

GENERAL NOTES

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-K-01-03	2008	ADD. 30	37

1. General Specifications: 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 (Fourth Edition, 2007) and modifications by the HDOT Highways Division.
- (B) HDOT Memorandum HWY-DB 2.6843 dated February 14, 2005 with subject title "Design Criteria for Bridges and Structures".

3. Loads:

- (A) Seismic Loads: Acceleration coefficient - 0.09

4. Materials:

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

Item No.	Structural Parts	Classes of Concrete	Compressive Strength f'c (28 Days)
(1)	Concrete Wall and Footing	-	4000 PSI
(2)	Cast-in-place Downturn	-	4000 PSI
(3)	Except as noted otherwise, all others	A	3000 PSI

- (B) The use of any calcium chloride in any concrete is prohibited.
- (C) All reinforcing steel shall be ASTM A 615, Grade 60 unless otherwise noted.
- (D) All anchor bolts, washers and nuts shall be ASTM A 193 (UNS S31600) stainless steel unless otherwise specified.
- (E) All dowels with non-shrink grout into existing wall shall be ASTM A 955 UNS 531603 Grade 60 deformed stainless steel reinforcement.

5. Reinforcement:

- (A) The covering measured from the surface of the concrete to the face of any reinforcing bar shall be as follows, except as otherwise noted.

- △ (1) Concrete cast against earth = 3"
- (2) All others unless otherwise noted = 2"

- (B) Reinforcing bars shall be detailed in accordance with the latest edition of the A.C.I. Detailing Manual unless otherwise noted.
- (C) Minimum clear spacing between parallel bars shall be 1 1/2 times the diameter of bars (for non-bundled bars). In no case shall the clear distance between the bars be less than 1 1/2 times the maximum size of the coarse aggregate or 1 1/2".
- (D) All dimensions relating to reinforcing bars are to centers of bars unless otherwise noted.
- (E) Reinforcing bars shall be securely tied at all intersections and lap splices except where the spacing of intersections is less than one foot in each direction, in which case alternate intersections shall be tied.

6. Retaining Wall Notes:

- (A) All work related to the retaining walls required for this project shall be performed in accordance with Standard Specification Section 503 Concrete Structures. Precast walls will not be permitted.
- (B) The Contractor shall provide and maintain a stable slope above and below the retaining walls.

7. Construction Notes:

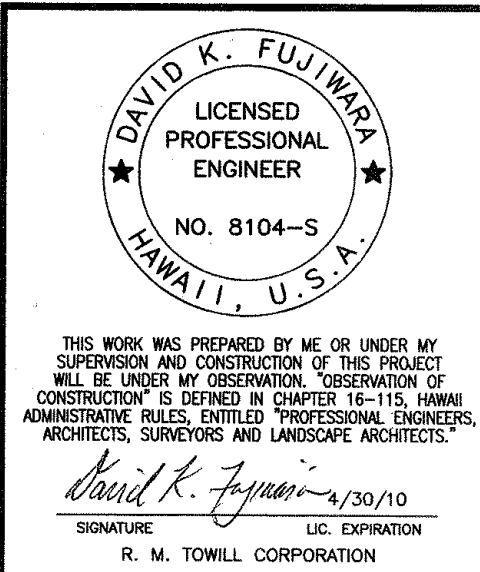
- (A) The Contractor shall verify all dimensions and site conditions and shall report any discrepancies in writing to the Engineer before commencing work or ordering materials.
- (B) The Contractor shall verify all site conditions and not rely upon these plans for existing elevations and azimuths, roads, roadway gutters, curbs and sidewalks, etc. Conditions may differ from those shown.
- (C) The Contractor shall be solely responsible for the protection of adjacent properties, utilities and existing and new structures from damage due to construction. Repairing any damage shall be at the Contractor's own expense, to the satisfaction of the Engineer.
- (D) The Contractor shall verify the location of all utility lines and notify the respective owners before commencing with excavation, and any temporary piling or sheeting.
- (E) The Contractor shall be responsible for any relocation and/or temporary supports of power poles during construction. See Civil Plans for further requirements.
- (F) Except as otherwise noted, all vertical dimensions are measured plumb.
- (G) For concrete finish see Standard Specifications and Special Provisions.
- (H) Control joints may be a construction joints providing the details are same as for control joints.
- (I) Unless otherwise noted, all exposed concrete edges shall be chamfered 3/4" x 3/4".
- (J) All construction dust debris or other material not incorporated in the permanent work shall not be allowed to contaminate the project site and shall be removed from the project site at the Contractor's expense.

8. Foundation:

- (A) For boring logs and other geotechnical information, see "Geotechnical Investigation" by URS Corporation.

SURVEY PLOTTED BY	DATE
DRAWN BY	02-2008
TRACED BY	02-2008
QUANTITIES BY	02-2008
CHECKED BY	02-2008
NO. ADD. 50%	

6/13/08	1	Revised Note
DATE		REVISION



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GENERAL NOTES

Kaunualii Highway, Kuhio Highway
& Kuamoo Road Retaining Walls
Project No. HWY-K-01-03

Scale: AS NOTED Date: MAY 2008

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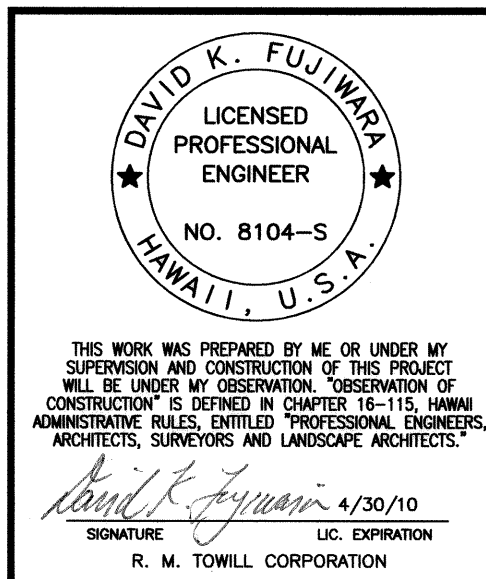
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BB	02-2008	
NOTE BOOK	DESIGNED BY	DATE
RM	02-2008	
QUANTITIES BY	CHECKED BY	DATE
No. 0104304040		02-2008

RMTC JOB NO. : 1-20132-0E

SYMBOLS AND ABBREVIATIONS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-K-01-03	2008	31	37

¢	And	Det.	Detail	Ga.	Gage, Gauge	NF	Near Face		
@	At	Dia.	Diameter	Galv.	Galvanized	N	North		
∅	Diameter	Dim.	Dimension	Gr.	Grade	NIC	Not in Contract	Std.	Standard
#	Number	Dist.	Distance	Grd.	Ground	No.	Number	Sta.	Station
		Dwls.	Dowels	GRP	Grouted Rubble Pavement	NTS	Not to Scale	Stirr.	Stirrup
Abbr.	Abbreviation	Dn.	Down					Stl.	Steel
Add.	Additional, Added	Dbl.	Double			O/S	Offset	Str.	Straight
Alt.	Alternate	DI	Drain Inlet, Ductile Iron	Ht.	Height	oc	On Center	Struct.	Structure
AB	Anchor Bolt			(H)	Hinge	Opn'g	Opening	Symm.	Symmetrical
AC	Asphaltic Concrete	Dwg., Dwgs.	Drawing, Drawings	Horiz., H	Horizontal	OB	Outbound		
Approx.	Approximate			HDOT	State of Hawaii Department of Transportation	OD	Outside Diameter	Temp.	Temporary
Az.	Azimuth	E	East			OG	Outside Girder, Outbound Girder	Thk.	Thick
		EA, Ea., ea.	Each	HS	High strength			T	Top
Bk.	Back	EF	Each Face					T&B	Top and Bottom
Bal.	Balance	EFH	Each Face Horizontal			Perf.	Perforated	TFE	Top of Footing Elevation
B	Baseline	EFV	Each Face Vertical	IB	Inbound	PL	Plate	Tot.	Total
Bm.	Beam	EP	Edge of Pavement	In.	Inch	PCF	Pounds per Cubic Foot	Transv.	Transverse
Bet.	Between	ES	Edge of Shoulder	ID	Inside Diameter	PSF	Pounds per Square Foot	TS	Structural Tubing
BF	Both Faces, Back Face	EW	Each Way	IF	Inside Face	PSI	Pounds per Square Inch	Typ.	Typical
BW	Both Ways	Elec.	Electrical	Int.	Interior	PLF	Pounds per Linear Foot		
BFE	Bottom of Footing Elevation	El., Elev.	Elevation	Inv.	Invert	Pt., Pts.	Point, Points	Undergrd.	Underground
		Eq.	Equal	Jt.	Joint	PVC	Polyvinyl Chloride		
Bot., Bott., B	Bottom	Est.	Estimated			Prestr.	Prestressed	Var.	Varies
Blt.	Bolt	Exc.	Excavation	K	Kips			Vert., V	Vertical
		Excl.	Excluding	KF	Kip Foot	Rad., R	Radius	VC	Vertical Curve
		Exist., Ex.	Existing	KSF	Kips Per Square Foot	RF	Rear Face		
Cant.	Cantilever	Exp., (E)	Expansion	KSI	Kips Per Square Inch	Rebar	Reinforcing Bar	W/C	Water/Cement Ratio
CIP	Cast-in-Place	EJ	Expansion Joint	KLF	Kips Per Linear Foot	Ref.	Reference	w/	With
CL	Centerline	Ext.	Exterior			Reinf.	Reinforced, Reinforcing, Reinforcement	W	West
CG	Center of Gravity			L	Length			WWF	Welded Wire Fabric
cc	Center to Center	FF	Far Face, Front Face			Req'd.	Required	WP	Work Point, Working Point
Cl.	Class	f'c	Specified Compressive Strength of Concrete at 28 days	lb., lbs., LBS.	Pound, Pounds	Ret.	Retaining		
Clr.	Clearance			Ltg. Std.	Lighting Standard	Rt.	Right	Yr.	Year
Col.	Column	Ft.	Feet, Foot	LF, Lin. Ft.	Linear Feet/Foot	ROW	Right of Way		
Conc.	Concrete	Fig.	Figure	LS	Lump Sum	Rdwy.	Roadway		
CRM	Concrete Rubble Masonry	Fin. Gr.	Finish Grade	Longit.	Longitudinal				
		(F)	Fixed			Sect.	Section		
Conn.	Connection	FB	Flat Bar	M	Modified	Sht.	Sheet		
Const.	Construction	Ftg.	Footing	MH	Manhole	Sim.	Similar		
CJ	Control Joint	FA	Force Account	Max.	Maximum	Sl.	Slope		
CJ	Control Joint	f's	Ultimate Tensile Strength of Tendon	Min.	Minimum	S	South		
Const. Jt.	Construction Joint			Misc.	Miscellaneous	Spc., Spg.	Spaces, Spacing		
Cont.	Continuous			MPH	Miles Per Hour	Sprd.	Spread		
CFCW	Continuous Flashing Compound Waterproofing					Spec.	Specification		
						SF	Square Feet		
CF	Cubic Feet					SY	Square Yard		
CY, Cu. Yd.	Cubic Yard					SS	Stainless Steel		



