BRIDGE GENERAL NOTES

1. <u>General Specifications:</u> Hawaii Standard Specifications for Road and Bridge Construction, 2005, together with Special Provisions prepared for this contract.

2. <u>Design Specifications:</u>

- (A) AASHTO 2014 LRFD Design Bridge Specifications 7th Edition and its subsequent interim specifications with interim supplements and modifications by the HDOT Highways Division.
- (B) HDOT Document dated August 8, 2014 with subject title "Design Criteria for Bridges and Structures".
- (C) Temporary shoring and falsework shall follow the 2008 AASHTO Guide Design Specifications for Bridge Temporary Works.

3. Loads:

(A) Live Load: 85 psf

4. Materials:

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

		Classes of	Compressive Strength
<u>Item N</u>	lo. <u>Structural Parts</u>	Concrete	f'c (28 Days)
(1)	Bridge Deck	-	5000 PSI
(2)	Abutment, Wing Wall, and Retaining Wall	-	5000 PSI
(3)	Abutment, Wing Wall, and Retaining Wall Footings	-	5000 PSI
(4)	Approach slab	-	4000 PSI
(5)	Except as noted otherwise, all others	Α	3000 PSI

All concrete for Item Nos. (1), (2), (3) and (4) shall have a maximum W/C Ratio of 0.45. The W/C Ratio for Class A concrete shall follow the Specifications.

A Shrinkage Reducing Admixture (SRA), Tetraguard AS20 by Master Builders or Eclipse by W.R. Grace & Co., or accepted equal, shall be added to the concrete mix for Item No. (1). The Minimum dosage requirement shall be 128 ounces per cubic yard of concrete.

- (B) All reinforcing steel shall be ASTM A 615 Grade 60 unless otherwise noted.
- (C) Reinforcing steel shall be ASTM A 706 where welded connections are required.
- (D) Glass fiber reinforced polymer (GFRP) reinforcing bars shall have a minimum elastic modulus of 8,800,000 psi and shall have a guaranteed minimum tensile strength of 141 ksi for #4 bar, 163 ksi for #5 bar, and 150 ksi for #6 bar.
- (E) All structural steel shapes and plates shall conform to ASTM A36, hot-dip galvanized unless otherwise noted.
- (F) All structural steel W beams shall conform to ASTM A709 Grade 50, hot-dip galvanized unless otherwise noted.

4. Materials (Cont.):

- (G) All anchor bolts, threaded rods, and other hardware, including nuts and washers, which connect steel to concrete shall be high-strength bolts conforming to ASTM F1554, Grade 55, unless otherwise noted.
- (H) All bolts which connect steel to steel shall be high-strength bolts conforming to ASTM A325, Type 1, unless otherwise noted.
- (I) All structural steel shapes and plates shall be ASTM A123 Hot-Dip Galvanized after fabrication. Bolts, nuts, and washers shall be ASTM A153 Hot-Dip Galvanized.
- (J) All welds shall be in conformity with the structural welding code AWS D1.5 of the American Welding Society (AWS). Electrodes shall be E70.

5. Reinforcement:

- (A) The covering measured from the surface of the concrete to the face of any reinforcing bars shall be as follows, except as otherwise shown:
 - (1) Deck slabs
 - a. Top bars = 2" with a tolerance of 0 inch to +3/8 inch b. Bottom bars = 2" except as otherwise noted
 - (2) Wing walls = 2"
 - (3) Approach slab top bars = 2" Approach slab bottom bars = 3"
 - (4) Concrete cast against and permanently exposed to earth = 3"
 - (5) All others unless otherwise noted = 2".
- (B) Reinforcing bars shall be detailed in accordance with the latest edition of the A.C.I. Detailing Manual unless otherwise noted.
- (C) 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".
- (D) All dimensions relating to reinforcing bars are to centers of bars unless otherwise noted.
- (E) Reinforcing bars shall be securely tied at all intersections and lap splices except where the spacing of intersections is less than one foot in each direction, in which case alternate intersections shall be tied.

6. Construction Notes:

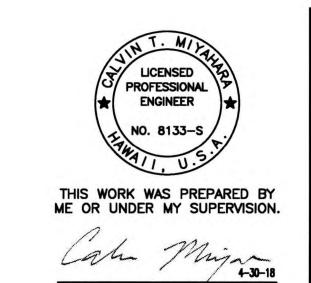
- (A) The Contractor shall verify all dimensions and site conditions and shall report any discrepancies in writing to the Engineer before commencing work or ordering materials.
- (B) The Contractor shall verify all site conditions and not rely upon these plans for existing bridge elevations and azimuths, stream channel location, roads, roadway gutters, curbs and sidewalks, etc.. Conditions may differ from those shown.

FED. ROAD DIST. NO. STATE PROJ. NO. FISCAL SHEET NO. SHEETS HAWAII HAW. 7241A-01-13 2016 19 36

6. Construction Notes (Cont.):

- (C) The Contractor shall be solely responsible for the protection of adjacent properties, utilities and existing and new structures from damage due to construction. Repairing any damage shall be at the Contractor's own expense, to the satisfaction of the Engineer.
- (D) The Contractor shall verify the location of all utility lines and notify the respective owners before commencing with excavation, and any temporary piling or sheeting.
- (E) The Contractor shall submit working drawings and calculations for the proposed bracing/falsework details needed to protect the existing structures from increases in the existing load due to equipment, drilled shaft rigs, cranes, vehicles and fresh concrete, etc.

 The drawings and calculations shall be stamped by a licensed Structural Engineer and a licensed Civil Engineer specializing in geotechnical engineering in the State of Hawaii. The above work, including working drawings and calculations, shall be incidental to various Contract items. The drawings and calculations shall be found acceptable by the Engineer before any construction work is to proceed.
- (F) The entire length of the bike path shall have a surface texture that complies with American Disabilities Act Accessibility Guidelines Section 4.3.6. and a minimum friction coefficient of 0.35 (see Caltrans Test Method 34.2).
- (G) For areas that are not broom finished, the surface of the concrete path shall have an abrasive coating according to Specification Section 712.11.
- (H) Except as otherwise noted, all vertical dimensions are measured plumb.
- (J) For concrete finish see Standard Specifications and Special Provisions.
- (K) Construction joints may be relocated or additional ones added subject to the acceptance of the Engineer.
- (L) Unless otherwise noted, all exposed concrete edges shall be chamfered 3/4" x 3/4".
- (M) Drilled holes in existing concrete for reinforcing steel dowels shall not be left unfilled for more than 8 hours. Epoxy in drilled holes shall develop the full strength of the dowels prior to pouring concrete around reinforcing steel dowels or attaching structural steel member to threaded rod dowels. Holes for epoxied dowels shall be 1/8" larger than dowel diameter.
- (N) Where specified that the concrete surface is to be roughened and cleaned the concrete shall be roughened to a full amplitude of 1/4 of an inch.



EXPIRATION DATE OF THE LICENSE

DEPARTMENT OF TRANSPORTATION

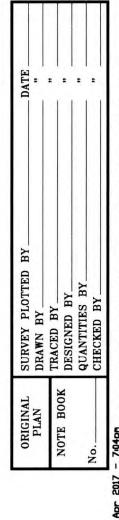
GENERAL NOTES

HALAWA HEIGHTS ROAD
PEDESTRIAN BRIDGE
Proj. No. 7241A-01-13

Scale: None

Date: April 24, 2017

SHEET No. SO.1 OF 3 SHEETS



BRIDGE GENERAL NOTES

FED. ROAD DIST. NO. STATE PROJ. NO. FISCAL SHEET NO. SHEETS HAWAII HAW. 7241A-01-13 2016 20 36

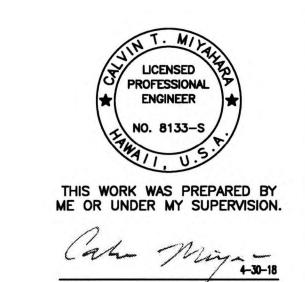
7. Foundation:

For boring logs and other geotechnical information, see foundation report by Geolabs, Inc. dated November 24, 2014.

- (A) Bearing Capacity
 - (1) Extreme event limit state = 8,000 pounds per square foot (psf)
 - (2) Strength limit state = 4,000 psf
 - (3) Service limit state = 2,200 psf
- (B) Friction Factor
 - (1) Extreme event limit state = 0.55
 - (2) Strength limit state = 0.45
- (C) Active \$ At-Rest Earth Pressures
 - (1) Active lateral earth pressure (level backfill conditions) = 38 pounds per cubic foot (pcf) equivalent fluid pressure.
 - (2) Active horizontal earth pressure (2H:1V backfill conditions) = 54 pcf
- - (5) At-rest horizontal earth pressure (Level backfill conditions) = 55 pcf
 - (6) At-rest vertical earth pressure (2H:1V backfill conditions) = 70 pcf
- (E) Passive Earth Resistance
 - (1) Extreme event limit state = 330 pcf
 - (2) Strength limit state = 160 pcf

8. General:

- (A) All items noted incidental will not be paid for separately.
- (B) Structure excavation and backfill, filter material, and impervious material for abutments, wing wall, and retaining wall shall be considered incidental to the various items.
- (C) Standard Plans refer to all structures in general, except for modifications as may be required for special conditions. For such modifications refer to the corresponding detailed drawings.
- (D) Plans of the existing bridge and the foundation report prepared by Geolabs, Inc. dated November 2014, are available for review from the Highways Design Branch located at the State Department of Transportation, Highways Division Kakuhihewa Building, Room 609, 601 Kamokila Boulevard, Kapolei, HI 96707 (Phone number 692-7580).



