161

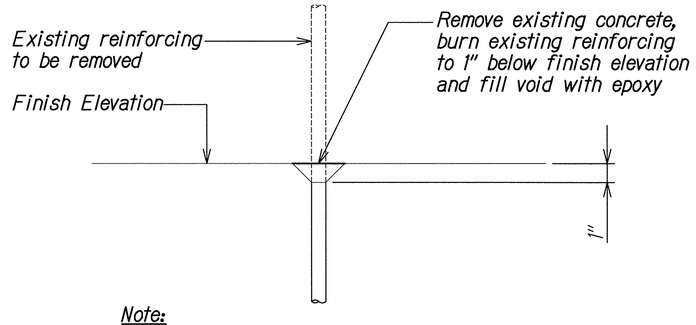


Note:

Abutment to be Removed. See detail 1/S-2 for reinforcing removal detail.

EXISTING BRIDGE DEMOLITION ELEVATION (A S2.1 | S2.2)

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

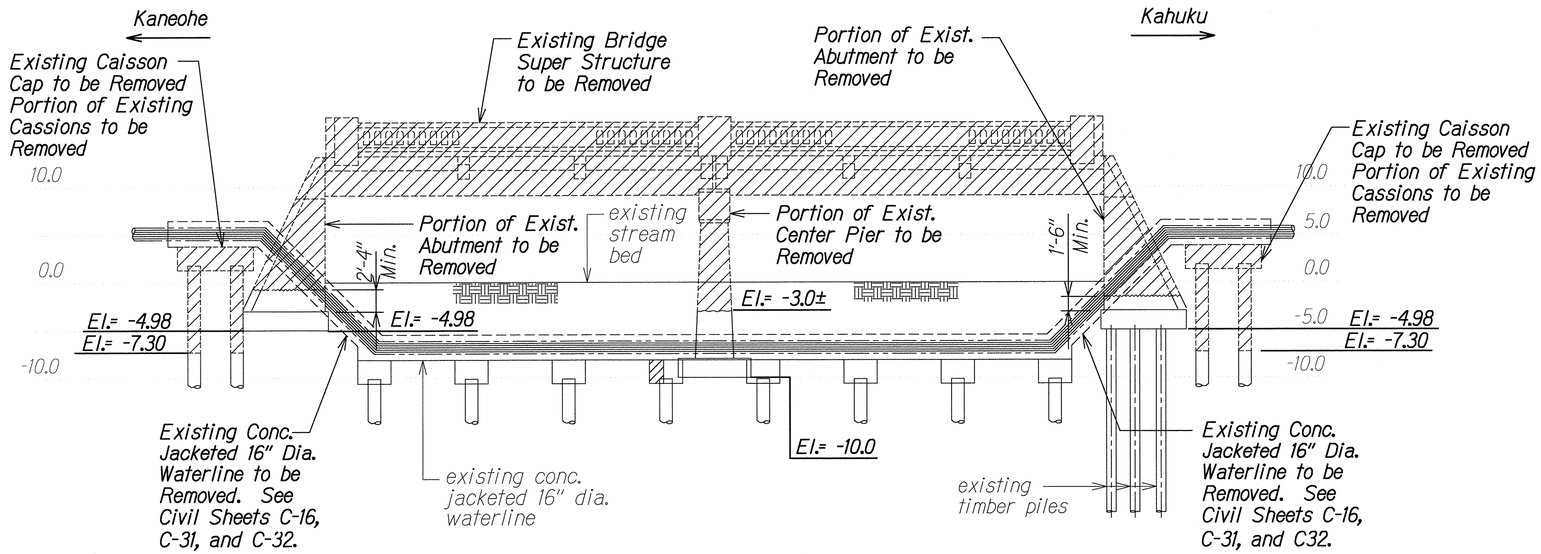


Note:

Top of existing abutment and pier after demolition shall be surface finished with a cement mortar paste.

REINFORCING REMOVAL DETAIL (1 S2.2 | S2.2)

Scale: 3" = 1'-0"



EXISTING CONCRETE JACKET & CAISSON FOUNDATION AT EXISTING 16" DIA. WATERLINE (B S2.1 | S2.2)

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

GRAPHIC SCALE:

8 6 4 2 0 8 16

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

APPROVED:

MAY 2 4 2021

Manager and Chief Engineer, BWS (for work affecting BWS facilities State R/W & BWS easements only) — DATE

DENNIS K. MITSUNAGA LICENSED PROFESSIONAL ENGINEER No. 2422-S HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

4/30/22

SIGNATURE — LIC. EXPIRATION

MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

EXISTING BRIDGE DEMOLITION SECTIONS

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted — Date: February 2021

SHEET No. S2.2 OF 2 SHEETS

ORIGINAL PLAN | NOTE BOOK | No.

SURVEY PLOTTED BY
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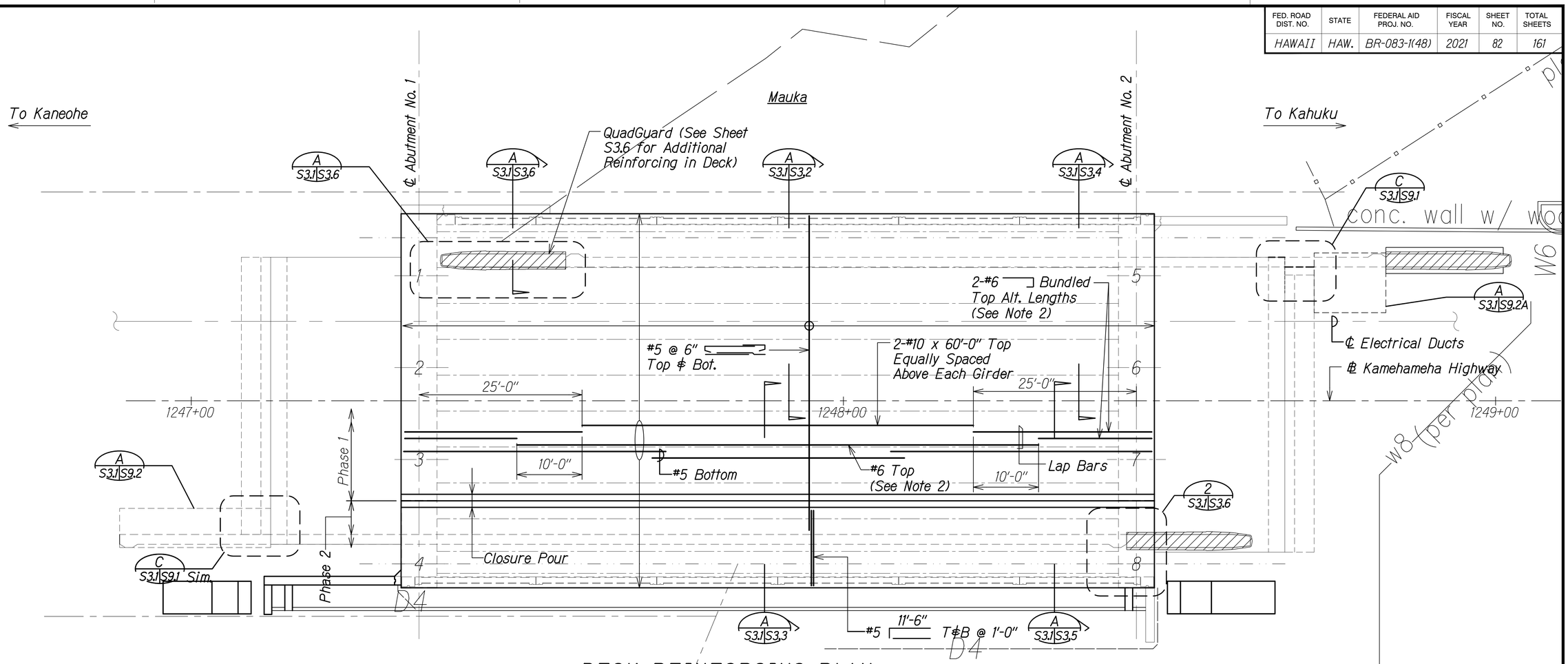
DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE

DRAWING NAME: T:\PROJECTS\1-ACTIVE FILES\913-01_KAIPAPAU BRIDGE\$$_REVISED_STRUCT\$_051221\WSB-SC01.DWG PLOT TIME: (05-13-21, 8:17 AM)

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	82	161



DECK REINFORCING PLAN

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

Notes:

1. #5 Bottom longitudinal rebars shall be composed of three equal lengths with two splice locations at 1/3 points of bridge span.
2. See sheets S3.2 through S3.5. for rebar spacing.

GRAPHIC SCALE:

8 6 4 2 0 8 16

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

DENNIS K. MITSUNAGA LICENSED PROFESSIONAL ENGINEER No. 2422-S HAWAII, U.S.A.

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4/30/22

SIGNATURE LIC. EXPIRATION

MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DECK REINFORCING PLAN

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

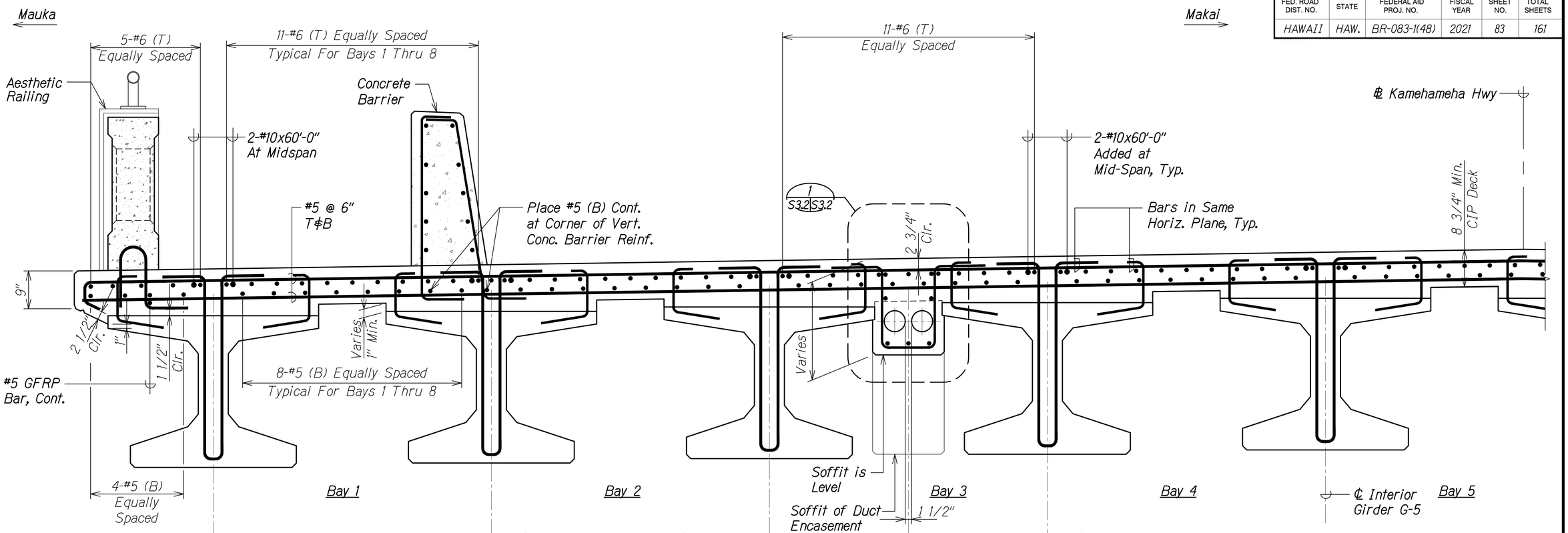
SHEET No. S3.1 OF 7 SHEETS

ORIGINAL PLAN
NOTE BOOK
No.

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

DRAWING NAME: T:\PROJECTS\1--ACTIVE FILES\913--01_KAIPAPAU BRIDGE\$$_REVISED_STRUCT\$$_051221\KSB-S301.DWG PLOT TIME: 06-09-21, 3:08 PM)

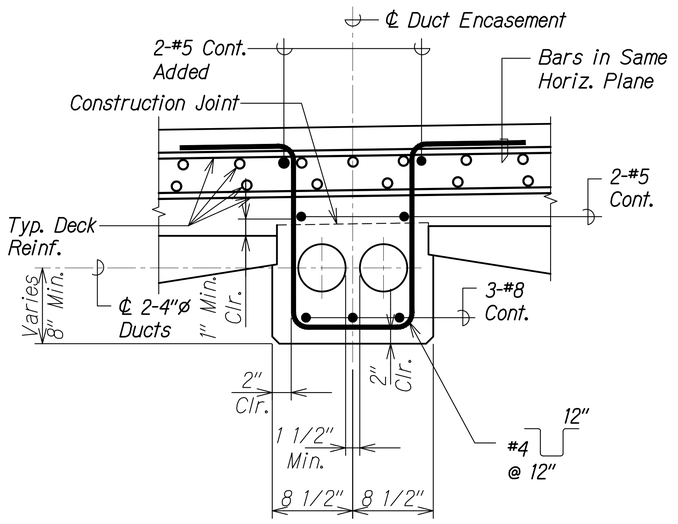
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	83	161



SECTION NEAR MIDSPAN

A S3.1 S3.2

Scale: 1" = 1'-0"



DUCT ENCASEMENT DETAIL

1 S3.2 S3.2 S3.4

Scale: 1 1/2" = 1'-0"

References:

1. See sheets S4.1 through S4.5 for balance of prestressed girder details.
2. See sheets S10.3 through S10.5 for aesthetic railing details.
3. See section B/S9.1 for concrete barrier details.
4. See sheet S10.2 for joints in concrete barrier.

GRAPHIC SCALES:

1 0 1 2

SCALE: 1"= 1'-0"

1 0 1FT

SCALE: 1 1/2"= 1'-0"

DENNIS K. MITSUNAGA LICENSED PROFESSIONAL ENGINEER No. 2422-S HAWAII, U.S.A.

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MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PARTIAL DECK AND DUCT ENCASEMENT DETAIL

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

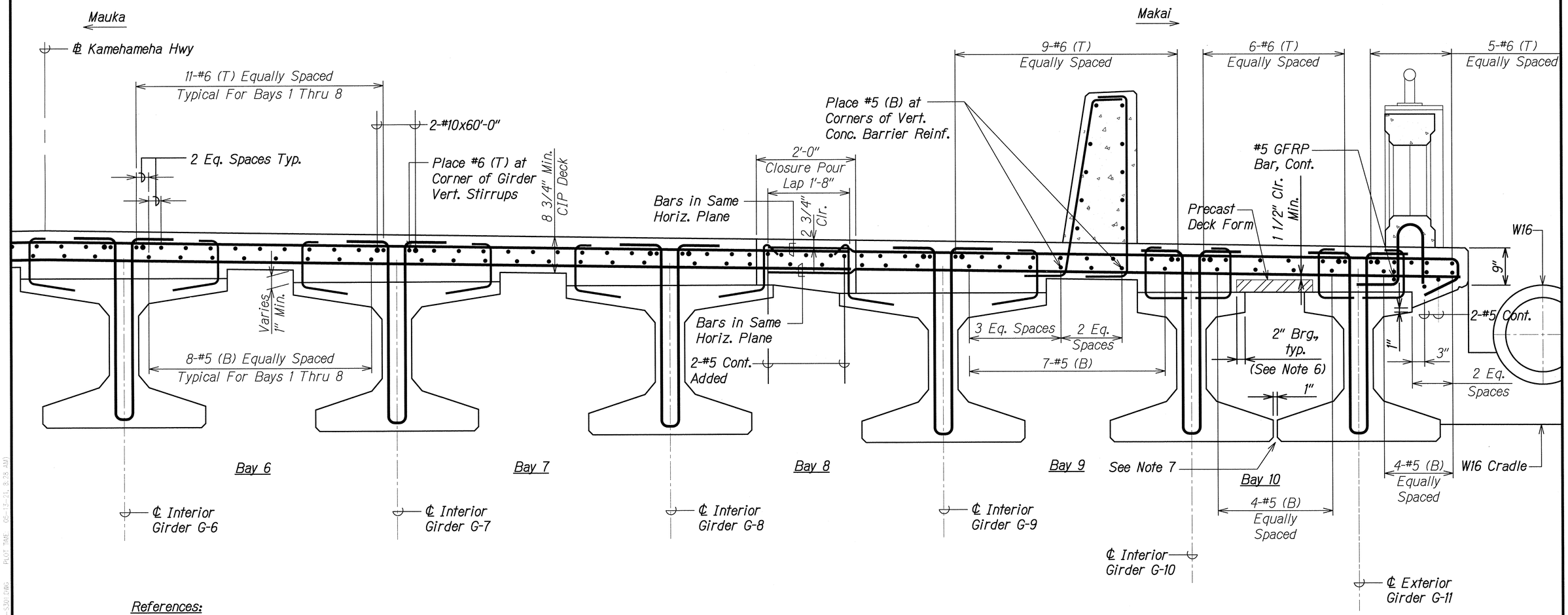
Scale: As Noted Date: February 2021

SHEET No. S3.2 OF 7 SHEETS

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

DRAWING NAME: T:\PROJECTS\1-ACTIVE FILES\913-01_KAIPAPAU BRIDGE\$$_REVISED_STRUCT\$$_051221\KSB-S301.DWG PLOT TIME: 06-09-21, 3:09 PM

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	84	161



SECTION NEAR MIDSPAN (A, S3.1 | S3.3)

Scale: 1" = 1'-0"

References:

1. See sheets S4.1 through S4.5 for balance of prestressed girder details.
2. See sheets S10.3 through S10.5 for aesthetic railing details.
3. See section B/S9.1 for concrete barrier details.
4. See sheet S10.2 for joints in concrete barrier.
5. See sheet S11.1 for W16 cradle.
6. Precast deck forms shall be supported on a continuous, 1/4" minimum thick, non-shrink grout bed.
7. Fill 1" gap with non-shrink grout over a length of 1'-6" centered on W16 cradle. Fill gap prior to pouring cradle.

GRAPHIC SCALE:

1 0 1 2

SCALE: 1"= 1'-0"

APPROVED:

For Manager and Chief Engineer, BWS
(for work affecting BWS facilities
State R/W & BWS easements only)

MAY 2 4 2021
DATE

DENNIS K. MITSUNAGA
LICENSED PROFESSIONAL ENGINEER
No. 2422-S
HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PARTIAL DECK SECTION

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

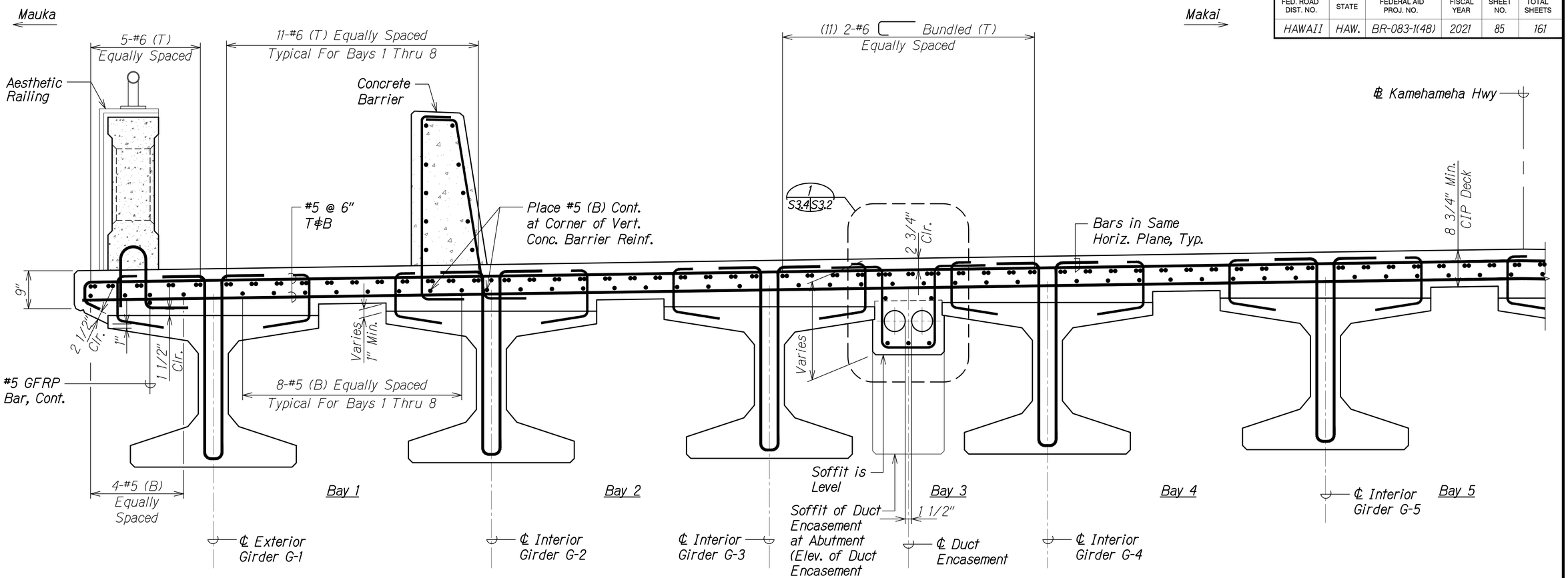
Scale: As Noted Date: February 2021

SHEET No. S3.3 OF 7 SHEETS

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

DRAWING NAME: T:\PROJECTS\13-01 KAIPAPAU BRIDGE\SS REVISED_STRUCTS_051221\V-S0-S30.DWG PLOT TIME: 05-13-21, 8:28 AM)

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	85	161



SECTION NEAR ABUTMENT

A S3.1 | S3.4

Scale: 1" = 1'-0"

References:

1. See sheets S4.1 through S4.5 for balance of prestressed girder details.
2. See sheets S10.3 through S10.5 for aesthetic railing details.
3. See section B/S9.1 for concrete barrier details.
4. See sheet S10.2 for joints in concrete barrier.

GRAPHIC SCALE:

1 0 1 2

SCALE: 1"= 1'-0"

DENNIS K. MITSUNAGA LICENSED PROFESSIONAL ENGINEER No. 2422-S HAWAII, U.S.A.

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SIGNATURE 4/30/22 LIC. EXPIRATION

MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PARTIAL DECK SECTION

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

SHEET No. S3.4 OF 7 SHEETS

ORIGINAL PLAN | NOTE BOOK | No.

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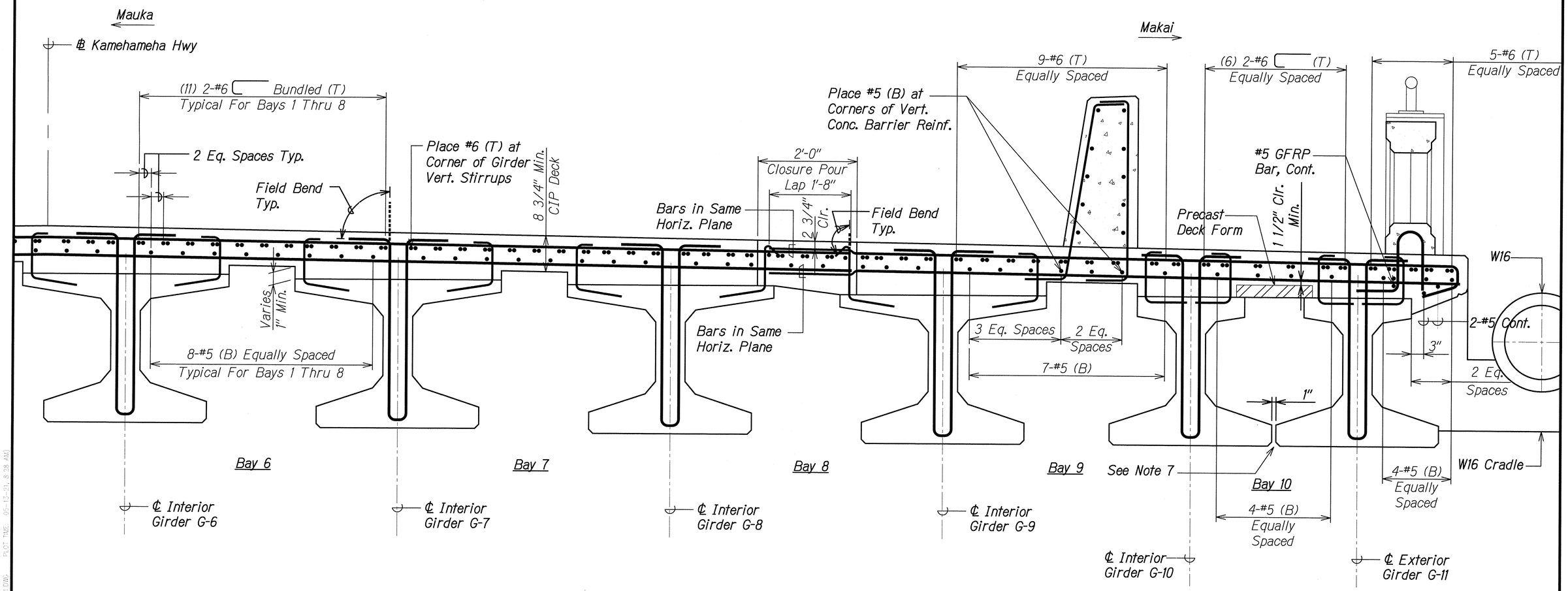
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE

DRAWING NAME: T:\PROJECTS\1-ACTIVE FILES\913-01_KAIPAPAU BRIDGE\$$_REVISED_STRUCT\$$_051221\KSB-S301.DWG PLOT TIME: 06-09-21, 3:10 PM

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	86	161



SECTION NEAR ABUTMENT

A
S3.1 | S3.5

Scale: 1" = 1'-0"

References:

1. See sheets S4.1 through S4.5 for balance of prestressed girder details.
2. See sheets S10.3 through S10.5 for aesthetic railing details.
3. See section B/S9.1 for concrete barrier details.
4. See sheet S10.2 for joints in concrete barrier.
5. See sheet S11.1 for W16 cradle.
6. Precast deck forms shall be supported on a continuous, 1/4" minimum thick, non-shrink grout bed.
7. Fill 1" gap with non-shrink grout over a length of 1'-6" centered on W16 cradle.
8. Fill gap prior to pouring cradle.

GRAPHIC SCALE:

1 0 1 2

SCALE: 1"= 1'-0"

APPROVED:

MAY 2 4 2021

Manager and Chief Engineer, BWS
(for work affecting BWS facilities State R/W & BWS easements only)

DATE

DENNIS K. MITSUNAGA
LICENSED PROFESSIONAL ENGINEER
No. 2422-S
HAWAII, U.S.A.

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SIGNATURE 4/30/22 LIC. EXPIRATION

MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PARTIAL DECK SECTION

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

SHEET No. S3.5 OF 7 SHEETS

ORIGINAL PLAN
NOTE BOOK No.
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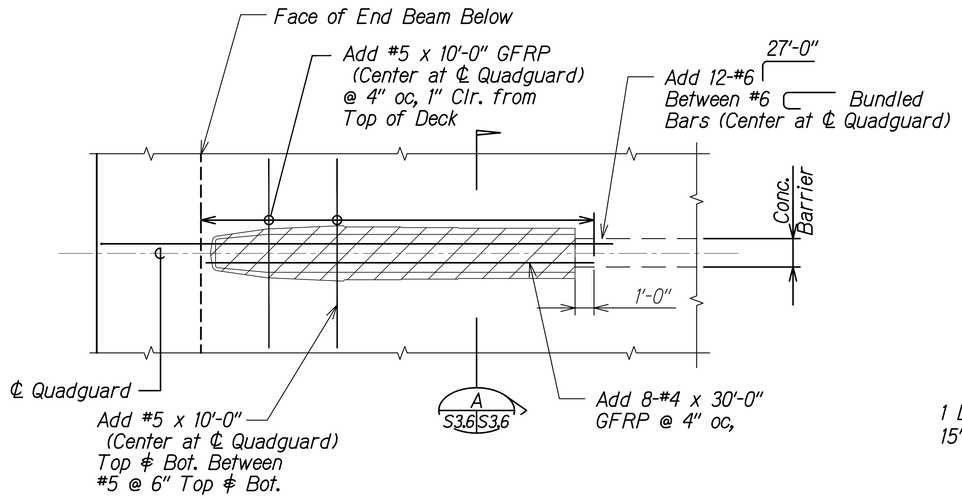
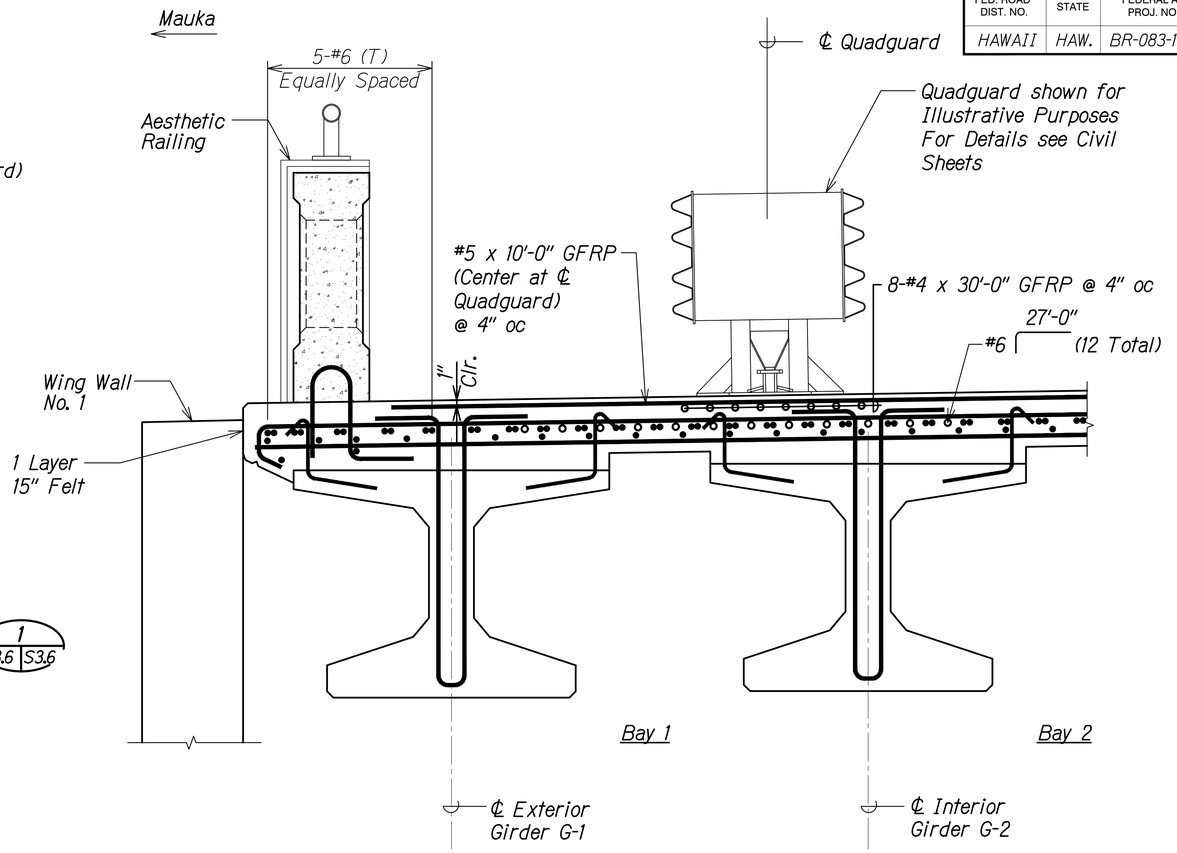
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	87	161



PARTIAL REINF. PLAN AT KANEOHE-MAUKA QUADGUARD

1 / S3.6 S3.6

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



PARTIAL REINF. PLAN AT KAHUKU-MAKAI QUADGUARD

2 / S3.6 S3.6

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

SECTION

A / S3.1 S3.6 / S3.6

Scale: 1" = 1'-0"

GRAPHIC SCALES:

4 3 2 1 0 4 8

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

1 0 1 2

SCALE: 1"= 1'-0"

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No. 2422-S
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DECK REINFORCING AT QUADGUARD

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

SHEET No. S3.6 OF 7 SHEETS

7

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

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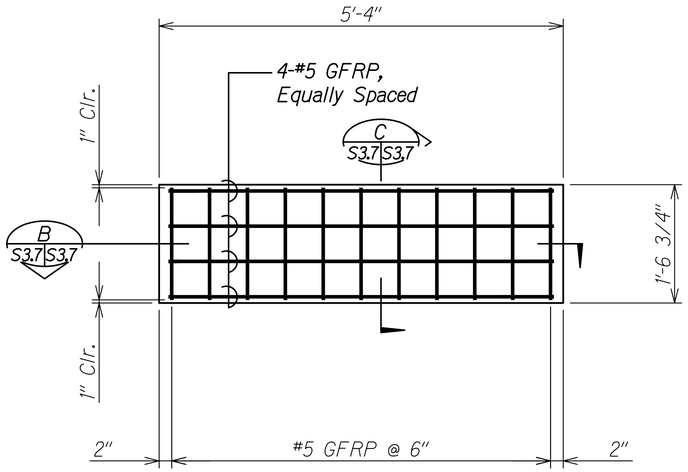
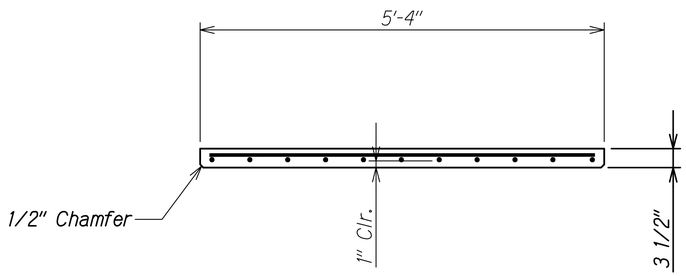
HAWAII	HAW.	BR-083-1(48)	2021	88	161



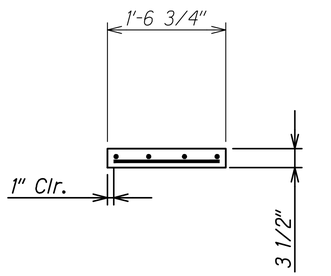
PLAN
Scale: 1" = 1'-0"
A S3.7 S3.7

Notes:

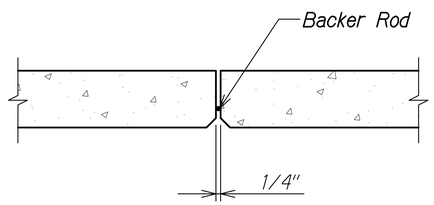
1. Details and locations of lifting devices shall be submitted to the Engineer for approval. Such approval does not relieve the Contractor of his responsibilities if the precast deck form is damaged due to failure of lifting device.
2. Contractor shall submit alternative method to lift precast deck form if lifting devices are damaged for review and acceptance.
3. Roughen top surface of precast deck form to 1/4" minimum amplitude.
4. Precast deck form is incidental to deck concrete.
5. GFRP is incidental to the precast deck form.



SECTION
Scale: 1" = 1'-0"
B S3.7 S3.7



SECTION
Scale: 1" = 1'-0"
C S3.7 S3.7



TRANSVERSE JOINT
Scale: 3" = 1'-0"
1 S3.7 S3.7

GRAPHIC SCALE:
1 0 1 2
SCALE: 1"= 1'-0"

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LICENSED PROFESSIONAL ENGINEER
No. 2422-S
HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PRECAST DECK FORM

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

SHEET No. S3.7 OF 7 SHEETS

ORIGINAL PLAN
NOTE BOOK No.
SURVEY PLOTTED BY
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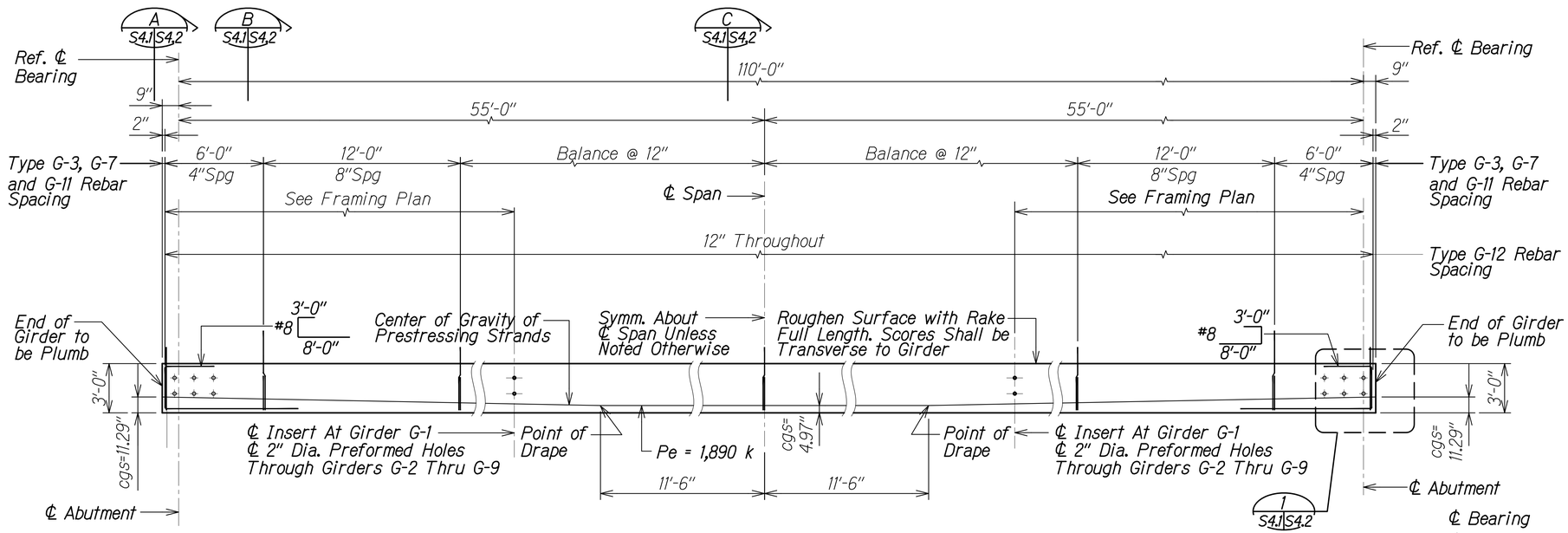
DATE

DRAWING NAME: T:\PROJECTS\1-ACTIVE FILES\913-01_KAIPAPAU BRIDGE\$$_REVISED_STRUCT\$$_051221\KSB-S301.DWG PLOT TIME: 06-09-21, 3:11 PM)

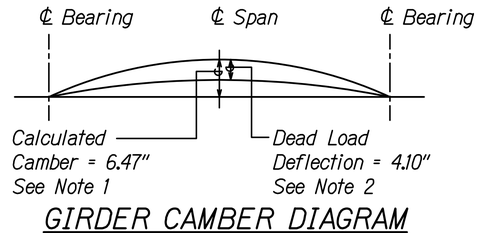
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	89	161



TYPE I PRESTRESSED GIRDER ELEVATION (G-1 THROUGH G-9)

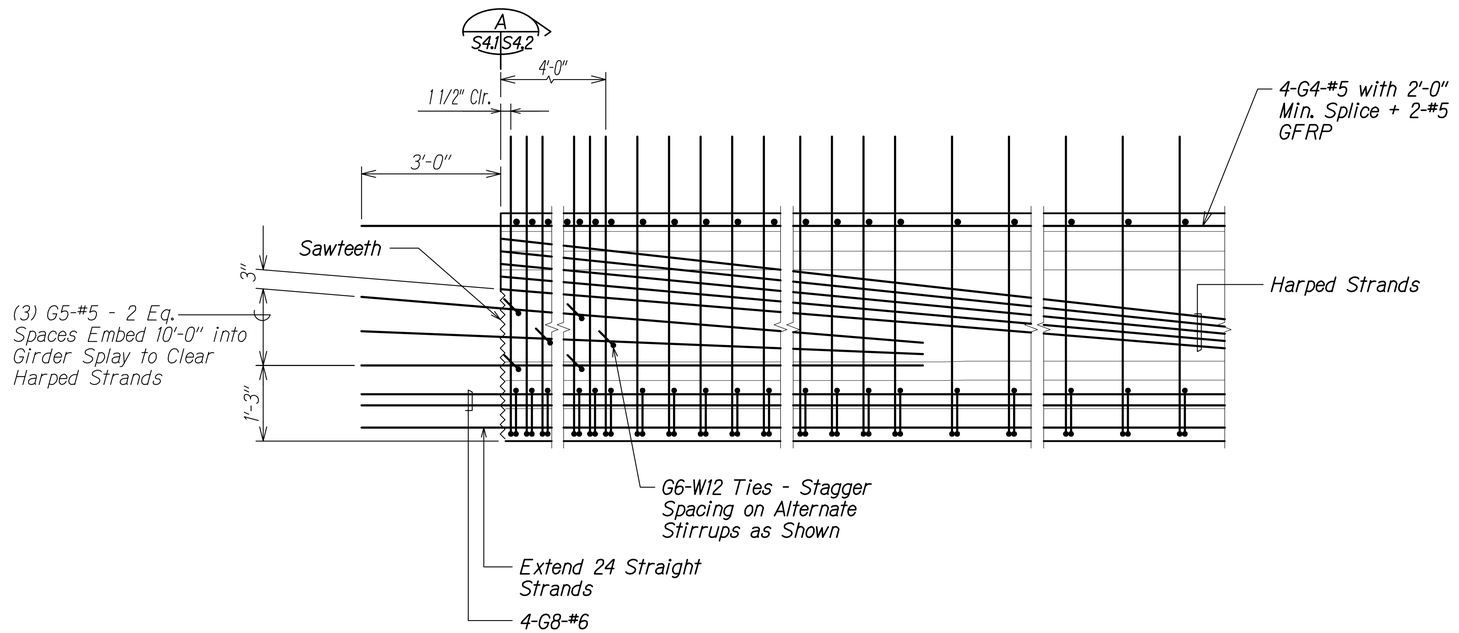
Scale: N.T.S.

Note:
For Prestressed Girder notes, see Sheet S4.5



GIRDER CAMBER DIAGRAM

SCALE: NONE



TYPICAL END ELEVATION

Not to Scale

A S4.1 S4.1

GIRDER CAMBER NOTES:

1. The calculated camber includes the effect of the initial prestress force and the weight of the girder after removal from the bed. The calculated camber value has been multiplied by creep factor to approximate the effect of camber growth and concrete creep. Positive values shown for initial camber indicate a net upward deflection. Maximum camber immediately prior to erection of girders shall not exceed the calculated camber by more than 1 inch. Girders with cambers exceeding the maximum camber will not be accepted.
2. The dead load deflection includes the combined effects of the weight of slab, drop panels, and diaphragms.
3. Contractor shall camber the deck form work as required to account for the calculated dead load deflection in order to provide the specified finish deck elevations.
4. All cambers and deflections are in inches.
5. Working force is designated as Pe.

DENNIS K. MITSUNAGA
LICENSED PROFESSIONAL ENGINEER
No. 2422-S
HAWAII, U.S.A.

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SIGNATURE 4/30/22 LIC. EXPIRATION

MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPE I PRESTRESSED GIRDER

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

SHEET No. S4.1 OF 5 SHEETS

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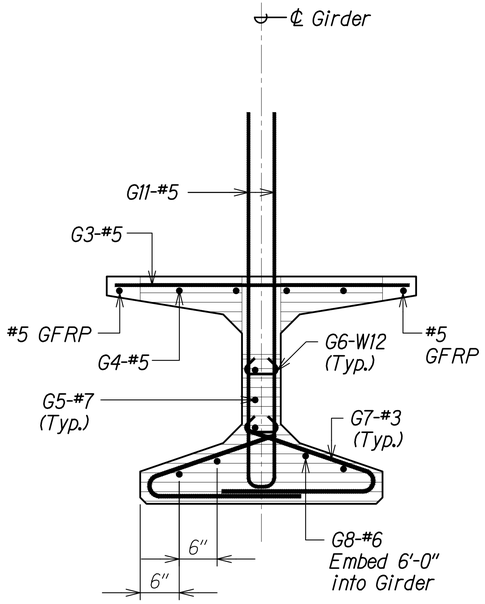
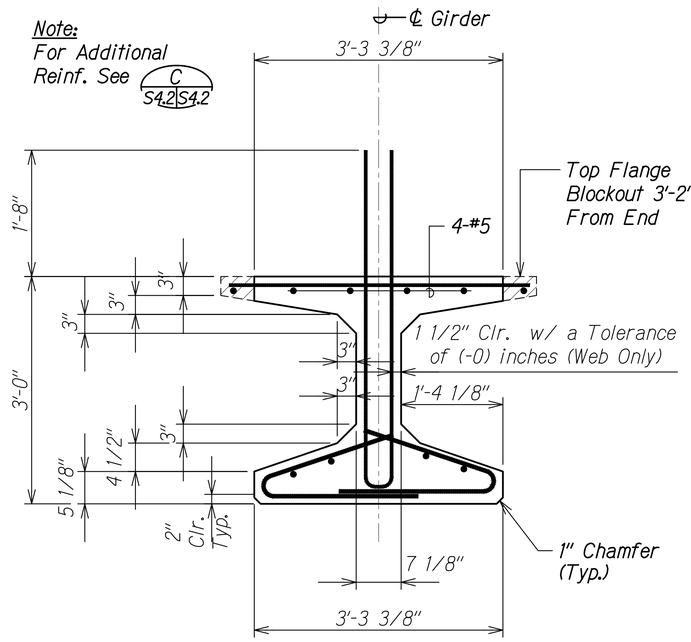
QUANTITIES BY
CHECKED BY

DRAWING NAME: T:\PROJECTS\1-ACTIVE FILES\913-01_KAIPAPAU BRIDGE\$$_REVISED_STRUCT\$$_051221\KSB-S401.DWG PLOT TIME: 06-09-21, 3:15 PM)

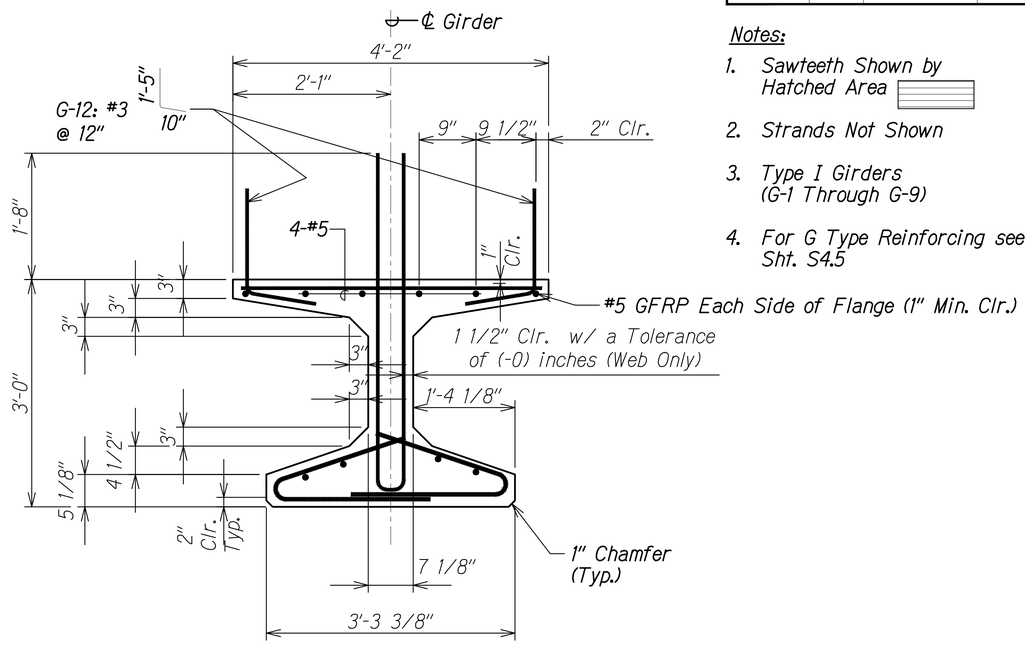
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	90	161



END ELEVATION (A)
Scale: 1" = 1'-0"
S4.1 | S4.2



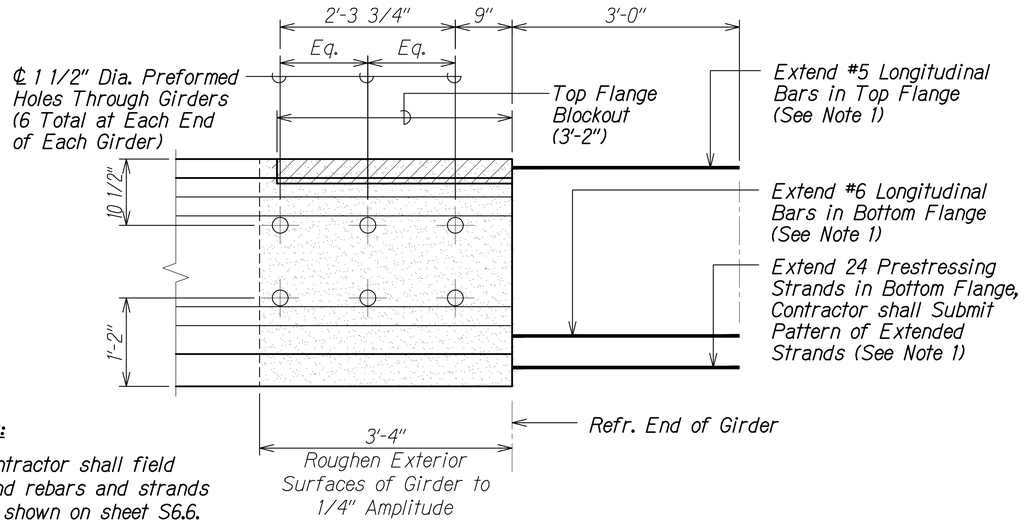
SECTION WITHIN END BEAM (B)
Scale: 1" = 1'-0"
S4.1 | S4.2



TYPICAL SECTION (C)
Scale: 1" = 1'-0"
S4.1 | S4.2

Notes:

1. Sawteeth Shown by Hatched Area
2. Strands Not Shown
3. Type I Girders (G-1 Through G-9)
4. For G Type Reinforcing see Sht. S4.5



Notes:

1. Contractor shall field bend rebars and strands as shown on sheet S6.6.
2. See S4.1 for additional reinforcing details.