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

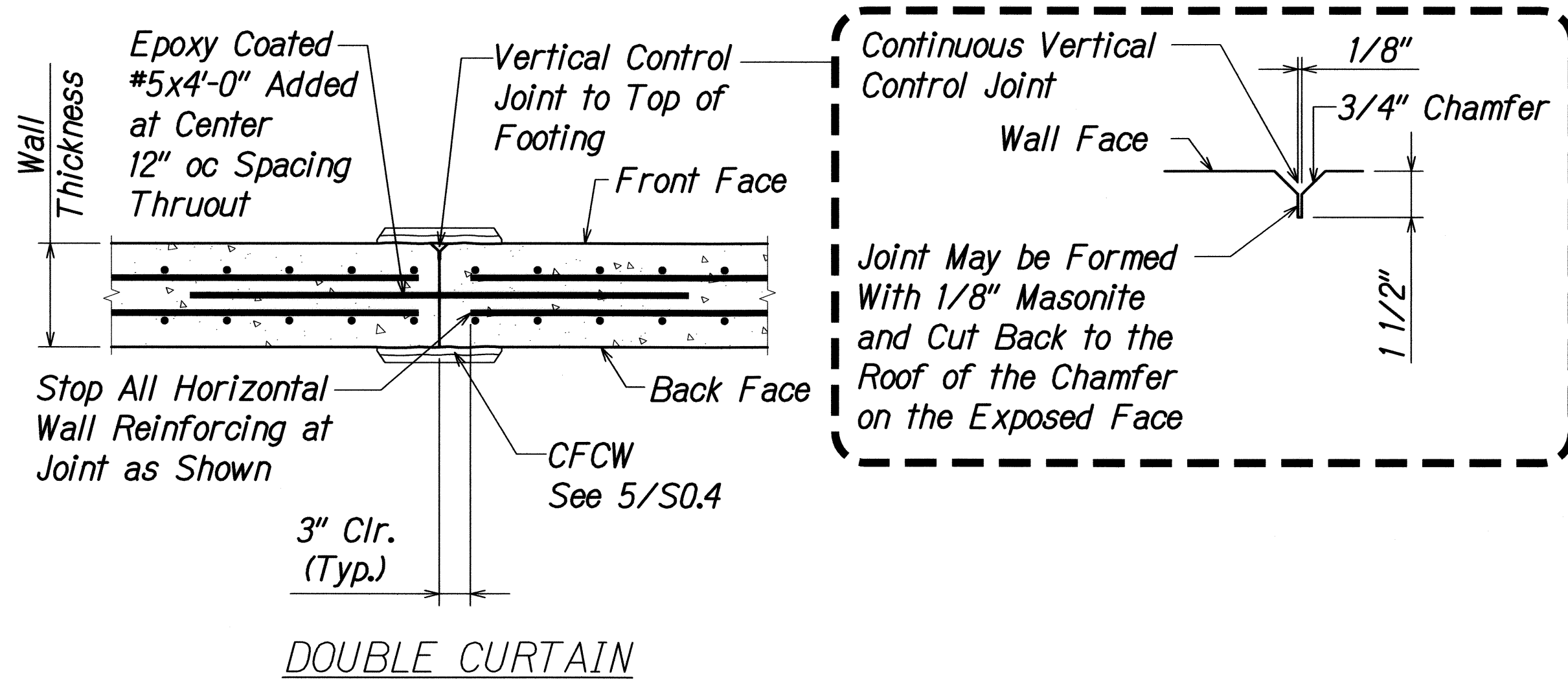
SYMBOLS AND ABBREVIATIONS

Kaunualii Highway, Kuhio Highway
& Kuamoo Road Retaining Walls
Project No. HWY-K-01-03

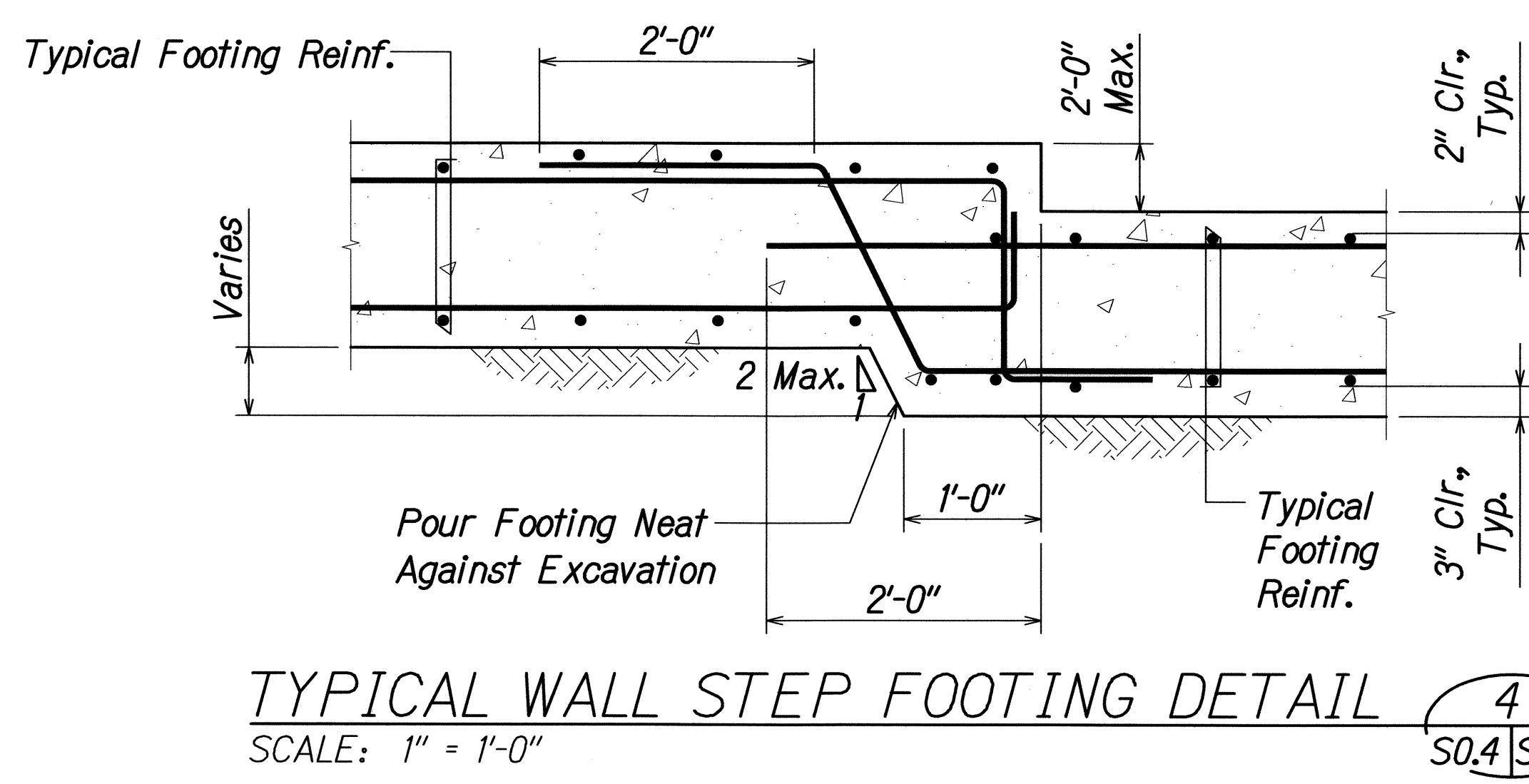
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SHEET No. 03 OF 9 SHEETS

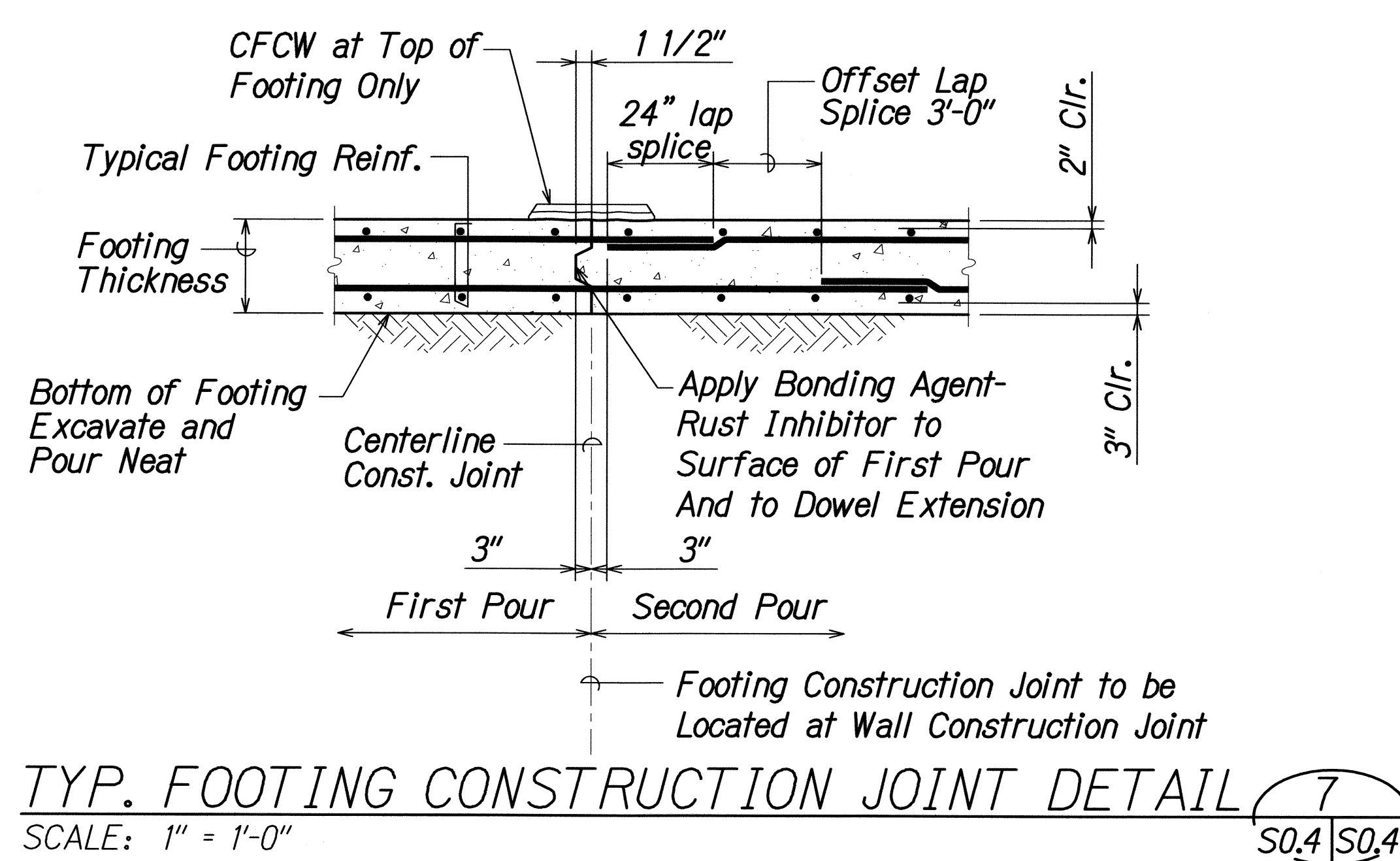
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-K-01-03	2008	32	37