EXPIRATION DATE OF THE LICENSE

DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GENERAL NOTES

HALAWA HEIGHTS ROAD
PEDESTRIAN BRIDGE
Proj. No. 7241A-01-13

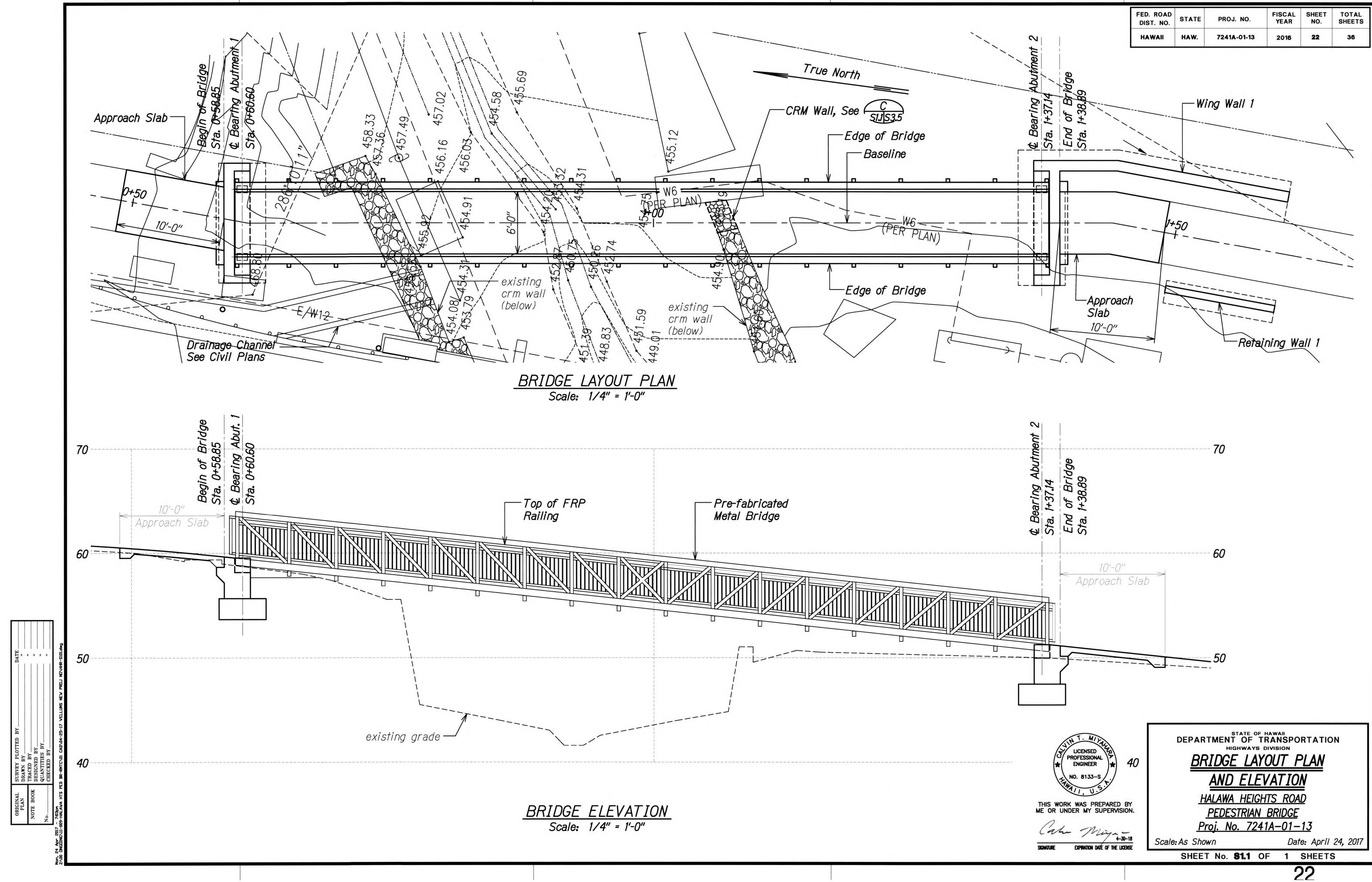
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Date: April 24, 2017