TYPE I GIRDER END DETAIL (1)
Scale: 1" = 1'-0"
S4.2 | S4.2

GRAPHIC SCALE:
1 0 1 2
SCALE: 1"= 1'-0"

DENNIS K. MITSUNAGA
LICENSED PROFESSIONAL ENGINEER
No. 2422-S
HAWAII, U.S.A.
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION
4/30/22
SIGNATURE LIC. EXPIRATION
MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPE I GIRDER SECTIONS

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

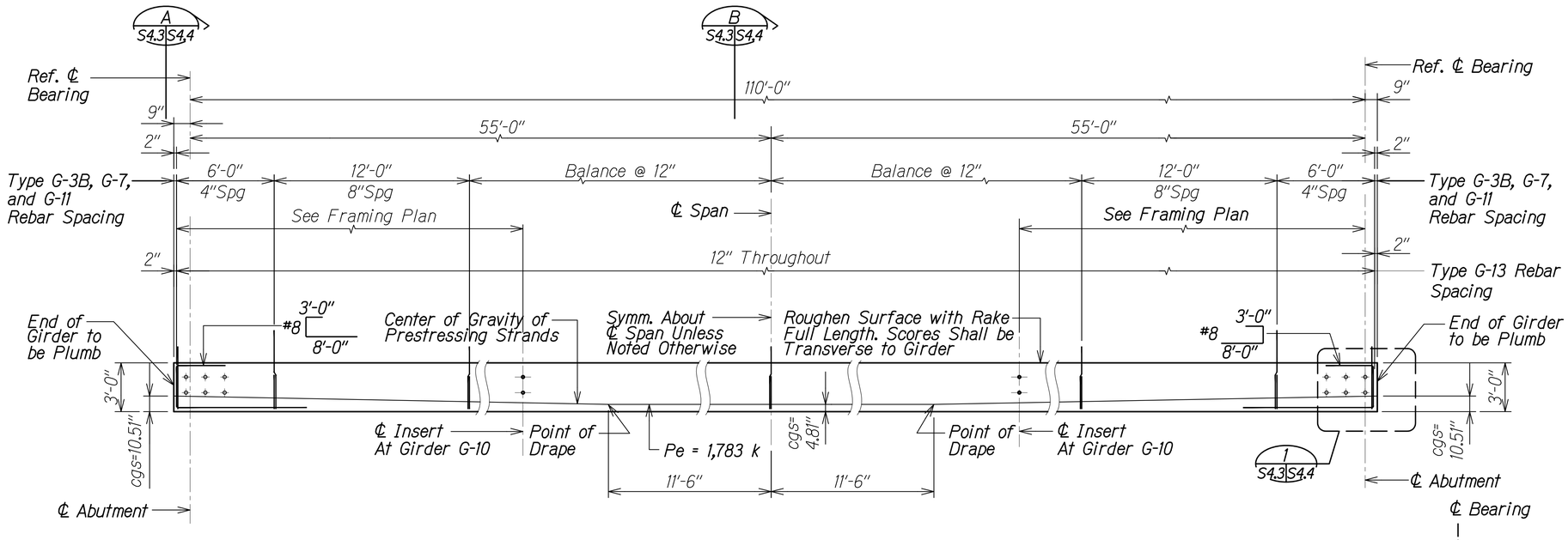
SHEET No. S4.2 OF 5 SHEETS

ORIGINAL PLAN
NOTE BOOK
No.

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

DRAWING NAME: T:\PROJECTS\1-ACTIVE FILES\913-01_KAIPAPAU BRIDGE\$$_REVISED_STRUCT\$$_051221\KSB-S401.DWG PLOT TIME: 06-09-21, 3:15 PM)

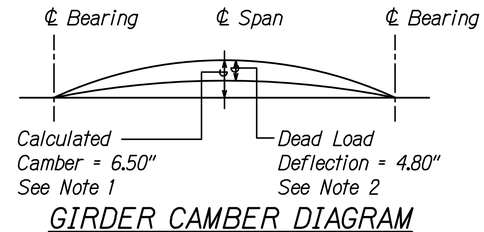
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	91	161



TYPE II PRESTRESSED GIRDER ELEVATION (G-10 AND G-11)

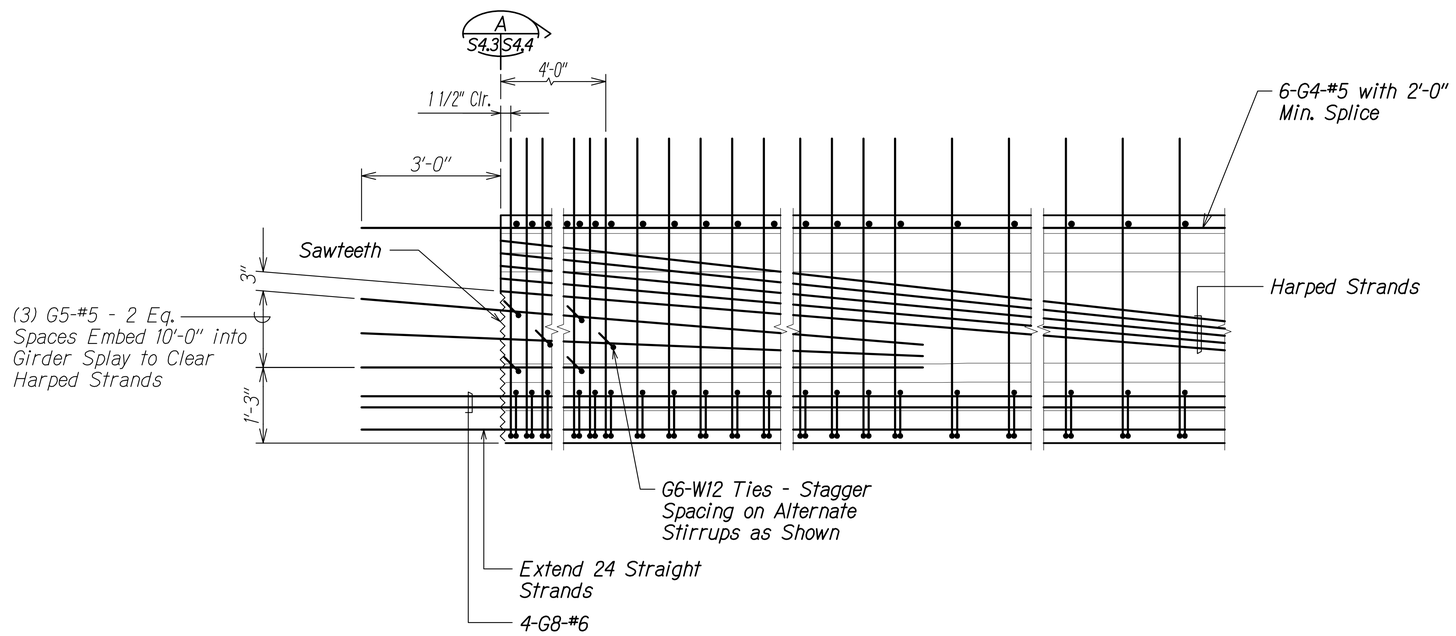
Scale: N.T.S.

Note:
For Prestressed Girder notes, see Sheet S4.5.



GIRDER CAMBER DIAGRAM

SCALE: NONE



TYPICAL END ELEVATION

A S4.3 S4.3

Not to Scale

GIRDER CAMBER NOTES:

1. The calculated camber includes the effect of the initial prestress force and the weight of the girder after removal from the bed. The calculated camber value has been multiplied by creep factor to approximate the effect of camber growth and concrete creep. Positive values shown for initial camber indicate a net upward deflection. Maximum camber immediately prior to erection of girders shall not exceed the calculated camber by more than 1 inch. Girders with cambers exceeding the maximum camber will not be accepted.
2. The dead load deflection includes the combined effects of the weight of slab, drop panels, and diaphragms.
3. Contractor shall camber the deck form work as required to account for the calculated dead load deflection in order to provide the specified finish deck elevations.
4. All cambers and deflections are in inches.
5. Working force is designated as Pe.

DENNIS K. MITSUNAGA ★ LICENSED PROFESSIONAL ENGINEER ★ No. 2422-S ★ HAWAII, U.S.A.

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MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPE II PRESTRESSED GIRDER

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

SHEET No. S4.3 OF 5 SHEETS

ORIGINAL PLAN | NOTE BOOK | No.
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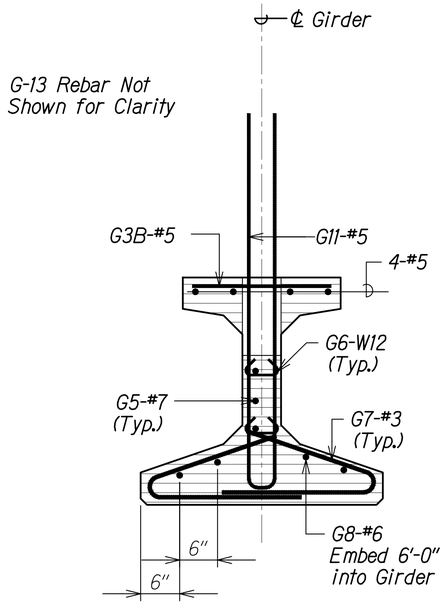
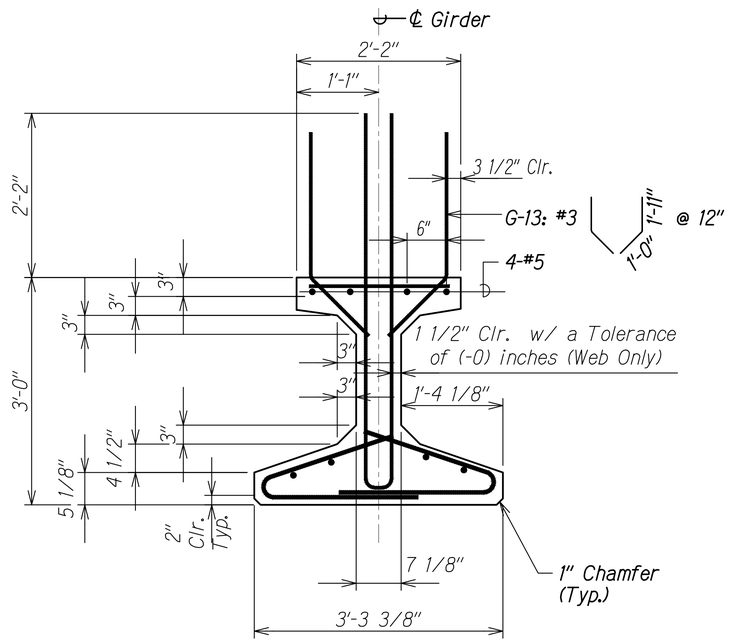
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	92	161



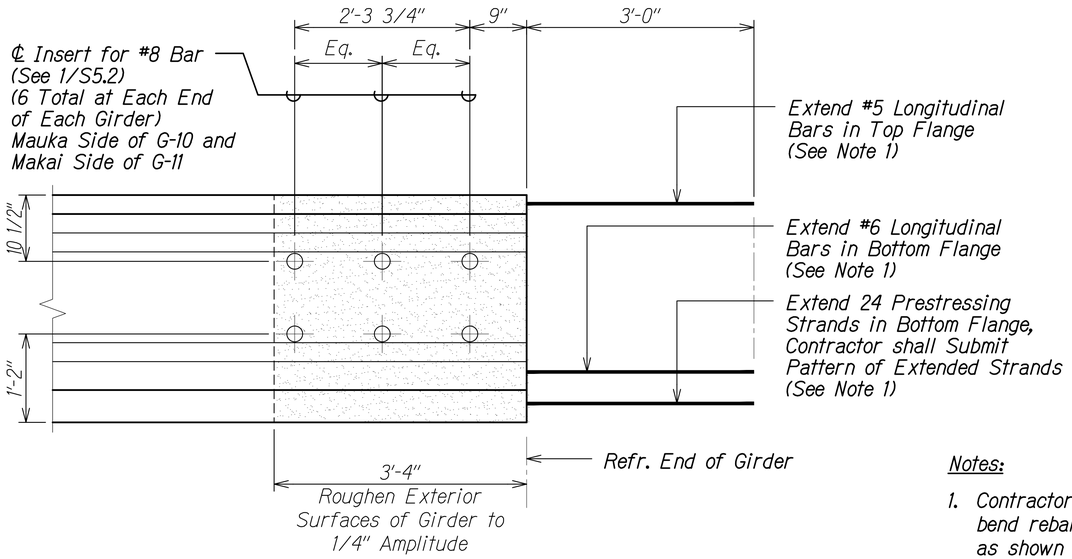
END ELEVATION A
Scale: 1" = 1'-0"
S4.3 | S4.4



TYPICAL SECTION B
Scale: 1" = 1'-0"
S4.3 | S4.4

Notes:

1. Sawteeth Shown by Hatched Area
2. Strands Not Shown
3. Type II Girders (G-10 and G-11)
4. For G Type Reinforcing see Sht. S4.5



TYPE II GIRDER END DETAIL 1
Scale: 1" = 1'-0"
S4.3 | S4.4

Notes:

1. Contractor shall field bend rebars and strands as shown on sheet S6.6.
2. See S4.3 for additional reinforcing details.

GRAPHIC SCALE:
1 0 1 2
SCALE: 1"= 1'-0"

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HIGHWAYS DIVISION

TYPE II GIRDER SECTIONS

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

SHEET No. S4.4 OF 5 SHEETS

ORIGINAL PLAN
NOTE BOOK
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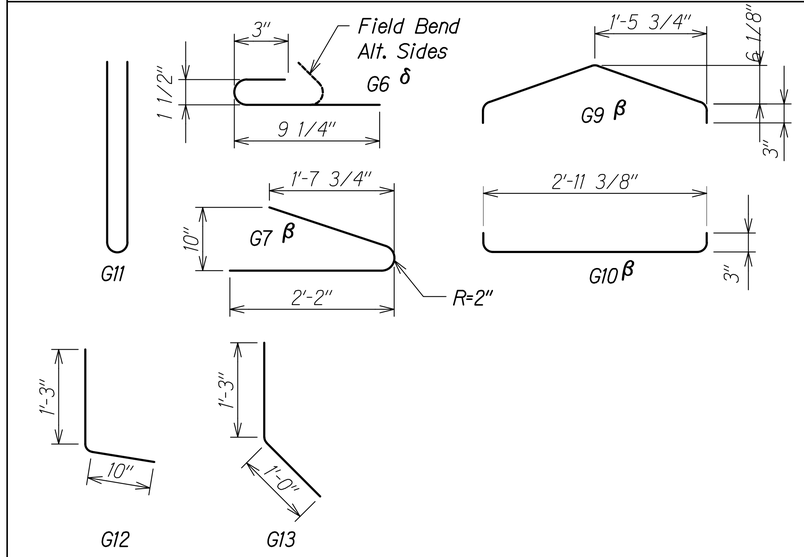
HAWAII	HAW.	BR-083-1(48)	2021	93	161

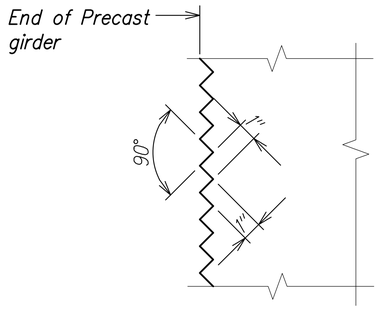
PRESTRESSED GIRDER NOTES:

1. Prestressed steel shall be 7-wire 0.6-inch diameter ASTM A416 Grade 270 low-relaxation strand.
2. See framing plans for location of diaphragms, ℄ bearing to ℄ bearing, and girder spacing.
3. Strand pattern shall be symmetrical about the longitudinal ℄ of the girder.
4. Strand release sequence shall not induce any lateral deflection of the girder.
5. Contractor shall submit shop drawings indicating proposed strand pattern, holes, inserts, releasing sequence, reinforcing details and hold down device details to the Engineer prior to fabrication.
6. The Contractor shall incorporate all holes, inserts, and other embedded items required in girders during fabrication of the girders.
7. Lifting devices shall be placed as close as possible to the center line bearing of the girder. 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 the girder is damaged due to failure of lifting device.
8. Prior to casting girder Contractor shall field verify span lengths at each abutment.
9. Contractor shall inspect all lifting devices for damage prior to delivery and immediately before installation.
10. Contractor shall submit alternative method to lift girder if lifting devices are damaged for review and acceptance.
11. Roughen top surface of girder to 1/4" min. amplitude.
12. The compressive strength of the girder at strand release shall be at least 8,500 psi.
13. See sheets S4.1 through S4.4 for rebar ⊄ strand extensions.
14. Contractor may adjust locations of holes ⊄ inserts with the approval of the Engineer.
15. The concrete shall pass a charge of less than 1000 Coulombs at 90-days from casting as determined by AASHTO T277. Concrete test specimens shall be cured under the same conditions as the Precast Girders.

BENDING DIAGRAM (ALL DIMENSIONS ARE OUT TO OUT)



δ - #3 or #4 May be Substituted. Field Bending is Optional.
β - Pairs of G7 Bars, or G9 and G10 Bars, May be Used Interchangeably as Bottom Flange Ties.



Sawteeth are full width

SAWTEETH DETAIL (1 / S4.5 | S4.5)
Not to Scale

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No. 2422-S
HAWAII, U.S.A.

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PRESTRESSED GIRDER NOTES AND DETAIL

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

SHEET No. S4.5 OF 5 SHEETS

ORIGINAL PLAN | NOTE BOOK | No.

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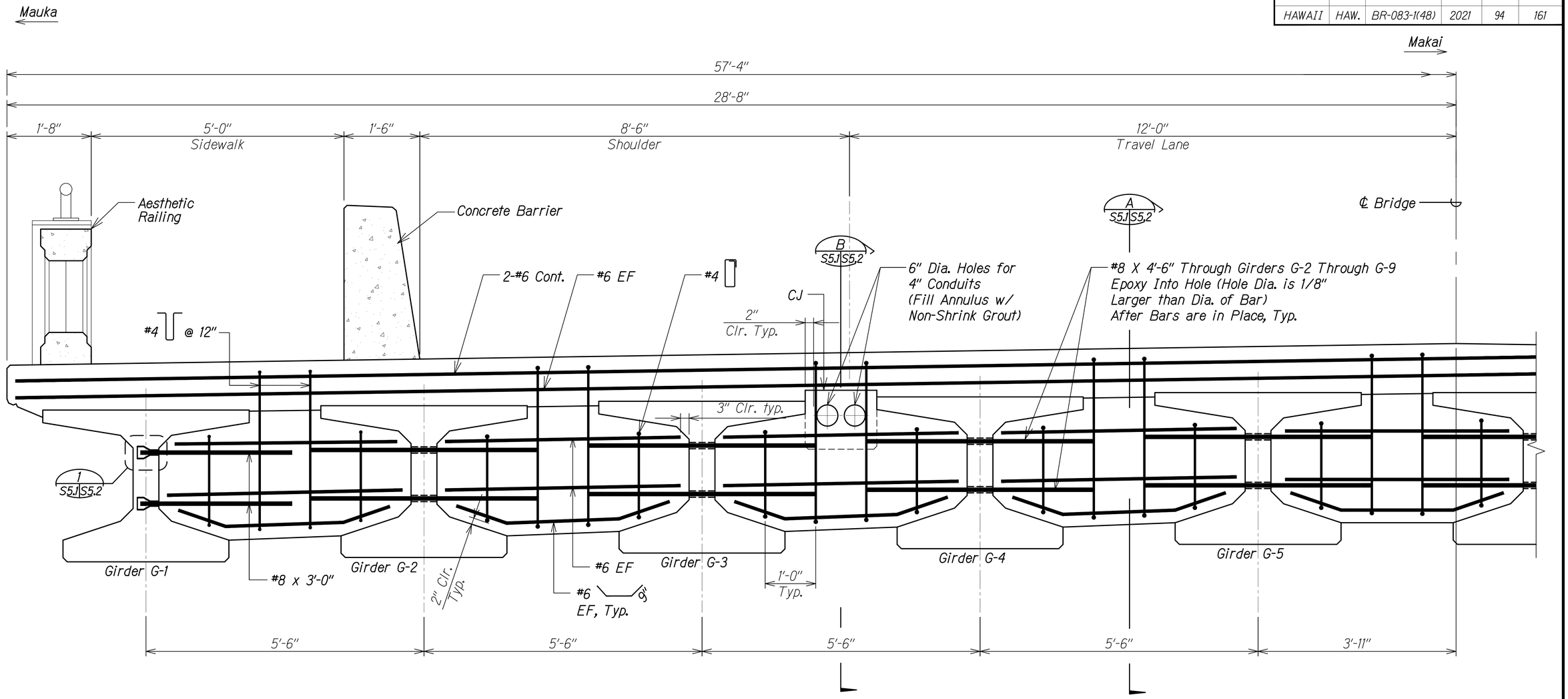
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	94	161



Note:
Deck, Concrete Barrier, Aesthetic Railing and Precast Girder Reinforcing are not shown for clarity.

DIAPHRAGM "A" ELEVATION (A S5.1 | S5.1)

Scale: 1" = 1'-0"

GRAPHIC SCALE:

1 0 1 2

SCALE: 1"= 1'-0"

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DIAPHRAGM ELEVATION

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

SHEET No. S5.1 OF 3 SHEETS

ORIGINAL PLAN
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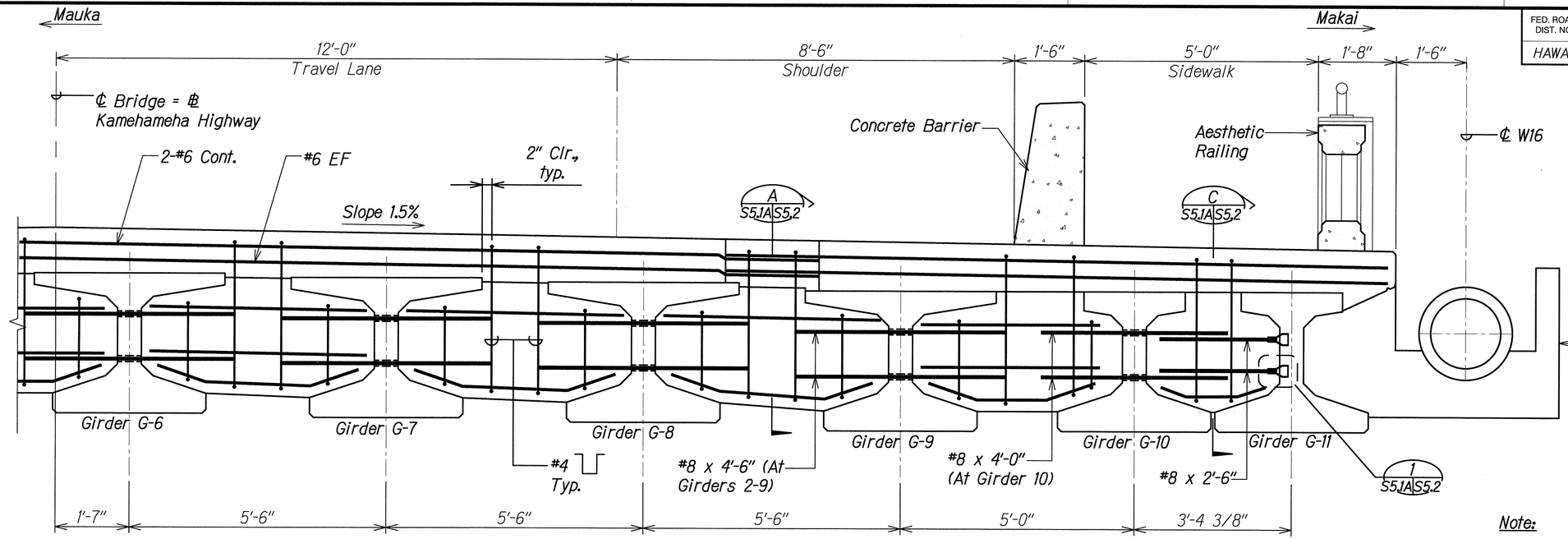
HAWAII	HAW.	BR-083-1(48)	2021	95	161



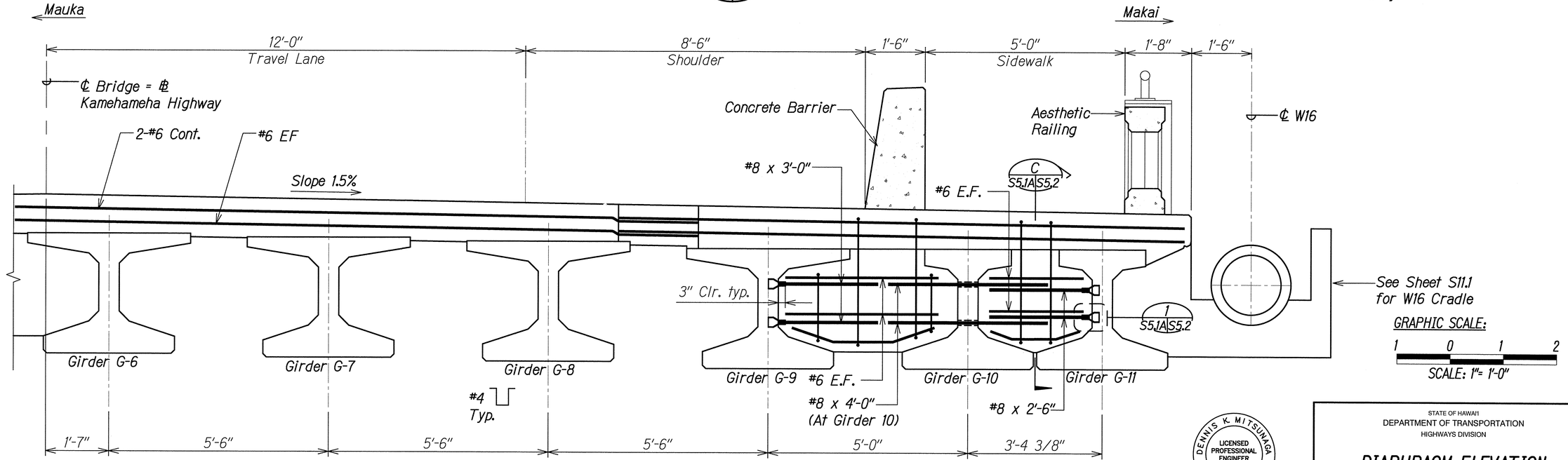
DIAPHRAGM "A" ELEVATION

Scale: 3/4" = 1'-0"

A S5.1A | S5.1A

Note:

Deck, Concrete Barrier, Aesthetic Railing and Precast Girder Reinforcing are not shown for clarity.



DIAPHRAGM "B" ELEVATION

Scale: 3/4" = 1'-0"

B S5.1A | S5.1A

GRAPHIC SCALE:

1 0 1 2

SCALE: 1"= 1'-0"

APPROVED:

MAY 2 4 2021

Manager and Chief Engineer, BWS
(for work affecting BWS facilities State R/W & BWS easements only)

DATE

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HIGHWAYS DIVISION

DIAPHRAGM ELEVATION

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

SHEET No. S5.1A OF 3 SHEETS

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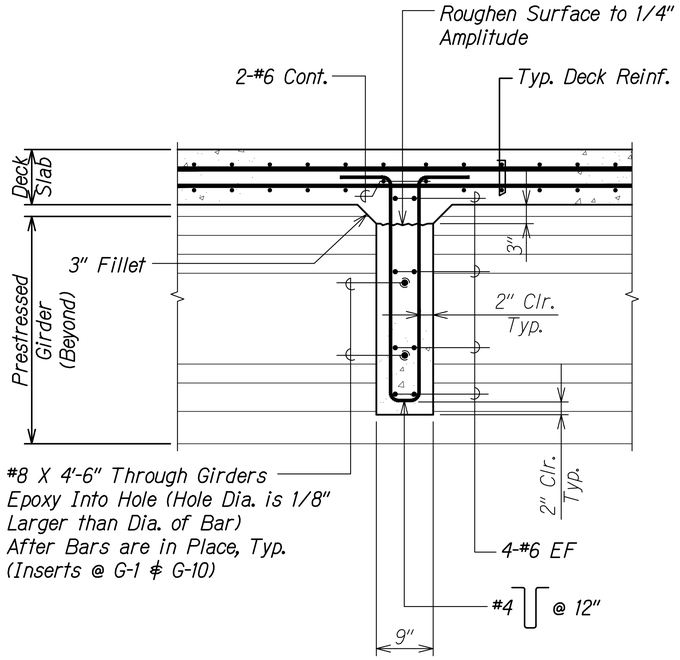
HAWAII	HAW.	BR-083-1(48)	2021	96	161

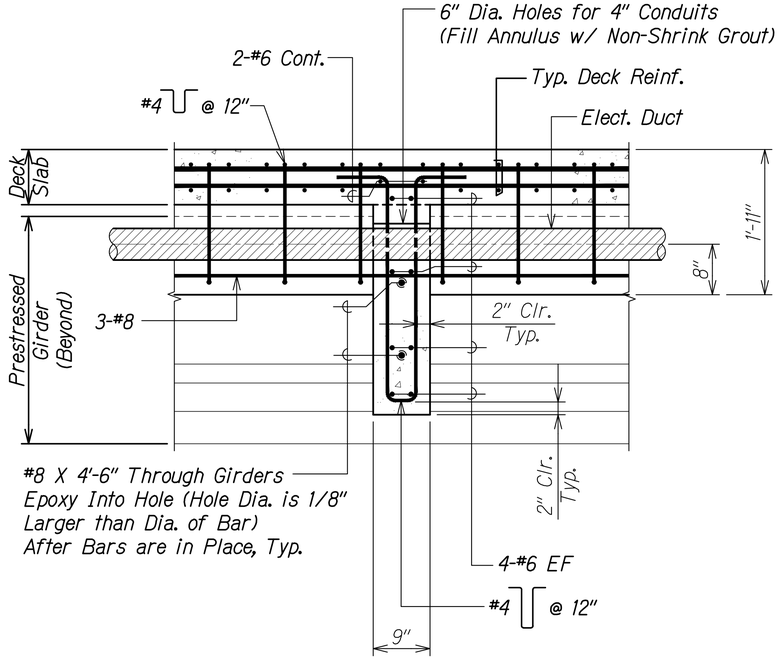


DIAPHRAGM SECTION A

Scale: 1" = 1'-0"

S5.1 | S5.2

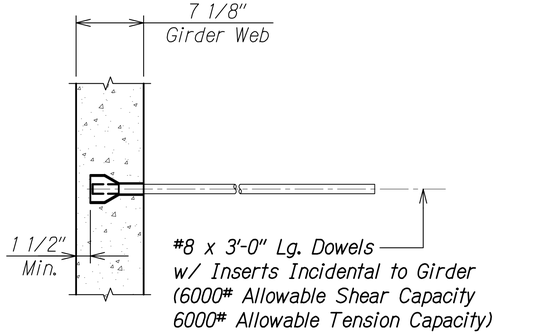
S5.1A



DIAPHRAGM SECTION AT ELECTRICAL DUCT B

Scale: 1" = 1'-0"

S5.1 | S5.2

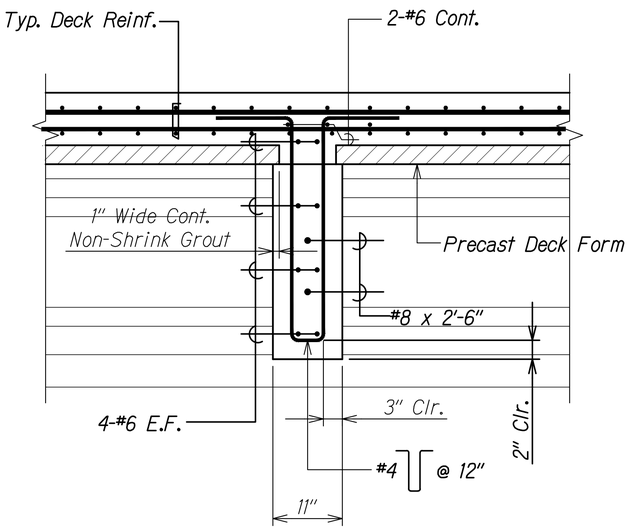


TYPICAL INSERT DETAIL 1

Scale: 1 1/2" = 1'-0"

S5.1 | S5.2

S5.1A



DIAPHRAGM "B" SECTION C

Scale: 1" = 1'-0"

S5.1 | S5.2

GRAPHIC SCALE:

1 0 1 2

SCALE: 1"= 1'-0"

1 0 1FT

SCALE: 1 1/2"= 1'-0"

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DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DIAPHRAGM SECTIONS AND DETAIL

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

SHEET No. S5.2 OF 3 SHEETS

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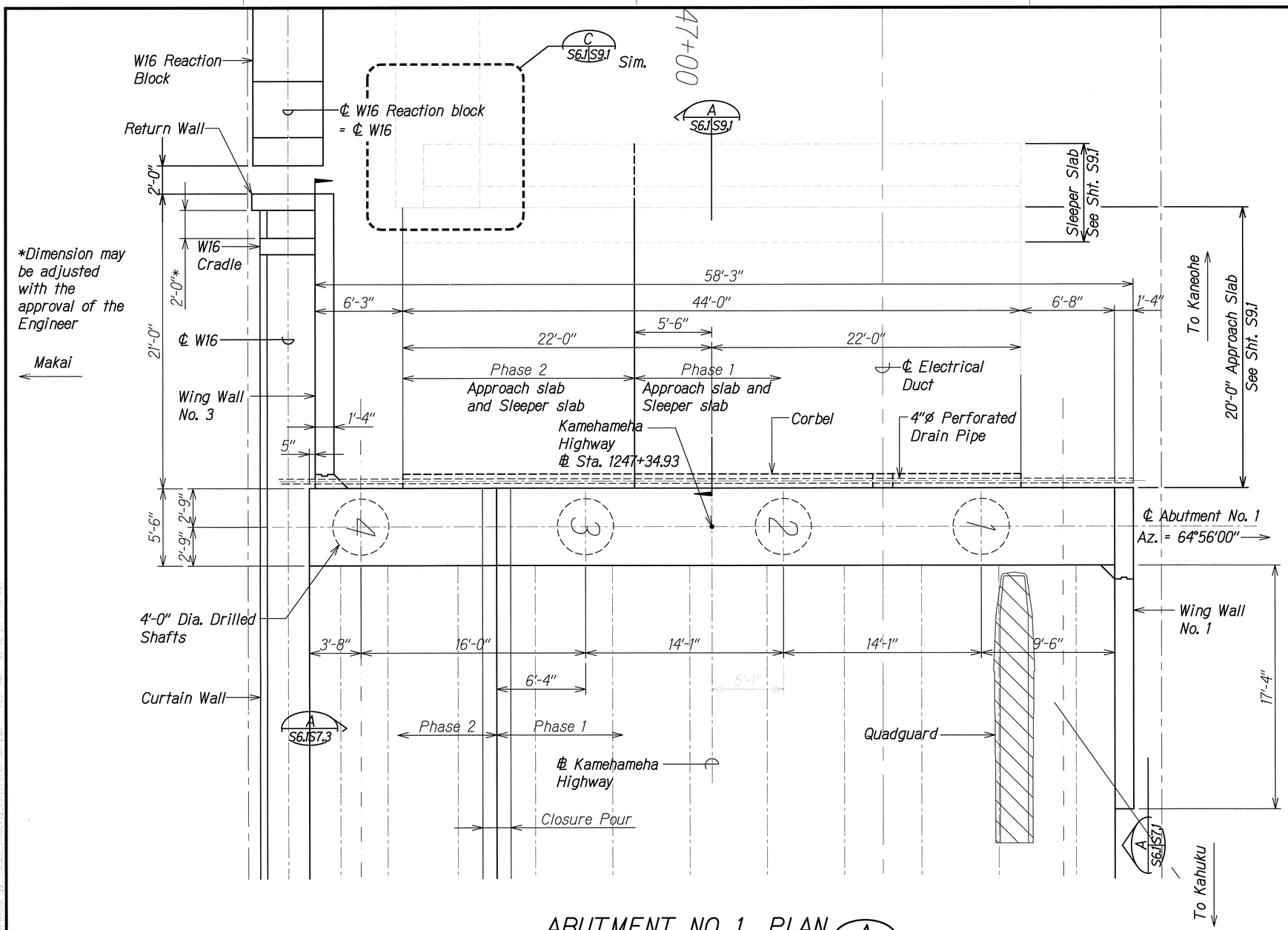
HAWAII	HAW.	BR-083-1(48)	2021	97	161



ABUTMENT NO. 1 PLAN (A S6.1 | S6.1)

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

Note:

1. Balance of W16 cradles are not shown for clarity, See Sheets S11.1 and S11.1A for details.
2. Contractor shall submit locations of W16 Cradles. Contractor shall coordinate W16 Cradle locations with precast girder manufacturer, deck reinforcing, wing wall reinforcing and abutment reinforcing.
3. 4" Diameter perforated drain pipe shall be included in the cost for structural backfill.

GRAPHIC SCALE:

4 3 2 1 0 4 8

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

APPROVED:

For Manager and Chief Engineer, BWS
(for work affecting BWS facilities State R/W & BWS easements only)

MAY 2 4 2021
DATE

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ABUTMENT NO. 1 PLAN

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

SHEET No. S6.1 OF 14 SHEETS

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
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	DESIGNED BY	"
No.	QUANTITIES BY	"
	CHECKED BY	"

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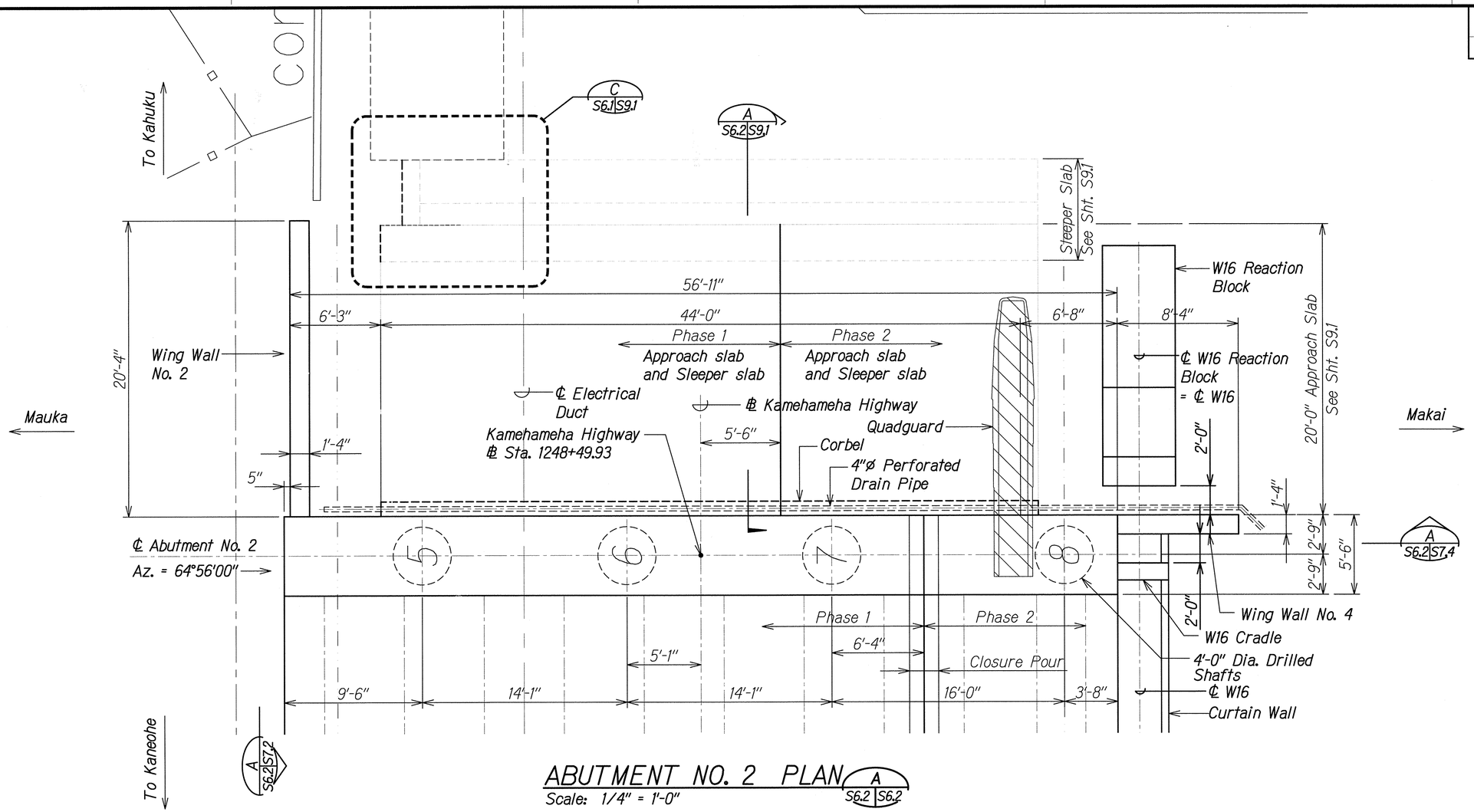
HAWAII	HAW.	BR-083-1(48)	2021	98	161



ABUTMENT NO. 2 PLAN

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

A S6.2 S6.2

Note:

1. Balance of W16 cradles are not shown for clarity, See Sheets S11.1 and S11.1A for details.
2. Contractor shall submit locations of W16 Cradles. Contractor shall coordinate W16 Cradle locations with precast girder manufacturer, deck reinforcing, wing wall reinforcing and abutment reinforcing.
3. 4" Diameter perforated drain pipe shall be included in the cost for structural backfill.

GRAPHIC SCALE:

4 3 2 1 0 4 8

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

APPROVED:

MAY 2 4 2021

Manager and Chief Engineer, BWS
(for work affecting BWS facilities
State R/W & BWS easements only)

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ABUTMENT NO. 2 PLAN

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

SHEET No. S6.2 OF 14 SHEETS

98

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

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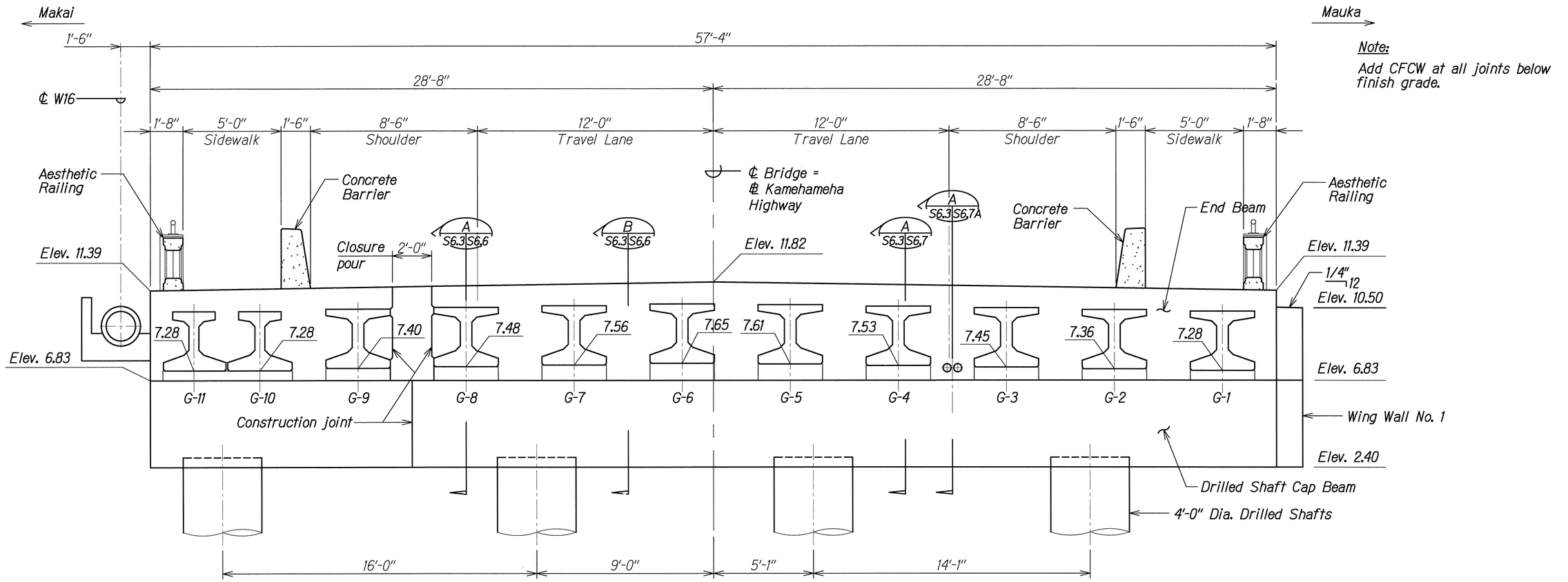
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	99	161



Note:
Add CFCW at all joints below finish grade.

