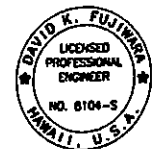


SYMBOLS AND ABBREVIATIONS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-01(42)	2009	2	63

#	And	Det.	Detail	Ht.	Height	Perf.	Perforated	Tan.	Tangent
@	At	Dia.	Diameter	(H)	Hinge	PL	Plate	Temp.	Temporary
Ø	Diameter	Diaph.	Diaphragm	Horiz., H	Horizontal	PCC	Portland Cement Concrete	Thk.	Thick
≥	Greater Than or Equal to	Dim.	Dimension	HDOT	State of Hawaii Department of Transportation	PC	Point of Curvature	T	Top
≤	Less Than or Equal to	Dist.	Distance			PCF	Pounds per Cubic Foot	T+B	Top and Bottom
#	Number	DO	Ditto	HDPE	High Density Polyethylene	PPM	Parts per Million	TCE	Top of Column (and Bent Cap Soffit) Elevation
		Dwls.	Dowels	HS	High strength	PSF	Pounds per Square Foot	TOD	Top of Deck
		Dn.	Down	HECO	Hawaiian Electric Company	PSI	Pounds per Square Inch	TFE	Top of Footing Elevation
Abut.	Abutment	Dbl.	Double			PLF	Pounds per Linear Foot	Tot.	Total
Abbr.	Abbreviation	DI	Drain Inlet, Ductile Iron	IB	Inbound	PI	Point of Intersection of Tangents	Transv.	Transverse
Add.	Additional	Dwg., Dwgs.	Drawing, Drawings	In.	Inch			TS	Structural Tubing
Alt.	Alternate	DS	Drilled Shaft	ID	Inside Diameter	P/VC	Point of Intersection of Vertical Curve	Typ.	Typical
AB	Anchor Bolt			IF	Inside Face				
AC	Asphaltic Concrete	E	East	Int.	Interior	PT	Point of Tangency	Undergrd.	Underground
Approx.	Approximate	EA, Ea, ea.	Each	Inv.	Invert	Pt., Pts.	Point, Points		
Az.	Azimuth	EF	Each Face			PRC	Point of Reverse Curvature		
		EFH	Each Face Horizontal	Jt.	Joint	PVC	Polyvinyl Chloride	Var.	Varies
		EFV	Each Face Vertical			Prestr.	Prestressed	Vert., V	Vertical
		EW	Each Way			P/S	Prestressed Strands	VC	Vertical Curve
Bk.	Back	EPE	Existing Edge of Pavement	K	Kips	PB	Pull Box		
Bal.	Balance	EPS	Expanded Polystyrene	KF	Kip Foot				
B.	Baseline	ES	Edge of Shoulder	KSF	Kips Per Square Foot	Rad., R	Radius	W/C	Water/Cement
Bm.	Beam	Elec.	Electrical	KSI	Kips Per Square Inch	RF	Rear Face	w/	With
Brg., Brgs.	Bearing, Bearings	EMH	Electrical Manhole	KLF	Kips Per Linear Foot	Rebar	Reinforcing Bar	W	West
BVC	Beginning of Vertical Curve	El., Elev.	Elevation			Ref.	Reference	WWF	Welded Wire Fabric
Bet.	Between	Emb.	Embankment	L	Length	Reinf.	Reinforced, Reinforcing, Reinforcement	WW	Wingwall
BF	Both Faces	EVC	End of Vertical Curve	lb., lbs., LBS.	Pound, Pounds			WP	Work Point, Working Point
BW	Both Ways	Eq.	Equal	Ltg. Std.	Lighting Standard	Req'd.	Required	WS	Water Surface
BFE	Bottom of Footing Elevation	Est.	Estimated	LF, Lin. Ft.	Linear Feet/Foot	Ret.	Retaining		
Bot., Bott., B	Bottom	Exc.	Excavation	LS	Lump Sum	ROW	Right of Way		
Br.	Bridge	Excl.	Excluding	Longit.	Longitudinal	Rdwy.	Roadway	Yr.	Year
Bit.	Bolt	Exist., Ex.	Existing						
		Exp., (E)	Expansion			Sect.	Section		
Cant.	Cantilever	EJ	Expansion Joint	M	Modified	SRW	Segmental Retaining Wall		
CIP	Cast Iron Pipe	Ext.	Exterior	MH	Manhole	Sht.	Sheet		
CL	Center line	FF	Far Face, Front Face	Max.	Maximum	Sim.	Similar		
CG	Center of Gravity	f'c	Specified Compressive Strength of Concrete at 28 days	Mech.	Mechanical	Sl.	Slope		
cc	Center to Center	f'ci	Specified Compressive Strength of Concrete at Time of Initial Prestress	Min.	Minimum	S	South		
Cl.	Class			Misc.	Miscellaneous	Spc., Spg.	Spaces, Spacing		
Clr.	Clearance			MPH	Miles Per Hour	SBD	Special Bridge Deck Concrete		
CO	Clean Out	Ft.	Feet, Foot			Sprd.	Spread		
Col.	Column	Fig.	Figure	NF	Near Face	Spec.	Specification		
Conc.	Concrete	Fin. Gr.	Finish Grade	N	North	SF	Square Feet		
CBW	Concrete Barrier Wall	(F)	Fixed	NIC	Not in Contract	SY	Square Yard		
Conn.	Connection	FB	Flat Bar	No.	Number	SS	Stainless Steel		
Const.	Construction	Ftg.	Footing	NTS	Not to Scale	Std.	Standard		
CJ	Construction Joint	FA	Force account			Sta.	Station		
Cntl. Jt.	Control Joint	Ga.	Gage, Gauge			Stiff.	Stiffener		
CLSM	Controlled Low Strength Material	Galv.	Galvanized	O/S	Offset	Stirr.	Stirrup		
		G, Gir.	Girder	oc	On Center	Stl.	Steel		
Cont.	Continuous	GDI	Grated Drain Inlet	Opn'g	Opening	Str.	Straight		
CSL	Cross Hole Sonic Loggin	GFRP	Glass Fiber Reinforced Polymer	OB	Outbound	Struct.	Structure		
CF	Cubic Feet	Gr.	Grade	OD	Outside Diameter	SE	Super Elevation		
CY, Cu. Yd.	Cubic Yard	Grd.	Ground	OG	Outside Girder, Outbound Girder	Symm.	Symmetrical		
		GRP	Grouted Rubble Pavement						



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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

SYMBOLS AND ABBREVIATIONS

**KAMEHAMEHA HIGHWAY - REPLACEMENT
OF SOUTH PUNALUU STREAM BRIDGE**
Federal Aid Project No. BR-083-01(42)

Scale: None Date: March, 2010

SHEET No. 512 OF 63 SHEETS

STRUCTURAL GENERAL NOTES

1. GENERAL SPECIFICATIONS:

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

2. DESIGN SPECIFICATIONS:

(A) AASHTO LRFD Bridge Design Specifications, 3rd Edition 2004.

(B) AASHTO Manual for Condition Evaluation and Load and Resistance Factor Rating (LRFR) of Highway Bridges, October 2003 (LRFR and Load Factor Methods), including subsequent interim revisions.

(C) AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 4th Edition 2001, including all subsequent interim revisions.

(D) HDOT Memorandum HWY-DB 2.6843 dated February 14 2005 with subject title "Design Criteria for Bridges and Structures".

3. DESIGN LOADS:

(A) Dead Load:

A 25 psf allowance for future wearing surface of asphalt concrete has been included in Dead Load calculations. Concrete units 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 in addition to precast tub for W12.

(B) Live Load:

AASHTO HL-93 Truck Loading

(C) Seismic:

Seismic Performance Zone: 2
Importance Category: Critical
Acceleration Coefficient: 0.17
Site Coefficient: Soil Profile Type IV

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

Zone: AE
Base Flood Elevation: 10.0
Non-Bore Tsunami Run up: 10.0

(E) Combined Scour Elevations: WEST Consultants, Inc. September 2004

Abutment No. 1: 100-year Scour El. = (-) 12.03
500-year Scour El. = (-) 17.00
Piers A and B: 100-year Scour El. = (-) 20.00
500-year Scour El. = (-) 22.60
Abutment No. 2: 100-year Scour El. = (-) 12.03
500-year Scour El. = (-) 15.95

(F) Railing Test Level TL-2

4. MATERIALS:

(A) Structural Concrete shall be as noted below:

Item No.	Structural Parts	Maximum W/C Ratio or Class of Concrete	Specified Compressive Strength, f'c (28 Days)
(1)	Abutment Caps, Pier Caps (See Items 4(B) and 4(C))	.4	7000 psi
(2)	Deck Topping, Approach Slabs, and Beams above Abutment Caps and Pier Caps (See Items 4(B) and 4(C))	.4	Type SBD (See Spec Sec 601)
(3)	Prestressed Tridecks (See Items 4(B), 4(C), and 4(D)) (Refer to Sheet S6.2)	.4	9000 psi
(4)	Drilled Shafts (See Item 4(C))	.4	4500 psi
(5)	Railing (See Item 4(B) and 4(C))	.4	5000 psi
(6)	Diaphragms (See Items 4(B) and 4(C))	.4	7000 psi
(7)	Wingwalls and Retaining Walls (See Items 4(B) and 4(C))	.4	5000psi
(8)	Precast Tub for W12	.4	6000psi
(9)	Precast Tub Cover for W12	.4	See Note 4.(R)
(10)	All Others	Class D	-

(B) A Shrinkage Reducing Admixture (SRA), Tetraguard AS20 by Master Builders or Eclipse by W.R. Grace & Co., or approved equal, shall be added to the concrete mix for Items (1), (2), (3), (5), (6) and (7). The minimum dosage requirement included shall be 128 ounces per cubic yard of concrete.

(C) A migrating corrosion inhibitor amine carboxylate water-based admixture shall be added to the concrete mix for Items (1), (2), (3), (4), (5), (6), and (7). The minimum dosage shall be 1.5 pints per cubic yard of concrete. The admixture shall not affect the set time of the concrete.

(D) The concrete for the Prestressed Tridecks shall pass a total charge not exceeding 1000 Coulombs at 90-days from casting as determined by AASHTO T277. Concrete test specimens shall be cured under the same conditions as the Prestressed Tridecks. Submit test results for Engineer's review and approval.

(E) A migrating corrosion inhibitor amine carboxylate water-based admixture shall be added to the dry pack mortar, grout, slush grout, and non-shrink grout. The minimum dosage shall be 10 grams per 0.4 to 0.5 cubic feet of dry pack mortar, grout, slush grout and non-shrink grout.

(F) All Reinforcing Steel shall be ASTM A615 deformed Grade 60 unless otherwise noted.

4. MATERIALS (Cont.):

(G) Epoxy Coated Reinforcing Steel shall comply with ASTM A775.

(H) Reinforcing Steel shall be ASTM A706 where welded connections are required.

(J) All Structural Steel shall be ASTM A36 hot dip galvanized after fabrication, unless otherwise noted.

(K) All Anchor Bolts, Washers and Nuts shall be ASTM A325 hot dip galvanized after fabrication, unless otherwise specified.

(L) Prestressing Steel shall be ASTM A416 0.5" diameter or 0.6" diameter Grade 270 low-relaxation strands.

(M) Stainless Steel reinforcing shall be provided at the Aesthetic Bridge Railings. Stainless Steel reinforcing shall be AISI316L deformed reinforcement conforming to ASTM A955/A955M-Q3b with a minimum yield 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 Type 316 Stainless Steel.

(N) Separate dissimilar metals e.g., Stainless Steel and Non-Stainless Steel rebar, with teflon tape at contact area only.

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

(Q) Glass Fiber Reinforced Polymer Bar:

(1) Glass Fiber Reinforced Polymer (GFRP) rebar shall have a minimum tensile strength of 110 ksi for #4 bar and smaller. All others shall have a minimum tensile strength of 95 ksi. The allowable stress is equal to 1/4 of the tensile strength.

(2) The modulus of elasticity of the GFRP bar shall be a minimum of 5,900,000 psi.

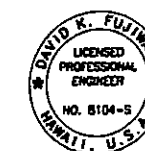
(3) Minimum concrete cover for the GFRP bars shall be 3/4" unless otherwise noted.

(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.

(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.



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KSF, INC. APRIL 30, 2010 UIC EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STRUCTURAL GENERAL NOTES

KAMEHAMEHA HIGHWAY - REPLACEMENT
OF SOUTH PUNALUU STREAM BRIDGE
Federal Aid Project No. BR-083-01(42)

Scale: None Date: March, 2010

SHEET No. 521 OF 63 SHEETS

03/2010	Revised Note
DATE	REVISION

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-01(42)	2009	4	63

STRUCTURAL GENERAL NOTES

4. MATERIALS (Cont.):

(R) Lightweight concrete shall have a minimum unit weight of 115 pcf and a 56-day compressive strength of 4,500 psi.

2

5. NOT USED

6. REINFORCEMENT NOTES:

(A) The minimum covering measured from the surface of the concrete to the face of any Reinforcing Bars shall be as follows, except as otherwise shown:

(1) For Prestressed Concrete Tridecks see details on sheets S6J through S6.7.

(2) All others unless otherwise noted = 3".

(B) Reinforcing Bars shall be detailed in accordance with the latest edition of the Design Specification in Note 2 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.

7. FOUNDATION NOTES:

(A) The foundation design is based upon recommendations contained in the Geotechnical Engineering Exploration report entitled "Geotechnical Engineering Exploration, Kamehameha Highway Replacement of South Punaluu Bridge, Project No. BR-083-1(42), Punaluu, Oahu, Hawaii, W.O. 4876-00 (B) dated February 23, 2009. The report shall be considered as a part of the construction 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.

(B) Design Soil Parameters

(1) Shallow Retaining Wall Foundations

(a) Bearing Pressure:

Extreme Event Limit State = 9 ksf
Strength Limit State = 4 ksf
Service Limit State = 3 ksf

(b) Coefficient of Sliding Friction:

Extreme Event Limit State = 0.35
Strength Limit State = 0.28

7. FOUNDATION NOTES (Cont.):

(c) Passive Pressure Resistance:

Extreme Event Limit State = 300 pcf
Strength Limit State = 150 pcf

(2) Static Lateral Earth Pressures at Abutments and Wing Walls:

(a) Active Condition, level backfill = 40 psf

(b) At-Rest Condition, level backfill = 60 psf

(3) Dynamic (Seismic) Lateral Earth Pressure at Abutments and Wing Walls:

(a) Active Condition, level backfill = 7H psf (rectangular distribution)

(b) At-Rest Condition, level backfill = 12H psf (rectangular distribution)

8. CONSTRUCTION REQUIREMENTS:

(A) Exact location of bars shall be arranged so that no interference will occur between vertical reinforcement and foundation or pier 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.

(I) The Contractor shall refer to the Geotechnical Engineering Exploration Report referenced at "FOUNDATION NOTES" for recommendations.

8. CONSTRUCTION REQUIREMENTS (Cont.):

(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 Engineers 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 geotechnical and structural engineers.

(H) Blasting is prohibited for demolition or any other work on this project.

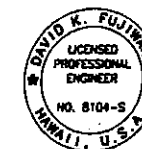
(J) Contractor's Temporary Shoring and Falsework design and construction shall comply with the Specifications, Special Provision 503.03 (B), AASHTO Guide Design Specifications for Bridge Temporary Works (latest edition) and AASHTO Construction Handbook for Bridge Temporary Works (latest edition). The most stringent requirements shall govern.

(K) Construction Joints may be relocated or additional ones added subject to the approval of the Engineer.

(L) In general, top of Concrete Deck Topping shall be constructed to follow the roadway vertical and horizontal curves and superelevations.

(M) Prestressed Trideck Shelf elevations shall be verified by the Contractor. Shelf elevations shall take into consideration the Concrete Topping thickness, Prestressed Trideck thickness, roadway slope, and the calculated, or if available, the actual camber of the Prestressed Trideck.

(N) During the pour of the Deck, the concrete portion of the Deck within 1/4 of the span length on each side of all Piers shall remain plastic until the Deck pour is completed in the spans on each side of the Pier.



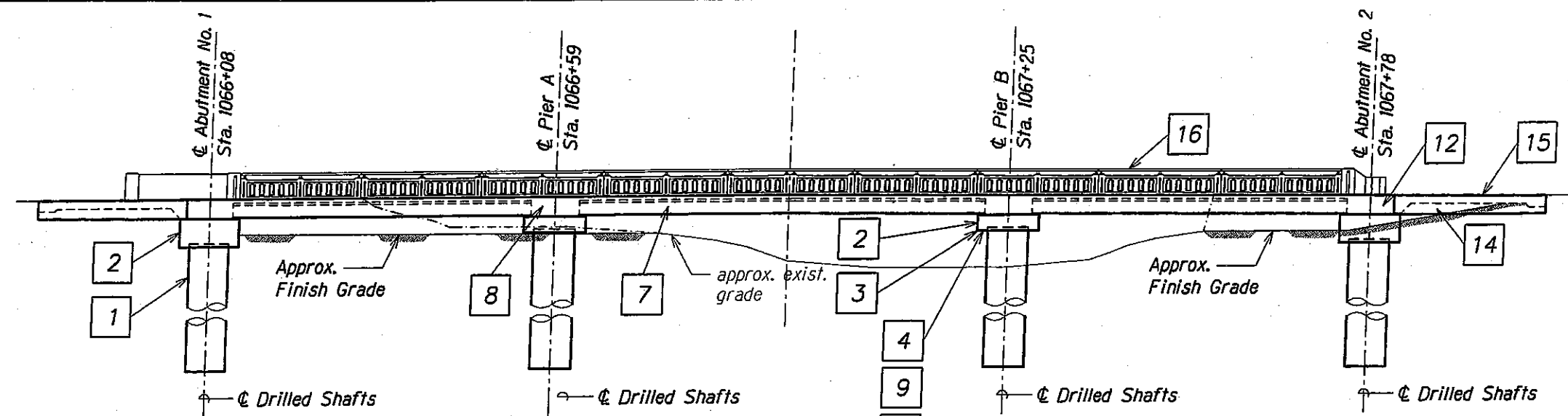
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UC EXP. DATE

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
STRUCTURAL GENERAL NOTES	
KAMEHAMEHA HIGHWAY - REPLACEMENT OF SOUTH PUNALUU STREAM BRIDGE Federal Aid Project No. BR-083-01(42)	
Scale: None	Date: March, 2010
SHEET No. 522 OF 63 SHEETS	

07/30/10	2 Revised Note
DATE	REVISION

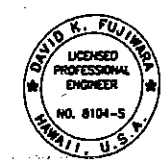
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-01(42)	2009	5	63



BRIDGE ELEVATION
Scale: 1" = 10'-0"

CONSTRUCTION SEQUENCE

STAGE	ACTION
<i>Note:</i> Stage 5 may be done concurrently with Stages 1, 2, 3, and 4.	
1	Construct Drilled Shafts.
2	Cast Cap Beams at least 7 days after the final Drilled Shaft concrete pour in Stage 1 or until the concrete in Stage 1 has attained a Compressive Strength of 4000 psi, whichever is later.
3	Post-tension lower tendons in Pier Cap Beams after concrete in Stage 2 has attained 5000 psi or aged for 7 days, whichever is later.
4	Apply corrosion inhibiting powder in lower Post-Tensioned Ducts then grout lower Post-Tensioned Ducts in Pier Caps.
5	Cast Tridecks.
6	Construct entire Wingwall. After Wingwall concrete has aged 7 days and reached 4000 psi, backfill behind Abutment to top of Abutment Cap with Class D concrete.
7	Erect Tridecks after grout in Stage 4 has aged for 72 hours and has attained a Compressive Strength of 5000 psi. Install Precast Tridecks starting at downstream end of Cap towards upstream. In addition, concrete in Tridecks shall be
7	aged for at least 28 days and shall have attained a Compressive Strength of at least 9000 psi and the Class D concrete in Stage 6 shall have aged 4 days and attained 1000 psi Compressive Strength.
8	Pour Cast-in-Place Deck topping and beams above Pier Caps. Begin downstream and proceed upstream. Refer to Note 8(N) on Sheet S2.2. (Note beam above abutment cap to be poured in Stage 8).
9	Post-tension upper tendons in Pier Cap Beams after concrete in Stage 8 has attained 6000 psi and has aged for 14 days.
10	Apply corrosion inhibiting powder in upper Post-tensioned Ducts, then grout upper Post-tensioned Ducts in Pier Caps.
11	Pour Closure Pour for Pier Cap Beams after grout in Stage 10 has aged for 72 hours and attained a Compressive Strength of 5000 psi.
12	Pour End Beams above Abutment Caps at least 28 days after post-tensioning in Stage 9.
13	Erect Precast Beam Tub for W12 after last concrete poured in Stage 11 Cap Beams and Stage 12 End Beams have attained 6000 psi and have aged for 14 days.
14	Pour remainder of Class D concrete backfill behind abutment. Backfill only after Class D concrete has attained 1000 psi and after 4 days.
<i>Note:</i> Stages 15 and 16 may be done concurrently.	
15	Construct Approach Slab.
16	Construct Railing and End Post.
17	Erect Light Poles.
18	Bridge may be opened for traffic after the concrete in the Approach Slab and Railing (including End Post) have attained a Compressive Strength of 4000 psi and 5000 psi respectively and at least 7 days after newest pour.



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HIGHWAYS DIVISION

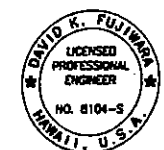
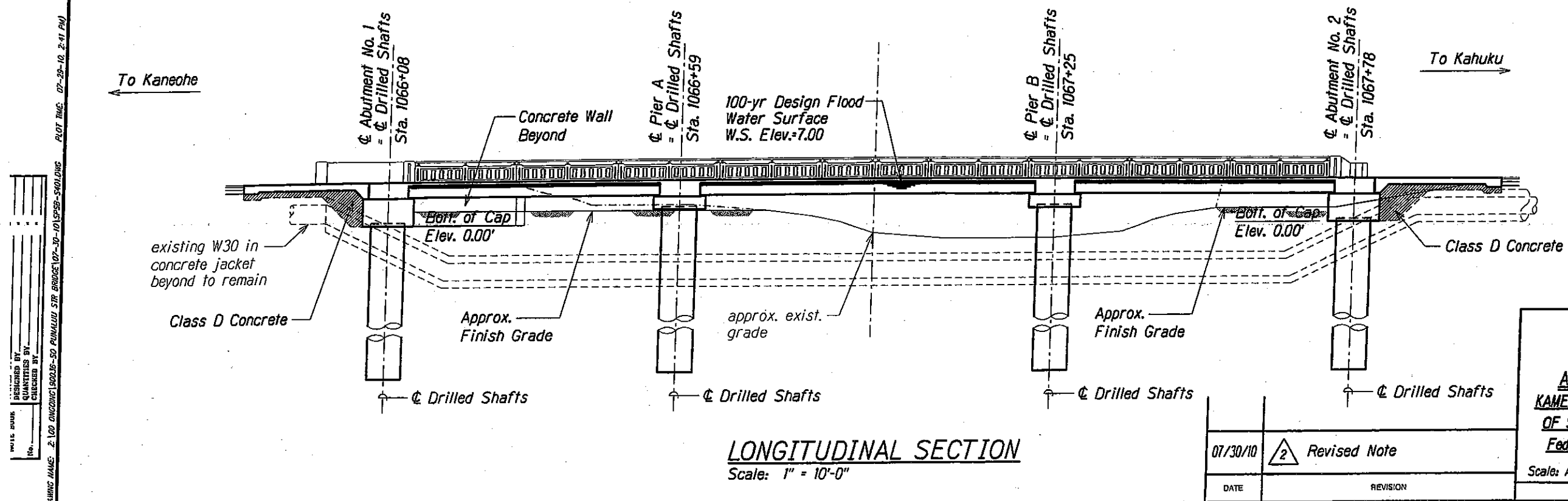
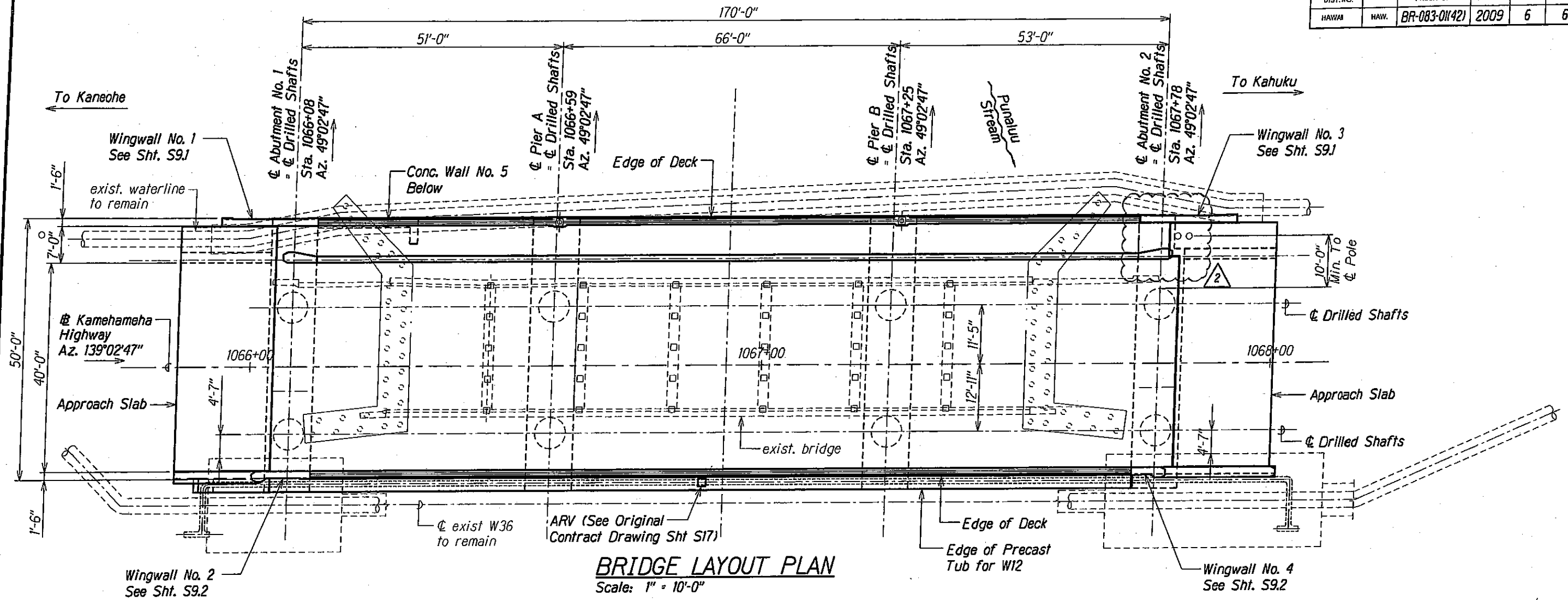
CONSTRUCTION SEQUENCE
KAMEHAMEHA HIGHWAY - REPLACEMENT
OF SOUTH PUNALUU STREAM BRIDGE
Federal Aid Project No. BR-083-01(42)

Scale: As Shown
Date: March, 2010

SHEET No. 53 OF 63 SHEETS

DRAWING NAME: 2-100 ONZONGA 10035-50 PUNALUU STR BRIDGE (07-10-10) SP5B-SOL/DWG
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 CHECKED BY: [blank]
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FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-01(42)	2009	6	63



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APR 30 2010
KSF, INC. U.C. EXP. DATE

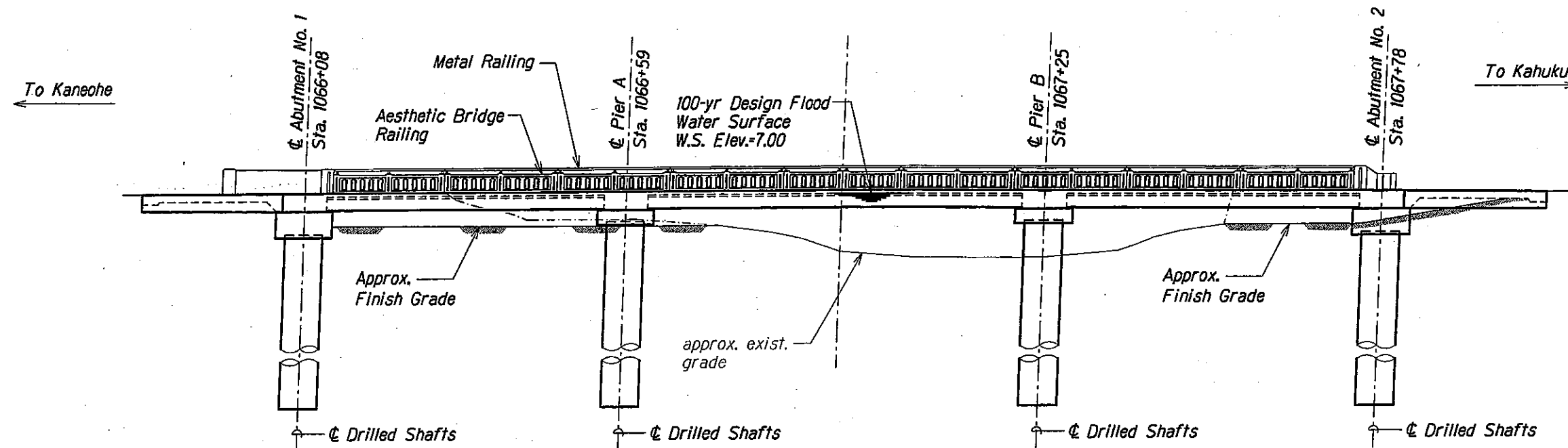
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
**BRIDGE LAYOUT PLAN
AND LONGITUDINAL SECTION**
KAMEHAMEHA HIGHWAY - REPLACEMENT
OF SOUTH PUNALUU STREAM BRIDGE
Federal Aid Project No. BR-083-01(42)
Scale: As Shown Date: March, 2010
SHEET No. 54J OF 63 SHEETS

DATE	REVISION
07/30/10	2 Revised Note

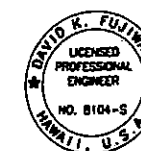
DESIGNED BY
QUANTITIES BY
CHECKED BY

DRAWING NAME: 2.100 (ORIGINAL) 80025-50 PUNALUU STR BRIDGE 107-10-101 SP59-SHOLDING
PLOT TIME: 07-28-10 2:41 PM

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-01(42)	2009	7	63



BRIDGE ELEVATION
Scale: 1" = 10'-0"



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KSF, INC. APRIL 30, 2010
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

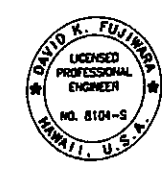
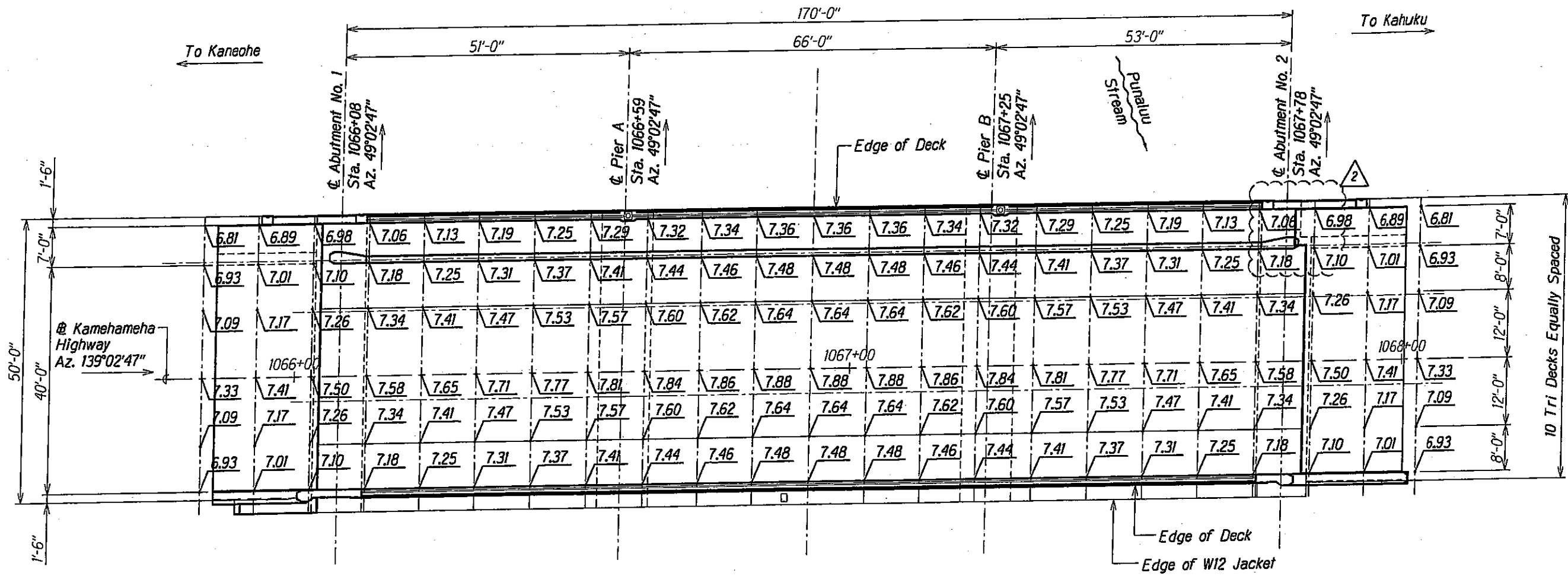
BRIDGE ELEVATION

**KANEHAMEHA HIGHWAY - REPLACEMENT
OF SOUTH PUNALUU STREAM BRIDGE
Federal Aid Project No. BR-083-01(42)**

Scale: As Shown Date: March, 2010

SHEET No. 542 OF 63 SHEETS

NOTES BOOK DESIGNED BY QUANTITIES BY CHECKED BY
DRAWING NAME: 2:100 CIVIL/2009-06-30 PUNALUU STR BRIDGE 107-30-10 SP5B-SHOLDING PLOT DATE: 07-29-10, 2:41 PM



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DATE: APR. 30, 2010
LIC. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DECK ELEVATION PLAN

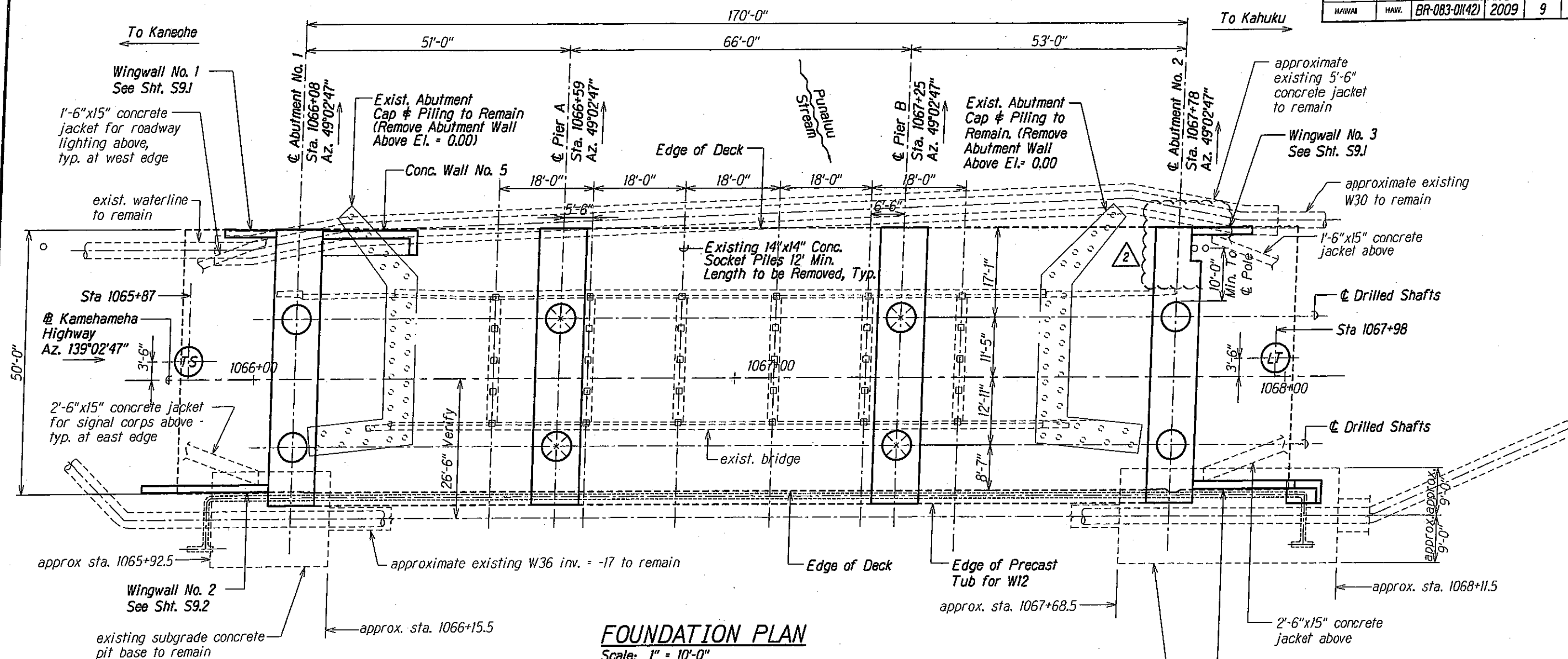
**KAMEHAMEHA HIGHWAY - REPLACEMENT
OF SOUTH PUNALUU STREAM BRIDGE**
Federal Aid Project No. BR-083-01(42)

Scale: As Shown Date: March, 2010

SHEET No. 543 OF 63 SHEETS

07/30/10	2	Revised Note
DATE	REVISION	

DESIGNED BY: [Blank]
CHECKED BY: [Blank]
DRAWING NAME: 2:100 ONZCOUN100236-SO PUNALUU STR BRIDGE(107-10-10)SP5B-S403.DWG
PLOT TIME: 07-29-10, 2:42 PM



FOUNDATION PLAN

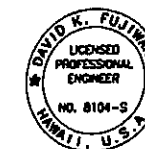
Scale: 1" = 10'-0"

Legend for Details A and B:

1. TS, LT see Legend 3. Indicates New Drilled Shafts. See S11.1 and S11.2 for Estimated Shaft Tip Elevations.
2. Indicates New Drilled Shafts with Permanent Steel Casings at Piers A and B. See S11.1 and S11.2 for Estimated Permanent Casing and Shaft Tip Elevations.
3. TS, LT indicates Test Shaft and Load Test Shafts. Load Test Shaft shall include Temporary Casing, See S11.3 for Load Test Shaft.
4. Existing 14"x14"x12'-0" long Concrete Socket Piles over 12" Round Wooden. Concrete Sockets to be removed. (Wooden Piles to remain).
5. Existing Abutment Timber Piles to remain.

Notes to Bridge Plans:

1. Pedestrian Walkway and Walkway Ramps shall have a Broom Finish.
2. For Existing Bridge Demolition see Original Contract Document Plans Sheet 53.
3. See Sheet S11.3 for Load Test Shaft.
4. For Demolition / Drilled Shaft Phasing Original Contract Document Plans Sheet 53.
5. As Built Existing Pile Locations shall be verified prior to Production Drilled Shafts, Reinforcing Steel Fabrication, and Prestressed Shop Drawing Production. The Contractor shall submit Existing Pile Layout Plan to the Engineer for review and resolution of any conflicts with new Drilled Shaft locations.
6. 100-year Design Flood Computed Water Surface Elevation, immediately upstream of South Punaluu Bridge El=7.00 feet. 100 year Discharge = 10,700 cubic feet per second. Computed Discharge through Bridge Opening = 6,528 c.f.s.
7. Portions of existing Abutment backfill were replaced with concrete fill during the 1990's. Contractor shall adjust excavation methods accordingly.
8. See original Contract document for Project Boring Logs.



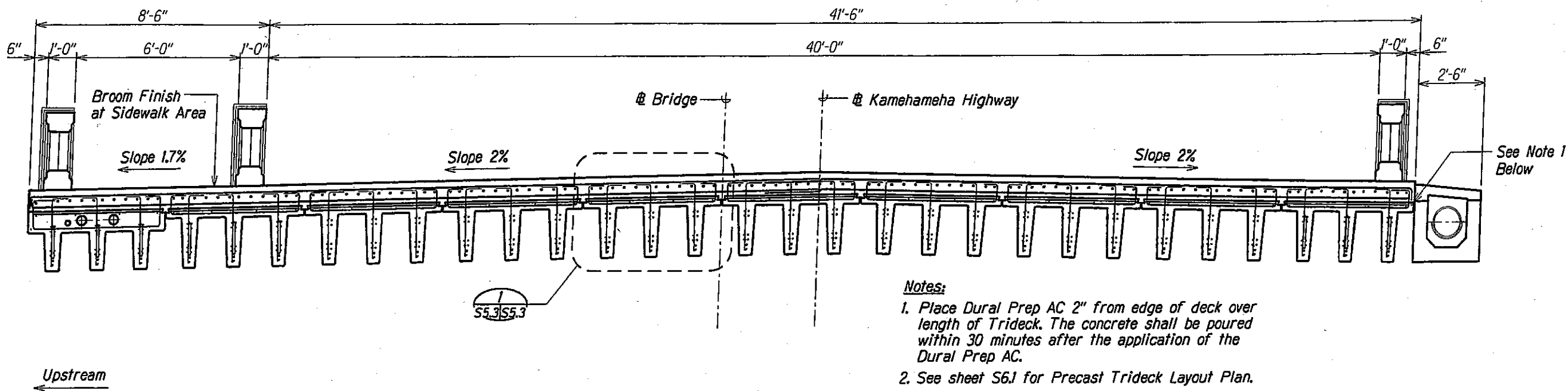
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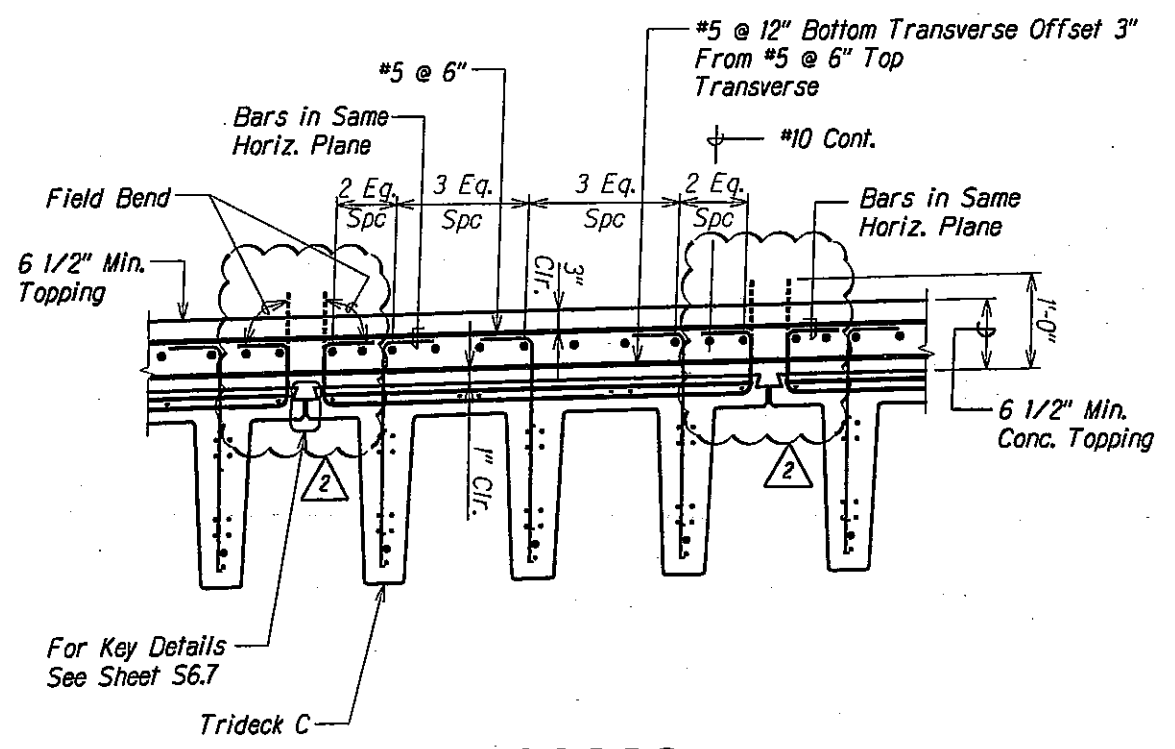
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
FOUNDATION PLAN	
KAMEHAMEHA HIGHWAY - REPLACEMENT OF SOUTH PUNALUU STREAM BRIDGE	
Federal Aid Project No. BR-083-01(42)	
Scale: As Shown	Date: March, 2010
SHEET No. 55J OF 63 SHEETS	

07/30/10	2 Revised Note
DATE	REVISION

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-01(42)	2009	11	63



TYPICAL DECK SECTION
 Scale: 1/2" = 1'-0"
 A
 S5.2 | S5.3



DETAIL
 Scale: 1" = 1'-0"
 1
 S5.3 | S5.3



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APRIL 28, 2010
 KSF, INC. LIC. EXP. DATE

DATE	REVISION
07/30/10	2 Revised Drawings
03/2010	1 Revised Stem Mesh and Reinforcing

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

TYPICAL DECK SECTION AND DETAIL

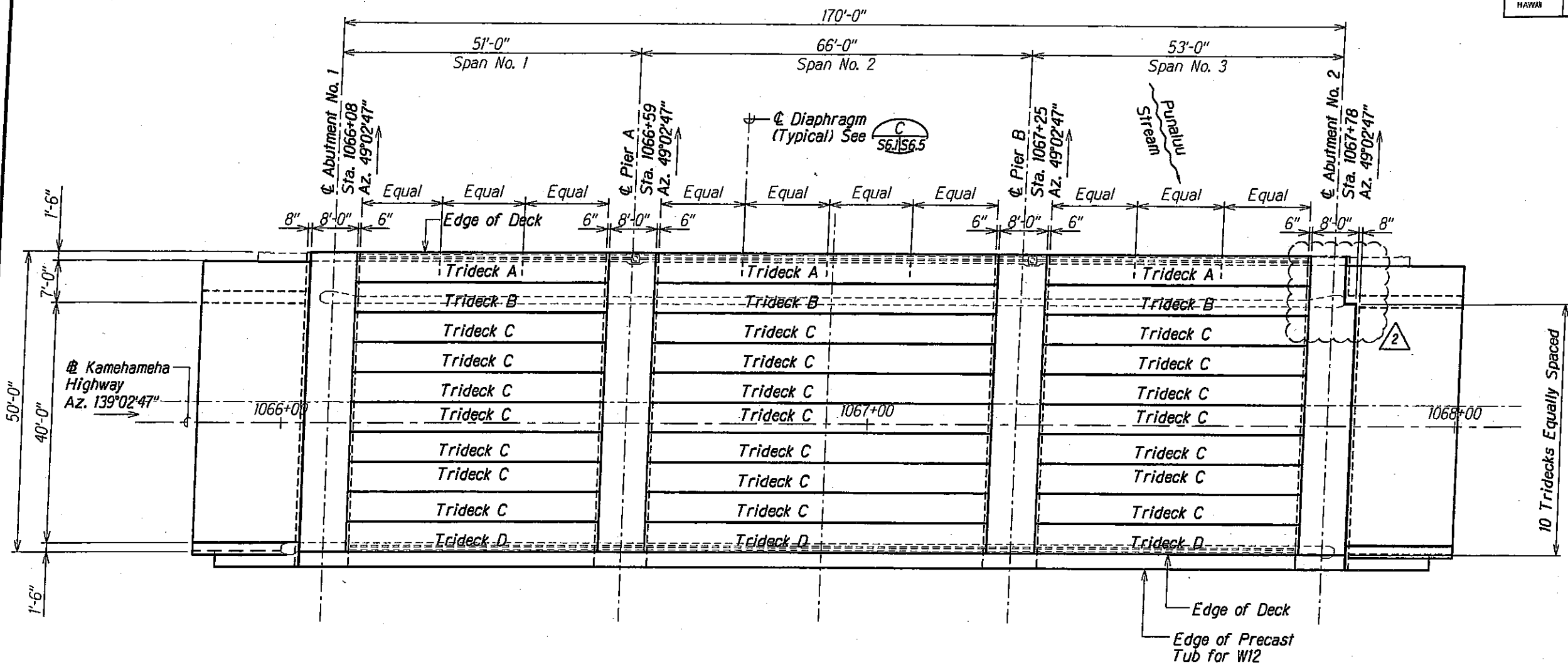
KAMEHAMEHA HIGHWAY - REPLACEMENT OF SOUTH PUNALUU STREAM BRIDGE
 Federal Aid Project No. BR-083-01(42)