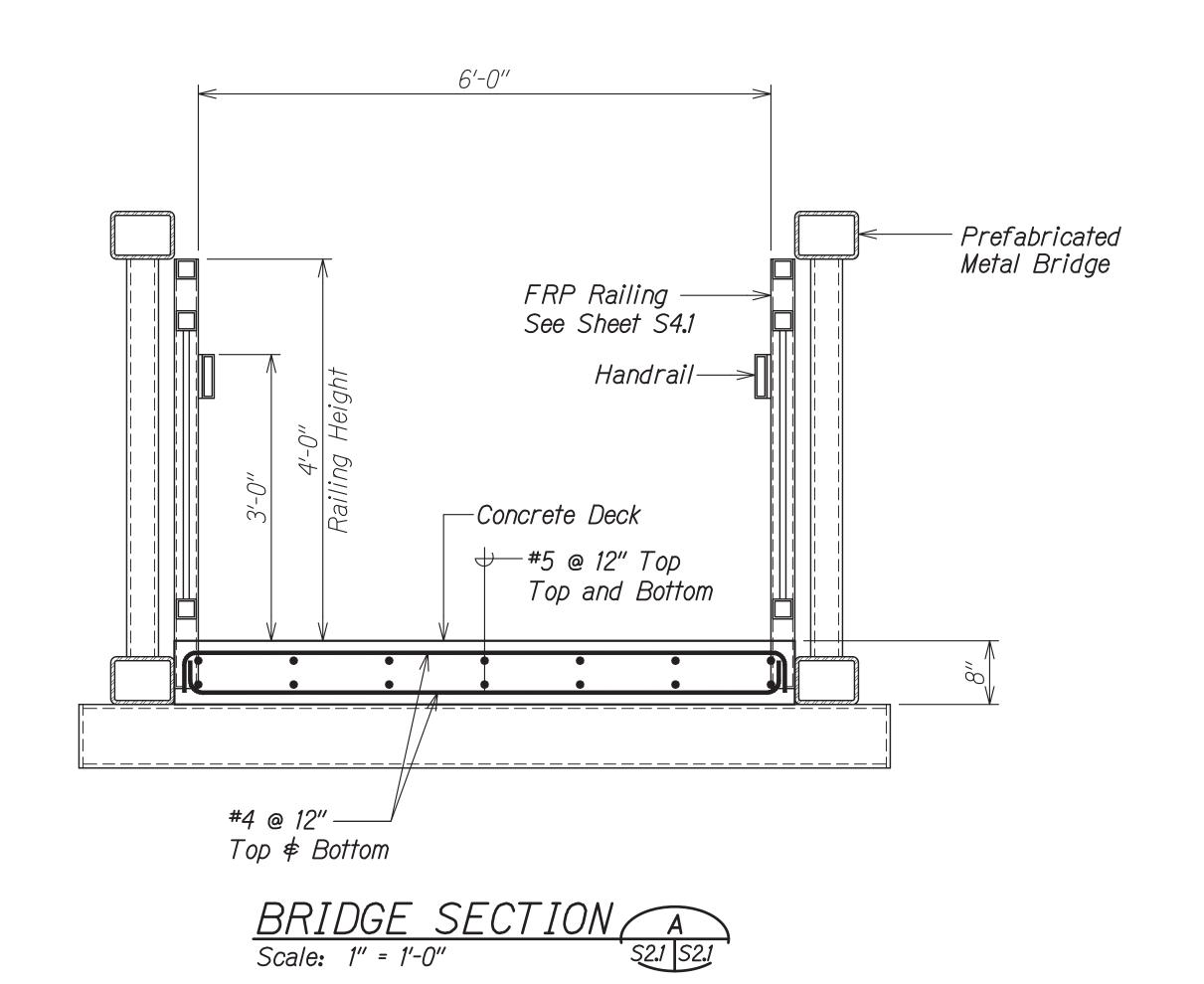
SHEET No. 80.2 OF 3 SHEETS

			<u>د</u>	SIMBULS AND	<u>ABBREVIATIONS</u>			FED. ROAD DIST. NO.	STATE PROJ. NO. FISCAL SHEET TO YEAR NO. SH
#	And	Demo.	Demolish, Demolition	<i>GDI</i>	Grated Drain Inlet	OG	Outside Girder,	HAWAII	HAW. 7241A-01-13 2016 21
a a	At	Det.	Detail		Glass Fiber Reinforced		Outbound Girder	Struct.	Structure
1	Diameter	Dia.	Diameter		Polymer Rebar	Perf.	Perforated	SE SE	Super Elevation
				1,27					
	Greater Than or Equal to	Diaph.	Diaphragm		Grade	PL	Plate	Symm.	Symmetrical
	Less Than or Equal to	Dim.	Dimension		Ground	PCC	Portland Cement Concrete		
	Number	Dist.	Distance	GRP	Grouted Rubble Pavement	PC	Point of Curvature	Tan.	Tangent
		DO	Ditto			PCF	Pounds per Cubic Foot	TC	Continuity Tendons
Abut.	Abutment	Dwls.	Dowels	Ht.	Height	P(e)	Effective Prestress Force	Temp.	Temporary
bbr.	Abbreviation	Dn.	Down	(H)	Hinge		After All Losses	TD	Deck Tendon
dd.	Additional	Dbl.	Double	Horiz, H	Horizontal	PPM	Parts Per Million	Thk.	Thick
/t .	Alternate	DI	Drain Inlet, Ductile Iron	HDOT	State of Hawaii Department	PSF	Pounds per Square Foot	T	Top
NB	Anchor Bolt		Drawing, Drawings	11501	of Transportation	PSI, psi	Pounds per Square Inch	, T ₽B	Top and Bottom
.C			Drilled Shaft	UDDE			그리아 마이에 여러들은 나라이라 하시아 있다면 하는 경험에 다른 나를 되었다.	TCE	
	Asphaltic Concrete	DS	Dillied Stall	HDPE	High Density Polyethylene	PLF DI	Pounds per Linear Foot	ICE	Top of Column
pprox.	Approximate	./. <u>~</u>		HS	High strength	PI	Point of Intersection	32023	(and Bent Cap Soffit) Elevation
Z.	Azimuth	E	East	<i>HECO</i>	Hawaiian Electric Company		of Tangents	TOD	Top of Deck
		EA, Ea., ea.	Each			PIVC	Point of Intersection of	TOP	Top of Pier
k.	Back	EF	Each Face	IB	Inbound		Vertical Curve	TFE	Top of Footing Elevation
al.	Balance	EFH	Each Face Horizontal	In.	Inch	PT	Point of Tangency	Tot.	Total
}	Baseline	EFV	Each Face Vertical	ID	Inside Diameter	Pt., Pts.	Point, Points	Transv.	Transverse
m.	Beam	EW	Each Way	IF	Inside Face	PRC	Point of Reverse Curvature	TS	Structural Tubing
Brg., Brgs.	Bearing, Bearings	EPE	Existing Edge of Pavement	Int.	Interior	PVC	Polyvinyl Chloride	TSS	Tendon For Girder in Simply
BVC	Beginning of Vertical Curve	<i>EPS</i>	Expanded Polystyrene	Inv.	Invert	Prestr.	Prestressed		Supported Condition
et.	Between	ES	Edge of Shoulder			P/S	Prestressed Strands	Тур.	Typical
F	Both Faces	Elec.	Electrical	Jt.	Joint	PB	Pull Box		
V	Both Ways	EMH	Electrical Manhole					Undergrd.	Underground
F <i>E</i>	Bottom of Footing Elevation	El., Elev.	Elevation	K	Kips	Rad., R	Radius	UHPC	Ultra High Performance Concr
ot., Bott., B	Bottom	Emb.	Embankment	KF	Kip Foot	RF	Rear Face	0111 0	om a mgm r or rormance coner
		EVC	End of Vertical Curve			Rebar	Reinforcing Bar	Vor	Varies
OF .	Bottom of Footing			KSF	Kips Per Square Foot			Var.	
r.	Bridge	Eq.	Equal	KSI	Kips Per Square Inch	Ref.	Reference	Vert., V	Vertical
2/1.	Bolt	Est.	Estimated	KLF	Kips Per Linear Foot	Reinf.	Reinforced, Reinforcing,	VC	Vertical Curve
		Exc.	Excavation				Reinforcement	VESLMC	Very Early Strength Latex
ant.	Cantilever	Excl.	Excluding	L	Length	Req'd.	Required		Modified Concrete
IP	Cast Iron Pipe	Exist., Ex.	Existing	Ib., Ibs., LBS.	Pound, Pounds	Ret.	Retaining		
•	Cast-In-Place	$Exp_{\bullet}(E)$	Expansion	Ltg. Std.	Lighting Standard	ROW	Right of Way	W/C	Water/Cement
	Center line	EJ	Expansion Joint	LF, Lin. Ft.	Linear Feet/Foot	Rdwy.	Roadway	w/	With
						nawy.	nodd wdy	W/	
;	Center of Gravity	Ext.	Exterior	LS	Lump Sum	C4	Cartina	W	West
	Center to Center			Longit.	Longitudinal	Sect.	Section	<i>WWF</i>	Welded Wire Fabric
-CW	Continuous Flashing Compound	(F)	Fixed			SRW	Segmental Retaining Wall	WW	Wingwall
	Waterproofing	FA	Force account	M	Modified	Sht.	Sheet	WP	Work Point, Working Point
	Class	FB	Flat Bar	MH	Manhole	Sim.	Similar	WS	Water Surface
r.	Clearance	FC	Compression Stresses	Max.	Maximum	SI.	Slope		
)	Clean Out	f'c	Specified Compressive Strength	Mech.	Mechanical	S	South	XJS	Expansion Joint System
		7 0				Snc Sna	Spaces, Spacing	703	Expansion John System
ol.	Column	<i>c</i> . •	of Concrete at 28 days	Min.	Minimum	Spc., Spg.		V	V
onc.	Concrete	f'ci	Specified Compressive Strength	Misc.	Miscellaneous	Sprd.	Spread	Yr.	Year
BW	Concrete Barrier Wall		of Concrete at Time of Initial	MPH	Miles Per Hour	Spec.	Specification		
MU	Concrete Masonry Unit		Prestress			SF	Square Feet		
RM	Concrete Rubble Masonry	FF	Far Face, Front Face	NF	Near Face	SY	Square Yard		
nn.	Connection	Fig.	Figure	N	North	SS	Stainless Steel		
nst.	Construction	Fin. Gr.	Finish Grade	NIC	Not in Contract	Std.	Standard		
						Sta.	Station Station		DEPARTMENT OF TRANSPORTATION
/	Construction Joint	FRP	Fiberglass Reinforced Plastic	No.	Number		Ctiffonor LICENSED		HIGHWAYS DIVISION
ntl. Jt.	Control Joint	FT	Tensile Stresses	NTS	Not to Scale	Stiff.	Stiffener S LICENSED PROFESSIONAL ENGINEER		
LSM	Controlled Low Strength	Ftg.	Footing			Stirr.	STIFFUP (NO. 8133-S)	$^{\prime\prime}$ SY	MBOLS AND ABBREVIATION
	Material	Ft.	Feet, Foot	0/5	Offset	Stl.	Steel Straight	/ 	
ont.	Continuous			oc	On Center	Str.	311 810111	250 511	HALAWA HEIGHTS ROAD
SL	Crosshole Sonic Log	Ga.	Gage, Gauge	Opn'g	Opening		THIS WORK WAS PREPA ME OR UNDER MY SUPE	RVISION.	PEDESTRIAN BRIDGE
<u></u>	- 1918年 - 19						Cah My	7 32 1	<u>Proj. No. 7241A-01-13</u>
F	Cubic Feet	Galv.	Galvanized	0B	Outbound			/	Prol. No. 774 IA-UI- 13

SHEET No. 80.3 OF 3 SHEETS



FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	7241A-01-13	2016	23	36

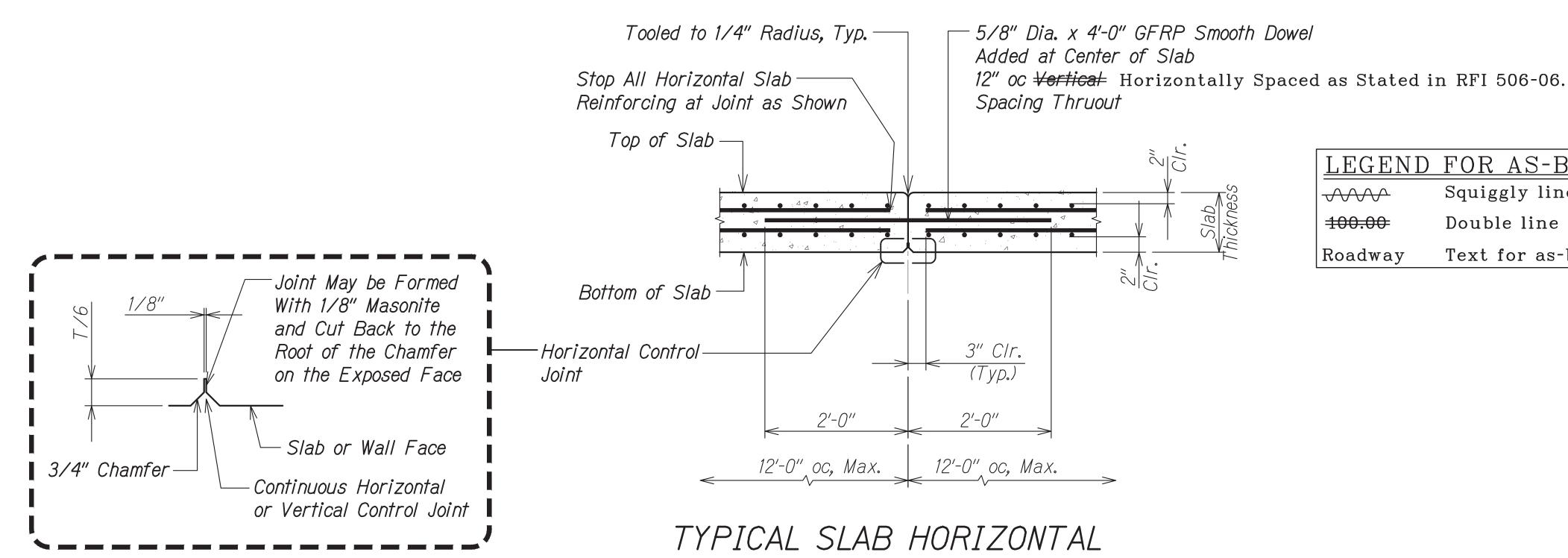


Notes:

- 1. The Longitudinal supports for the 8" concrete slab shall be a maximum of 12'-0" oc.
- 2. Control joints shall be placed at each support.
- 3. If there are any deviations from the plans, the slab shall be redesigned. Calculations and drawings stamped by a Structural Engineer licensed in the State of Hawaii shall be submitted for approval.