ABUTMENT NO. 1 ELEVATION (A S6.3 | S6.3)

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

GRAPHIC SCALE:
2 0 2 4FT
SCALE: 3/8"= 1'-0"

APPROVED:
MAY 2 4 2021
For Manager and Chief Engineer, BWS
DATE
(for work affecting BWS facilities
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DENNIS K. MITSUNAGA
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ABUTMENT NO. 1 ELEVATION

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

SHEET No. S6.3 OF 14 SHEETS

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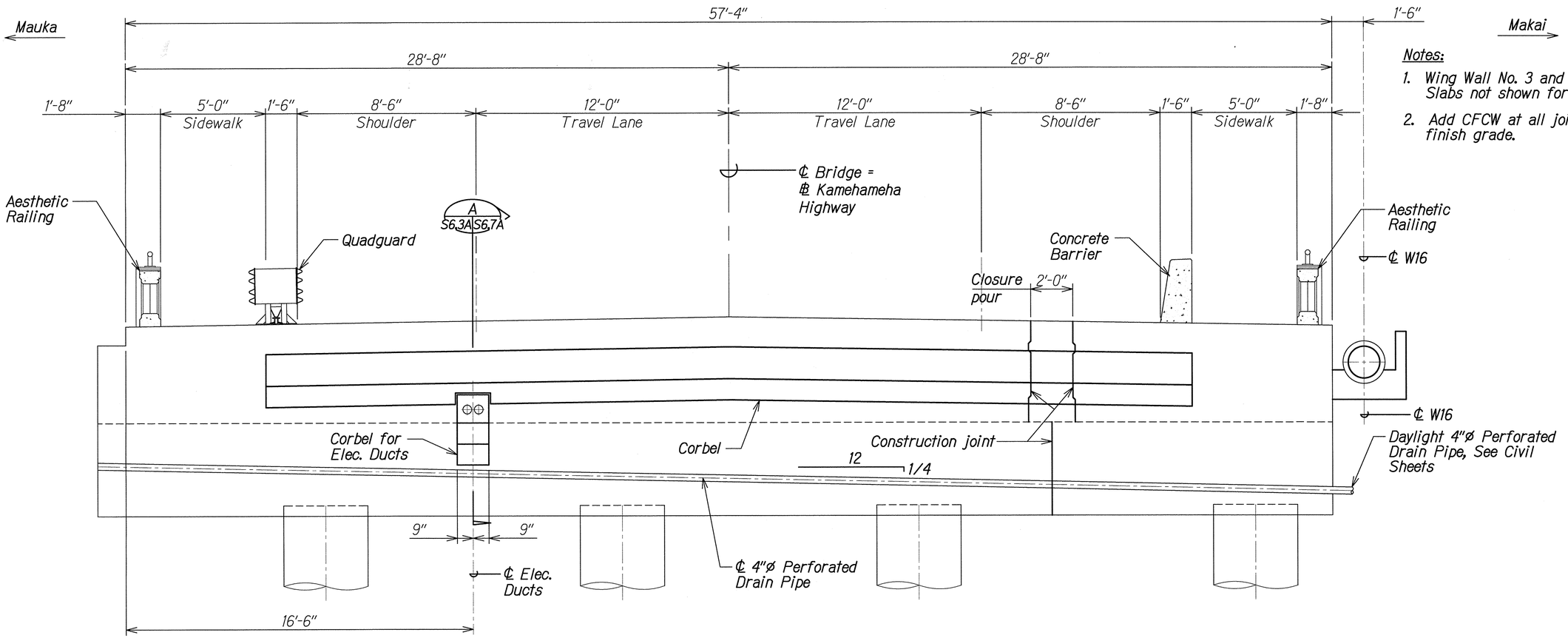
TRACED BY "
DESIGNED BY "
QUANTITIES BY "
CHECKED BY "

DRAWING NAME: T:\PROJECTS\1-ACTIVE FILES\913-01_KAIPAPAU BRIDGE\$S_REVISED_STRUCT\$_051221\K-EB-3603.DWG PLOT TIME: 05-13-21, 8:32 AM

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	100	161



Notes:

1. Wing Wall No. 3 and Approach Slabs not shown for clarity.
2. Add CFCW at all joints below finish grade.

ABUTMENT NO. 1 BACK ELEVATION

A S6.3A | S6.3A

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

GRAPHIC SCALE:

2 0 2 4FT

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

APPROVED:

MAY 2 4 2021

Manager and Chief Engineer, BWS
(for work affecting BWS facilities
State R/W & BWS easements only)

DATE

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DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ABUTMENT NO. 1
BACK ELEVATION

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

SHEET No. S6.3A OF 14 SHEETS

100

ORIGINAL PLAN | NOTE BOOK | No.

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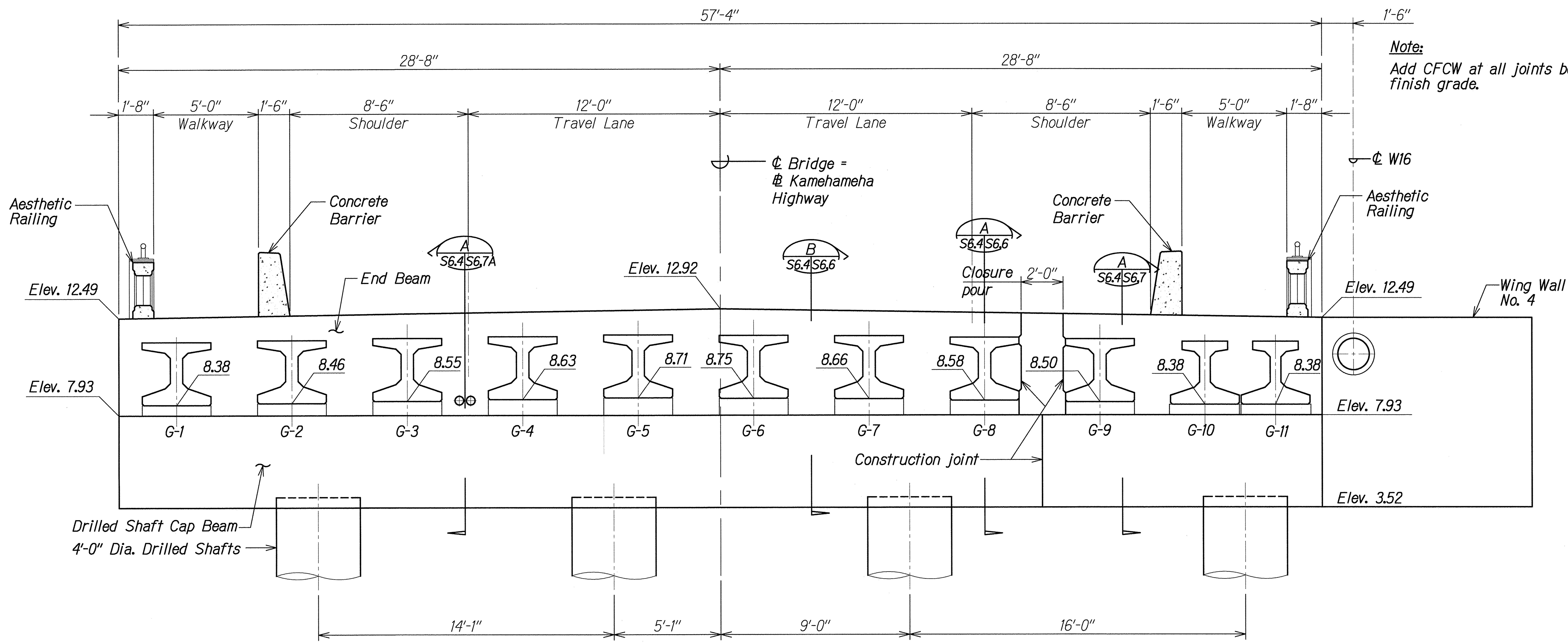
QUANTITIES BY
CHECKED BY

DRAWING NAME: T:\PROJECTS\1-ACTIVE FILES\913-01_KAIPAPAU BRIDGE\$$_REVISED_STRUCT\$_05121VER-S63.DWG PLOT TIME: 05-13-21 8:43 AM

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	101	161

Note:
Add CFCW at all joints below finish grade.



ABUTMENT NO. 2 ELEVATION
A S6.4 S6.4
Scale: 3/8" = 1'-0"

GRAPHIC SCALE:
2 0 2 4FT
SCALE: 3/8"= 1'-0"

APPROVED:
Manager and Chief Engineer, BWS — MAY 2 4 2021 — DATE
(for work affecting BWS facilities State R/W & BWS easements only)

DENNIS K. MITSUNAGA LICENSED PROFESSIONAL ENGINEER No. 2422-S HAWAII, U.S.A.
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION
SIGNATURE — LIC. EXPIRATION 4/30/22
MITSUNAGA & ASSOCIATES, INC.

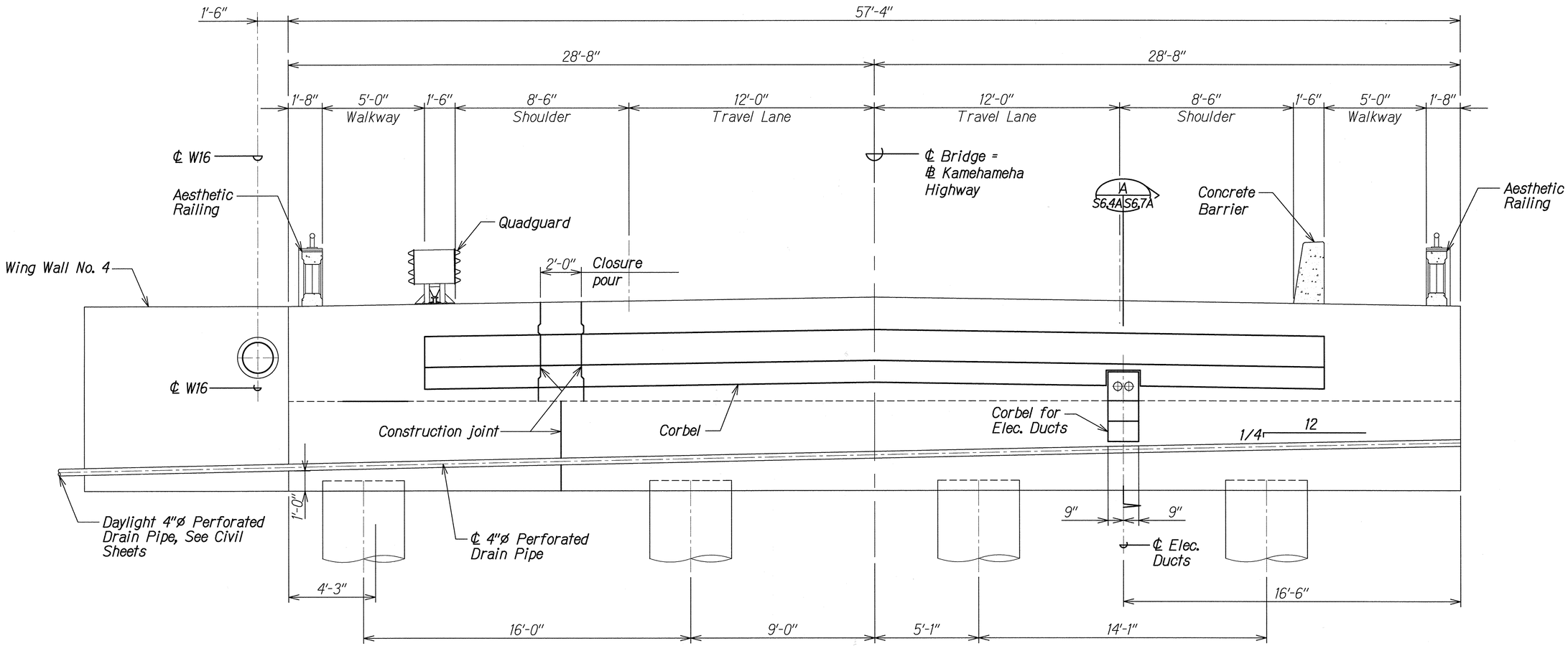
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ABUTMENT NO. 2 ELEVATION

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)
Scale: As Noted — Date: February 2021
SHEET No. S6.4 OF 14 SHEETS

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

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	102	161



ABUTMENT NO. 2 BACK ELEVATION

A S6.4A | S6.4A

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

Note:

Add CFCW at all joints below finish grade.

GRAPHIC SCALE:

2 0 2 4FT

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

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

APPROVED:

MAY 2 4 2021

Manager and Chief Engineer, BWS (for work affecting BWS facilities State R/W & BWS easements only) — DATE

DENNIS K. MITSUNAGA LICENSED PROFESSIONAL ENGINEER No. 2422-S HAWAII, U.S.A.

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4/30/22

SIGNATURE — LIC. EXPIRATION

MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

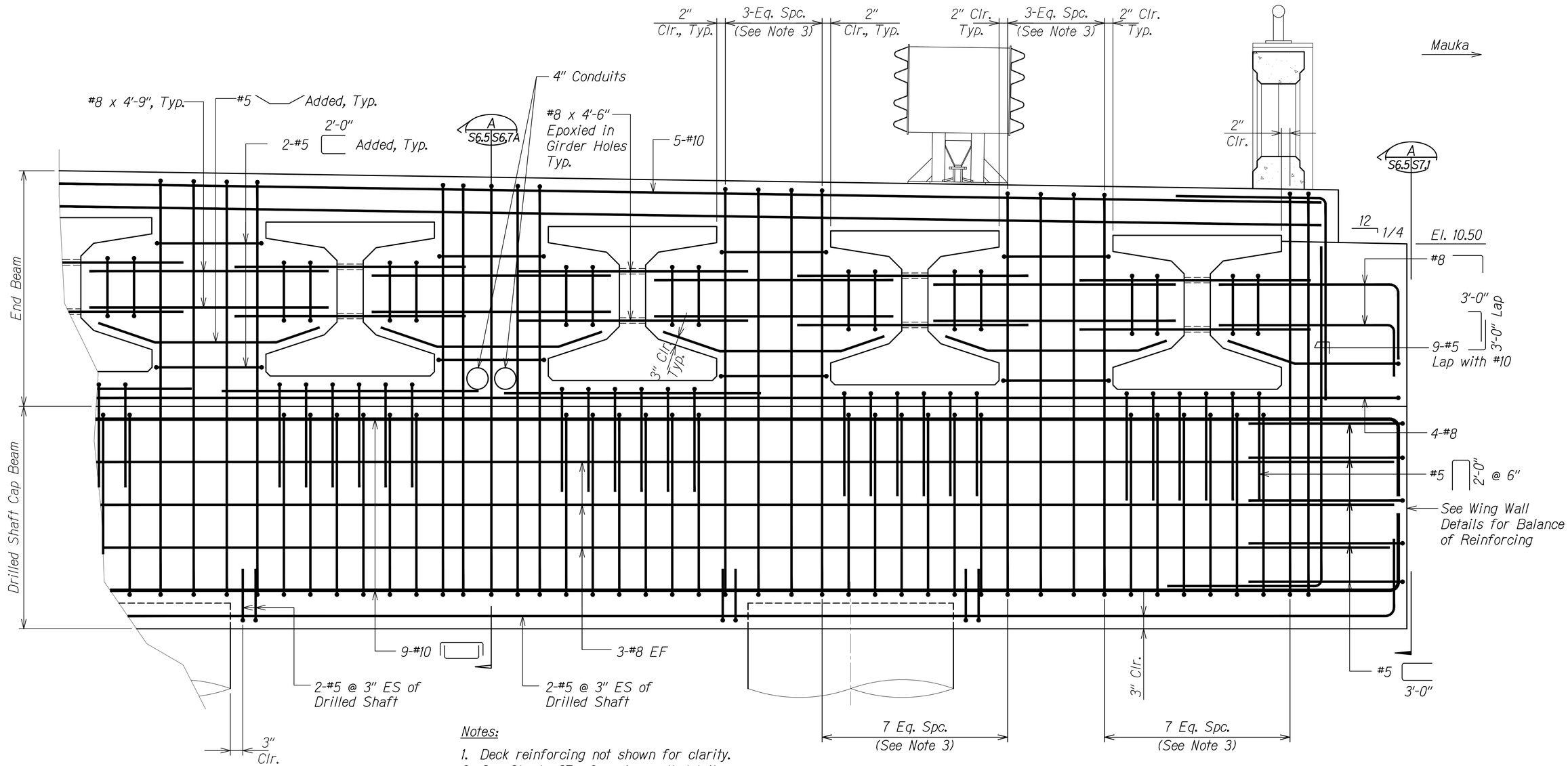
ABUTMENT NO. 2 BACK ELEVATION

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted — Date: February 2021

SHEET No. S6.4A OF 14 SHEETS

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	103	161



Notes:

1. Deck reinforcing not shown for clarity.
2. See Sheets S7.* for wing wall details.
3. Coordinate stirrup spacing with #6 deck reinforcing.

ELEVATION
(Abutment No. 1 Shown)

A S6.5 | S6.5

Scale: 1" = 1'-0"

GRAPHIC SCALE:

1 0 1 2

SCALE: 1"= 1'-0"

DENNIS K. MITSUNAGA
LICENSED PROFESSIONAL ENGINEER
No. 2422-S
HAWAII, U.S.A.

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SIGNATURE 4/30/22 LIC. EXPIRATION

MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ABUTMENT ELEVATION

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

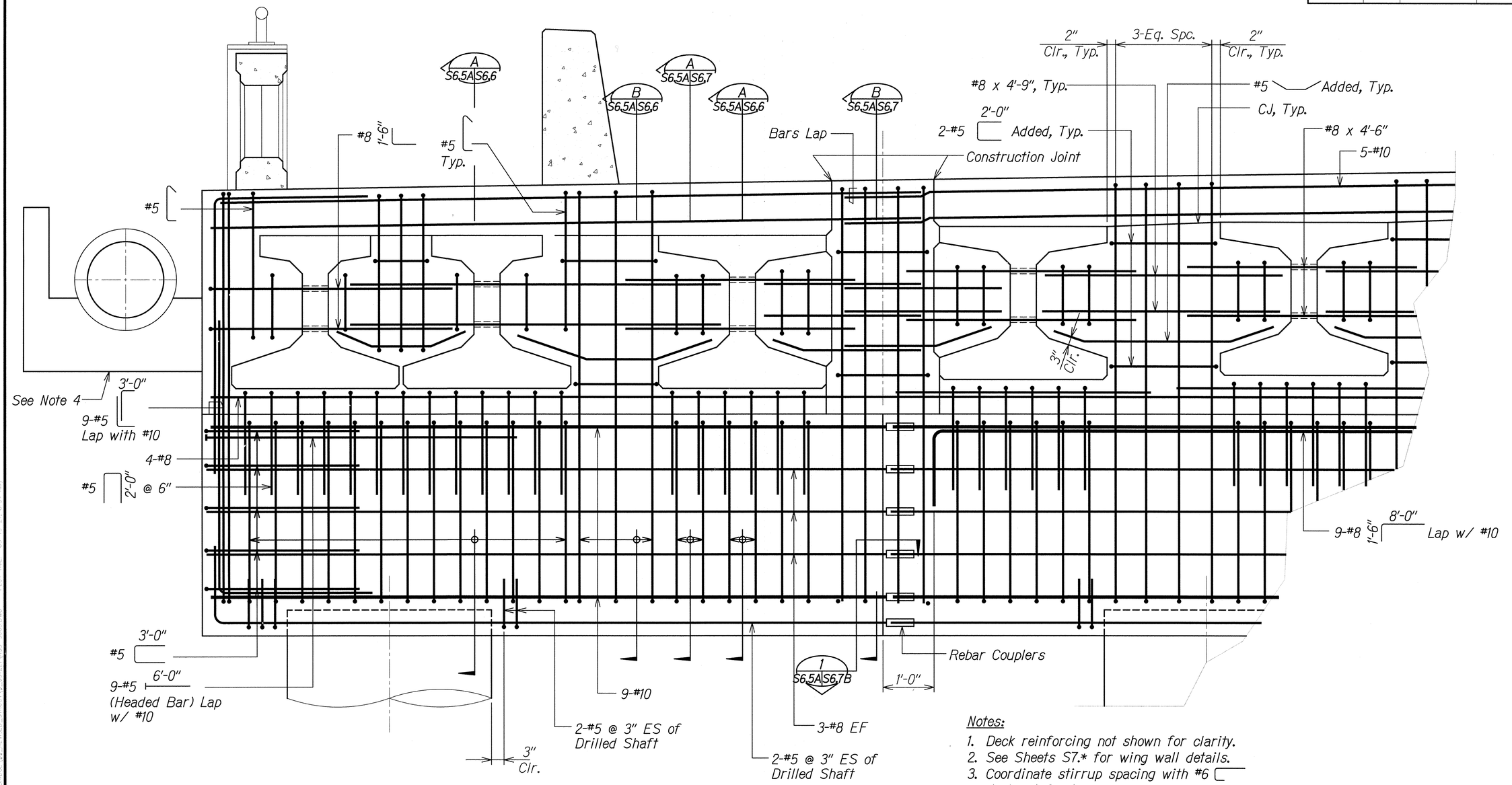
SHEET No. S6.5 OF 14 SHEETS

ORIGINAL PLAN | NOTE BOOK No.

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

DRAWING NAME: T:\PROJECTS\1-ACTIVE FILES\913-01_KAIPAPAU BRIDGE\$$_REVISED_STRUCT\$$_051221\KSB-S605.DWG PLOT TIME: 06-09-21, 3:22 PM)

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	104	161



Notes:

1. Deck reinforcing not shown for clarity.
2. See Sheets S7.* for wing wall details.
3. Coordinate stirrup spacing with #6 ⊏ deck reinforcing.
4. See sheets S11.1 and S11.1A for W16 Cradle details.

ELEVATION
(Abutment No. 1 Shown)

A S6.5A S6.5A

Scale: 1" = 1'-0"

GRAPHIC SCALE:

1 0 1 2

SCALE: 1"= 1'-0"

APPROVED:

MAY 24 2021

Manager and Chief Engineer, BWS
(for work affecting BWS facilities
State R/W & BWS easements only)

DATE

DENNIS K. MITSUNAGA
LICENSED PROFESSIONAL ENGINEER
No. 2422-S
HAWAII, U.S.A.

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4/30/22

SIGNATURE LIC. EXPIRATION

MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ABUTMENT ELEVATION

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

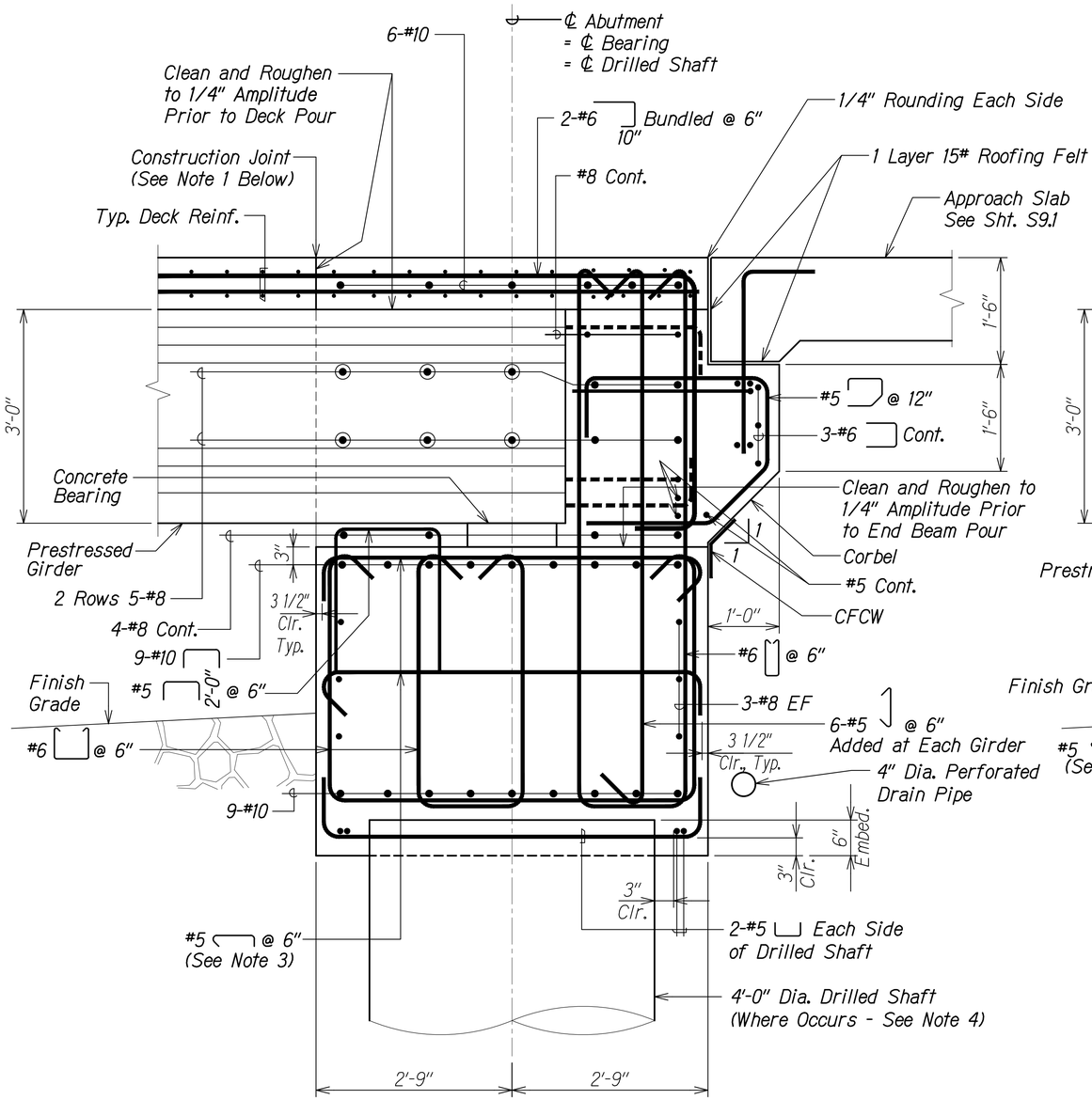
Scale: As Noted Date: February 2021

SHEET No. S6.5A OF 14 SHEETS

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

DRAWING NAME: I:\PROJECTS\...\ACAD FILES\S1-01_KAIPAPAU BRIDGE S3 REVISED STRUCTURES.DGN V8i-SS4.DWG PLOT TIME: 05-15-21, 8:14 AM

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	105	161

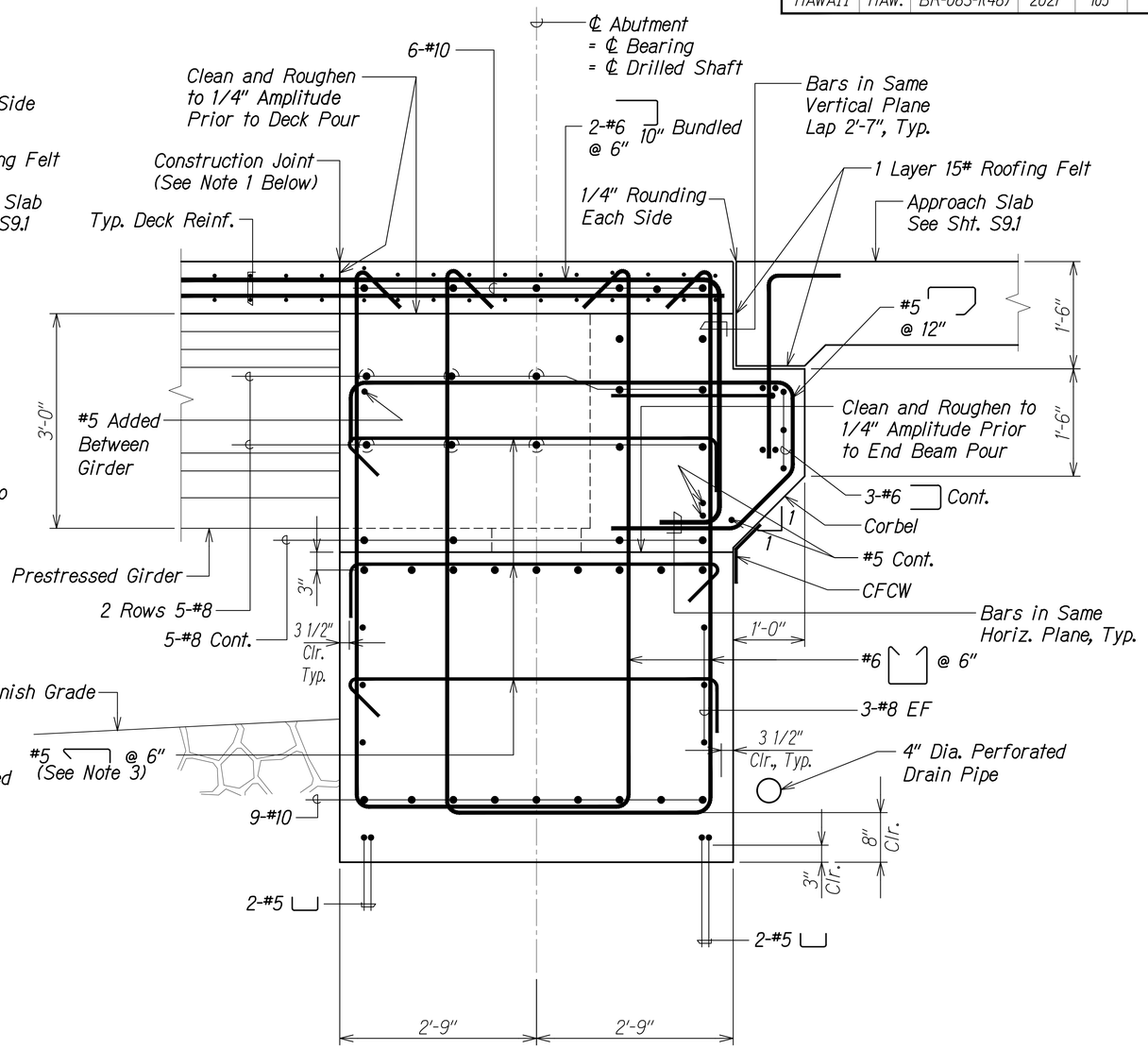


SECTION AT GIRDER (A)

Scale: 1" = 1'-0"

S6.3 | S6.6

S6.4, S6.5A



SECTION BETWEEN GIRDERS (B)

Scale: 1" = 1'-0"

S6.3 | S6.6

S6.4, S6.5A

Notes:

1. Apply bonding agent such as Dural prep A.C., Armatec 110 Epocem or approved equal to Vertical deck deck joint prior to pouring deck section over end beam.
2. See Sheet S6.8 for concrete bearing details.
3. #5 tie at middepth of drilled shaft cap beam is not required at drilled shaft spirals.
4. See sheet S8.1 and S8.2 for drilled shafts.

GRAPHIC SCALE:

1 0 1 2

SCALE: 1"= 1'-0"

DENNIS K. MITSUNAGA
LICENSED PROFESSIONAL ENGINEER
No. 2422-S
HAWAII, U.S.A.

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SIGNATURE 4/30/22 LIC. EXPIRATION

MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ABUTMENT SECTIONS

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

SHEET No. S6.6 OF 14 SHEETS

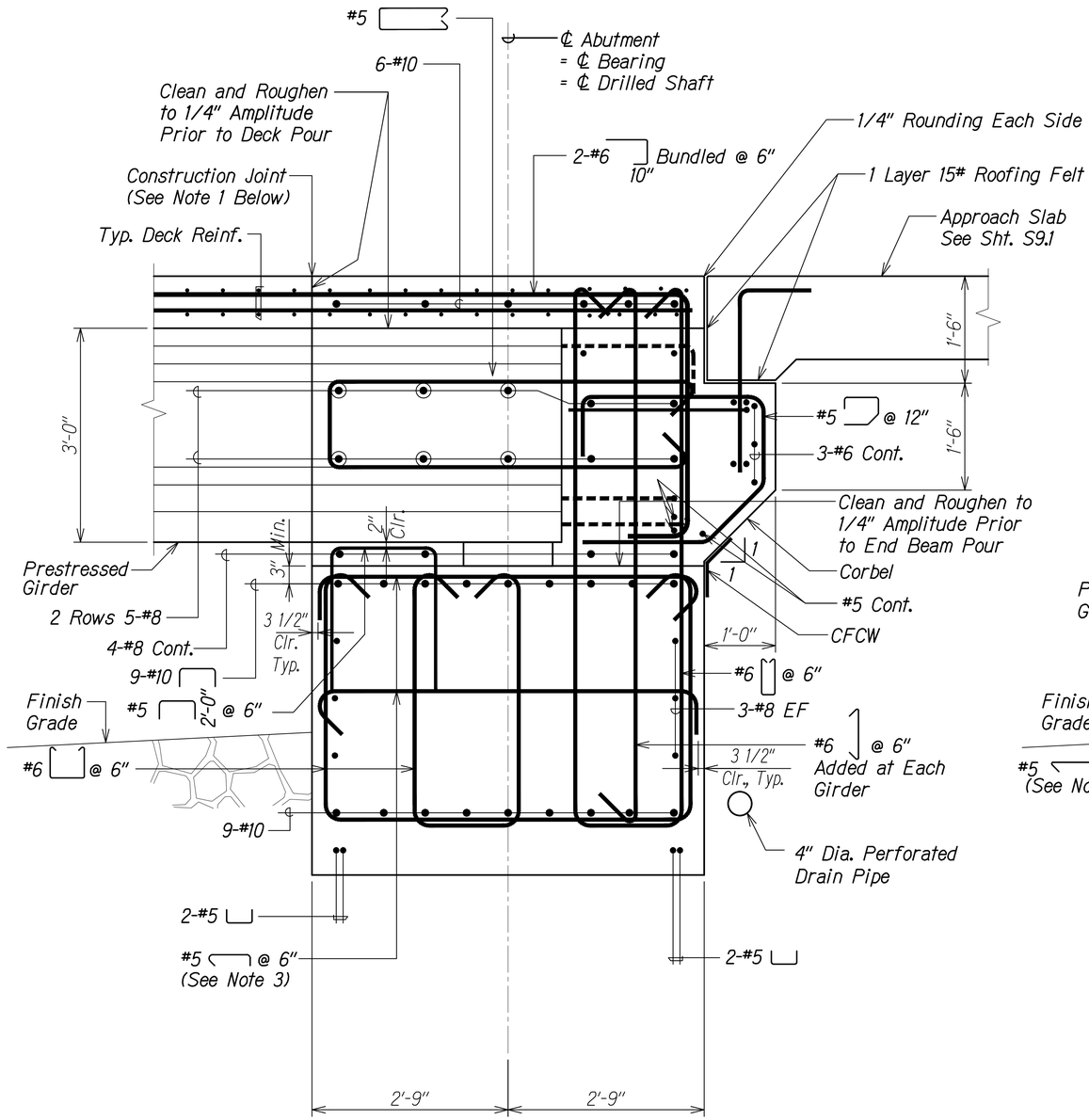
ORIGINAL PLAN | NOTE BOOK | No.

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

DRAWING NAME: T:\PROJECTS\1-ACTIVE FILES\913-01_KAIPAPAU BRIDGE\$$_REVISED_STRUCT\$$_051221\KSB-S606.DWG PLOT TIME: 06-09-21, 3:23 PM)

1

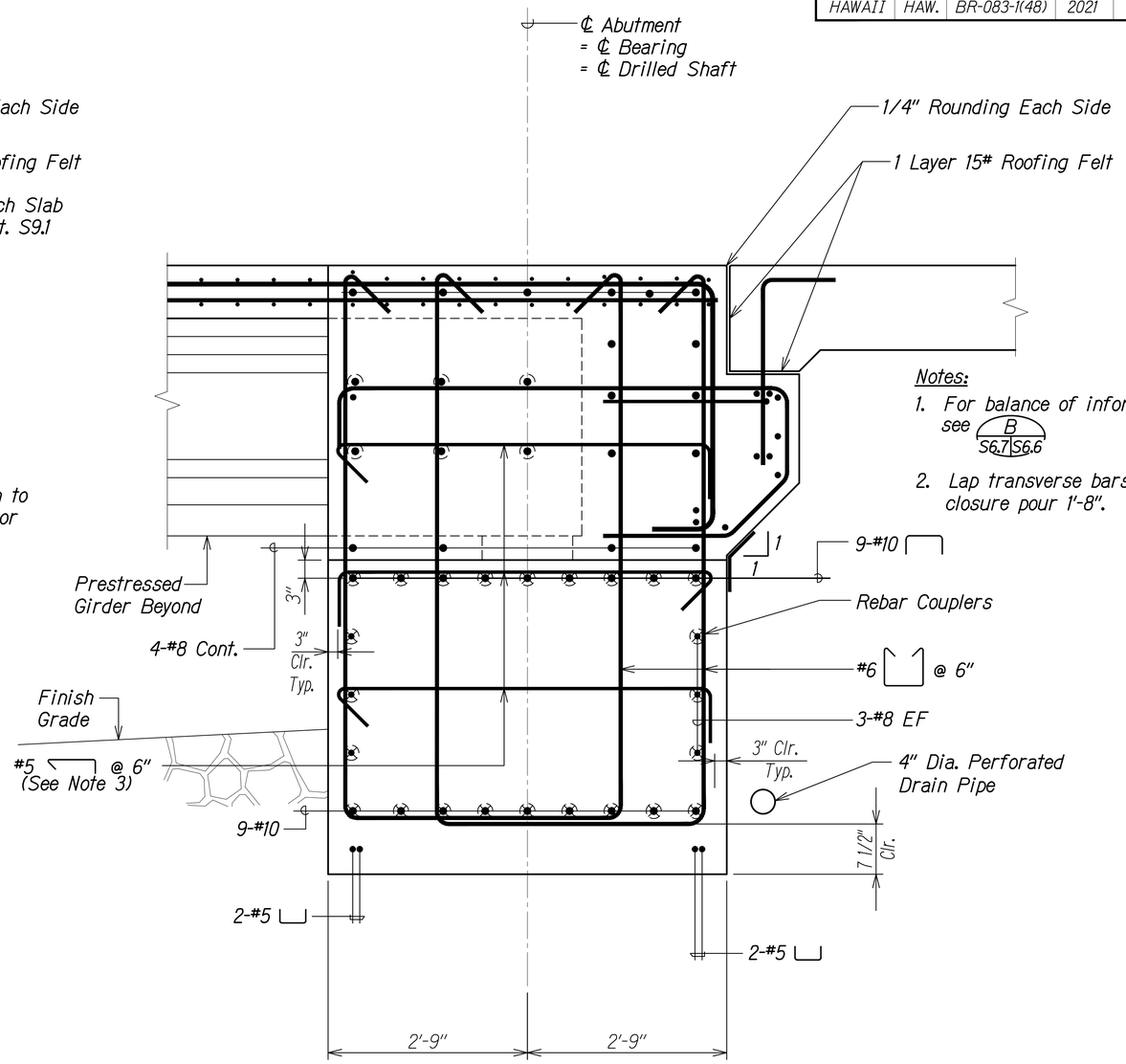
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	106	161



SECTION AT GIRDER FLANGE

Scale: 1" = 1'-0"

A — S6.3 | S6.7; S6.4, S6.5A



SECTION AT DRILLED SHAFT CAP BEAM CONSTRUCTION JOINT

Scale: 1" = 1'-0"

B — S6.5A | S6.7

Notes:

1. Apply bonding agent such as Dural prep A.C., Armatec 110 Epocem or approved equal to Vertical deck deck joint prior to pouring deck section over end beam.
2. See Sheet S6.8 for concrete bearing details.
3. #5 tie at middepth of drilled shaft cap beam is not required at drilled shaft spirals.
4. See sheet S8.1 and S8.2 for drilled shafts.

GRAPHIC SCALE:

1 0 1 2

SCALE: 1"= 1'-0"

DENNIS K. MITSUNAGA
LICENSED PROFESSIONAL ENGINEER
No. 2422-S
HAWAII, U.S.A.

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SIGNATURE 4/30/22 LIC. EXPIRATION

MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ABUTMENT SECTIONS

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

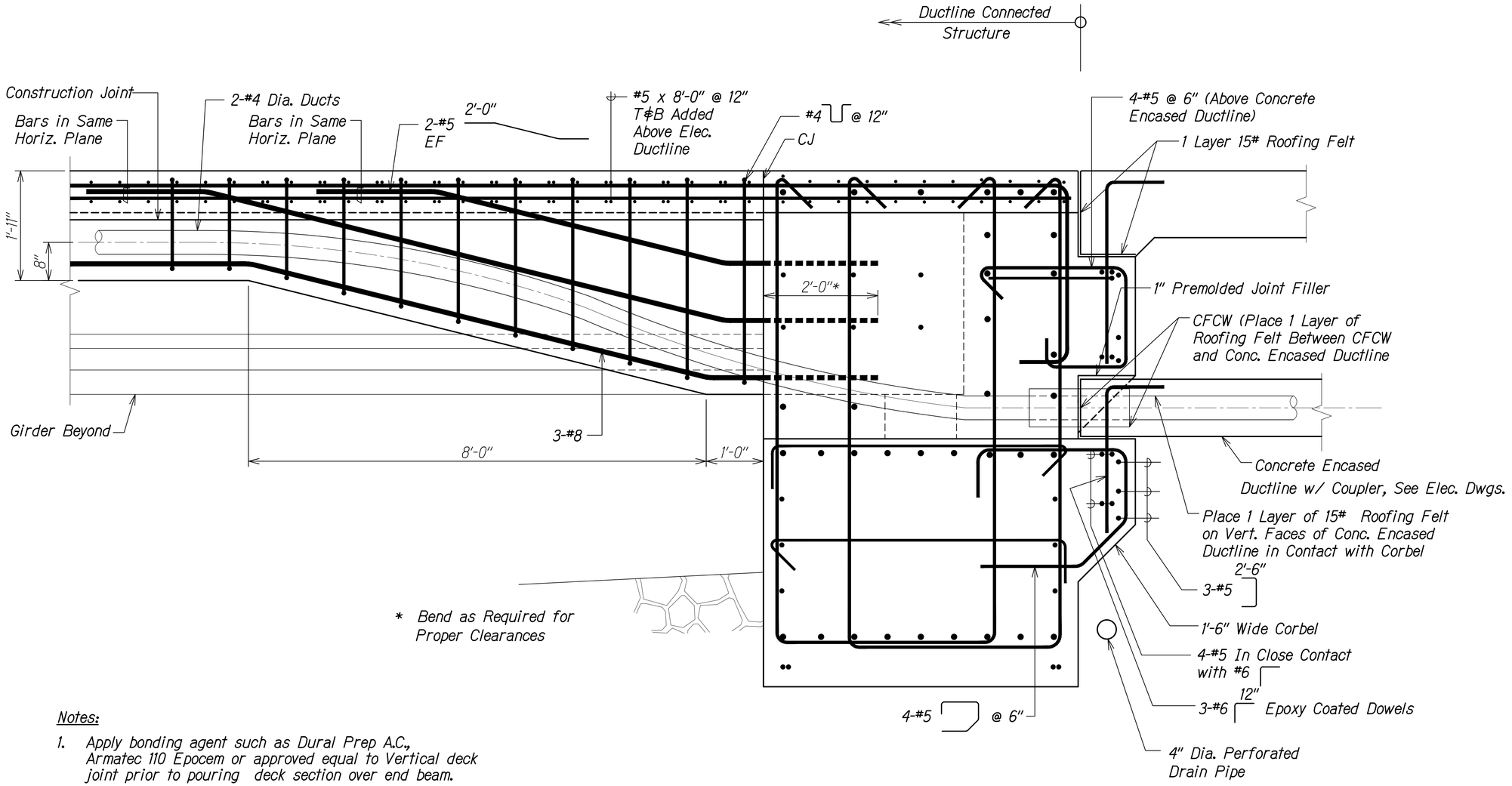
Scale: As Noted Date: February 2021

SHEET No. S6.7 OF 14 SHEETS

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

DRAWING NAME: T:\PROJECTS\1-ACTIVE FILES\913-01_KAIPAPAU BRIDGE\$$$_REVISED_STRUCT\$$$_051221\KSB-S606.DWG PLOT TIME: 06-09-21, 3:24 PM)

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	107	161



Notes:

1. Apply bonding agent such as Dural Prep A.C., Armatec 110 Epocem or approved equal to Vertical deck joint prior to pouring deck section over end beam.
2. For balance of reinforcing See Section B/S6.6.
3. For upper corbel reinforcing and approach slab details see sht. S9.1.

SECTION AT ELECTRICAL DUCTLINE

Scale: 1" = 1'-0"

A S6.3 S6.7A

S6.3A, S6.4, S6.4A, S6.5

GRAPHIC SCALE:

1 0 1 2

SCALE: 1"= 1'-0"

DENNIS K. MITSUNAGA LICENSED PROFESSIONAL ENGINEER No. 2422-S HAWAII, U.S.A.