Scale: As Shown Date: March, 2010

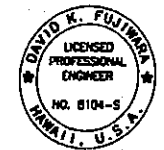
SHEET No. S5.3 OF 63 SHEETS

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 PLOT TIME: 07-29-10 2:43 PM
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 CHECKED BY: [blank]
 NO. [blank]

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-01(42)	2009	12	63



PRECAST TRIDECK LAYOUT PLAN
 Scale: 1" = 10'-0"



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KSF, INC. APR 30, 2010
 UC EXP. DATE

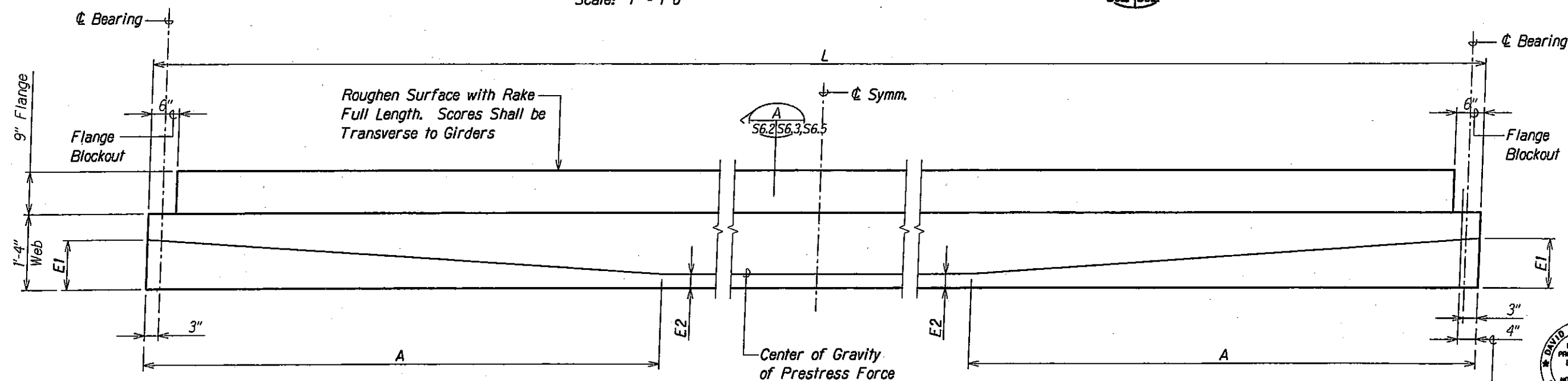
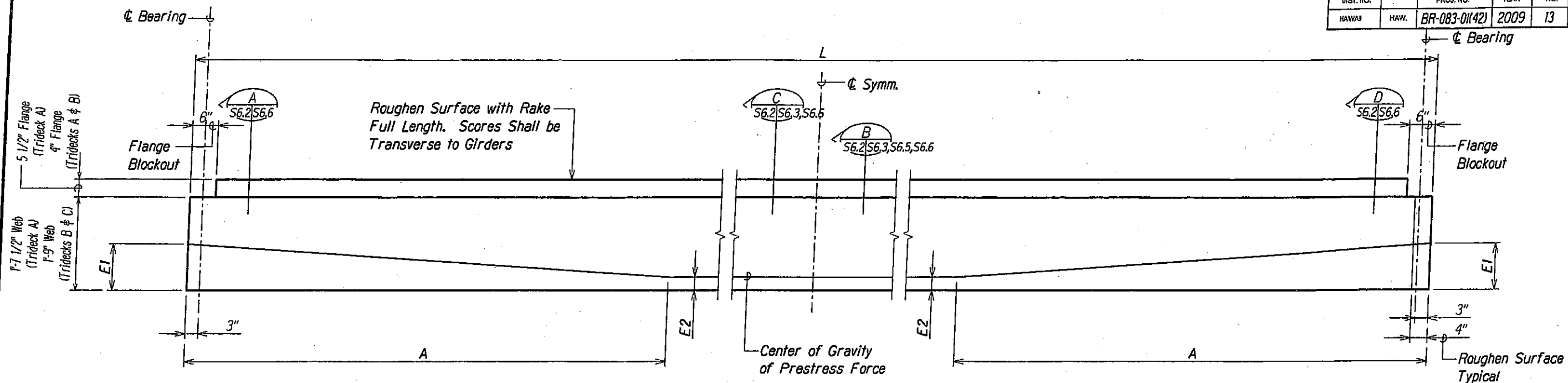
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PRECAST TRIDECK LAYOUT PLAN
KAMEHAMEHA HIGHWAY - REPLACEMENT
OF SOUTH PUNALUU STREAM BRIDGE
Federal Aid Project No. BR-083-01(42)
Scale: As Shown Date: March, 2010
SHEET No. S6J OF 63 SHEETS

07/30/10	2 Revised Note
DATE	REVISION

DESIGNED BY: []
 CHECKED BY: []
 DRAWING NAME: 2:100 BRIDGE/10016-50 PUNALUU STR BRIDGE/10-10 SP5B-S6J.DWG
 PLOT TIME: 07-29-10 2:43 PM

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-01(42)	2009	13	63



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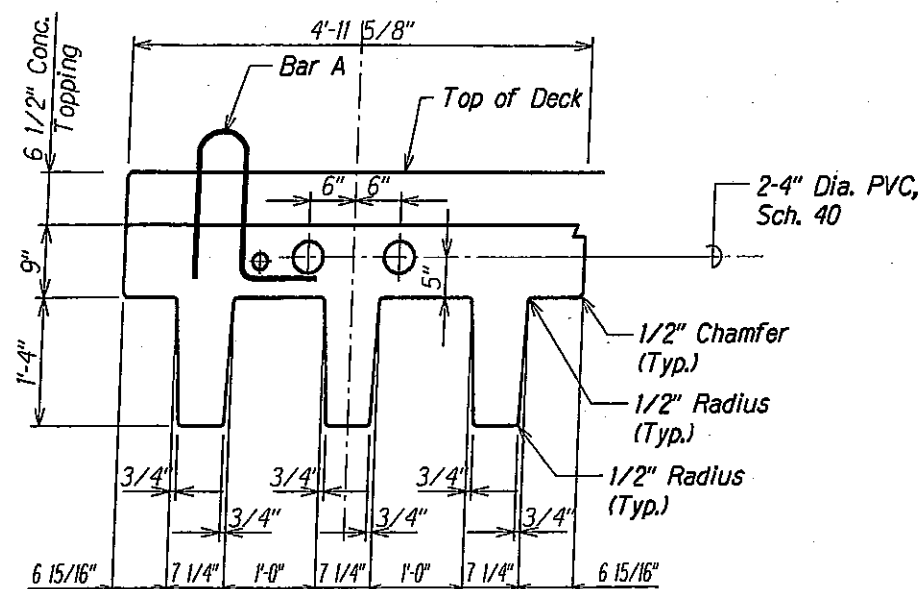
KSF, INC. APR 30, 2010 UC EXP. DATE

SPAN 1 ($f'_{ci} = 5.5$ ksi)						SPAN 2 ($f'_{ci} = 7.1$ ksi)						SPAN 3 ($f'_{ci} = 5.5$ ksi)					
TRIDECK MARK	L	A	E1	E2	WORKING FORCE	TRIDECK MARK	L	A	E1	E2	WORKING FORCE	TRIDECK MARK	L	A	E1	E2	WORKING FORCE
A	43'-0"	17'-2"	10.60	5.70	500 ^k	A	58'-0"	23'-2"	9.83	5.86	738 ^k	A	45'-0"	18'-0"	10.60	5.70	506 ^k
B	43'-0"	17'-2"	11.73	5.70	482 ^k	B	58'-0"	23'-2"	12.37	5.13	703 ^k	B	45'-0"	18'-0"	11.73	5.70	488 ^k
C	43'-0"	17'-2"	11.73	5.70	482 ^k	C	58'-0"	23'-2"	12.37	5.13	703 ^k	C	45'-0"	18'-0"	11.73	5.70	488 ^k
D	43'-0"	17'-2"	11.73	5.70	486 ^k	D	58'-0"	23'-2"	12.37	5.13	714 ^k	D	45'-0"	18'-0"	11.73	5.70	492 ^k

03/2010 Revised Table

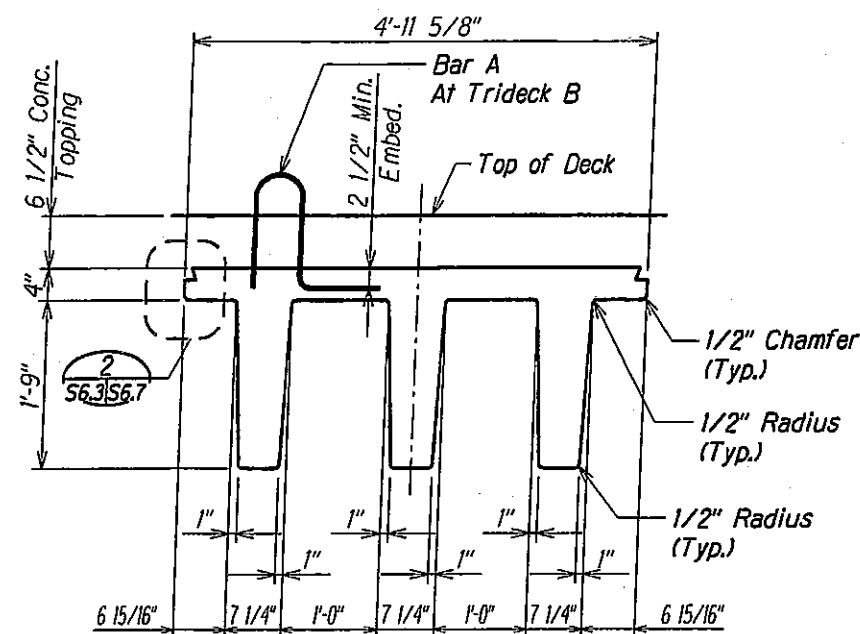
DATE REVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
**PRECAST TRIDECK ELEVATION
AND SCHEDULES**
KAMEHAMEHA HIGHWAY - REPLACEMENT
OF SOUTH PUNALUU STREAM BRIDGE
Federal Aid Project No. BR-083-01(42)
Scale: As Shown Date: March, 2010
SHEET No. 562 OF 63 SHEETS



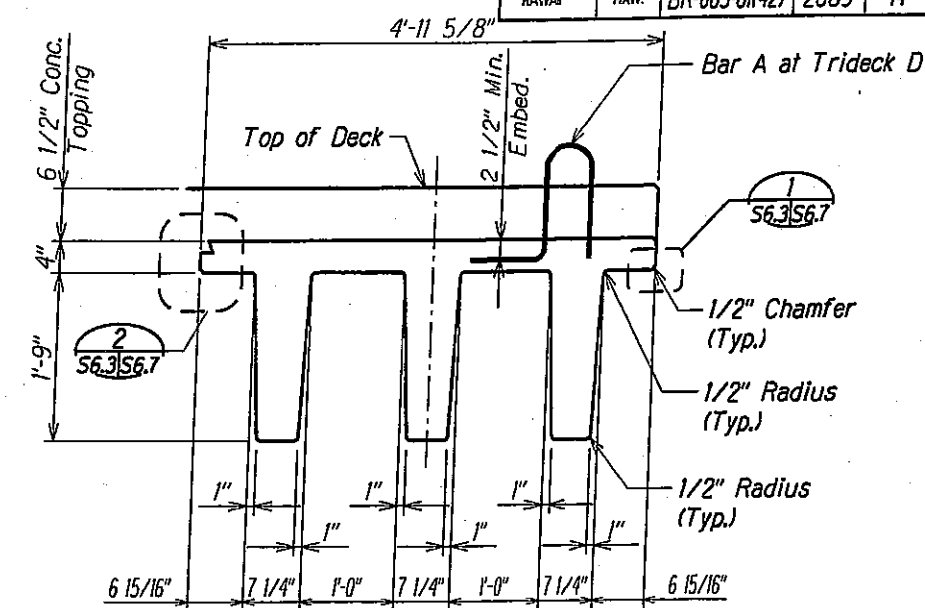
Note:
Railing Reinforcing Bar "A". See Sheet S13.6.

TRIDECK A - SECTION 
Scale: 1" = 1'-0" 



Note:
Trideck B is similar to Trideck C. Trideck B contains Railing Reinforcing Bar "A".
See Sheet S136.

TRIDECK C - SECTION B
Scale: 1" = 1'-0" S62 S63



TRIDECK D - SECTION C
Scale: 1" = 1'-0" 56.2 56.

NOTES:

1. *Prestressed concrete 28-day strength $f'_c = 9000$ psi
For Prestressed concrete strength at time of release (f'_{ci}),
see Sheet S6.2.*
2. *Pretensioned Strands shall be 7-wire 0.5-inch diameter Low
Relaxation Steel Strands (Area = 0.153 in²) with an ultimate
tensile strength of 270 ksi. For properties, see Specifications.*

	SPAN 1		SPAN 2		SPAN 3	
Trideck Mark	B, C & D	A	B, C & D	A	B, C & D	A
Initial Strand Stress	203 ksi	203 ksi	203 ksi	203 ksi	203 ksi	203 ksi
Initial Loss	18.2 ksi	16.2 ksi	21.3 ksi	19.4 ksi	17.8 ksi	15.6 ksi
Total Loss	52.1 ksi	46.9 ksi	62.8 ksi	56.4 ksi	50.5 ksi	44.8 ksi

Working force (see Sheet S6.2) is the force remaining in Prestressing Steel after all losses.

3. *Non-Prestressed Reinforcing steel shall be Grade 60 or Welded Wire Reinforcing (WWR), ASTM A497, Grade 80. For properties, see Specifications.*
4. *Strand pattern shall be symmetrical about the longitudinal C of the Trideck.*

5. Strand release sequence shall not induce any lateral deflection of the Trideck.
6. Contractor shall submit shop drawings indicating proposed strand pattern, utility duct layout, releasing sequence, reinforcing details and hold down device details to the Engineer prior to fabrication.
7. During curing, care shall be taken to avoid any lateral deflection of the Trideck due to improper orientation. Steam curing may be used to accelerate strength gain.
8. Lifting devices shall be placed as close as possible to the centerline of bearings of the Trideck. 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 beam is damaged due to failure of the lifting device.
9. See Sheet S6.4 for Camber Diagram.
10. 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 Tridecks.
11. Trideck shall contain 128 oz. of Shrinkage Reducing Admixture (SRA) per cubic yard of concrete.
12. Trideck shall contain 1.5 pints of CORTEC MCI-2005 NS Corrosion Inhibitor per cubic yard of concrete.

13. Place 1" Coil Insert for leveling at midspan of each Trideck above middle stem.
14. Place Weld Ties (A/S6.7) @ 5'-0" oc each edge of each Trideck (except exterior of Tridecks A and D). Begin 2'-6" each side of Trideck midspan.
15. Extend all strands and longitudinal reinforcing 3'-6" beyond ends of Tridecks.
16. Trideck A shall contain 2 pounds of Kuralon RSC15 PVA fibers per cubic yard of concrete.



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	APRIL 30, 2011
KSE INC	11C EXP D

03/2010	 Added Note
DATE:	REV:

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PRECAST TRIDECK SECTIONS

KAMEHAMEHA HIGHWAY - REPLACEMENT
OF SOUTH PUNALUU STREAM BRIDGE
Federal Aid Project No. BR-083-01(42)

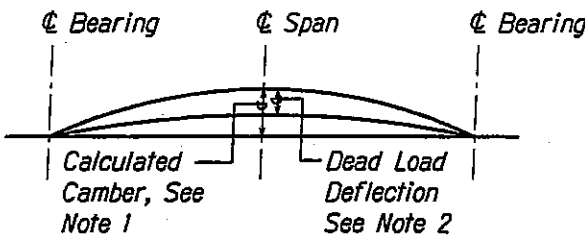
Scale: As Shown Date: March, 2010

SHEET No. 563 OF 63 SHEETS

TRIDECK TYPE, CAMBER AND DEAD LOAD DEFLECTION SCHEDULE

	TRIDECK MARK	TRIDECK LENGTH ¢ BRG TO ¢ BRG	CAMBER	DEAD LOAD DEFLECTION
SPAN NO. 1	A	42' - 6"	+ 0.88"	0.16"
	B	42' - 6"	+ 0.91"	0.17"
	C	42' - 6"	+ 0.91"	0.17"
	D	42' - 6"	+ 0.91"	0.17"
SPAN NO. 2	A	57' - 6"	+ 1.99"	0.59"
	B	57' - 6"	+ 2.20"	0.62"
	C	57' - 6"	+ 2.20"	0.62"
	D	57' - 6"	+ 2.20"	0.62"
SPAN NO. 3	A	44' - 6"	+ 0.91"	0.21"
	B	44' - 6"	+ 0.97"	0.21"
	C	44' - 6"	+ 0.97"	0.21"
	D	44' - 6"	+ 0.97"	0.21"

NOTE: Trideck length given is the horizontal distance between ¢ Bearing in Feet.



GIRDER CAMBER DIAGRAM

NOT TO SCALE

CAMBER AND DEFLECTION NOTES:

1. Calculated camber includes the effect of the prestress force and the weight of the Trideck after removal from the bed. Positive values shown for calculated camber indicate a net upward deflection. The calculated camber value has been multiplied by creep factors to approximate the effect of camber growth and concrete creep. The actual camber shall not exceed the calculated camber by more than 1/2".
2. Dead load deflection resulting from the weight of the Cast-In-Place Concrete topping.
3. All cambers and deflections are in inches.



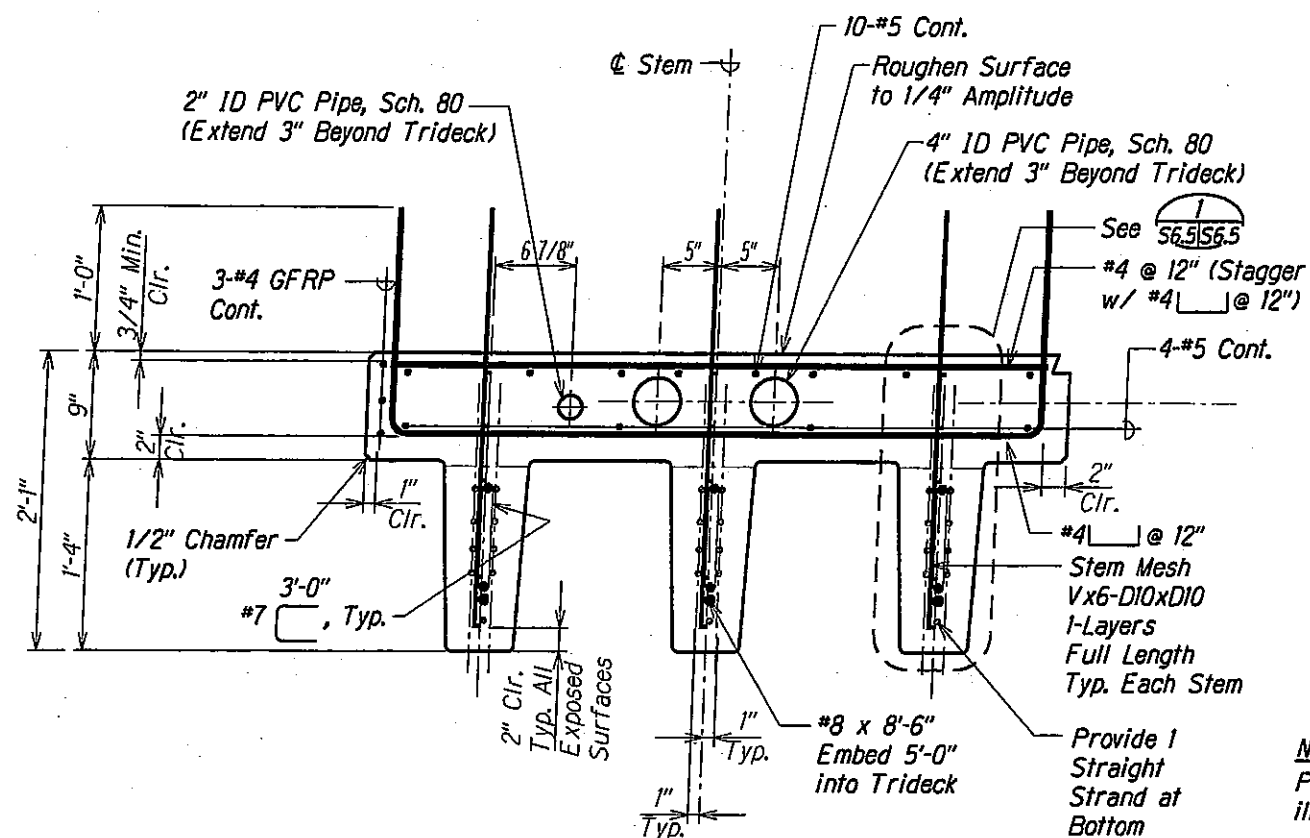
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

DATE: APR 30, 2010
LIC. EXP. DATE

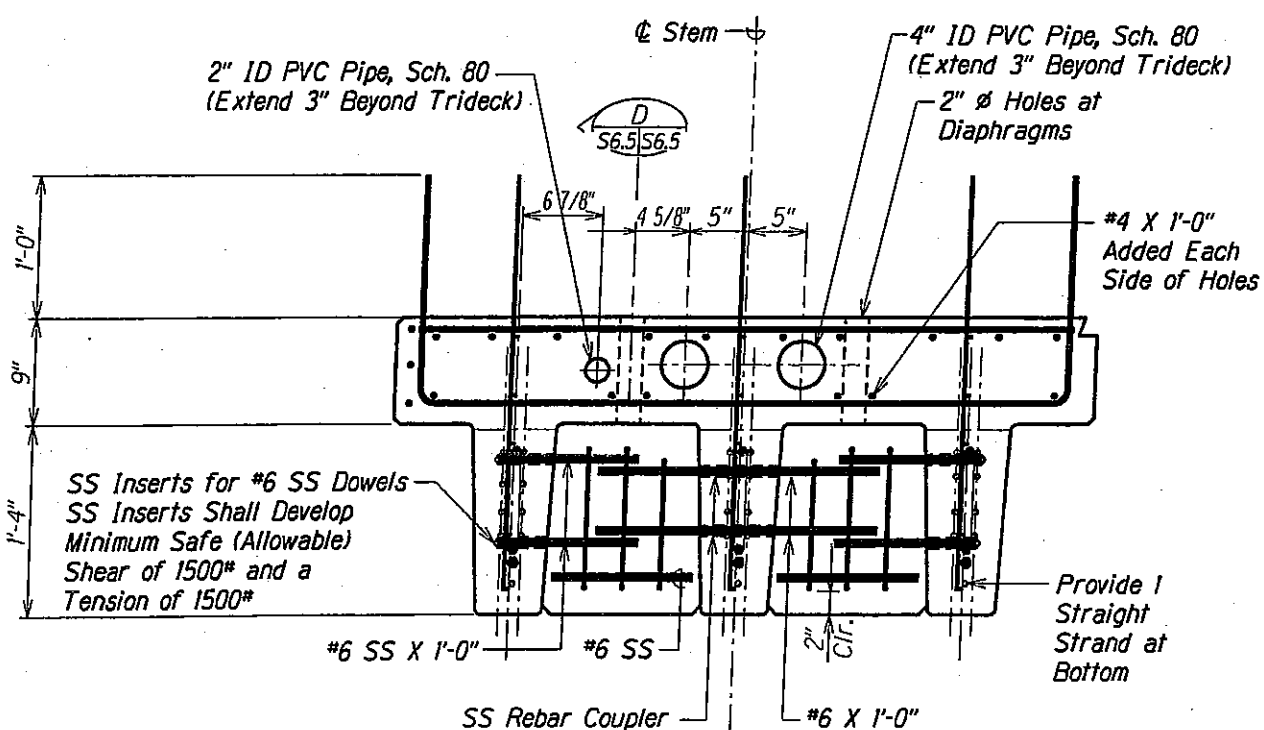
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
TRIDECK CAMBER AND DEFLECTION	
KAMEHAMEHA HIGHWAY - REPLACEMENT OF SOUTH PUNALUU STREAM BRIDGE Federal Aid Project No. BR-083-01(42)	
Scale: As Shown	Date: March, 2010
SHEET No. 564 OF 63 SHEETS	

03/2010	Revised Table
DATE	REVISION

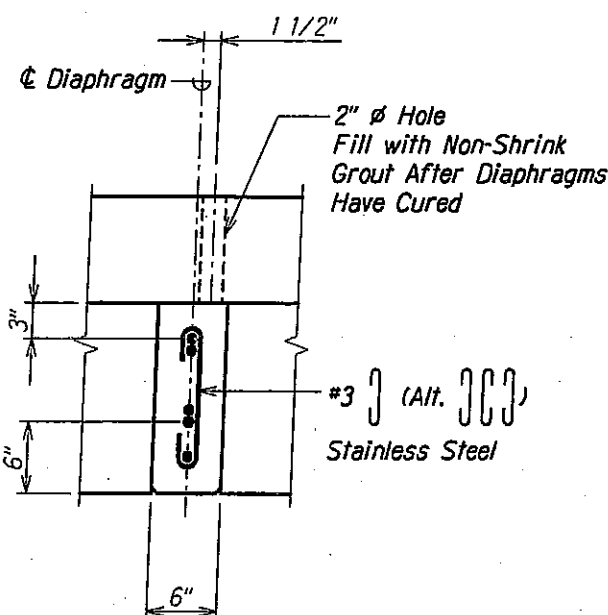
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-01(42)	2009	16	63



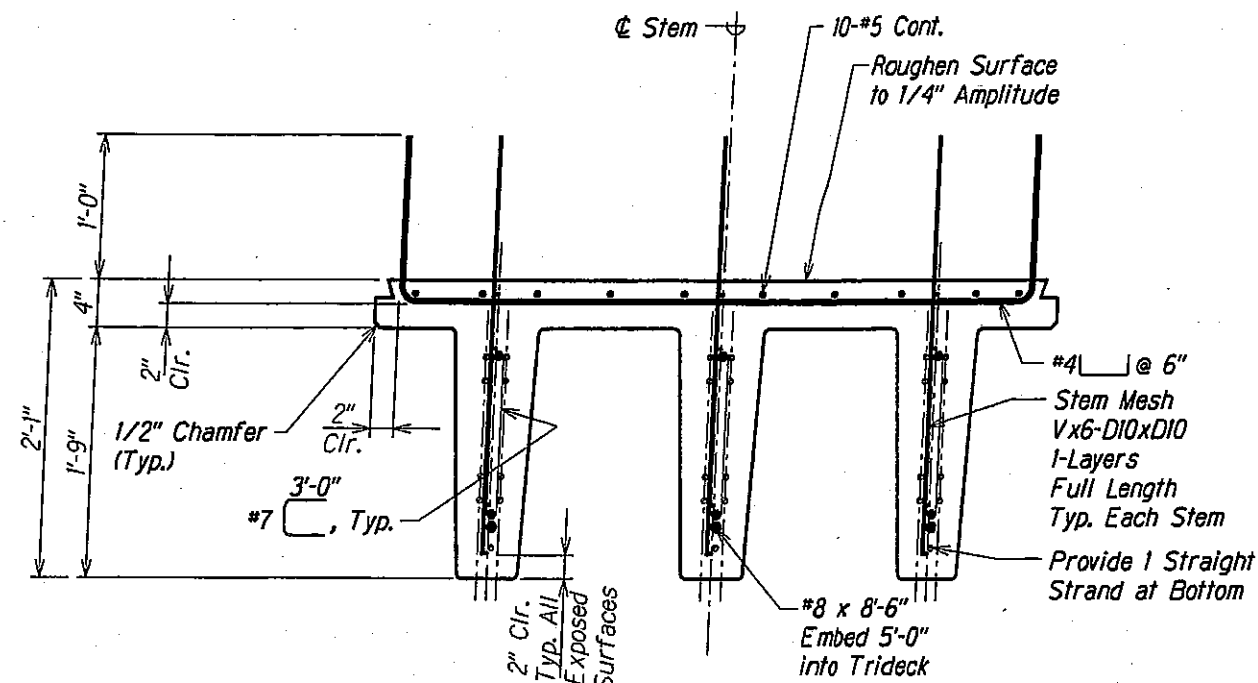
TRIDECK A - SECTION A
Scale: 1 1/2" = 1'-0"



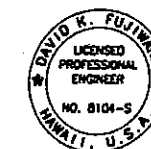
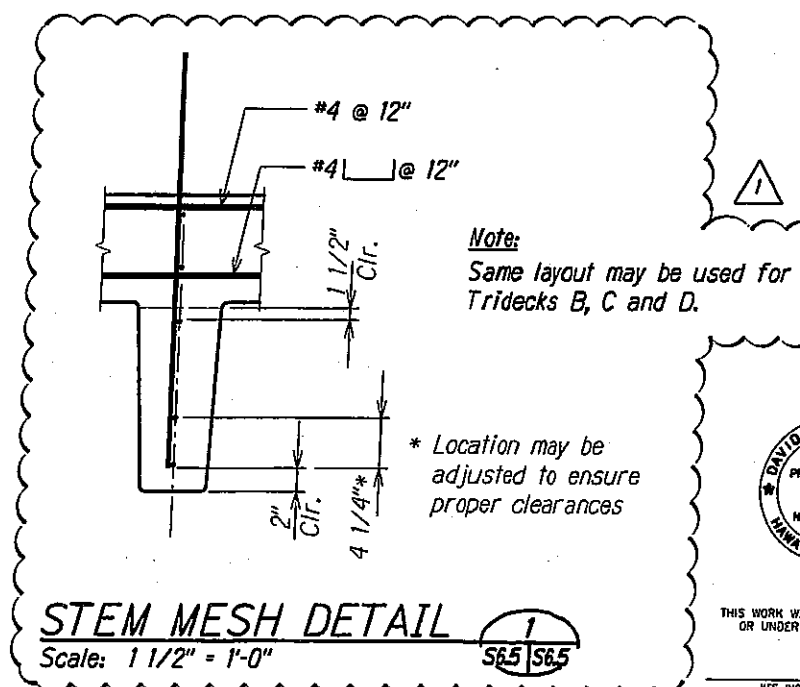
TRIDECK A - SECTION AT DIAPHRAGM C
Scale: 1 1/2" = 1'-0"



SECTION AT DIAPHRAGM D
Scale: 1 1/2" = 1'-0"



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



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KSF, INC. APRIL 30, 2010 LIC. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PRECAST TRIDECK SECTIONS

KAMEHAMEHA HIGHWAY - REPLACEMENT OF SOUTH PUNALUU STREAM BRIDGE

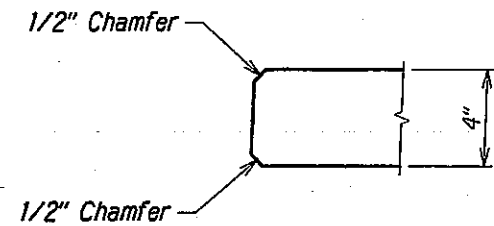
Federal Aid Project No. BR-083-01(42)

Scale: As Shown Date: March, 2010

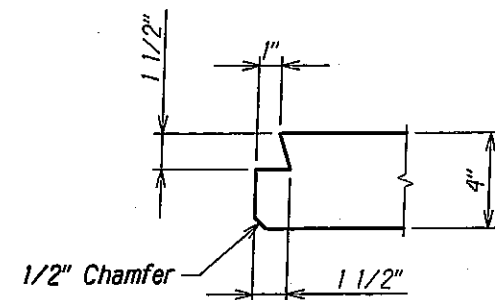
SHEET No. S65 OF 63 SHEETS

03/2010	1	Revised Stem Mesh, Section and Added Detail
DATE	REVISION	

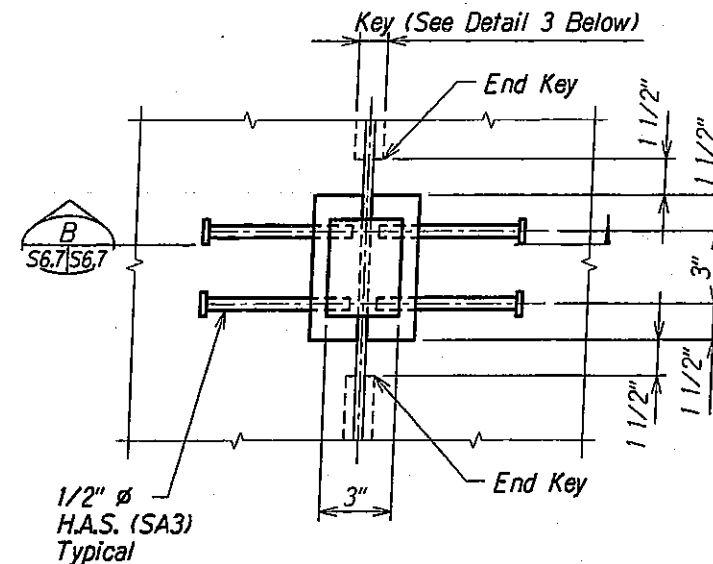
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HAWAII	HAW.	BR-083-01(42)	2009	18	63



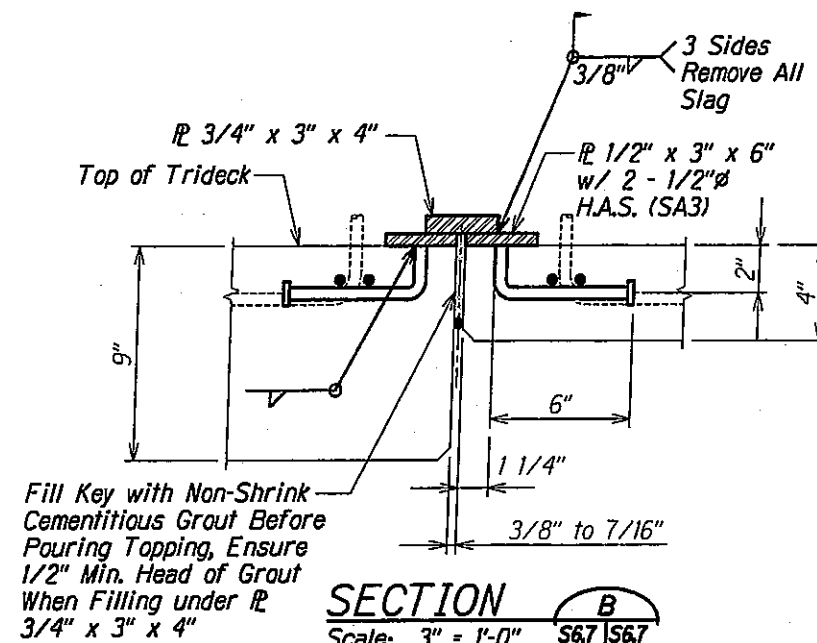
**FLANGE
EXTERIOR EDGE**
Scale: 3" = 1'-0" S6.3 S6.7



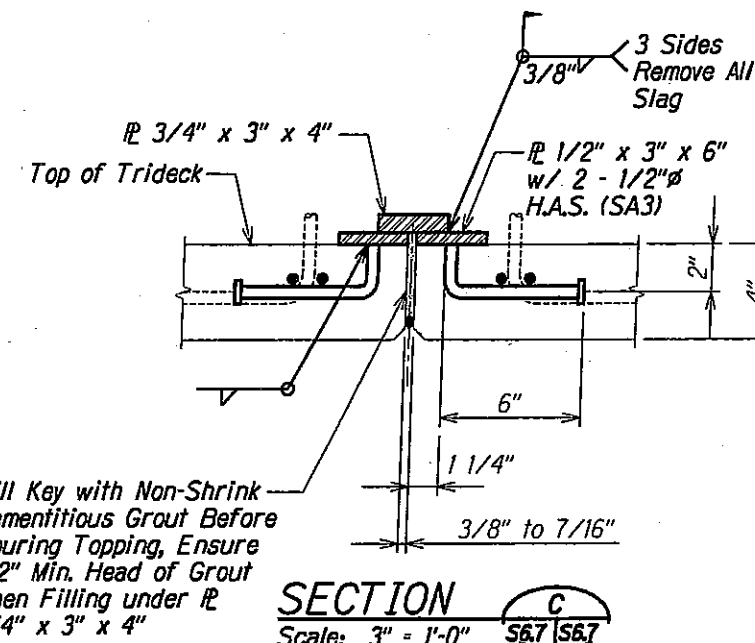
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TYPICAL EDGE**
Scale: 3" = 1'-0" S6.3 S6.7



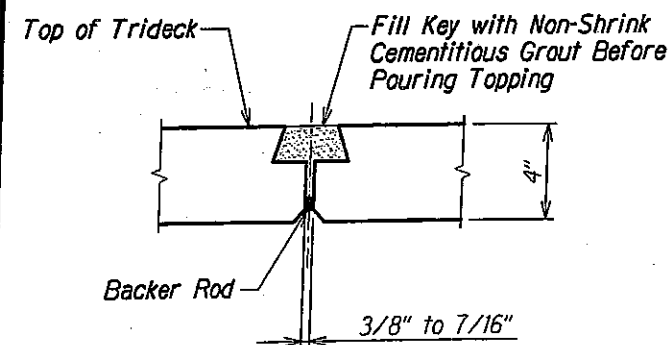
WELD TIE PLAN
Scale: 3" = 1'-0" S6.7 S6.7



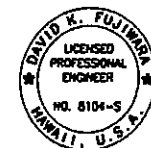
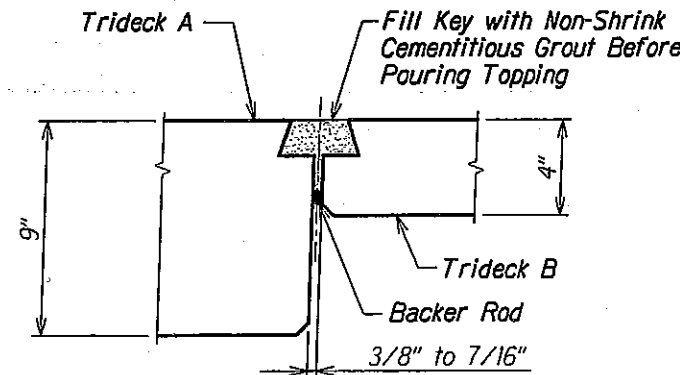
SECTION B
Scale: 3" = 1'-0" S6.7 S6.7



SECTION C
Scale: 3" = 1'-0" S6.7 S6.7



KEY DETAILS
Scale: 3" = 1'-0" S6.3 S6.7



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STATE OF HAWAII
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HIGHWAYS DIVISION

PRECAST TRIDECK DETAILS

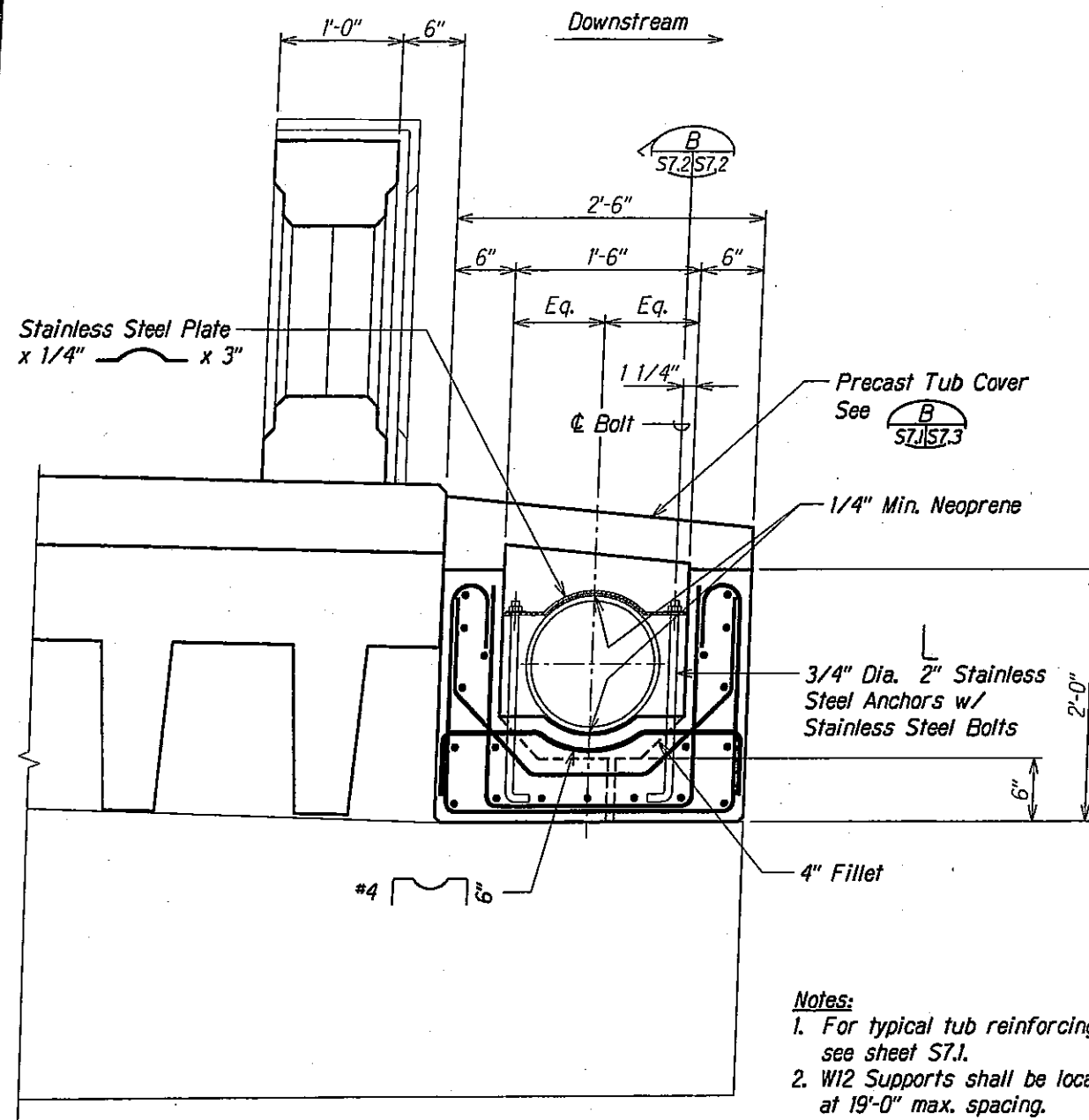
**KAMEHAMEHA HIGHWAY - REPLACEMENT
OF SOUTH PUNALUU STREAM BRIDGE**

Federal Aid Project No. BR-083-01(42)

Scale: As Shown Date: March, 2010

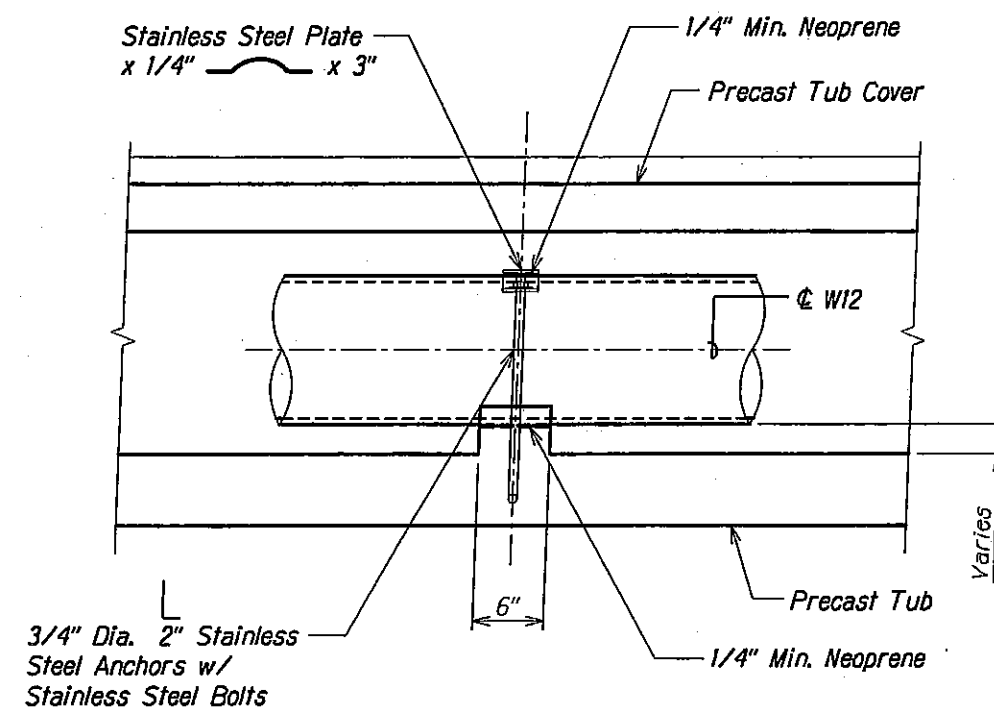
SHEET No. S6.7 OF 63 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-01(42)	2009	20	63

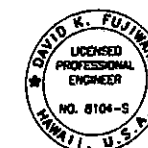


- Notes:**
1. For typical tub reinforcing see sheet S7.1.
 2. W12 Supports shall be located at 19'-0" max. spacing.