S2.1 S2.1

4. Calculations and details shall be submitted for the connection of FRP Railing to bridge. Plans and calculations shall be stamped by a Structural Engineer licensed in the State of Hawaii.



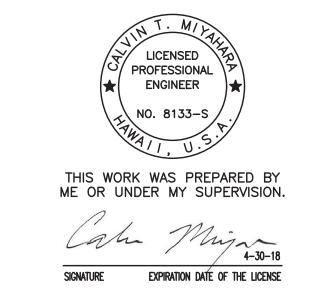
CONTROL JOINT DETAIL

Scale: 1" = 1'-0"

LEGEND FOR AS-BUILT POSTINGS Squiggly line for as-built deletion **₩**

Double line for as-built deletion 100.00

Roadway Text for as-built posting



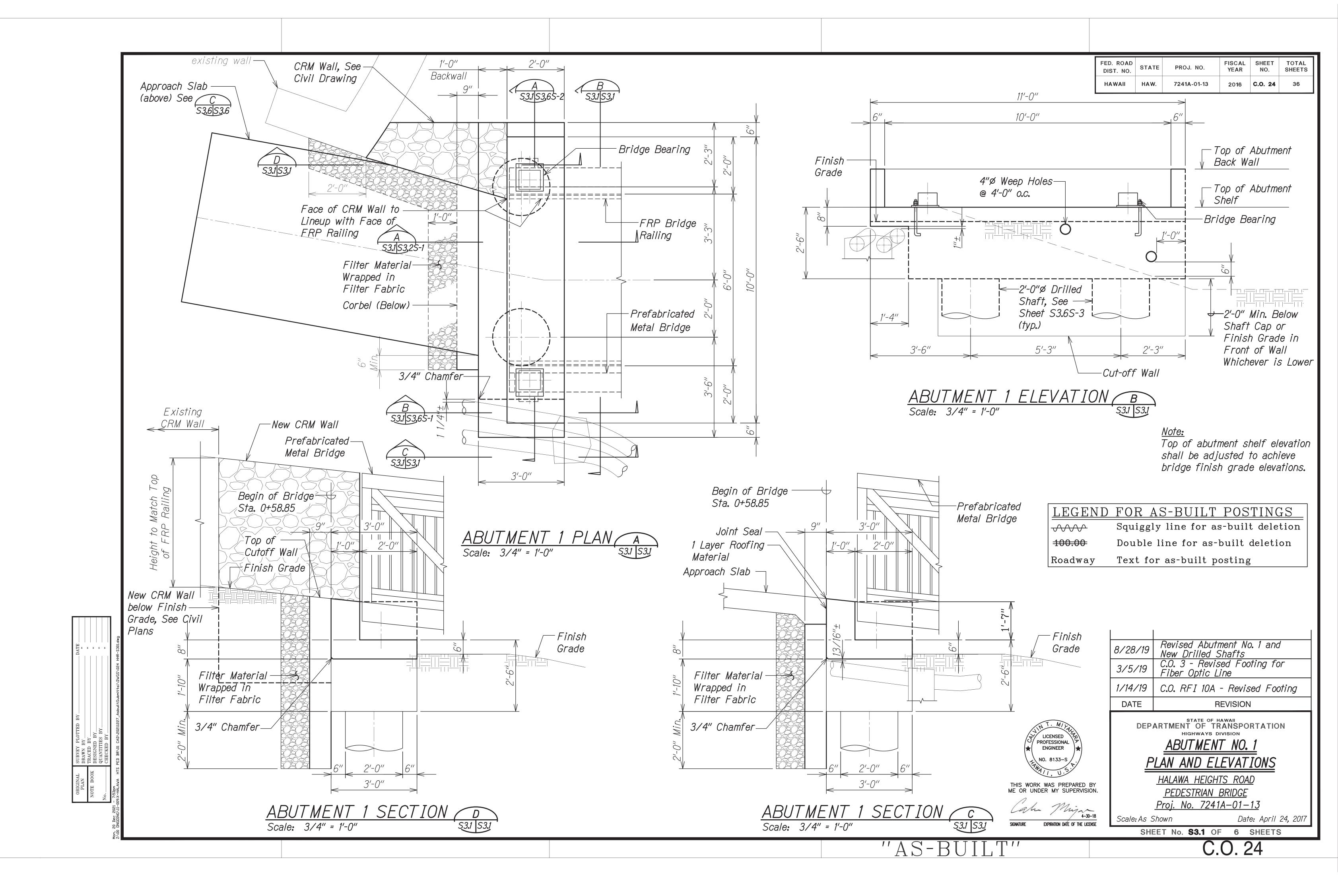
DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION