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4/30/22

SIGNATURE LIC. EXPIRATION

MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ABUTMENT SECTION

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

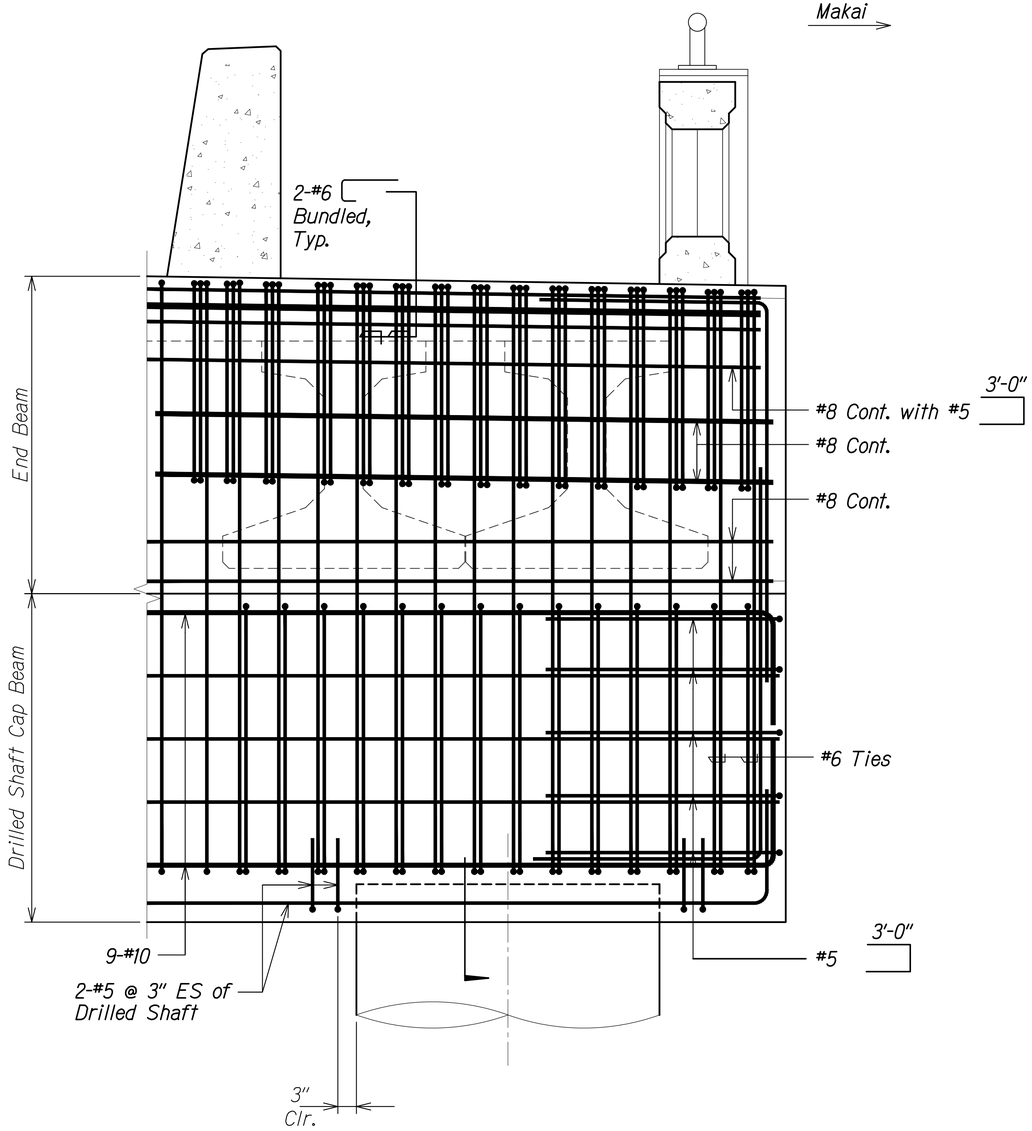
SHEET No. S6.7A OF 14 SHEETS

ORIGINAL PLAN | NOTE BOOK | No. | DATE

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

DRAWING NAME: T:\PROJECTS\1-ACTIVE FILES\913-01_KAIPAPAU BRIDGE\$$_REVISED_STRUCT\$$_051221\KSB-S606.DWG PLOT TIME: 06-09-21, 3:25 PM)

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	108	161

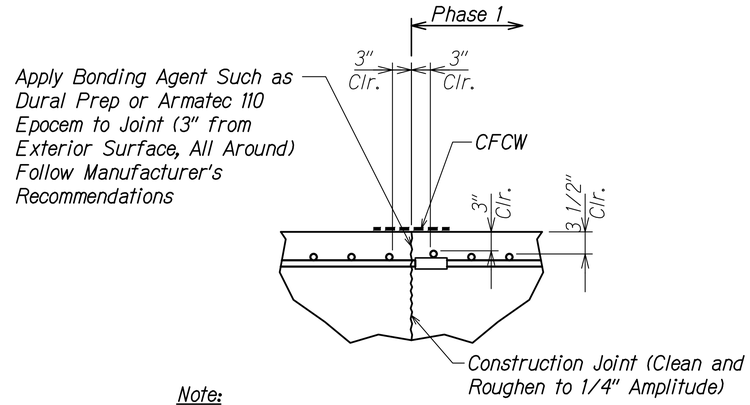


REAR ELEVATION (MAKAI SIDE)

A

Scale: 1" = 1'-0"

S6.7B | S6.7B



Note:
Coupler shown in this detail is for illustrative purposes.
Contractor shall submit details.

REBAR COUPLER DETAIL

1

Scale: 1" = 1'-0"

S1.3 | S6.7B

S6.5A

GRAPHIC SCALE:

1 0 1 2

SCALE: 1"= 1'-0"

DENNIS K. MITSUNAGA
LICENSED PROFESSIONAL ENGINEER
No. 2422-S
HAWAII, U.S.A.

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SIGNATURE 4/30/22 LIC. EXPIRATION

MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ABUTMENT SECTION AND DETAIL

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

SHEET No. S6.7B OF 14 SHEETS

ORIGINAL PLAN
NOTE BOOK
No.

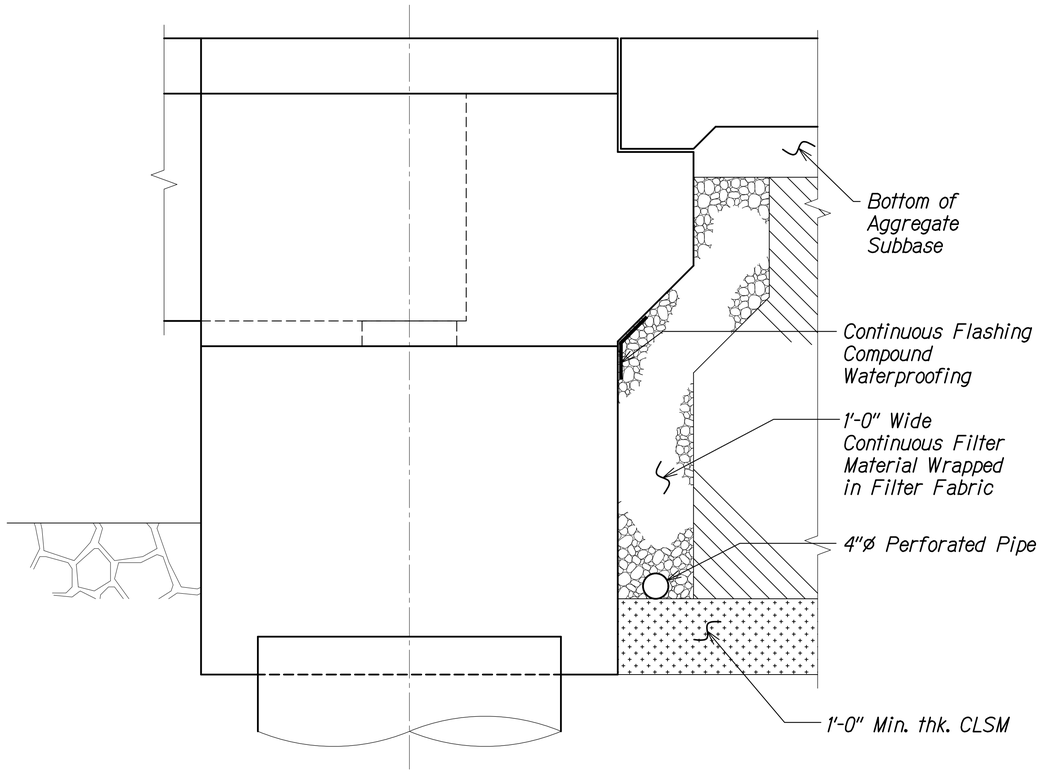
SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE

DRAWING NAME: T:\PROJECTS\1-ACTIVE FILES\913-01_KAIPAPAU BRIDGE\$$_REVISED_STRUCT\$$_051221\KSB-S606.DWG PLOT TIME: 06-09-21, 3:25 PM)

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	109	161

Legend:

- *Structure Backfill*
- *Filter Material*
- *Impervious Material*



BACKFILL DETAIL

Scale: 1" = 1'-0"

1 S6.7C | S6.7C

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

DRAWING NAME: T:\PROJECTS\1-ACTIVE FILES\913-01_KAIPAPAU BRIDGE\$$_REVISED_STRUCT\$$_051221\KSB-S606.DWG PLOT TIME: 06-09-21, 3:26 PM)

GRAPHIC SCALE:

1 0 1 2

SCALE: 1"= 1'-0"

DENNIS K. MITSUNAGA LICENSED PROFESSIONAL ENGINEER No. 2422-S HAWAII, U.S.A.

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4/30/22

SIGNATURE LIC. EXPIRATION

MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

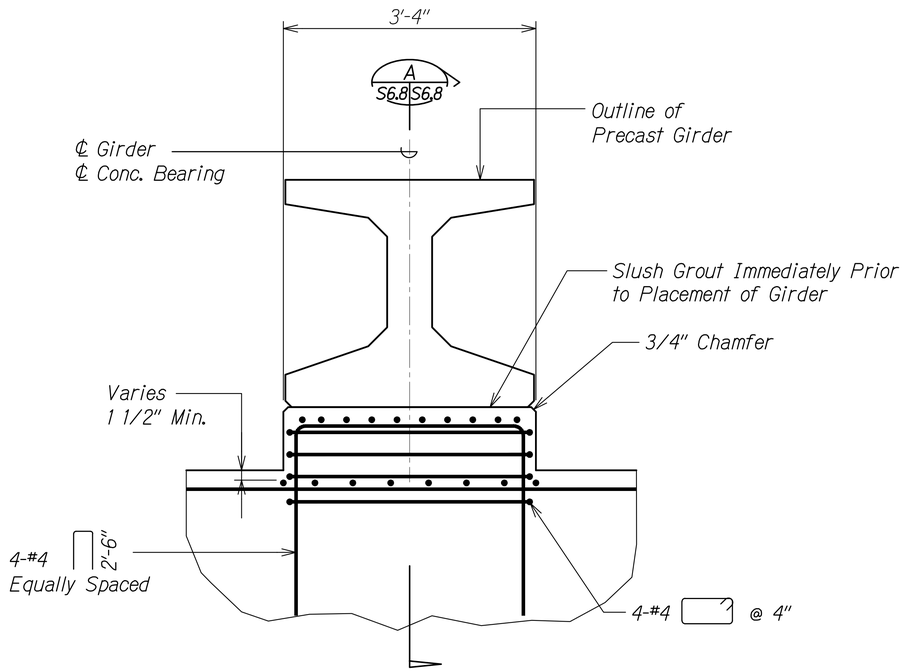
BACKFILL DETAIL

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

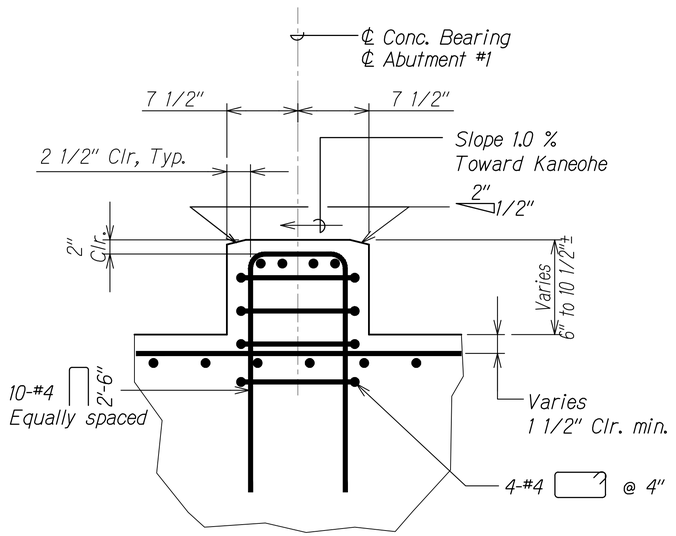
SHEET No. S6.7C OF 14 SHEETS

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	110	161

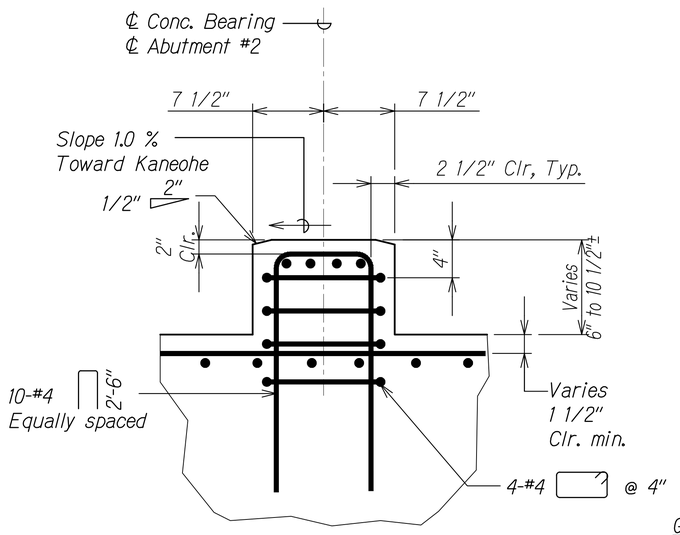


CONCRETE BEARING DETAIL (1 S8.8 | S6.8)

Scale: 1" = 1'-0"



CONCRETE BEARING
AT ABUTMENT NO. 1



CONCRETE BEARING
AT ABUTMENT NO. 2

SECTION (A S8.8 | S6.8)

Scale: 1 1/2" = 1'-0"

GRAPHIC SCALES:

1 0 1 2
SCALE: 1"= 1'-0"

1 0 1FT
SCALE: 1 1/2"= 1'-0"

DENNIS K. MITSUNAGA
LICENSED PROFESSIONAL ENGINEER
No. 2422-S
HAWAII, U.S.A.

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SIGNATURE 4/30/22 LIC. EXPIRATION

MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CONCRETE BEARING DETAIL

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

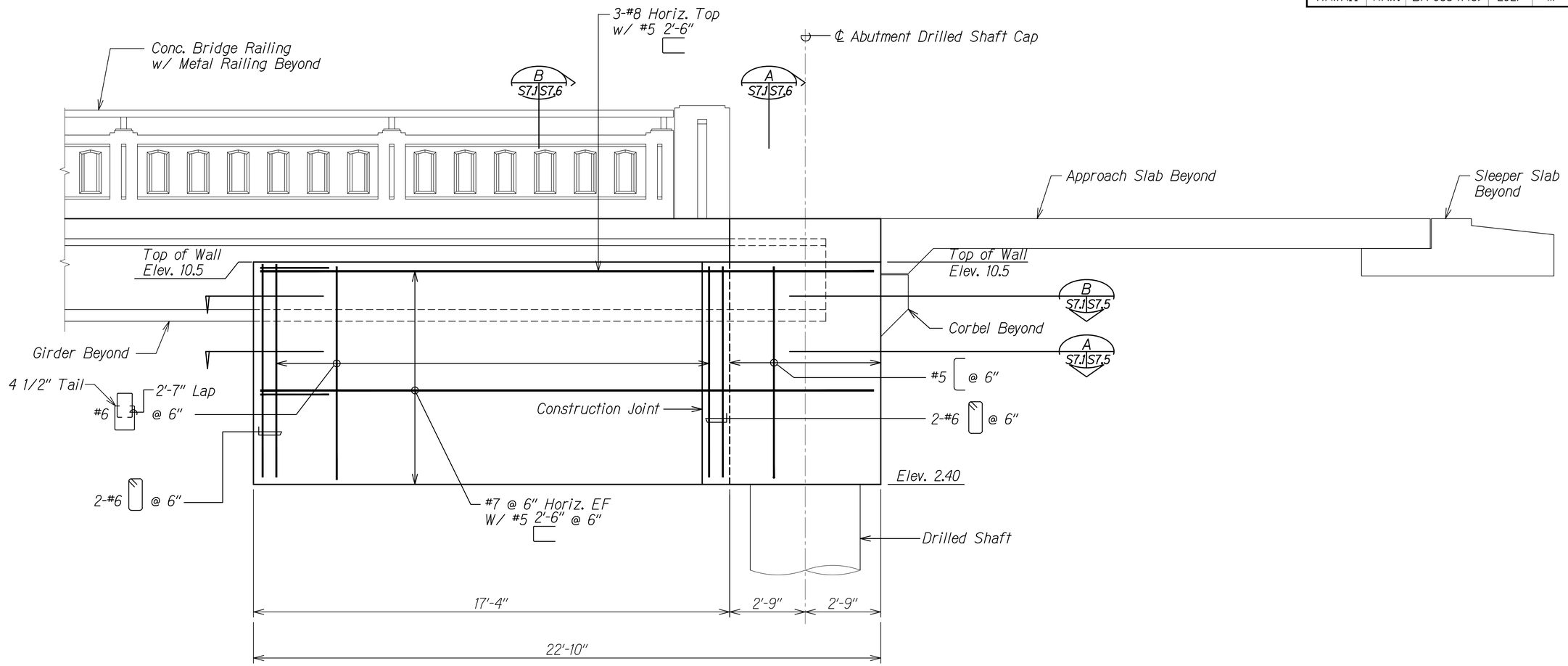
SHEET No. S6.8 OF 14 SHEETS

ORIGINAL PLAN
NOTE BOOK
No.

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

DRAWING NAME: T:\PROJECTS\1-ACTIVE FILES\913-01_KAIPAPAU BRIDGE\$$_REVISED_STRUCT\$$_051221\KSB-S608.DWG PLOT TIME: 06-09-21, 3:27 PM)

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	111	161



WING WALL NO. 1 ELEVATION

Scale: 1/2" = 1'-0"

A S6.1 S7.1 S6.5

GRAPHIC SCALE:

2 1 0 2 4

SCALE: 1/2"= 1'-0"

DENNIS K. MITSUNAGA
LICENSED PROFESSIONAL ENGINEER
No. 2422-S
HAWAII, U.S.A.

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SIGNATURE 4/30/22 LIC. EXPIRATION

MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

WING WALL NO. 1
ELEVATION

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

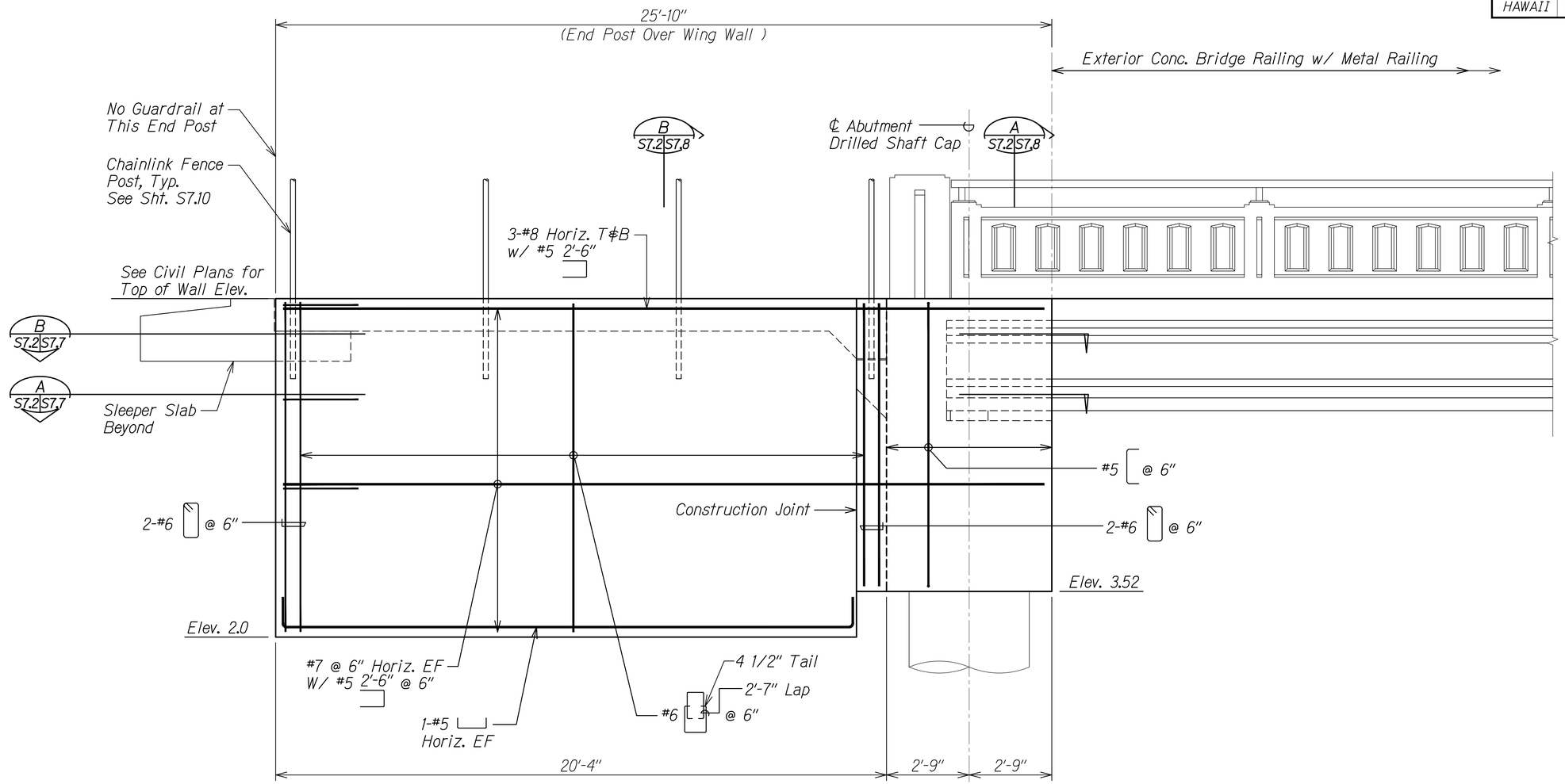
Scale: As Noted Date: February 2021

SHEET No. S7.1 OF 11 SHEETS

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

DRAWING NAME: T:\PROJECTS\1-ACTIVE FILES\913-01_KAIPAPAU BRIDGE\$$_REVISED_STRUCT\$$_051221\KSB-S701.DWG PLOT TIME: 06-09-21, 3:27 PM)

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	112	161



WING WALL NO. 2 ELEVATION

A S6.2 S7.2

Scale: 1/2" = 1'-0"

GRAPHIC SCALE:

2 1 0 2 4

SCALE: 1/2"= 1'-0"

DENNIS K. MITSUNAGA
LICENSED PROFESSIONAL ENGINEER
No. 2422-S
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

SIGNATURE 4/30/22 LIC. EXPIRATION

MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

WING WALL NO. 2 ELEVATION

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

SHEET No. S7.2 OF 11 SHEETS

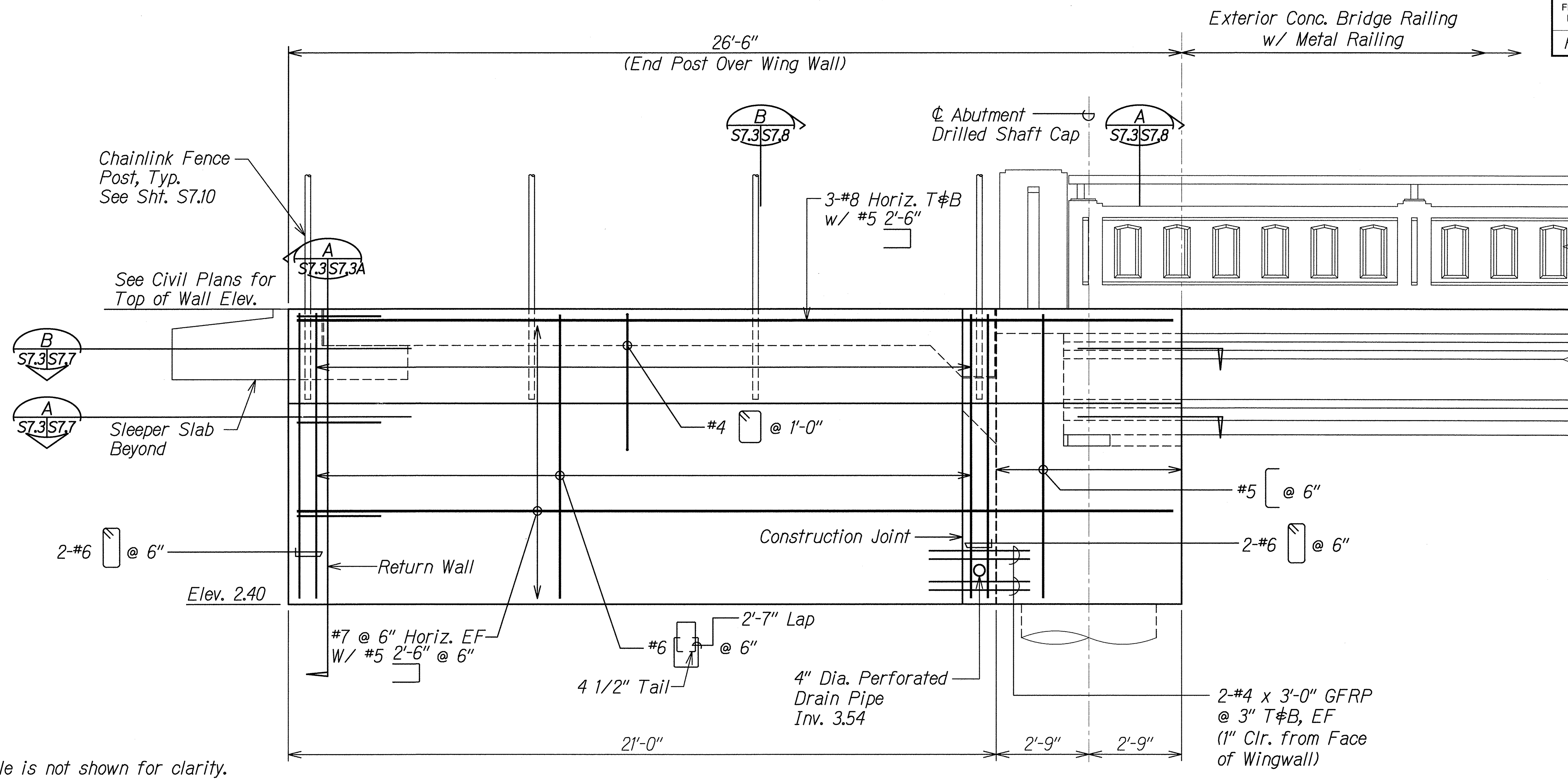
11

ORIGINAL PLAN
NOTE BOOK No.

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

DRAWING NAME: T:\PROJECTS\1-ACTIVE FILES\913-01_KAIPAPAU BRIDGE\$$_REVISED_STRUCT\$$_051221\KSB-S701.DWG PLOT TIME: 06-09-21, 3:28 PM)

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	113	161



Note:

W16 Cradle is not shown for clarity.

WING WALL NO. 3 ELEVATION (A S6.1 S7.3)

Scale: 1/2" = 1'-0"

GRAPHIC SCALE:

2 1 0 2 4
SCALE: 1/2"= 1'-0"

1 0 1 2
SCALE: 1"= 1'-0"

APPROVED: MAY 24 2021
Manager and Chief Engineer, BWS — DATE
(for work affecting BWS facilities State R/W & BWS easements only)

DENNIS K. MITSUNAGA LICENSED PROFESSIONAL ENGINEER No. 2422-S HAWAII, U.S.A.
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION
SIGNATURE 4/30/22 LIC. EXPIRATION
MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

WING WALL NO. 3
ELEVATION

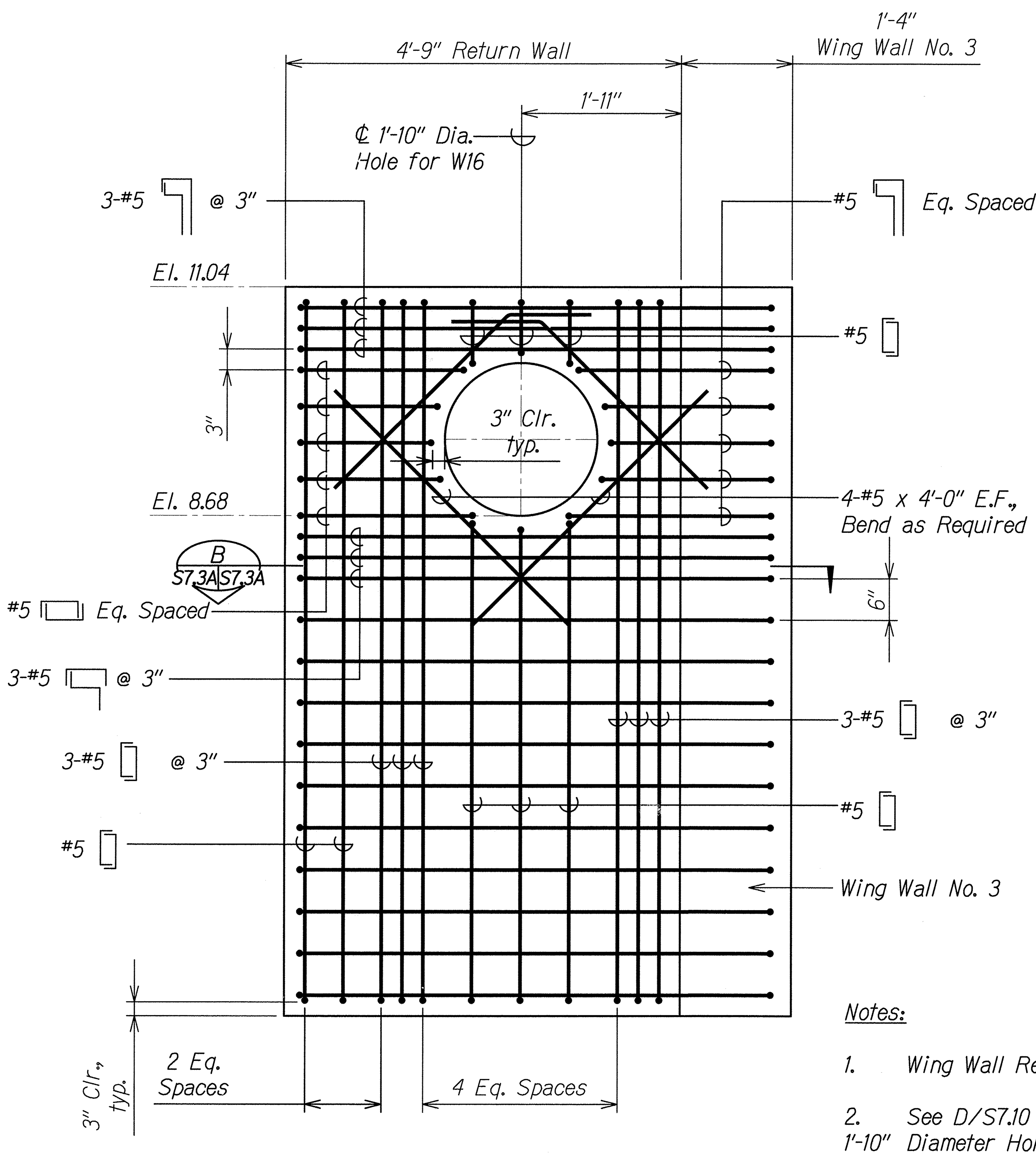
KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted   Date: February 2021

SHEET No. S7.3 OF 11 SHEETS

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

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	114	161

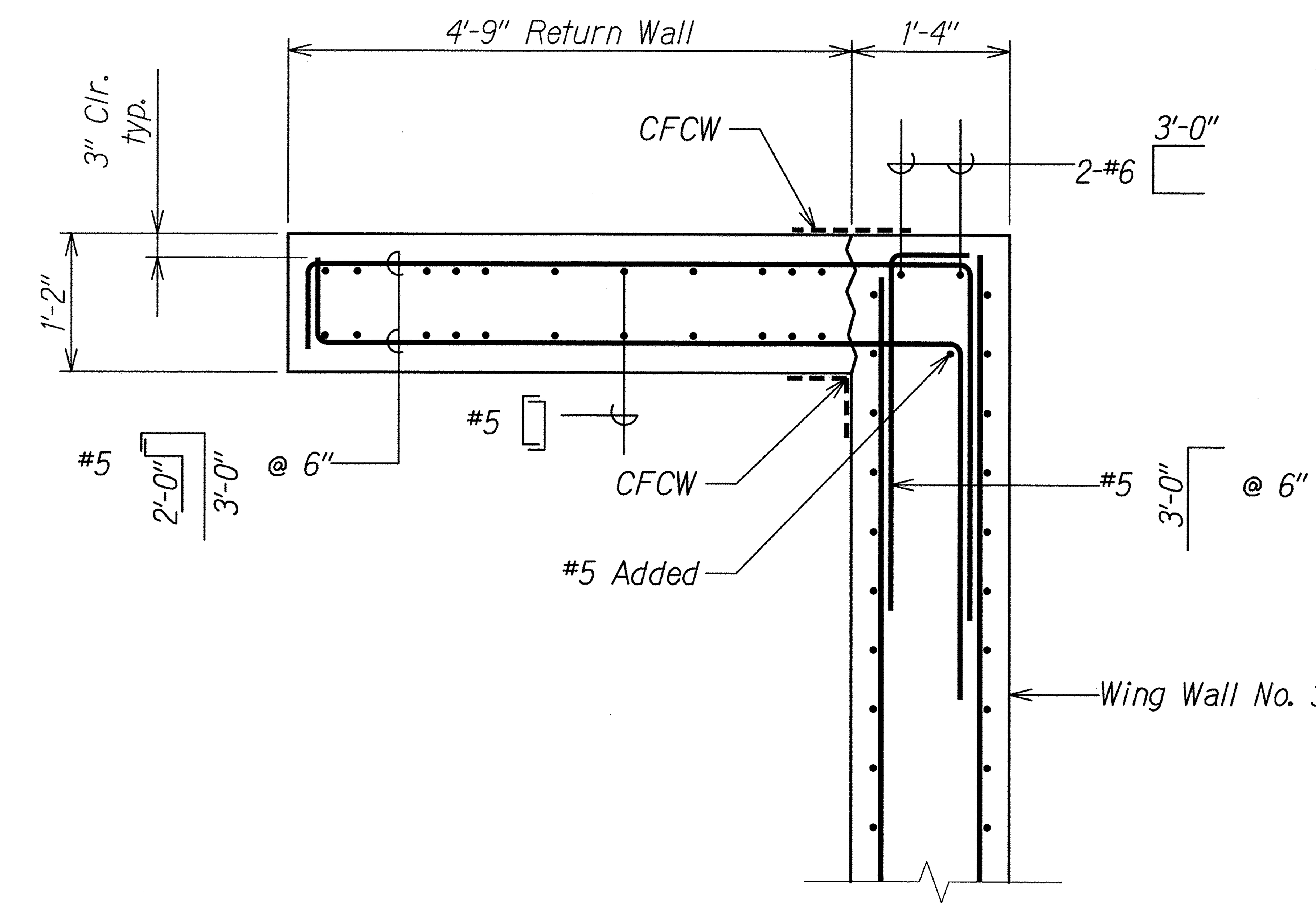


RETURN WALL SECTION (A S7.3 S7.3A)

Scale: 1" = 1'-0"

Notes:

1. Wing Wall Reinforcement not shown for Clarity.
2. See D/S7.10 for Additional Information at 1'-10" Diameter Hole.



SECTION (B S7.3A S7.3A)

Scale: 1" = 1'-0"

APPROVED: MAY 2 4 2021
Manager and Chief Engineer, BWS — DATE
(for work affecting BWS facilities State R/W & BWS easements only)

GRAPHIC SCALE: 2 1 0 2 4
SCALE: 1/2"= 1'-0"

DENNIS K. MITSUNAGA LICENSED PROFESSIONAL ENGINEER No. 2422-S HAWAII, U.S.A.
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MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

RETURN WALL SECTIONS

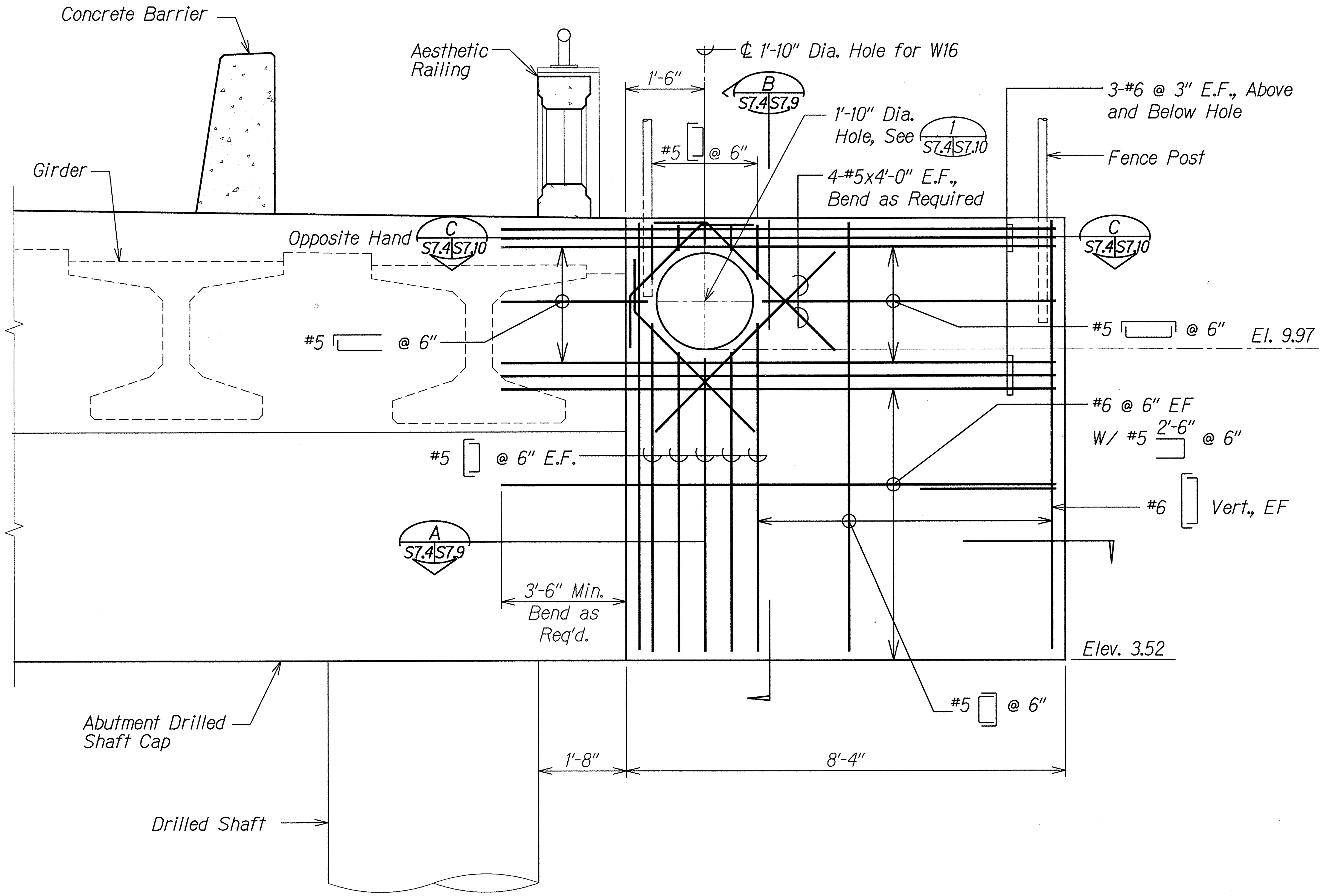
KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted — Date: February 2021

SHEET No. S7.3A OF 11 SHEETS

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

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	115	161



WING WALL NO. 4 ELEVATION (A S6.2 S7.4)

Scale: 3/4" = 1'-0"

APPROVED:

MAY 2 4 2021

For Manager and Chief Engineer, BWS — DATE
(for work affecting BWS facilities State R/W & BWS easements only)

GRAPHIC SCALE:
1 0 1 2FT
SCALE: 3/4"= 1'-0"

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LICENSED PROFESSIONAL ENGINEER
No. 2422-S
HAWAII, U.S.A.

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DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

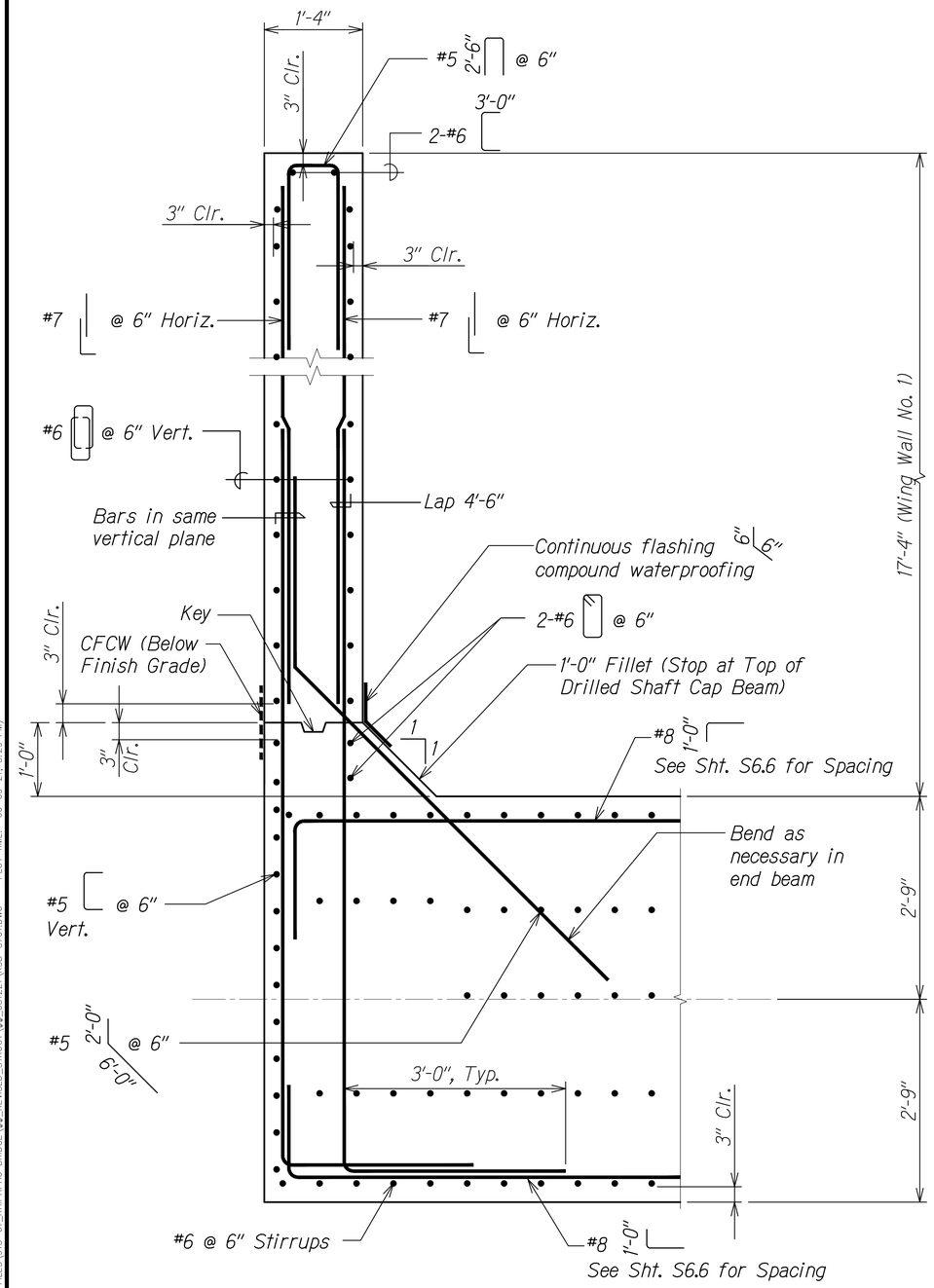
WING WALL NO. 4 ELEVATION

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

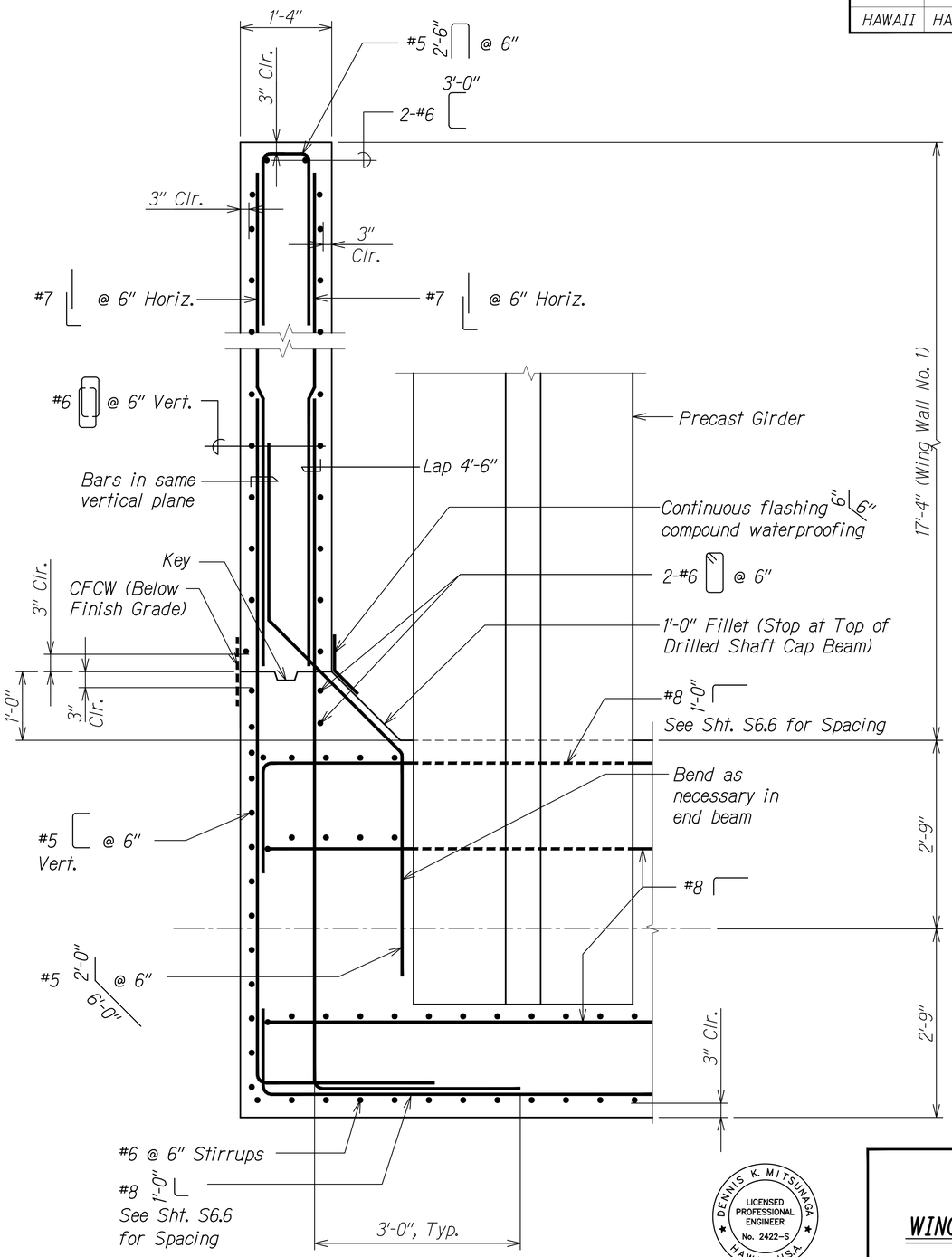
Scale: As Noted — Date: February 2021

SHEET No. S7.4 OF 11 SHEETS

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	116	161



SECTION A
Scale: 1" = 1'-0" S7.1 S7.5



SECTION B
Scale: 1" = 1'-0" S7.1 S7.5

GRAPHIC SCALE:
1 0 1 2
SCALE: 1"= 1'-0"

DENNIS K. MITSUNAGA
LICENSED PROFESSIONAL ENGINEER
No. 2422-S
HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

WING WALL NO. 1 SECTIONS

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

SHEET No. S7.5 OF 11 SHEETS

ORIGINAL PLAN
NOTE BOOK
No.