TYPICAL SECTION AT W12 SUPPORT A
Scale: 1 1/2" = 1'-0" S7.2/S7.2



TYPICAL SECTION B
Scale: 1 1/2" = 1'-0" S7.2/S7.2



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APR 30, 2010
LIC. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PRECAST TUB FOR W12

**KAMEHAMEHA HIGHWAY - REPLACEMENT
OF SOUTH PUNALUU STREAM BRIDGE**

Federal Aid Project No. BR-083-01(42)

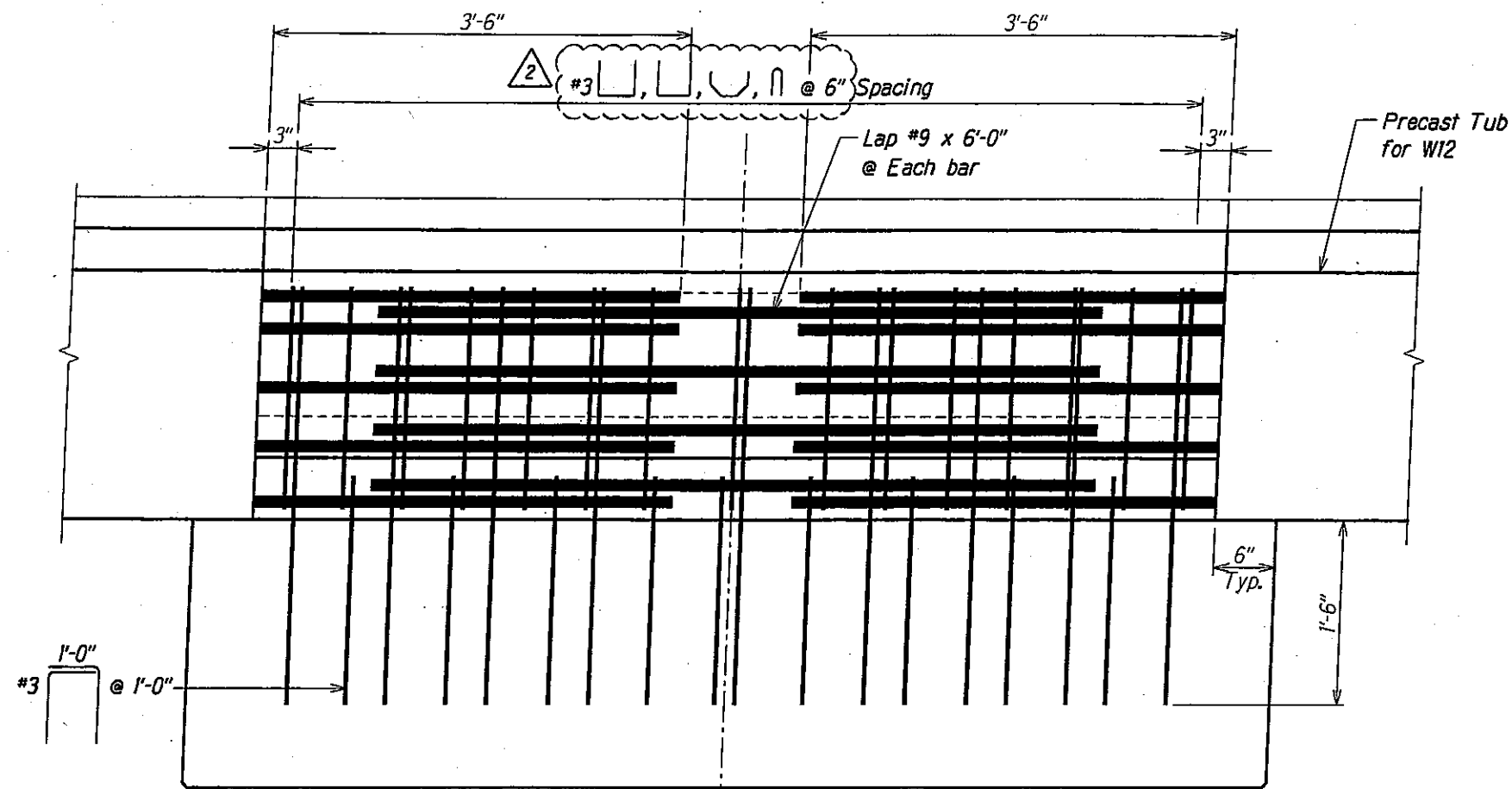
Scale: As Shown Date: March, 2010

SHEET No. S7.2 OF 63 SHEETS

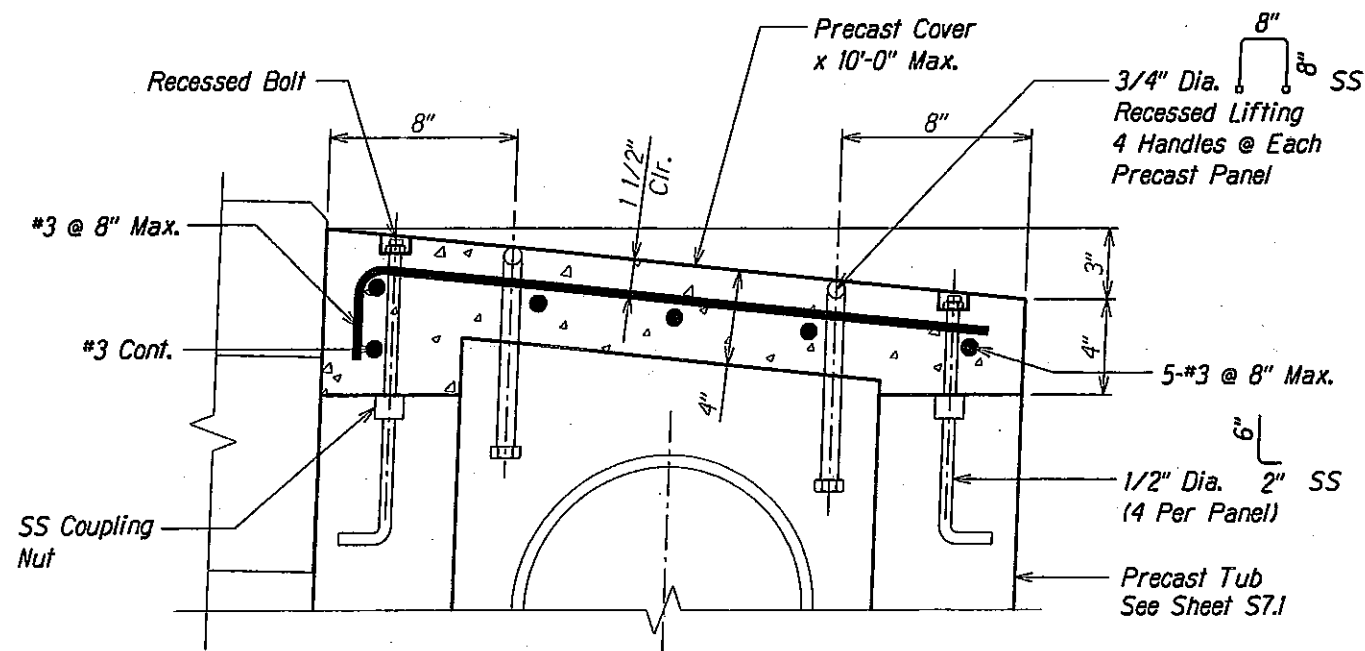
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NOTES BOOK
REVISIONS BY
QUANTITIES BY
CHECKED BY

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-01(42)	2009	21	63



SECTION AT PIER CAP A
Scale: 1 1/2" = 1'-0" S7.1 S7.3



PRECAST TUB COVER - SECTION B
Scale: 3" = 1'-0" S7.1 S7.3



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APRIL 30, 2010
U.C. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PRECAST TUB FOR W12

**KAMEHAMEHA HIGHWAY - REPLACEMENT
OF SOUTH PUNALUU STREAM BRIDGE**

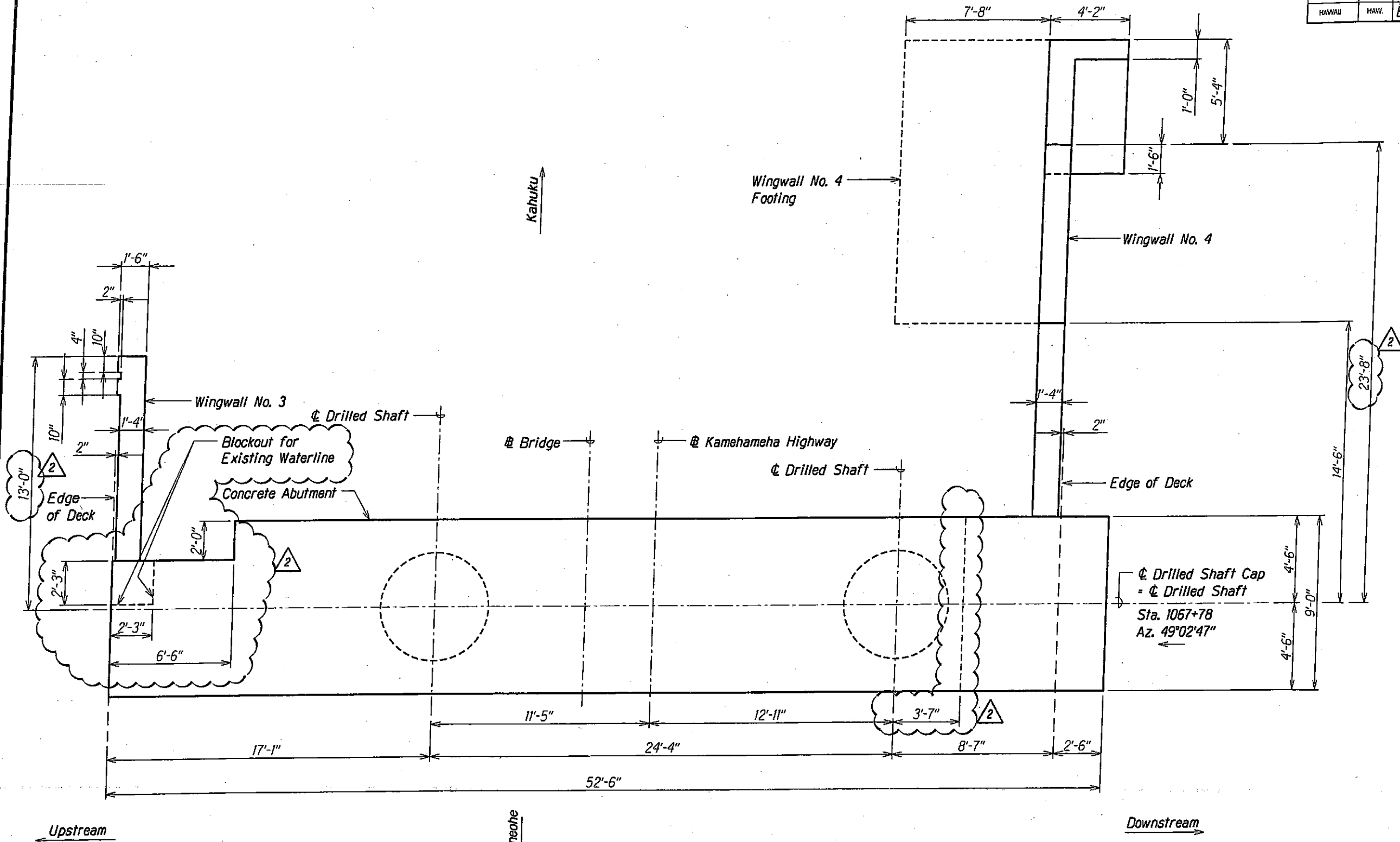
Federal Aid Project No. BR-083-01(42)

Scale: As Shown Date: March, 2010

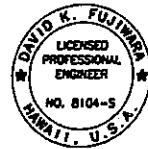
SHEET No. 21 OF 63 SHEETS

07/30/10	2 Revised Drawing
DATE	REVISION

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-01(42)	2009	23	63



ABUTMENT NO. 2 LAYOUT PLAN A
 Scale: 3/8" = 1'-0" S82 | S82



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KSF, INC. APR 30, 2010 LIC. EXP. DATE

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

ABUTMENT NO. 2 LAYOUT PLAN

**KAMEHAMEHA HIGHWAY - REPLACEMENT
 OF SOUTH PUNALUU STREAM BRIDGE**

Federal Aid Project No. BR-083-01(42)

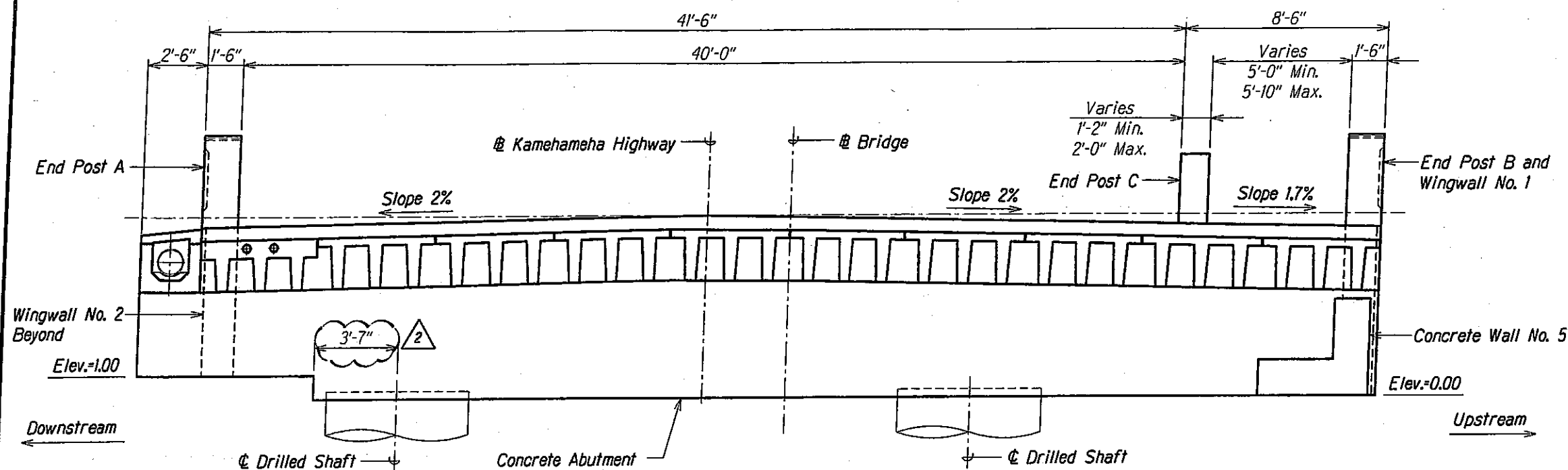
Scale: As Shown Date: March, 2010

SHEET No. S82 OF 63 SHEETS

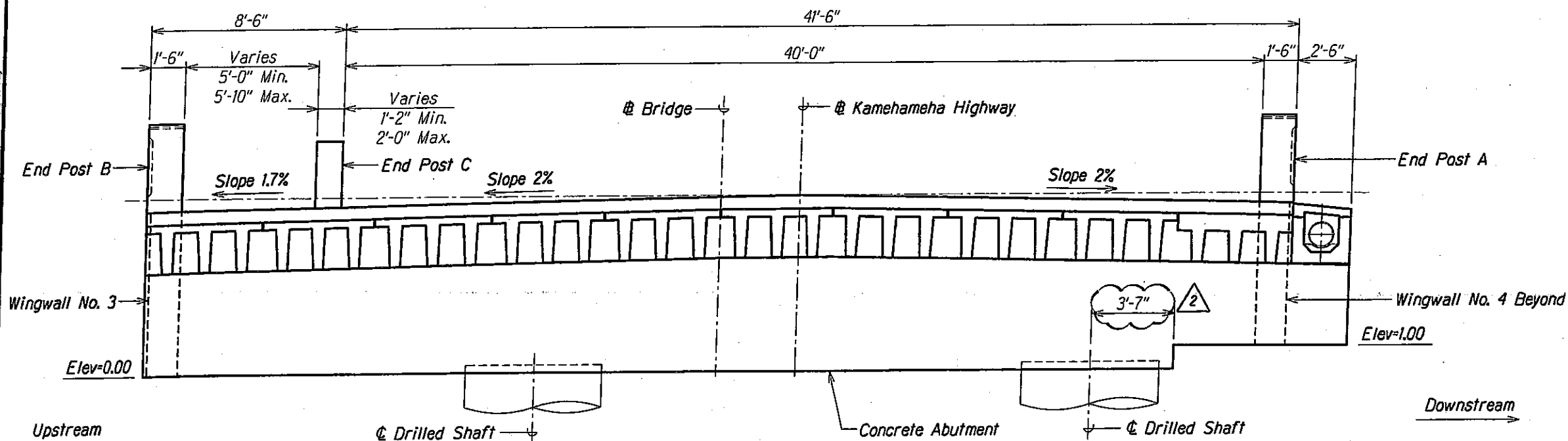
07/30/10	2 Revised Drawings
DATE	REVISION

DESIGNED BY: []
 QUANTITIES BY: []
 CHECKED BY: []
 DRAWING NAME: 2: DO ONCONG (02016-SD PUNALUU STR BRIDGE 07-10-10) SP5B-SB01.DWG PLOT TIME: 07-29-10, 2:46 PM

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-01(42)	2009	24	63



ABUTMENT NO. 1 ELEVATION A
 Scale: 3/8" = 1'-0" S8.3 | S8.3



ABUTMENT NO. 2 ELEVATION B
 Scale: 3/8" = 1'-0" S8.3 | S8.3



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KSF, D/C APR 30, 2010
LIC. EXP. DATE

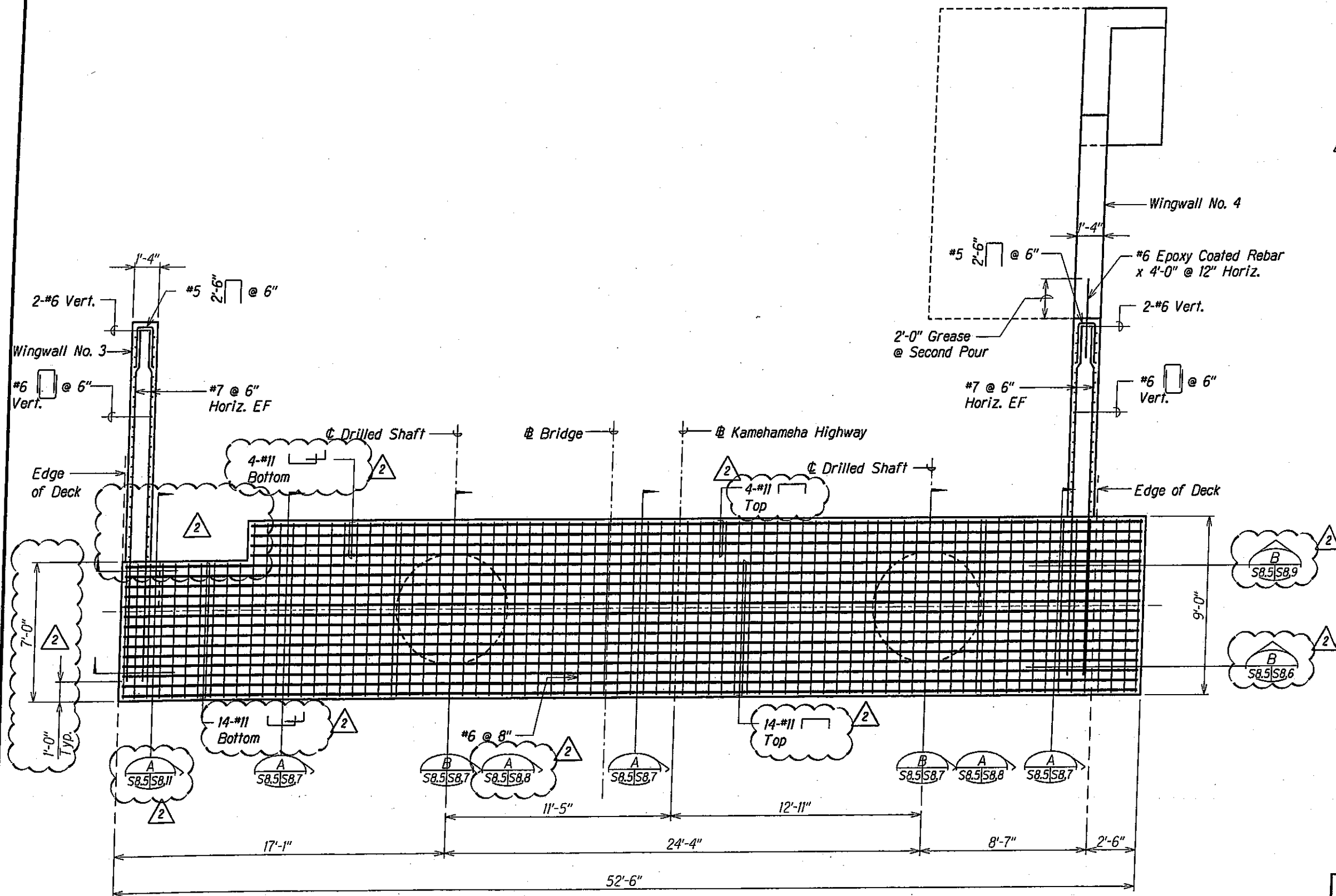
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ABUTMENT NO. 1 AND NO. 2 ELEVATIONS
KAMEHAMEHA HIGHWAY - REPLACEMENT
OF SOUTH PUNALUU STREAM BRIDGE
Federal Aid Project No. BR-083-01(42)
Scale: As Shown Date: March, 2010
SHEET No. S8.3 OF 63 SHEETS

07/30/10	2	Revised Drawings
DATE	REVISION	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-01(42)	2009	26	63

2 Note:
See S11.1 for drilled shaft information.



ABUTMENT NO. 2 CAP REINFORCING PLAN
Scale: 3/8" = 1'-0"
A
S8.5/S8.5



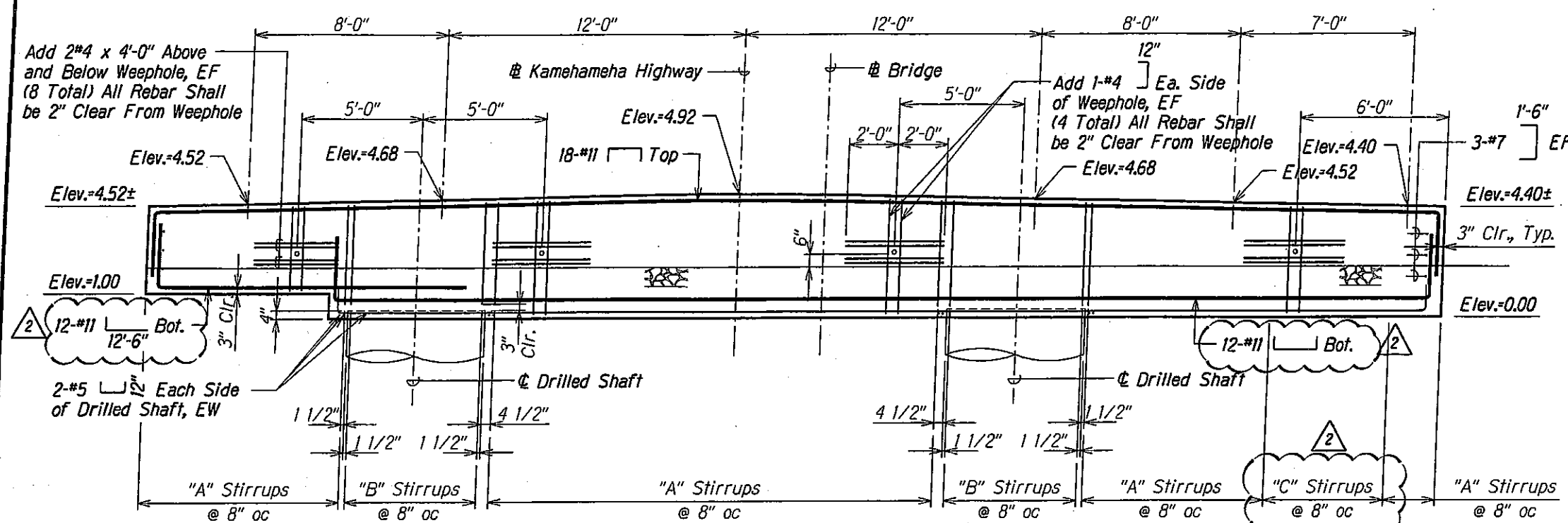
THIS WORK WAS PREPARED BY ME
OR UNDER MY SUPERVISION.

KSF, INC. APRIL 30, 2010
U.C. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
ABUTMENT NO. 2
CAP REINFORCING PLAN
KAMEHAMEHA HIGHWAY - REPLACEMENT
OF SOUTH PUNALUU STREAM BRIDGE
Federal Aid Project No. BR-083-01(42)
Scale: As Shown Date: March, 2010
SHEET No. S8.5 OF 63 SHEETS

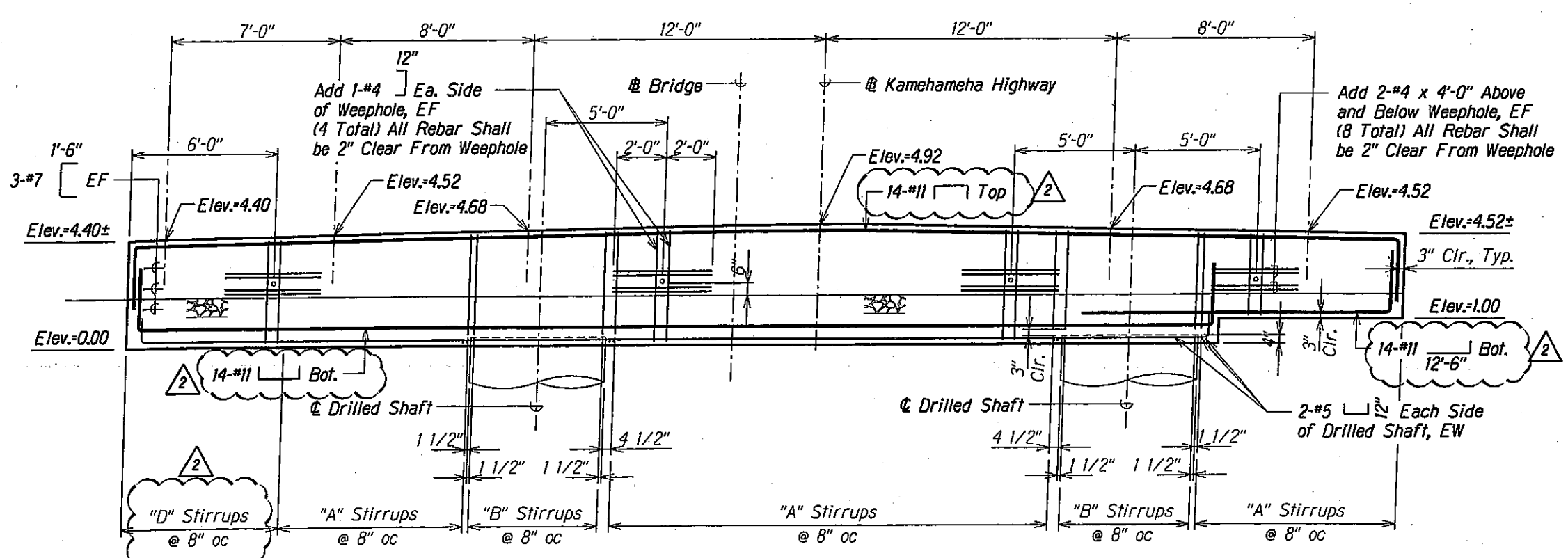
07/30/10	2 Revised Drawings
DATE	REVISION

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-01(42)	2009	27	63

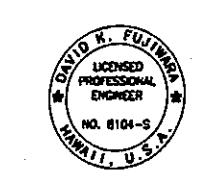


Note:
See S11J for drilled shaft information.

ABUTMENT NO. 1 CAP REINFORCING ELEVATION
Scale: 3/8" = 1'-0"



ABUTMENT NO. 2 CAP REINFORCING ELEVATION
Scale: 3/8" = 1'-0"



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KSF, INC. 12/28/10 30 2010 LIC. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

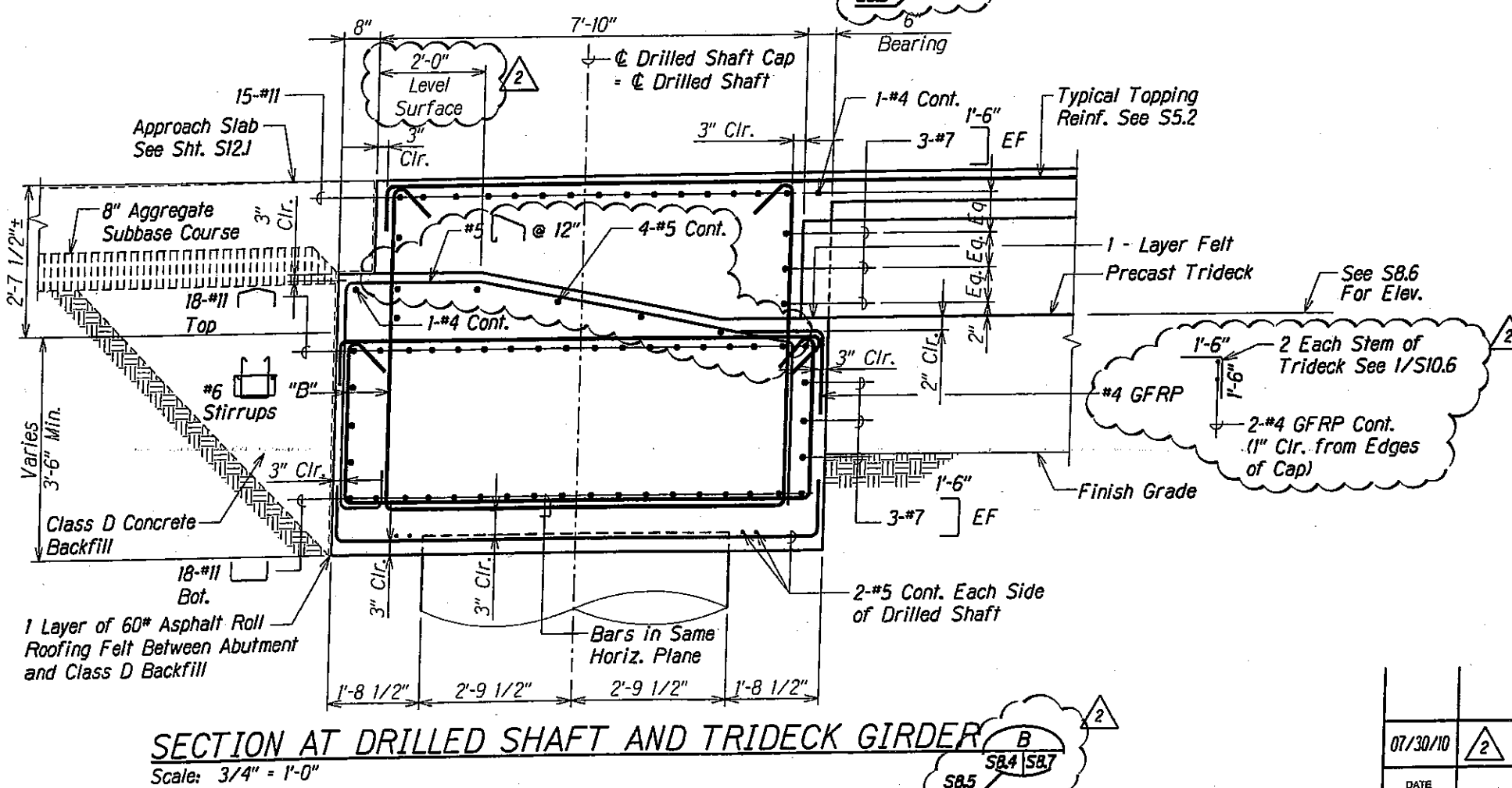
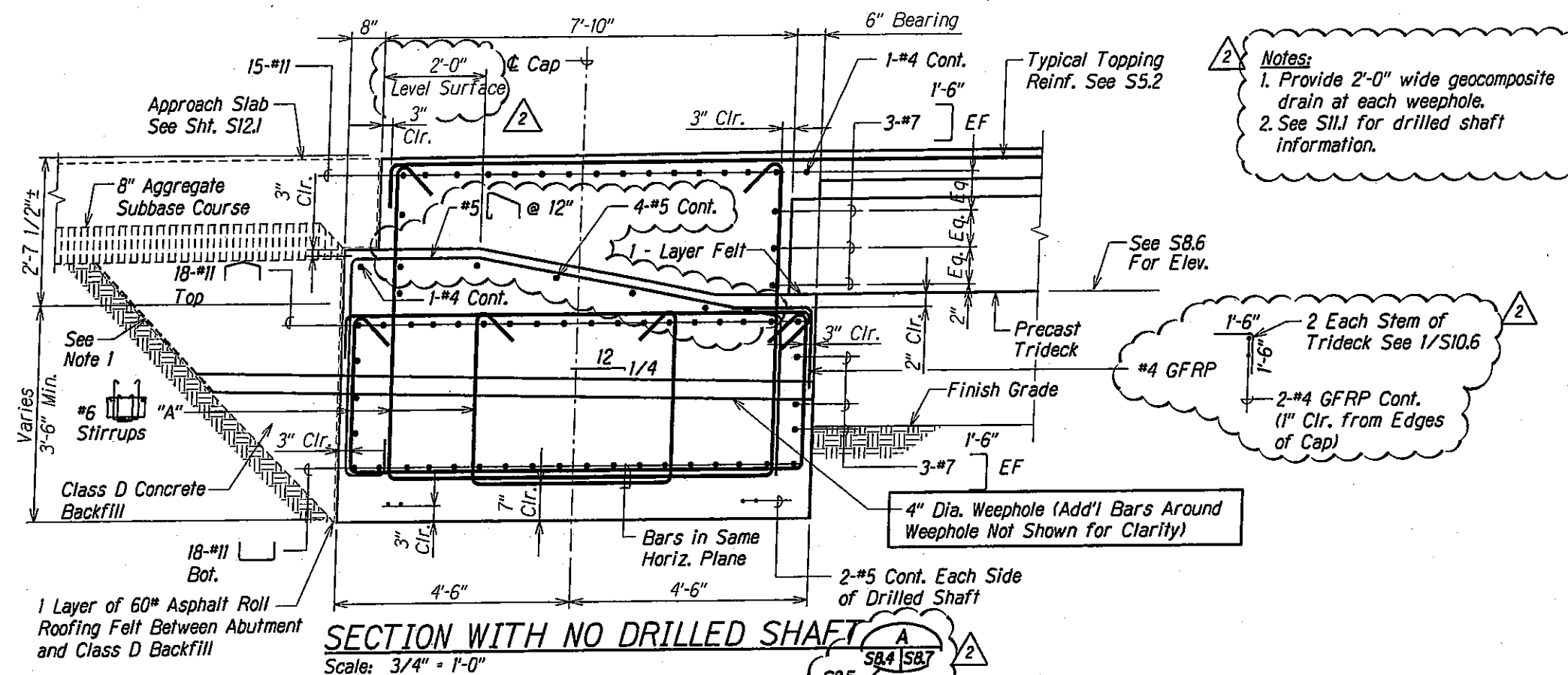
**ABUTMENT NO. 1 AND NO. 2
REINFORCING ELEVATIONS**

KAMEHAMEHA HIGHWAY - REPLACEMENT
OF SOUTH PUNALUU STREAM BRIDGE
Federal Aid Project No. BR-083-01(42)

Scale: As Shown Date: March, 2010
SHEET No. S86 OF 63 SHEETS

07/30/10	2	Revised Drawings
DATE		REVISION

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEET
HAWAII	HAW.	BR-083-01(42)	2009	28	63



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	APRIL 30
<u>KES INC</u>	<u>NIC EXP</u>

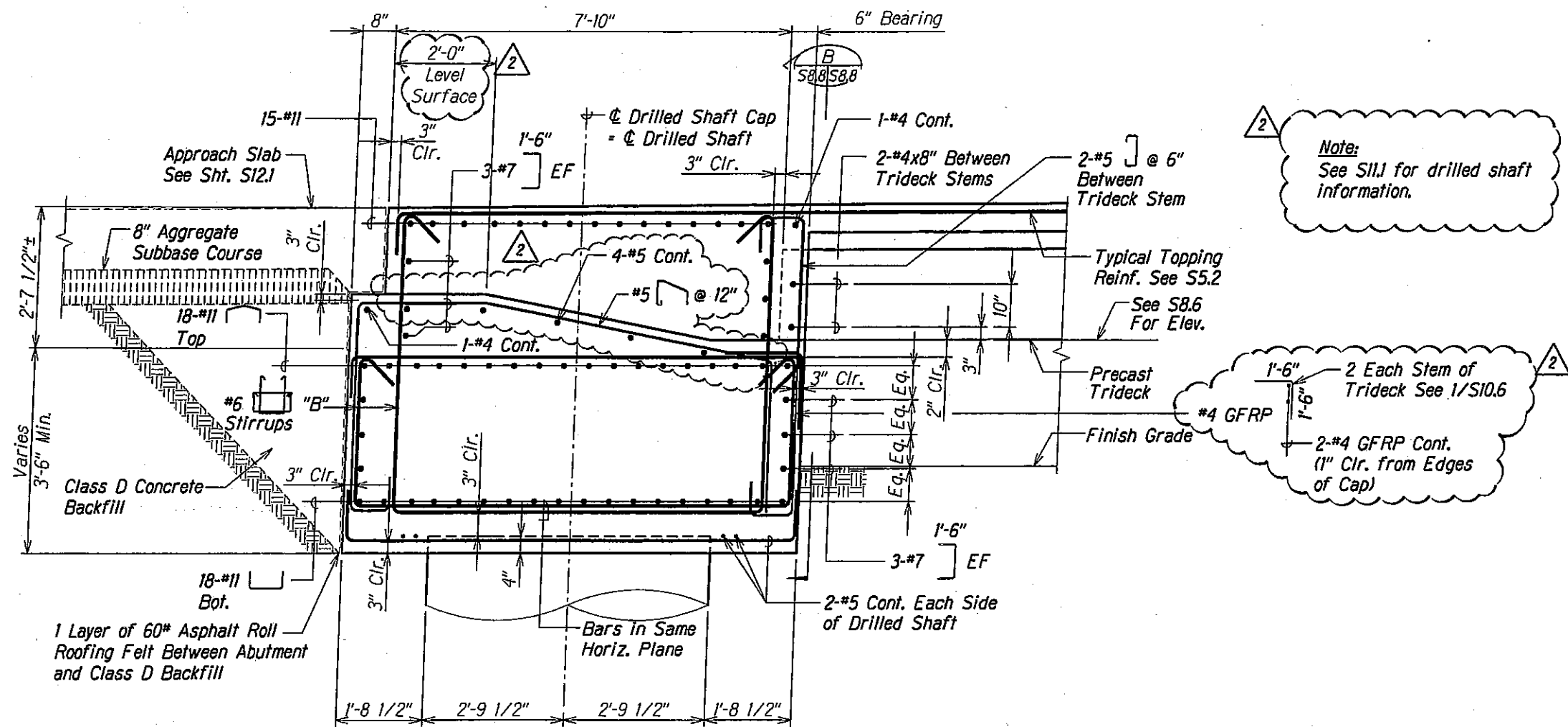
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ABUTMENT SECTIONS
KAMEHAMEHA HIGHWAY - REPLACEMENT
OF SOUTH PUNALUU STREAM BRIDGE
Federal Aid Project No. BR-083-01(42)

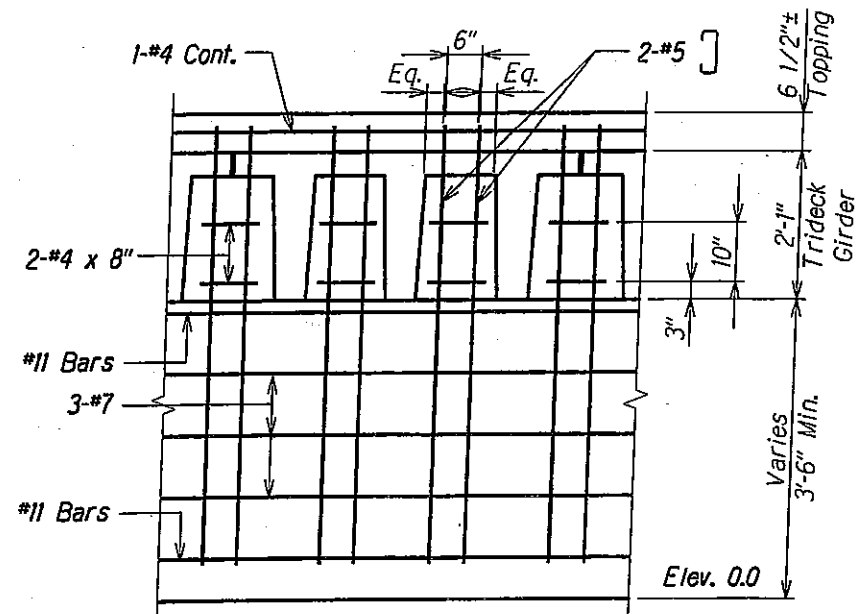
Scale: As Shown Date: March, 2010

SHEET No. 587 OF 63 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-01(42)	2009	29	63



SECTION THRU DRILLED SHAFT BETWEEN TRIDECK STEMS
 Scale: 3/4" = 1'-0"



PARTIAL ABUTMENT ELEVATION
 Scale: 3/4" = 1'-0"

Note:
 "A" Stirrups and
 "B" Stirrups
 Not shown for clarity.

07/30/10	2	Revised Drawings
DATE		REVISION

STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION

HIGHWAYS DIVISION

ABUTMENT SECTION AND ELEVATION

KAMEHAMEHA HIGHWAY - REPLACEMENT

OF SOUTH PUNALUU STREAM BRIDGE

Federal Aid Project No. BR-083-01(42)

Scale: As Shown

Date: March, 2010

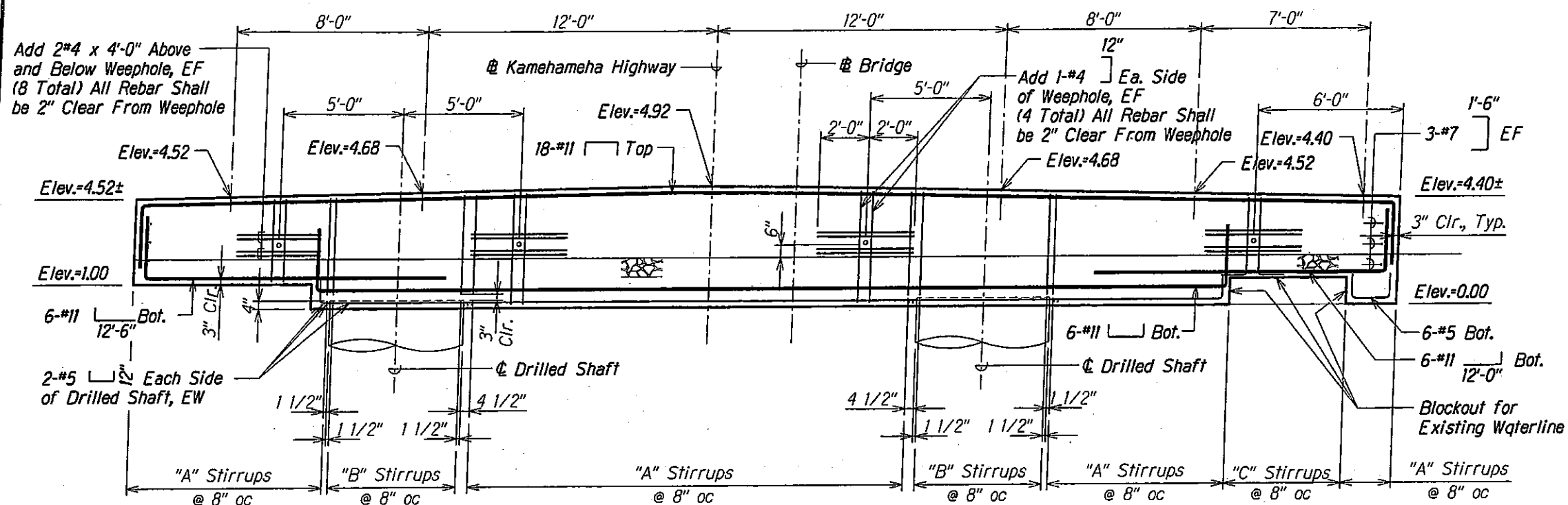
SHEET NO. 58.8 OF 63 SHEETS



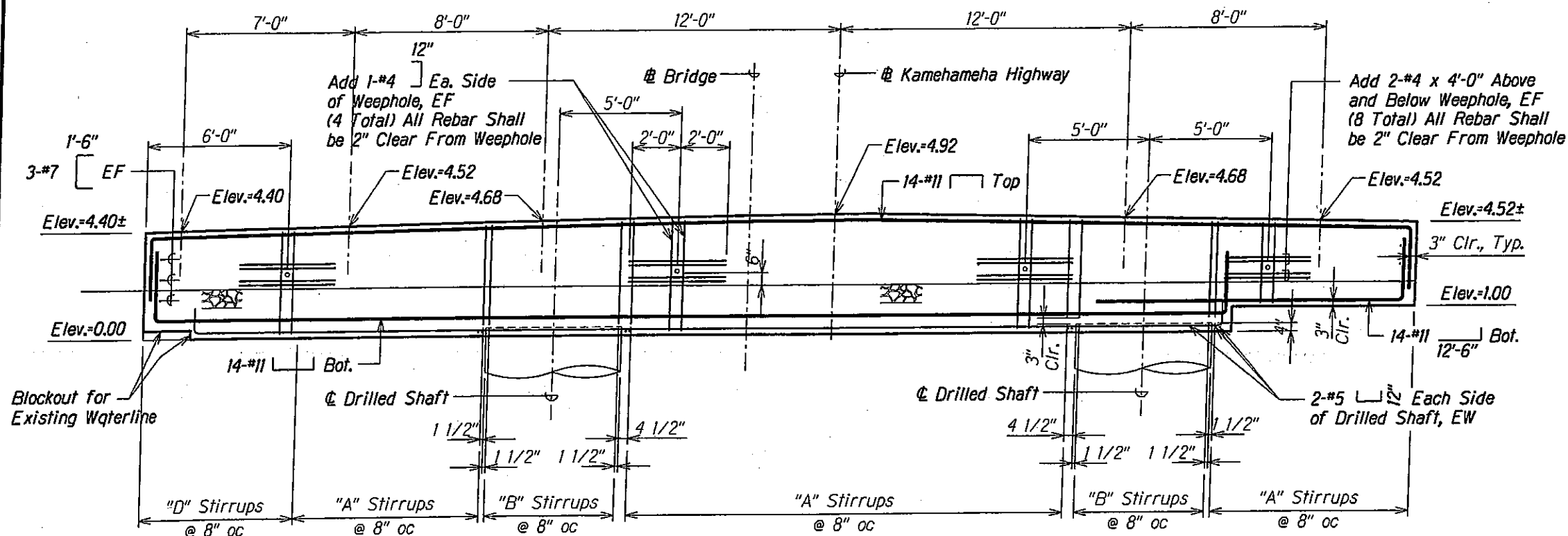
THIS WORK WAS PREPARED BY ME
 OR UNDER MY SUPERVISION.