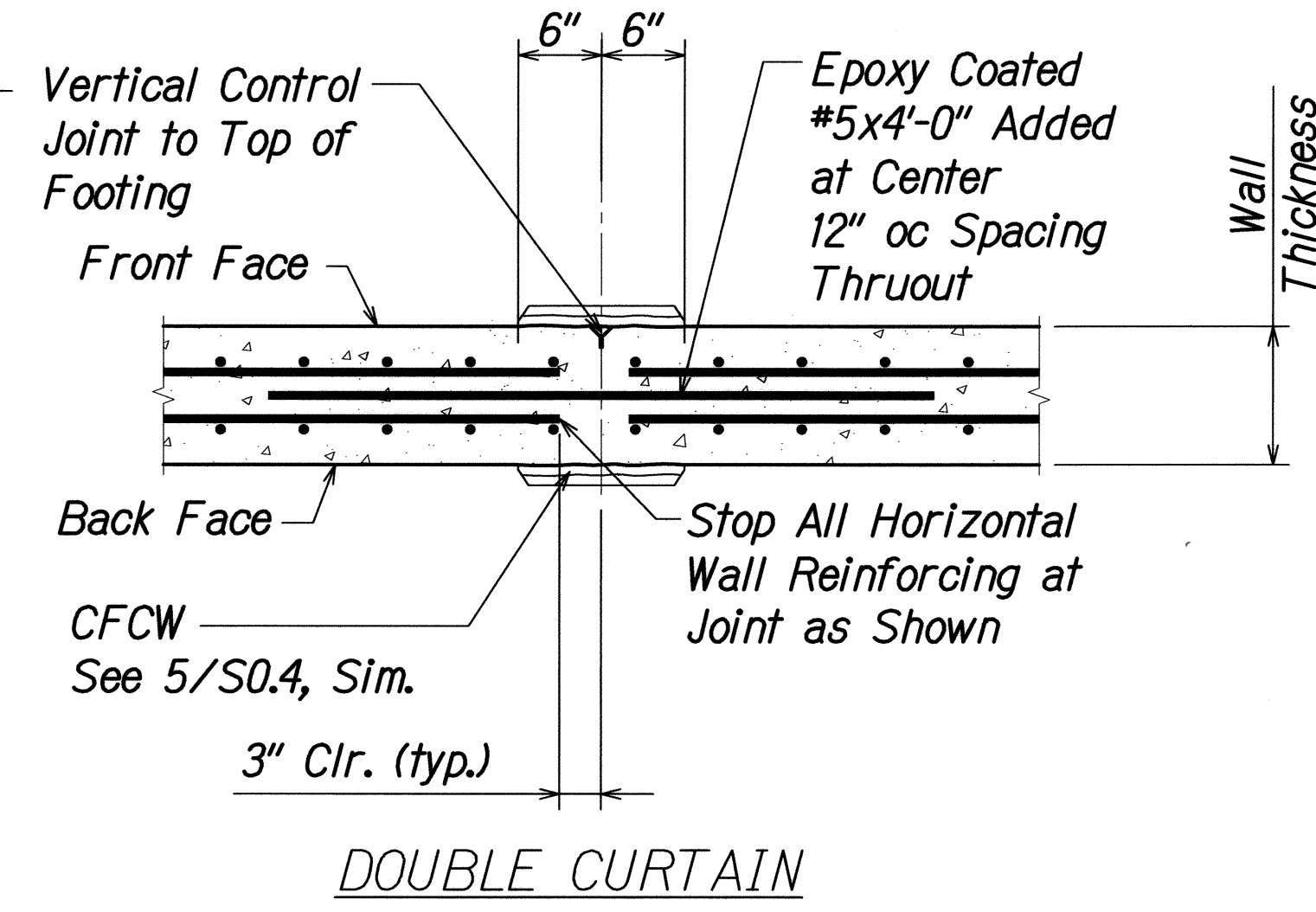
DOUBLE CURTAIN
CONSTRUCTION JOINT AT CONTROL JOINT LOCATION
SCALE: 1" = 1'-0" 1
S0.4 S0.4



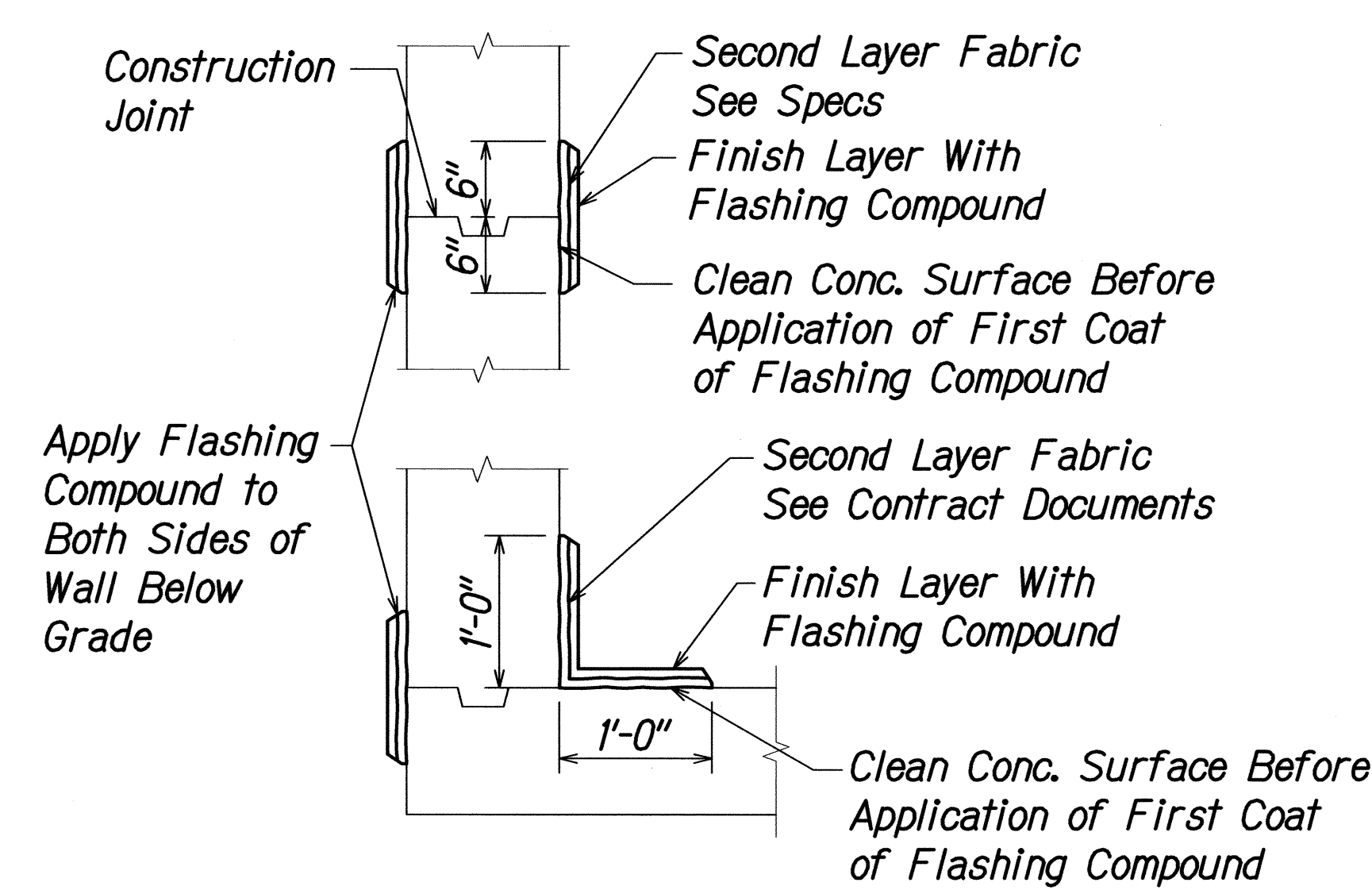
TYPICAL WALL STEP FOOTING DETAIL
SCALE: 1" = 1'-0" 4
S0.4 S0.4