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DATE

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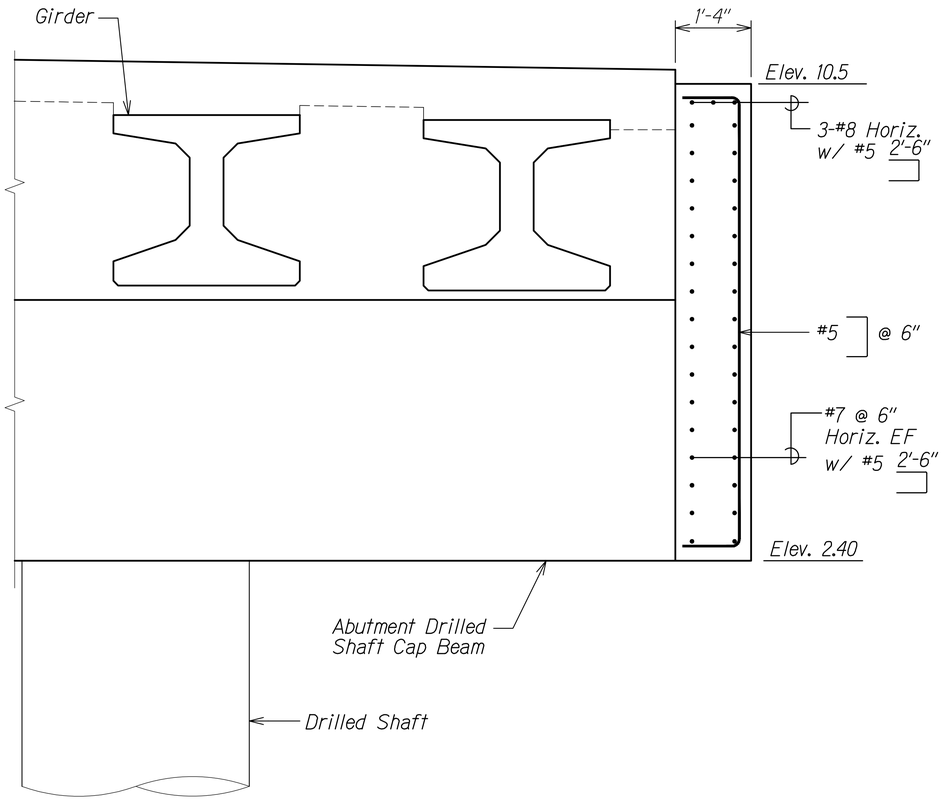
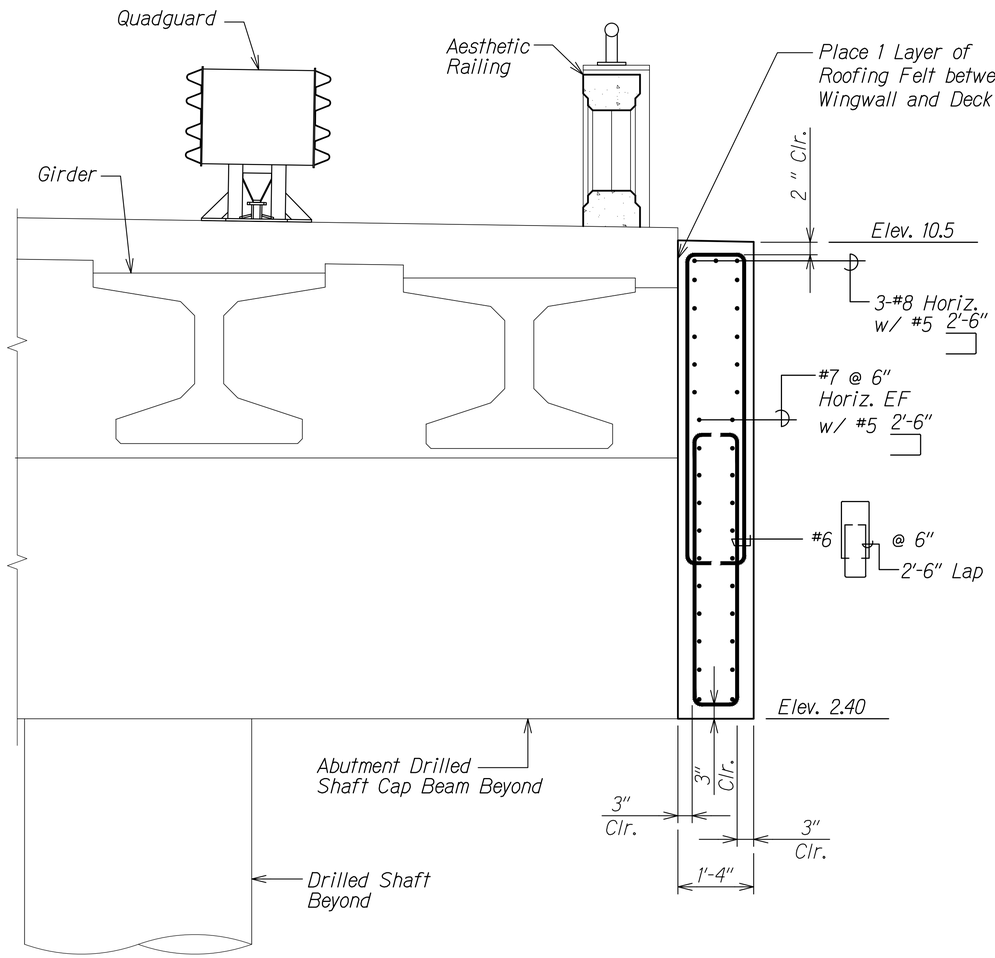
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	117	161



WING WALL NO. 1 SECTION A

Scale: 3/4" = 1'-0"

S7.1 | S7.6



WING WALL NO. 1 SECTION B

Scale: 3/4" = 1'-0"

S7.1 | S7.6

GRAPHIC SCALE:

1 0 1 2FT

SCALE: 3/4"= 1'-0"

DENNIS K. MITSUNAGA
LICENSED PROFESSIONAL ENGINEER
No. 2422-S
HAWAII, U.S.A.

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HIGHWAYS DIVISION

WING WALL NO. 1 SECTIONS

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

SHEET No. S7.6 OF 11 SHEETS

117

ORIGINAL PLAN
NOTE BOOK
No.

SURVEY PLOTTED BY
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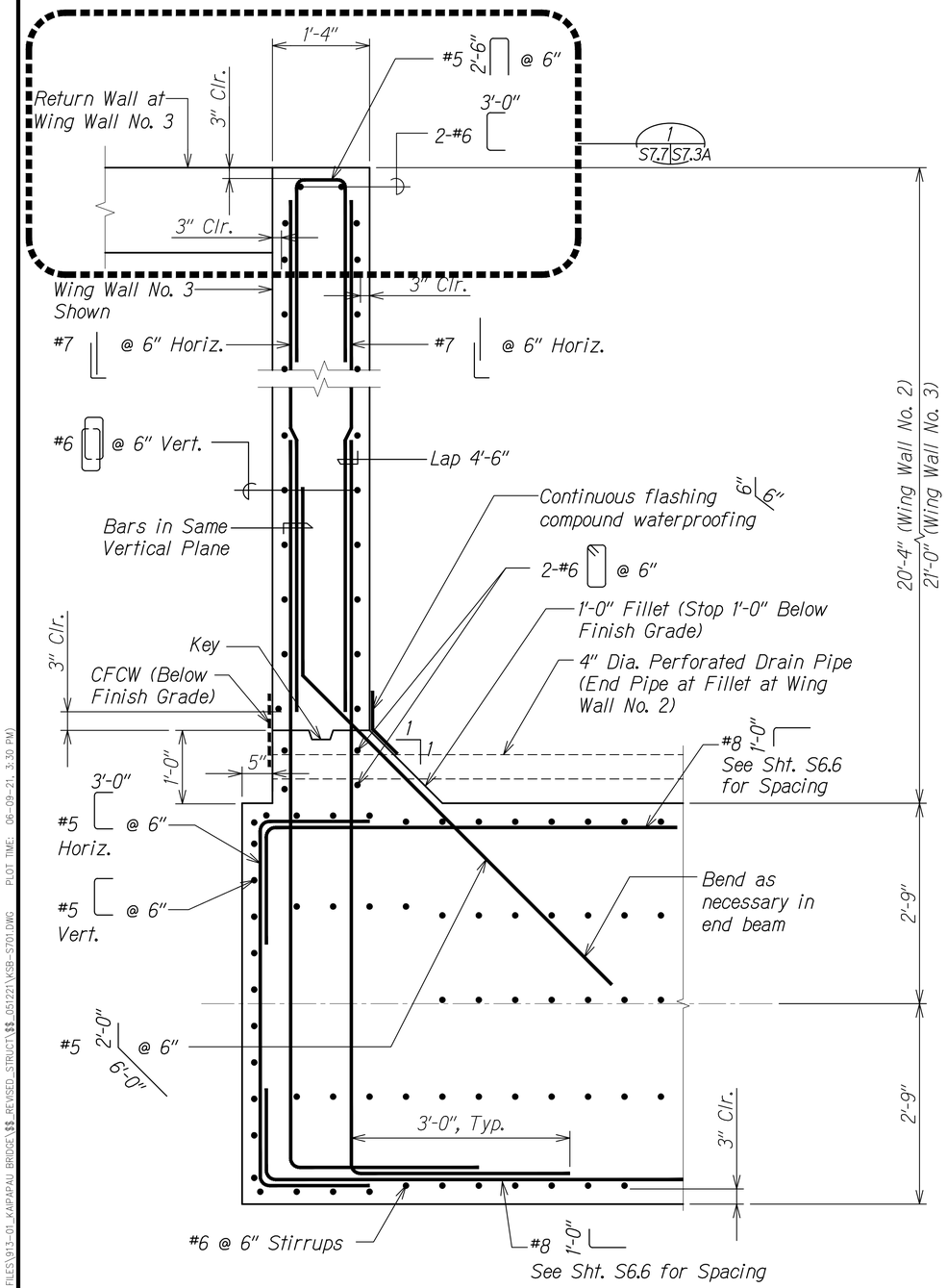
DATE

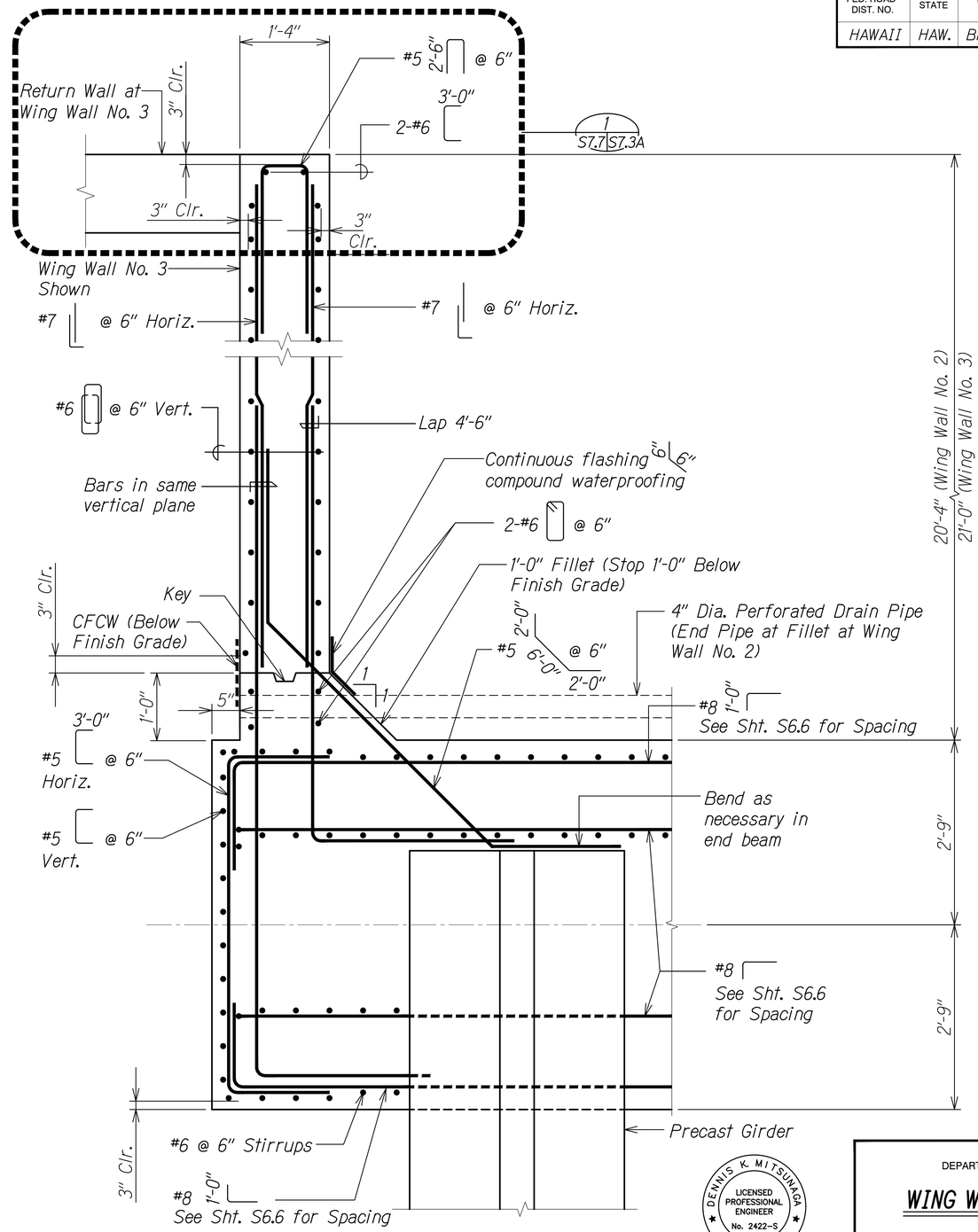
DRAWING NAME: T:\PROJECTS\1-ACTIVE FILES\913-01_KAIPAPAU BRIDGE\$$_REVISED_STRUCT\$$_051221\KSB-S701.DWG PLOT TIME: 06-09-21, 3:29 PM)

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	118	161



SECTION A
Scale: 1" = 1'-0" S7.2 S7.7 S7.3

GRAPHIC SCALE:
1 0 1 2
SCALE: 1"= 1'-0"



SECTION B
Scale: 1" = 1'-0" S7.2 S7.7 S7.3

DENNIS K. MITSUNAGA
LICENSED PROFESSIONAL ENGINEER
No. 2422-S
HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

WING WALL NOS. 2 AND 3
SECTIONS

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

SHEET No. S7.7 OF 11 SHEETS

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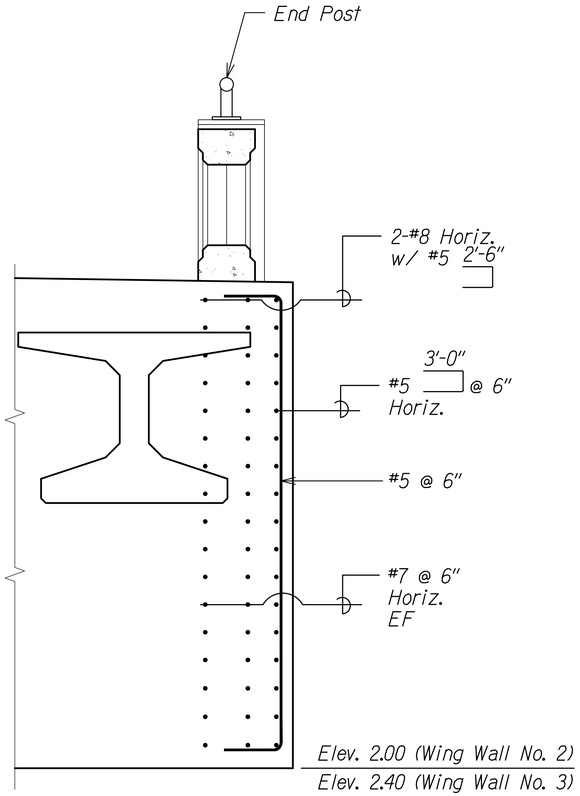
CHECKED BY
DATE

DRAWING NAME: T:\PROJECTS\1-ACTIVE FILES\913-01_KAIPAPAU BRIDGE\$$_REVISED_STRUCT\$$_051221\KSB-S701.DWG PLOT TIME: 06-09-21, 3:30 PM)

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	119	161

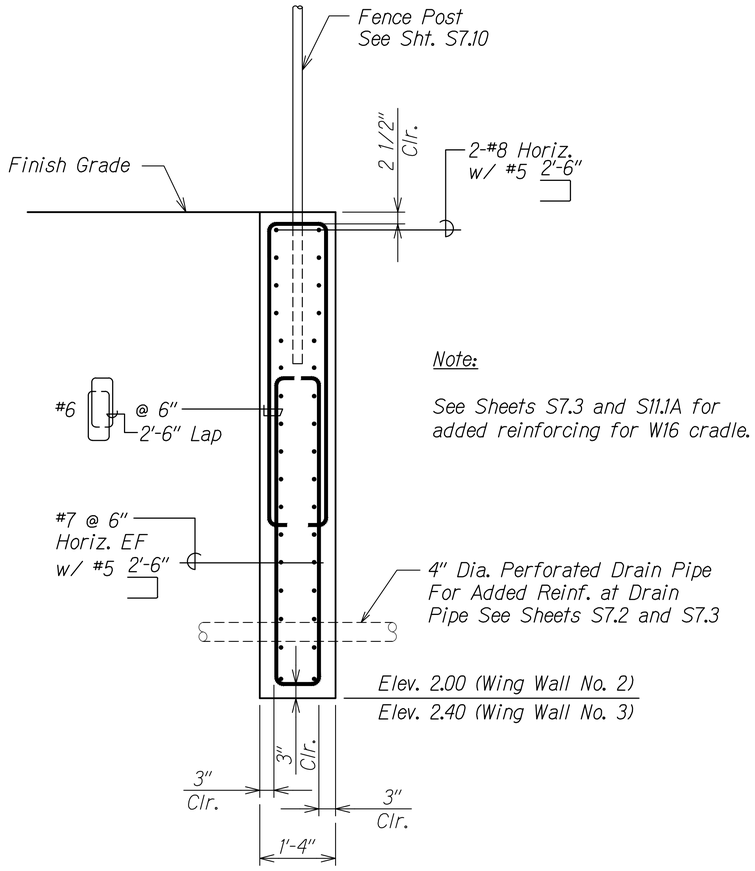


WING WALL SECTION A

Scale: 3/4" = 1'-0"

S7.2 | S7.8

S7.3



Note:

See Sheets S7.3 and S11.1A for added reinforcing for W16 cradle.

WING WALL SECTION B

Scale: 3/4" = 1'-0"

S7.2 | S7.8

S7.3

GRAPHIC SCALE:

1 0 1 2FT

SCALE: 3/4"= 1'-0"

DENNIS K. MITSUNAGA
LICENSED PROFESSIONAL ENGINEER
No. 2422-S
HAWAII, U.S.A.

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SIGNATURE 4/30/22 LIC. EXPIRATION

MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

WING WALL SECTIONS

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

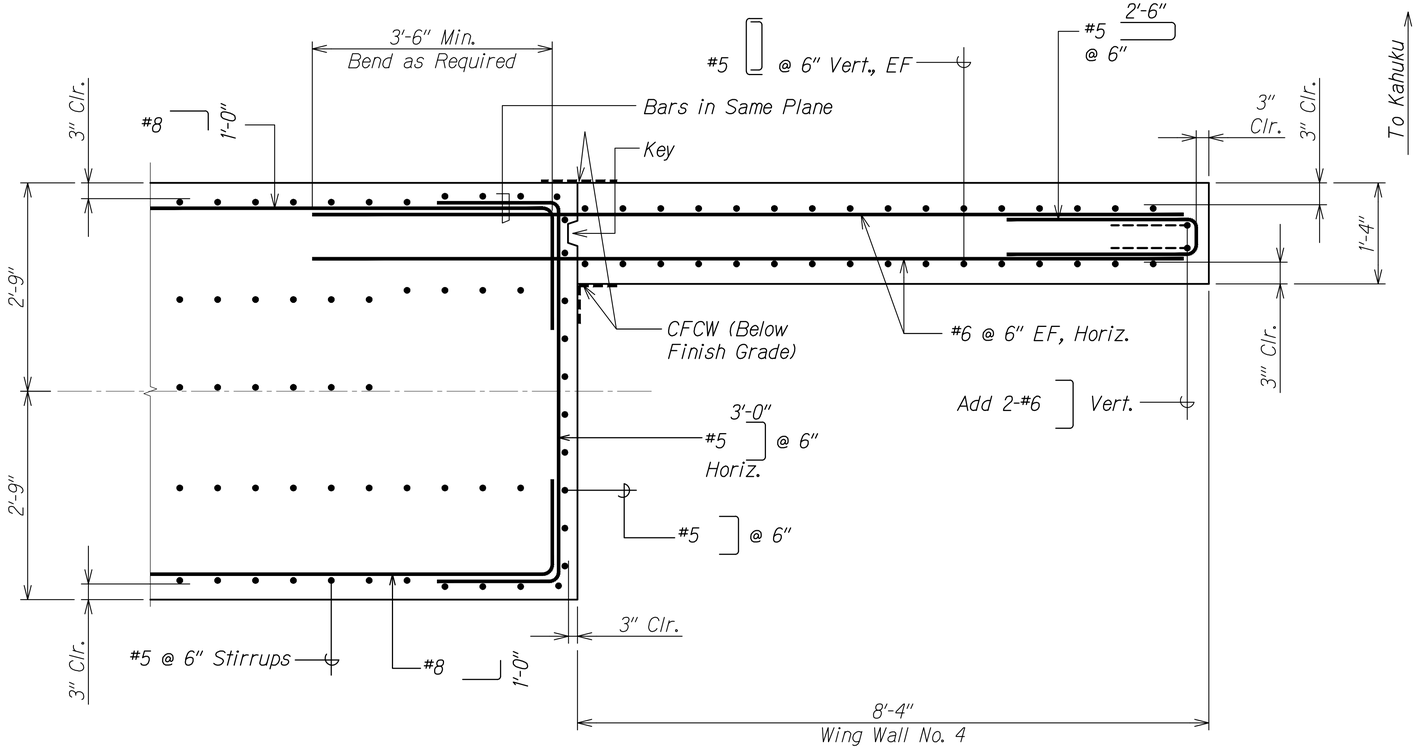
Scale: As Noted Date: February 2021

SHEET No. S7.8 OF 11 SHEETS

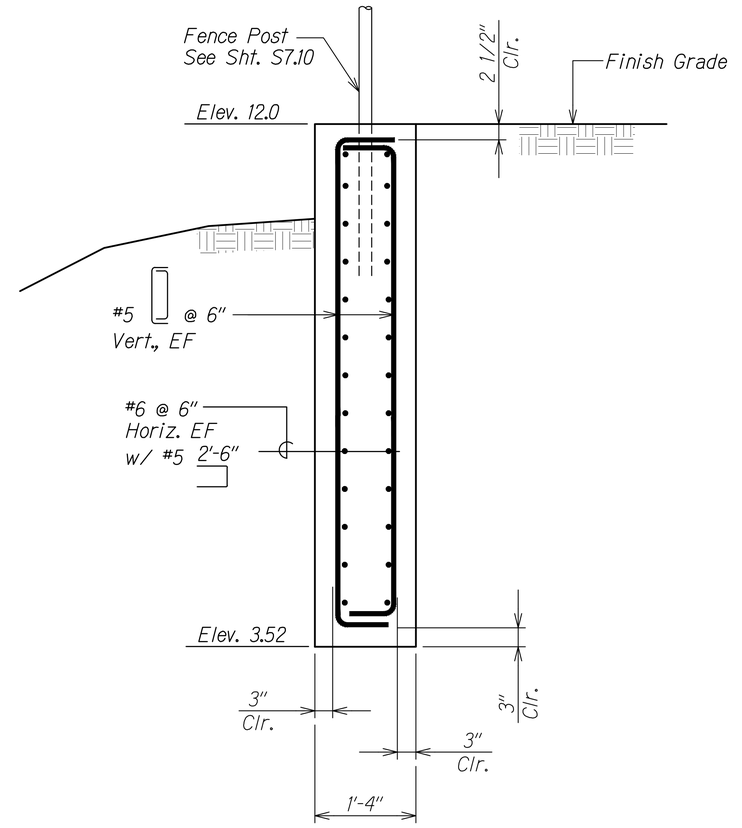
ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
No.	TRACED BY	
	DESIGNED BY	
	QUANTITIES BY	
	CHECKED BY	

DRAWING NAME: T:\PROJECTS\1-ACTIVE FILES\913-01_KAIPAPAU BRIDGE\$$_REVISED_STRUCT\$$_051221\KSB-S701.DWG PLOT TIME: 06-09-21, 3:30 PM)

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	120	161



SECTION A
Scale: 1" = 1'-0"
S7.4 | S7.9



WING WALL NO. 4 SECTION B
Scale: 1" = 1'-0"
S7.4 | S7.9

GRAPHIC SCALE:
1 0 1 2
SCALE: 1"= 1'-0"

DENNIS K. MITSUNAGA
LICENSED PROFESSIONAL ENGINEER
No. 2422-S
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

SIGNATURE 4/30/22 LIC. EXPIRATION

MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

WING WALL SECTIONS

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

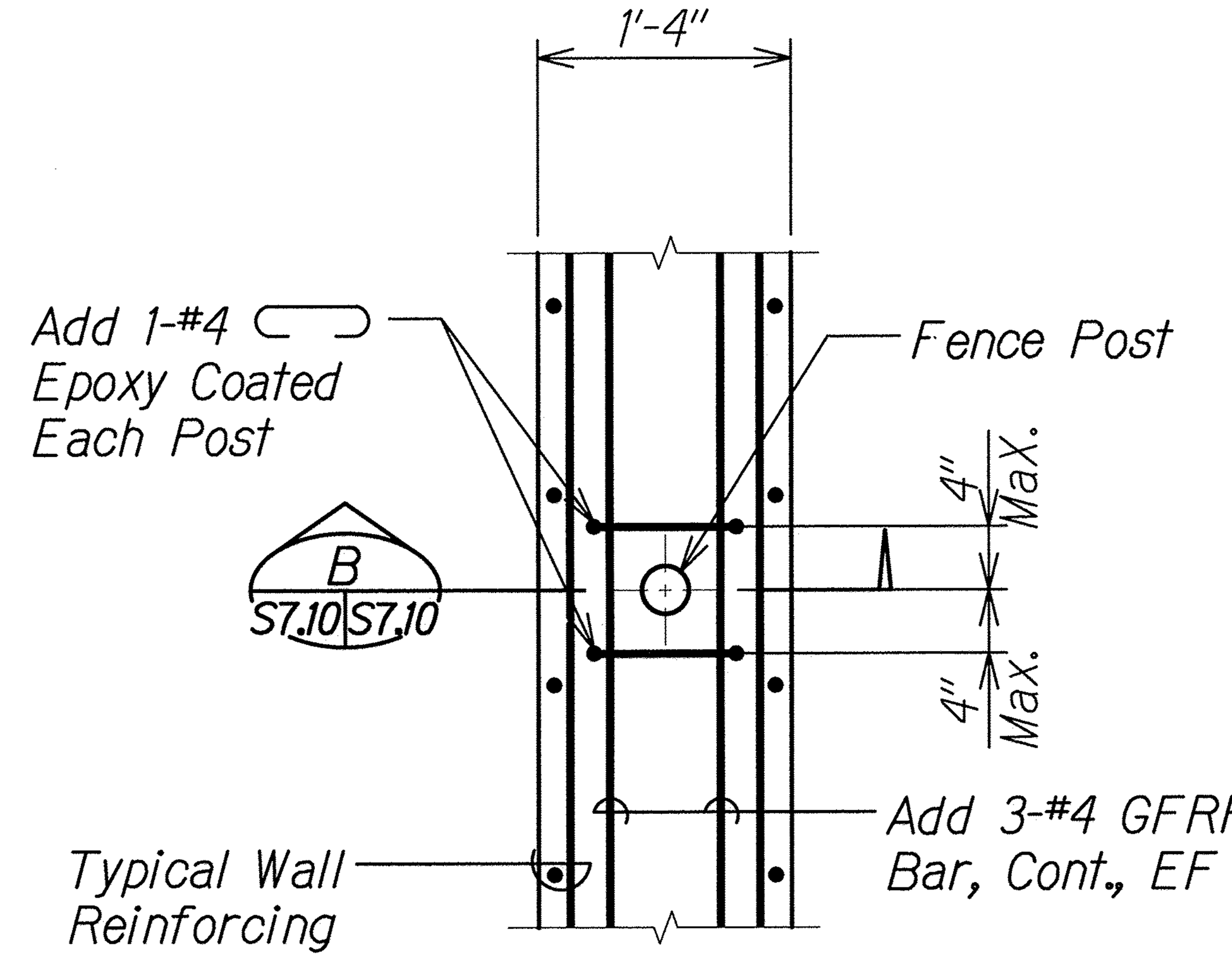
Scale: As Noted Date: February 2021

SHEET No. S7.9 OF 11 SHEETS

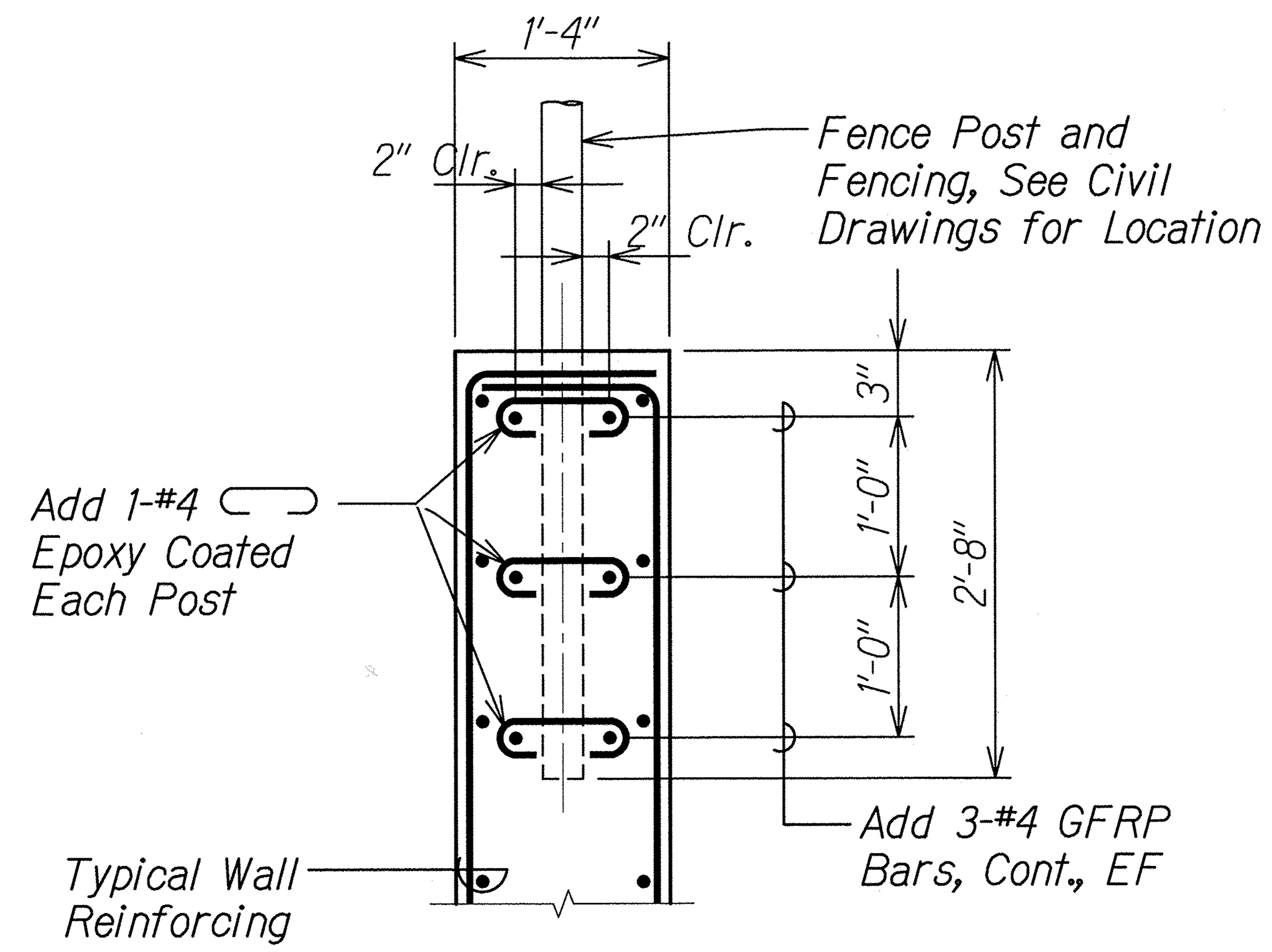
ORIGINAL PLAN
NOTE BOOK No.
SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE

DRAWING NAME: T:\PROJECTS\1-ACTIVE FILES\913-01_KAIPAPAU BRIDGE\$$_REVISED_STRUCT\$$_051221\KSB-S701.DWG PLOT TIME: 06-09-21, 3:31 PM)

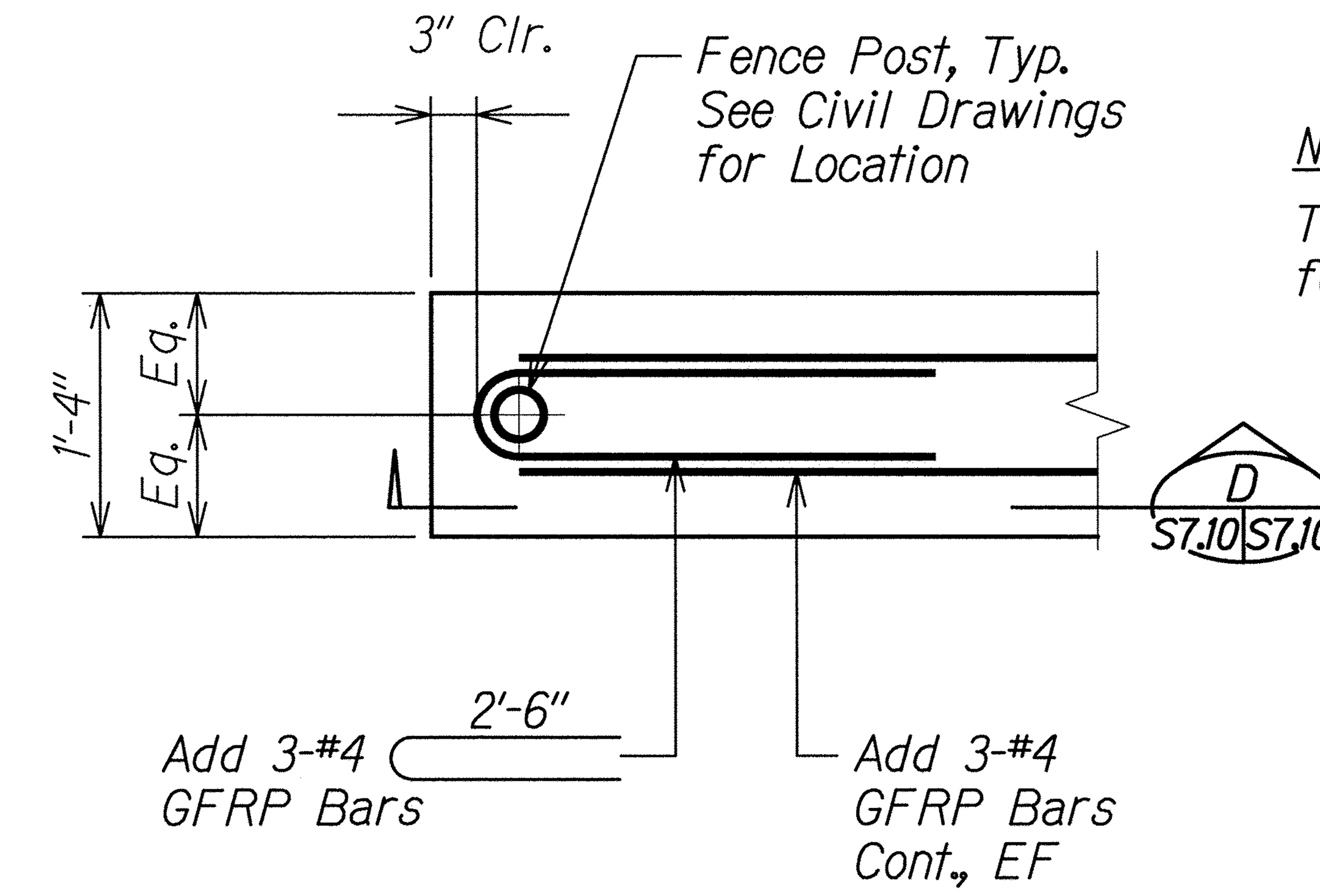
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	121	161



PLAN SECTION (A S7.2 S7.10)
Scale: 1" = 1'-0"
S7.3, S7.8, S7.9

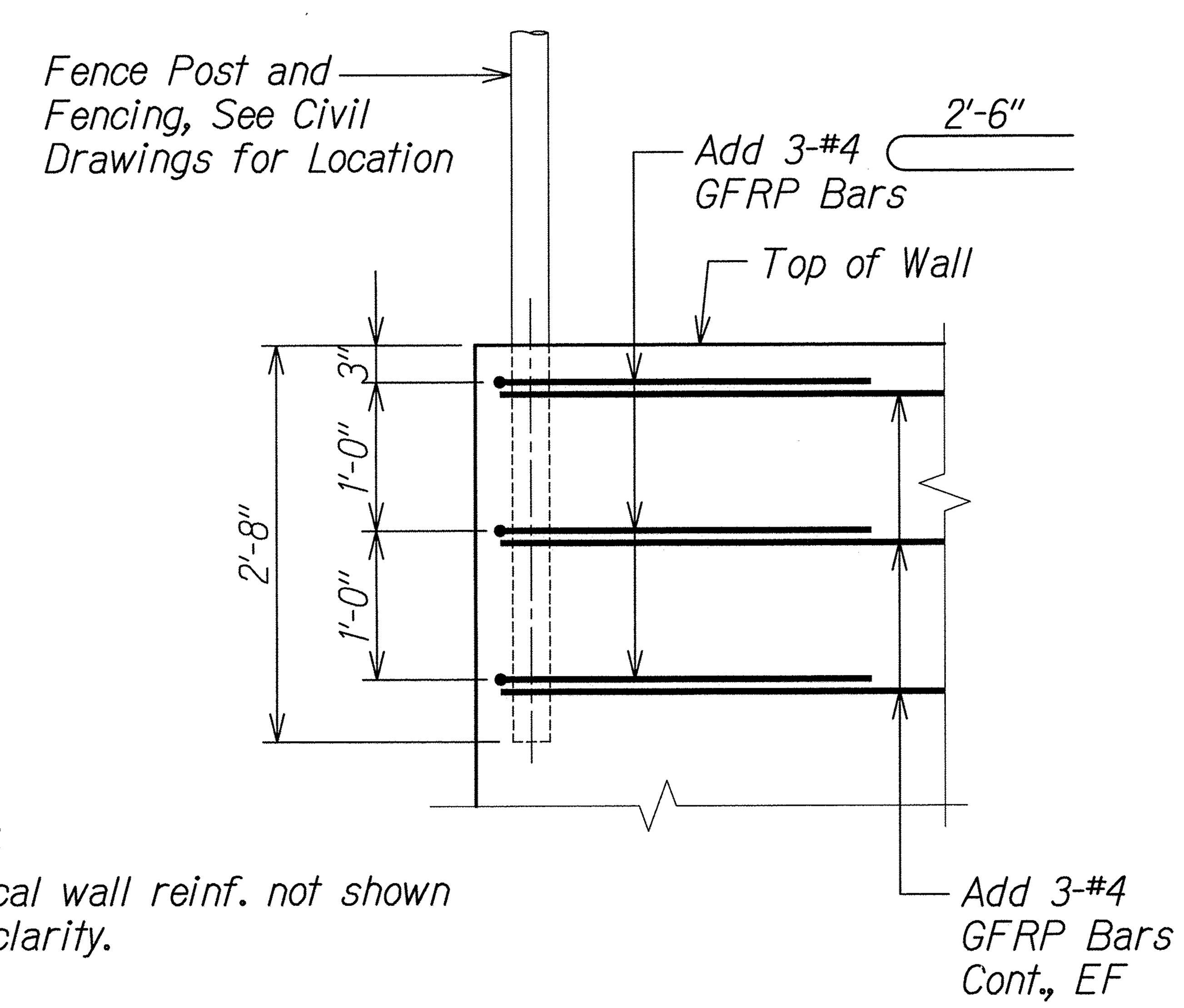


TYPICAL POST DETAIL AT RETAINING WALL (B S7.2 S7.10)
Scale: 1" = 1'-0"
S7.3, S7.8, S7.9



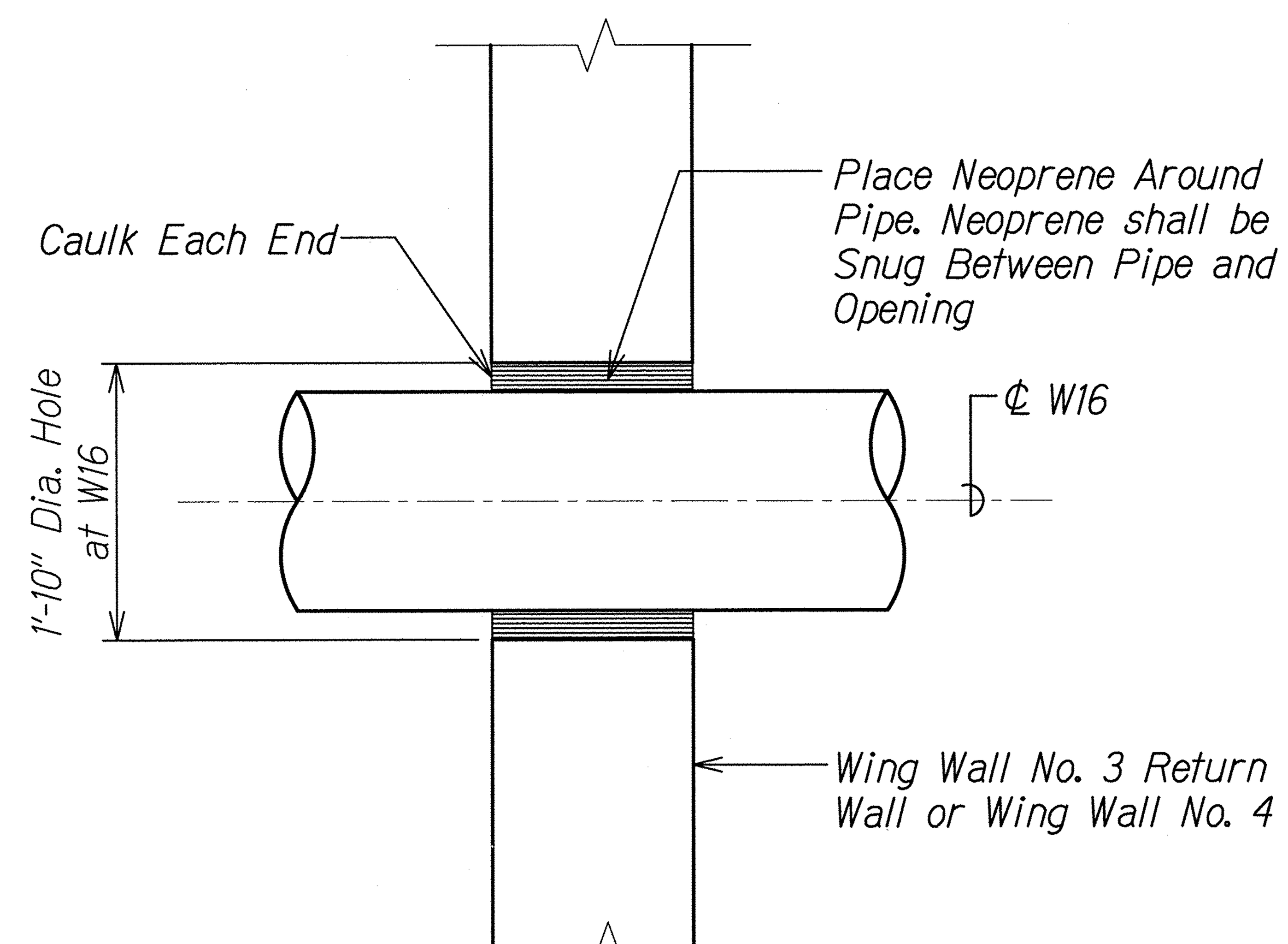
Note:
Typical wall reinf. not shown for clarity.

TYPICAL CHAINLINK POST AT END OF WALL - PLAN (C S7.2 S7.10)
Scale: 1" = 1'-0"
S7.3, S7.8, S7.9



Note:
Typical wall reinf. not shown for clarity.