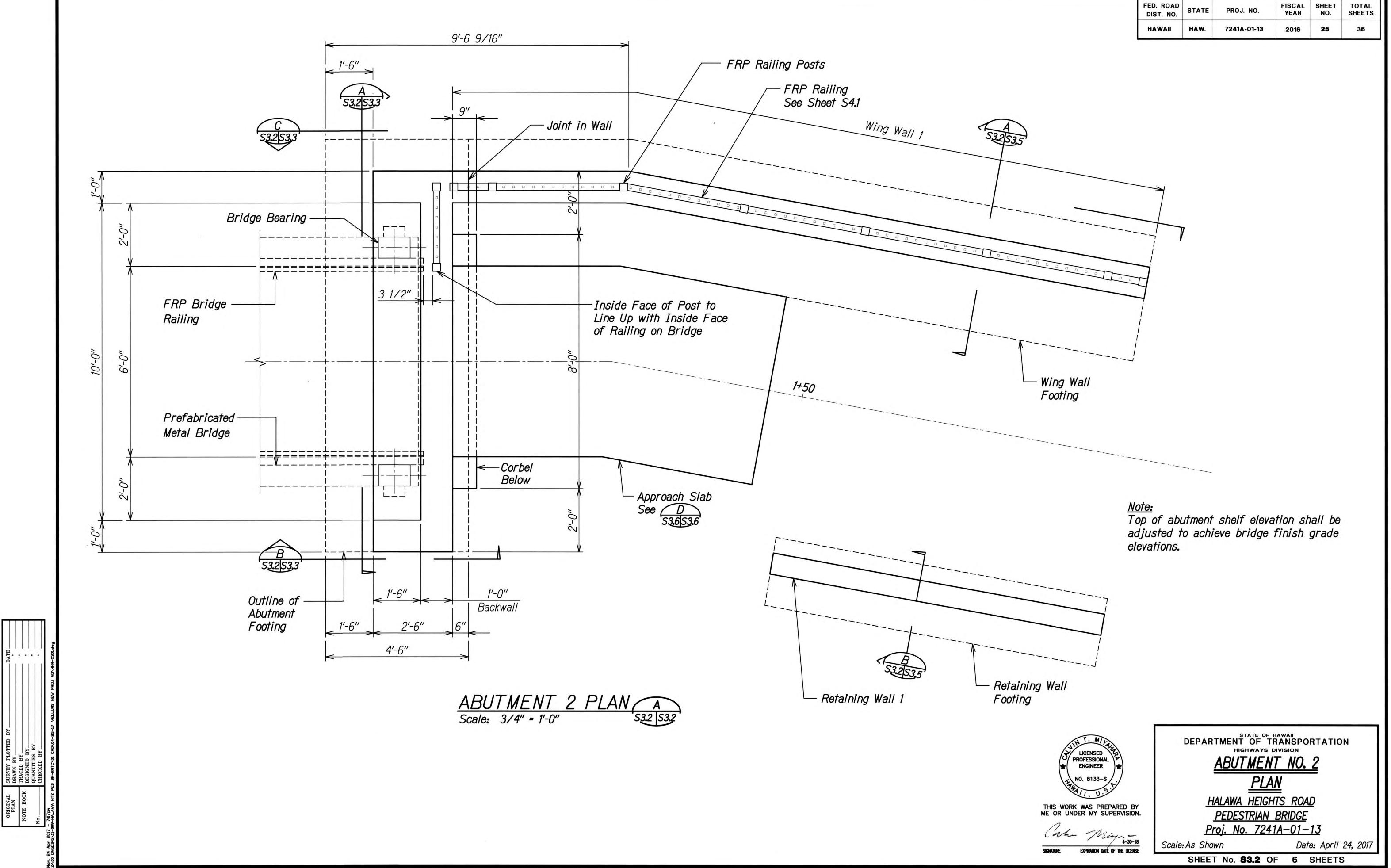
TYPICAL SECTION

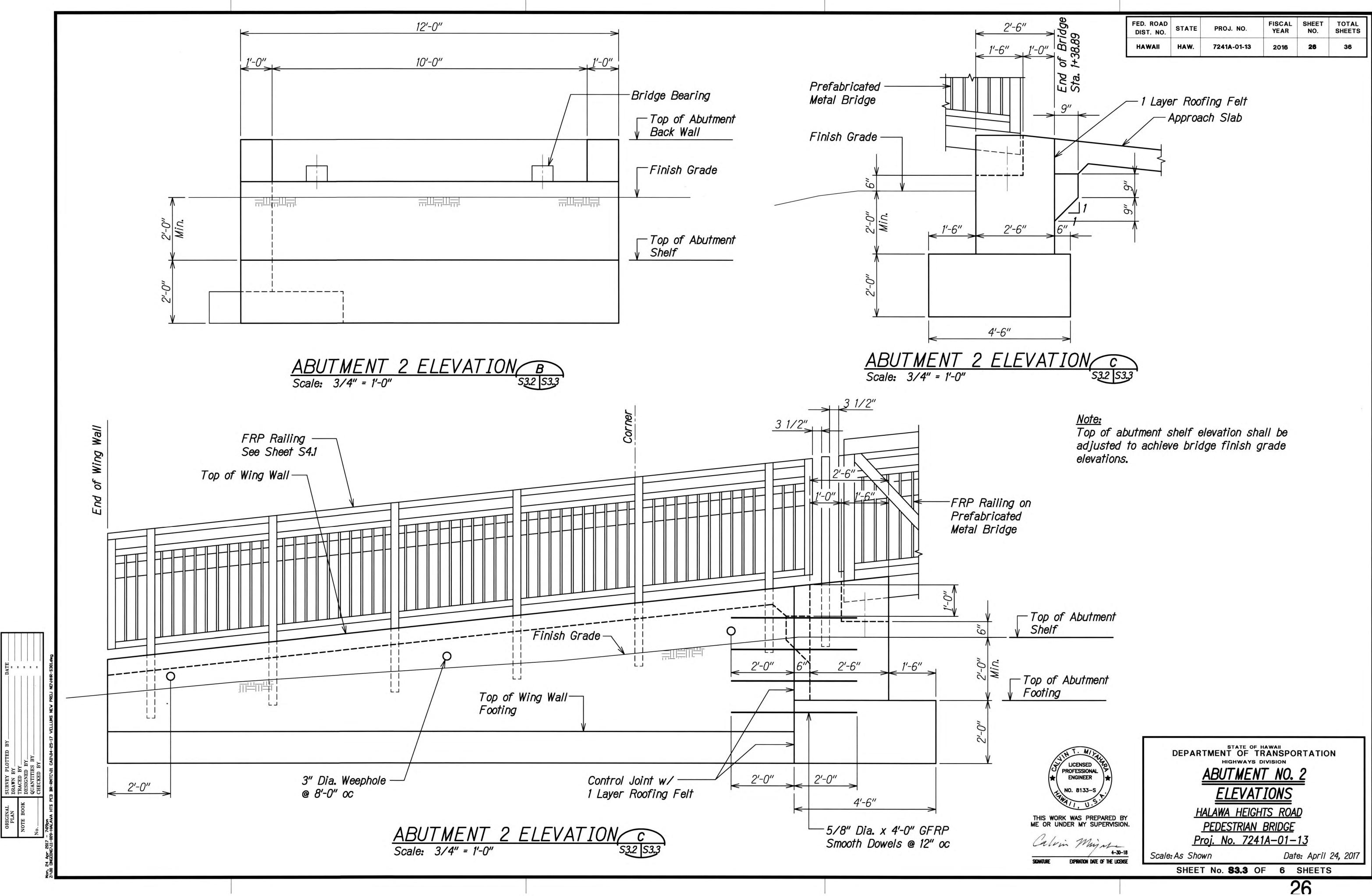
HALAWA HEIGHTS ROAD PEDESTRIAN BRIDGE Proj. No. 7241A-01-13