KSF, INC. APRIL 30, 2010
 LIC. EXP. DATE

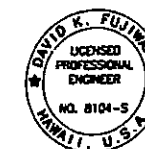
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-01(42)	2009	30	63



ABUTMENT NO. 1 CAP REINFORCING ELEVATION A
 Scale: 3/8" = 1'-0" S84/S89



ABUTMENT NO. 2 CAP REINFORCING ELEVATION B
 Scale: 3/8" = 1'-0" S85/S89



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KSF, INC. APR 30, 2010 LIC. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**ABUTMENT NO. 1 AND NO. 2
REINFORCING ELEVATIONS**

**KAMEHAMEHA HIGHWAY - REPLACEMENT
OF SOUTH PUNALUU STREAM BRIDGE**

Federal Aid Project No. BR-083-01(42)

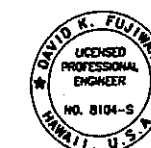
Scale: As Shown Date: March, 2010

SHEET No. **S89** OF **63** SHEETS

07/30/10	2	New Sheet
DATE		REVISION

NOTE BOOK	TRACED BY _____	_____
	DESIGNED BY _____	_____
	QUANTITIES BY _____	_____
	CHECKED BY _____	_____

NOTE BOOK	TRACED BY _____
No. _____	DESIGNED BY _____
	QUANTITIES BY _____
	CHECKED BY _____



APRIL 30, 2000

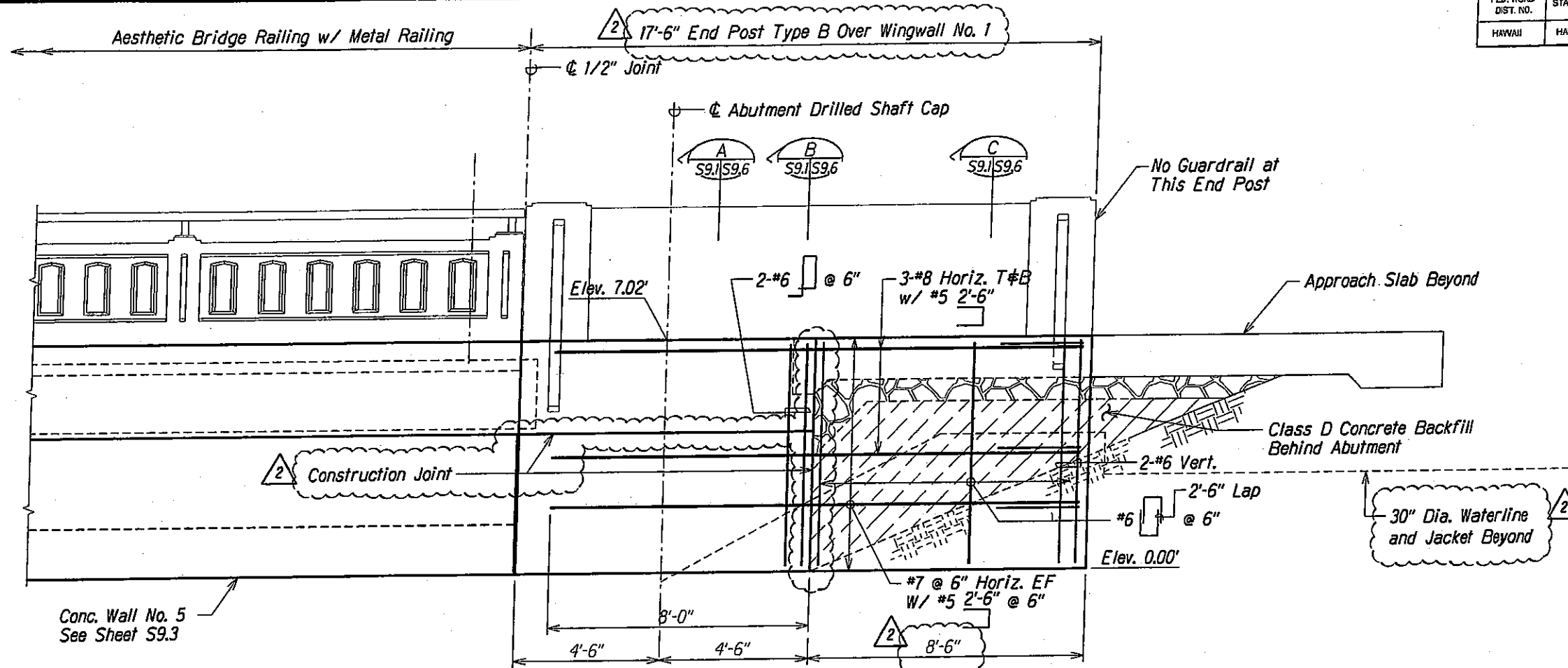
WSE INC

INC EXP DA

SHEET No. 5810 OF 63 SHEETS

DATE	REVISION
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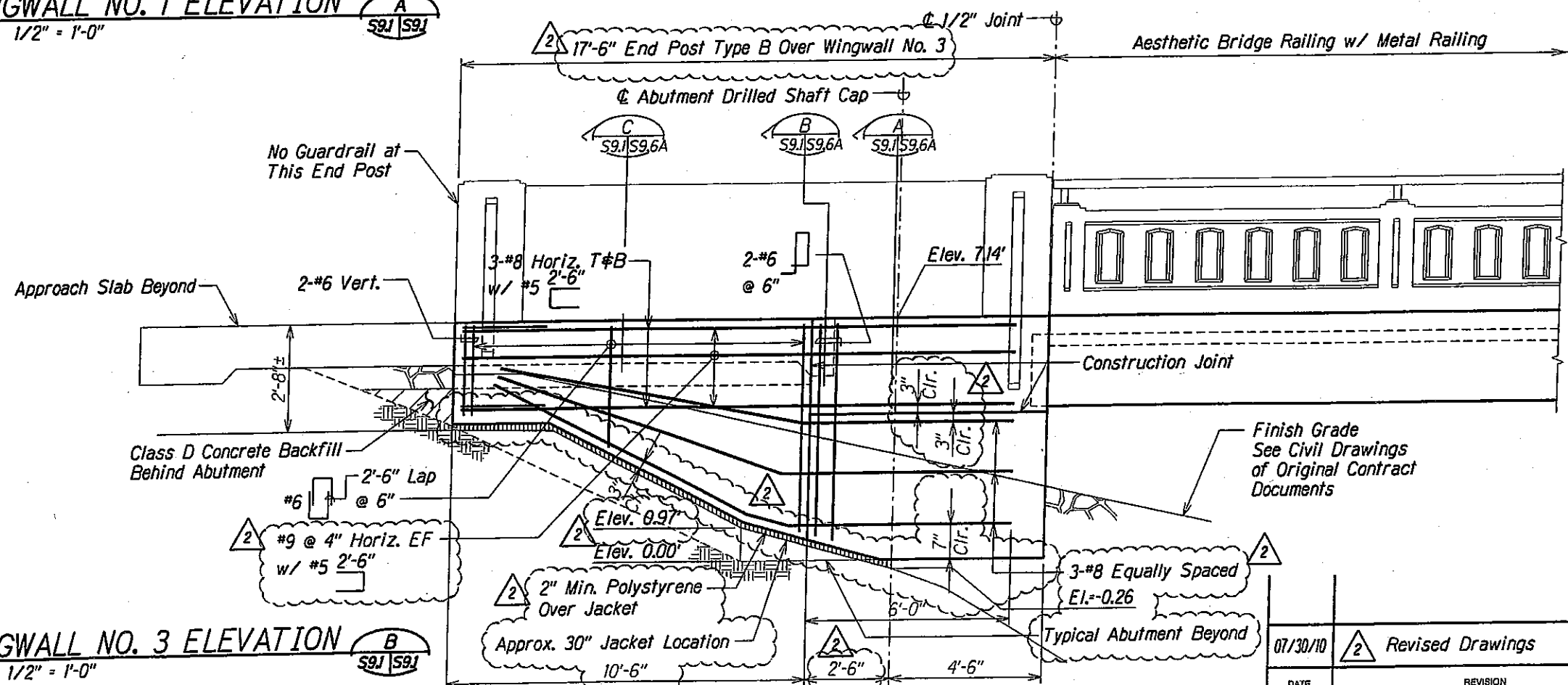
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-01(42)	2009	33	63



WINGWALL NO. 1 ELEVATION

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

A
S9J/S9J



WINGWALL NO. 3 ELEVATION

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

B
S9J/S9J



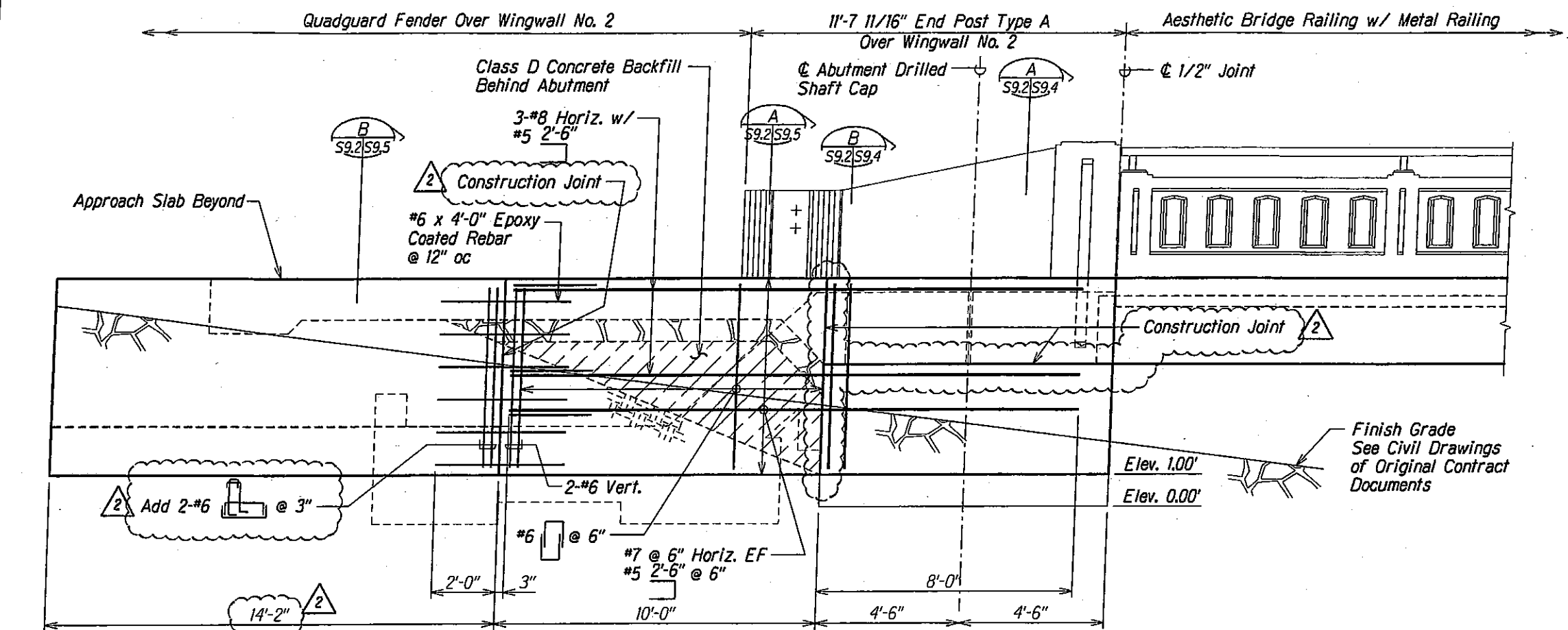
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

KSF, INC. APRIL 30, 2012 U.C. EXP. DATE

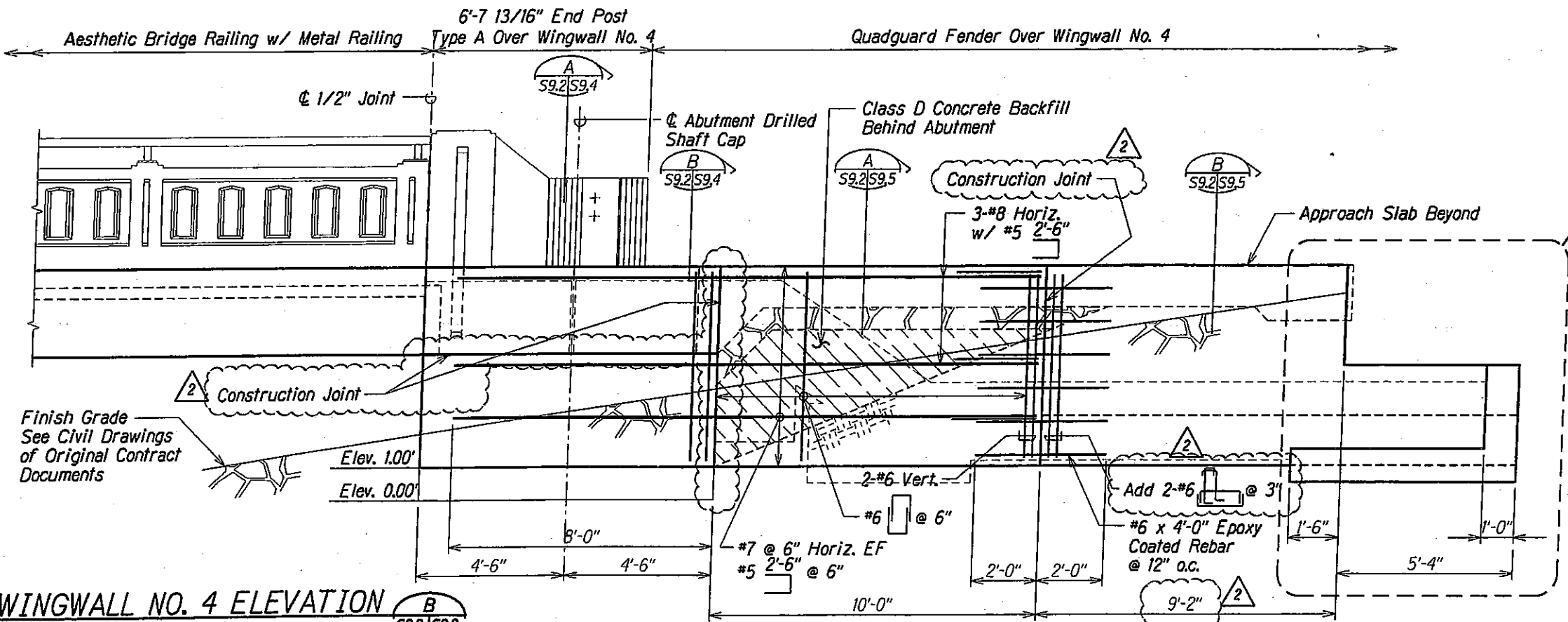
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
WINGWALL NOS 1 & 3 ELEVATIONS	
KAMEHAMEHA HIGHWAY - REPLACEMENT OF SOUTH PUNALUU STREAM BRIDGE	
Federal Aid Project No. BR-083-01(42)	
Scale: As Shown	Date: March, 2010
SHEET No. S9J OF 63 SHEETS	

DATE	07/30/10
REVISION	2 Revised Drawings

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-01(42)	2009	34	63

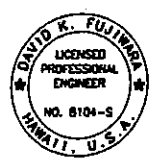


WINGWALL NO. 2 ELEVATION
 Scale: 1/2" = 1'-0"



WINGWALL NO. 4 ELEVATION
 Scale: 1/2" = 1'-0"

07/30/10	2	Revised Drawings
DATE		REVISION



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APR 30 2010
 L.C. EXP. DATE

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

WINGWALL NOS 2 & 4 ELEVATIONS

KAMEHAMEHA HIGHWAY - REPLACEMENT OF SOUTH PUNALUU STREAM BRIDGE

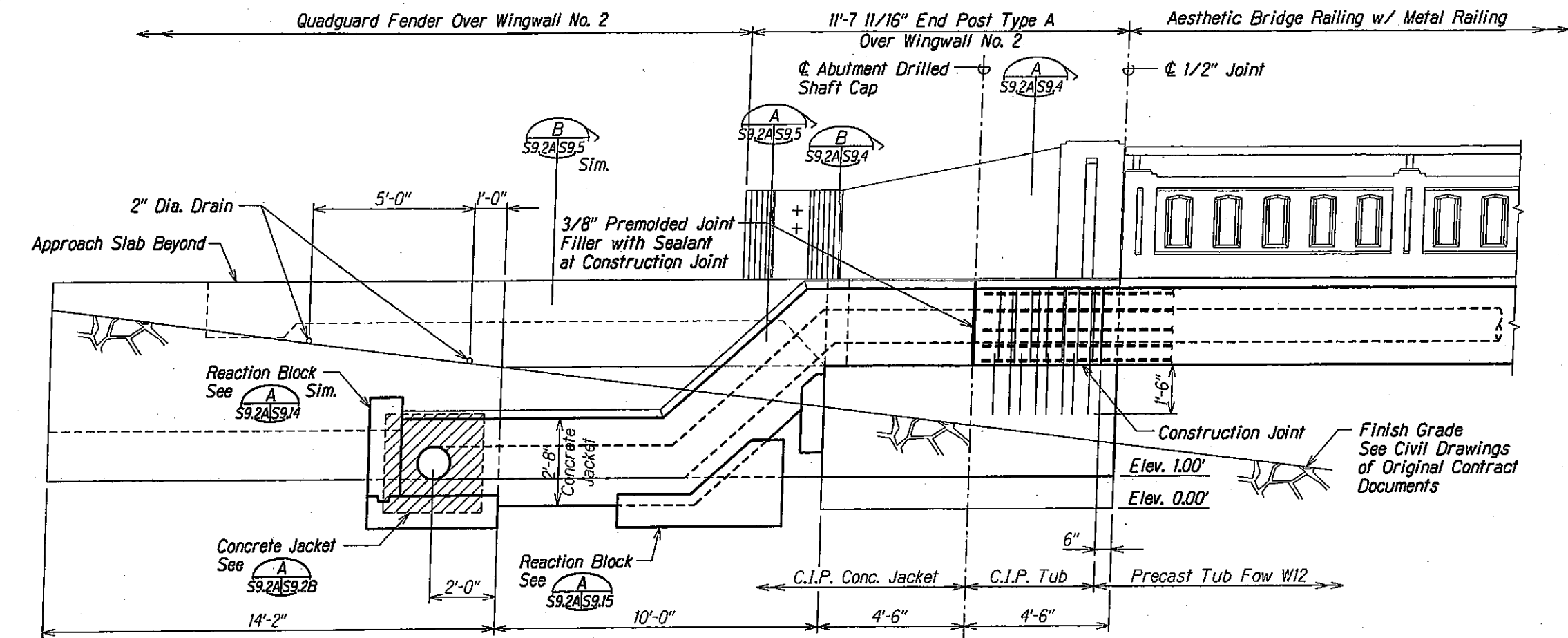
Federal Aid Project No. BR-083-01(42)

Scale: As Shown Date: March, 2010

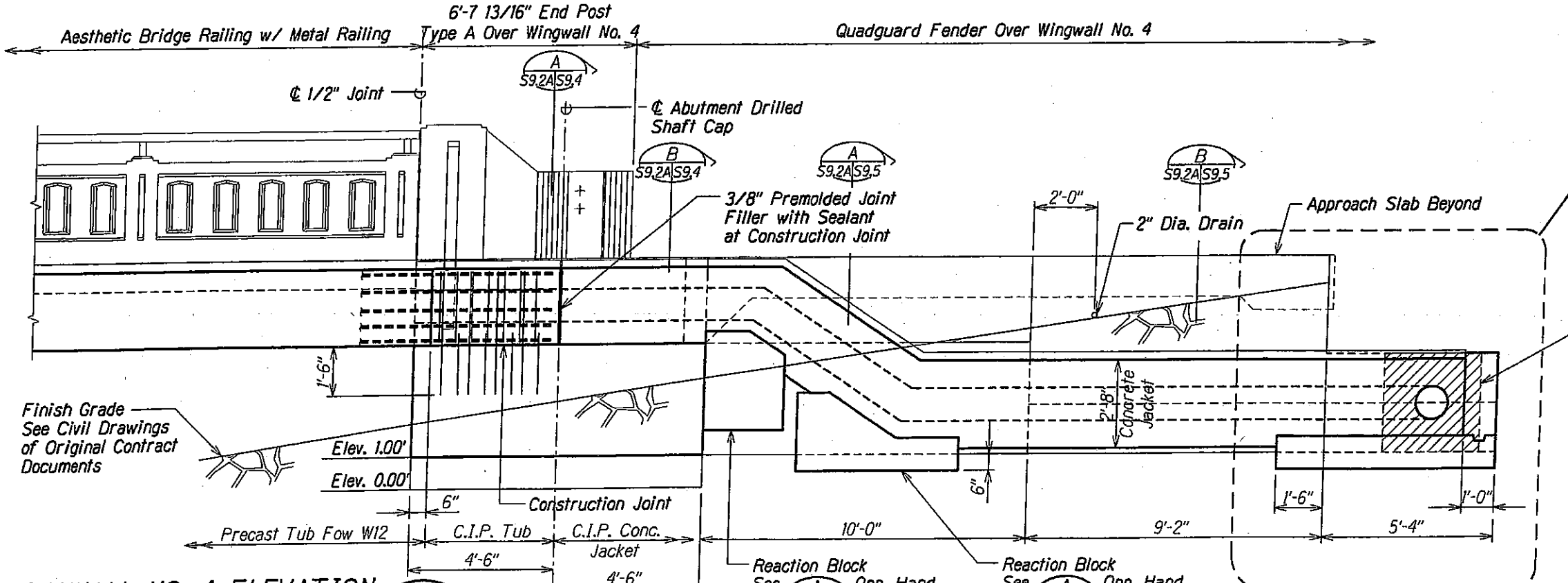
SHEET No. S92 OF 63 SHEETS

DRAWING NAME: 2100 ORIGINATING 900136-50 PUNALUU STR BRIDGE 107-10-10 SP59-5500.DWG
 PLOT TIME: 07-29-10 2:52 PM
 DESIGNED BY: [blank]
 CHECKED BY: [blank]

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-01(42)	2009	35	63

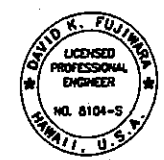


WINGWALL NO. 2 ELEVATION
 Scale: 1/2" = 1'-0"



WINGWALL NO. 4 ELEVATION
 Scale: 1/2" = 1'-0"

07/30/10	2	New Sheet
DATE		REVISION

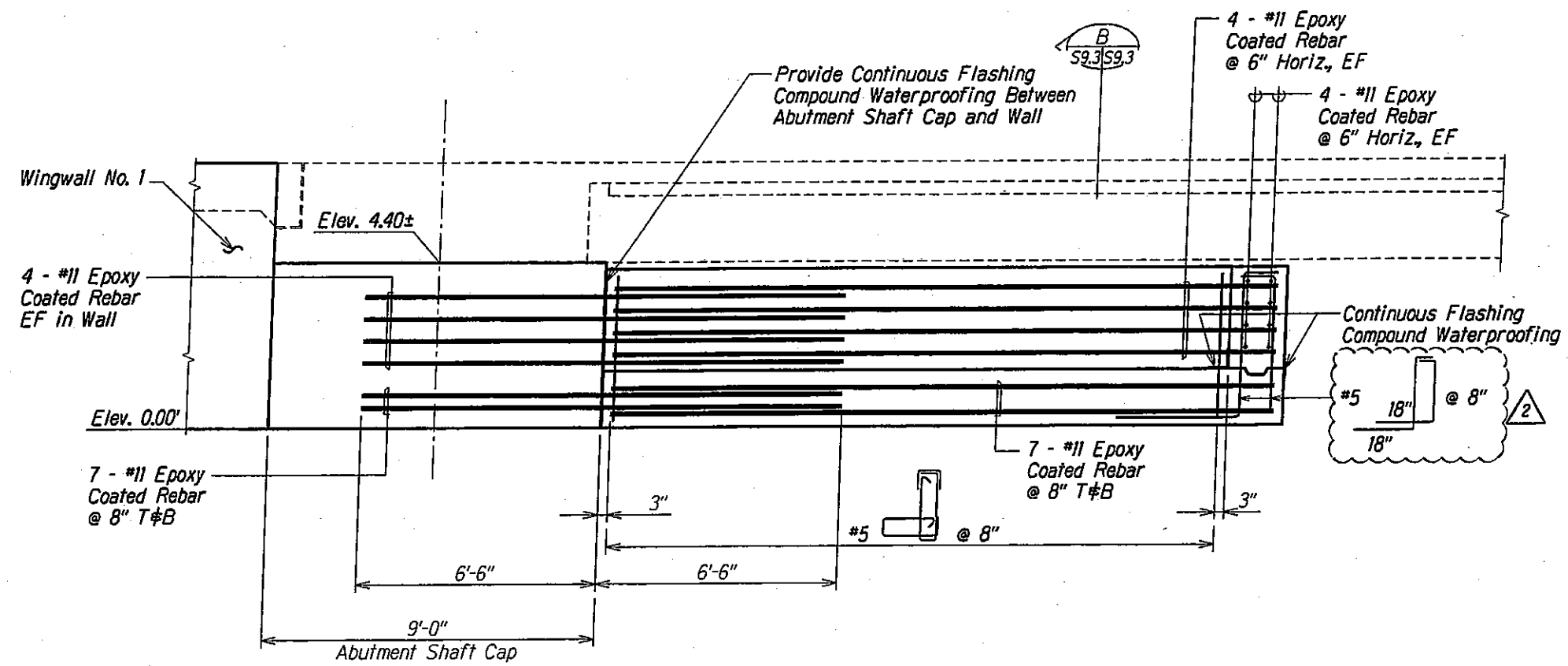


THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

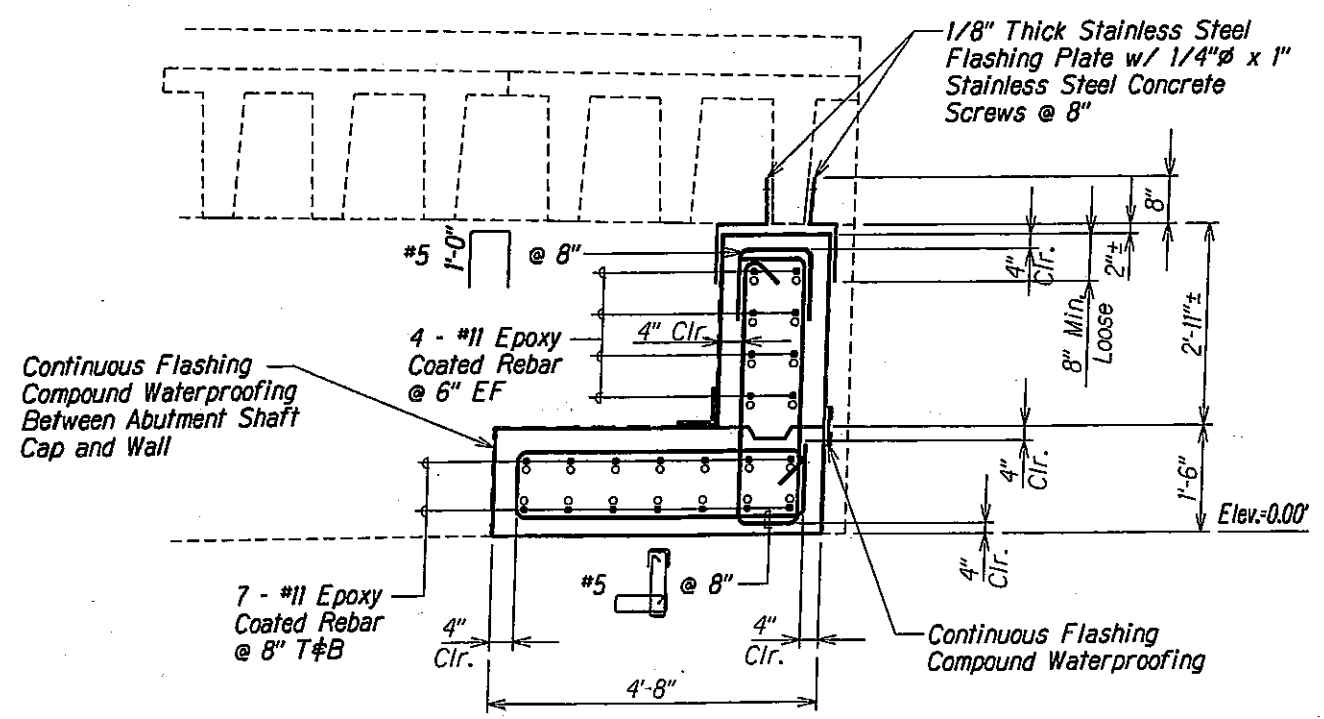
APR 30 2010
 LIC. EXP. DATE

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION
WINGWALL NOS 2 & 4
CONCRETE JACKET ELEVATIONS
KAMEHAMEHA HIGHWAY - REPLACEMENT
OF SOUTH PUNALUU STREAM BRIDGE
 Federal Aid Project No. BR-083-01(42)
 Scale: As Shown Date: March, 2010
 SHEET No. S9.2A OF 63 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-01(42)	2009	36	63



CONCRETE WALL NO. 5 ELEVATION
 Scale: 1/2" = 1'-0"
 A
 S9.3 | S9.3



CONCRETE WALL NO. 5 SECTION
 Scale: 3/4" = 1'-0"
 B
 S9.3 | S9.3



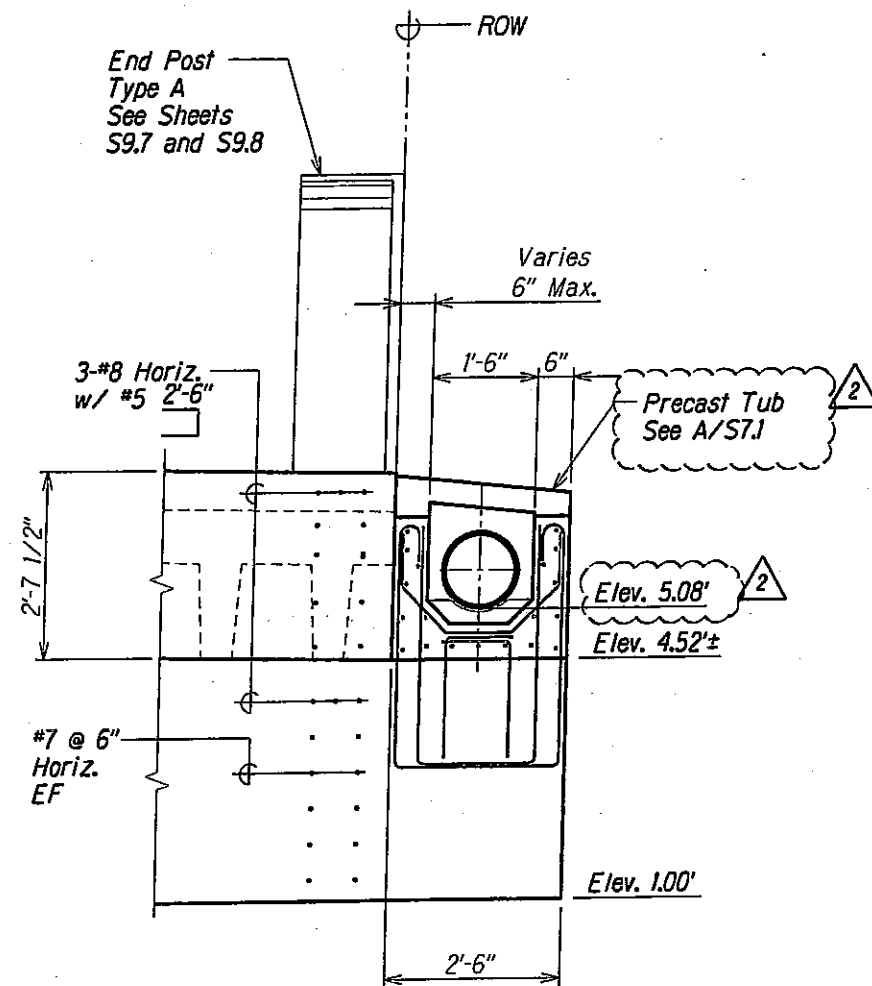
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

KSF, INC. APRIL 30, 2010 LIC. EXP. DATE

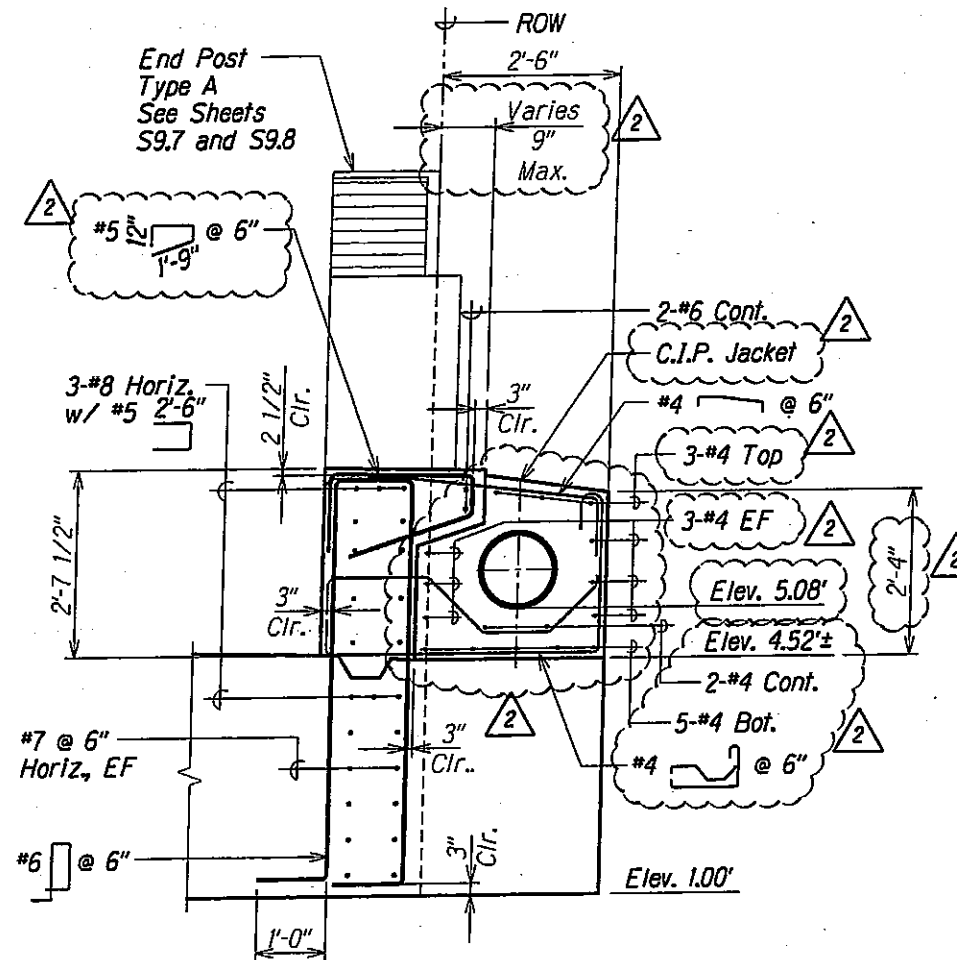
07/30/10	2	Revised Drawings
DATE	REVISION	

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION
CONCRETE WALL NO. 5 ELEVATION AND SECTION
KAMEHAMEHA HIGHWAY - REPLACEMENT OF SOUTH PUNALUU STREAM BRIDGE
Federal Aid Project No. BR-083-01(42)
 Scale: As Shown Date: March, 2010
 SHEET No. S9.3 OF 63 SHEETS

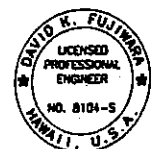
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-01(42)	2009	37	63



WINGWALL SECTION A
Scale: 3/4" = 1'-0"
S9.2A S9.4



WINGWALL SECTION B
Scale: 3/4" = 1'-0"
S9.2 S9.4



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KSF, INC. APRIL 30, 2010
LIC. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

WINGWALL SECTIONS

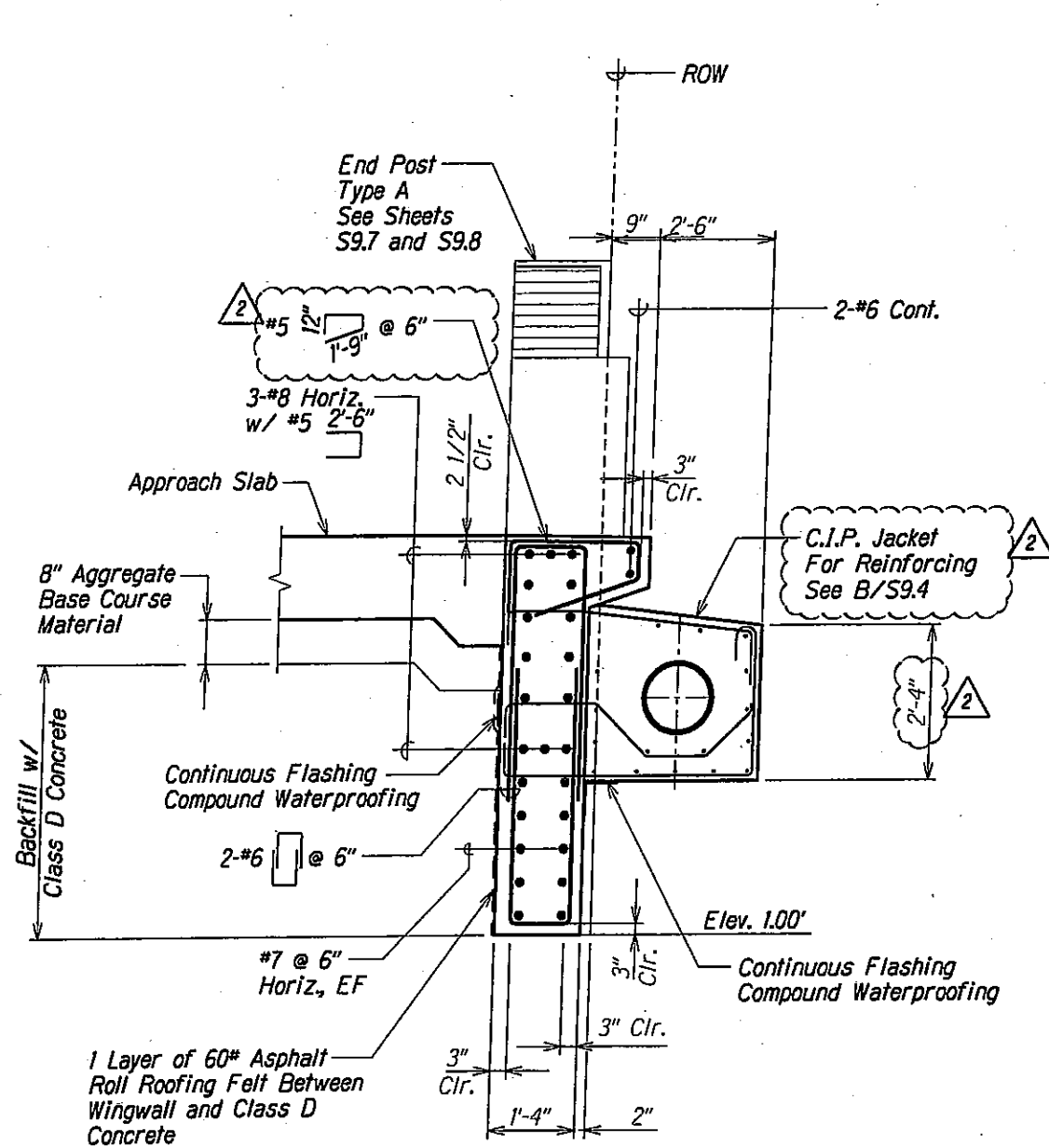
**KAMEHAMEHA HIGHWAY - REPLACEMENT
OF SOUTH PUNALUU STREAM BRIDGE**
Federal Aid Project No. BR-083-01(42)

Scale: As Shown Date: March, 2010

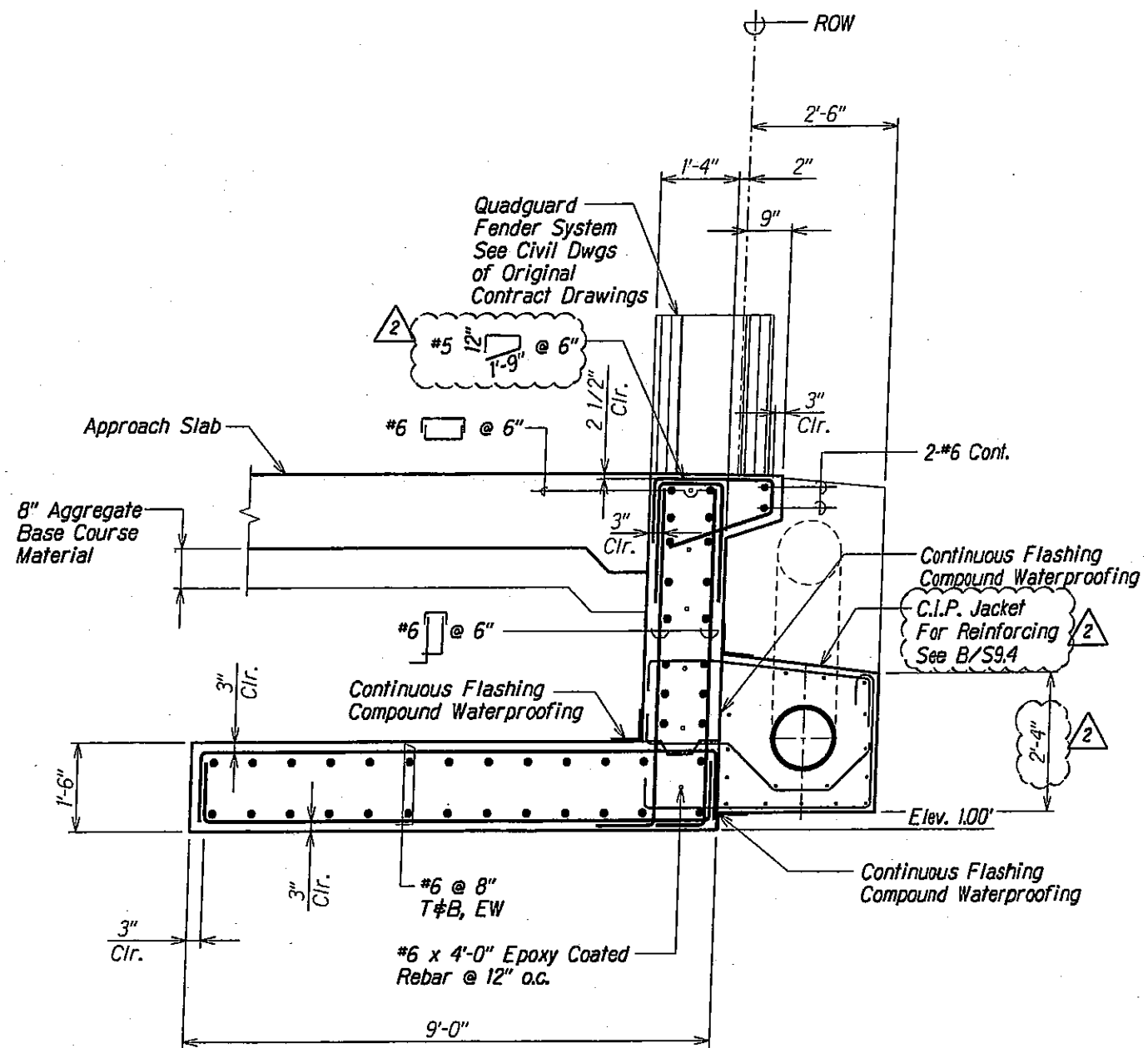
SHEET No. 59.4 OF 63 SHEETS

07/30/10	2 Revised Drawings
DATE	REVISION

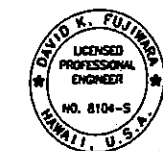
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-01(42)	2009	38	63



WINGWALL SECTION A
Scale: 3/4" = 1'-0"
S9.2A S9.5



WINGWALL SECTION B
Scale: 3/4" = 1'-0"
S9.2A S9.5



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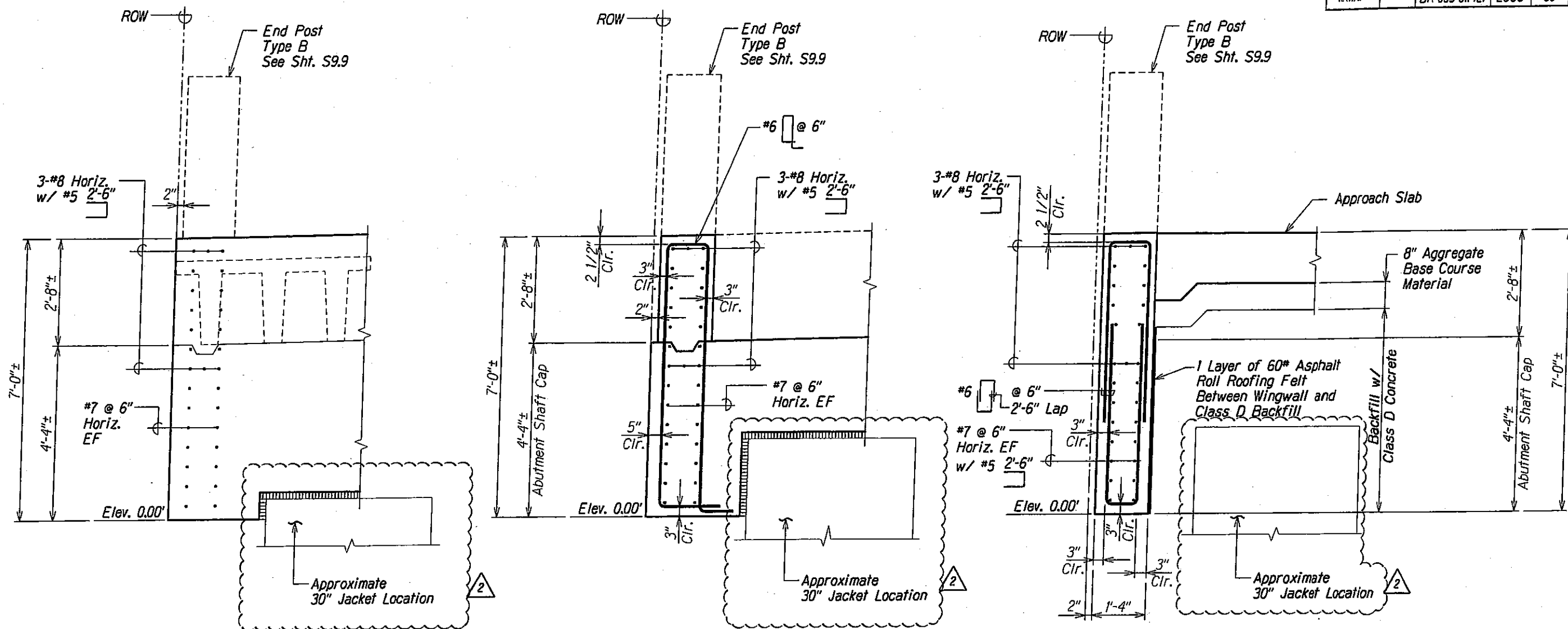
APRIL 30, 2010
KSF, INC. U.C. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

WINGWALL SECTIONS
KAMEHAMEHA HIGHWAY - REPLACEMENT
OF SOUTH PUNALUU STREAM BRIDGE
Federal Aid Project No. BR-083-01(42)
Scale: As Shown Date: March, 2010
SHEET No. S9.5 OF 63 SHEETS

07/30/10	2	Revised Drawings
DATE		REVISION

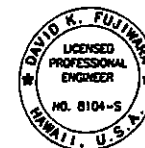
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-01(42)	2009	39	63



WINGWALL SECTION A
Scale: 3/4" = 1'-0"
S91 S96

WINGWALL SECTION B
Scale: 3/4" = 1'-0"
S91 S96

WINGWALL SECTION C
Scale: 3/4" = 1'-0"
S91 S96



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KST, INC. APRIL 30, 2010
LIC. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