TYPICAL CHAINLINK POST AT END OF WALL - ELEVATION (D S7.2 S7.10)
Scale: 1" = 1'-0"
S7.3, S7.8, S7.9



W16 OR W8 AT WING WALLS (D S7.3, S7.3A, S7.4 S7.10)
Scale: 1" = 1'-0"

GRAPHIC SCALE:
1 0 1 2
SCALE: 1"= 1'-0"

APPROVED:
For Manager and Chief Engineer, BWS — MAY 24 2021 — DATE
(for work affecting BWS facilities State R/W & BWS easements only)

DENNIS K. MITSUNAGA
LICENSED PROFESSIONAL ENGINEER
No. 2422-S
HAWAII, U.S.A.
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SIGNATURE — LIC. EXPIRATION 4/30/22
MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPICAL DETAILS

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted
Date: February 2021
SHEET No. S7.10 OF 11 SHEETS

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

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	122	161

DRILLED SHAFT NOTES:

1. All excavation and drilling operations for foundations shall be monitored by the Engineer.
2. Bottom of drilled shaft cap beam and drilled shaft tip elevations shall be verified by the Engineer prior to placing reinforcement and concrete.
3. Concrete shall be placed in the shaft immediately after placing the reinforcing steel and shall not be placed without approval of the Engineer.
4. Drilled shaft tip elevations shown on this sheet are the minimum depths to be constructed and shall be used to estimate quantities for bidding. The actual tip elevation shall be determined by the Engineer.
5. Construction of drilled shafts shall be done in such a manner and sequence to prevent collapse of drilled shafts due to premature loading of poured drilled shafts before its 28-day concrete strength and other mishaps that may reduce its capacity.
6. Drilling of adjacent shafts shall be staggered in such a manner that the shaft concrete shall have cured a minimum of 24 hours prior to drilling adjacent shafts.
7. Reinforcement:
   A. Lap splice length for #10 Cont. shall be 6'-6". No lap splices are allowed in the upper half of the drilled shaft.
   B. Lap splice length for #6 Spiral shall be 3'-8".
   C. Stagger splice points so that not more than 50% of the bars are spliced at any section normal to axis of the member.
   D. Lapped splices shall have a minimum of 2'-0" vertically between ends of splice points.
8. Concrete for drilled shaft shall have a compressive strength of 4500 psi at 28-days of age.
9. Unless noted otherwise, concrete for drilled shafts shall be placed by pumping through a solid tremie pipe. A water reducing and set retarding admixture may be used in all drilled shaft concrete. Proposed admixture shall be tested and certified in the mix design and approved by the Engineer.
10. Concrete placement shall continue after the shaft is full and until good quality concrete is evident at the least 4 feet above top of the shaft and/or drilled shaft extension.
11. Vibration or agitation of drilled shaft concrete during placement is prohibited.
12. Plastic spacers or spacers made with accepted materials shall be used to maintain proper position and clearances to reinforcing bars.
13. The Contractor shall record actual volume of drilled shaft concrete placed and compare with predicted and/or theoretical volumes.
14. The center of the drilled shaft concrete and reinforcing bars shall not vary horizontally by more than 3 inches from the location shown on the plans. The vertical alignment of the drilled shaft shall not vary by more than quarter (1/4) inch per foot of depth.
15. An instrumented load test shall be conducted on the drilled shaft load test shaft. The drilled shaft load test shaft shall be located in the vicinity of Abutment No. 2, as shown on sheet S1.1 and S1.2 and shall be a minimum length of 109 feet below the ground surface. The drilled shaft load test shaft shall be reinforced as shown. A bi-directional axial load test shall be conducted using an expandable base load cell (Osterberg load cell).
    The drilled shaft load test should be performed in general accordance with the quick load test method of ASTM Test Designation D 1143 except as modified in specifications. The drilled test shaft shall be loaded to failure to evaluate the ultimate side shear resistance of the shaft.
16. The drilled shaft load test shaft shall be instrumented with a minimum of forty-two (42) embedment strain gages as shown on sheet S8.3. A load cell capable of applying a test load of at least 3,600 kips in each direction shall be used. The instrumented load test shall be completed before construction of any production drilled shafts. The Contractor shall allow seven (7) working days after completion of the load test before any estimated drilled shaft tip elevations will be provided for production drilled shafts.
17. Crosshole Sonic Logging (CSL) nondestructive integrity testing shall be performed on every production shaft, trial shaft, and at the load test shaft shown on S1.1 and S1.2 and on sheets S8.2 and S8.3. Shafts indicating irregular CSL readings may be subject to additional testing, and remedial repairs or drilled shaft replacement.
18. After completion of the CSL tests and final acceptance of the drilled shaft, remove portion of CSL test access tubes within footing and completely fill tubes with non-metallic, non-shrink, non-gaseous cementitious grout of equal strength as the drilled shaft prior to footing reinforcing and concrete placement. See Specifications Section 511.

DRILLED SHAFT TABLE

Location	Drilled Shaft Type (in Inches)	Length (in Feet)	Estimated Tip Elevation (in Feet MSL)
Abutment No. 1	48	82	(-) 79.6
Abutment No. 2	48	68	(-) 64.5
Trial Shaft	48	100	--

AXIAL LOADS OF DRILLED SHAFT

Location		Strength Limit State (Kips)		Extreme Limit State (Kips)	
		Demand	Capacity	Demand	Capacity
Abutment No. 1	Axial Compression	883	885	830	1960
Abutment No. 2	Axial Compression	924	925	878	2060

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

DRAWING NAME: T:\PROJECTS\1-ACTIVE FILES\913-01_KAIPAPAU BRIDGE\$$_REVISED_STRUCT\$$_051221\KSB-S801.DWG PLOT TIME: 06-09-21, 3:32 PM)

DENNIS K. MITSUNAGA
LICENSED PROFESSIONAL ENGINEER
No. 2422-S
HAWAII, U.S.A.

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MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

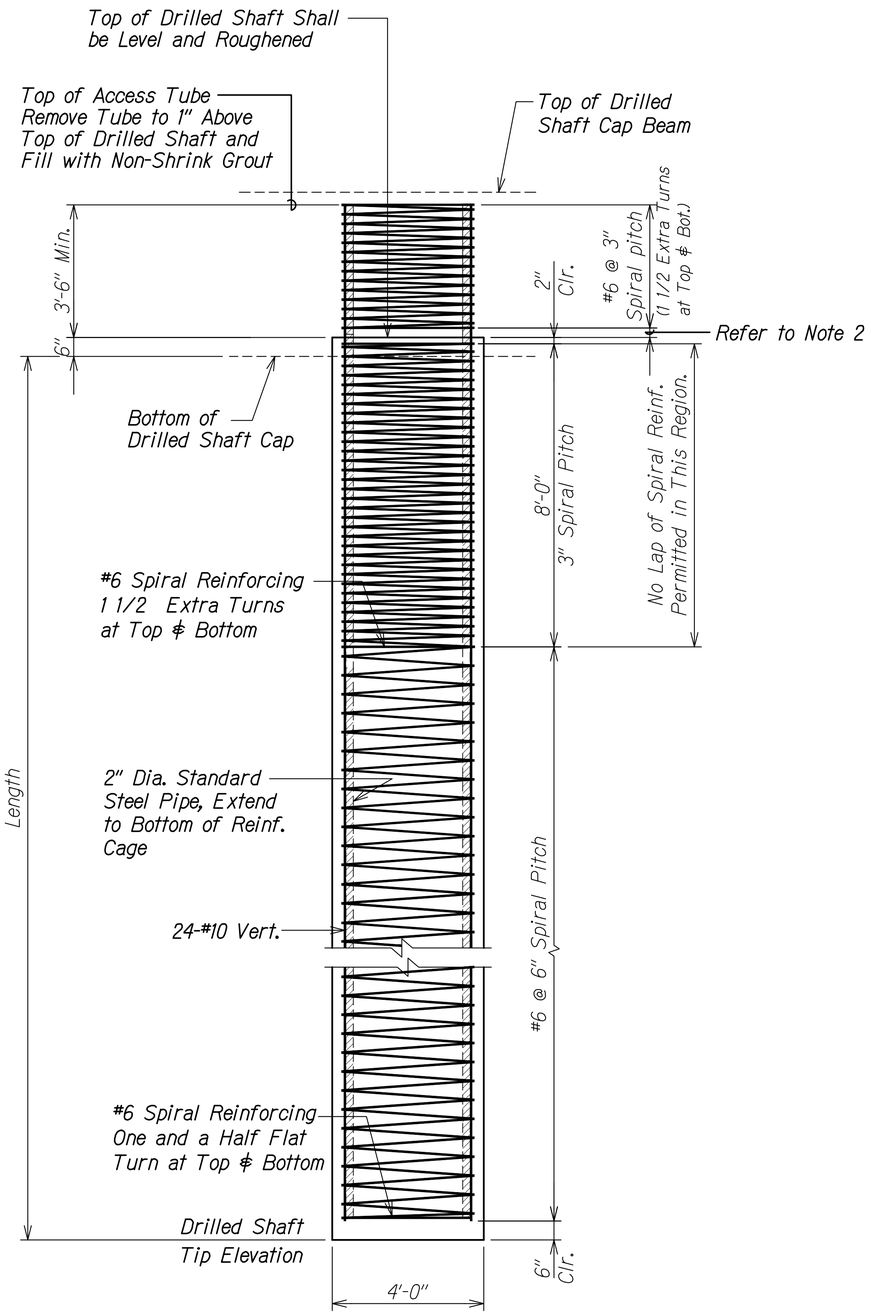
DRILLED SHAFT NOTES

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

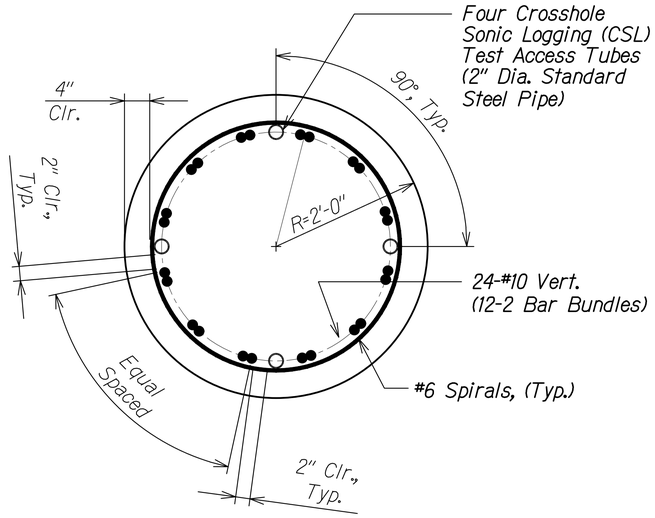
SHEET No. S8.1 OF 3 SHEETS

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	123	161



TYPICAL DRILLED SHAFT ELEVATION

Not to scale



SECTION AT DRILLED SHAFT FOR ABUTMENT

A S8.2 S8.2

Scale: 1" = 1'-0"

NOTES:

1. The Contractor shall refer to the Special Provisions Section 511 "DRILLED SHAFT".
2. Spirals may be discontinuous at drilled shaft cap beam reinforcement to allow for placing drilled shaft cap beam reinforcement. Each end of the spiral shall have 1 1/2 extra turns.
3. Provide template or mock-up to ensure no interference between vertical #10 bars and horizontal rebars in shaft cap beams.

GRAPHIC SCALE:

1 0 1 2

SCALE: 1"= 1'-0"

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DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRILLED SHAFT SECTION AND ELEVATION

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

SHEET No. S8.2 OF 3 SHEETS

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

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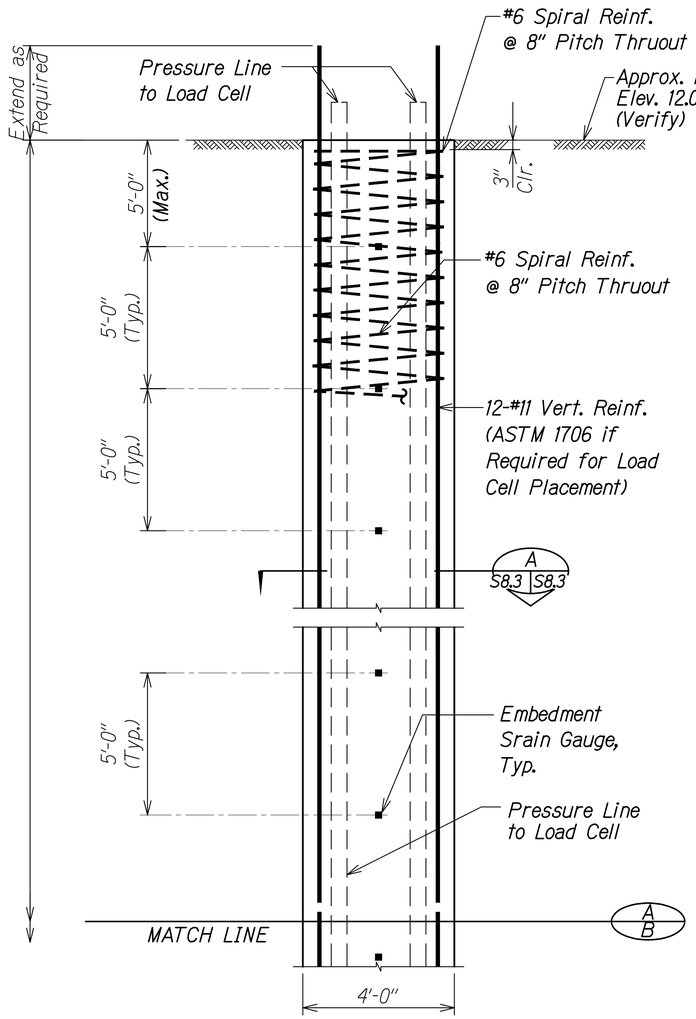
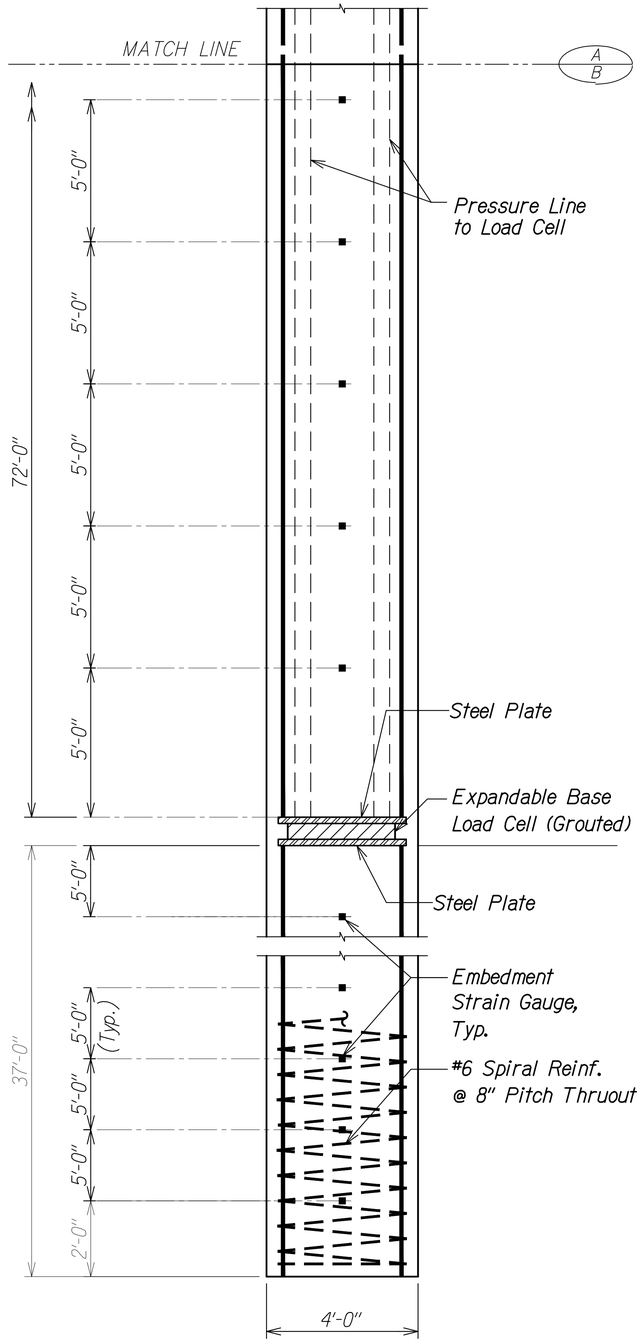
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	124	161



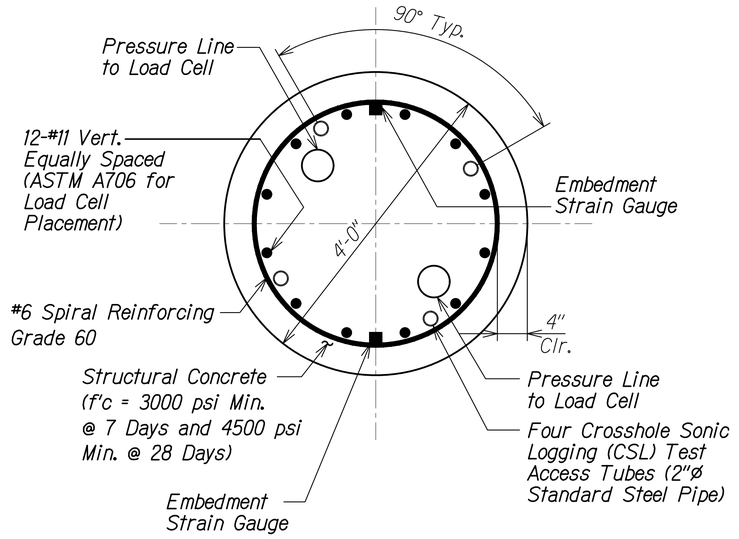
ELEVATION - UPPER PORTION "A"

Scale: Horiz. 1/2" = 1'-0"
Vert. 3/16" = 1'-0"



ELEVATION - LOWER PORTION "B"

Scale: Horiz. 1/2" = 1'-0"
Vert. 3/16" = 1'-0"



SECTION

Scale: 1" = 1'-0"

A
S8.3 S8.3

GRAPHIC SCALES:

2 1 0 2 4
SCALE: 1/2"= 1'-0"

4 0 4 8FT
SCALE: 3/16"= 1'-0"

1 0 1 2
SCALE: 1"= 1'-0"

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No. 2422-S
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

LOAD TEST SHAFT
SECTION AND ELEVATION

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

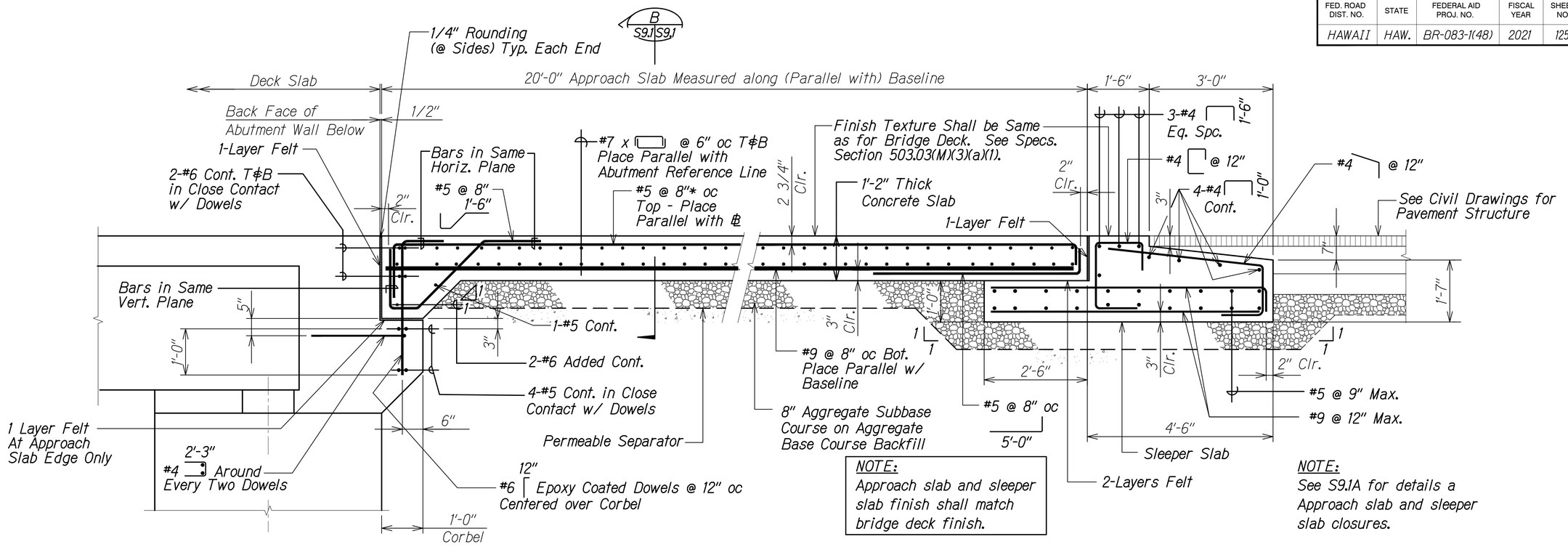
Scale: As Noted Date: February 2021

SHEET No. S8.3 OF 3 SHEETS

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

DRAWING NAME: T:\PROJECTS\1-ACTIVE FILES\913-01_KAIPAPAU BRIDGE\$$_REVISED_STRUCT\$$_051221\KSB-S801.DWG PLOT TIME: 06-09-21, 3:33 PM)

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	125	161

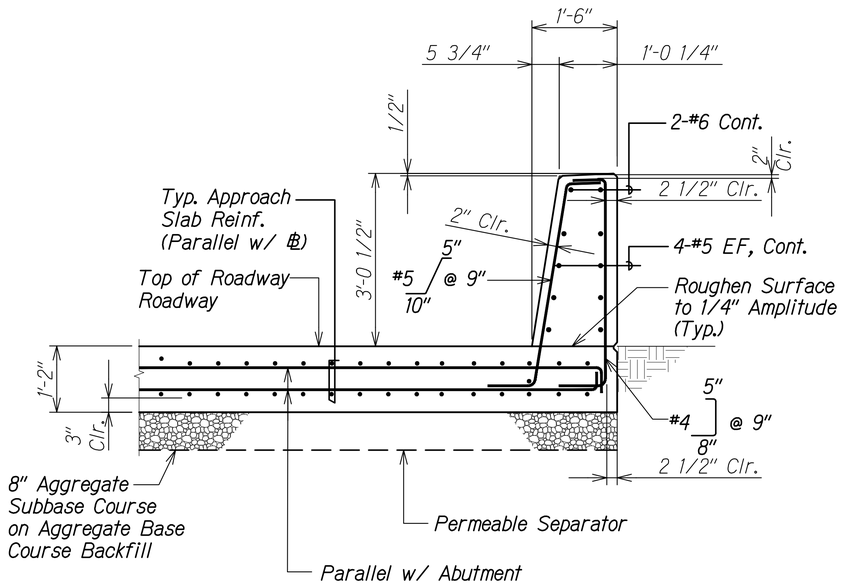


NOTE:
Approach slab and sleeper slab finish shall match bridge deck finish.

NOTE:
See S9.1A for details a Approach slab and sleeper slab closures.

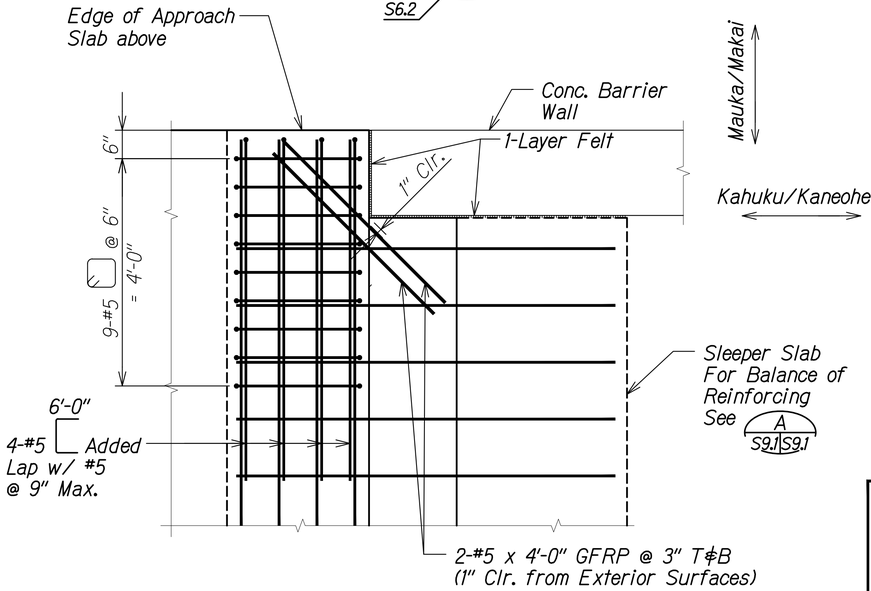
TYPICAL APPROACH SLAB SECTION (A: S6.1 | S9.1; S6.2)

Scale: 3/4" = 1'-0"



SECTION (B: S9.1 | S9.1)

Scale: 3/4" = 1'-0"



SLEEPER SLAB AT CONCRETE BARRIER (C: S3.1 | S9.1; S6.1, S6.2, S9.1)

Scale: 3/4" = 1'-0"

GRAPHIC SCALE:
1 0 1 2FT
SCALE: 3/4"= 1'-0"

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No. 2422-S
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HIGHWAYS DIVISION

APPROACH SLAB SECTIONS

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

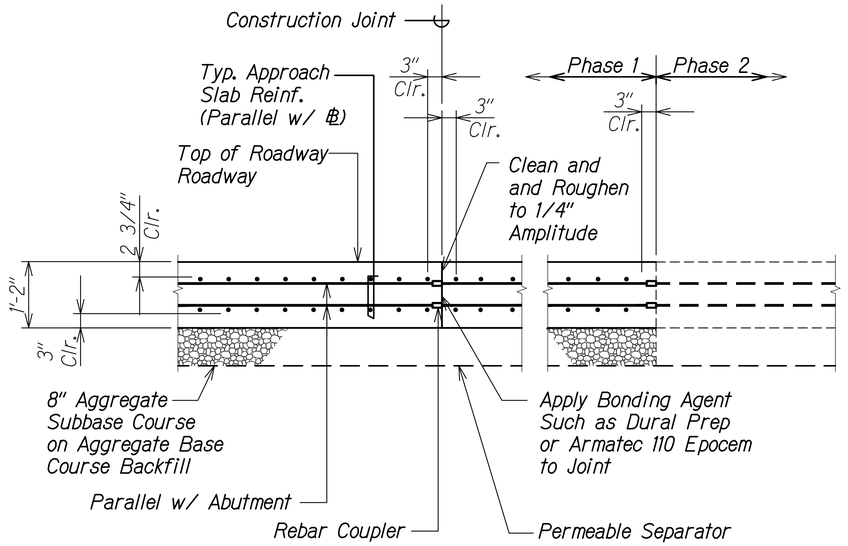
Scale: As Noted Date: February 2021

SHEET No. S9.1 OF 4 SHEETS

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

DRAWING NAME: T:\PROJECTS\1-ACTIVE FILES\913-01_KAIPAPAU BRIDGE\$$_REVISED_STRUCT\$$_051221\KSB-S901.DWG PLOT TIME: 06-09-21, 3:34 PM)

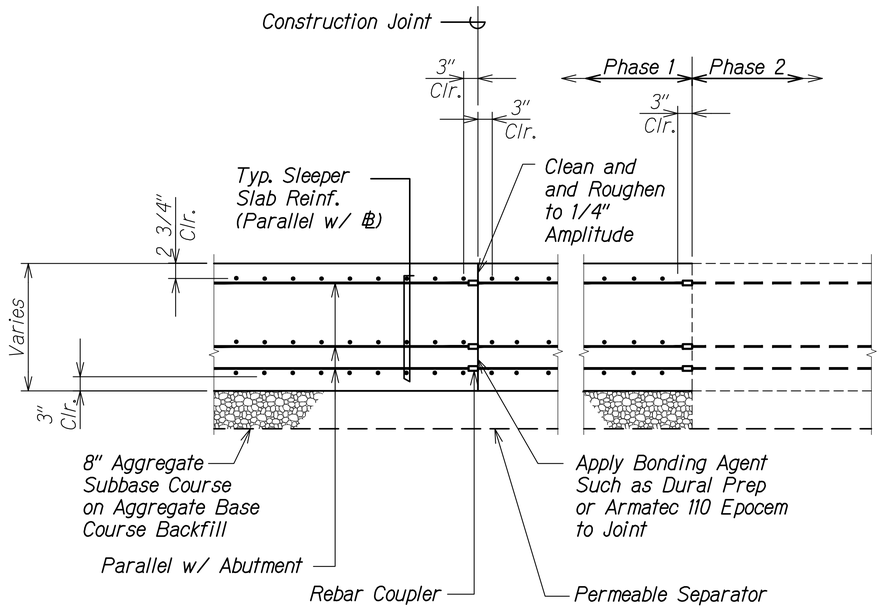
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	126	161



APPROACH SLAB SECTION AT CLOSURE

Scale: 3/4" = 1'-0"

A S9.1A | S9.1A



SLEEPER SLAB SECTION AT CLOSURE

Scale: 3/4" = 1'-0"

B S9.1A | S9.1A

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

DRAWING NAME: T:\PROJECTS\1-ACTIVE FILES\913-01_KAIPAPAU BRIDGE\$$_REVISED_STRUCT\$$_051221\KSB-S901.DWG PLOT TIME: 06-09-21, 3:34 PM)

GRAPHIC SCALE:

1 0 1 2FT

SCALE: 3/4"= 1'-0"

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No. 2422-S
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HIGHWAYS DIVISION

SLAB SECTIONS

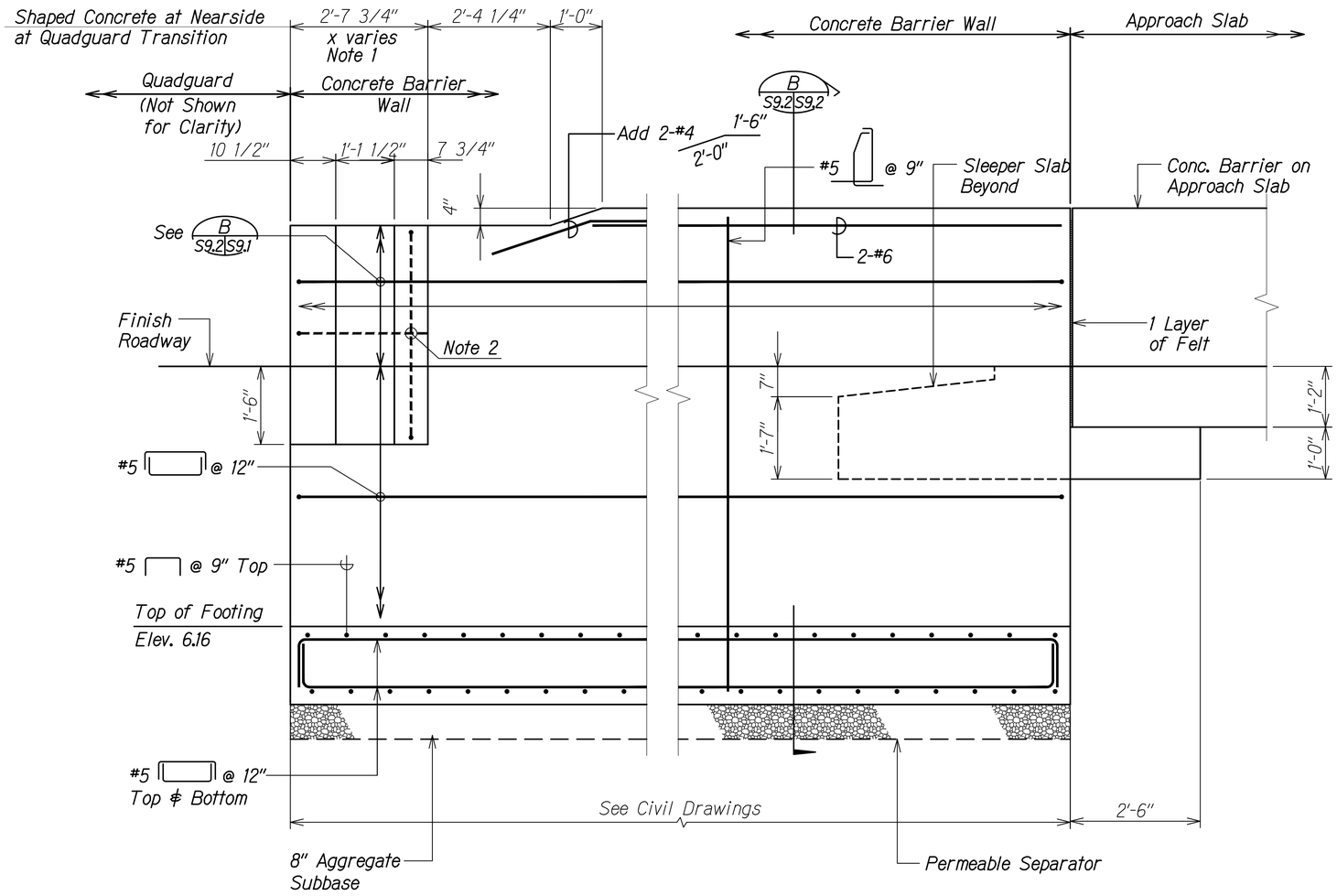
KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

SHEET No. S9.1A OF 4 SHEETS

1

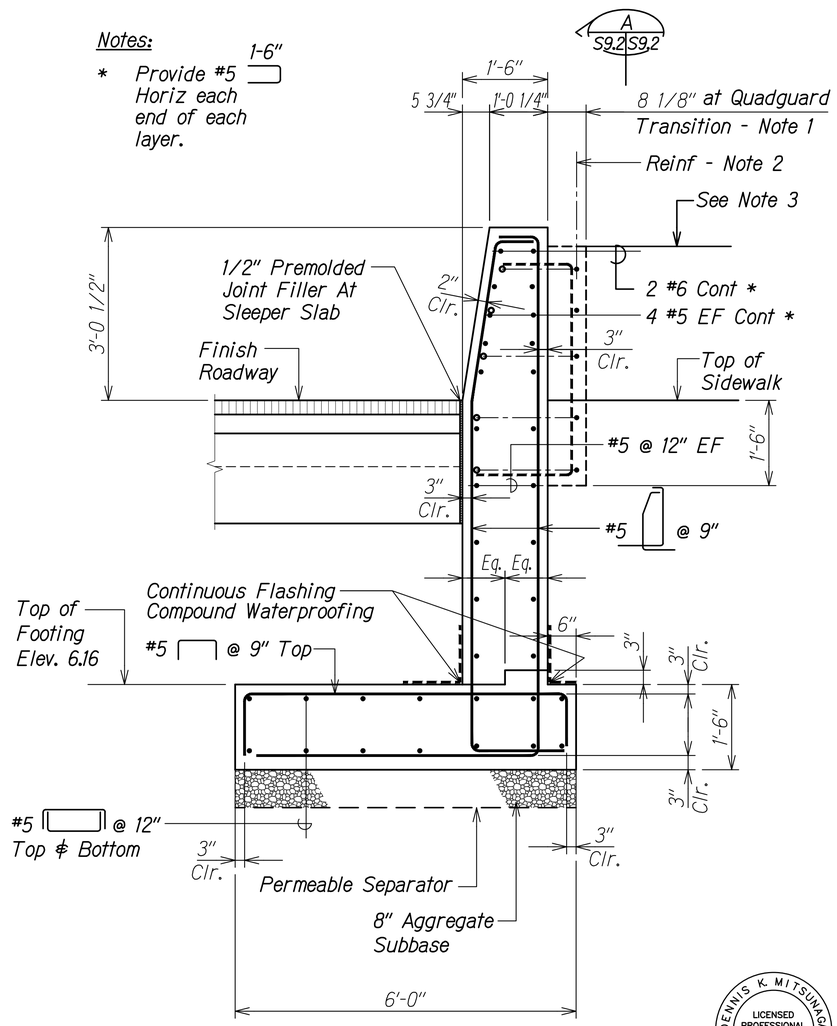
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	127	161



CONCRETE BARRIER WALL

Scale: 3/4" = 1'-0"

A S9.2 S9.2 — S3.1



SECTION

Scale: 3/4" = 1'-0"

B S9.2 S9.2

Notes:

1. At Shaped Concrete at Quadguard Transition, see Civil drawings for layout.
2. Provide #5 @9" x ⌓ Horiz with minimum 6 #5 x ⌐ Vertical
3. Top of barrier at Quadguard transition.

GRAPHIC SCALE:

1 0 1 2FT

SCALE: 3/4"= 1'-0"

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MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CONCRETE BARRIER WALL

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

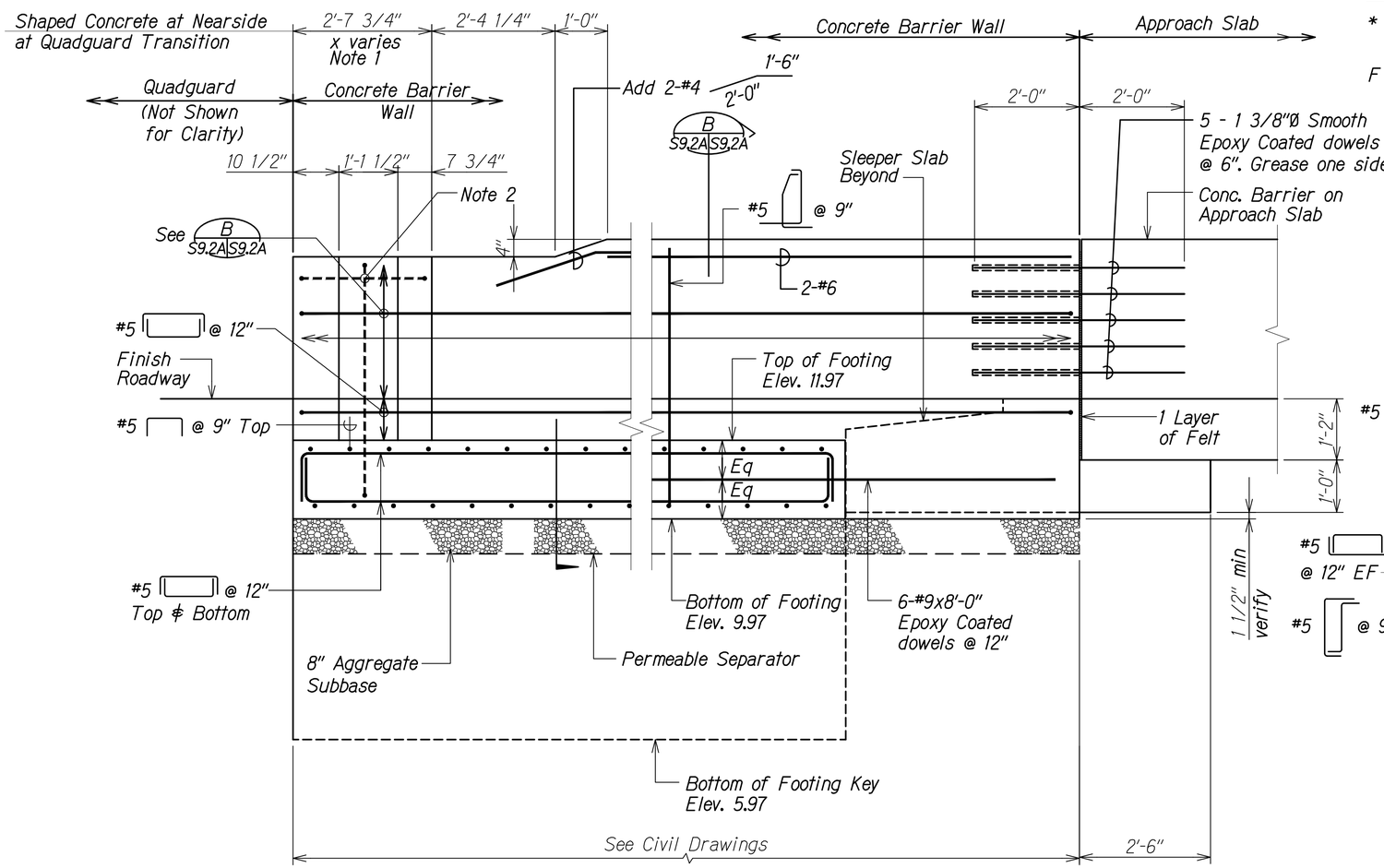
Scale: As Noted Date: February 2021

SHEET No. S9.2 OF 4 SHEETS

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

DRAWING NAME: T:\PROJECTS\1-ACTIVE FILES\913-01_KAIPAPAU BRIDGE\$$_REVISED_STRUCT\$$_051221\KSB-S902.DWG PLOT TIME: 06-09-21, 3:35 PM)

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	128	161



CONCRETE BARRIER WALL

A S3.1 S9.2A

Scale: 3/4" = 1'-0"

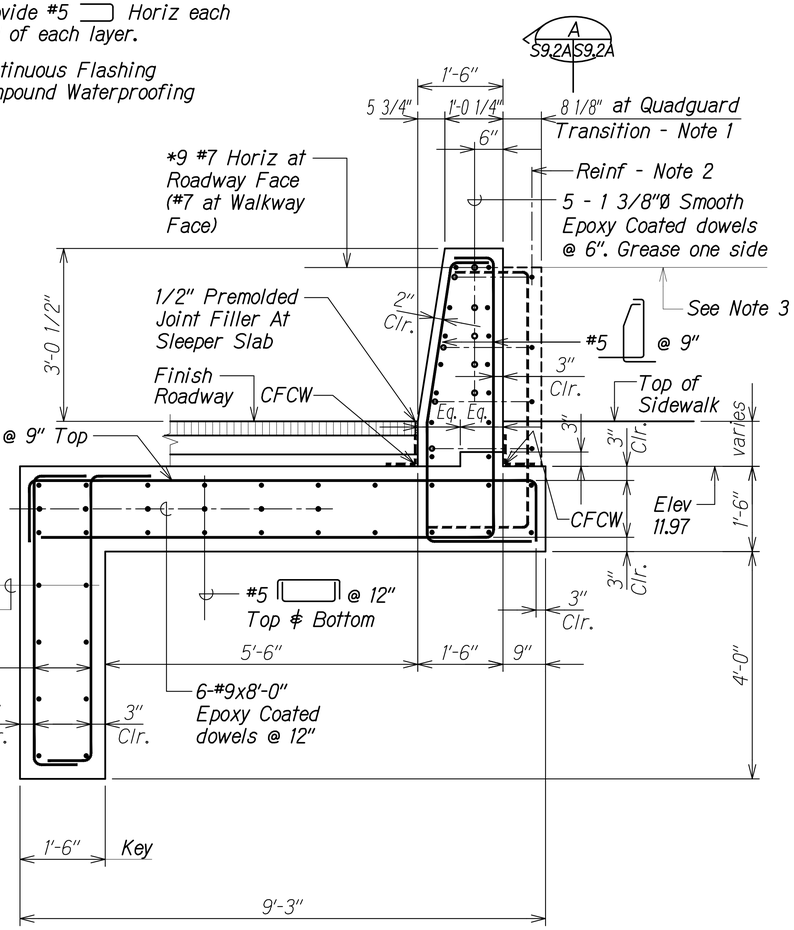
Notes:

1. At Shaped Concrete at Quadguard Transition, see Civil drawings for layout.
2. Provide #5 @9" x ⌓ Horiz with minimum 6 #5 x ⌐ Vertical
3. Top of barrier at Quadguard transition.

Notes:

* Provide #5 1-6" Horiz each end of each layer.

F Continuous Flashing Compound Waterproofing



SECTION

B S9.2A S9.2A

Scale: 3/4" = 1'-0"

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GRAPHIC SCALE:

1 0 1 2FT

SCALE: 3/4"= 1'-0"

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CONCRETE BARRIER WALL

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

SHEET No. S9.2A OF 4 SHEETS

ORIGINAL PLAN | NOTE BOOK | No.

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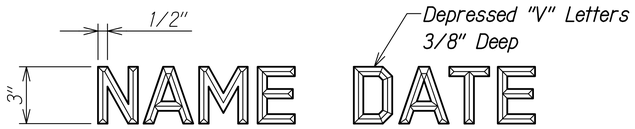
QUANTITIES BY
CHECKED BY
DATE

DRAWING NAME: T:\PROJECTS\1-ACTIVE FILES\913-01_KAIPAPAU BRIDGE\$$_REVISED_STRUCT\$$_051221\KSB-S902A.DWG PLOT TIME: 06-09-21, 3:36 PM)

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	129	161



Name of Bridge Date of Year Built

NOTES:
1. Exact details and spacing of letter and figures and location shall be as directed by the Engineer. Gothic letters and figures approximating the dimensions shown will be acceptable if approved by the Engineer.
2. Name & date shall be place on the trailing (exit) end post on each side of bridge.
3. Unless otherwise directed by the Engineer, The name of the bridge shall be "KA'IPAPAU STREAM BRIDGE". The year shall be the year at completion.

TYPICAL DETAIL OF LETTERS AND FIGURES

BRIDGE IDENTIFICATION DETAIL

1 / S10.1 | S10.1

Scale: 3" = 1'-0"

GRAPHIC SCALE:

6 4 2 0 6IN

SCALE: 3"= 1'-0"

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No. 2422-S
HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BRIDGE IDENTIFICATION DETAIL

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

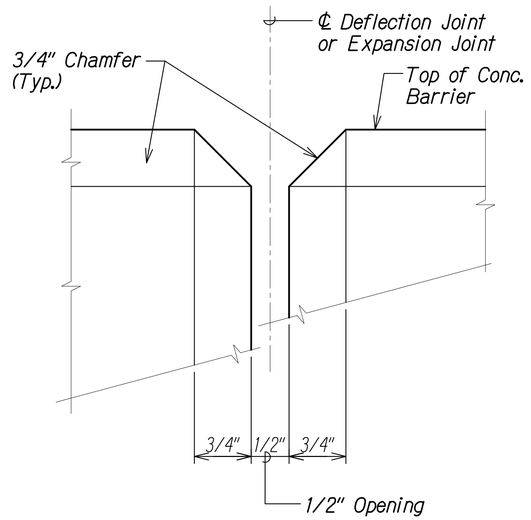
SHEET No. S10.1 OF 7 SHEETS

ORIGINAL PLAN
NOTE BOOK
No.

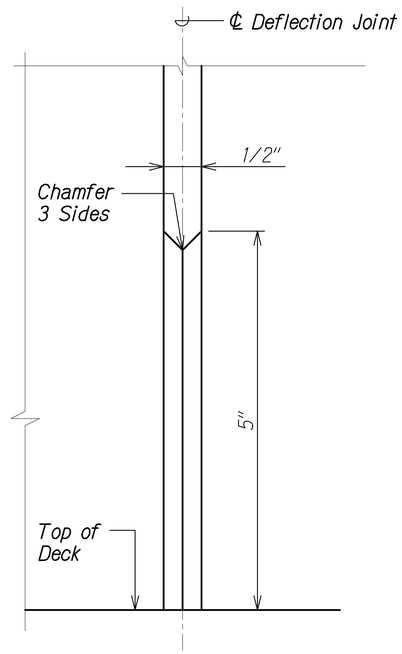
SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE

DRAWING NAME: T:\PROJECTS\1-ACTIVE FILES\913-01_KAIPAPAU BRIDGE\$$_REVISED_STRUCT\$$_051221\KSB-S1001 SW FIXED.DWG PLOT TIME: 06-09-21, 3:37 PM

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	130	161



JOINT DETAIL 1 (S10.2 | S10.2)
Scale: 1" = 1'-0"



JOINT DETAIL 2 (S10.2 | S10.2)
Scale: 1" = 1'-0"

Note:
Align joints in concrete barrier with 1/2" joints in Aesthetic Railing.