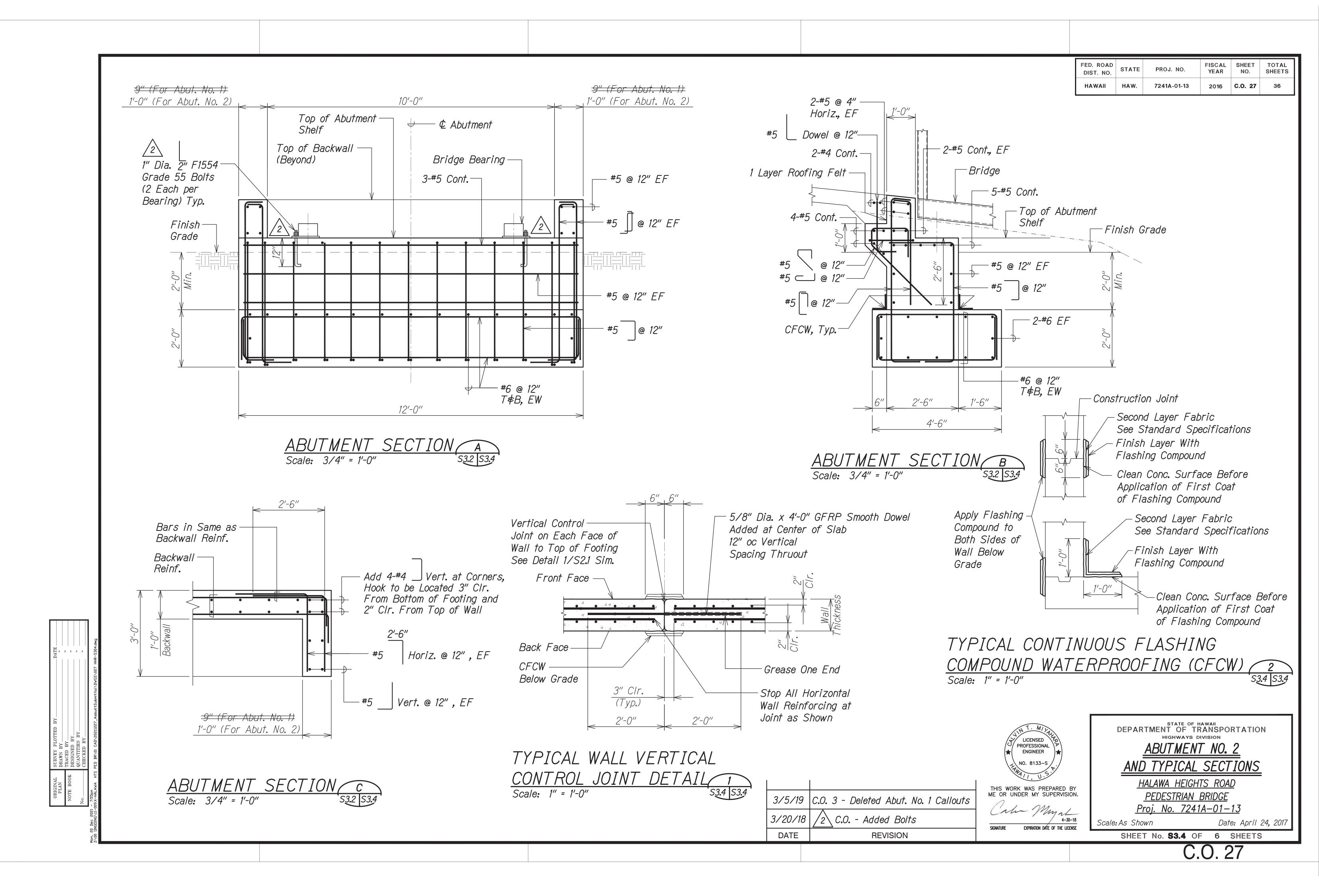
Scale: As Shown Date: April 24, 2017

SHEET No. **\$2.1** OF 1 SHEETS



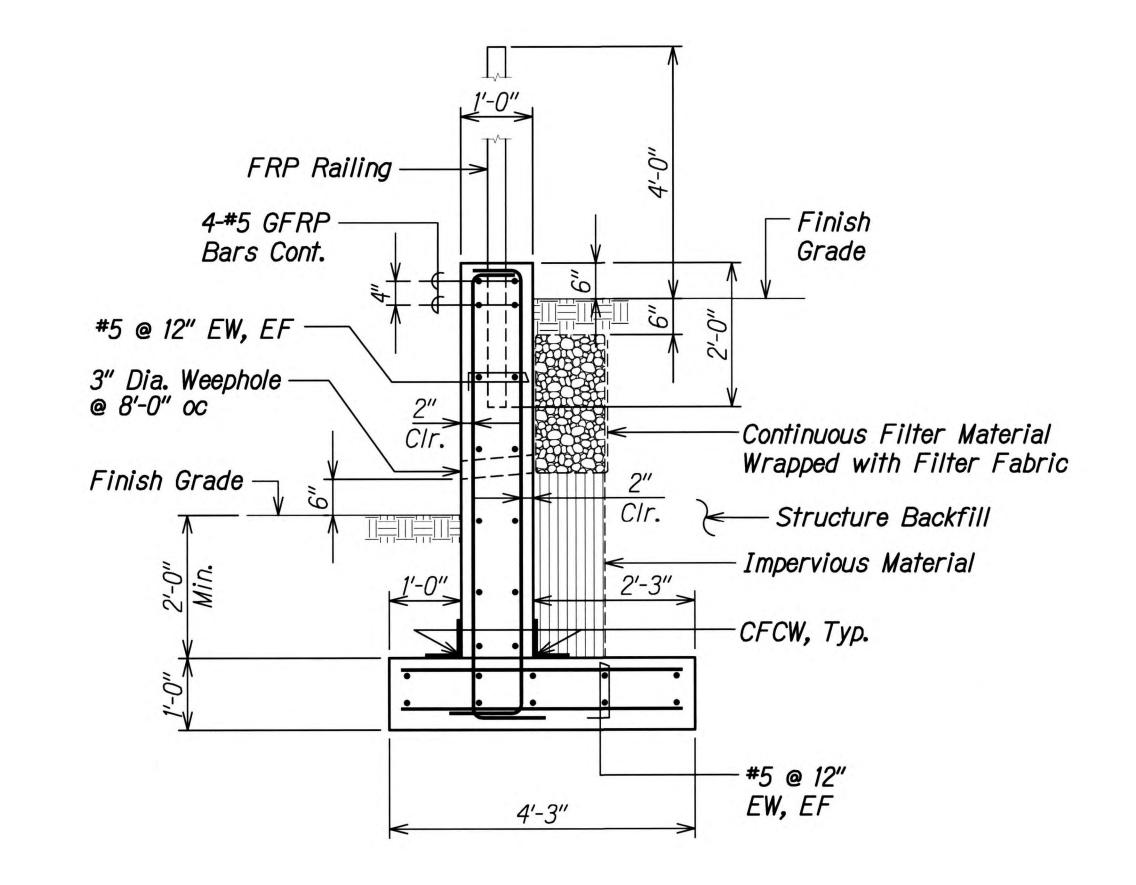






FED. ROAD DIST. NO. STATE PROJ. NO. FISCAL SHEET NO. SHEETS

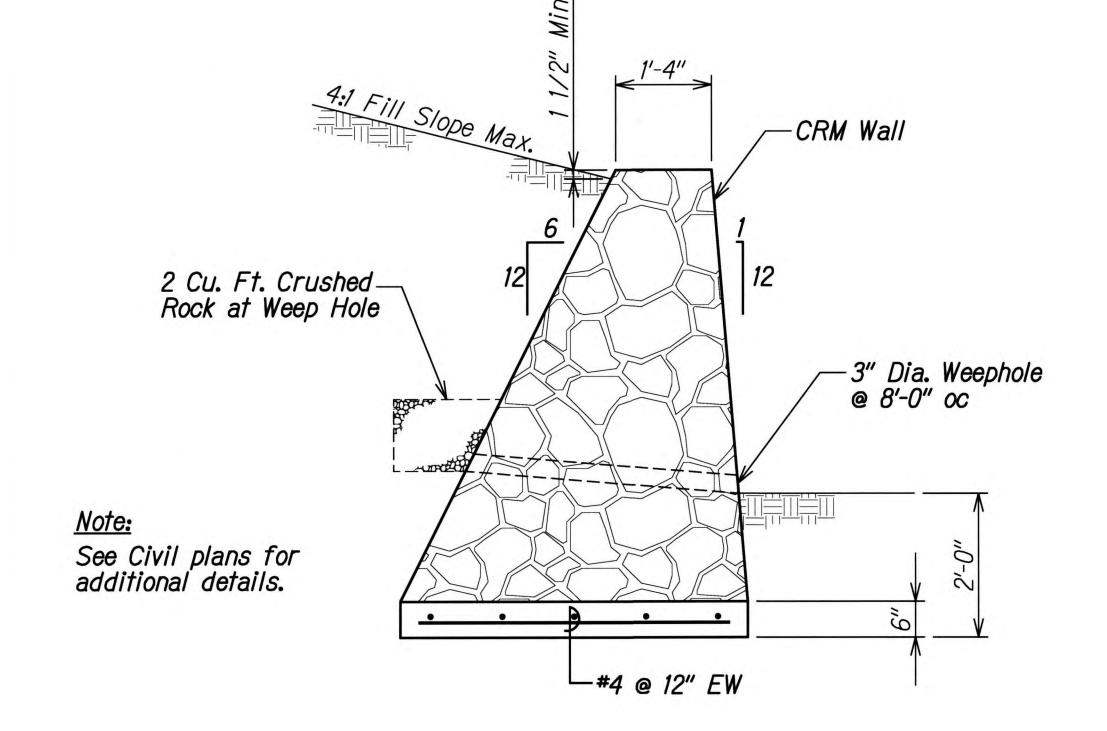
HAWAII HAW. 7241A-01-13 2016 28 36



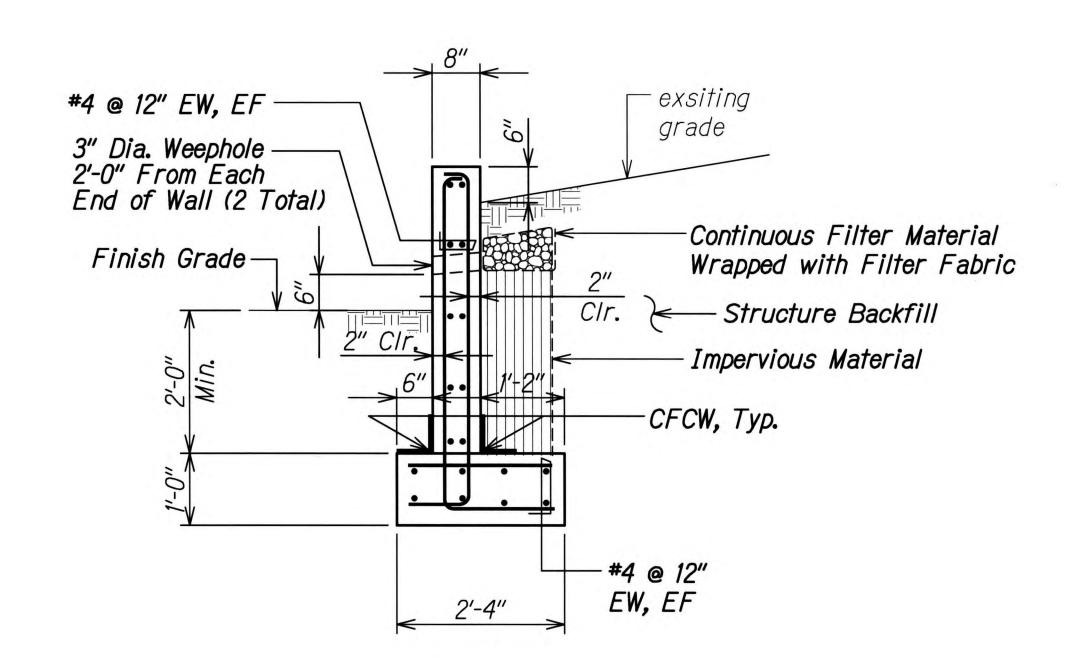
WING WALL 1 SECTION A

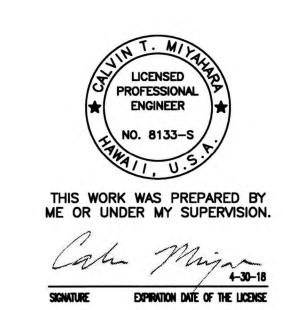
Scale: 3/4" = 1'-0"