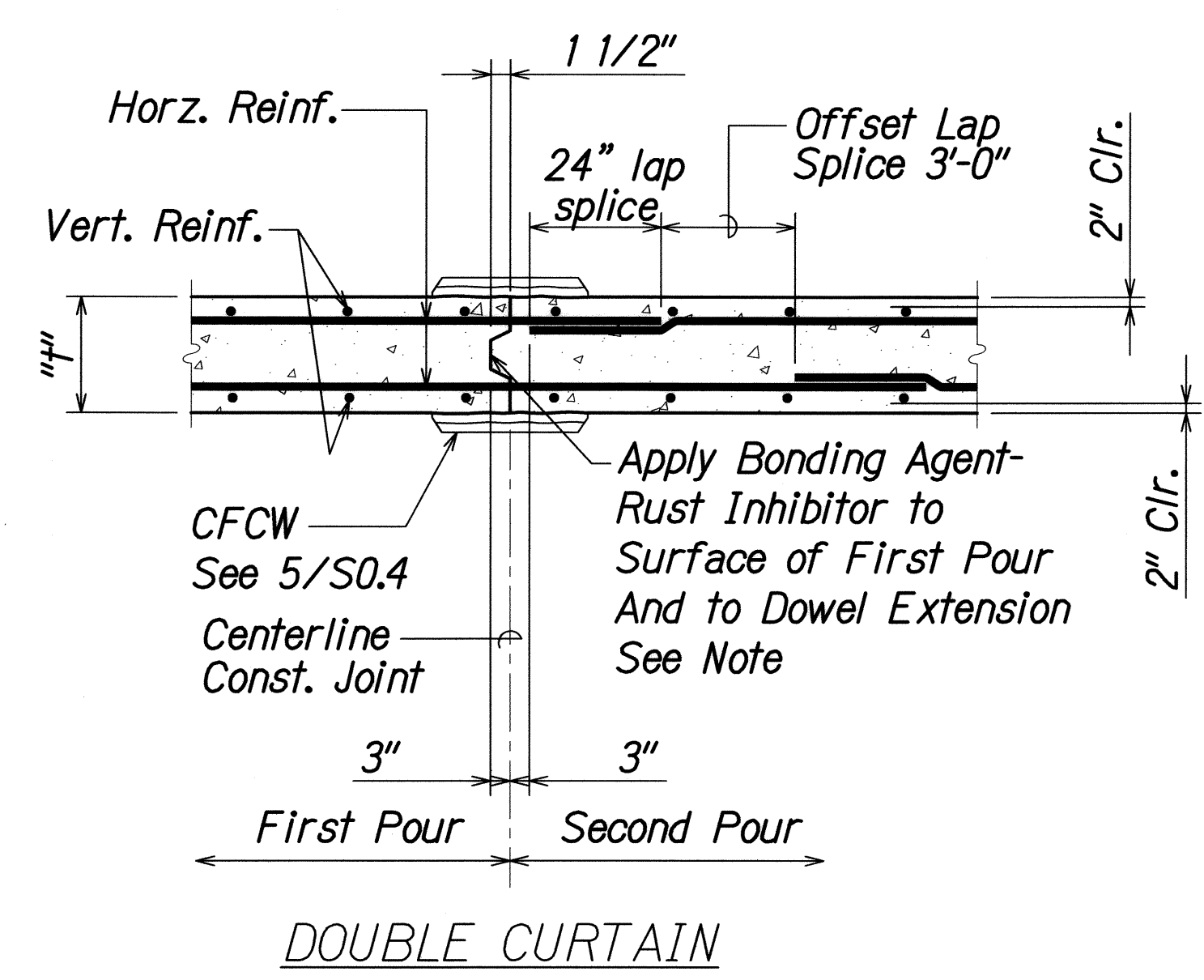
TYP. FOOTING CONSTRUCTION JOINT DETAIL
SCALE: 1" = 1'-0" 7
S0.4 S0.4



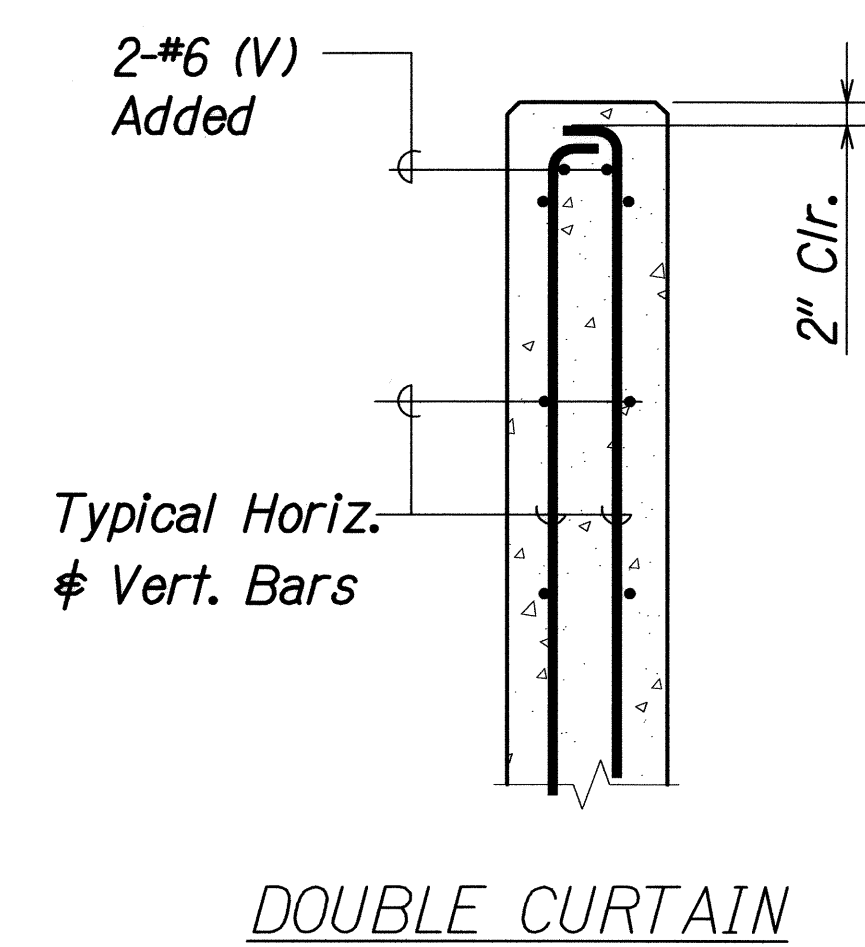
DOUBLE CURTAIN
TYPICAL WALL VERTICAL CONTROL JOINT DETAIL
SCALE: 1" = 1'-0" 2
S0.4 S0.4



TYP. CONTINUOUS FLASHING COMPOUND WATERPROOFING (CFCW) DETAILS
SCALE: 1" = 1'-0" 5
S0.4 S0.4



Note: Use 1 1/2" Deep X 4"/3 Keys.
DOUBLE CURTAIN
TYPICAL WALL VERTICAL CONSTRUCTION JOINT DETAIL
SCALE: 1" = 1'-0" 3
S0.4 S0.4



DOUBLE CURTAIN
CONCRETE WALL ENDS
SCALE: 1" = 1'-0" 6
S0.4 S0.4

DATE	02-2008
DESIGNED BY	RM
CHECKED BY	DFP
NO. 02-2008	
ORIGINAL PLAN	
NOTE BOOK	
QUANTITIES BY	
DESIGNED BY	
CHECKED BY	
DATE	02-2008

DAVID K. FUJIWARA
LICENSED PROFESSIONAL ENGINEER
NO. 8104-S
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. OBSERVATION OF CONSTRUCTION IS DEFINED IN CHAPTER 16-115, HAWAII ADMINISTRATIVE RULES, ENTITLED "PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS AND LANDSCAPE ARCHITECTS."

Signature: David K. Fujiwara
R. M. TOWILL CORPORATION
LIC. EXPIRATION: 4/30/10

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

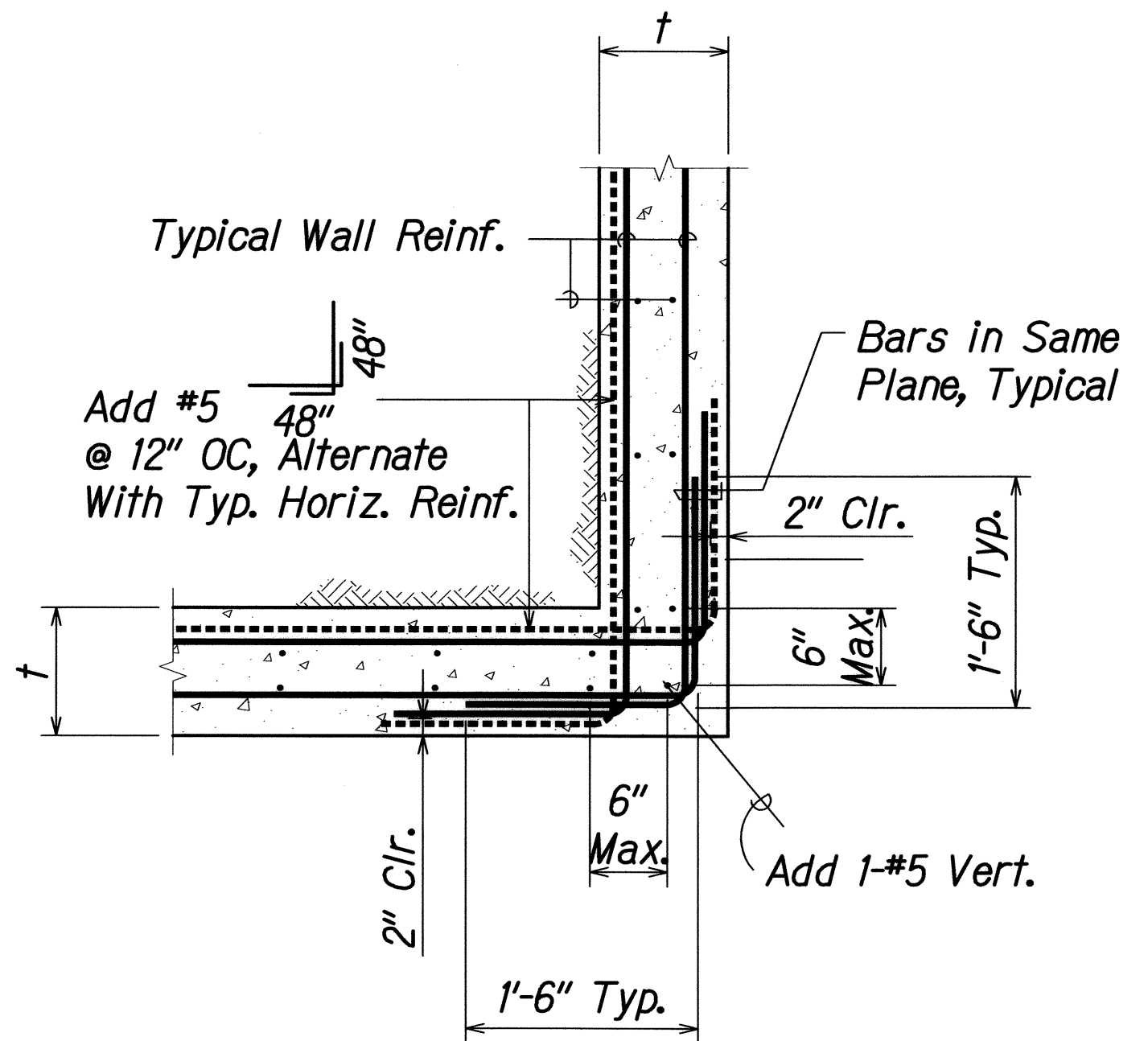
TYPICAL DETAILS

Kaunualii Highway, Kuhio Highway & Kuamoo Road Retaining Walls
Project No. HWY-K-01-03