GRAPHIC SCALE:
1 0 1 2
SCALE: 1"= 1'-0"

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HIGHWAYS DIVISION

TYPICAL JOINT DETAILS

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

SHEET No. S10.2 OF 7 SHEETS

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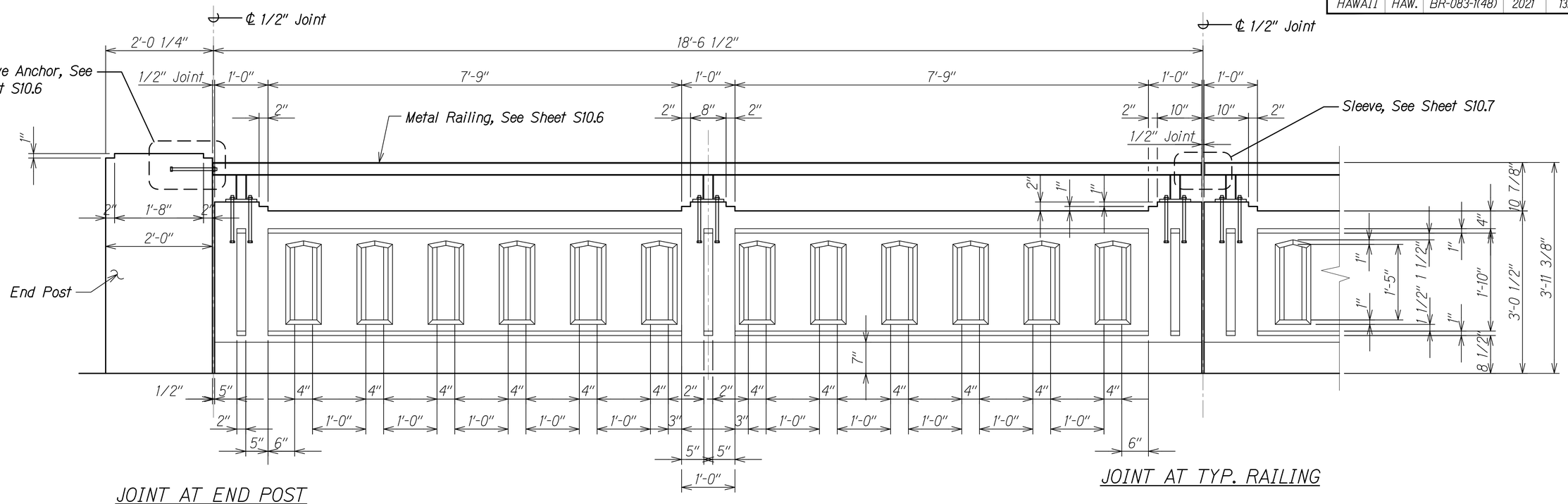
DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE

DRAWING NAME: T:\PROJECTS\1-ACTIVE FILES\913-01_KAIPAPAU BRIDGE\$$_REVISED_STRUCT\$$_051221\KSB-S1001 SW FIXED.DWG PLOT TIME: 06-09-21, 3:37 PM)

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	131	161

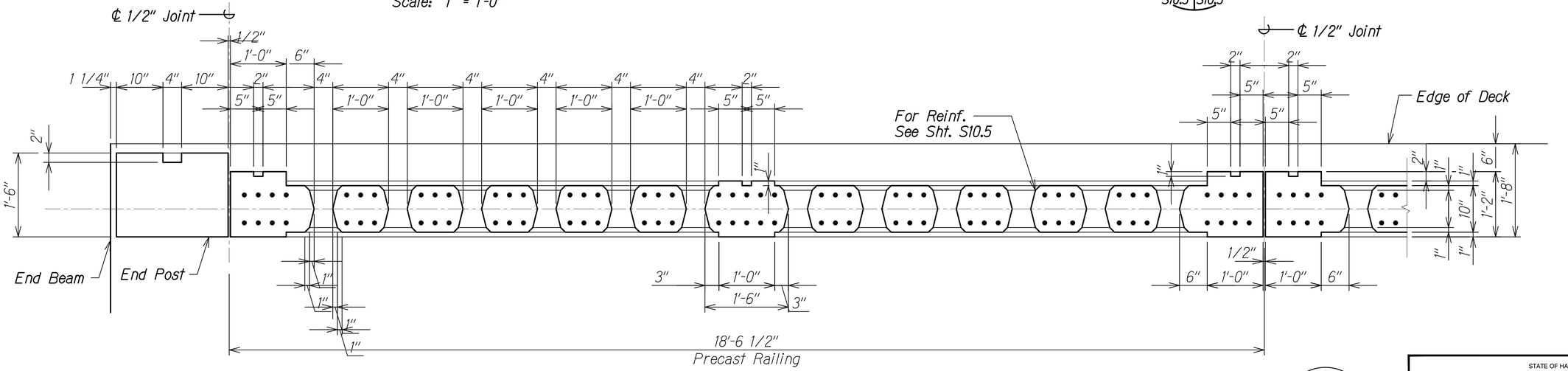


JOINT AT END POST

JOINT AT TYP. RAILING

TYPICAL AESTHETIC BRIDGE RAILING END PANEL ELEVATION (A S10.3 | S10.3)

Scale: 1" = 1'-0"



TYPICAL AESTHETIC BRIDGE RAILING END PANEL PLAN / SECTION (A S10.4 | S10.4)

Scale: 1" = 1'-0"

GRAPHIC SCALE:

1 0 1 2

SCALE: 1"= 1'-0"

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DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

RAILING ELEVATION AND PLAN AT END PANEL

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

SHEET No. S10.3 OF 7 SHEETS

1 1

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

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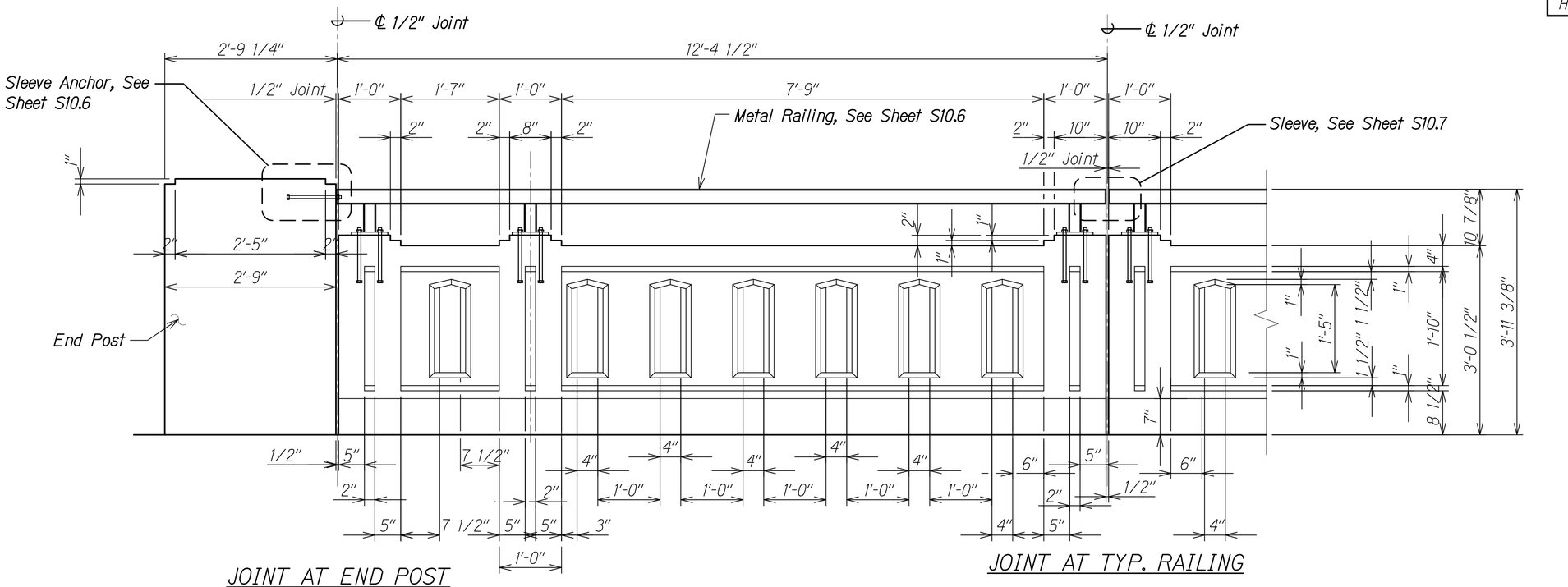
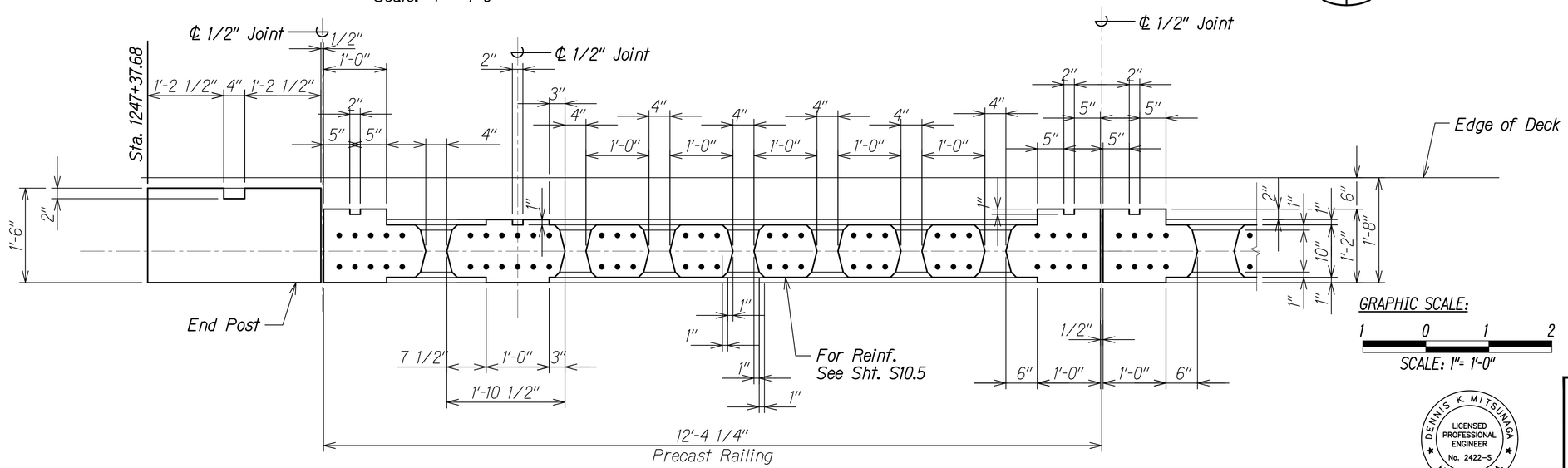
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	132	161



AESTHETIC BRIDGE RAILING END PANEL ELEVATION AT DRIVEWAY

Scale: 1" = 1'-0"

A S10.3 | S10.3



AESTHETIC BRIDGE RAILING END PANEL PLAN / SECTION AT DDRIVEWAY

Scale: 1" = 1'-0"

A S10.4 | S10.4

GRAPHIC SCALE:

1 0 1 2

SCALE: 1"= 1'-0"

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MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

RAILING ELEVATION AND PLAN AT DRIVEWAY

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

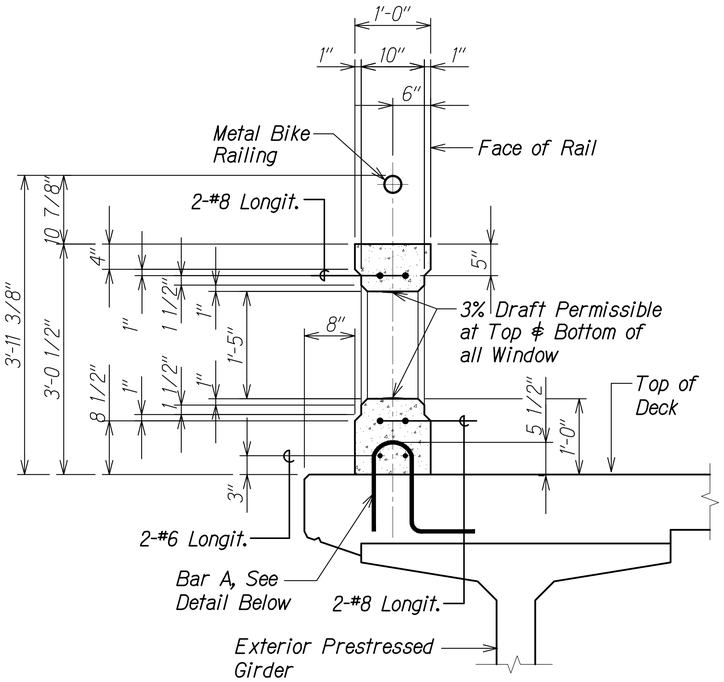
Scale: As Noted Date: February 2021

SHEET No. S10.4 OF 7 SHEETS

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

DRAWING NAME: T:\PROJECTS\1-ACTIVE FILES\913-01_KAIPAPAU BRIDGE\$$_REVISED_STRUCT\$$_051221\KSB-S1003 SW FIXED.DWG PLOT TIME: 06-09-21, 3:39 PM)

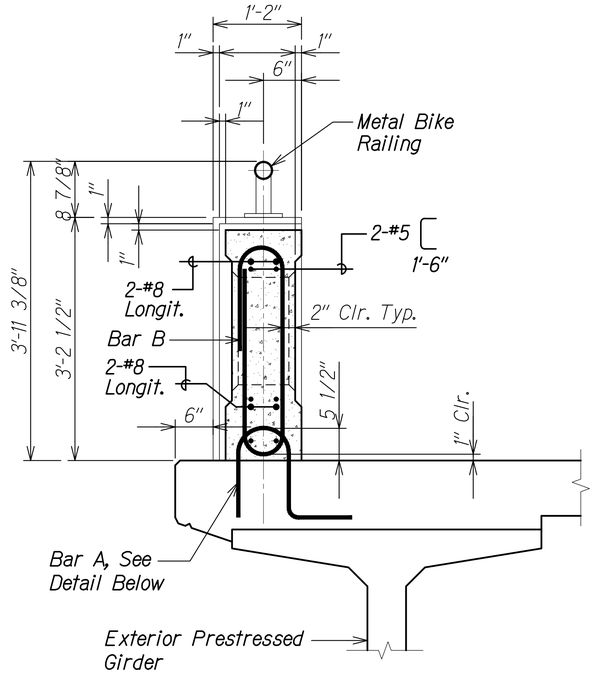
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	133	161



SECTION THRU WINDOW (A)

Scale: 1" = 1'-0"

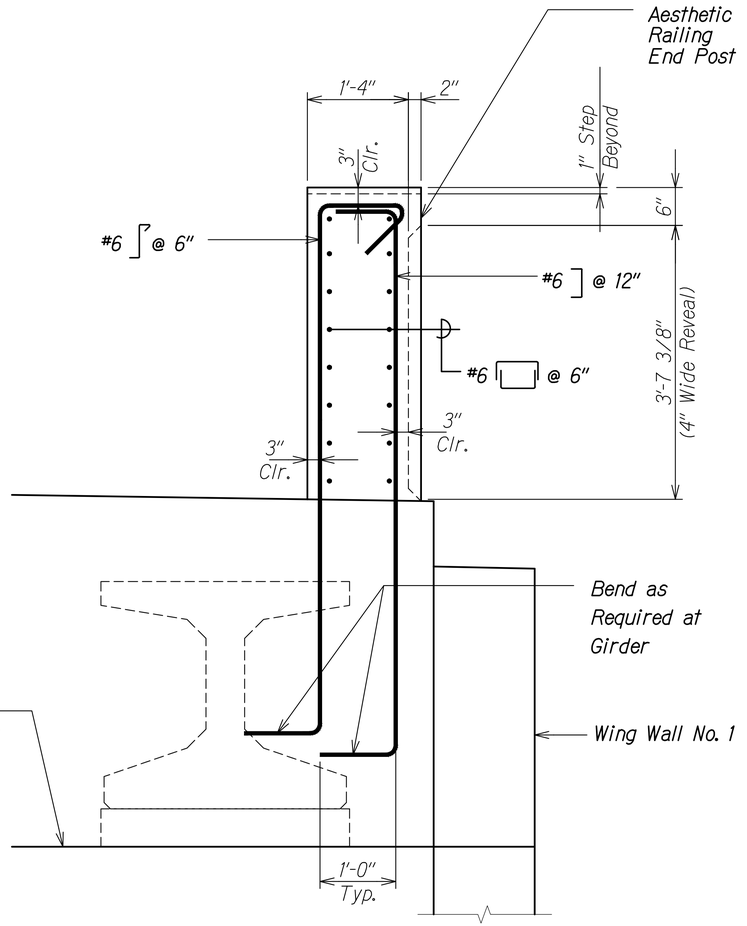
S10.5 | S10.5



SECTION THRU POST (B)

Scale: 1" = 1'-0"

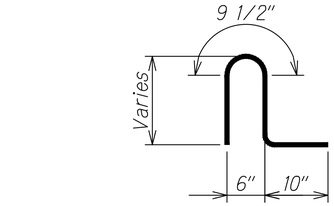
S10.5 | S10.5



SECTION THRU END POST (D)

Scale: 1" = 1'-0"

S10.5 | S10.5

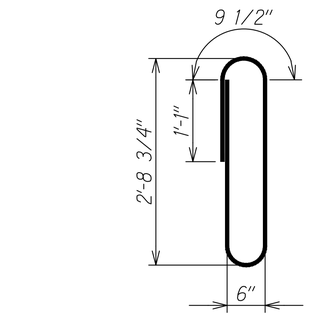


NOTE:
Bar A shall be plumb

BAR A (#5) DETAIL (1)

Scale: 1" = 1'-0"

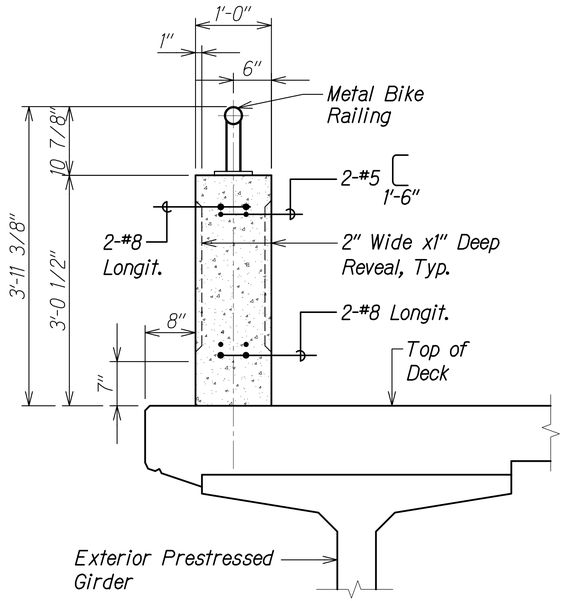
S10.5 | S10.5



BAR B (#5) DETAIL (2)

Scale: 1" = 1'-0"

S10.5 | S10.5



SECTION THRU INTERMEDIATE POST (C)

Scale: 1" = 1'-0"

S10.5 | S10.5

NOTE:

Stainless Steel reinforcing shall be provided at the Aesthetic Bridge Railings. See General Note 4.(L) on sheet S0.3. Bar A shall also be Stainless Steel.

GRAPHIC SCALE:

1 0 1 2

SCALE: 1"= 1'-0"

DENNIS K. MITSUNAGA
LICENSED PROFESSIONAL ENGINEER
No. 2422-S
HAWAII, U.S.A.

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MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

RAILING SECTIONS AND DETAILS

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

SHEET No. S10.5 OF 7 SHEETS

ORIGINAL PLAN | NOTE BOOK | No.

SURVEY PLOTTED BY
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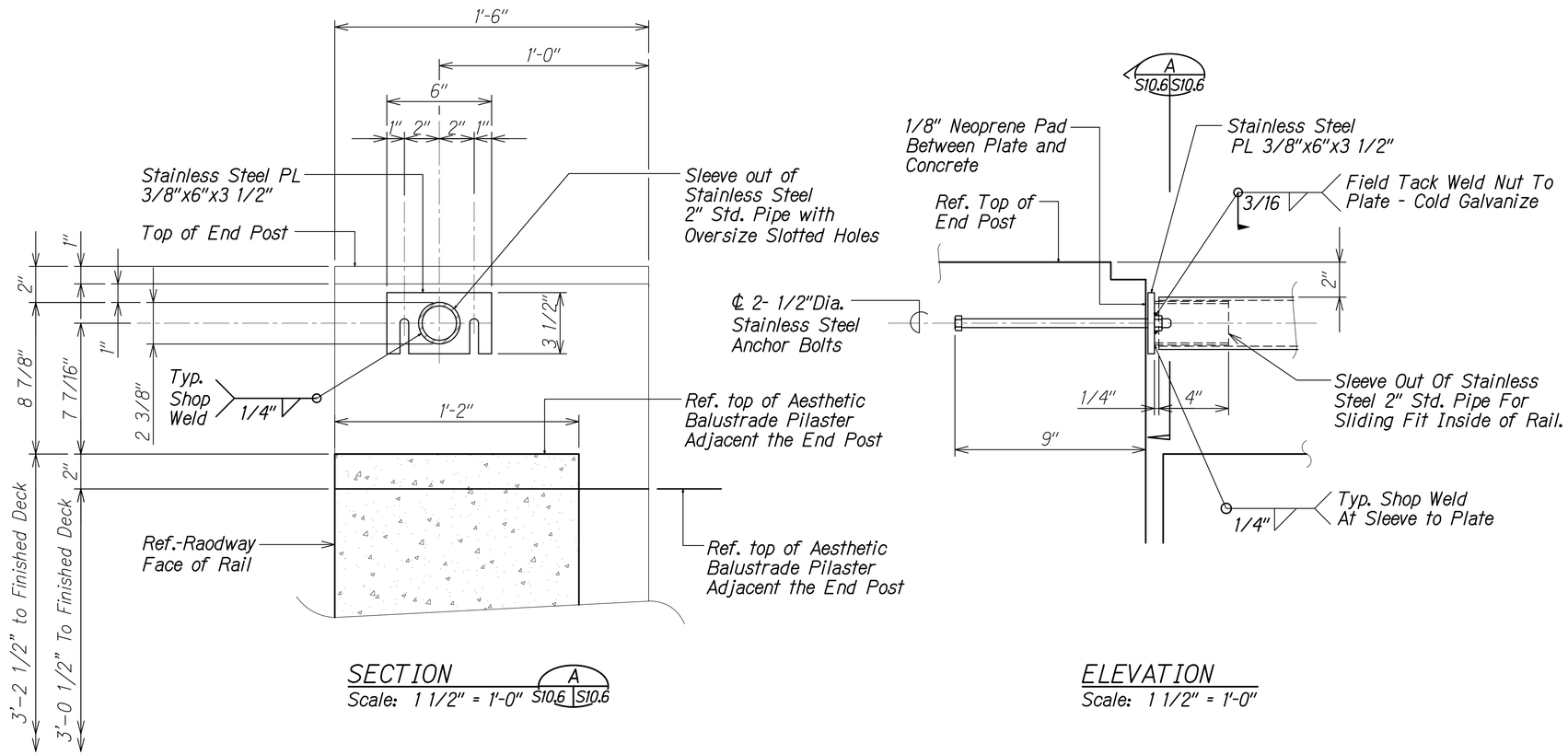
1

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	134	161



SECTION
Scale: 1 1/2" = 1'-0"

ELEVATION
Scale: 1 1/2" = 1'-0"

RAIL SLEEVE ANCHOR AT END POST CONNECTION DETAIL

GRAPHIC SCALE:
1 0 1FT
SCALE: 1 1/2"= 1'-0"

DENNIS K. MITSUNAGA
LICENSED PROFESSIONAL ENGINEER
No. 2422-S
HAWAII, U.S.A.

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MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

METAL BIKE RAILING DETAILS

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

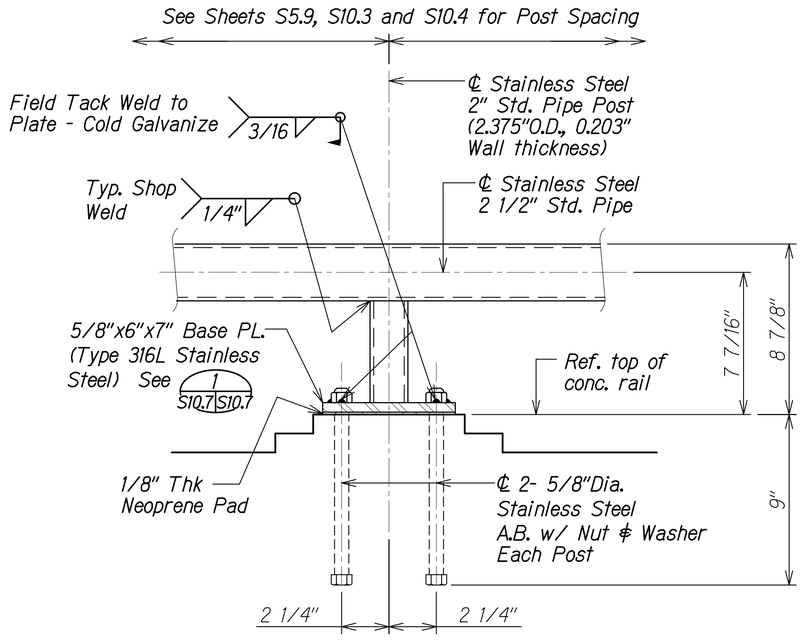
Scale: As Noted Date: February 2021

SHEET No. S10.6 OF 7 SHEETS

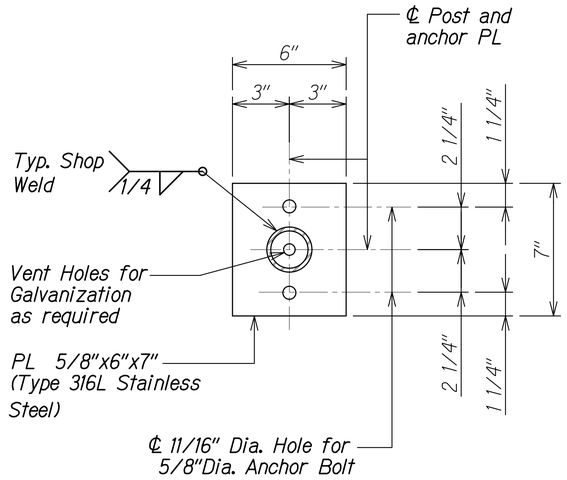
ORIGINAL PLAN
NOTE BOOK
No.
SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE

DRAWING NAME: T:\PROJECTS\1-ACTIVE FILES\913-01_KAIPAPAU BRIDGE\$$_REVISED_STRUCT\$$_051221\KSB-S1003 SW FIXED.DWG PLOT TIME: 06-09-21, 3:41 PM)

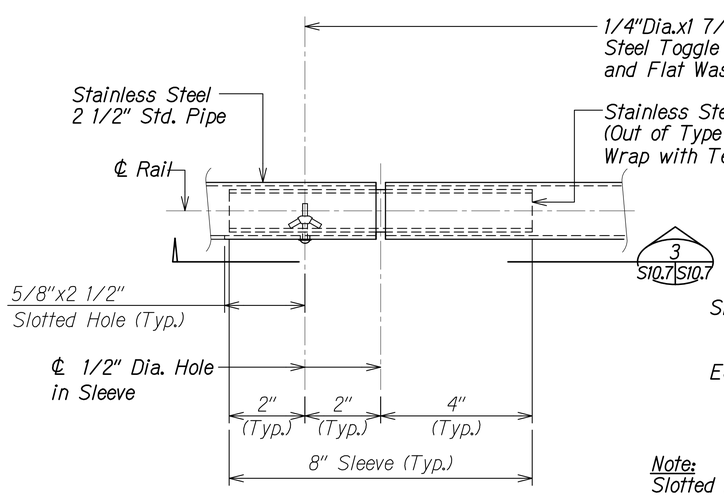
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	135	161



ELEVATION A S10.7 S10.7
Scale: 3" = 1'-0"

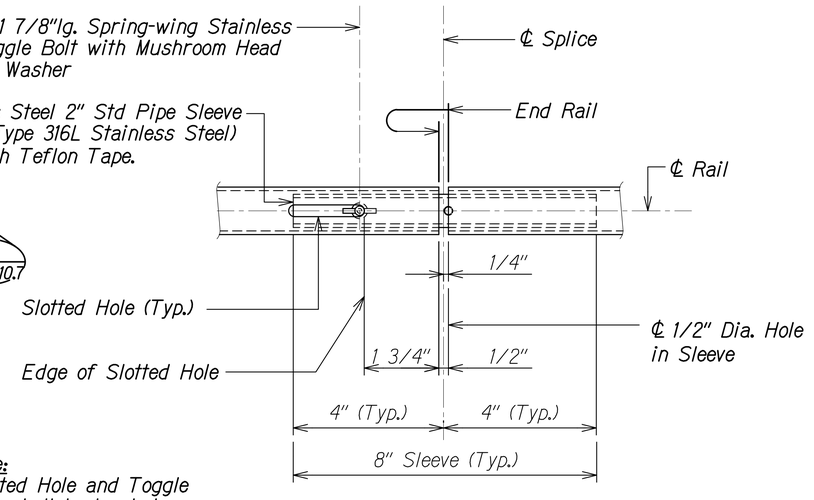


ANCHOR PLATE DETAIL 1 S10.6 S10.6
Scale: 3" = 1'-0"



Note: Round All Edges at Splices - Typical

ELEVATION



Note: Slotted Hole and Toggle Bolt shall be located on underside of Pipe.

REFLECTED SOFFIT 3 S10.7 S10.7

TYPICAL TUBE SPLICE DETAIL 2 S10.7 S10.7
Not to Scale

METAL RAILING ON AESTHETIC BRIDGE RAILING

GRAPHIC SCALE:
6 4 2 0 6IN
SCALE: 3"= 1'-0"

DENNIS K. MITSUNAGA
LICENSED PROFESSIONAL ENGINEER
No. 2422-S
HAWAII, U.S.A.

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MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

METAL BIKE RAILING DETAILS

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

SHEET No. S10.7 OF 7 SHEETS

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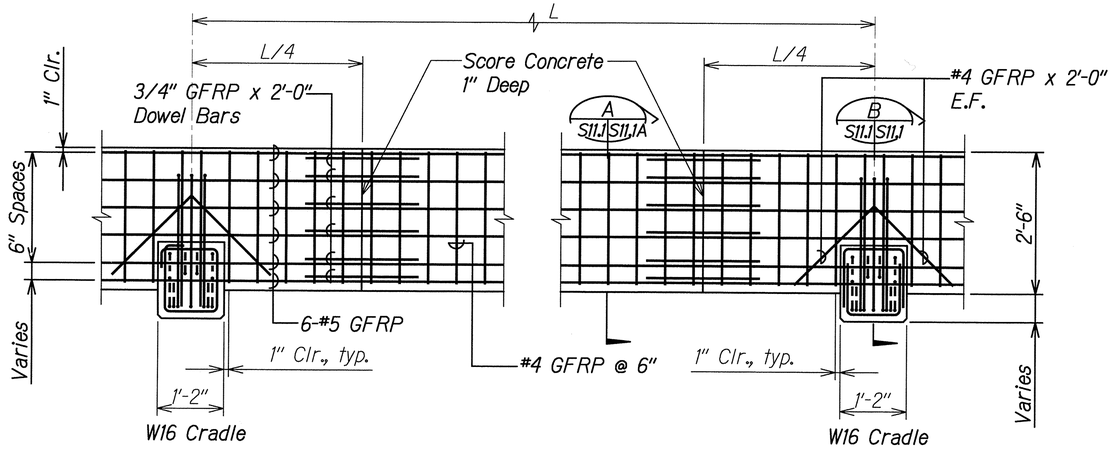
DATE

DRAWING NAME: T:\PROJECTS\1-ACTIVE FILES\913-01_KAIPAPAU BRIDGE\$$_REVISED_STRUCT\$$_051221\KSB-S1003 SW FIXED.DWG PLOT TIME: 06-09-21, 3:41 PM)

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	136	161



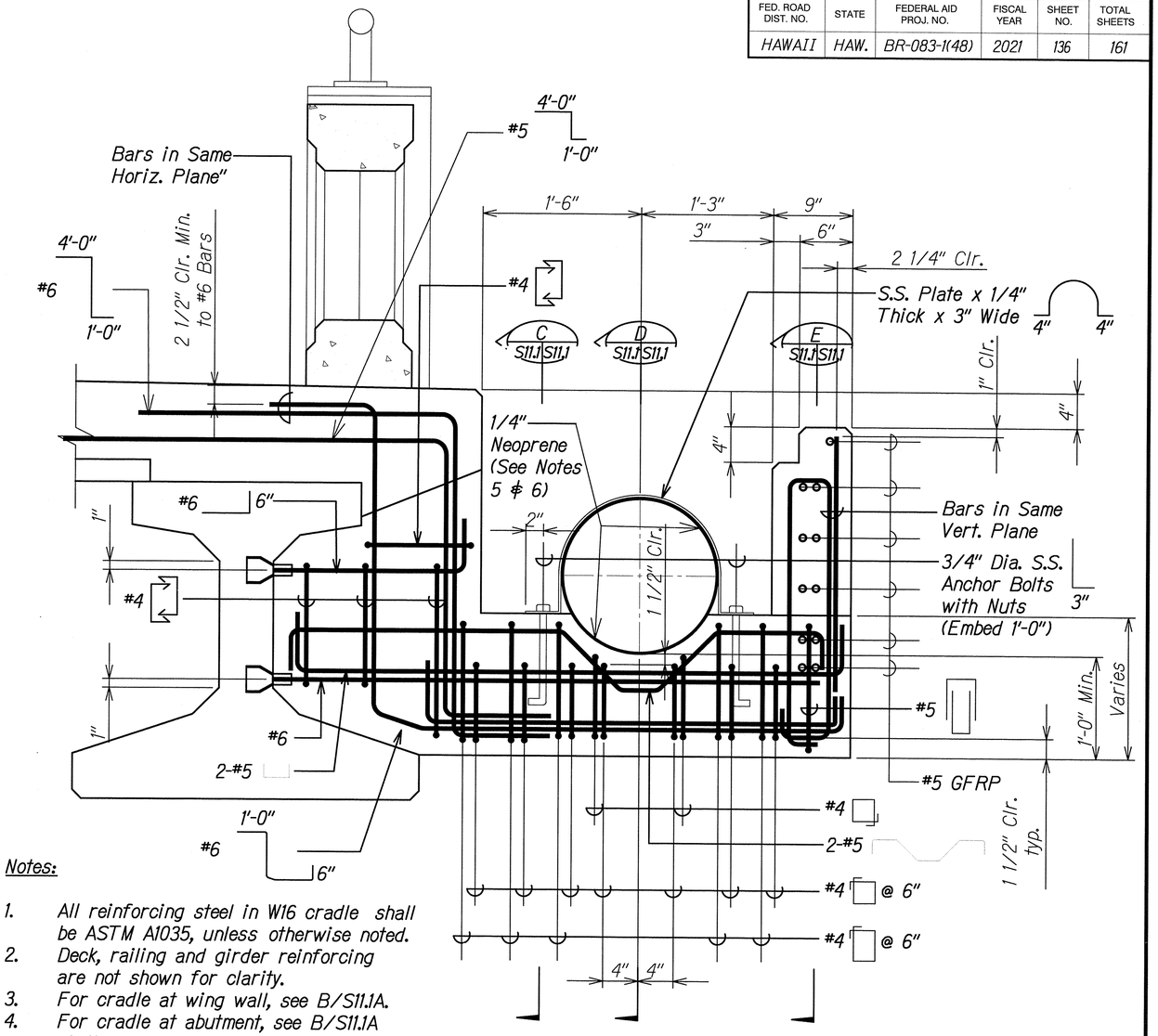
Notes:

1. Contractor shall submit locations of W16 Cradles. Contractor shall coordinate W16 Cradle locations with precast girder manufacturer, deck reinforcing abutment reinforcing and wing wall reinforcing.
2. Concrete is not Scored within First and Last 2'-0" of Curtain Wall.

CURTAIN WALL ELEVATION

Scale: 3/4" = 1'-0"

A S11.1 S11.1



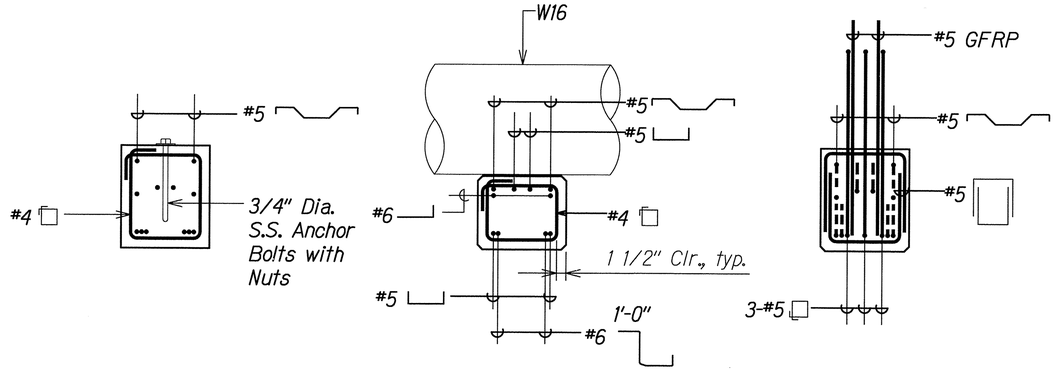
Notes:

1. All reinforcing steel in W16 cradle shall be ASTM A1035, unless otherwise noted.
2. Deck, railing and girder reinforcing are not shown for clarity.
3. For cradle at wing wall, see B/S11.1A.
4. For cradle at abutment, see B/S11.1A similar.
5. Place 1/4" Neoprene Between W16 and S.S. Plate.
6. Place 1/4" Neoprene Between W16 and Cradle.

W16 CRADLE SECTION

Scale: 1 1/2" = 1'-0"

B S11.1 S11.1



SECTION

Scale: 1" = 1'-0"

C S11.1 S11.1

SECTION

Scale: 1" = 1'-0"

D S11.1 S11.1

SECTION

Scale: 1" = 1'-0"

E S11.1 S11.1

GRAPHIC SCALE:

1 0 1 2

SCALE: 1"= 1'-0"

APPROVED:

For Manager and Chief Engineer, BWS
(for work affecting BWS facilities
State R/W & BWS easements only)

MAY 2 4 2021
DATE

DENNIS K. MITSUNAGA
LICENSED PROFESSIONAL ENGINEER
No. 2422-S
HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

W16 CRADLE AND CURTAIN WALL

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

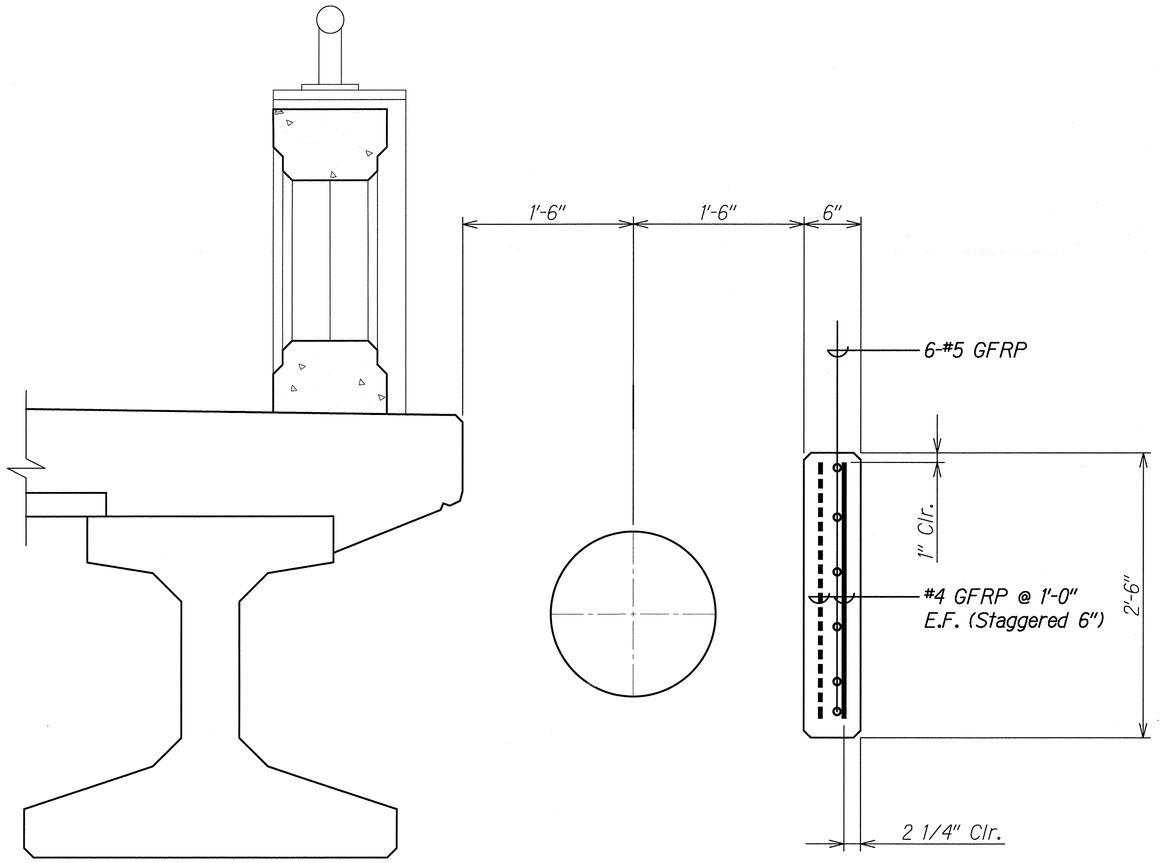
Scale: As Noted Date: February 2021

SHEET No. S11.1 OF 5 SHEETS

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

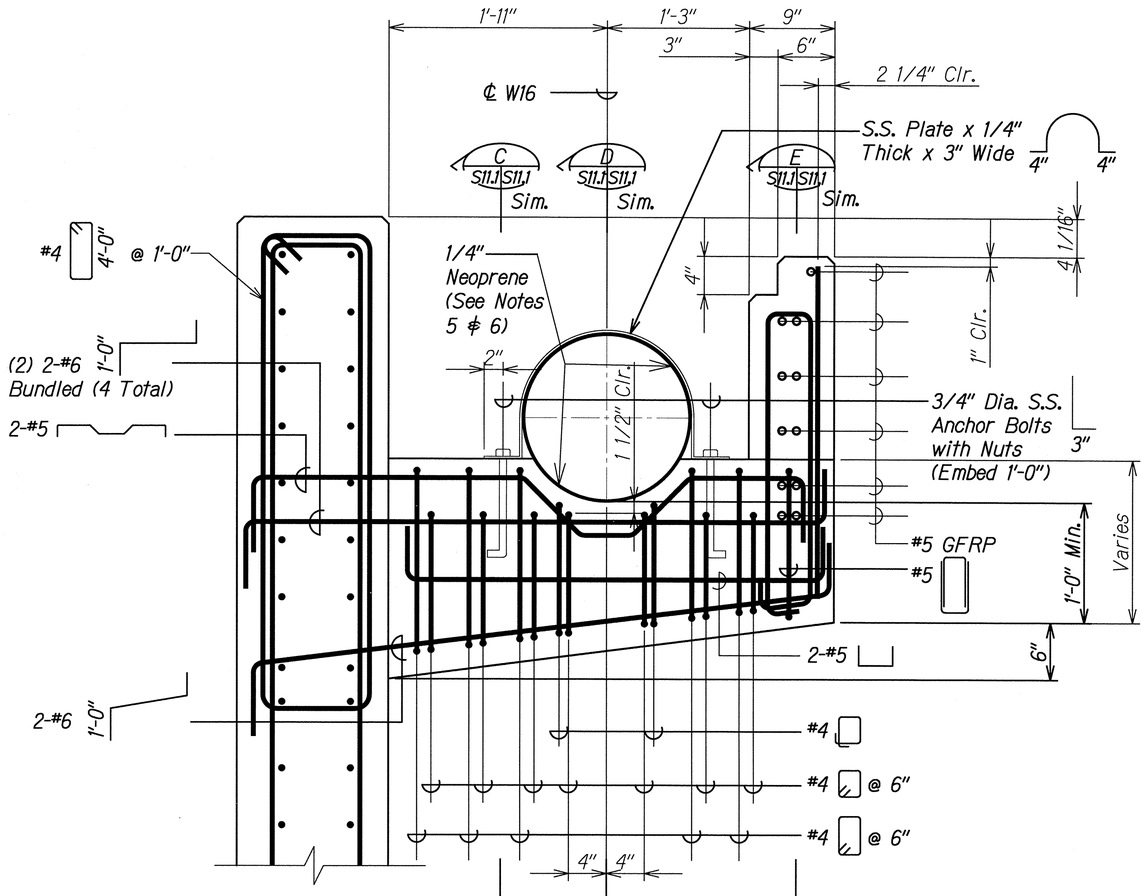
DRAWING NAME: T:\PROJECTS\1-ACTIVE FILES\913-01_KAIPAPAU BRIDGE S&B_REVISED_STRUCT\S_051221\K-38-S110.DWG PLOT TIME: 05-13-21 8:51 AM

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	137	161



W16 CURTAIN WALL SECTION (A S11.1 | S11.1A)

Scale: 1 1/2" = 1'-0"



W16 CRADLE AT WING WALL (B S11.1A | S11.1A)

Scale: 1 1/2" = 1'-0"

Notes:

1. All reinforcing steel in W16 cradle shall be ASTM A1035, unless otherwise noted.
2. Deck, railing and girder reinforcing are not shown for clarity.
3. For cradle at wing wall, see B/S11.1A.
4. For cradle at abutment, see B/S11.1A similar.
5. Place 1/4" Neoprene Between W16 and S.S. Plate.
6. Place 1/4" Neoprene Between W16 and Cradle.

GRAPHIC SCALE:

1 0 1 2

SCALE: 1"= 1'-0"

APPROVED:

MAY 2 4 2021

for Manager and Chief Engineer, BWS (for work affecting BWS facilities State R/W & BWS easements only) — DATE

DENNIS K. MITSUNAGA * LICENSED PROFESSIONAL ENGINEER * No. 2422-S * HAWAII, U.S.A.