WINGWALL NO. 1 SECTIONS

**KAMEHAMEHA HIGHWAY - REPLACEMENT
OF SOUTH PUNALUU STREAM BRIDGE**
Federal Aid Project No. BR-083-01(42)

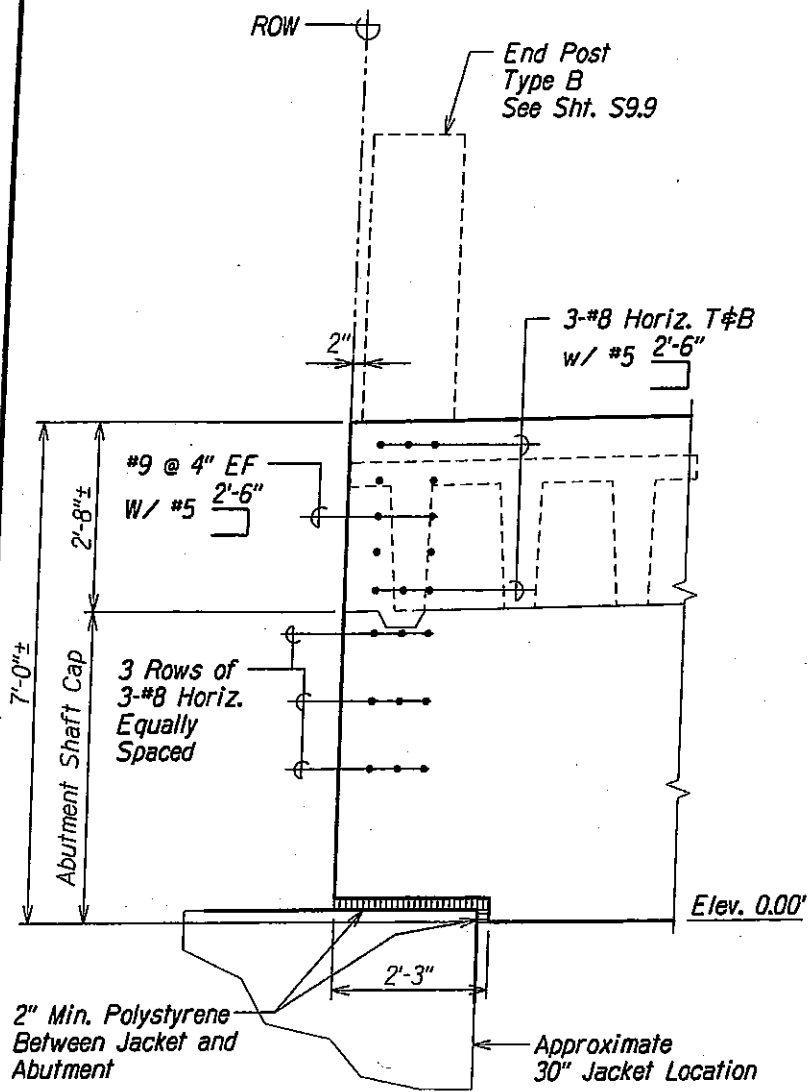
Scale: As Shown Date: March, 2010

SHEET No. S96 OF 63 SHEETS

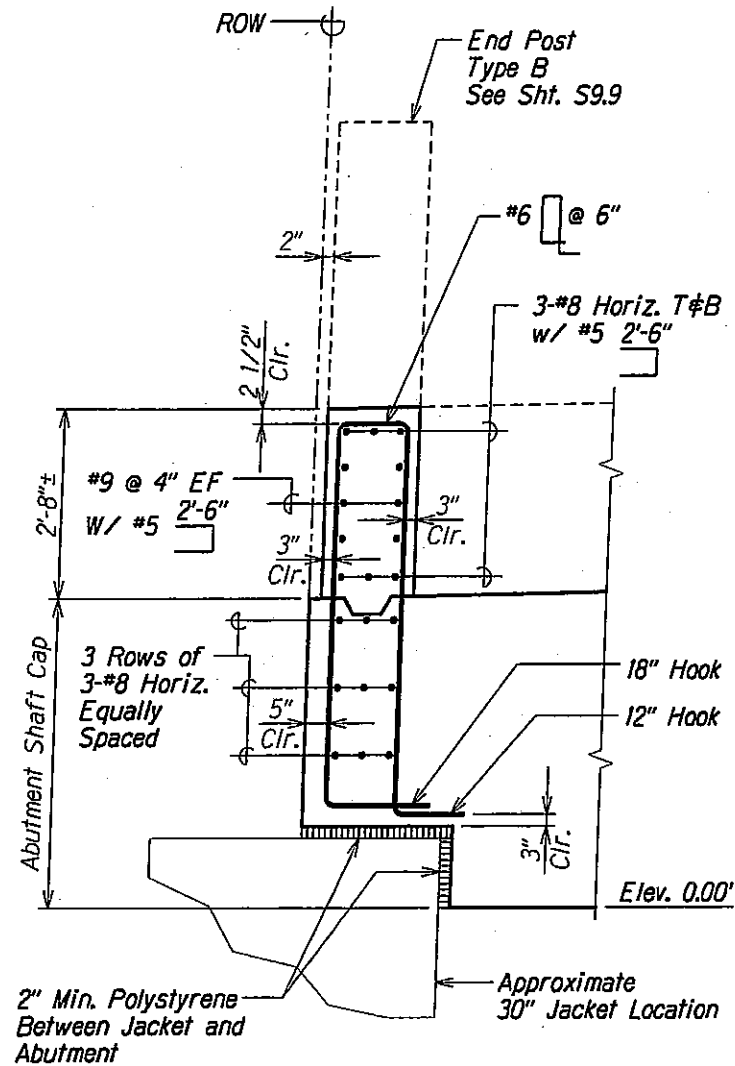
07/30/10	2	Revised Drawings
DATE		REVISION

DRAWING NAME: 2.100 (ANGING) 190215-50 PUNALUU STR BRIDGE 07-30-10 (SPSP-BUILDING) PLOT TIME: 07-29-10, 2:53 PM
 DESIGNED BY: [blank]
 CHECKED BY: [blank]
 NO. [blank]

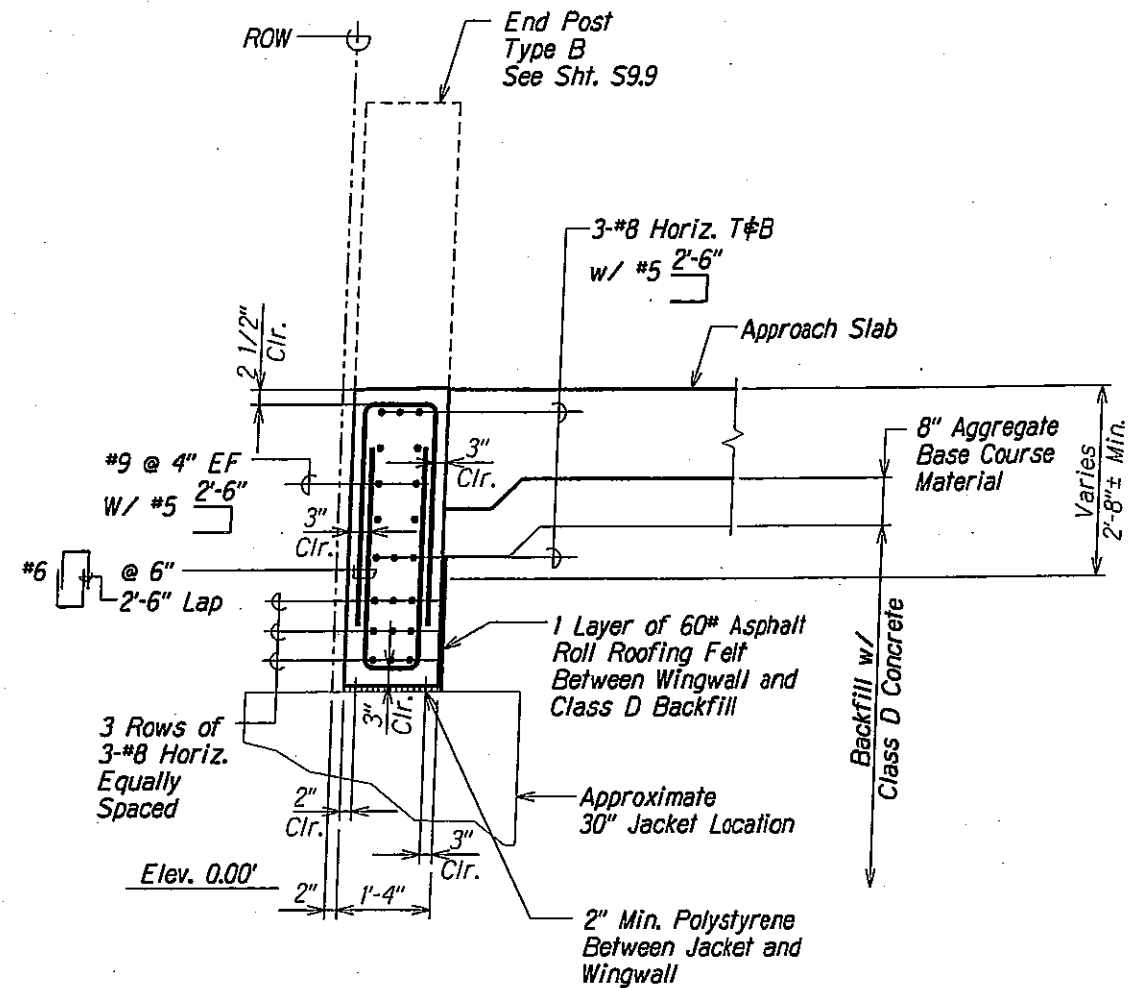
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-01(42)	2009	40	63



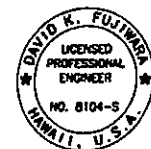
WINGWALL SECTION **A**
Scale: 3/4" = 1'-0"
S9J S9.6A



WINGWALL SECTION **B**
Scale: 3/4" = 1'-0"
S9J S9.6A



WINGWALL SECTION **C**
Scale: 3/4" = 1'-0"
S9J S9.6A



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OR UNDER MY SUPERVISION.

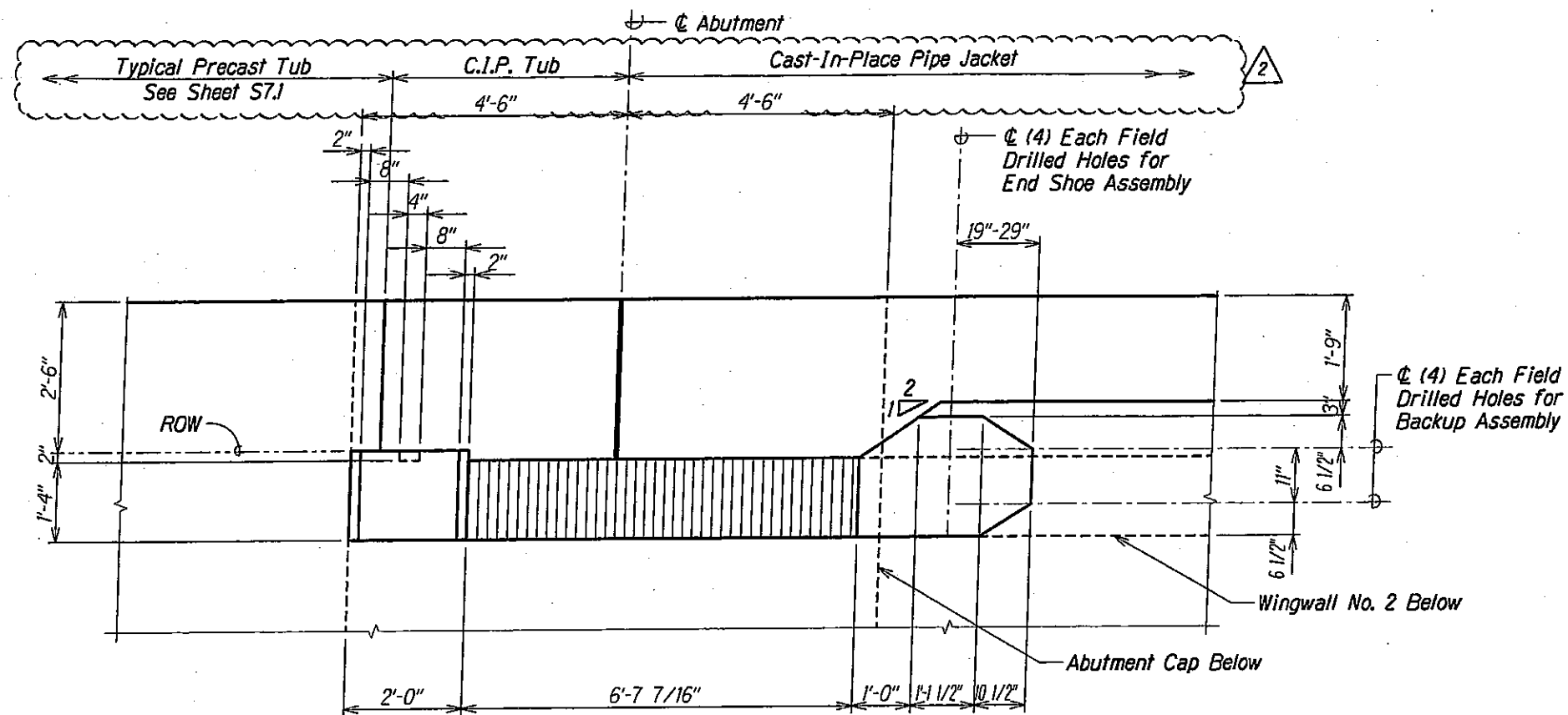
APR 30, 2010
UC EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

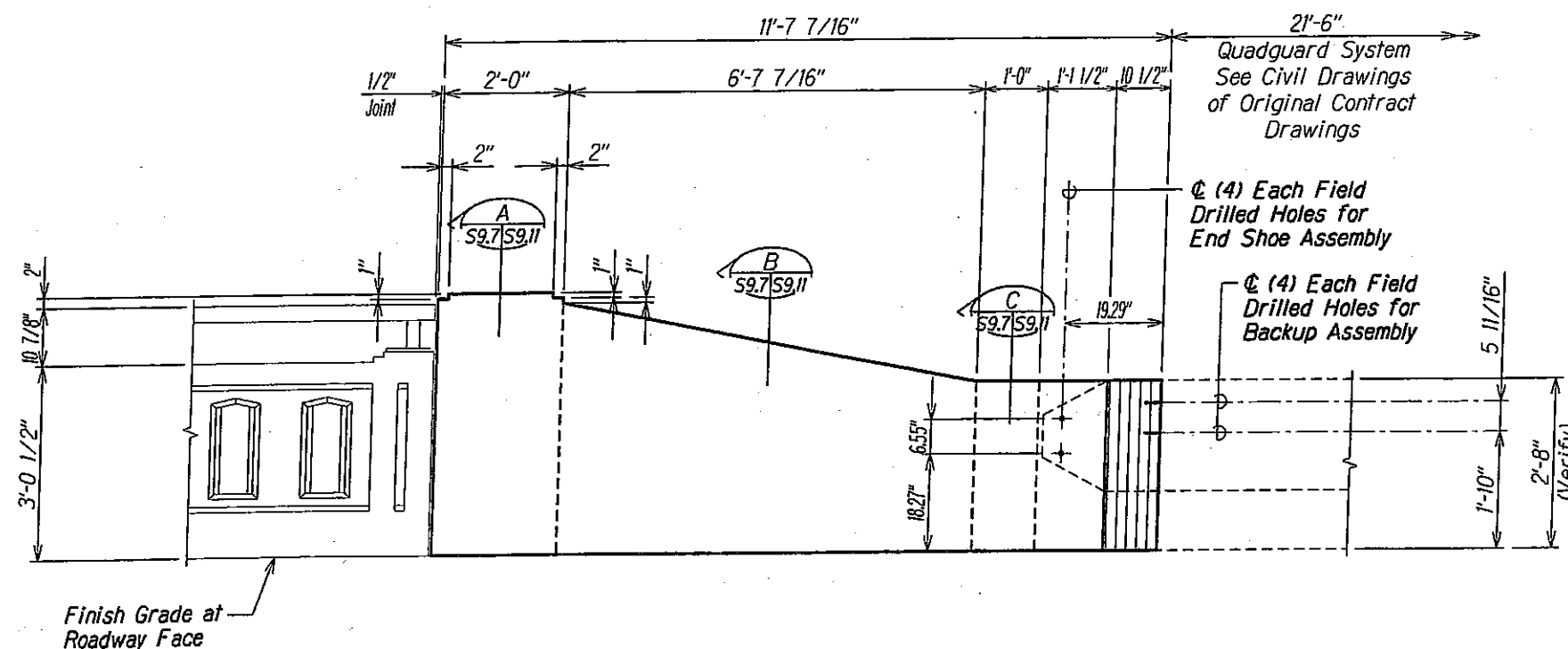
WINGWALL NO. 3 SECTIONS
KAMEHAMEHA HIGHWAY - REPLACEMENT
OF SOUTH PUNALUU STREAM BRIDGE
Federal Aid Project No. BR-083-01(42)
Scale: As Shown Date: March, 2010
SHEET No. S9.6A OF 63 SHEETS

07/30/10	2	New Sheet
DATE	REVISION	

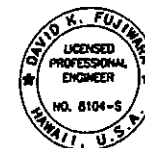
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-01(42)	2009	41	63



END POST TYPE A AT WINGWALL NO. 2 PLAN
Scale: 3/4" = 1'-0"



END POST TYPE A AT WINGWALL NO. 2 ELEVATION
(Viewed from Roadway)
Scale: 3/4" = 1'-0"



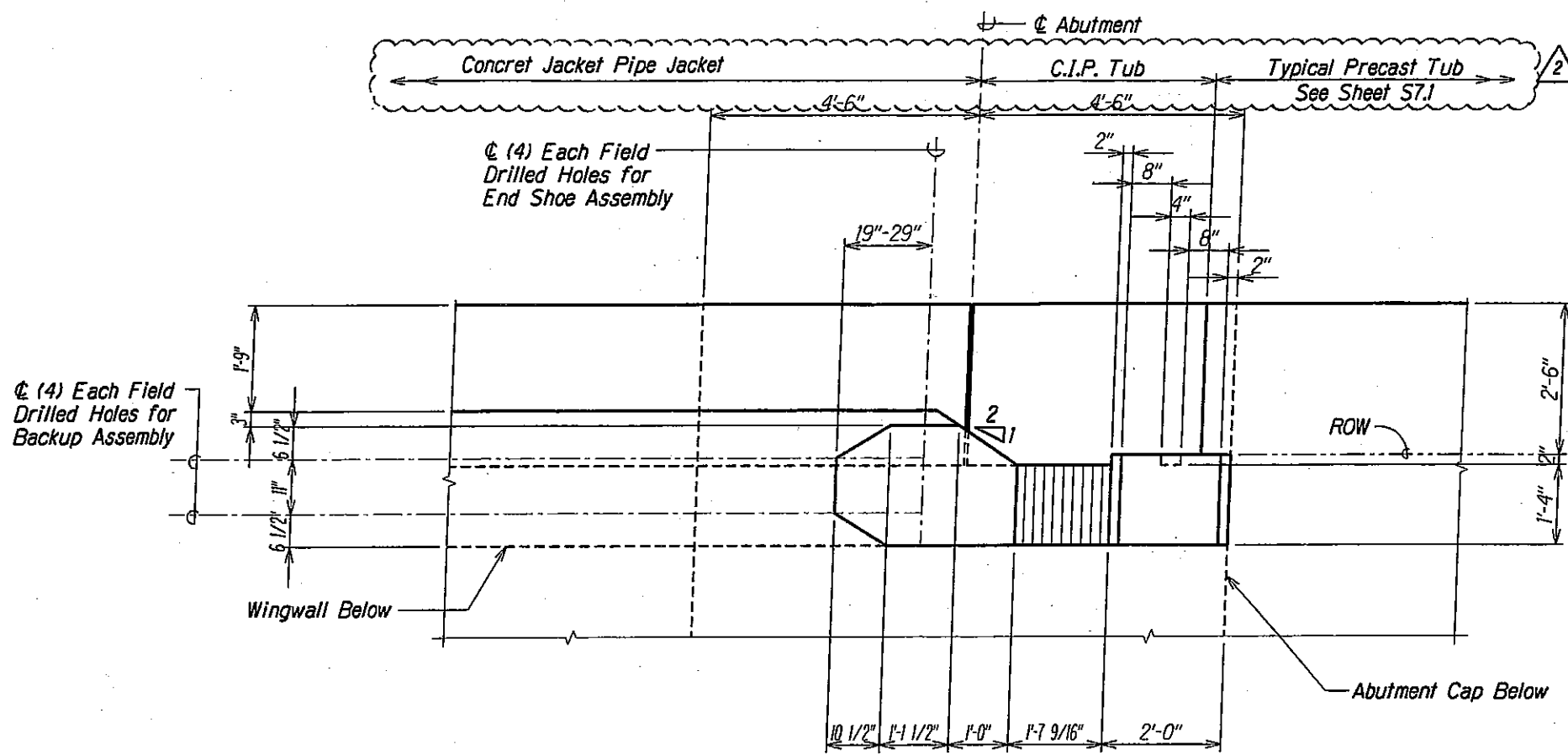
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

KST, INC. APRIL 30, 2010 UC EXP. DATE

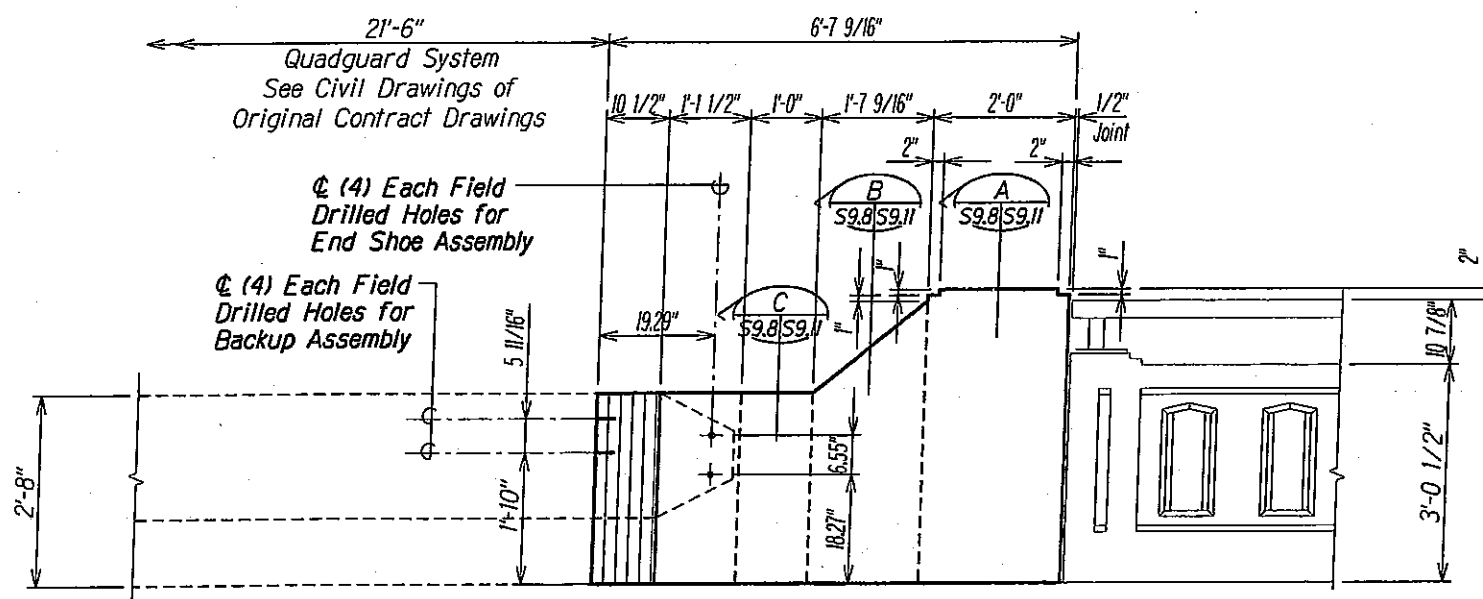
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
END POST TYPE A
PLAN AND ELEVATION
KAMEHAMEHA HIGHWAY - REPLACEMENT
OF SOUTH PUNALUU STREAM BRIDGE
Federal Aid Project No. BR-083-01(42)
Scale: As Shown Date: March, 2010
SHEET No. S9.7 OF 63 SHEETS

07/30/10	2	Revised Drawings
DATE	REVISION	

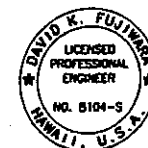
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-01(42)	2009	42	63



END POST TYPE A AT WINGWALL NO. 4 PLAN
 Scale: 3/4" = 1'-0"
 S9.8 S9.8



END POST TYPE A AT WINGWALL NO. 4 ELEVATION
 (Viewed From Roadway)
 Scale: 3/4" = 1'-0"
 S9.8 S9.8



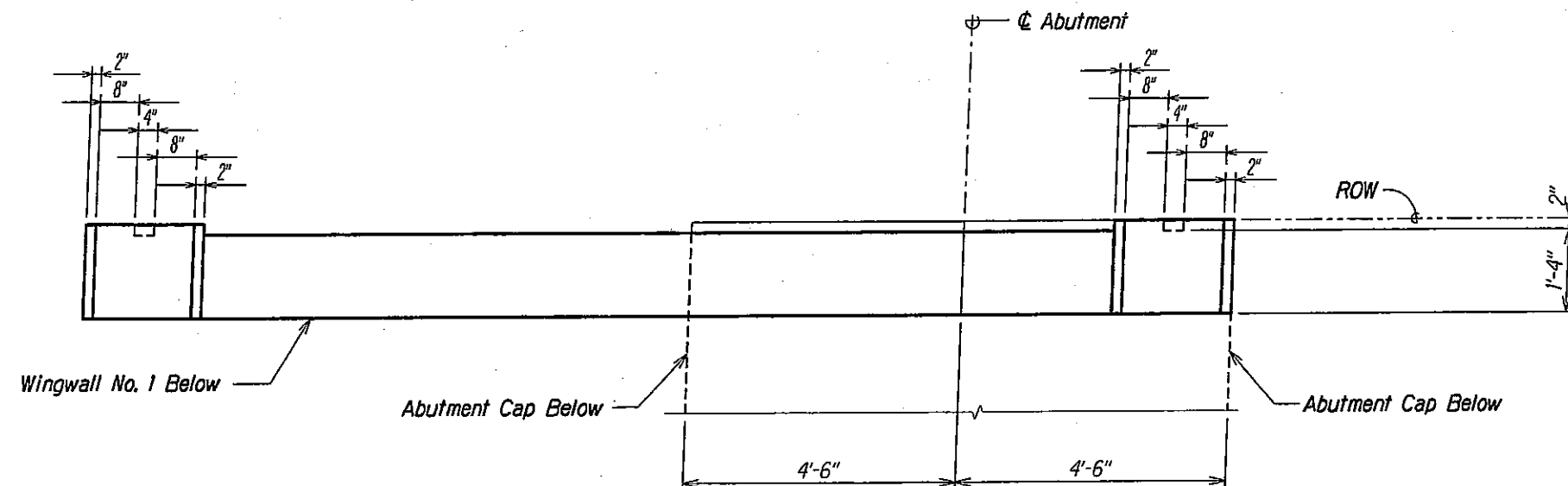
THIS WORK WAS PREPARED BY ME
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KST, INC. APRIL 30, 2010
 LIC. EXP. DATE

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION
END POST TYPE A
PLAN AND ELEVATION
KAMEHAMEHA HIGHWAY - REPLACEMENT
OF SOUTH PUNALUU STREAM BRIDGE
Federal Aid Project No. BR-083-01(42)
 Scale: As Shown Date: March, 2010
 SHEET No. S9.8 OF 63 SHEETS

07/30/10	2	Revised Drawings
DATE	REVISION	

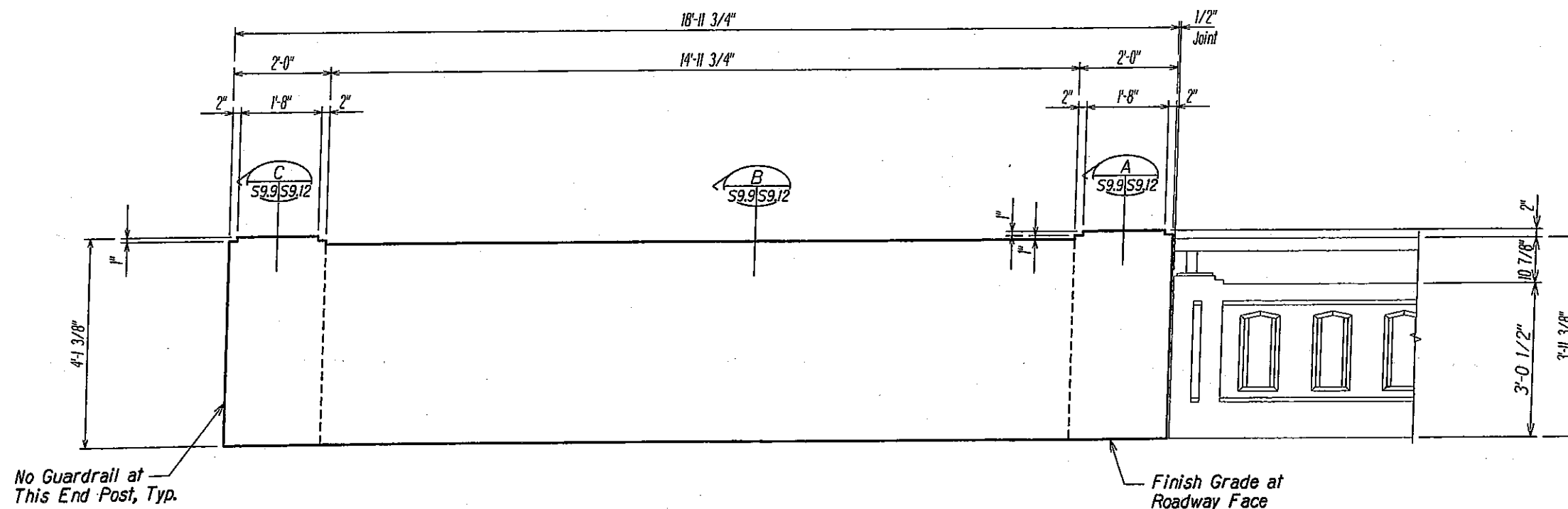
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-01(42)	2009	43	63



END POST TYPE B PLAN - KANEOHE APPROACH SHOWN
(SIMILAR FOR KAHUKU APPROACH)

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

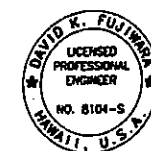
A
S9.9/S9.9



END POST TYPE B ELEVATION - KANEOHE APPROACH SHOWN
(SIMILAR FOR KAHUKU APPROACH)

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

B
S9.9/S9.9



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APR 30 2010
KSF, INC. U.C. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

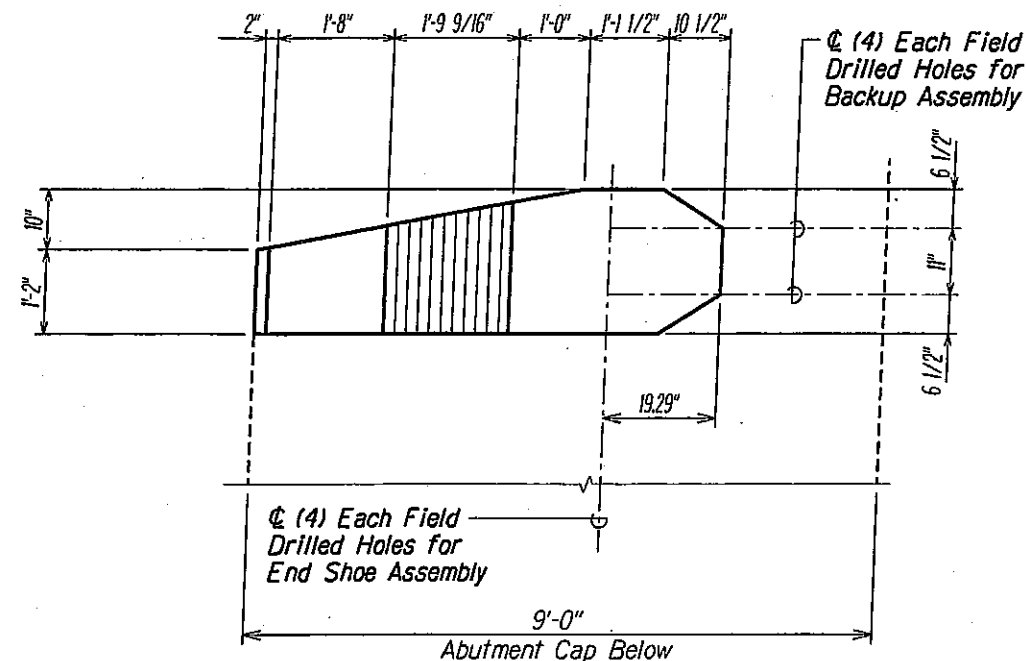
END POST TYPE B
PLAN AND ELEVATION

KAMEHAMEHA HIGHWAY - REPLACEMENT
OF SOUTH PUNALUU STREAM BRIDGE
Federal Aid Project No. BR-083-01(42)

Scale: As Shown Date: March, 2010

SHEET No. S9.9 OF 63 SHEETS

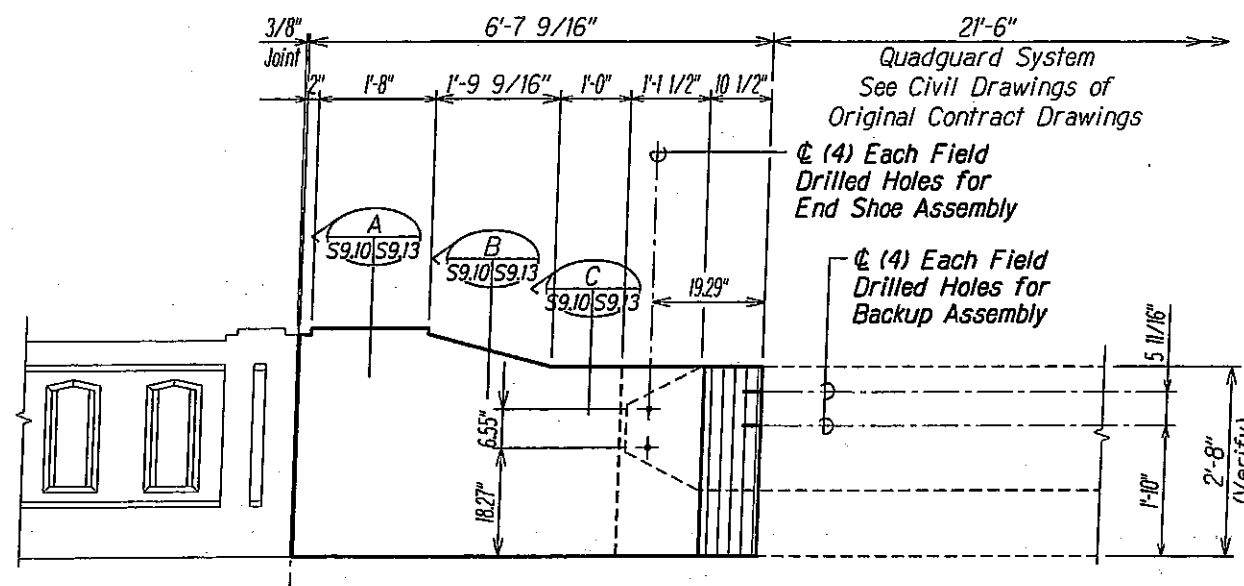
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-01(42)	2009	44	63



END POST TYPE C PLAN - KAHUKU APPROACH SHOWN
(SIMILAR FOR KANEOHE APPROACH)

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

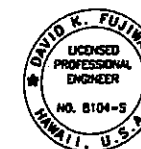
A
S9.10 S9.10



END POST TYPE C ELEVATION - KAHUKU APPROACH SHOWN
(SIMILAR FOR KANEOHE APPROACH)

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

B
S9.10 S9.10



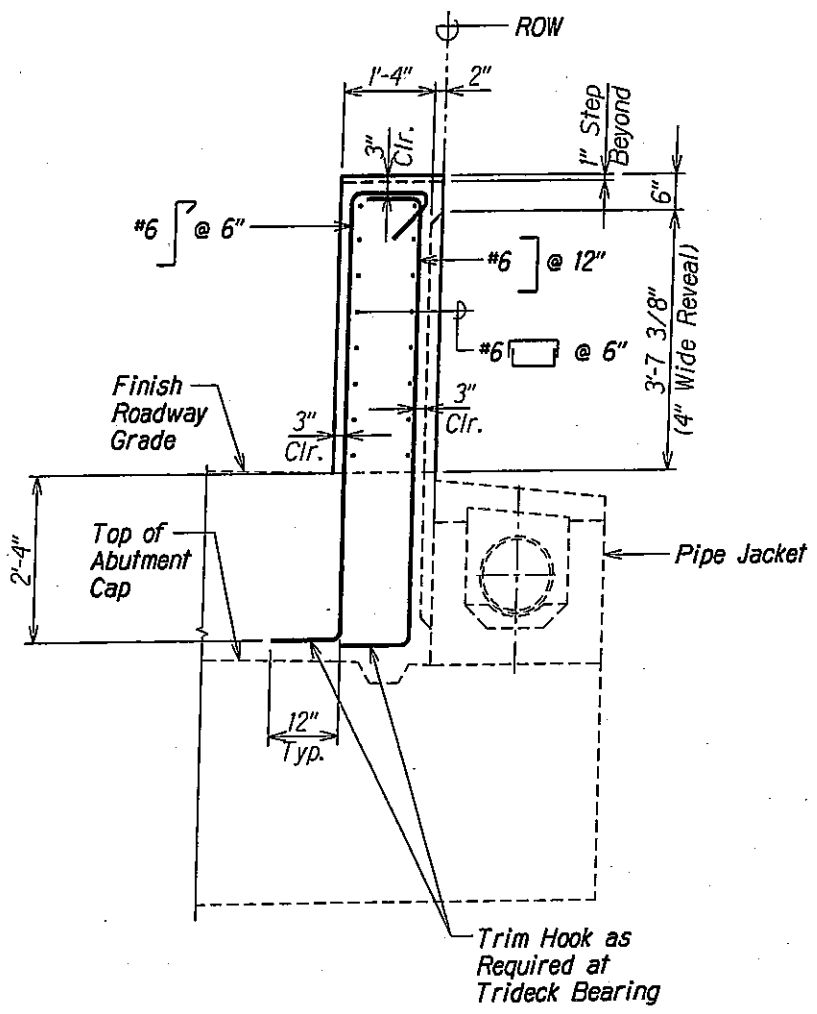
THIS WORK WAS PREPARED BY ME
OR UNDER MY SUPERVISION.

APR 30 2010
UC EXP. DATE

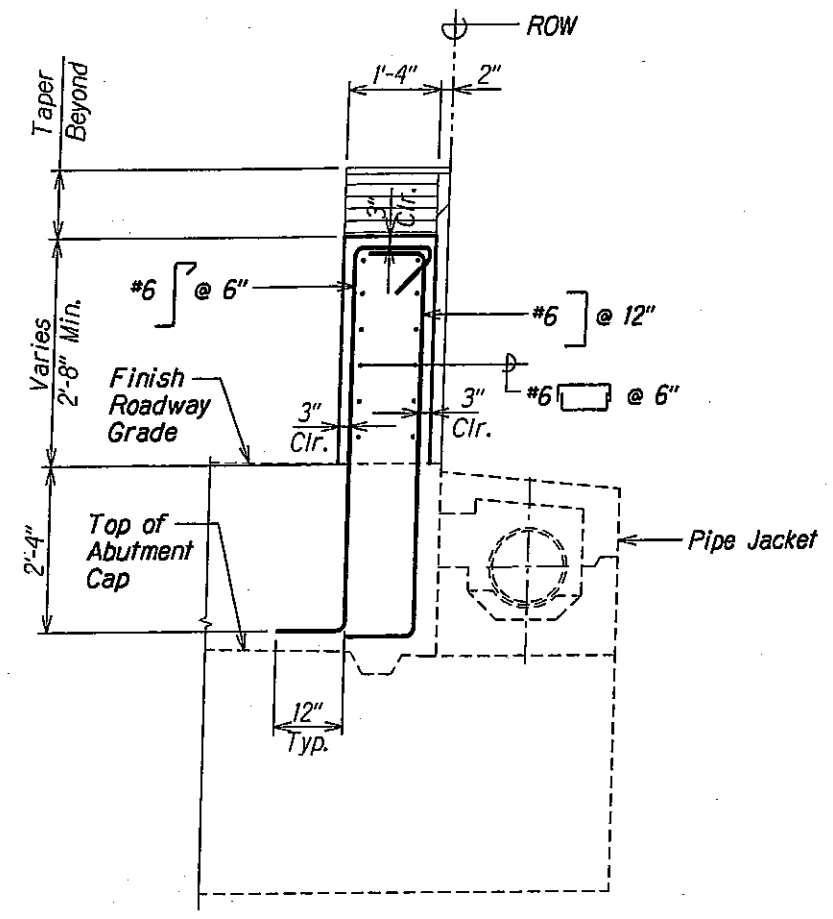
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
END POST TYPE C PLAN AND ELEVATION	
KAMEHAMEHA HIGHWAY - REPLACEMENT OF SOUTH PUNALUU STREAM BRIDGE	
Federal Aid Project No. BR-083-01(42)	
Scale: As Shown	Date: March, 2010
SHEET No. S9.10 OF 63 SHEETS	

DRAWING NAME: 2-100 CIRCUMFERENCE-SD PUNALUU STR BRIDGE 107-10-101 SP59-S9.10-10
 PLOT TIME: 07-29-10, 2:54 PM
 TRACED BY: []
 DESIGNED BY: []
 QUANTITIES BY: []
 CHECKED BY: []
 NO. []

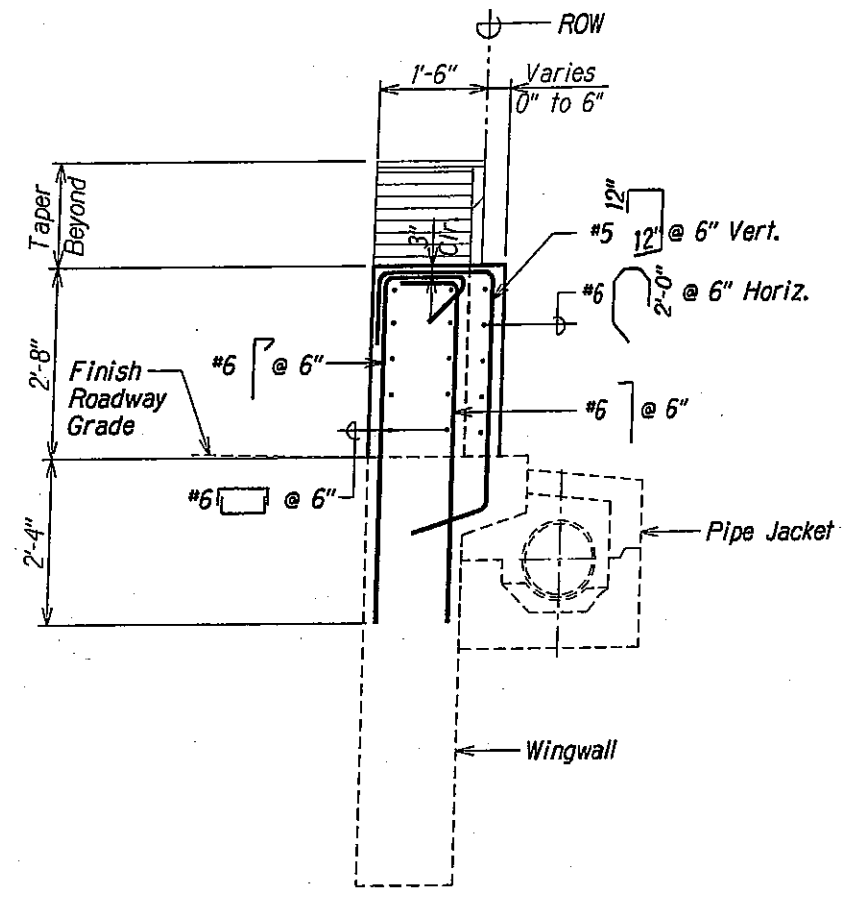
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-01(42)	2009	45	63



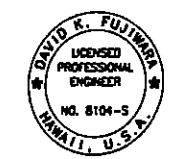
END POST TYPE A SECTION A
Scale: 3/4" = 1'-0"
S9.8



END POST TYPE A SECTION B
Scale: 3/4" = 1'-0"
S9.8



END POST TYPE A SECTION C
Scale: 3/4" = 1'-0"
S9.8



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KST, RLC APRIL 30, 2010 UC EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

END POST TYPE A SECTIONS

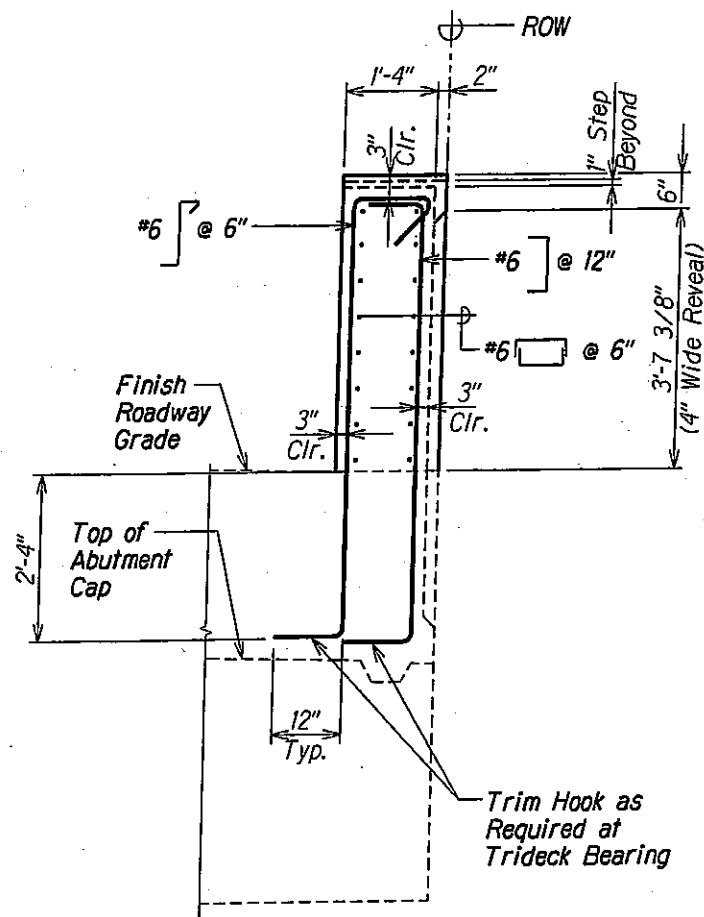
**KAMEHAMEHA HIGHWAY - REPLACEMENT
OF SOUTH PUNALUU STREAM BRIDGE**
Federal Aid Project No. BR-083-01(42)

Scale: As Shown Date: March, 2010

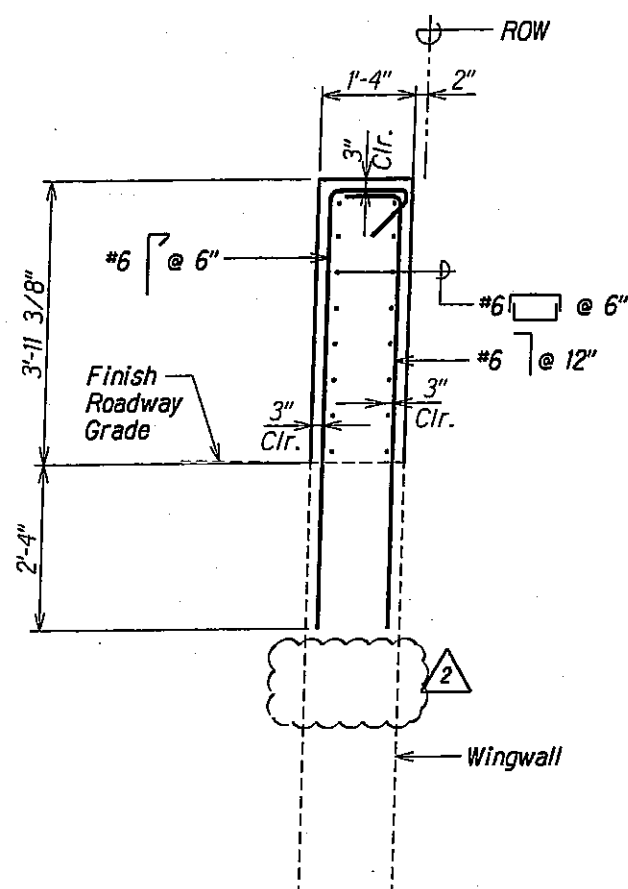
SHEET No. S9.11 OF 63 SHEETS

DESIGNED BY: []
CHECKED BY: []
DATE: []
DRAWING NAME: 2.100 ONCONC190216-50 PUNALUU STR BRIDGE (02-30-10) SPSB-SPOOLING PLOT FILE: 02-30-10 2-54 PM