S3.2 S3.5



TYPICAL CRM WALL SECTION C Scale: 3/4" = 1'-0" SIJ S3.5





DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

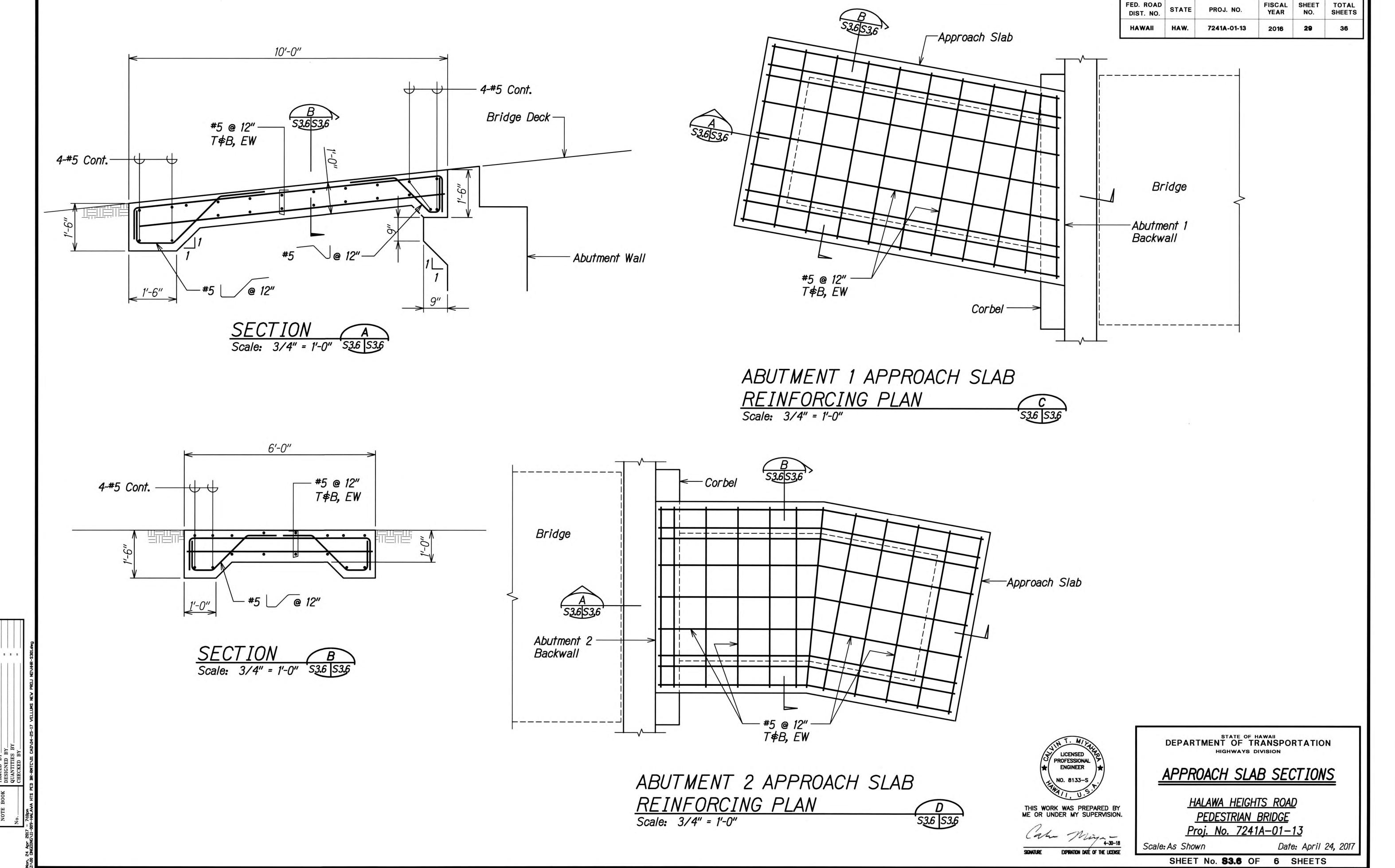
TYPICAL SECTIONS

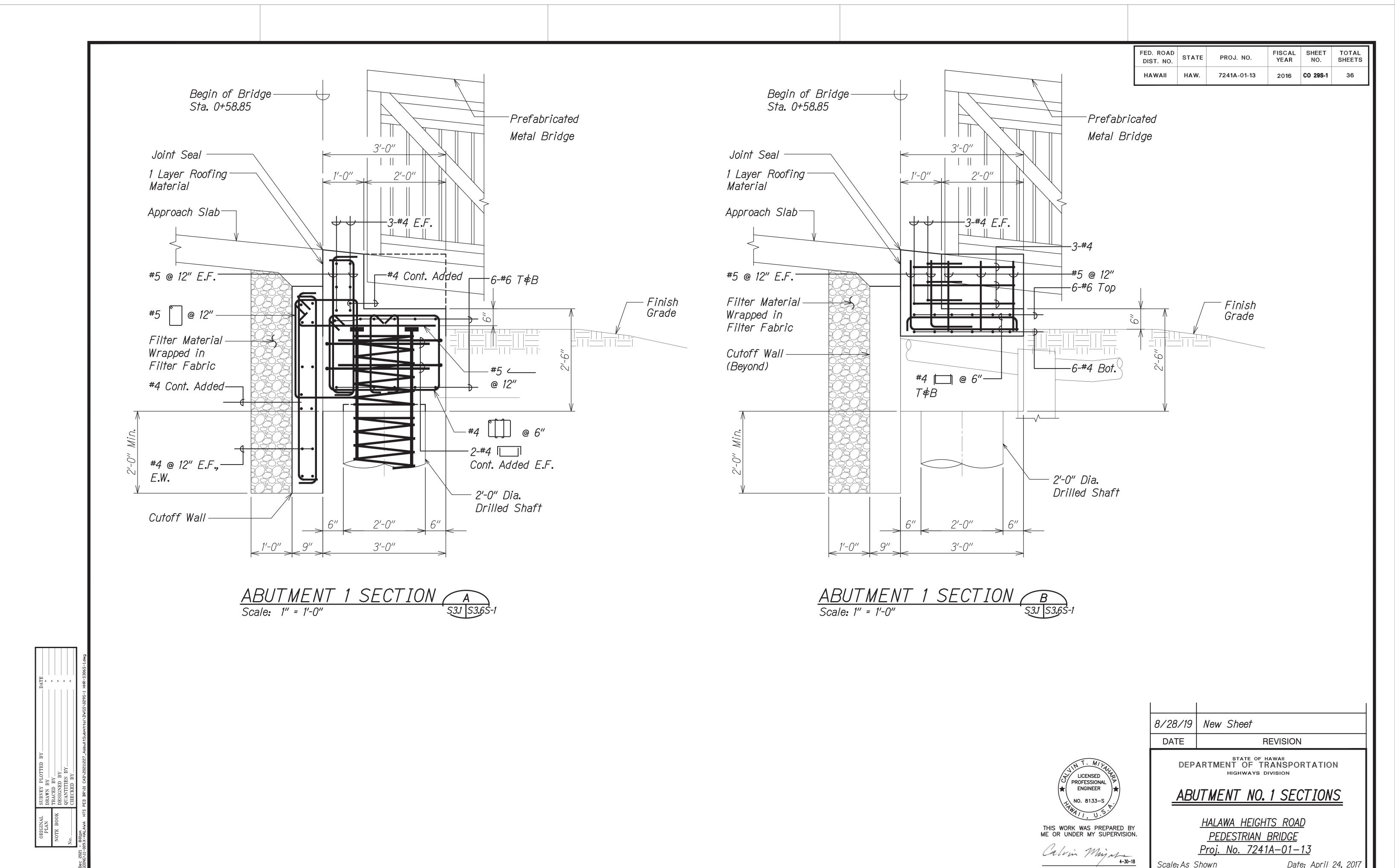
HALAWA HEIGHTS ROAD
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Scale: As Shown