Scale: AS NOTED Date: MAY 2008

SHEET No. S0.4 OF 9 SHEETS

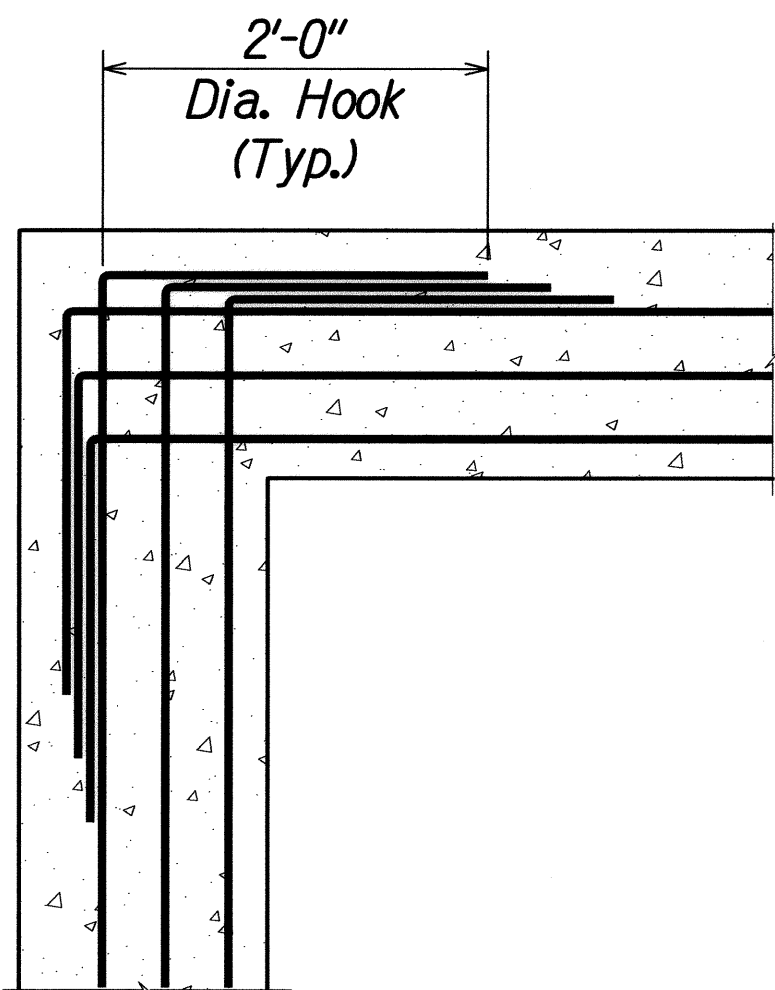
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-K-01-03	2008	33	37



TYP. WALL CORNER REINFORCEMENT LAPPING (DOUBLE CURTAIN)

SCALE: 1" = 1'-0"

1
S0.5 | S0.5

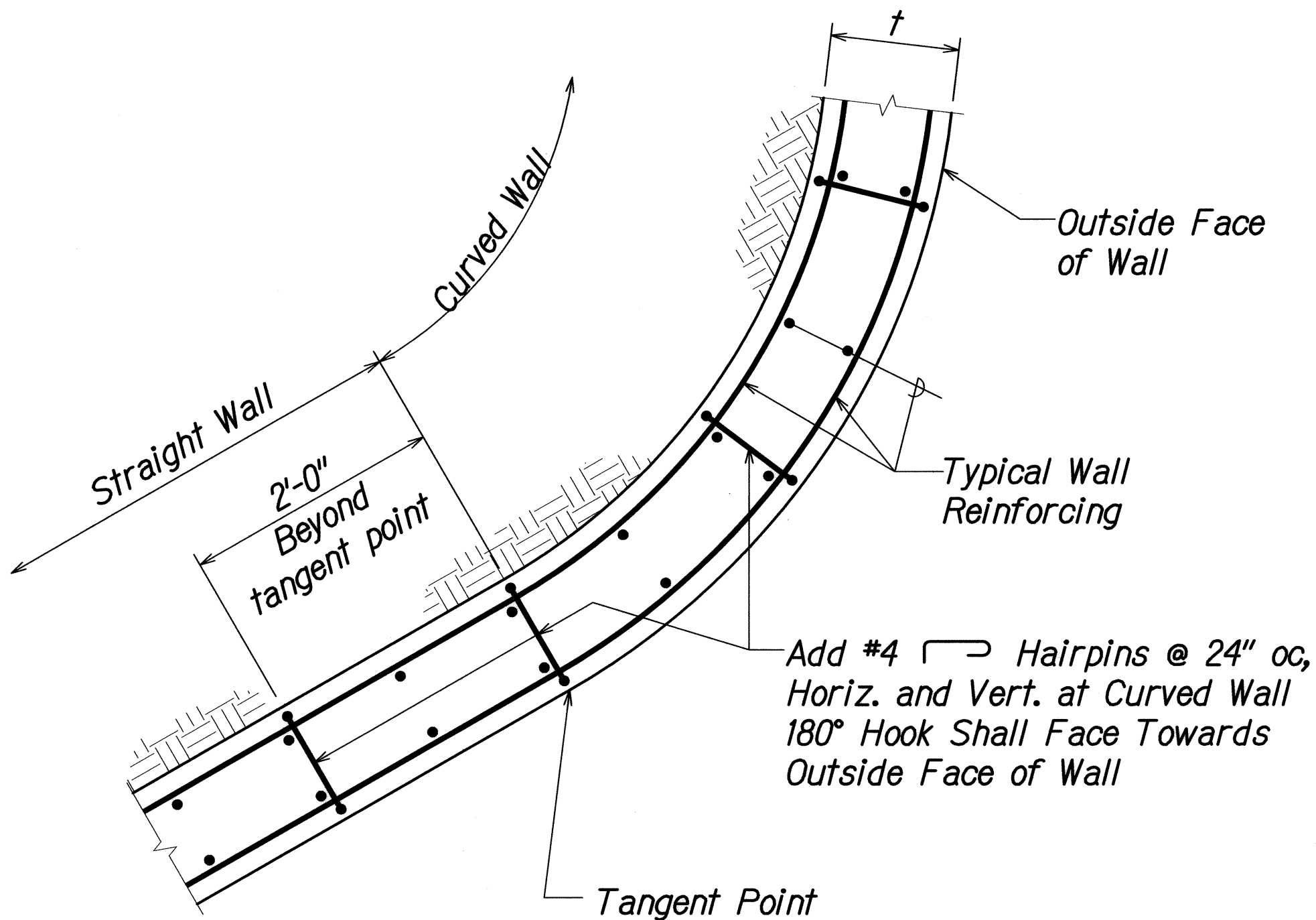


AT CORNERS

TYPICAL WALL FOOTING DETAIL

SCALE: 1" = 1'-0"

2
S0.5 | S0.5



ADDED REINFORCING AT CURVED WALL

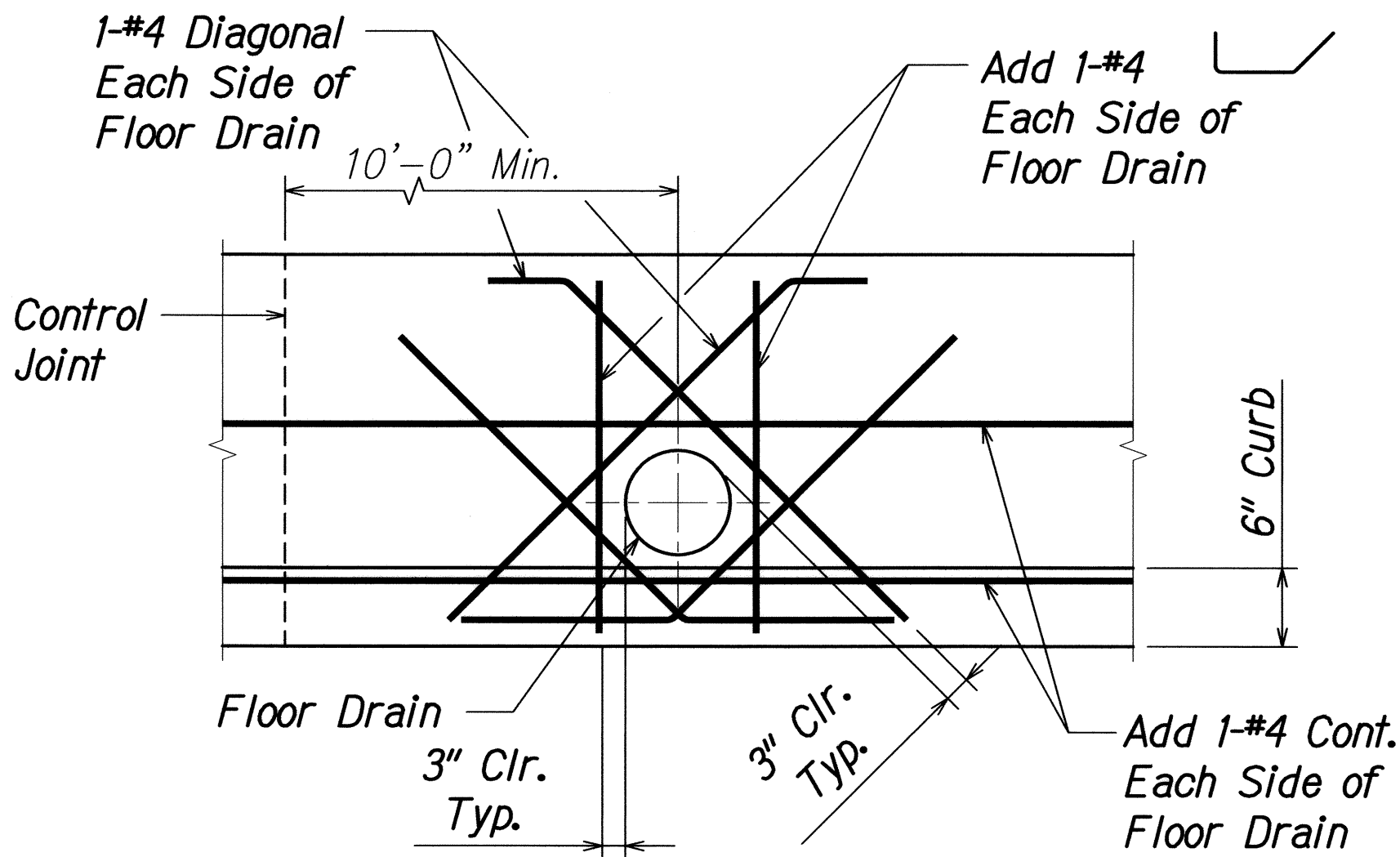
SCALE: 1" = 1'-0"