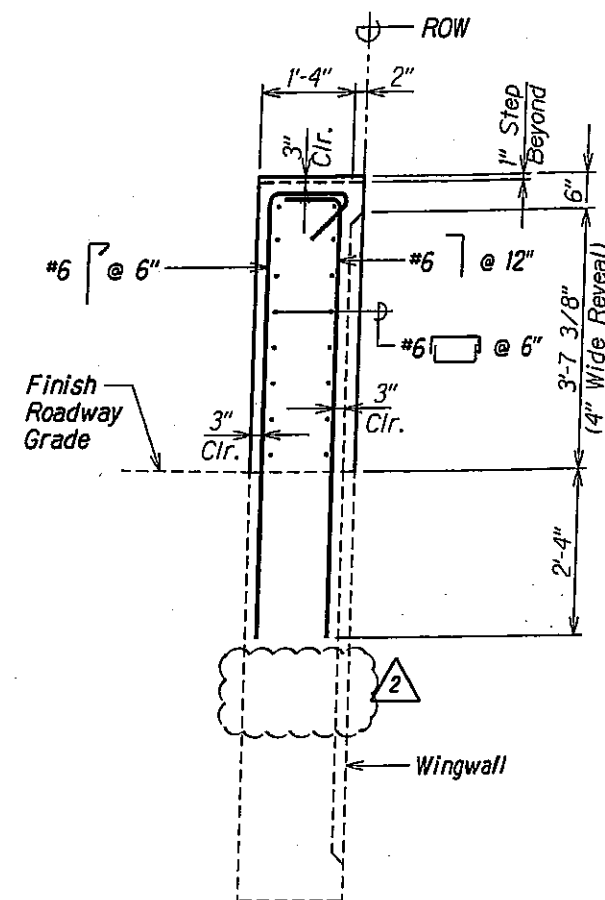
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-01(42)	2009	46	63



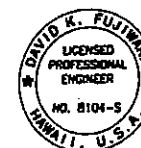
END POST TYPE B SECTION A
Scale: 3/4" = 1'-0" S9.9 | S9.12



END POST TYPE B SECTION B
Scale: 3/4" = 1'-0" S9.9 | S9.12



END POST TYPE B SECTION C
Scale: 3/4" = 1'-0" S9.9 | S9.12



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KSF, INC. APRIL 30, 2010
LIC. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

END POST TYPE B SECTIONS

**KAMEHAMEHA HIGHWAY - REPLACEMENT
OF SOUTH PUNALUU STREAM BRIDGE**

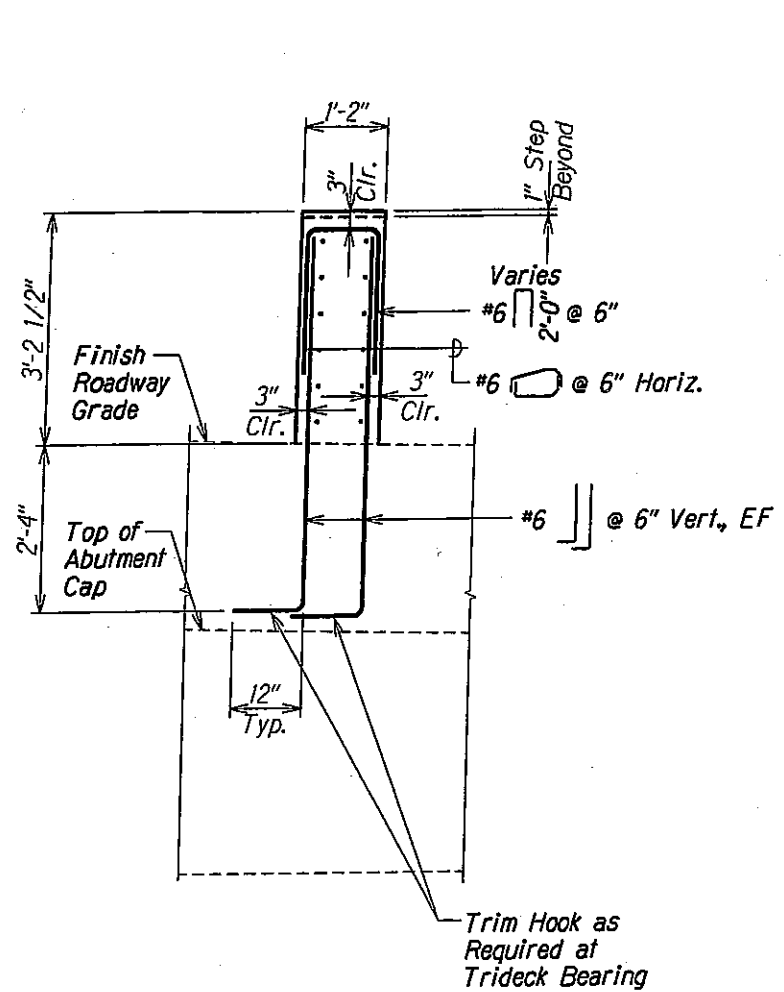
Federal Aid Project No. BR-083-01(42)

Scale: As Shown Date: March, 2010

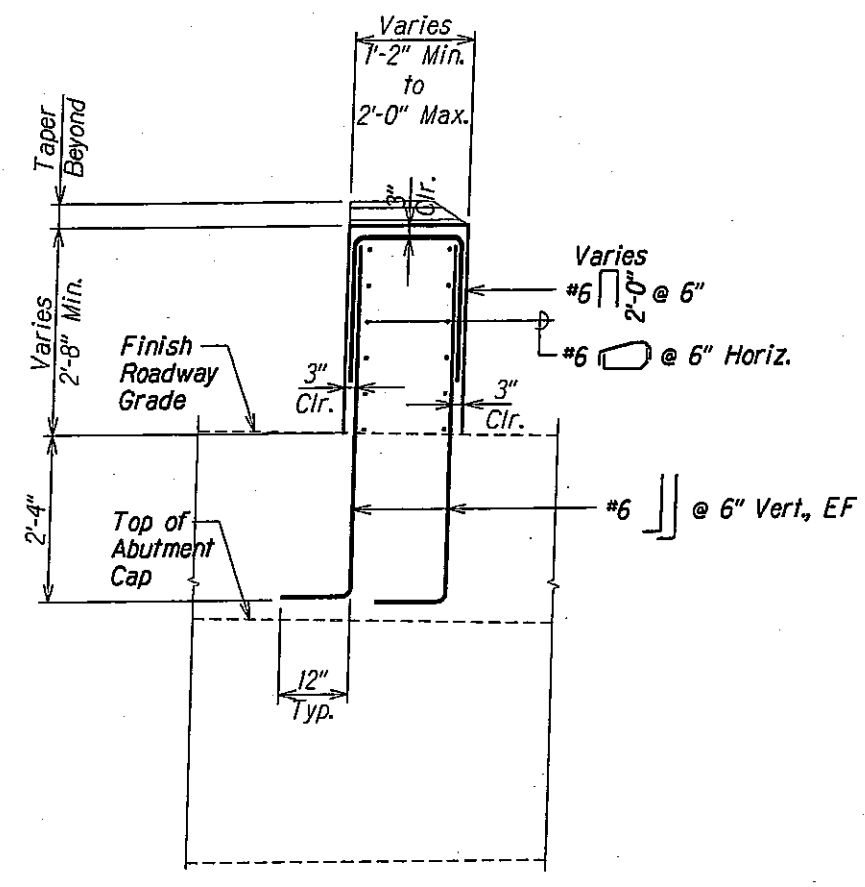
SHEET No. S9J2 OF 63 SHEETS

07/30/10	2 Revised Drawings
DATE	REVISION

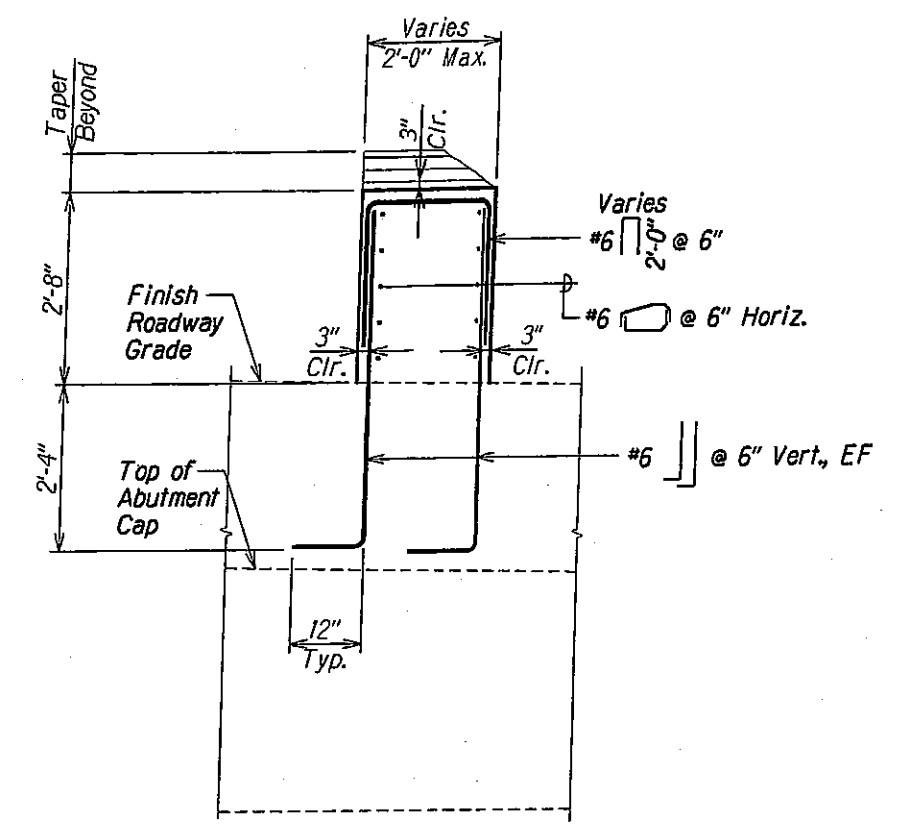
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-01(42)	2009	47	63



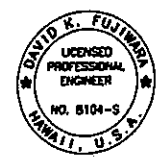
END POST TYPE C SECTION **A**
Scale: 3/4" = 1'-0" S9J0 S9J3



END POST TYPE C SECTION **B**
Scale: 3/4" = 1'-0" S9J0 S9J3



END POST TYPE C SECTION **C**
Scale: 3/4" = 1'-0" S9J0 S9J3



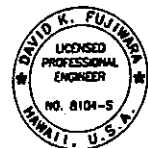
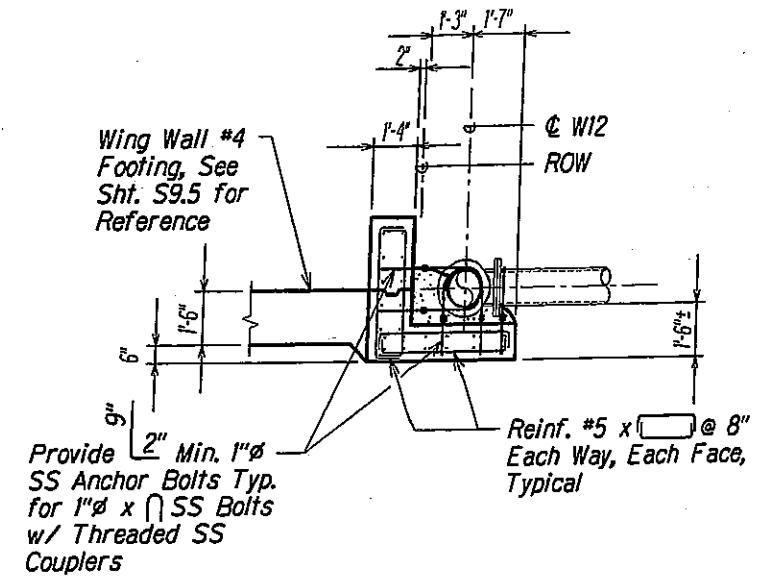
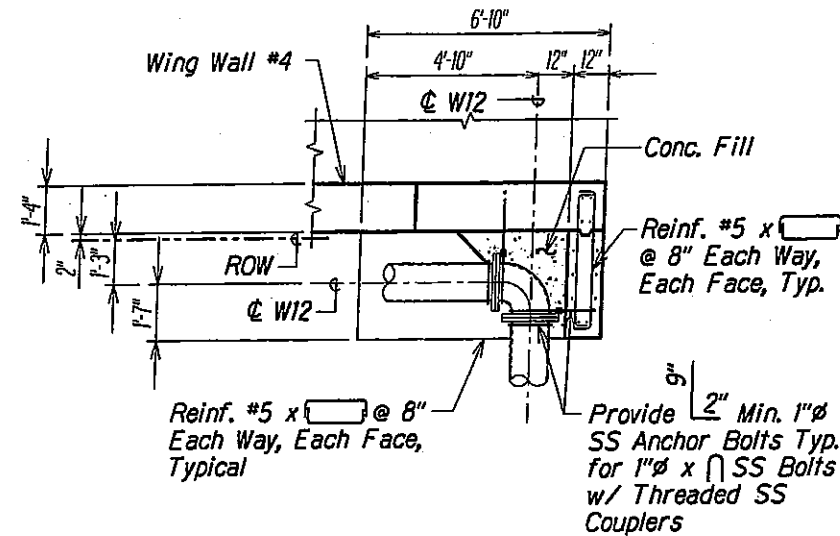
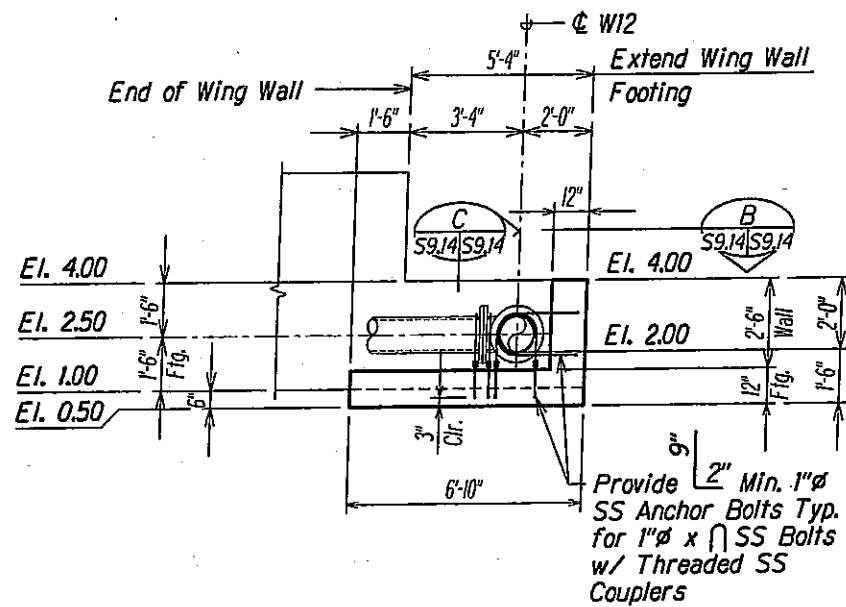
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KSF, INC. APR 30, 2010 UC EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
END POST TYPE C SECTIONS
KAMEHAMEHA HIGHWAY - REPLACEMENT
OF SOUTH PUNALUU STREAM BRIDGE
Federal Aid Project No. BR-083-01(42)
Scale: As Shown Date: March, 2010
SHEET No. S9J3 OF 63 SHEETS

DRAWING NAME: 2:100 ONCONING 190215-SD PUNALUU STR. BRIDGE (02-10-10) S9J0-S9J3
PLOT TIME: 02-28-10, 2:54 PM
DESIGNED BY: [blank]
CHECKED BY: [blank]
DATE: [blank]

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-01(42)	2009	48	63



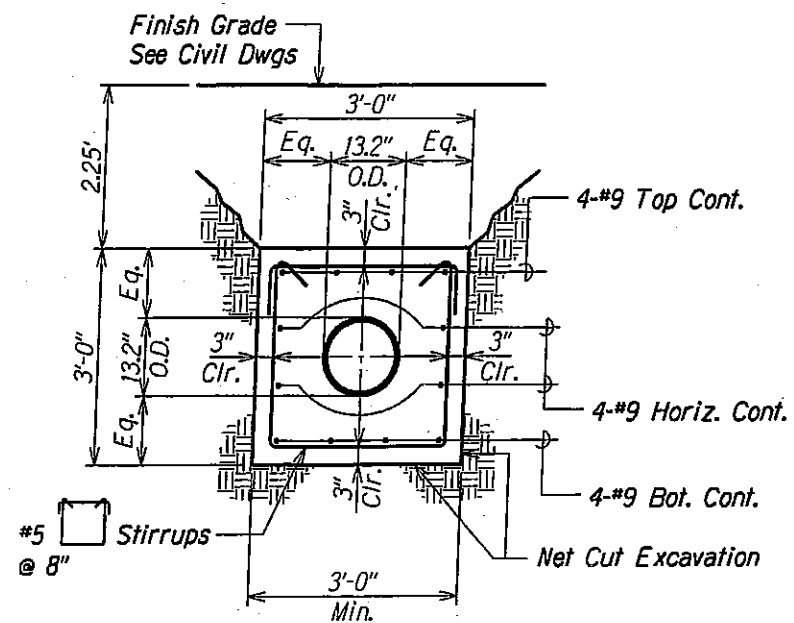
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

APR 30, 2010
UC EXP. DATE

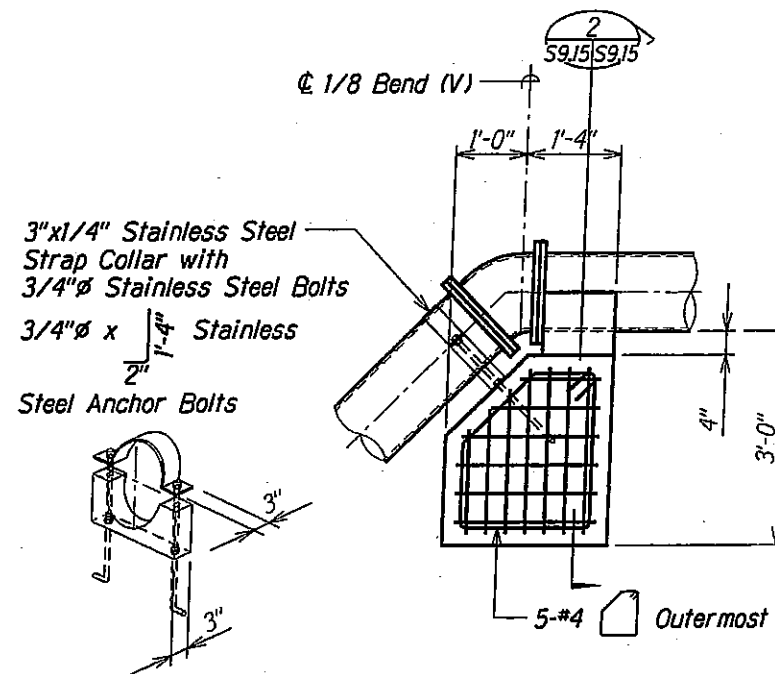
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
REACTION BLOCK DETAILS	
KAMEHAMEHA HIGHWAY - REPLACEMENT OF SOUTH PUNALUU STREAM BRIDGE	
Federal Aid Project No. BR-083-01(42)	
Scale: As Shown	Date: March, 2010
SHEET No. S9.14 OF 63 SHEETS	

07/30/10	2 New Sheet
DATE	REVISION

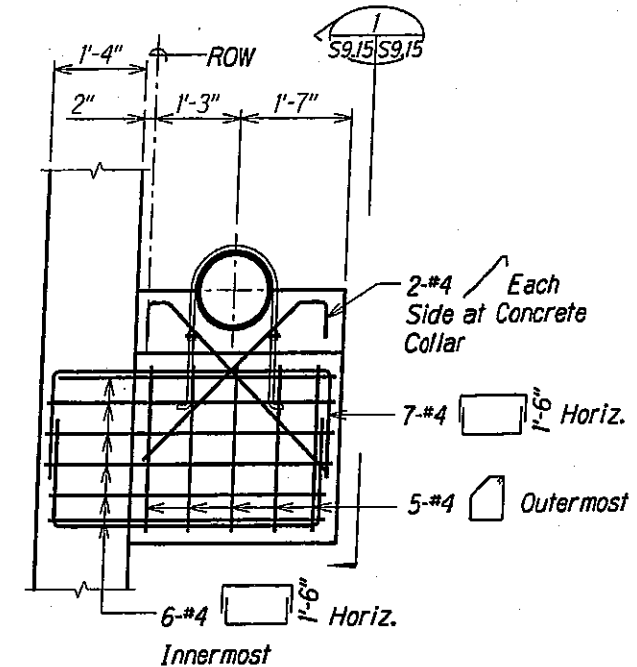
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-01(42)	2009	49	63



W12 CONCRETE JACKET SECTION A
Scale: 3/4" = 1'-0"
S9.2A S9.15

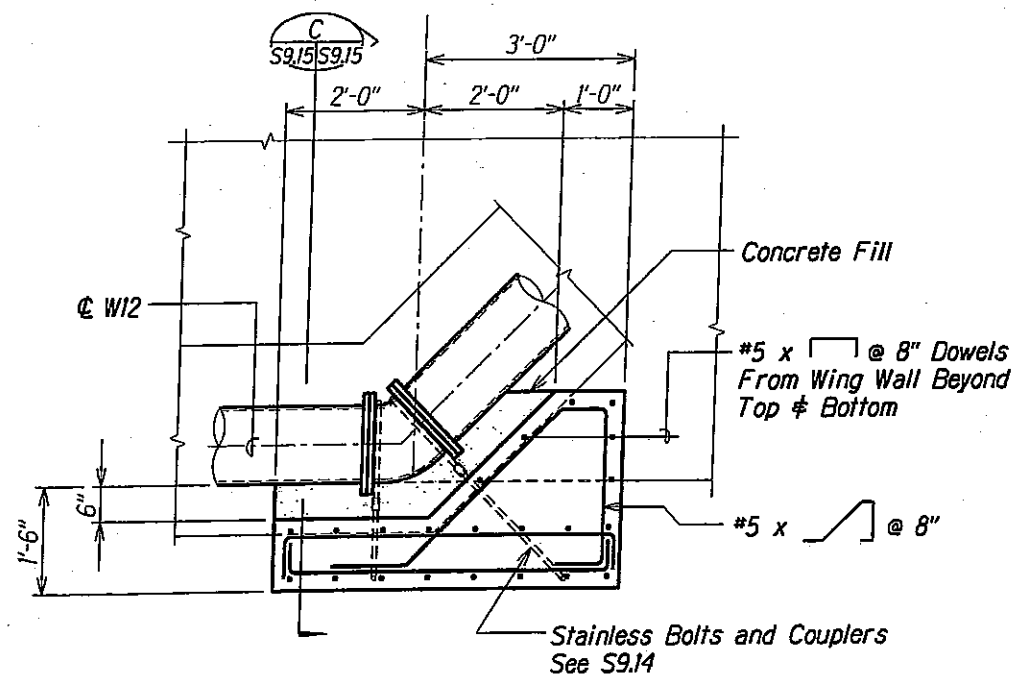


ELEVATION 1
Scale: 3/4" = 1'-0"
S9.2A S9.15

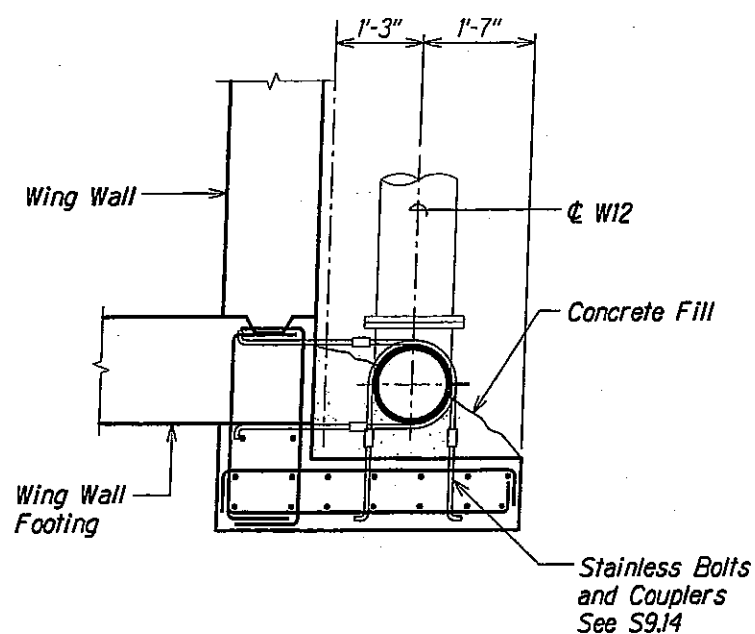


ELEVATION 2
Scale: 3/4" = 1'-0"
S9.2A S9.15

REACTION BLOCK DETAIL
Scale: 3/4" = 1'-0"



REACTION BLOCK SECTION B
Scale: 3/4" = 1'-0"
S9.2A S9.15



REACTION BLOCK SECTION C
Scale: 3/4" = 1'-0"
S9.2A S9.15



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APRIL 30, 2010
LIC. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

REACTION BLOCK DETAILS

**KAMEHAMEHA HIGHWAY - REPLACEMENT
OF SOUTH PUNALUU STREAM BRIDGE**

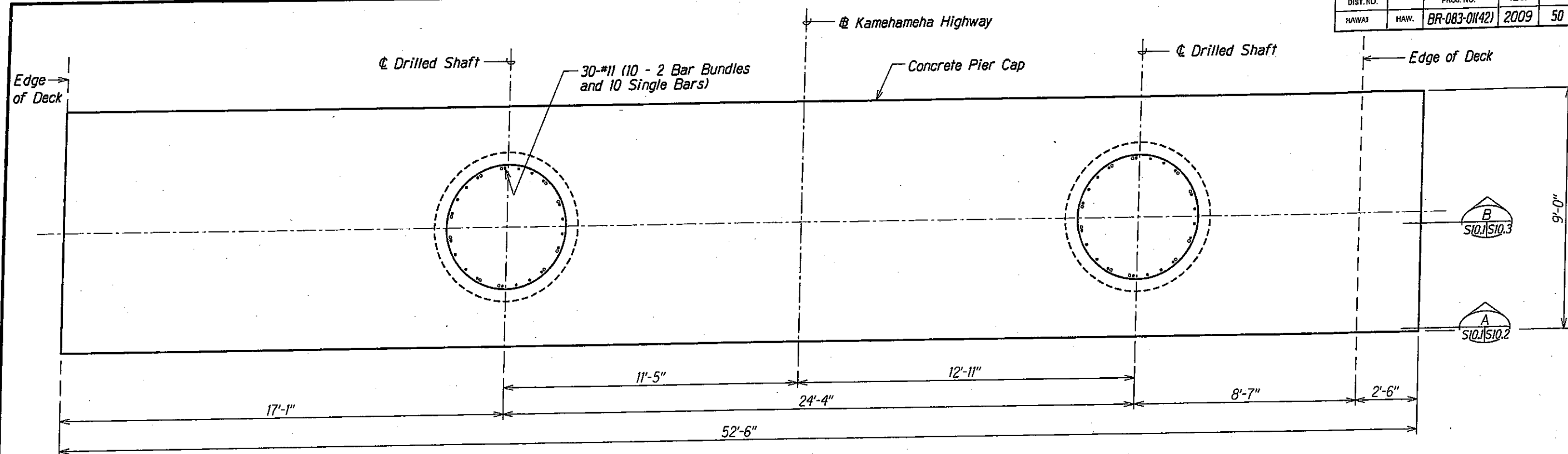
Federal Aid Project No. BR-083-01(42)

Scale: As Shown Date: March, 2010

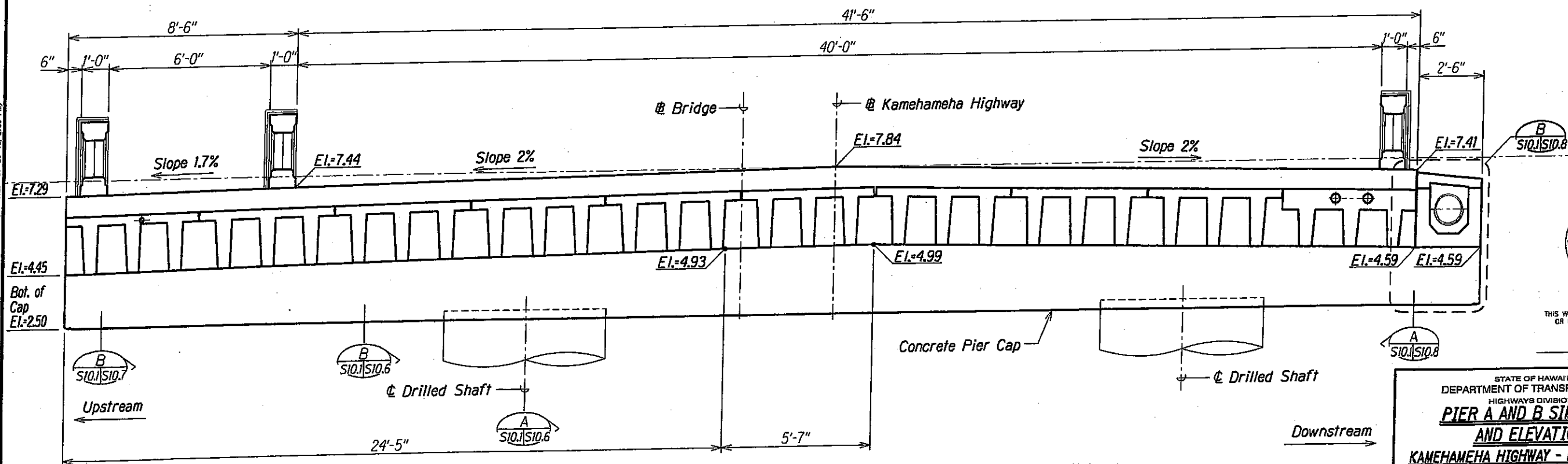
SHEET No. S9.15 OF 63 SHEETS

DATE	07/30/10	REVISION	2 New Sheet
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FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-01(42)	2009	50	63



PIER A AND B SIM. PLAN 
Scale: 1/2" = 1'-0"



PIER A AND B SIM. ELEVATION  

Note:
Top of deck elevations shown are for
Kahuku Side of Pier A only.



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APR 30, 2010
LIC. EXP. DATE

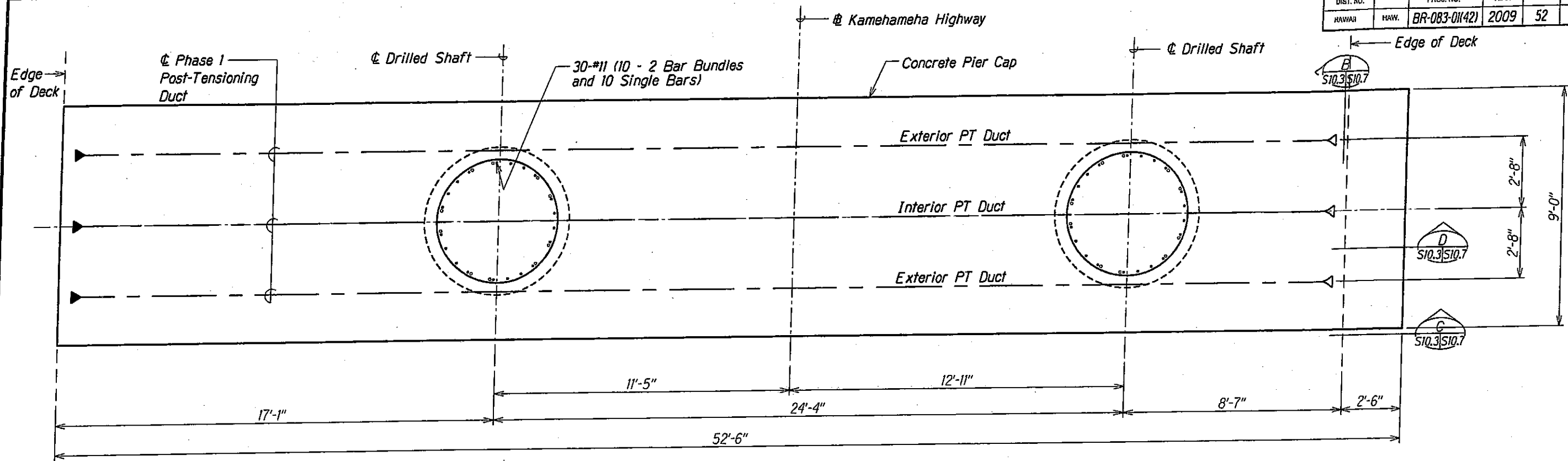
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
PIER A AND B SIM. PLAN
AND ELEVATION
KAMEHAMEHA HIGHWAY - REPLACEMENT
OF SOUTH PUNALUU STREAM BRIDGE
Federal Aid Project No. BR-083-01(42)

Scale: As Shown Date: March, 2010

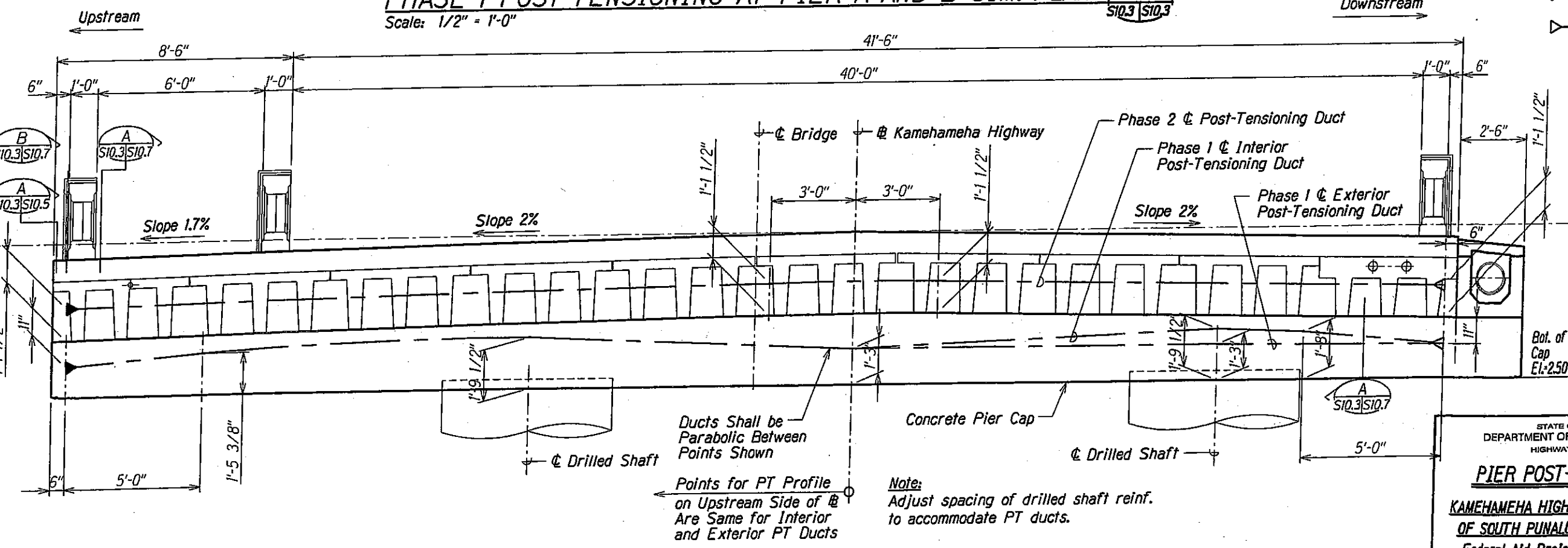
SHEET No. 5101 OF 63 SHEETS

DRAWING NAME: 2:00 ONGONG 90036-50 PUNALUU STR BRIDGE 07-30-10 SP58-S1001.DWG PLOT TIME: 07-29-10 2:59 PM

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-01(42)	2009	52	63



PHASE 1 POST-TENSIONING AT PIER A AND B SIM. PLAN
 Scale: 1/2" = 1'-0"



PHASE 1 AND 2 POST-TENSIONING AT PIER A AND B SIM. ELEVATION
 Scale: 1/2" = 1'-0"



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STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

PIER POST-TENSIONING

**KAMEHAMEHA HIGHWAY - REPLACEMENT
 OF SOUTH PUNALUU STREAM BRIDGE**

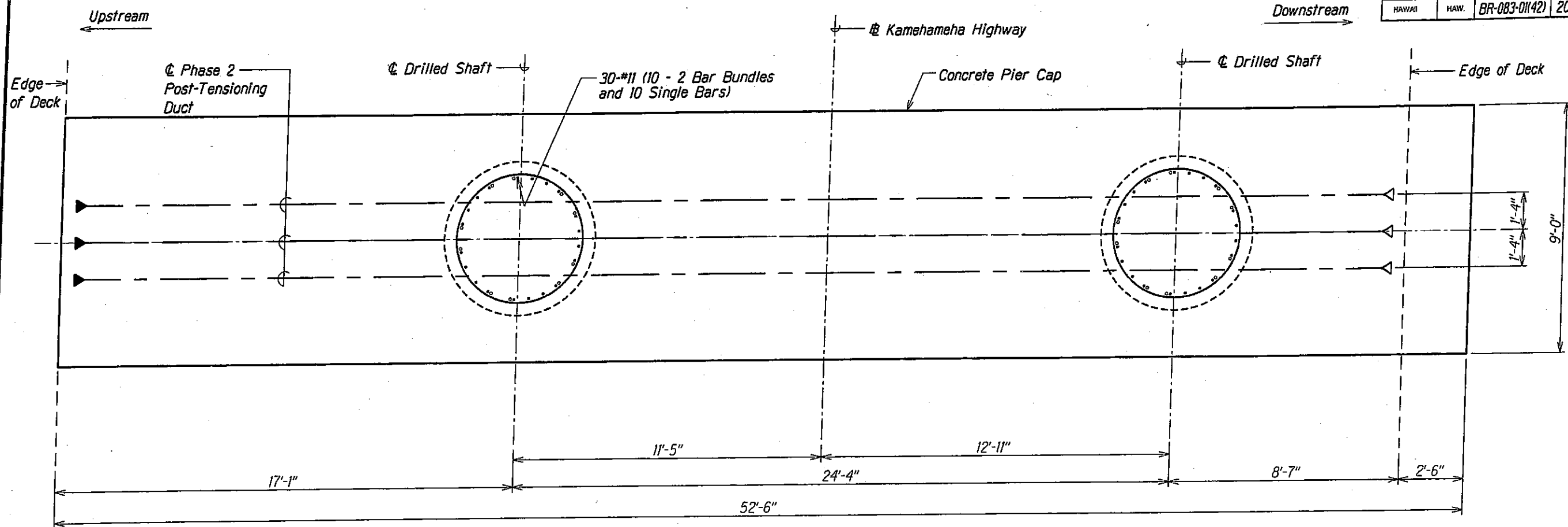
Federal Aid Project No. BR-083-01(42)

Scale: As Shown Date: March, 2010

SHEET No. 510.3 OF 63 SHEETS

DRAWING NAME: 2.100 DRIVING 50035-50 PUNALUU STR BRIDGE 107-10-10 SP5B-S1003.DWG
 PLOT TIME: 07-29-10 2:59 PM
 TRACED BY: [blank]
 DESIGNED BY: [blank]
 QUANTITIES BY: [blank]
 CHECKED BY: [blank]

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-01(42)	2009	53	63



PHASE 2 POST-TENSIONING AT PIER A AND B SIM. PLAN A
S10.4 S10.4
Scale: 1/2" = 1'-0"

LEGEND:

- ▶ Jacking End
- ◀ Dead End



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APRIL 30, 2010
UC EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PIER POST-TENSIONING

**KAMEHAMEHA HIGHWAY - REPLACEMENT
OF SOUTH PUNALUU STREAM BRIDGE**

Federal Aid Project No. BR-083-01(42)

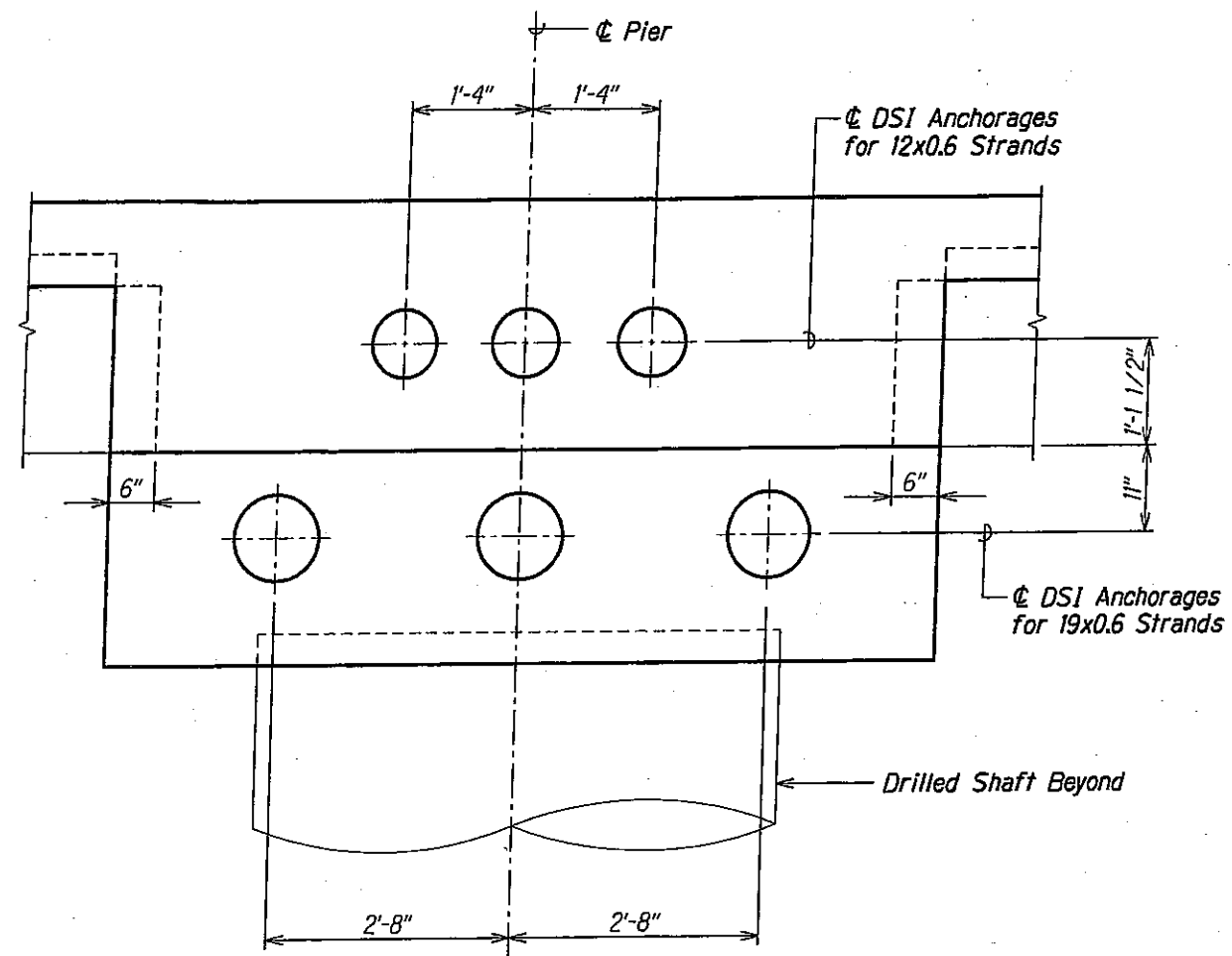
Scale: As Shown Date: March, 2010

SHEET No. S10.4 OF 63 SHEETS

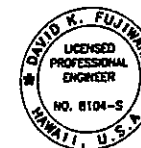
DRAWING NAME: 2:100 CHANGING 1002.16-50 PUNALUU STR BRIDGE (07-30-10) SPSB-S1002.16C PLOT TIME: 07-29-10, 2:59 PM

NOTES BOOK	DESIGNED BY	QUANTITIES BY	CHECKED BY
No.			