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4/30/22

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MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

W16 CURTAIN WALL SECTION AND CRADLE AT WING WALL

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

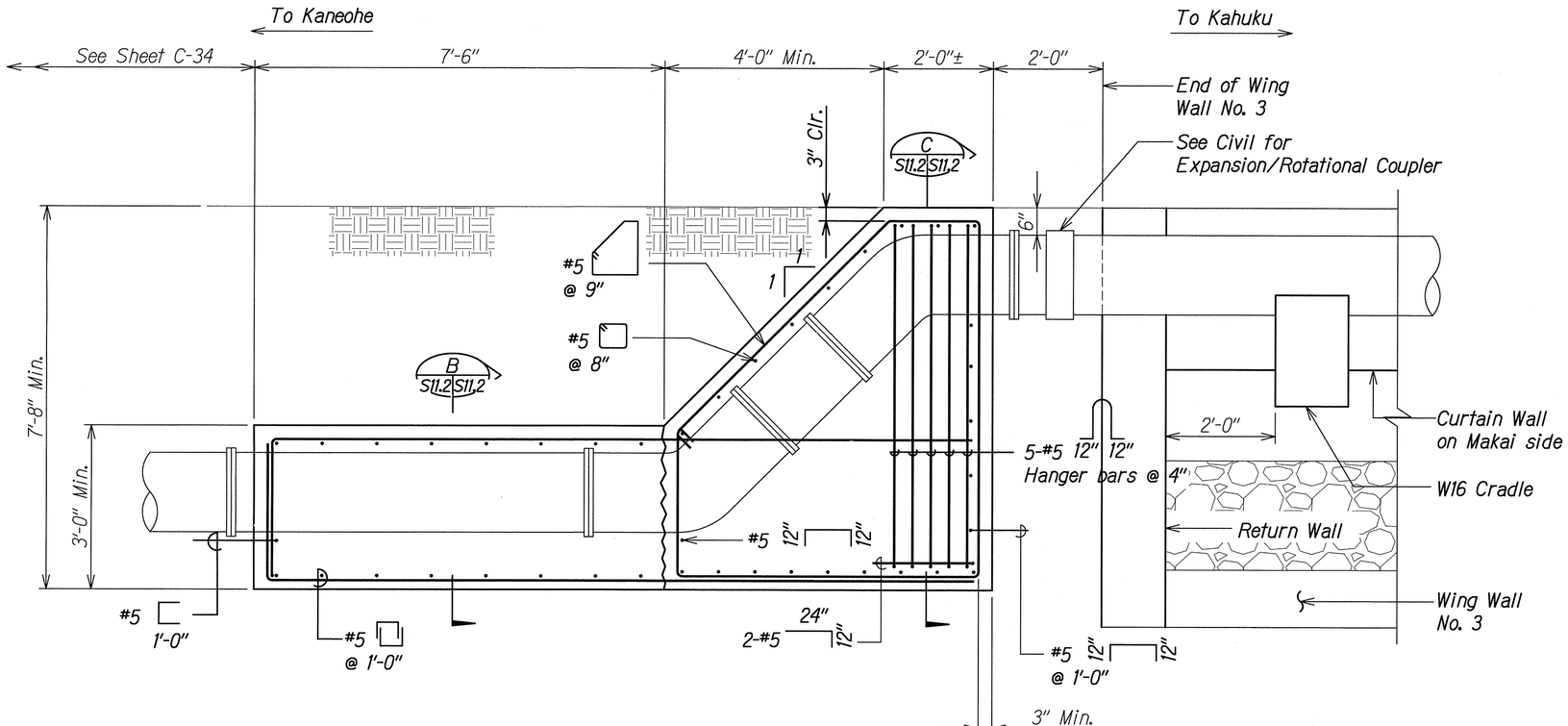
Scale: As Noted — Date: February 2021

SHEET No. S11JA OF 5 SHEETS

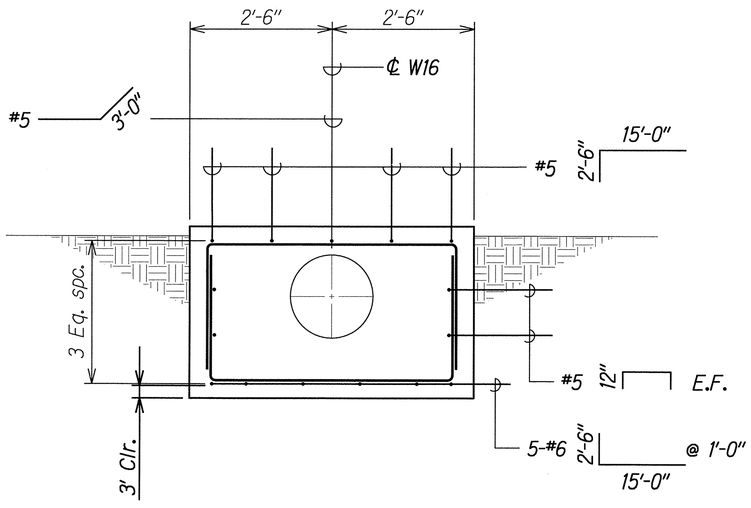
ORIGINAL PLAN | NOTE BOOK No. ____

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

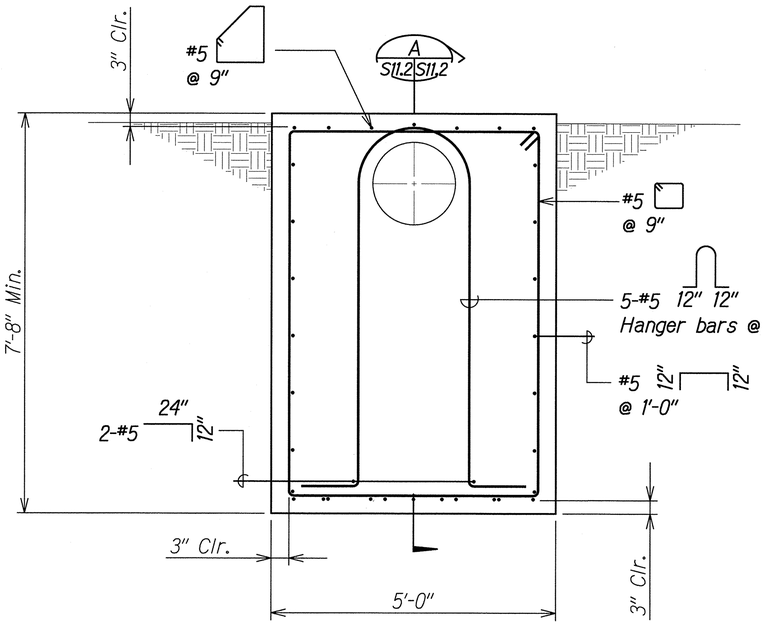
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	138	161



SECTION A
Scale: 3/4" = 1'-0"



SECTION B
Scale: 3/4" = 1'-0"



SECTION C
Scale: 3/4" = 1'-0"

GRAPHIC SCALE:
1 0 1 2FT
SCALE: 3/4"= 1'-0"

APPROVED:
MAY 2 4 2021
For Manager and Chief Engineer, BWS DATE
(for work affecting BWS facilities
State R/W & BWS easements only)

DENNIS K. MITSUNAGA
LICENSED PROFESSIONAL ENGINEER
No. 2422-S
HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

REACTION BLOCK AT WING WALL NO. 3

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

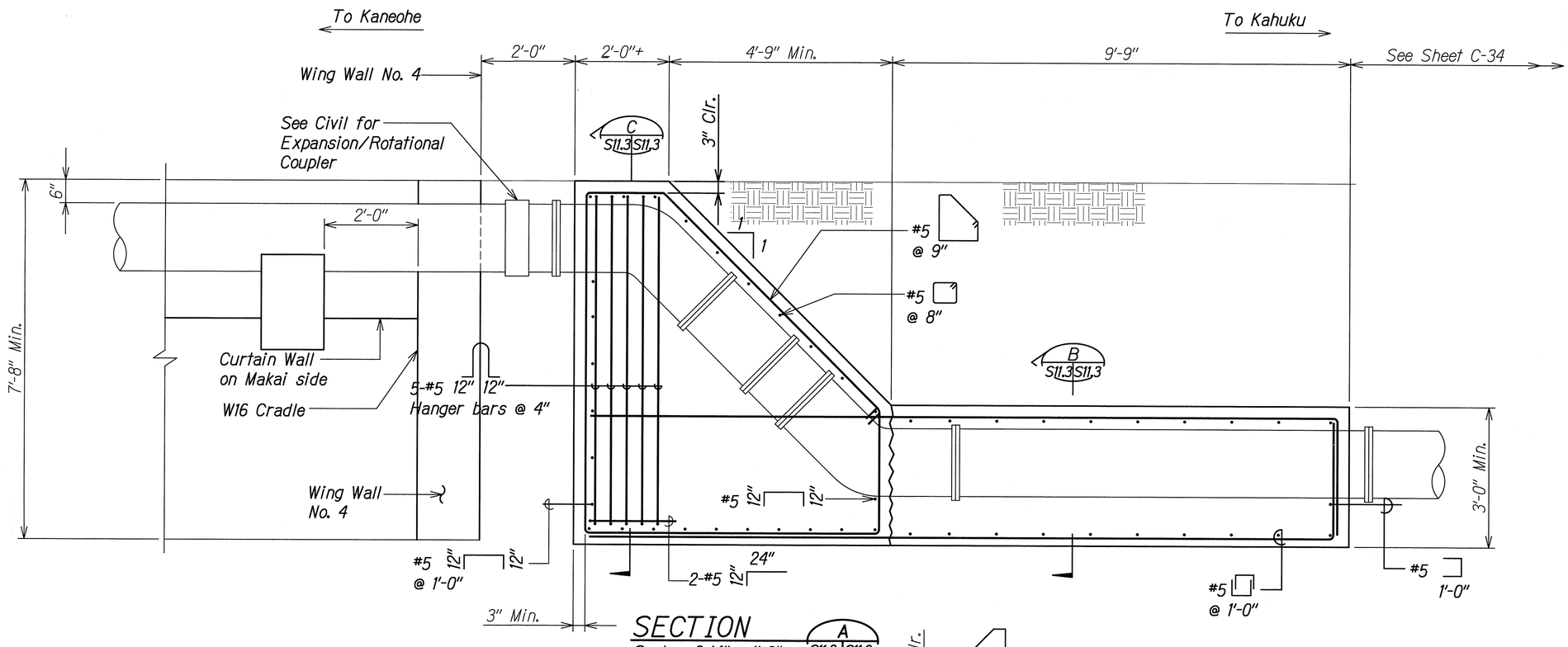
Scale: As Noted Date: February 2021

SHEET No. S11.2 OF 5 SHEETS

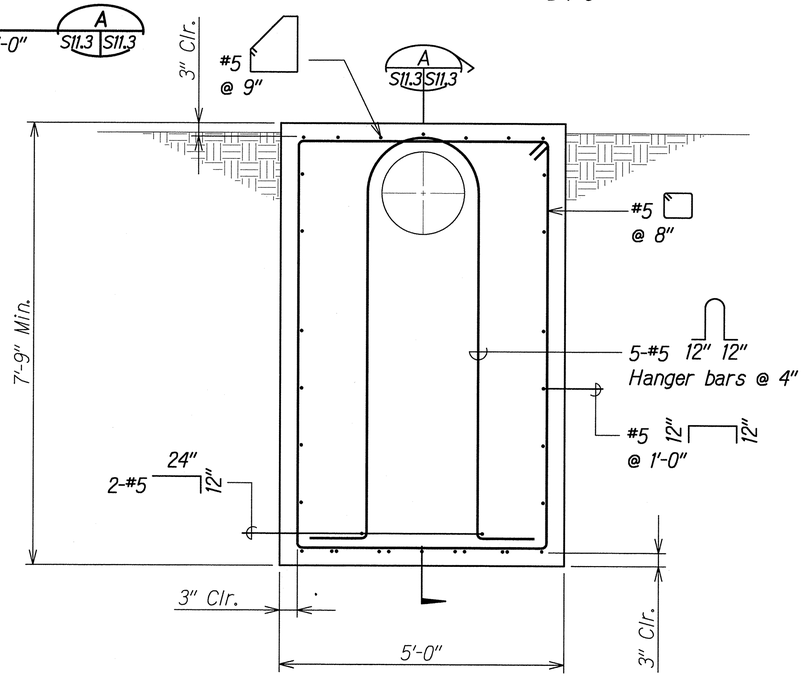
ORIGINAL PLAN | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE
NOTE BOOK | No.

DRAWING NAME: T:\PROJECTS\1-ACTIVE FILES\083-01 KAIPAPAU BRIDGE\SS REVISED STRUCT\S 051221\KSB-S1101.DWG PLOT TIME: 05-13-21, 8:32 AM

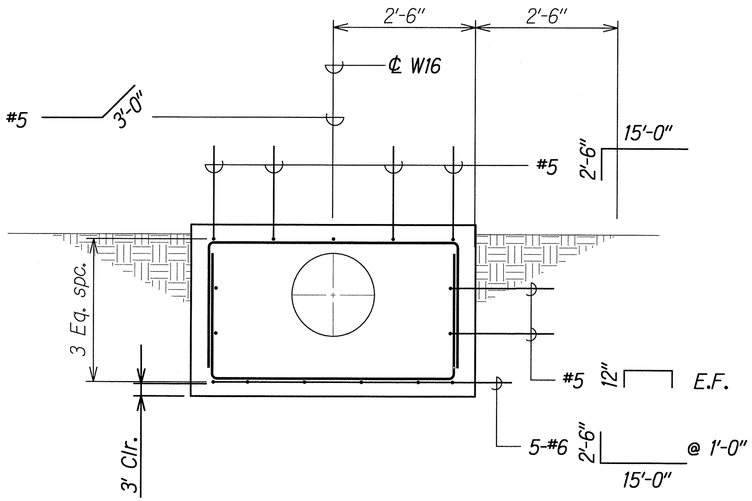
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	139	161



SECTION Scale: 3/4" = 1'-0" A S11.3 S11.3



SECTION Scale: 3/4" = 1'-0" C S11.3 S11.3



SECTION Scale: 3/4" = 1'-0" B S11.3 S11.3

GRAPHIC SCALE:
1 0 1 2FT
SCALE: 3/4"= 1'-0"

APPROVED:
MAY 2 4 2021
Manager and Chief Engineer, BWS (for work affecting BWS facilities State R/W & BWS easements only) DATE

DENNIS K. MITSUNAGA LICENSED PROFESSIONAL ENGINEER No. 2422-S HAWAII, U.S.A.

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SIGNATURE 4/30/22 LIC. EXPIRATION
MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

REACTION BLOCK AT WING WALL NO. 4

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

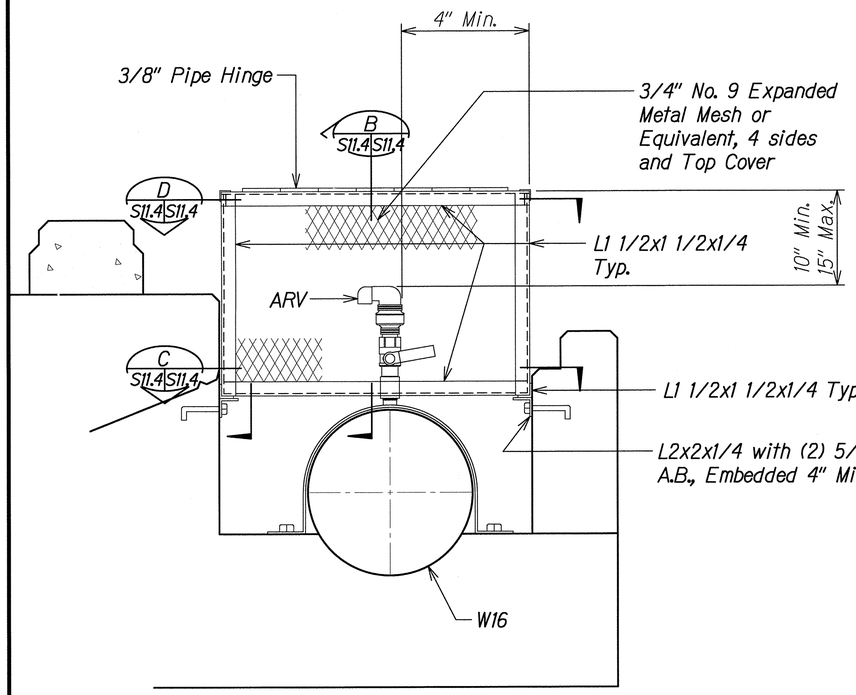
Scale: As Noted Date: February 2021

SHEET No. S11.3 OF 5 SHEETS

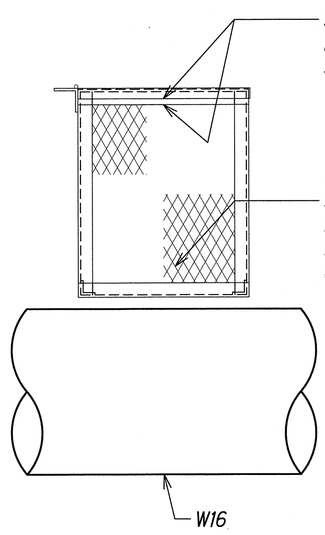
ORIGINAL PLAN | NOTE BOOK | No. | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE

DRAWING NAME: I:\PROJECTS\ACTIVE FILES\813-01 KAIPAPAU BRIDGE\$$ REVISED STRUCT\$_051221\K58-S1101.DWG PLOT TIME: 05-13-21, 8:52 AM

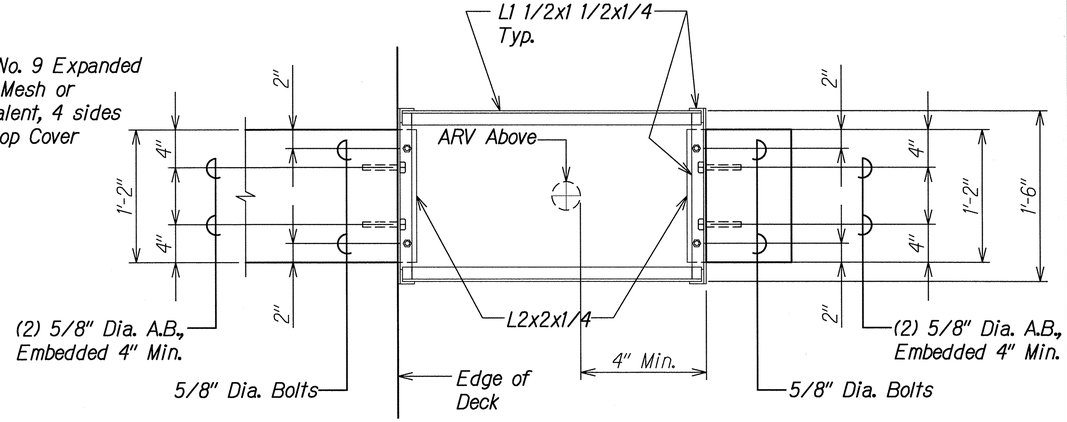
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	140	161



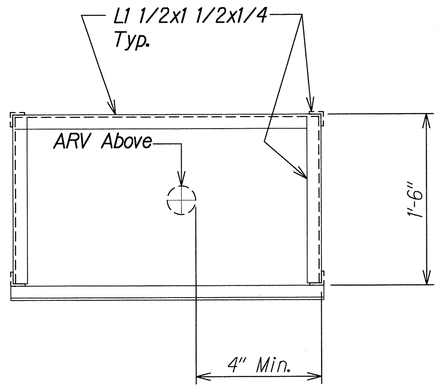
SECTION A
Scale: 1 1/2" = 1'-0" S11.4 S11.4



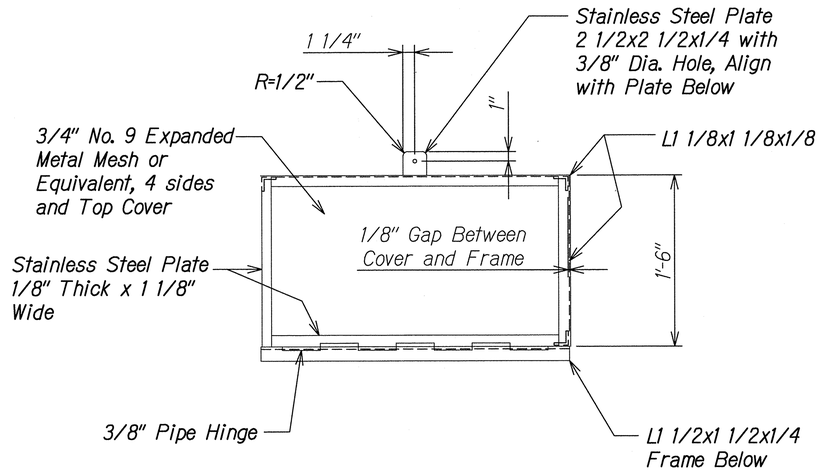
SECTION B
Scale: 1 1/2" = 1'-0" S11.4 S11.4



SECTION C
Scale: 1 1/2" = 1'-0" S11.4 S11.4



SECTION D
Scale: 1 1/2" = 1'-0" S11.4 S11.4



SECTION E
Scale: 1 1/2" = 1'-0" S11.4 S11.4

Notes:

1. All angle connections shall be $\frac{3}{16}$" fillet welds unless noted.
2. Expanded metal mesh shall be welded to inside edges of angles.
3. Stainless steel pin thru pipe hinge shall be inserted and welded to exterior 2" pipes.
4. All pipe hinges, angles and expanded metal mesh shall be stainless steel.
5. Unless otherwise noted all anchor bolts shall be a minimum of 4" from edge of existing concrete.

GRAPHIC SCALE:
1 0 1FT
SCALE: 1 1/2"= 1'-0"

APPROVED:
For Manager and Chief Engineer, BWS
(for work affecting BWS facilities State R/W & BWS easements only)
MAY 24 2021
DATE

DENNIS K. MITSUNAGA
LICENSED PROFESSIONAL ENGINEER
No. 2422-S
HAWAII, U.S.A.
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION
SIGNATURE 4/30/22 LIC. EXPIRATION
MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ARV ENCLOSURE DETAILS

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

SHEET No. S11.4 OF 5 SHEETS

ORIGINAL PLAN	NOTE BOOK	No.

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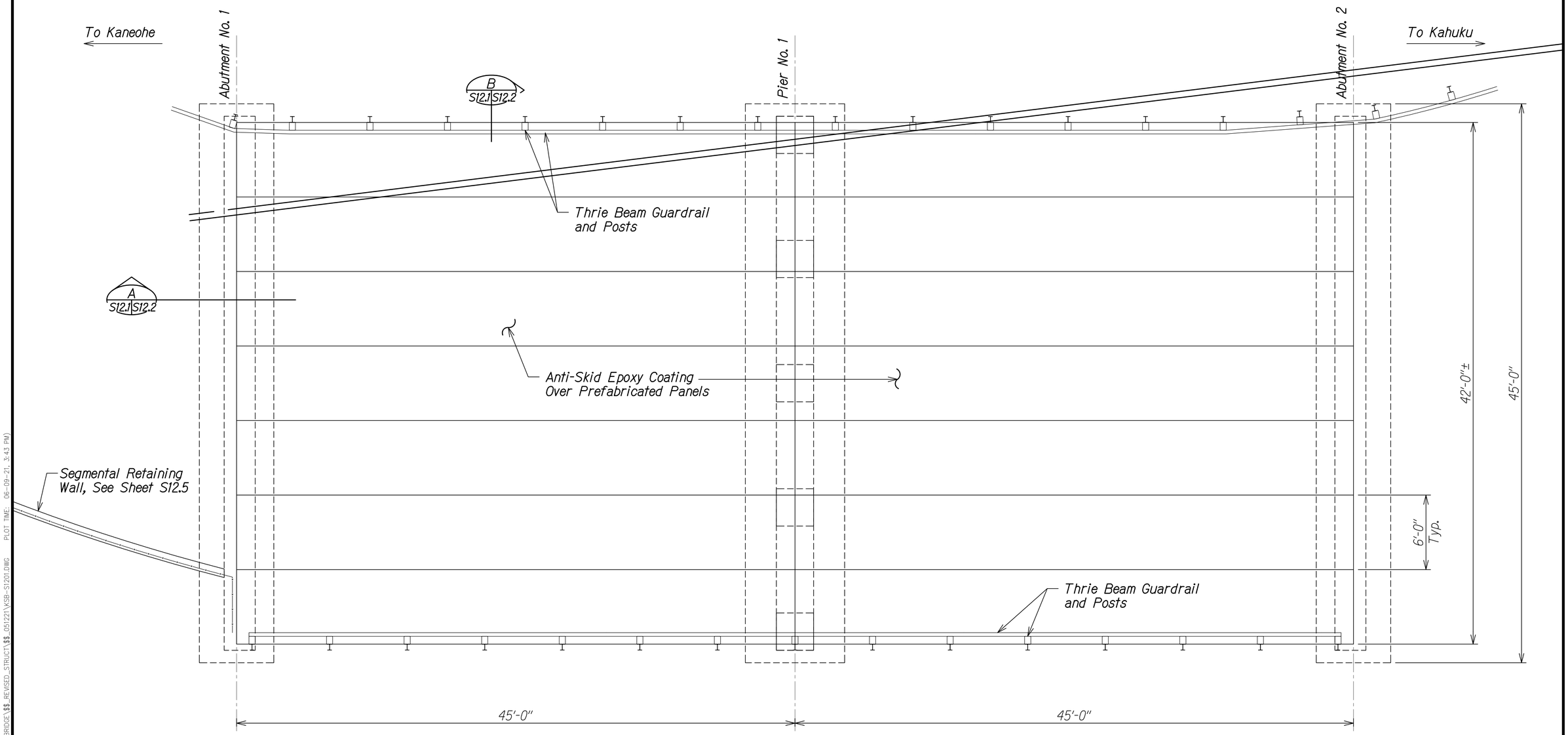
TRACED BY " "
DESIGNED BY " "
QUANTITIES BY " "
CHECKED BY " "

DRAWING NAME: T:\PROJECTS\1-ACTIVE PJCS\013-01 KAIPAPAU BRIDGE\SS REHSE STRUCTS 05\22\VKSR-S110.DWG PLOT TIME: 05-13-21 8:51 AM

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	141	161



NOTES:

1. See Section 512 for submittals to be stamped and sealed by Hawaii licensed professional geotechnical and structural Engineers.
2. All drawings and details for the prefabricated steel beam bridge and segmental retaining wall shown on sheets S12.1 to S12.5 are schematic only and are shown for bidding purposes only.

DETOUR ROAD TEMPORARY BRIDGE LAYOUT PLAN

A / S12.1 | S12.1

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

GRAPHIC SCALE:

4 3 2 1 0 4 8

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

DENNIS K. MITSUNAGA
LICENSED PROFESSIONAL ENGINEER
No. 2422-S
HAWAII, U.S.A.

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4/30/22
SIGNATURE LIC. EXPIRATION

MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PREFABRICATED STEEL BEAM BRIDGE

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

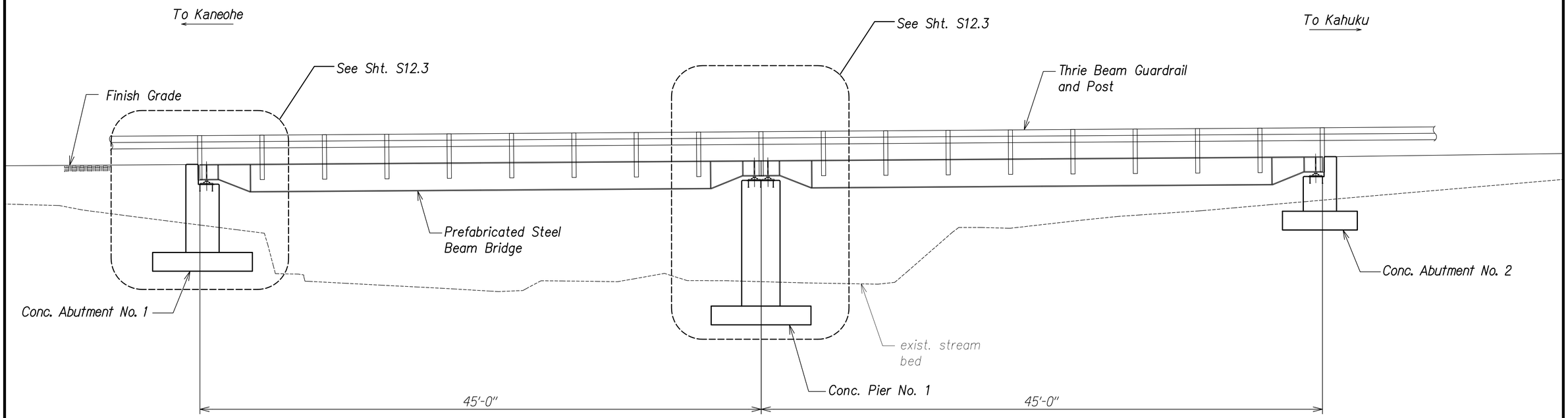
Scale: As Noted Date: February 2021

SHEET No. S12.1 OF 5 SHEETS

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

DRAWING NAME: T:\PROJECTS\1-ACTIVE FILES\913-01_KAIPAPAU BRIDGE\$$_REVISED_STRUCT\$$_051221\KSB-S1201.DWG PLOT TIME: 06-09-21, 3:43 PM)

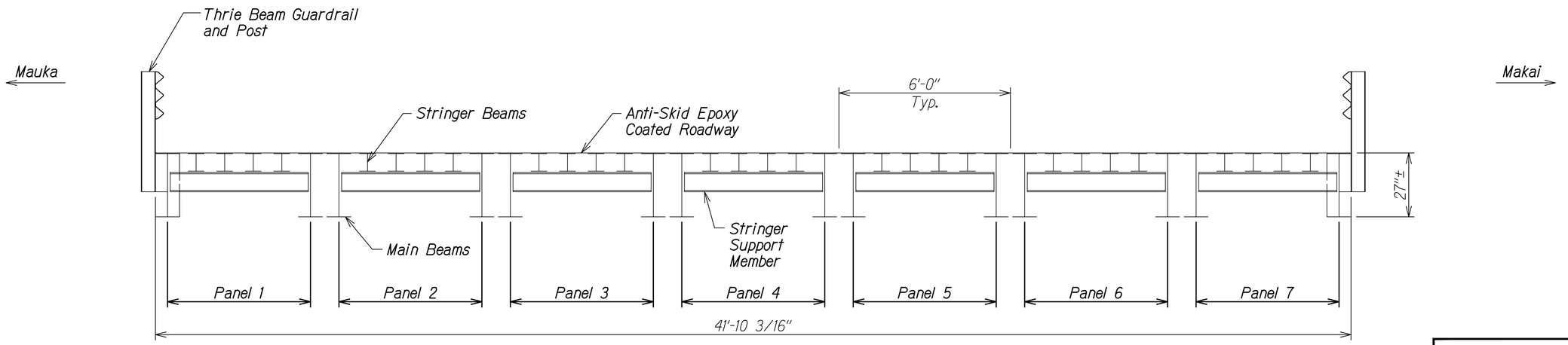
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	142	161



LONGITUDINAL ELEVATION (A)

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

S12.1 | S12.2



TYPICAL SECTION (B)

Scale: 1/2" = 1'-0"

S12.1 | S12.2

NOTES:

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GRAPHIC SCALE:

4 3 2 1 0 4 8
SCALE: 1/4"= 1'-0"

2 1 0 2 4
SCALE: 1/2"= 1'-0"

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HAWAII, U.S.A.

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SIGNATURE LIC. EXPIRATION

MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PREFABRICATED STEEL BEAM BRIDGE
ELEVATION AND TYPICAL SECTION

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

SHEET No. S12.2 OF 5 SHEETS

ORIGINAL PLAN | NOTE BOOK | No.

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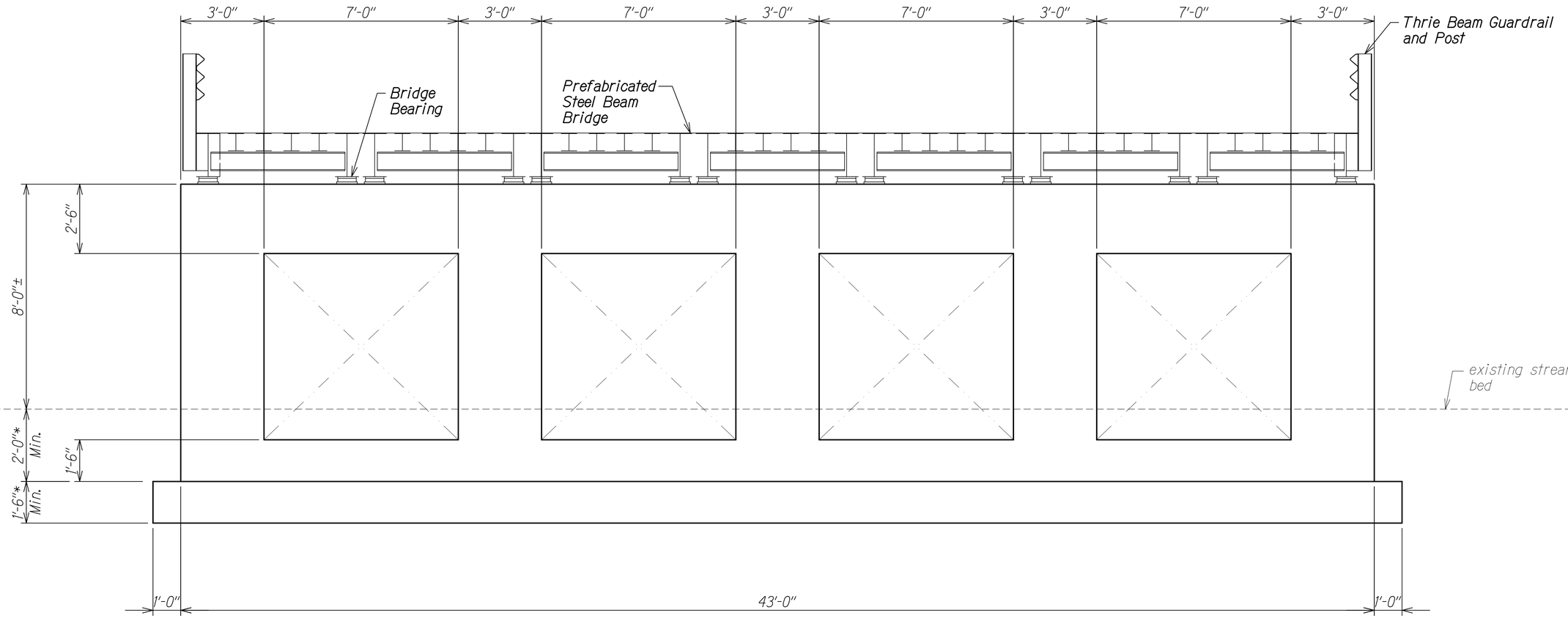
TRACED BY | "
DESIGNED BY | "
QUANTITIES BY | "
CHECKED BY | "

DRAWING NAME: T:\PROJECTS\1-ACTIVE FILES\913-01_KAIPAPAU BRIDGE\$$_REVISED_STRUCT\$$_051221\KSB-S1202.DWG PLOT TIME: 06-09-21, 3:44 PM)

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	143	161



* Submit calculations and details to show that the foundation will not be adversely affected by scouring.

PIER NO. 1 ELEVATION

Scale: 1/2" = 1'-0"

A S12.4 | S12.3

NOTES:

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GRAPHIC SCALE:

2 1 0 2 4

SCALE: 1/2"= 1'-0"

DENNIS K. MITSUNAGA
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No. 2422-S
HAWAII, U.S.A.

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SIGNATURE LIC. EXPIRATION

MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PREFABRICATED STEEL BEAM BRIDGE
FOUNDATION ELEVATION

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

SHEET No. S12.3 OF 5 SHEETS

ORIGINAL PLAN
NOTE BOOK No.

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DESIGNED BY
QUANTITIES BY
CHECKED BY

DATE
" " " " "

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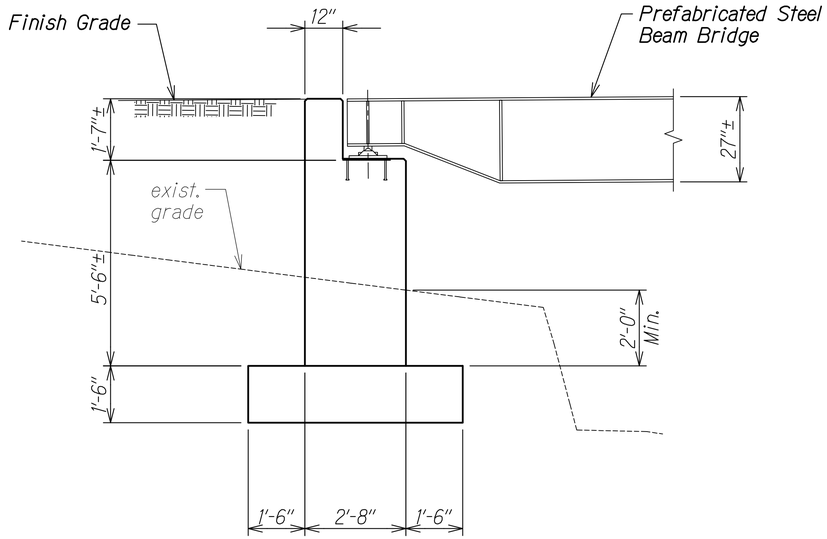
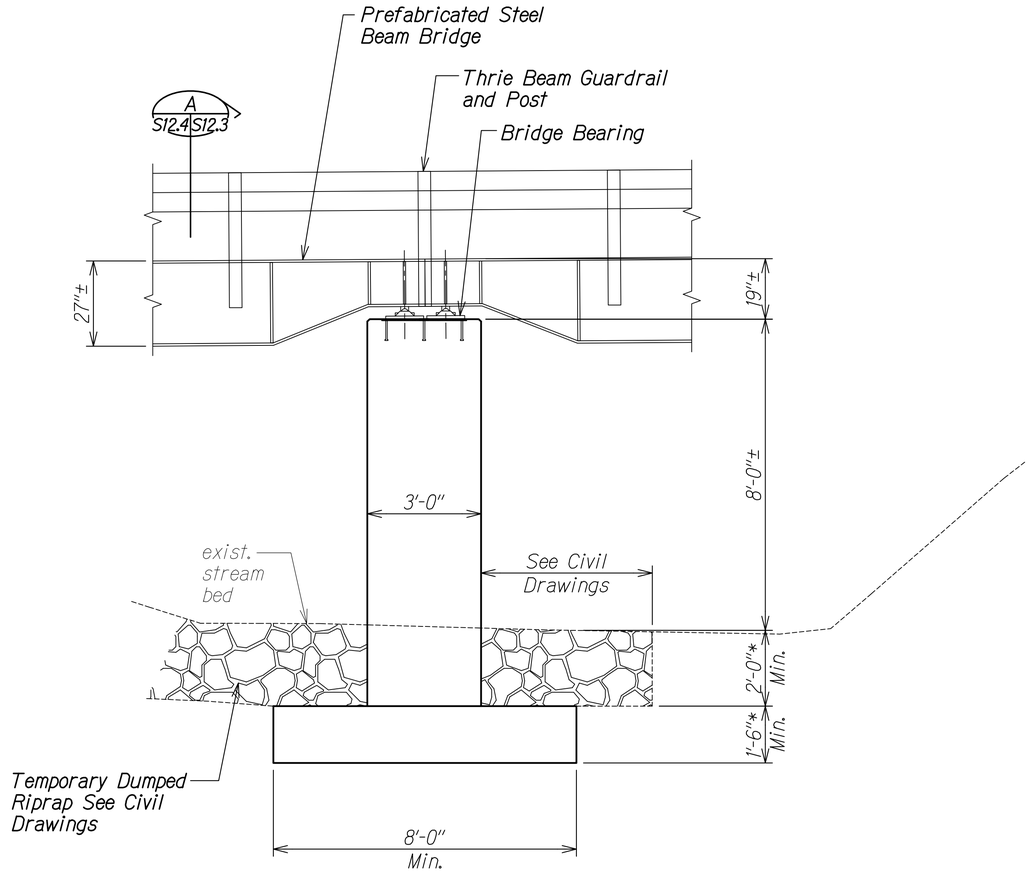
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	144	161



ABUTMENT SECTION

Scale: 1/2" = 1'-0"

A S12.4 | S12.4



PIER NO. 1 SECTION

Scale: 1/2" = 1'-0"

B S12.4 | S12.4

* Submit calculations and details to show that the foundation will not be adversely affected by scouring.

NOTES:

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2. All drawings and details for the prefabricated steel beam bridge and segmental retaining wall shown on sheets S12.1 to S12.5 are schematic only and are shown for bidding purposes only.
3. Should loose/soft subsoils be encountered at the footing level, the loose/soft materials shall be over excavated a minimum of 24 inches and replaced with stabilization layer consisting of no. 2 coarse rock wrapped with a filter fabric (Mirafi 180N or equal).

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

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GRAPHIC SCALE:

2 1 0 2 4

SCALE: 1/2"= 1'-0"

DENNIS K. MITSUNAGA
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4/30/22
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MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PREFABRICATED STEEL BEAM BRIDGE SECTIONS

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

SHEET No. S12.4 OF 5 SHEETS

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	145	161

NOTES:

1. See Section 530 for submittals to be stamped and sealed by Hawaii licensed professional geotechnical and structural Engineers.

2. All drawings and details for the prefabricated steel beam bridge and segmental retaining wall shown on sheets S12.1 to S12.5 are schematic only and are shown for bidding purposes only.

3. Cost of installation and removal of segmental wall shall be incidental to cost for installing fabrication steel beam bridge abutment and piers in Section 512.

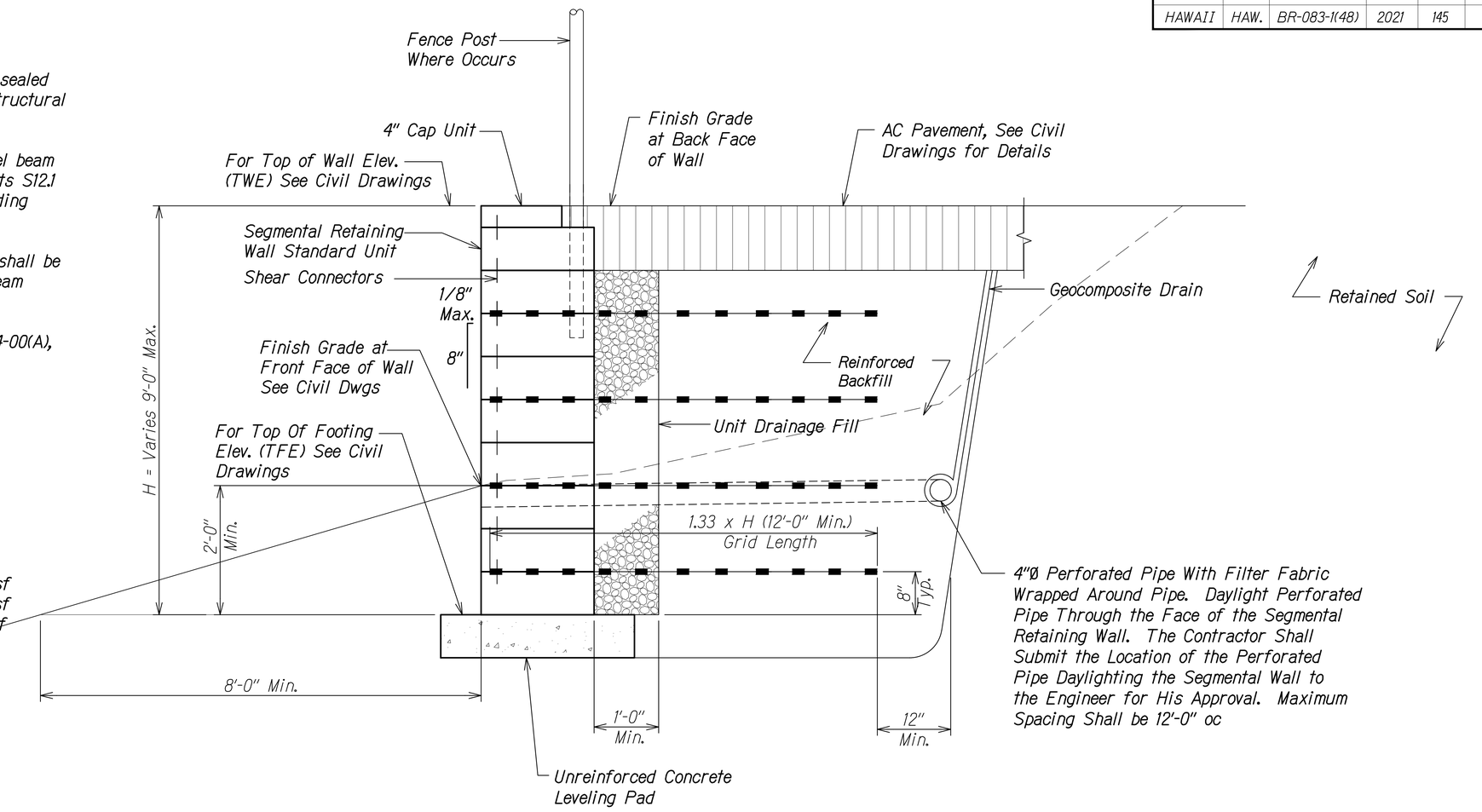
4. Soil Design Parameters. (Refer to Geolabs W.O. 5014-00(A), August 6, 2104.)

(a) Active pressure, level backfill
- Above Groundwater = 40 pcf
- Below Groundwater = 80 pcf

(b) At-rest pressure, level backfill
- Above Groundwater = 58 pcf
- Below Groundwater = 88 pcf

(c) Soil bearing pressures
- Extreme Event Limit State = 4,500 psf
- Strength Limit State = 2,000 psf
- Service Limit State = 1,500 psf

(d) Segmental Wall Reinforced Fill Material
(Imported Select Granular Fill Material)
Angle of Internal Friction = 34° Min.



TYPICAL SEGMENTAL WALL SECTION AT DETOUR ROAD

Scale: 1/2" = 1'-0"

A S12.5 | S12.5

GRAPHIC SCALE:

2 1 0 2 4

SCALE: 1/2"= 1'-0"

DENNIS K. MITSUNAGA LICENSED PROFESSIONAL ENGINEER No. 2422-S HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

4/30/22

SIGNATURE LIC. EXPIRATION

MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPICAL SEGMENTAL WALL SECTION AT DETOUR ROAD

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

SHEET No. S12.5 OF 5 SHEETS

ORIGINAL PLAN | NOTE BOOK No. ____

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TRACED BY " "
DESIGNED BY " "
QUANTITIES BY " "
CHECKED BY " "

DRAWING NAME: T:\PROJECTS\1-ACTIVE FILES\913-01_KAIPAPAU BRIDGE\$$_REVISED_STRUCT\$$_051221\KSB-S1205.DWG PLOT TIME: 06-09-21, 3:45 PM)