3
S0.5 | S0.5

Lap Length of Vert. Reinf. in Wall

Bar Size	L
#4	2'-0"
#5	2'-6"
#6	3'-0"
#7	4'-6"
#8	5'-2"
#9	5'-10"

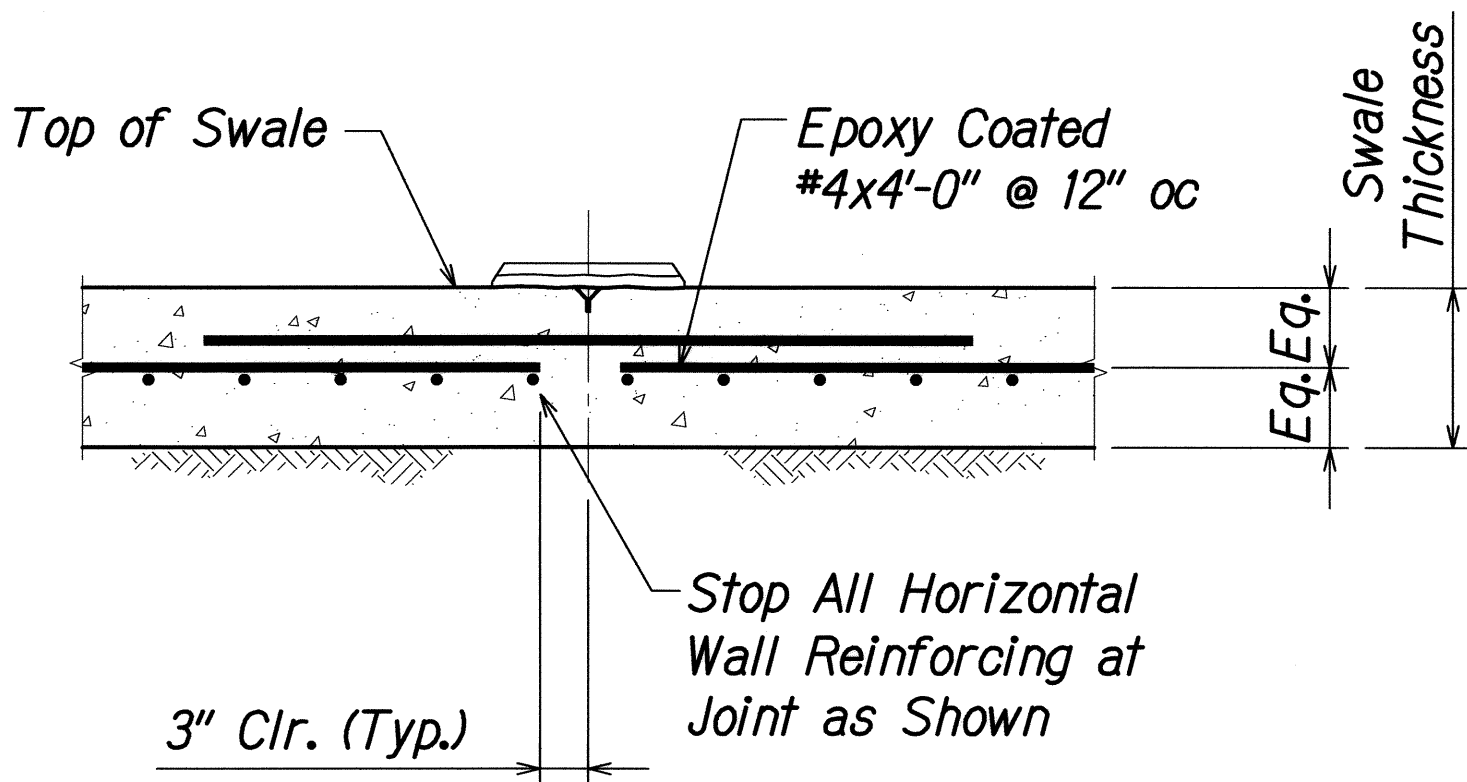
Unless Otherwise Noted



ADDED REINFORCING AT FLOOR DRAIN WITHIN SWALE

SCALE: 1" = 1'-0"

4
S0.5 | S0.5



TYPICAL SWALE CONTROL JOINT DETAIL

SCALE: 1" = 1'-0"

5
S0.4 | S0.4

ORIGINAL PLAN	DATE
DESIGNED BY	02-2008
DRAWN BY	02-2008
NOTED BY	02-2008
CHECKED BY	02-2008
DATE	

DAVID K. FUJIWARA
LICENSED PROFESSIONAL ENGINEER
NO. 8104-S
HAWAII, U.S.A.

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Signature: *David K. Fujiwara* 4/30/10
R. M. TOWELL CORPORATION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

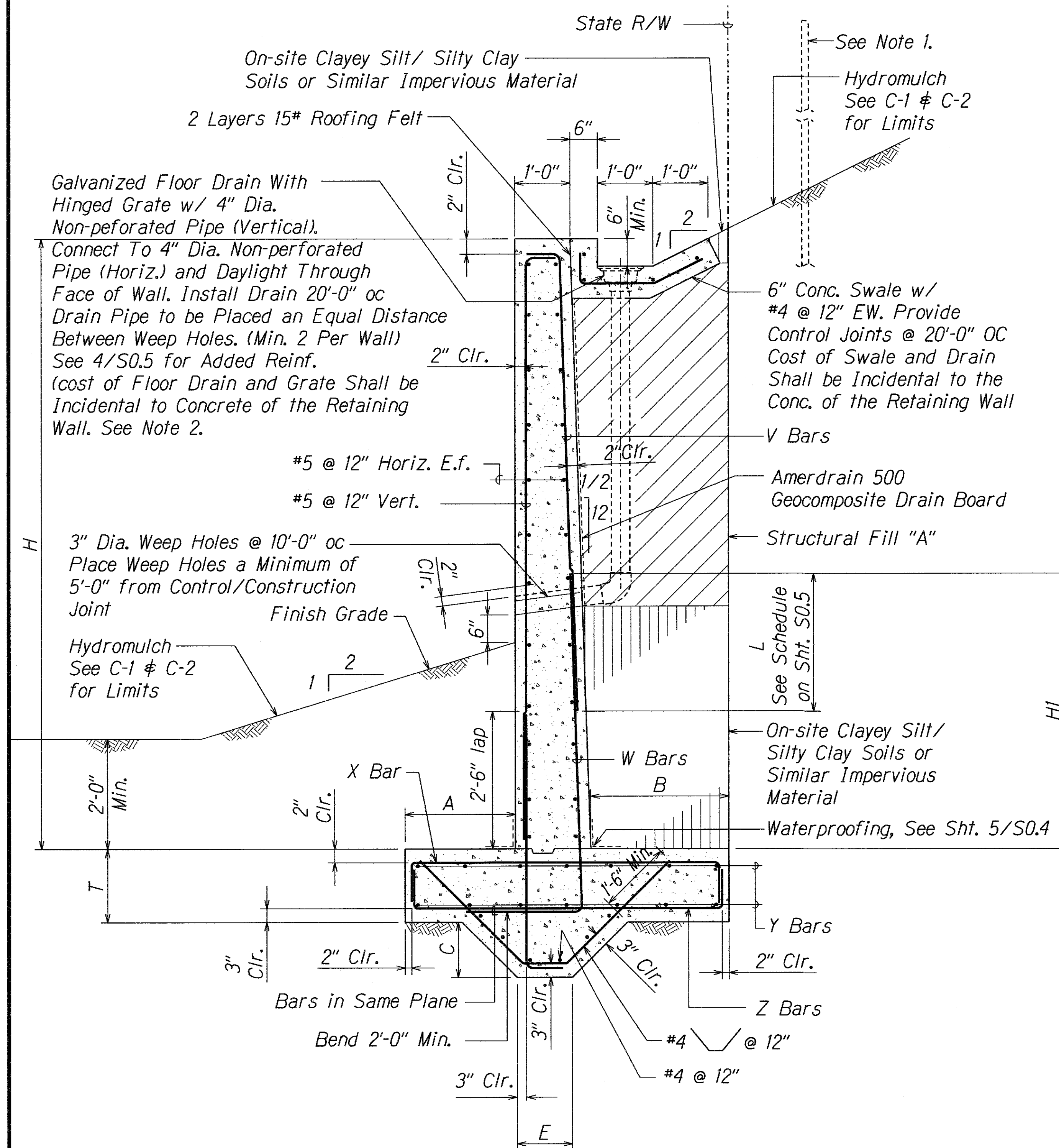
TYPICAL DETAILS

*Kaunualii Highway, Kuhio Highway
& Kuamoo Road Retaining Walls
Project No. HWY-K-01-03*

Scale: AS NOTED Date: MAY 2008

SHEET No. S0.5 OF 9 SHEETS

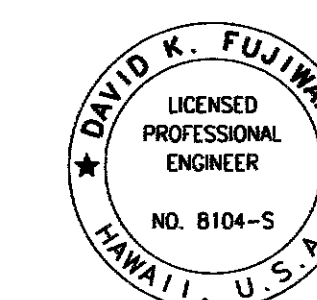
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-K-01-03	2008	34S-1	37



TYPICAL RETAINING WALL SECTION
SCALE: 3/4" = 1'-0"



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



THIS WORK WAS PREPARED BY
ME OR UNDER MY SUPERVISION.