Date: April 24, 2017

SHEET No. S3.5 OF 6 SHEETS





CO 29S-1

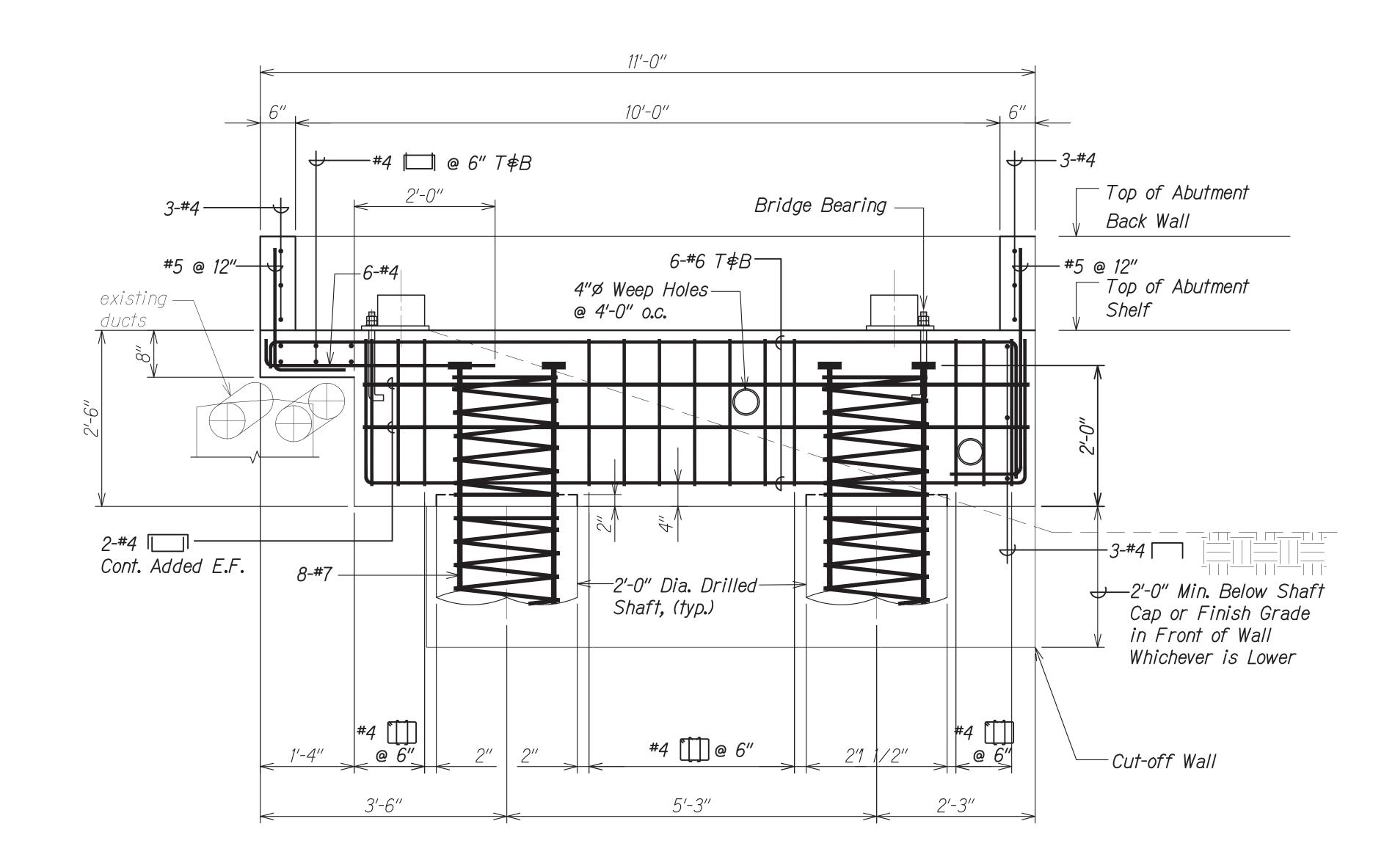
SHEET No. **\$3.6\$-1** OF 6 SHEETS

Date: April 24, 2017

Scale: As Shown

SIGNATURE EXPIRATION DATE OF THE LICENSE

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
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ABUTMENT 1 ELEVATION A

Scale: 1" = 1'-0"

S3.1 S3.6S-2

Note:

Weep holes and reinforcing shall be adjusted to provide 2" clear from weep hole to reinforcing.



		ı
8/00/19	New Sheet	
DATE		REVISION

DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ABUTMENT NO. 1 SECTIONS

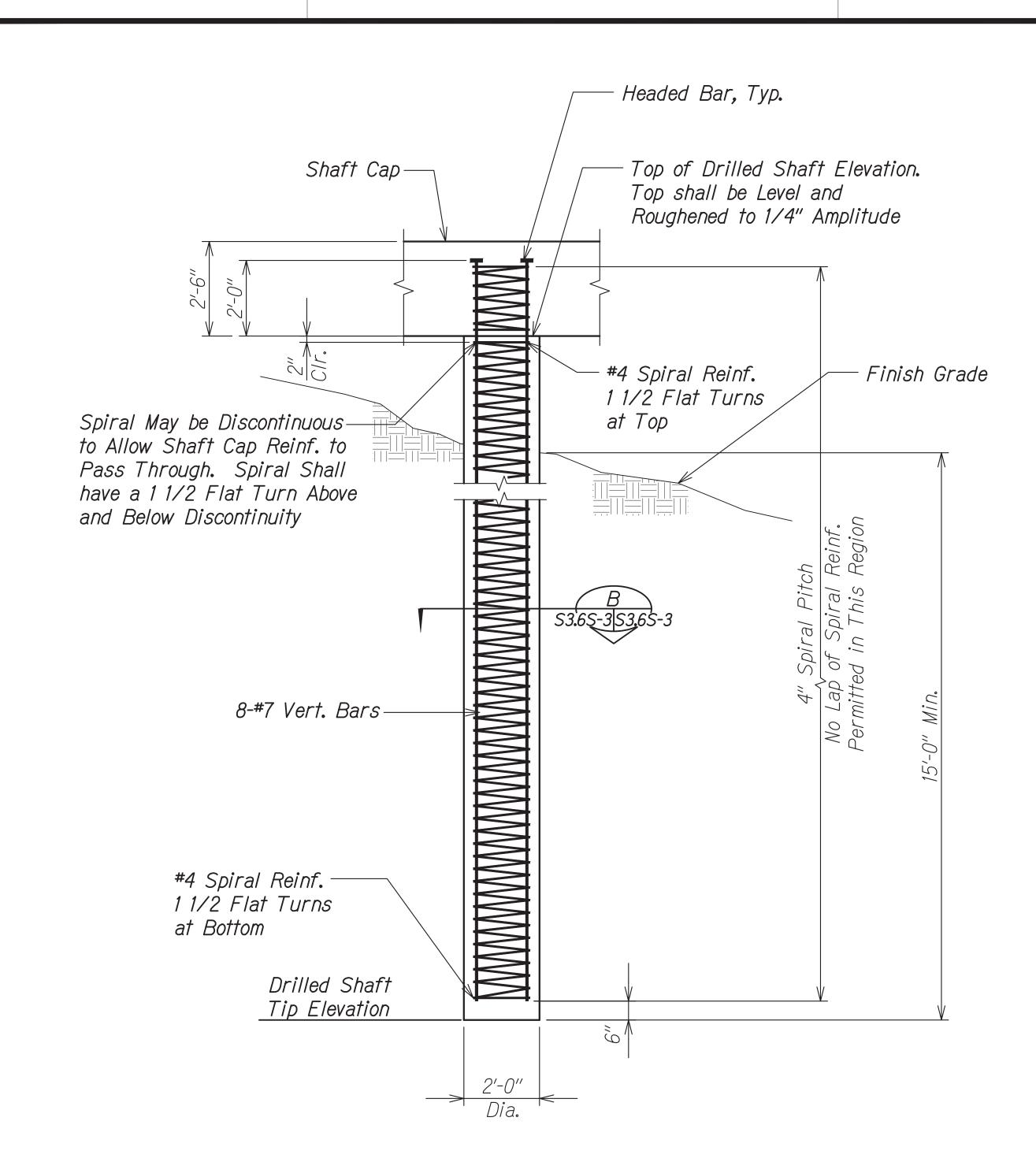
<u>HALAWA HEIGHTS ROAD</u>

<u>PEDESTRIAN BRIDGE</u>

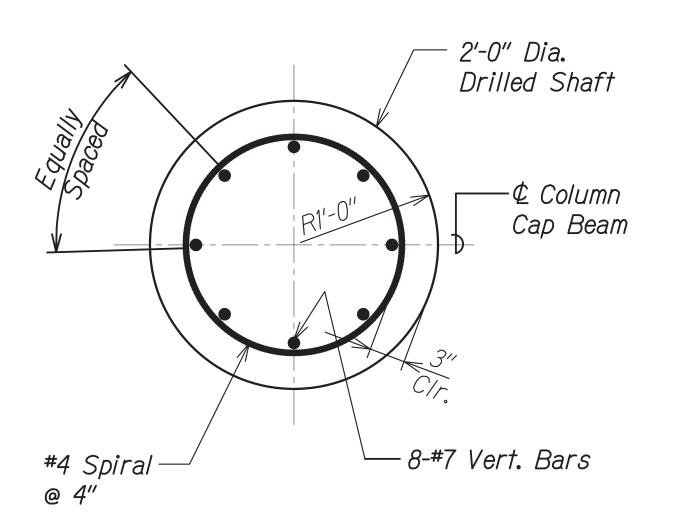
<u>Proj. No. 7241A-01-13</u>

Scale: As Shown Date: April 24, 2017

SHEET No. S3.6S-2 OF 6 SHEETS



DRILLED SHAFT 1 AND 2 ELEVATION A
S3.65-3 S3.65-3

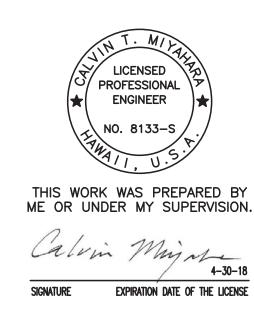


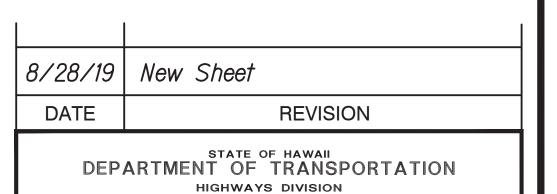
SECTION Scale: 1" = 1'-0" S3.65-3 S3.6S-3

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	7241A-01-13	2016	CO 29S-3	36

NOTES:

- 1. Lap splice length for #6 spirals shall be 3'-6" min. with a 135° hook bend at each end.
- 2. Each end of the spiral shall have 1 1/2 extra turns with a 135° hook around a vertical reinforcing bar.
- 3. Concrete or other non-corrosive spacing devices shall be used to maintain the reinforcement cage in position within the shaft.



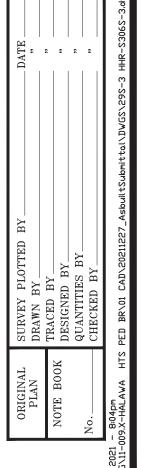


DRILLED SHAFT

HALAWA HEIGHTS ROAD PEDESTRIAN BRIDGE Proj. No. 7241A-01-13

Scale: As Shown Date: April 24, 2017

SHEET No. \$3.6\$-3 OF 6 SHEETS



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