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-01(42)	2009	54	63



SECTION A
Scale: 1" = 1'-0" S10.3 S10.5



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APR 30 2010
KSF, INC. LIC. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

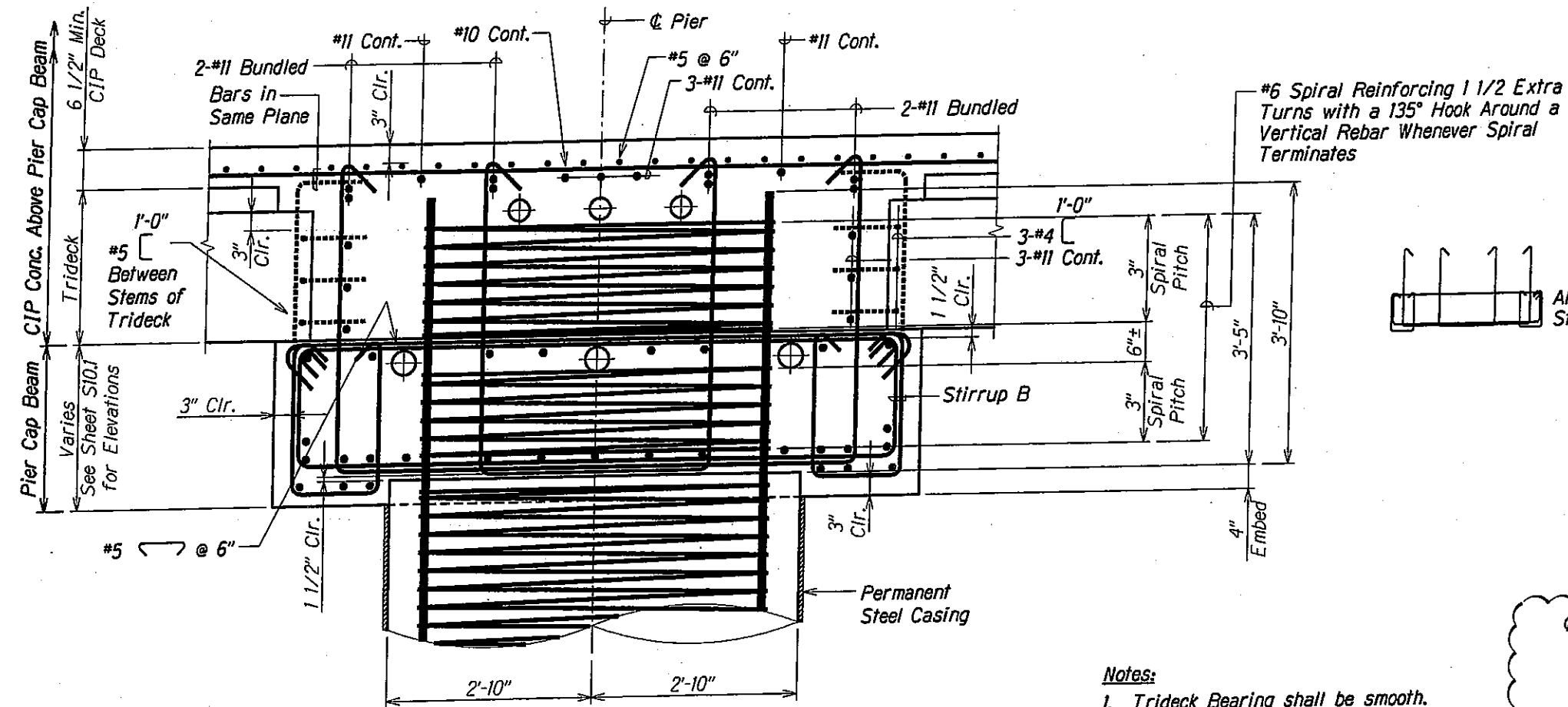
TYPICAL SECTIONS

KAMEHAMEHA HIGHWAY - REPLACEMENT
OF SOUTH PUNALUU STREAM BRIDGE
Federal Aid Project No. BR-083-01(42)

Scale: As Shown Date: March, 2010

SHEET No. S10.5 OF 63 SHEETS

NOTES:
1. NOTE BOOK
2. QUANTITIES BY
3. CHECKED BY
4. DATE
5. DRAWING NAME: 2.100 CHOCOLATE 100235-50 PUNALUU STR BRIDGE (10-30-10) BPSB-S1005.DWG PLOT TIME: 07-29-10, 3:00 PM



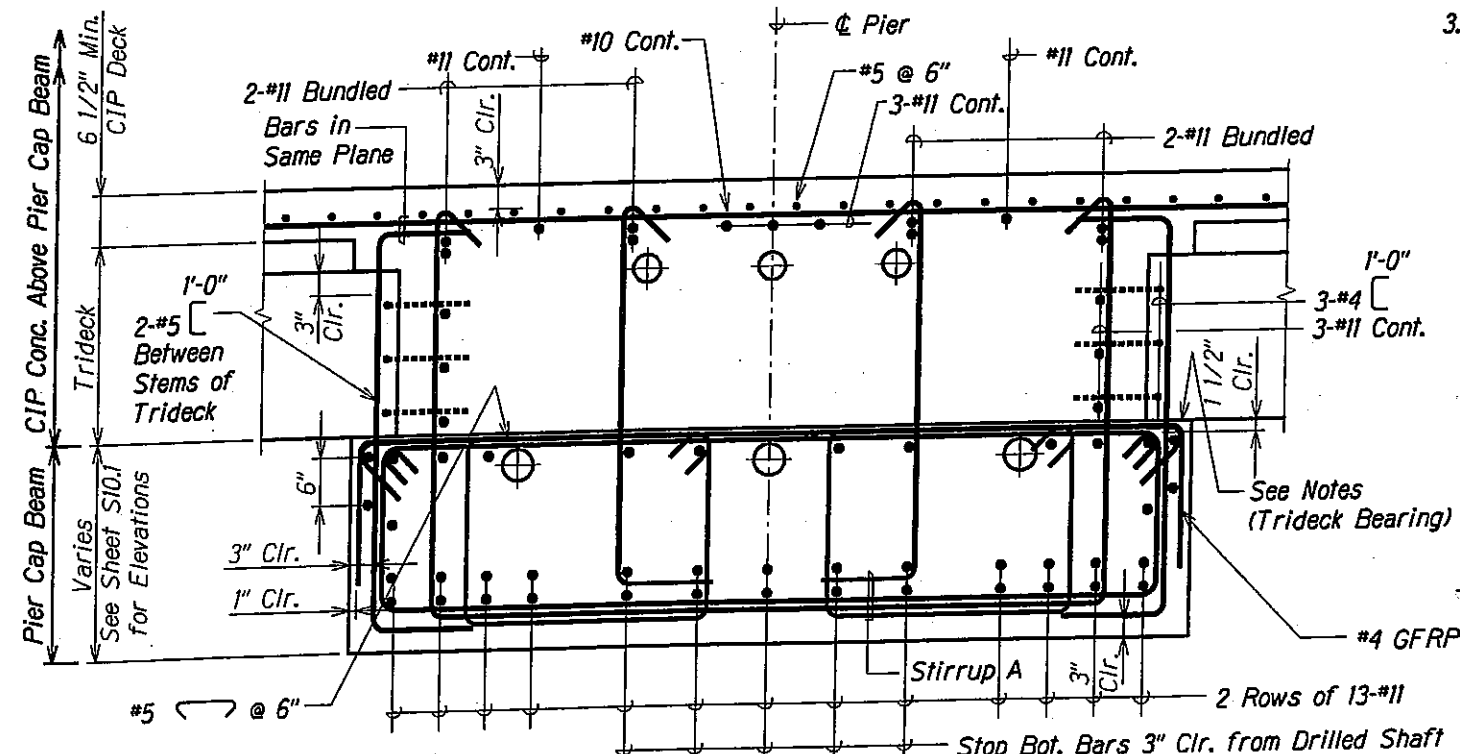
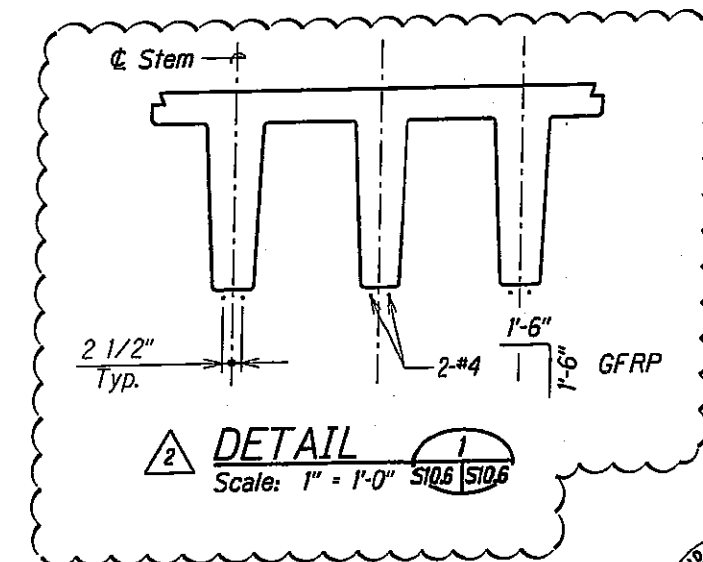
All Reinforcing Steel = #6 Bars
Stirrup B

SECTION AT DRILLED SHAFT

Scale: 1" = 1'-0"

Notes:

1. *Trideck Bearing shall be smooth.*
2. *Place Slush Grout on Trideck Bearing immediately prior to setting Trideck.*
3. *See Section B/SI0.6 for additional #4 GFRP Bars at adjacent Pier Cap.*



SECTION WHERE NO DRILLED SHAFT OCCURS

Scale: 1" = 1'-0"



All Reinforcing Steel = #6 Bars
Stirrup A

2 Under Each Stem of Trideck
See Def. 1 on this sheet

1'-6"
1'-9"
@ 12"

2-#4 GFRP Cont.
Each Side
1" Clr. from Edges
of Cap

07/30/10	2	Add
----------	---	-----

07/30/10	 Add Note and Detail
DATE	REVISION

STATE OF MAHAWI
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

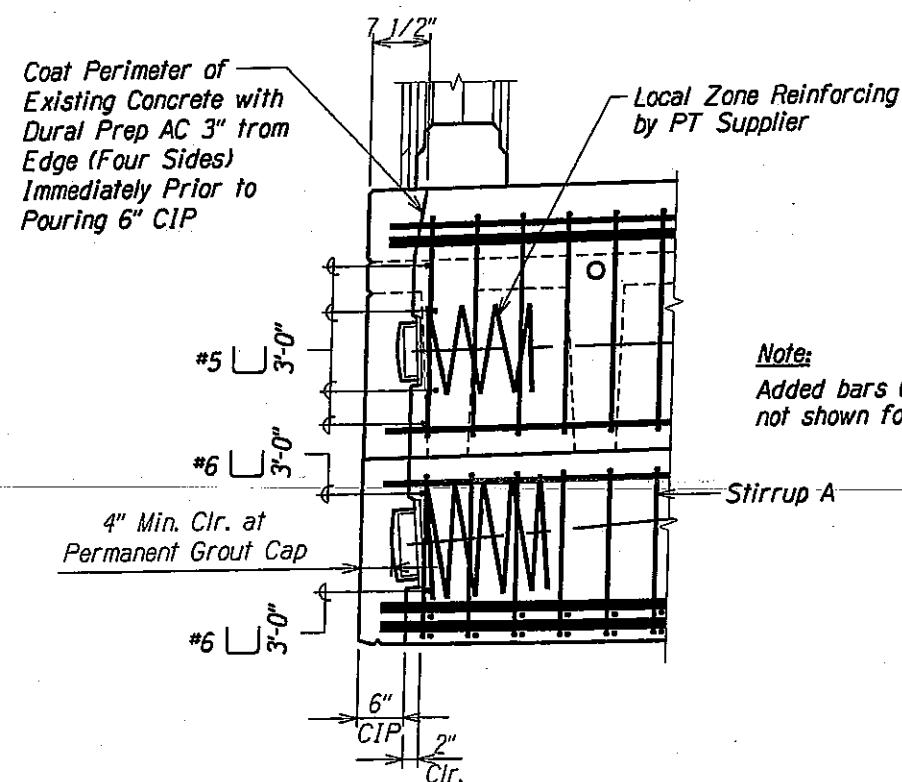
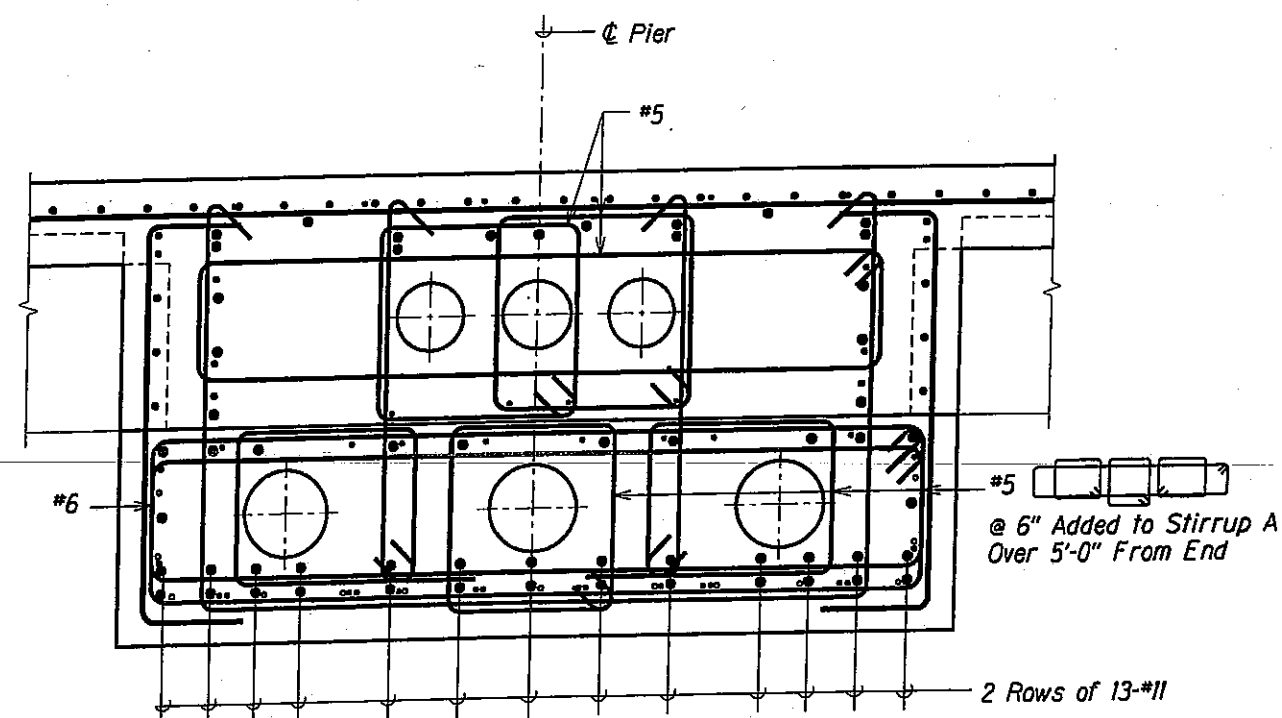
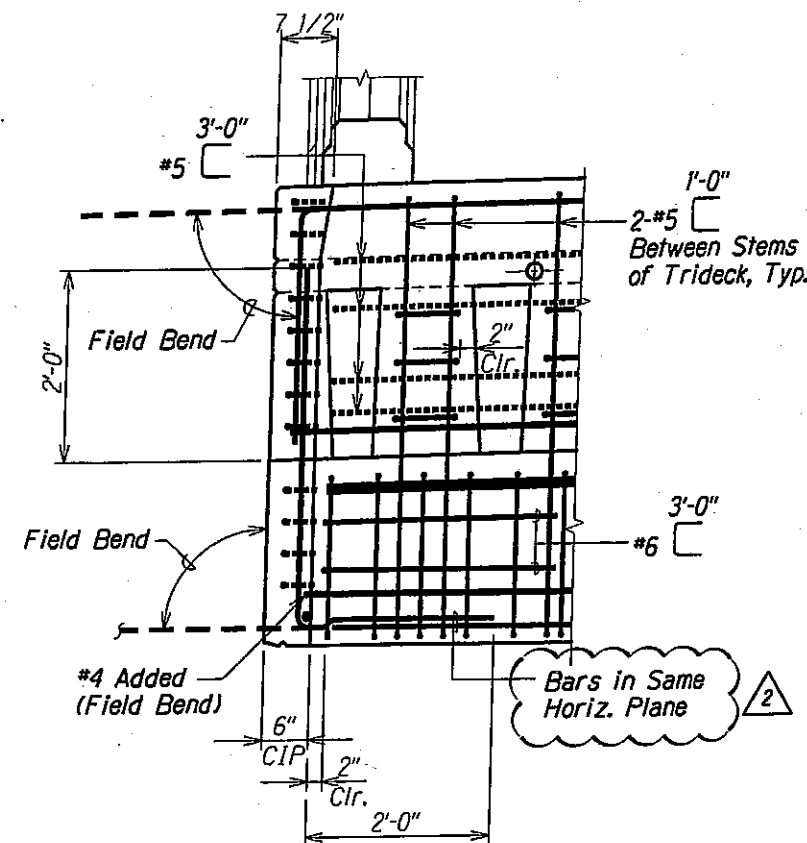
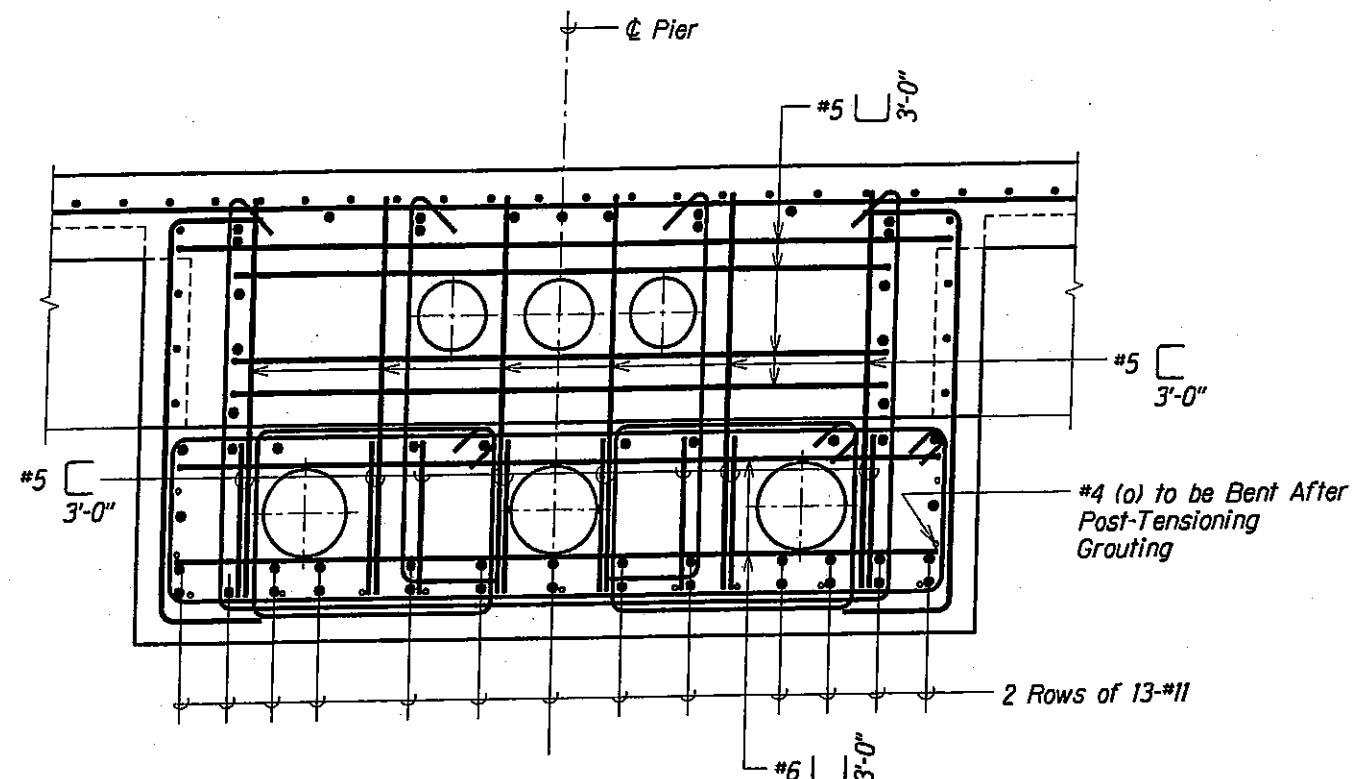
TYPICAL SECTIONS

KAMEHAMEHA HIGHWAY - REPLACEMENT
OF SOUTH PUNALUU STREAM BRIDGE
Federal Aid Project No. BR-083-01(42)

Scale: As Shown Date: March, 2010

SHEET No. 5106 OF 63 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-01(42)	2009	56	63



DATE	REVISION
01/30/10	2 Revised Note



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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

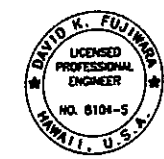
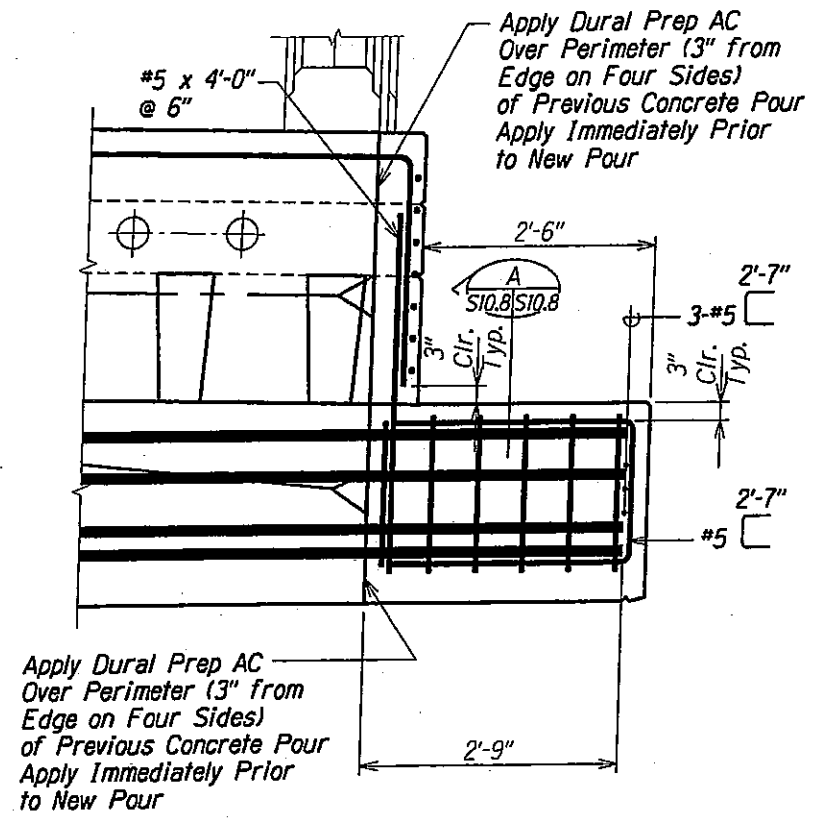
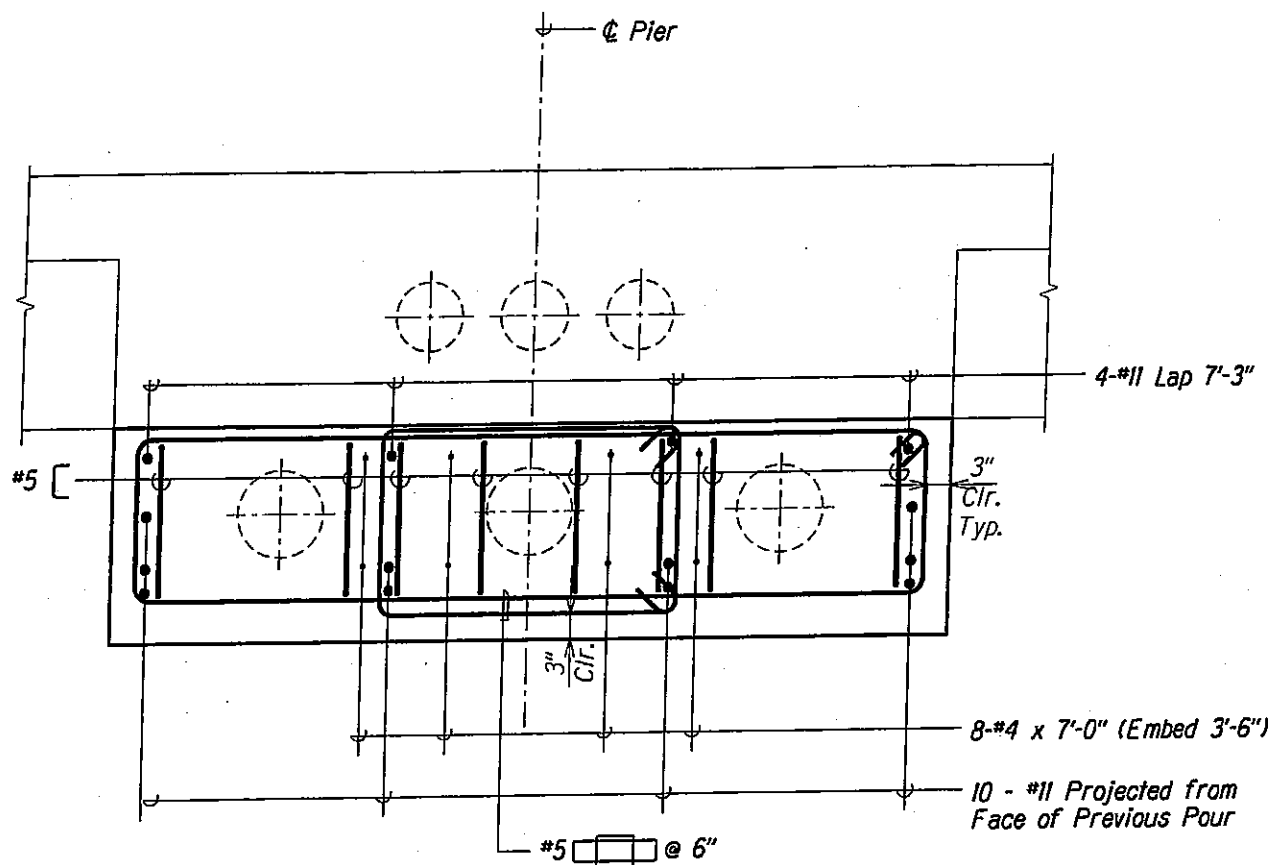
TYPICAL SECTIONS

**KAMEHAMEHA HIGHWAY - REPLACEMENT
OF SOUTH PUNALUU STREAM BRIDGE**
Federal Aid Project No. BR-083-01(42)

Scale: As Shown Date: March, 2010

SHEET No. 510.7 OF 63 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-01(42)	2009	57	63



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APR 30 2010
UC EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPICAL SECTIONS

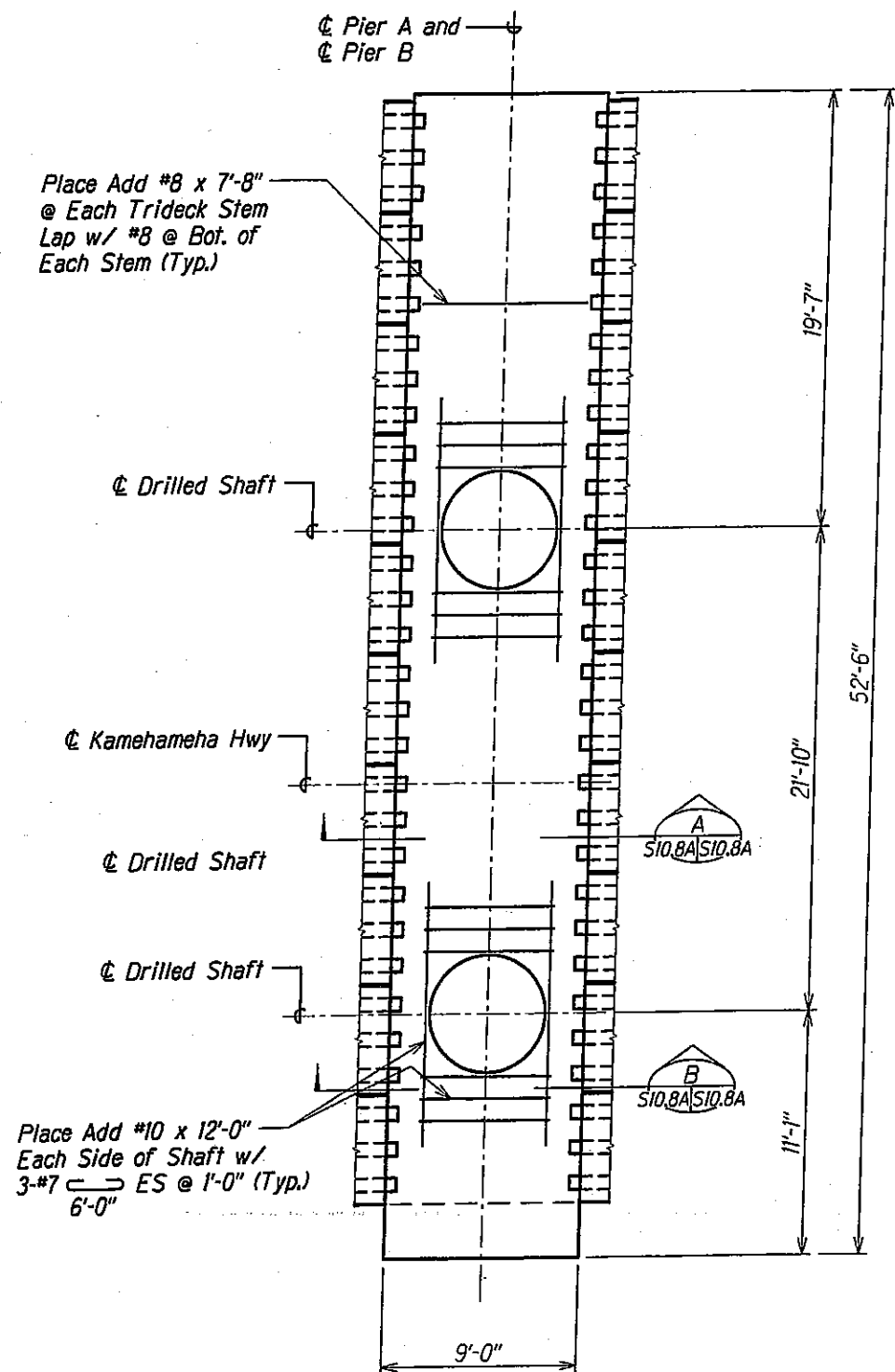
**KAMEHAMEHA HIGHWAY - REPLACEMENT
OF SOUTH PUNALUU STREAM BRIDGE**
Federal Aid Project No. BR-083-01(42)

Scale: As Shown Date: March, 2010

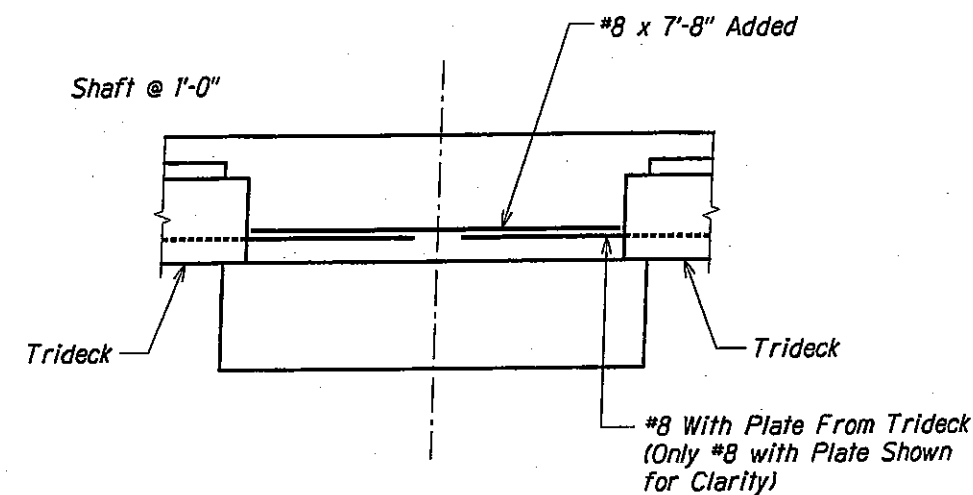
SHEET No. S10.8 OF 63 SHEETS

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 NOTE BOOK
 DESIGNED BY: _____
 QUANTITIES BY: _____
 CHECKED BY: _____
 No. _____

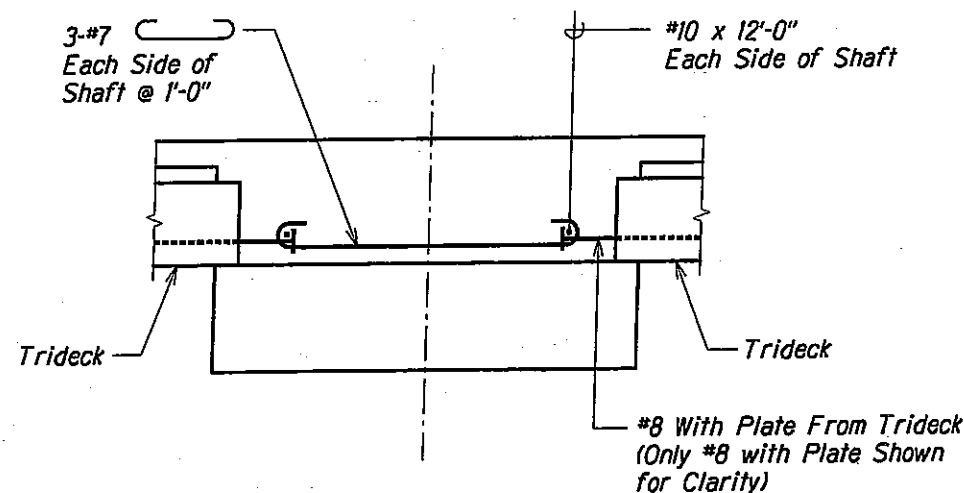
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-01(42)	2009	58	63



PIER A AND B ADDED REINF. PLAN **A**
Scale: 1/4" = 1'-0" S10.8A S10.8A



SECTION **A**
Scale: 1/2" = 1'-0" S10.8A S10.8A



SECTION **B**
Scale: 1/2" = 1'-0" S10.8A S10.8A



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KSF, INC. APRIL 30, 2010 LIC. EXP. DATE

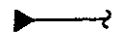
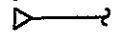
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
**PIER A AND B ADDED REINF. PLAN
AND SECTIONS**
KAMEHAMEHA HIGHWAY - REPLACEMENT
OF SOUTH PUNALUU STREAM BRIDGE
Federal Aid Project No. BR-083-01(42)
Scale: As Shown Date: March, 2010
SHEET No. S10.8A OF 63 SHEETS

07/30/10
DATE

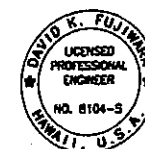
2 New Sheet
REVISION

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-01(42)	2009	59	63

POST-TENSIONING NOTES

- Post-tensioning strands shall be ASTM A416 Grade 270 0.6" diameter uncoated 7 wire low relaxation steel strands. Post-tensioning ducts shall be Spiro-Type Semi-Rigid Galvanized.
- After Post-tensioning, tendons shall be pressure grouted with Masterflow 1205 cable grout, Sika Grout 300 PT, or approved equal. Ducts shall have grouting vents at anchorage and at each high point along the tendon profile.
- Ducts shall be secured to prevent misalignment or leakage during concrete pour.
- A minimum Compressive Strength of 6000 psi shall be attained in the Pier Cap Beam before the application of Phase 1 post-tensioning.
- A minimum Compressive Strength of 6000 psi shall be attained in the Cast-In-Place concrete above Pier Cap Beam and Deck Topping before the application of Phase 2 post-tensioning.
- Post-tension middle tendon first. Then post-tension exterior tendons simultaneously for each Phase.
- The post-tensioning design assumptions are as follows:
 Curve Friction Coefficient 0.18
 Wobble Friction Coefficient 0.0002/ft.
 Anchor Set 3/8"
- Design Jacking force at end of each 19x0.6 tendon (Stage 1 PT) = 835k.
 Design jacking force at ends of each 12x0.6 Tendon (Stage 2 PT) = 527k.
- Jacking symbols are as follows:
 Jacking end 
 Dead end 
- Post-tensioning shall comply with AASHTO LRFD Bridge Construction Specifications including the latest interim revisions.
- Apply corrosion inhibitor amine carboxylate powder (Cortec MCI-309) in all Post-tension Ducts.
- The minimum force in Prestressing Steel shall not be less than shown in Note 8 above.

 The force in the Prestressing Steel shall be considered as the smaller of the two values as determined by the measured elongation and the gage pressure. If the difference in stress as obtained by the measured elongation and the measured gage pressure exceeds 5 percent of the required prestressing force, the stressing process shall be terminated and shall not resume until the Contractor submits data indicating the cause of such difference and makes corrections, approved by the Engineer, to rectify such difference.
- Prevent ducts, at all times, from getting plugged or damaged. Ducts shall be checked to show that ducts are clear and contain no obstructions prior to installing prestressing steel and stressing the member.
- See Specifications Section 504 for additional requirements.



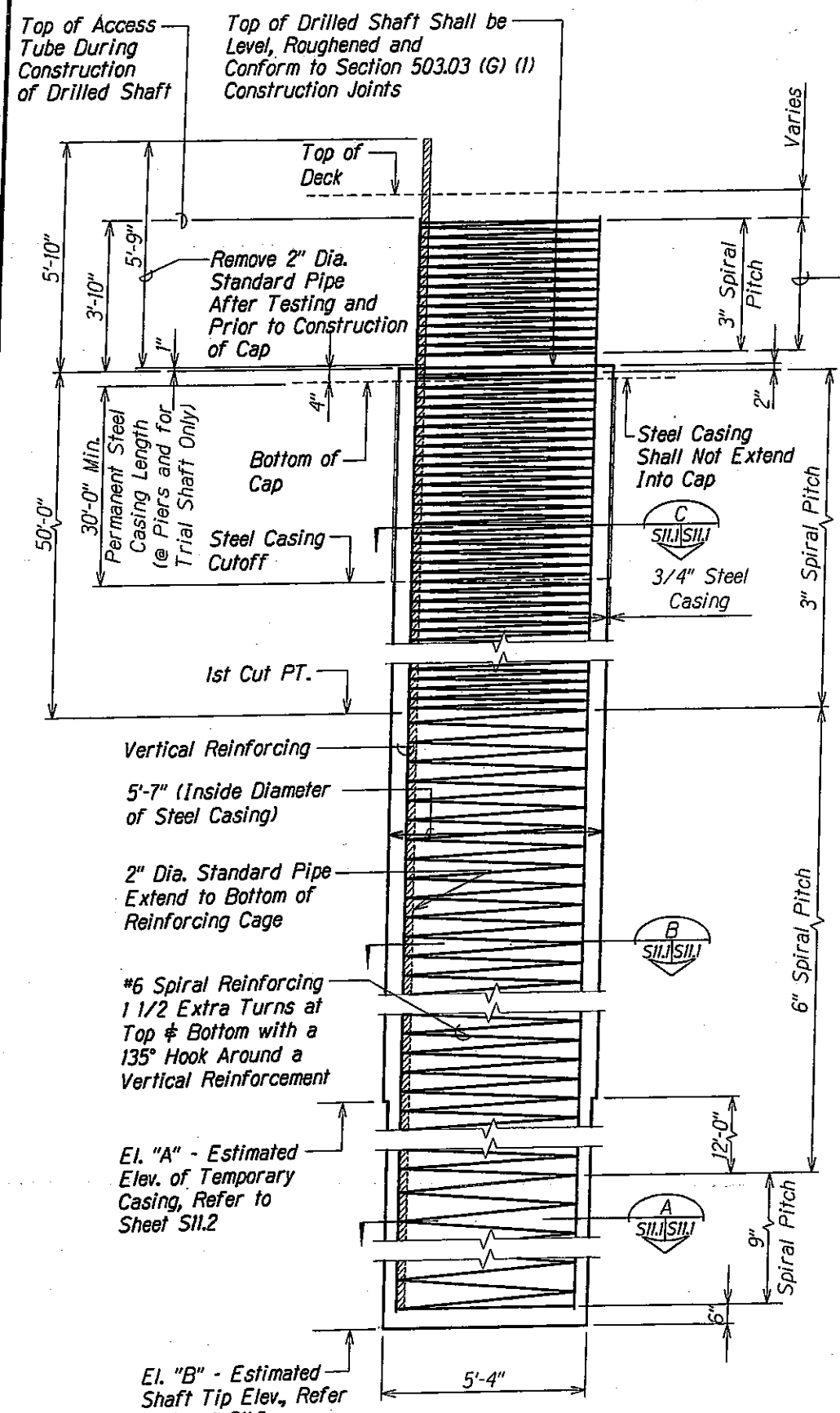
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LIC. EXP. DATE

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
POST TENSIONING NOTES	
KAMEHAMEHA HIGHWAY - REPLACEMENT OF SOUTH PUNALUU STREAM BRIDGE	
Federal Aid Project No. BR-083-01(42)	
Scale: None	Date: March, 2010
SHEET No. 5109 OF 63 SHEETS	

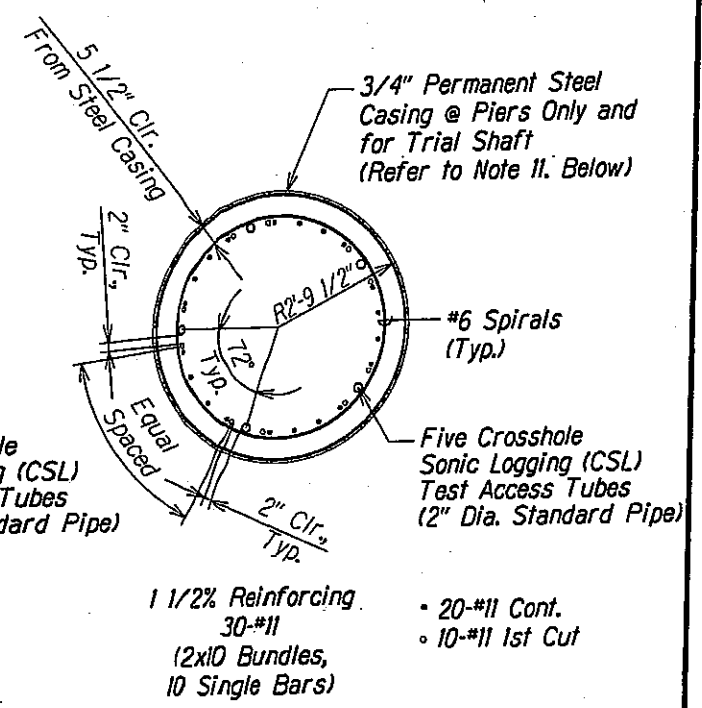
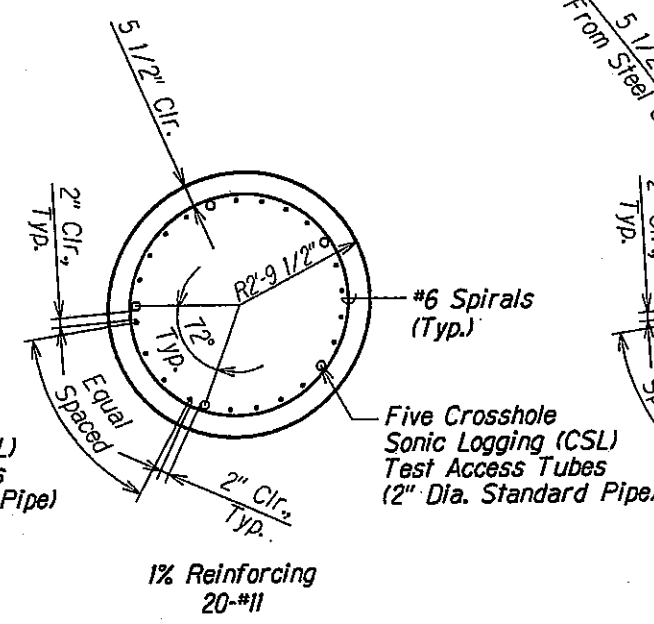
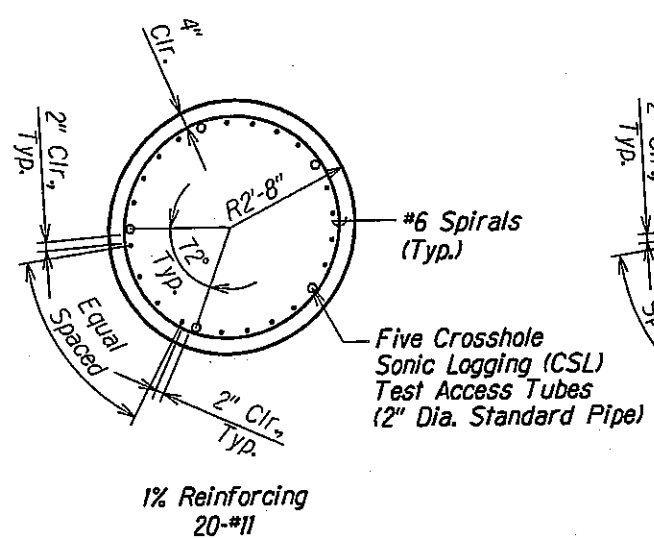
DRAWING NAME: 2.100 (CONCRETE) BODIES-50 PUNALUU STR BRIDGE (PT-10-10) (S&S-STUDY.DWG) PLOT TIME: 07-29-10 3:01 PM
 NOTE BOOK
 DESIGNED BY
 QUANTITIES BY
 CHECKED BY
 No.

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-01(42)	2009	60	63



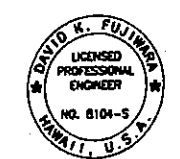
#6 Spiral Reinforcing 1 1/2 Extra Turns with a 135° Hook Around a Vertical Rebar Whenever Spiral Terminates, Refer to Note 4. Below

Note: Spiral detail shown is for condition at abutments. For spiral detail at piers, refer to Section A S10.6/S10.6



NOTES:

1. Drilled shaft tips are estimated. The actual Drilled Shaft lengths will be determined by the Engineer.
2. Concrete or other non-corrosive spacing devices shall be used to maintain the reinforcement cage in position within the shaft.
3. Lap splice length for #6 Spiral shall be 3'-8" min. with a 135° bend at each end.
4. Spirals may be discontinuous at the cap reinforcement to allow for placing of the reinforcement. Each end of the spiral shall have 1 1/2 extra turns with a 135° hook around a vertical reinforcement.
5. Lap splice length for #11 cont. shall be 8'-0". No lap splices are allowed in the upper 20'-0" of the drilled shaft.
6. Staggered splice points not more than 50% of total at any section normal to the axis of the member.
7. Lapped splices shall have a minimum of 2'-0" vertically between ends of splice points.
8. Drilling of adjacent shaft not be drilled within 12 hours of completion of concreting of the adjacent shaft.
9. CSL testing shall be performed on every shaft except the load test shaft.
10. Remove portion of CSL test access tubes within cap and completely fill tubes with non-shrink, non-metallic, non-gaseous cementitious grout of equal strength as drilled shaft prior to cap pour.
11. Permanent steel casing shall be supported for at least 12 hours after the concrete pour.
12. Submit shop drawings for template showing non-interference among vertical drilled shaft reinforcing, cap bars and post-tensioning ducts. (Reference shts S8.4 through S8.7 and S10.1 through S10.6.)



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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRILLED SHAFT DETAILS
KAMEHAMEHA HIGHWAY - REPLACEMENT
OF SOUTH PUNALUU STREAM BRIDGE
Federal Aid Project No. BR-083-01(42)

Scale: As Shown Date: March, 2010
SHEET No. S11 OF 63 SHEETS

TYPICAL DRILLED SHAFT ELEVATION
(PRODUCTION & TEST SHAFT)
Not to Scale

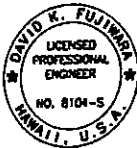
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-01(42)	2009	61	63

DRILLED SHAFT SCHEDULE					
Location	Trial Shaft	Abutment No. 1	Pier A	Pier B	Abutment No. 2
El. "A" - Estimated El. for temporary casing	-122.0	-122.0	-111.5	-111.5	-70.0
El. "B" - Estimated shaft TIP El.	-187.0	-174.0	-187.0	-187.0	-137.0

AXIAL LOADS OF DRILLED SHAFT			
Location		Strength Limit State (Kips)	Extreme Event Limit State (Kips)
		Demand	Demand
Abutments	Axial Compression See Note (i)	1080	*
Piers	Axial Compression See Note (i)	1305	*

Notes:

- (i) Tension demand is zero.
- * Does not govern.