Signature: *David K. Fujimura*
 EXPIRATION DATE OF THE LICENSE: 4-30-08

2/19/10	2	As Built - New Sheet
DATE		REVISION

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION
TYPICAL RETAINING WALL
SECTION-KAUMUALII HIGHWAY
 Kaumualii Highway, Kuhio Highway
 & Kuamoo Road Retaining Walls
 Project No. HWY-K-01-03

Scale: AS NOTED Date: MAY 2008

SHEET No. S1.1A OF 9 SHEETS

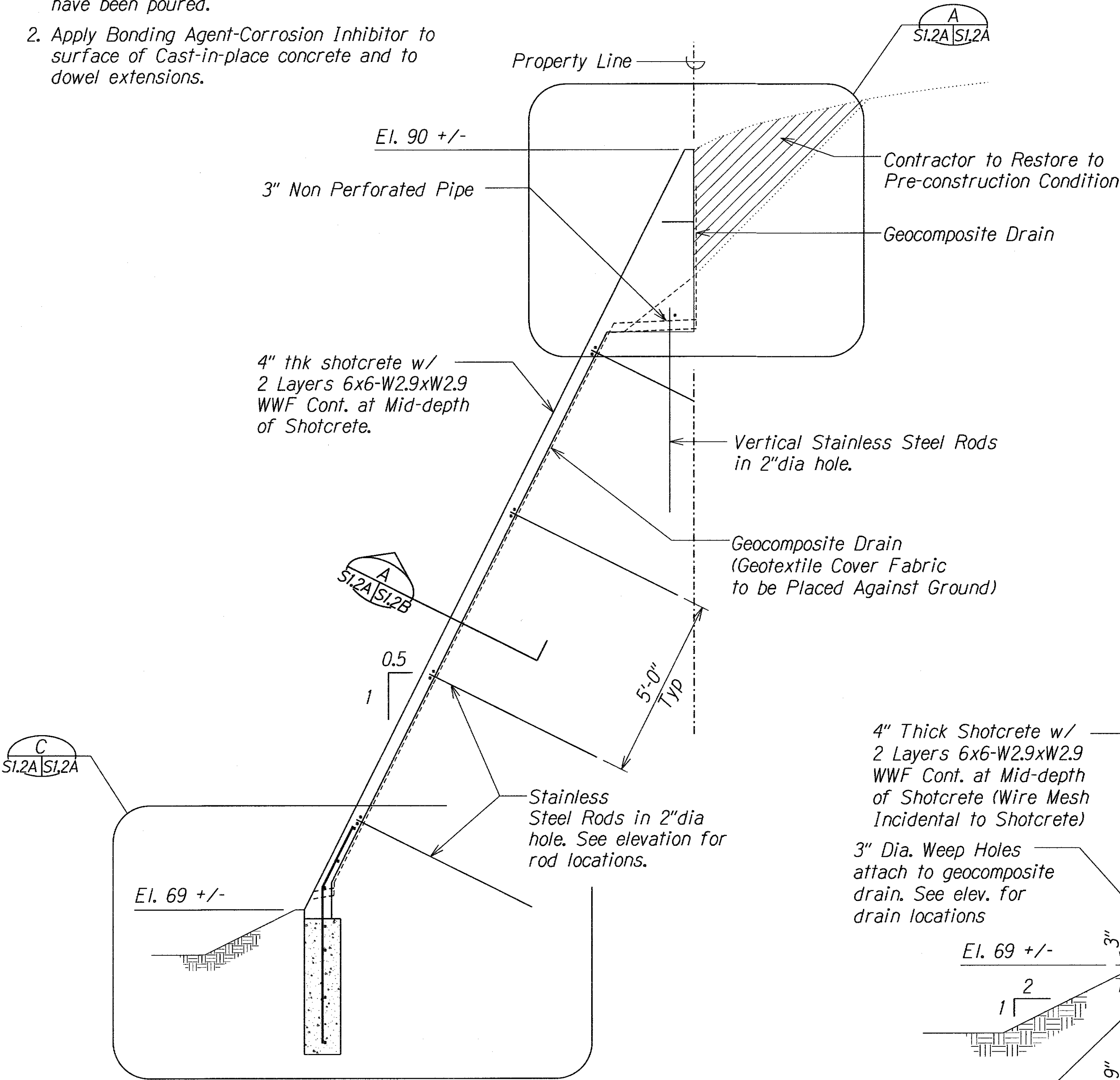
AS-BUILT

34S-1

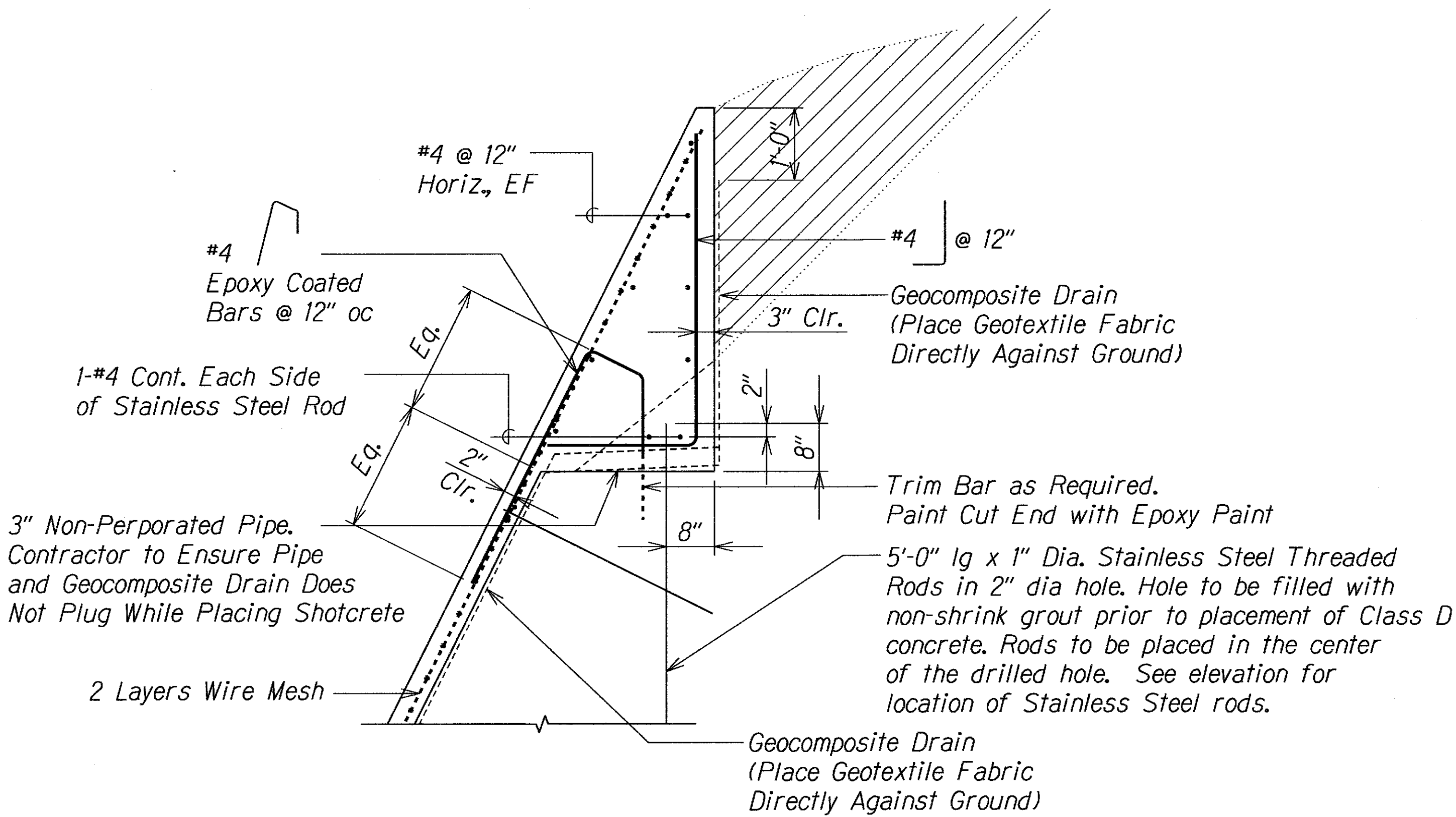
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-K-01-03	2008	35S-1	37

NOTES:

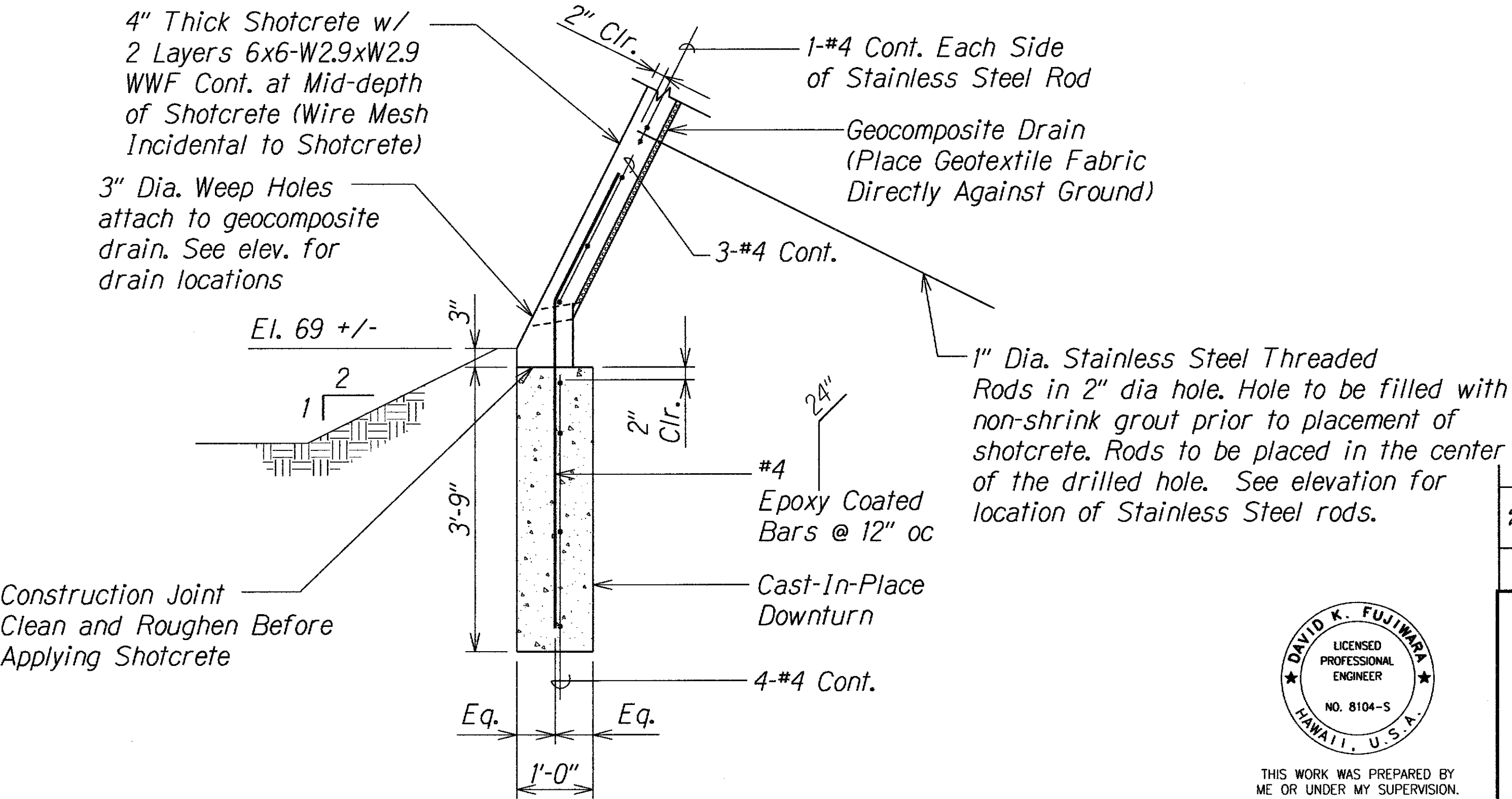
1. Apply Shotcrete a minimum of 4 days after downturns and Class D concrete have been poured.
2. Apply Bonding Agent-Corrosion Inhibitor to surface of Cast-in-place concrete and to dowel extensions.