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KST, INC. UC EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRILLED SHAFT SCHEDULES

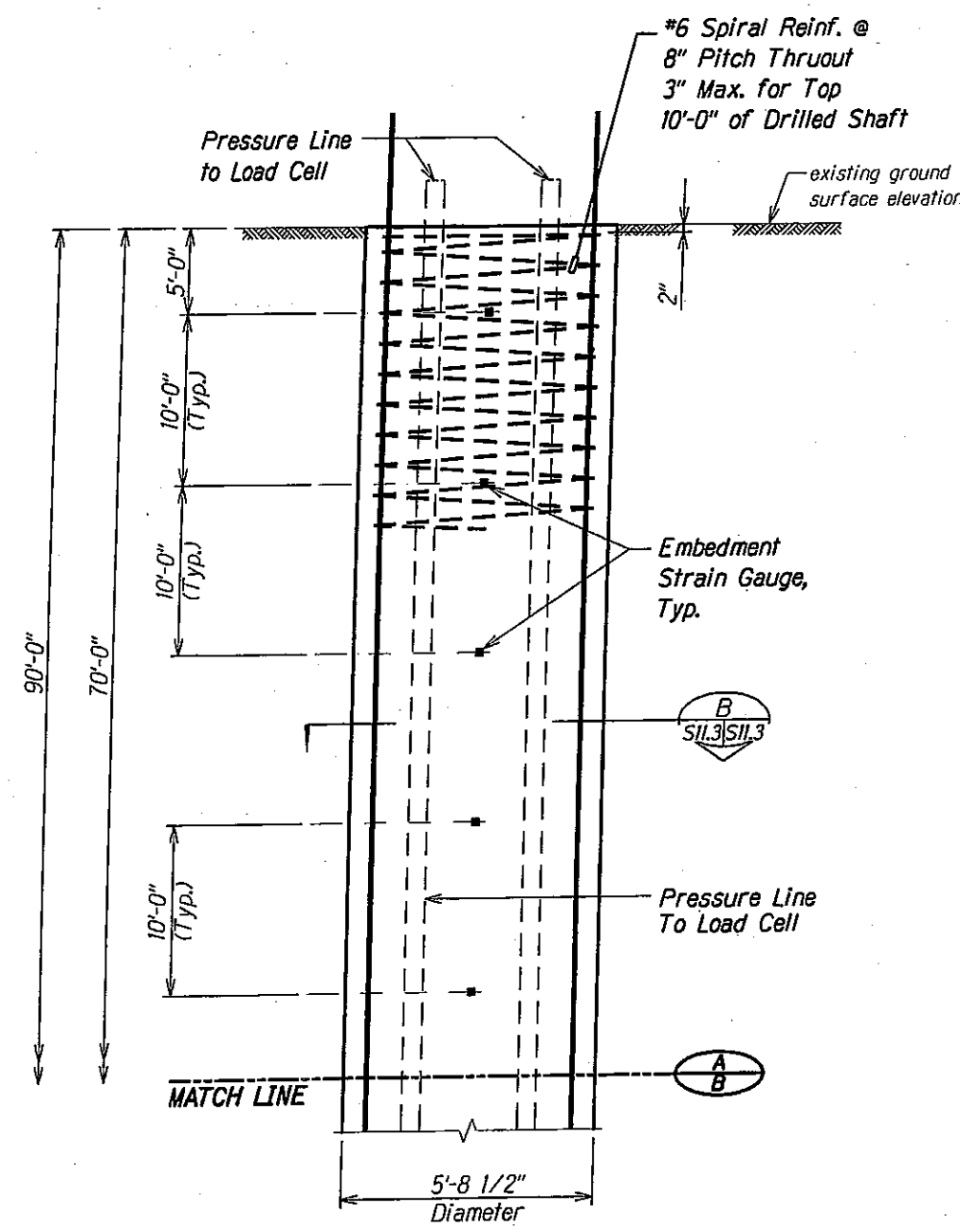
KAMEHAMEHA HIGHWAY - REPLACEMENT
OF SOUTH PUNALUU STREAM BRIDGE
Federal Aid Project No. BR-083-01(42)

Scale: As Shown Date: March, 2010

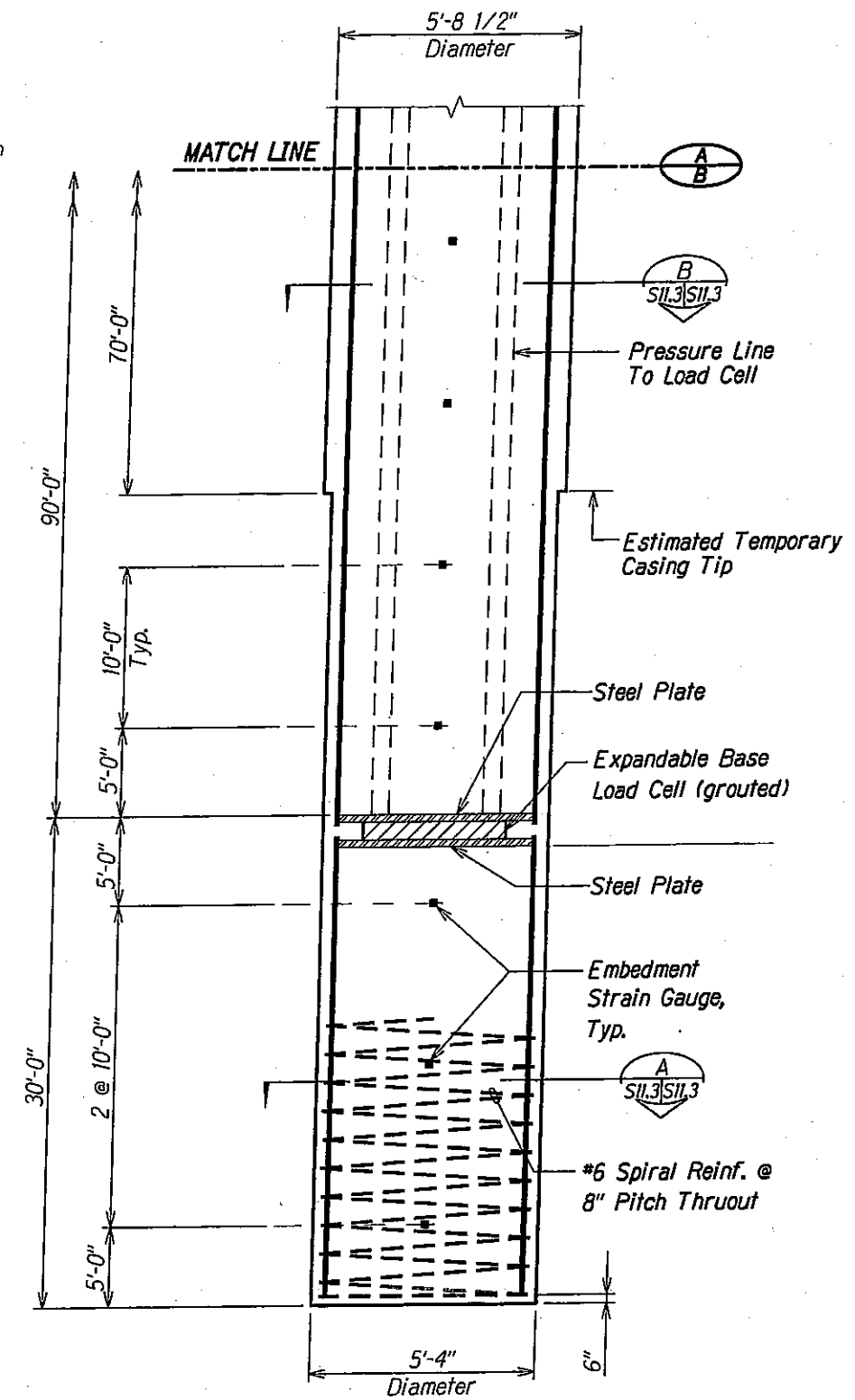
SHEET No. 57/2 OF 63 SHEETS

NOTES BOOK
DESIGNED BY: _____
CHECKED BY: _____
DRAWING NAME: 2:100 CHICAGO 10015-50 PUNALUU STR BRIDGE (07-10-10) (SP5B-S101.DWG) PLOT TIME: 07-29-10, 3:02 PM

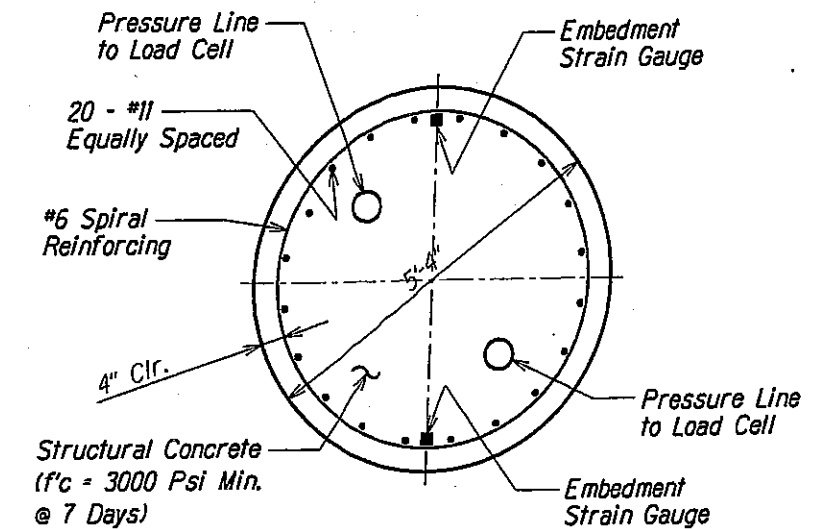
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-01(42)	2009	62	63



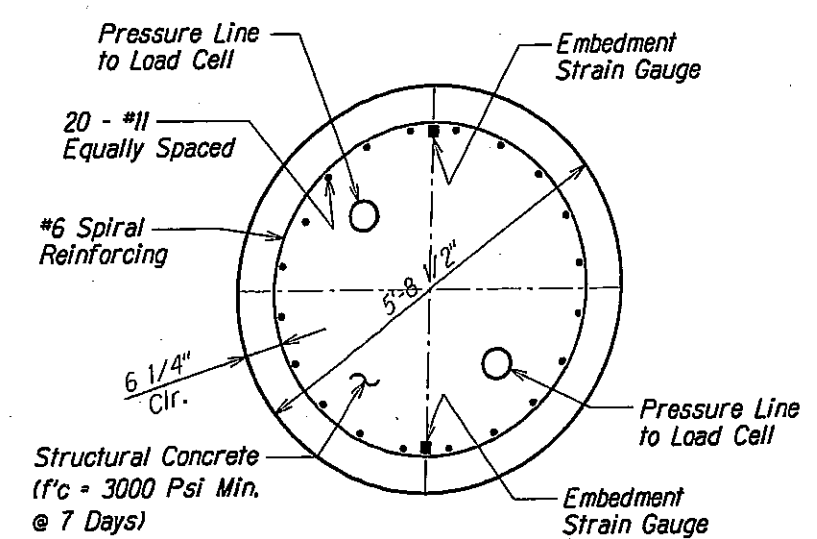
ELEVATION - LOWER PORTION "A"
 Scale: Horiz. 1/2" = 1'-0"
 Vert. 3/16" = 1'-0"



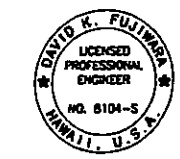
ELEVATION - LOWER PORTION "B"
 Scale: Horiz. 1/2" = 1'-0"
 Vert. 3/16" = 1'-0"



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



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



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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

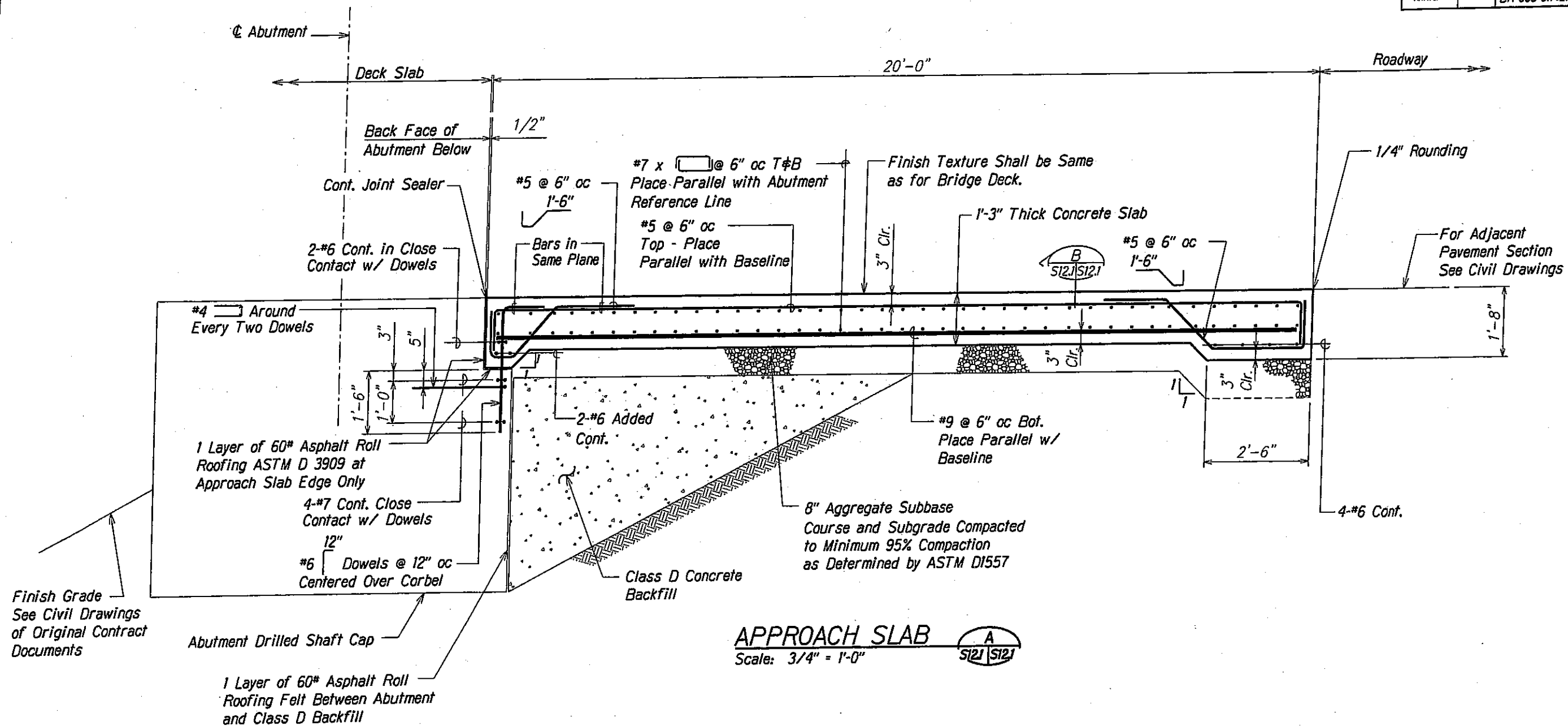
LOAD TEST SHAFT DETAILS
KAMEHAMEHA HIGHWAY - REPLACEMENT
OF SOUTH PUNALUU STREAM BRIDGE
Federal Aid Project No. BR-083-01(42)

Scale: As Shown Date: March, 2010
SHEET No. S11.3 OF 63 SHEETS

- NOTES:**
1. 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 S5J and shall be a minimum length of 120 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 (Ostenberg Load Cell). The expandable base load cell shall be attached to the bottom of the shaft reinforcing cage prior to lowering the cage in place. The drilled shaft load test should be performed in general accordance with the Quick Load Test Method of ASTM Test Designation D 1143. The drilled test shaft shall be loaded to failure to evaluate the ultimate side shear resistance of the shaft.
 2. A load cell of adequate size to measure the maximum test load 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 shaft.
 3. A sonic caliper shall be used to determine the shaft diameter below the casing.

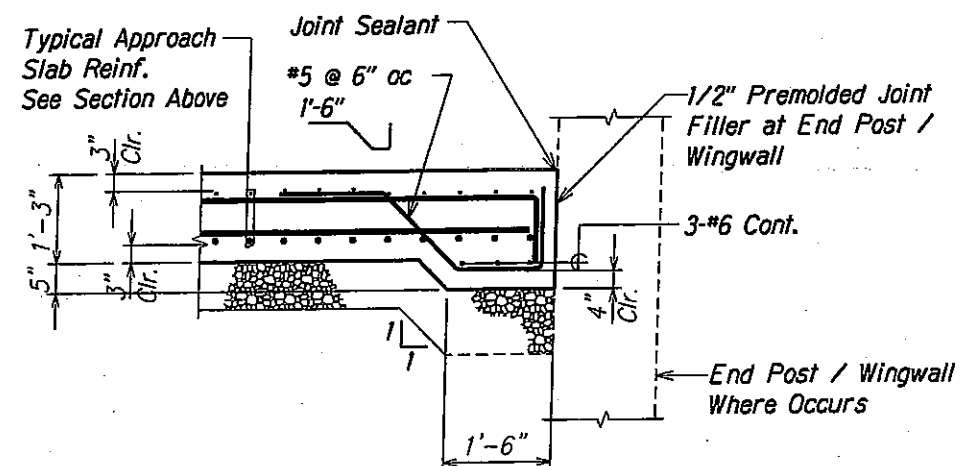
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 PLOT TIME: 07-29-10, 3:02 PM
 DESIGNED BY: []
 CHECKED BY: []
 IN CHARGE: []
 DATE: []

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-011421	2009	63	63



APPROACH SLAB

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



APPROACH SLAB EDGE SECTION

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



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KSE, LLC	APRIL 30, 2010 LIC. EXP. DATE
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

APPROACH SLAB SECTIONS

KAMEHAMEHA HIGHWAY - REPLACEMENT
OF SOUTH PUNALUU STREAM BRIDGE
Federal Aid Project No. BR-083-01(42)

Scale: As Shown

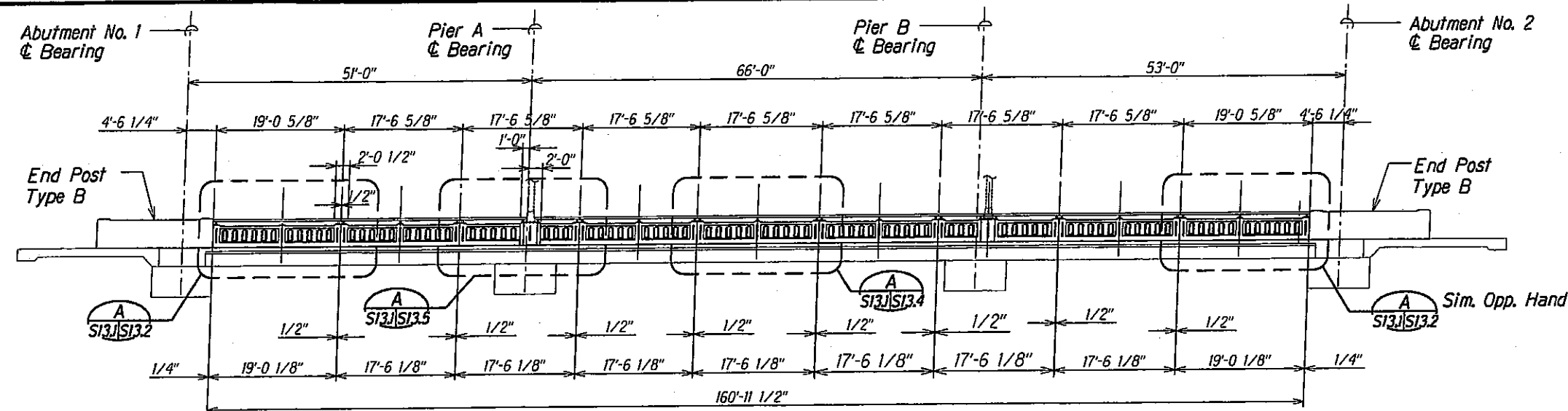
Date: March, 2010

SHEET No. 5121 OF 63 SHEETS

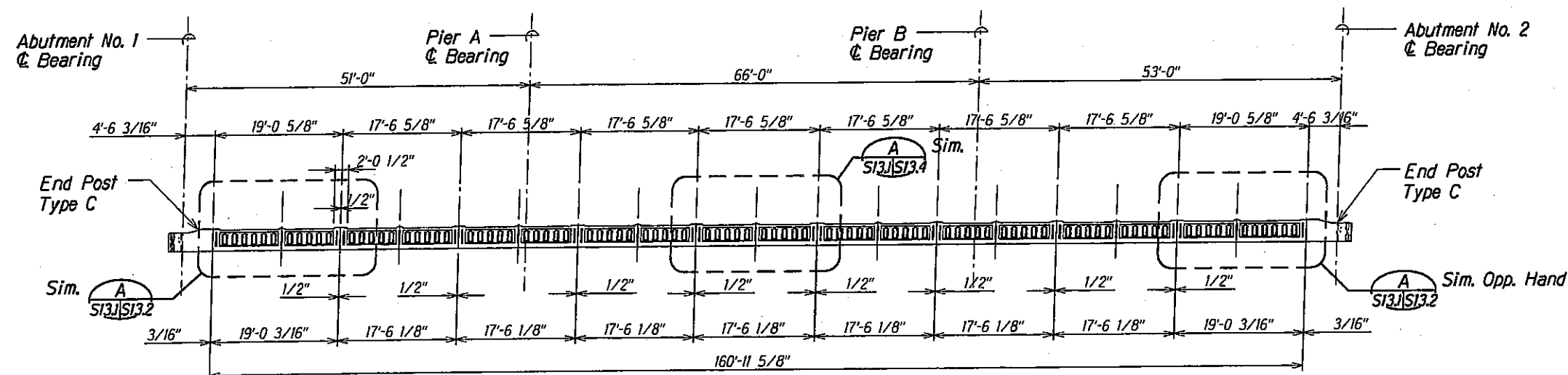
DRAINAGE NAME: 2:100 ONGONG\90206-SO PUNALUU STR BRIDGE\07-10-10\SP58-S1201.DWG PLOT TIME: 07-29-10 1:02 PM

NOTE BOOK	TRACED BY _____	_____
	DESIGNED BY _____	_____
	QUANTITIES BY _____	_____
No. _____	CHECKED BY _____	_____

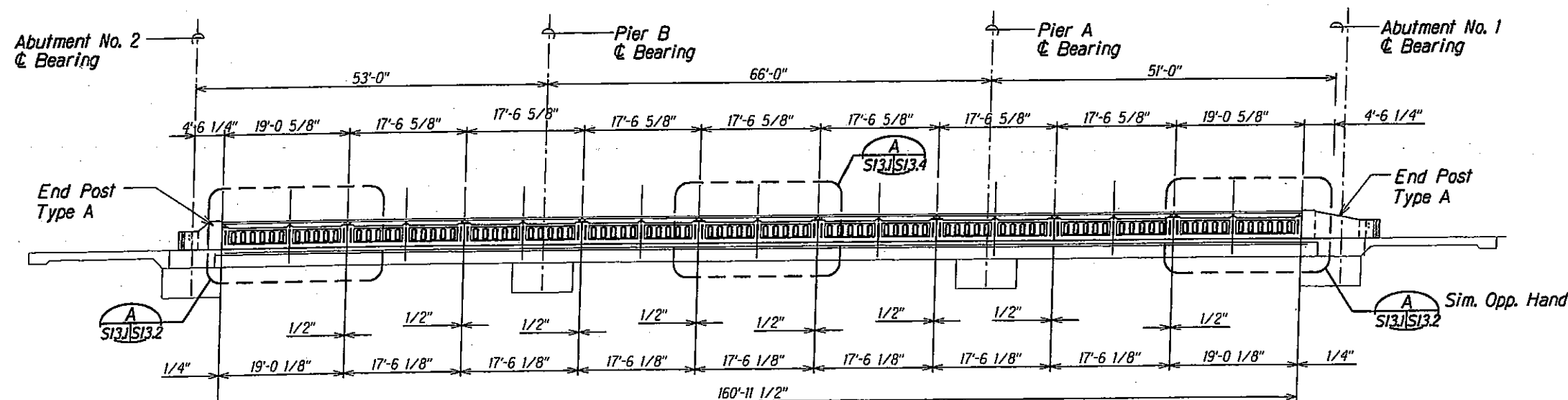
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-01(42)	2009	64	63



WALKWAY RAILING - VIEW FROM WALKWAY
Scale: 1" = 10'-0"



LEFT RAILING - VIEW FROM ROADWAY
Scale: 1" = 10'-0"



RIGHT RAILING - VIEW FROM ROADWAY
Scale: 1" = 10'-0"



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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

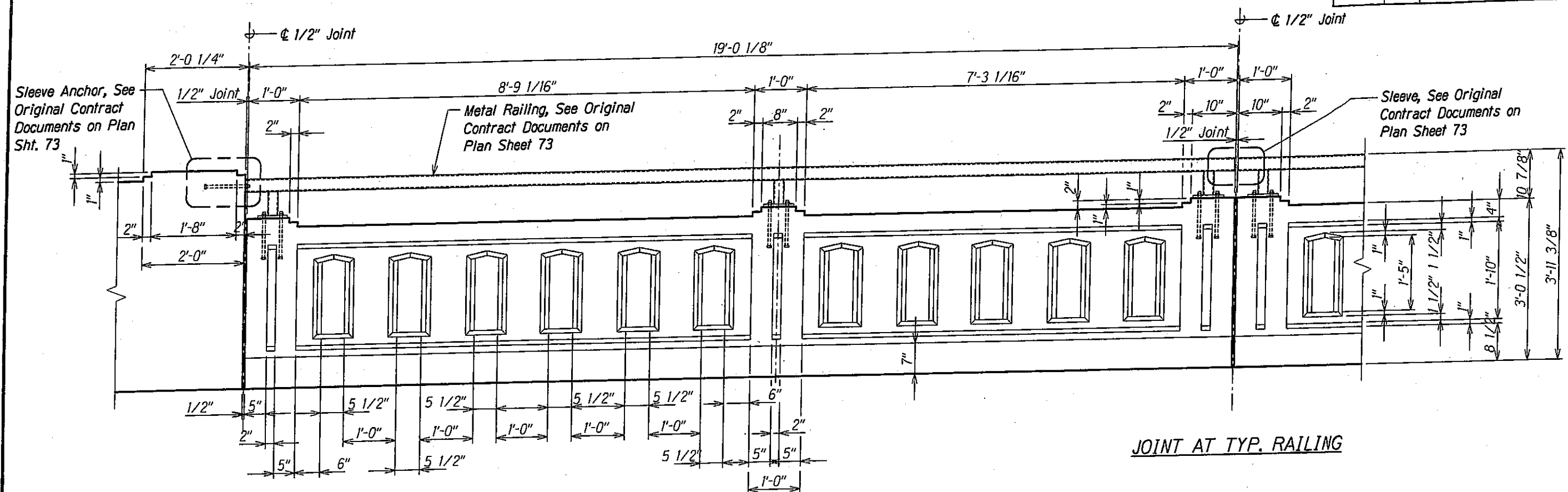
RAILING ELEVATIONS

**KAMEHAMEHA HIGHWAY - REPLACEMENT
OF SOUTH PUNALUU STREAM BRIDGE**
Federal Aid Project No. BR-083-01(42)

Scale: As Shown Date: March, 2010

SHEET No. S13J OF 63 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-01(42)	2009	65	63



JOINT AT END POST

JOINT AT TYP. RAILING

AESTHETIC BRIDGE RAILING END PANEL ELEVATION
 Scale: 1" = 1'-0"



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DATE: APR 30, 2010
 LIC. EXP. DATE

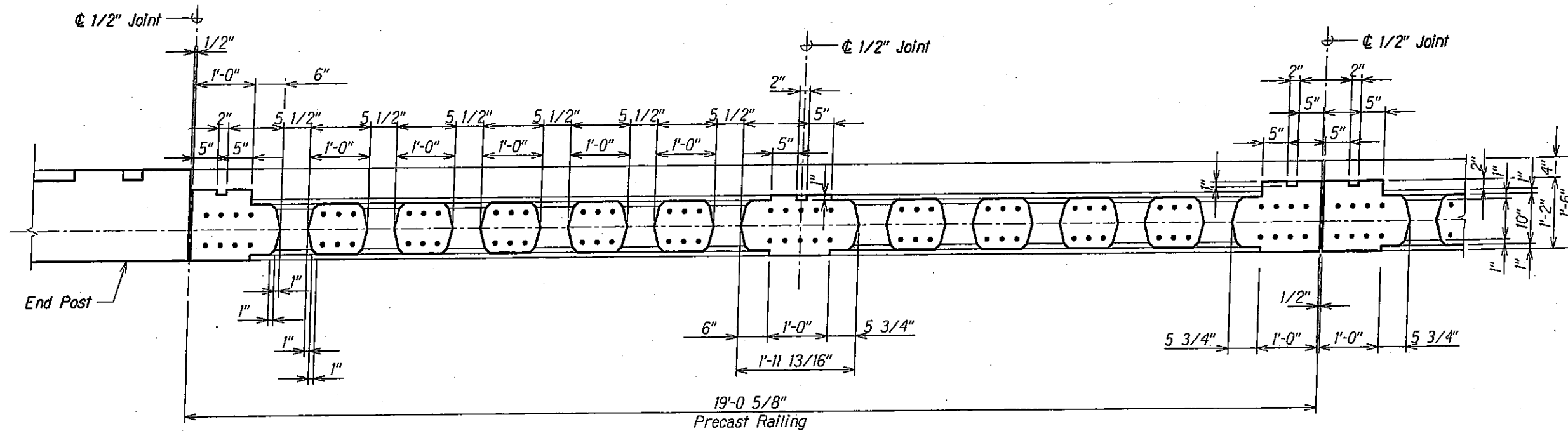
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
RAILING ELEVATION
AT END PANEL
KAMEHAMEHA HIGHWAY - REPLACEMENT
OF SOUTH PUNALUU STREAM BRIDGE
Federal Aid Project No. BR-083-01(42)

Scale: As Shown
Date: March, 2010

SHEET No. S132 OF 63 SHEETS

DRAWING NAME: 2. LOD CONC/CONC 190216-50 PUNALUU STR BRIDGE (07-10-10) (S132-S137) (ING)
 PLOT FILE: 07-28-10, 3:04 PM
 DESIGNED BY:
 CHECKED BY:
 DATE:

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-01(42)	2009	66	63



AESTHETIC BRIDGE RAILING END PANEL PLAN / SECTION

Scale: 1" = 1'-0"

A
S133 S133



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APRIL 30, 2010
KSF, INC. LIC. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

RAILING PLAN AT END PANEL

KAMEHAMEHA HIGHWAY - REPLACEMENT
OF SOUTH PUNALUU STREAM BRIDGE
Federal Aid Project No. BR-083-01(42)

Scale: As Shown Date: March, 2010

SHEET No. S133 OF 63 SHEETS

REVISIONS
NO. 1
DATE
BY
CHECKED BY
DATE

NOTE BOOK

DRAWING NAME: 2.100 CHOCOMA 190016-50 PUNALUU STR BRIDGE (07-10-10) SPEED-REBUILDING PLOT TIME: 07-29-10, 3:04 PM

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPICAL RAILING ELEVATION AND PLAN

KAMEHAMEHA HIGHWAY - REPLACEMENT
OF SOUTH PUNALUU STREAM BRIDGE
Federal Aid Project No. BR-083-0K(2)

Scale: As Shown Date: March, 2010

SHEET No. 5134 OF 63 SHEETS

NOTE BOOK	DESIGNED BY	•
No. _____	QUANTITIES BY	•
	CHECKED BY	•

DRAWING NAME: 2. 100 ONCEING 90236-SO PUNJALLU STR BRIDGE 107-30-101 9599-5161 DMC
 PLOT TIME: 07-29-10 3:04 PM

Technical drawing of a bridge railing cross-section. The drawing shows a railing with a central light base and two side sections. Key dimensions and components include:

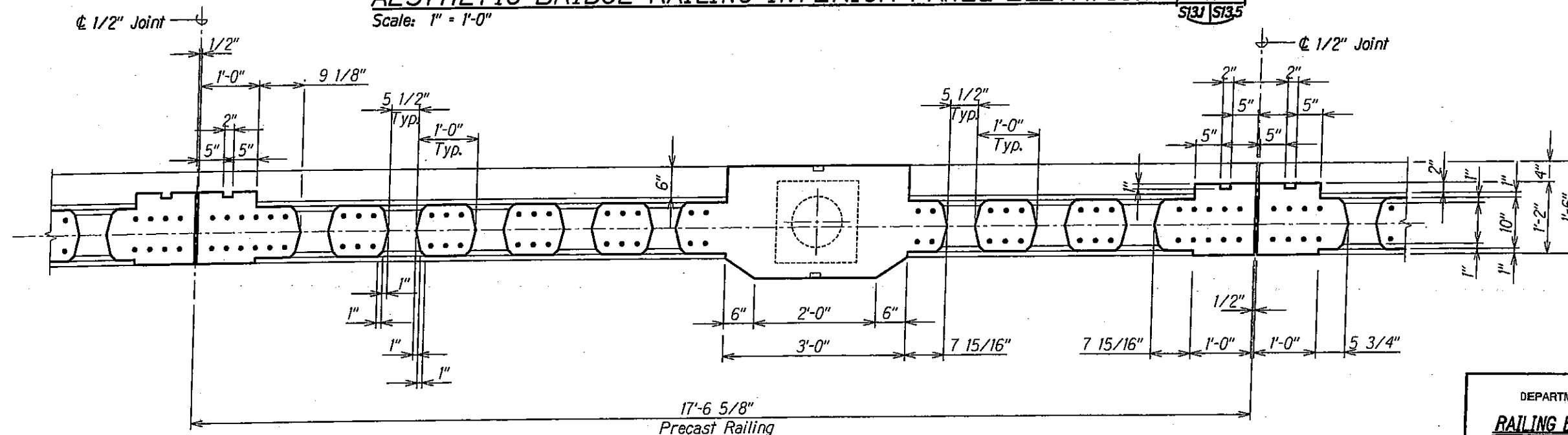
- Overall Width:** 17'-6 1/8"
- Light Base:** 17'-6 1/8" wide, 10'-0" high. It features a central light standard and a base with a 2" recess EF. The base is supported by a 3'-0" wide cast-in-place concrete foundation.
- Side Sections:** Each side section is 5'-8 3/8" wide and 3'-11 3/8" high. They feature a 2" recess EF and a 1" wide opening. The side sections are supported by a 3'-0" wide cast-in-place concrete foundation.
- Dimensions:**
 - Overall width: 17'-6 1/8"
 - Light base width: 10'-0"
 - Light base height: 10'-0"
 - Side section width: 5'-8 3/8"
 - Side section height: 3'-11 3/8"
 - Light base foundation width: 3'-0"
 - Side section foundation width: 3'-0"
 - Light base foundation height: 3'-0"
 - Side section foundation height: 3'-0"
 - Light base foundation depth: 3'-0"
 - Side section foundation depth: 3'-0"
 - Light base foundation width: 3'-0"
 - Side section foundation width: 3'-0"
 - Light base foundation height: 3'-0"
 - Side section foundation height: 3'-0"
 - Light base foundation depth: 3'-0"
 - Side section foundation depth: 3'-0"
- Components:**
 - Light Standard
 - Light Base
 - Metal Railing
 - Cast-in-Place
 - Precast Railing
 - Joint
 - Recess EF
 - Clearance (1" Clr.)

JOINT AT TYP. RAILING

A

S131 | S132

Scale: 1" = 1'-0"



Scale: 1" = 1'-0"



THIS WORK WAS PREPARED BY ME
OR UNDER MY SUPERVISION.

KSC, INC. APR 30, 2011
LIC. EXP. 04/30/11

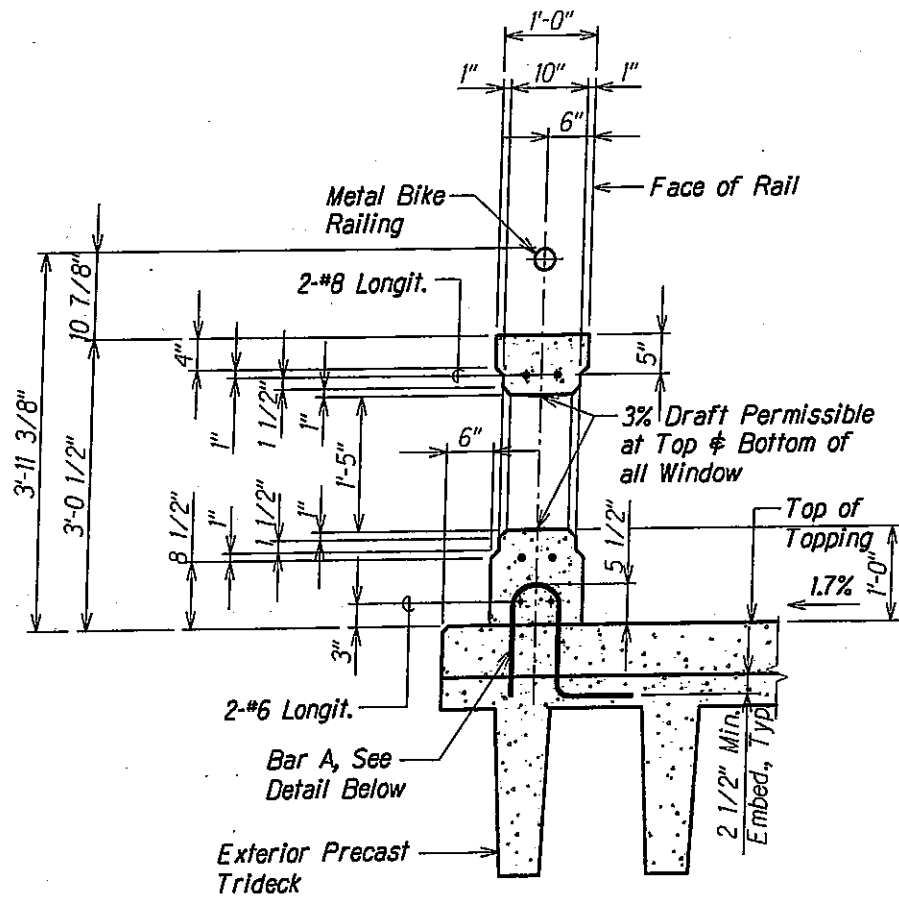
Scale: As Shown Date: March, 2010

SHEET No. 5/35 OF 63 SHEETS

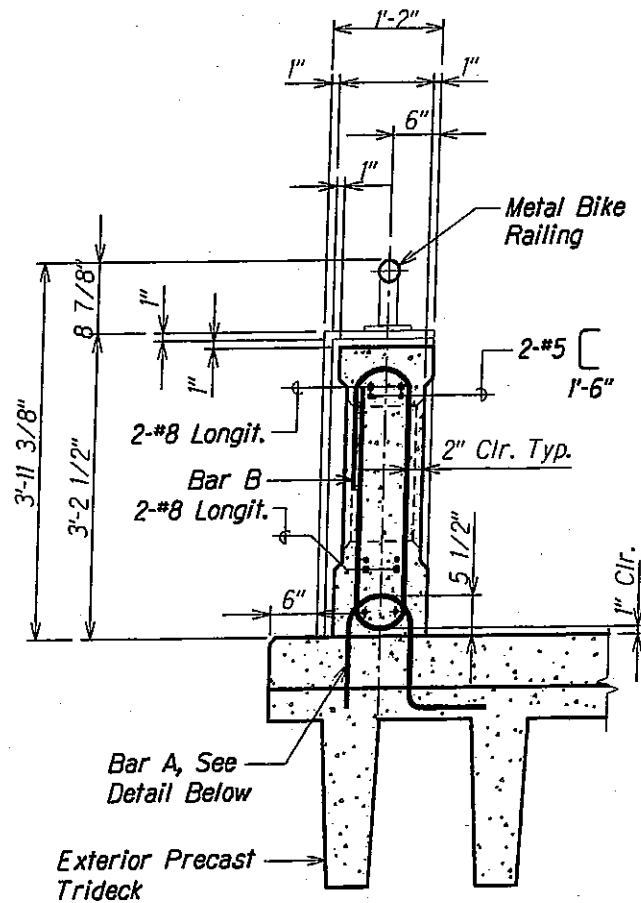
NOTE BOOK	DESIGNED BY _____	_____	_____
	QUANTITIES BY _____	_____	_____
No. _____	CHECKED BY _____	_____	_____

DRAWING NAME: Z.100 QINQING)PODS-SO RUMULU STR BRIDGE 107-30-101 SP58-SUNDUNG PLOT TIME: 07-29-10, 3:04 PM

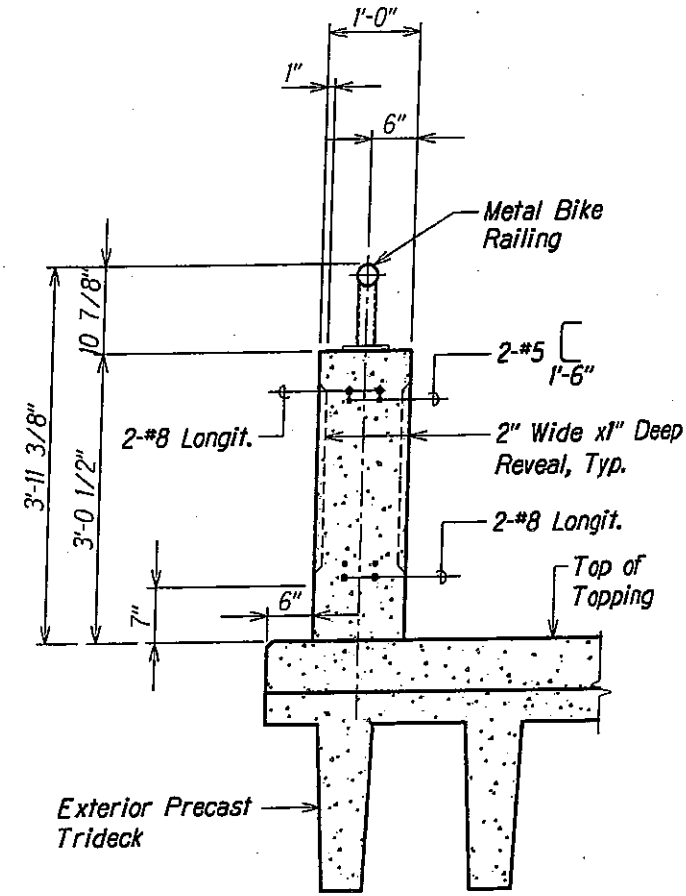
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-01(42)	2009	69	63



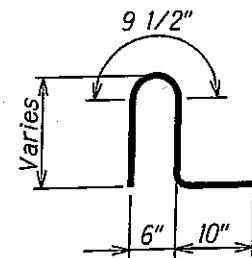
SECTION THRU WINDOW A
Scale: 1" = 1'-0"
S13.6 S13.6



SECTION THRU POST B
Scale: 1" = 1'-0"
S13.6 S13.6

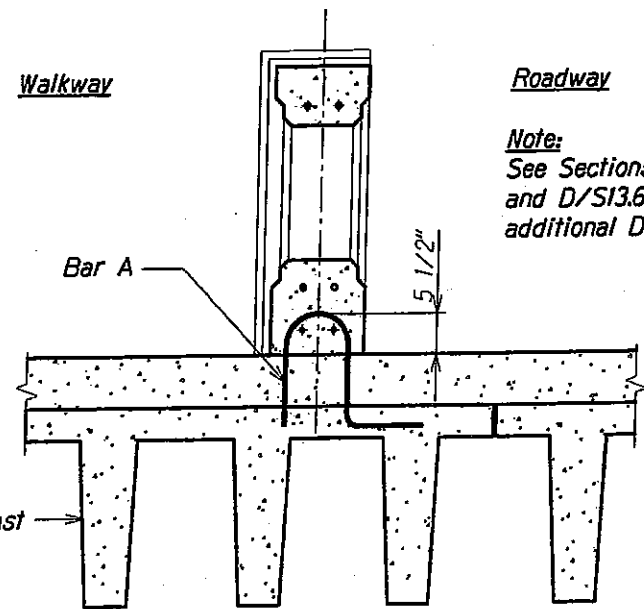


SECTION THRU INTERMEDIATE POST C
Scale: 1" = 1'-0"
S13.6 S13.6



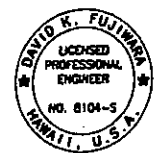
NOTE:
Bar A shall be plumb after erection of Tridecks.

BAR A (#5) D
Scale: 1" = 1'-0"
S13.6 S13.6



SECTION THRU POST E
Scale: 1" = 1'-0"
S13.6 S13.6

Note:
See Sections A, B, C and D/S13.6 for additional Details.



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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

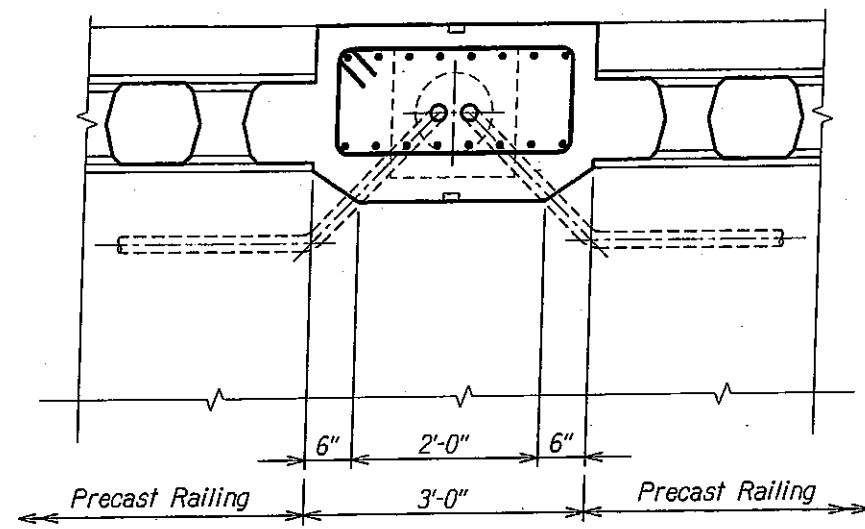
RAILING SECTIONS AND DETAIL

KAMEHAMEHA HIGHWAY - REPLACEMENT OF SOUTH PUNALUU STREAM BRIDGE
Federal Aid Project No. BR-083-01(42)

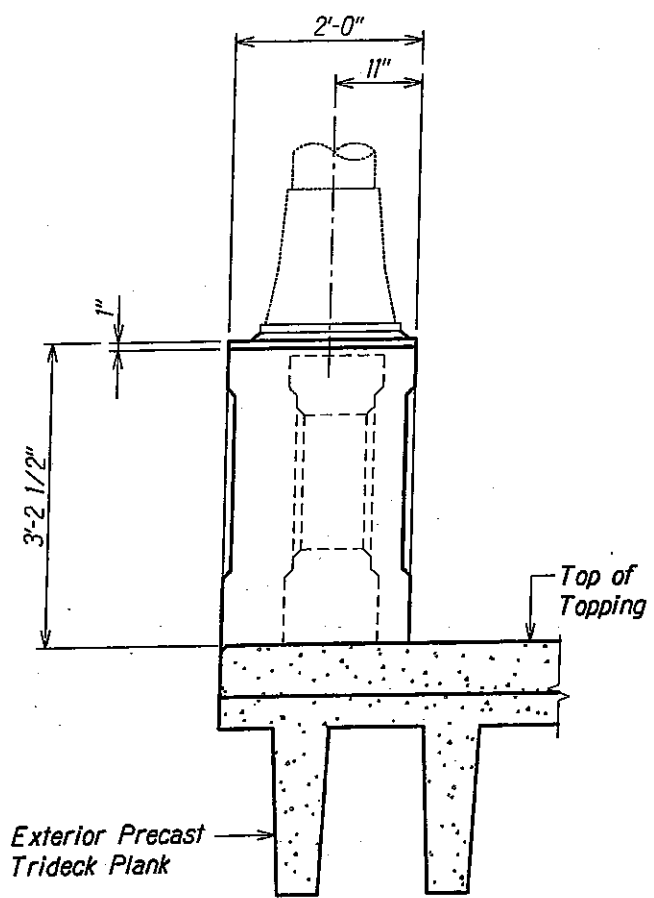
Scale: As Shown Date: March, 2010

SHEET No. S13.6 OF 63 SHEETS

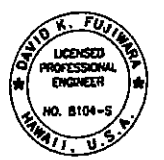
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-01(42)	2009	70	63



PLAN / SECTION A
Scale: 1" = 1'-0"



SECTION THRU POST B
Scale: 1" = 1'-0"



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KSF, INC. APR 30, 2010 LIC. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
RAILINGS SECTIONS
AT LIGHT POLE
KAMEHAMEHA HIGHWAY - REPLACEMENT
OF SOUTH PUNALUU STREAM BRIDGE
Federal Aid Project No. BR-083-01(42)
Scale: As Shown Date: March, 2010
SHEET No. S137 OF 63 SHEETS

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