TYPICAL SHOTCRETE SECTION **A**
SCALE: 1/2" = 1'-0" S1.2A S1.2A

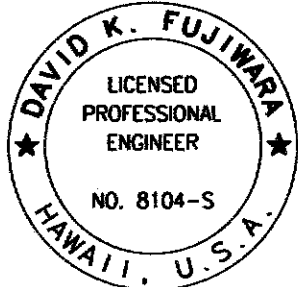


UPPER WEDGE DETAIL **B**
SCALE: 3/4" = 1'-0" S1.2A S1.2A



BOTTOM DOWNTURN DETAIL **C**
SCALE: 3/4" = 1'-0" S1.2A S1.2A

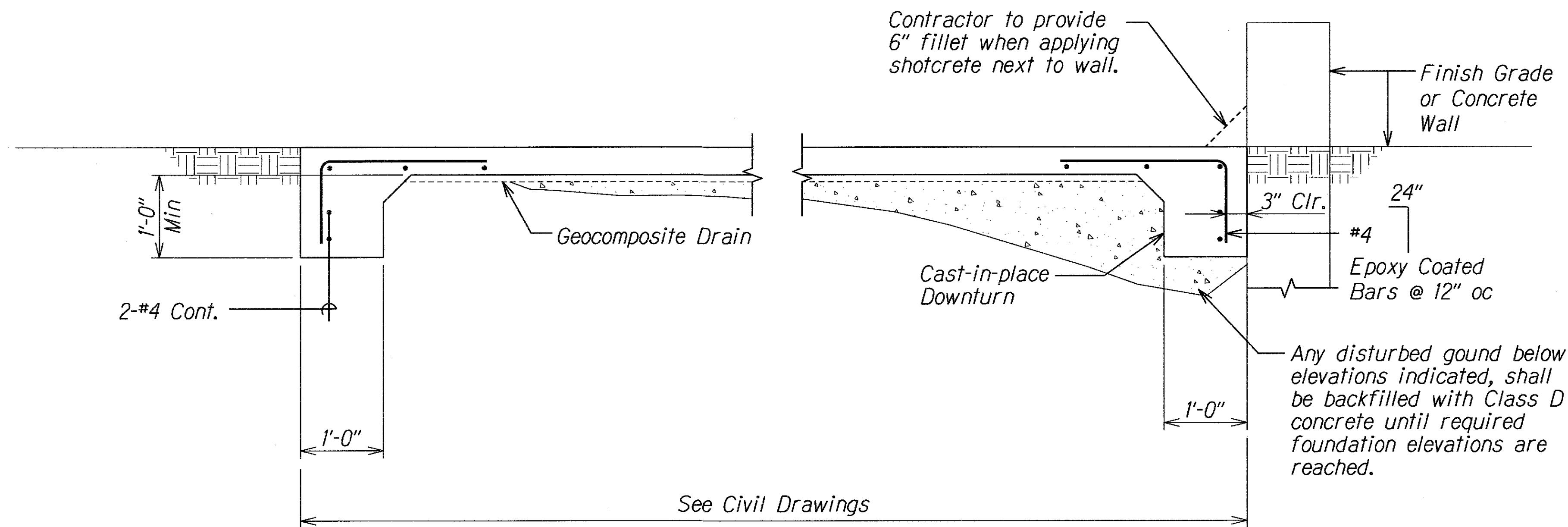
SURVEY PLOTTED BY	DATE
DRAWN BY	
DESIGNED BY	
QUANTITIES BY	
CHECKED BY	
ORIGINAL PLAN	
NOTE BOOK	
No.	



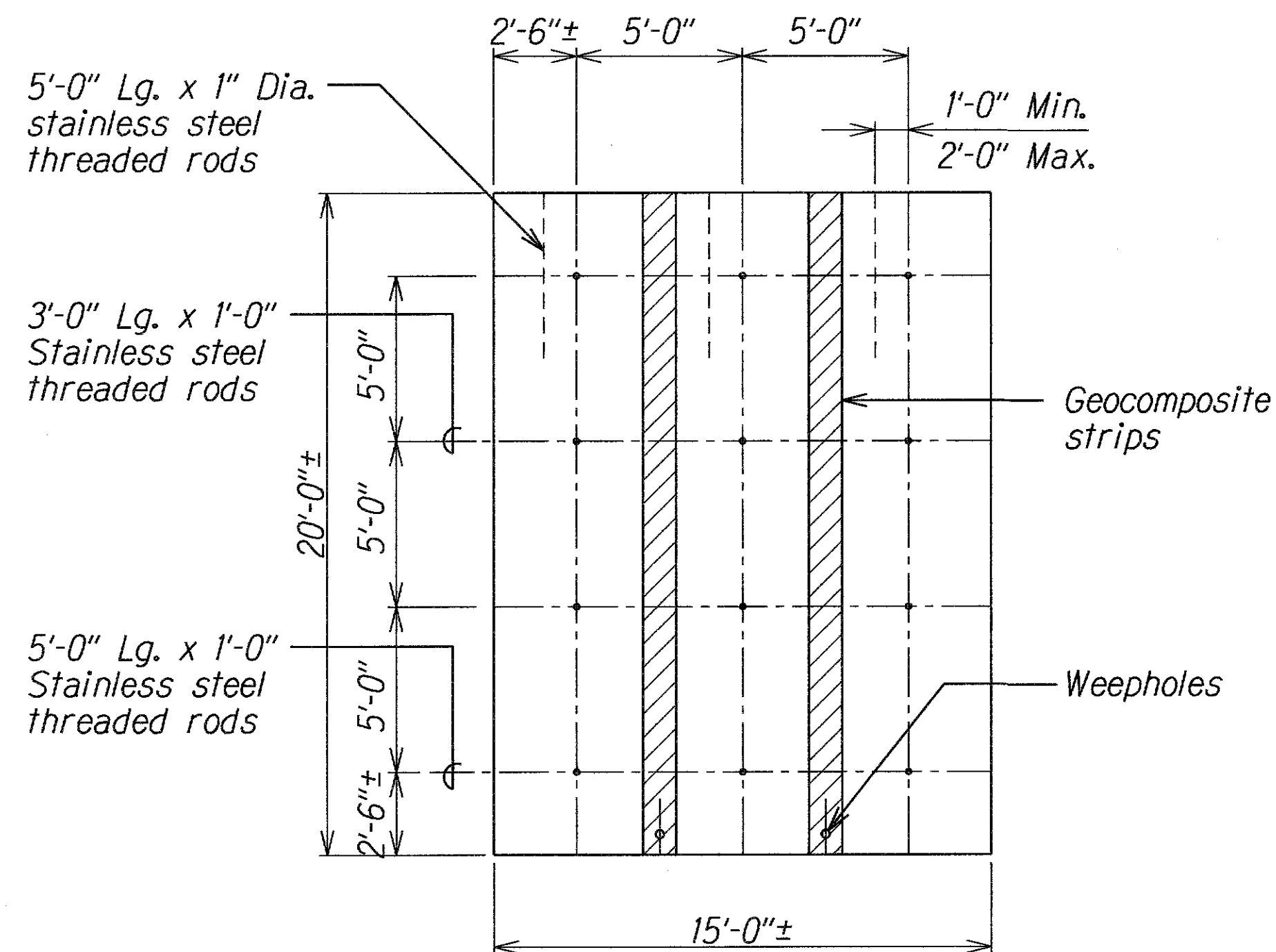
THIS WORK WAS PREPARED BY
ME OR UNDER MY SUPERVISION.
Signature: David K. Fujimura
EXPIRATION DATE OF THE LICENSE: 4-30-08

2/19/10	2	As Built-New Sheet
DATE		REVISION
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION TYPICAL SHOTCRETE SECTION # DETAILS-KAUMUALII HIGHWAY Kaumualii Highway, Kuhio Highway # Kuamoo Road Retaining Walls Project No. HWY-K-01-03 Scale: AS NOTED Date: MAY 2008 SHEET No. S1.2A OF 9 SHEETS		

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-K-01-03	2008	35S-2	37

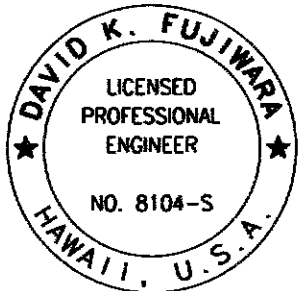


TYPICAL SHOTCRETE SECTION A
SCALE: 1" = 1'-0" SI.2A SI.2B



DOWEL LAYOUT AND GEOCOMPOSITE DRAINAGE STRIP DETAIL
SCALE: 1/4" = 1'-0"

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



THIS WORK WAS PREPARED BY
ME OR UNDER MY SUPERVISION.

David K. Fujiwara
SIGNATURE

EXPIRATION DATE OF THE LICENSE: 4-30-08

2/19/10	2	As Built-New Sheet
DATE		REVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPICAL SHOTCRETE SECTION
AND DETAIL KAUMUALII HIGHWAY

Kaumualii Highway, Kuhio Highway
& Kuamoo Road Retaining Walls
Project No. HWY-K-01-03

Scale: AS NOTED Date: MAY 2008

SHEET No. SI.2B OF 9 SHEETS

