

DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	37C-02-23	2024	69	115

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STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

INDEX TO STRUCTURAL DRAWINGS

KULA HIGHWAY,  
INTERSECTION IMPROVEMENTS  
AT OMAOPTO ROAD  
Project No. 37C-02-23

Scale: None Date: Apr. 2024

SHEET No. S0.1 OF 8 SHEETS

STRUCTURAL GENERAL NOTES

DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
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1. General Specifications: Hawaii Department of Transportation, Standard Specifications for Road and Bridge Construction, 2005, and Standard Special Provisions containing the most current revisions together with Special Provisions prepared for this contract.
2. Design Specifications:
- A. American Association of State Highway and Transportation Officials (AASHTO) 2020 "LFRD Bridge Design Specifications", 9th Edition as amended by HDOT document dated August 8, 2014 with subject title "Design Criteria for Bridges and Structures".
- B. HDOT Document dated August 8, 2014 with subject title "Design Criteria for Bridges and Structures" and HDOT memorandum dated January 8, 2018 with subject title "Changes to Design Criteria for Bridges and Structures".
- C. AASHTO 2015 "LRFD Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals", 1st Edition including all subsequent interim revisions and editions as amended by the HDOT document dated August 8, 2014 with subject title "Design Criteria for Bridge and Structures".

3. Materials:
- A. Concrete structures shall be as noted below:

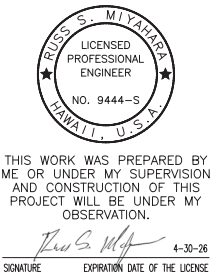
Item No.	Structural Parts	Compressive Strength, f'c (28 Days)	Maximum Water/ Cementitious (W/C)	Maximum Cementitious Material Content (lbs./cy)	Included Admixtures (See Notes Below in This Section)
(1)	Final CIP Facing	5,000 psi	0.45	670	C, D, E
(2)	Concrete Ditch "A"	5,000 psi	0.45	700	C, D, E
(3)	All Others, except as noted otherwise	4,000 psi	0.49	700	C

- B. The use of any calcium chloride in any concrete is prohibited.
- C. Amine carboxylate corrosion inhibiting water-based admixture such as Cortec MCI 2005 NS or approved equal shall be added at a dosage of 24 ounces per cubic yard of concrete.
- D. Shrinkage reducing admixture such as Masterlife SRA 35 or approved equal shall be added at a dosage of 128 ounces per cubic yard of concrete or as recommended by the Manufacturer.

3. Materials (Cont.):
- E. Alkali resistant structural glass fiber such as CEMFIL, ANTI-CRAK HP67/36 or approved equal shall be added to the concrete mix. The dosage rate shall be 15 lbs. per cubic yard of concrete for CEMFIL or the equivalent amount of approved equal to achieve similar properties as the glass dosage. The fiber shall be added to the concrete as recommended by the Manufacturer during the mixing process.
- F. The Contractor has the option to design the concrete for all items to be pumpable and flowable. All concrete shall be designed for minimum segregation and separation.
- G. Shotcrete for wall:
- (1) Shotcrete for walls shall have a minimum compressive strength at 28-days of 5000 psi and have a maximum 0.45 water to cement ratio and contain 24 oz. per cubic yard of migrating amine carboxylate corrosion inhibiting water-based admixture, Cortec MCI-2005 NS or approved equivalent. A shrinkage reducing admixture, such as Eclipse or Master Life SRA 20 or approved equivalent shall be added at a dosage of 128 oz. per cubic yard. Shotcrete shall contain 7.5 lbs of Strux 85/50 synthetic structural fiber per cubic yard or approved equal.
- (2) Temperature of shotcrete shall not exceed 90°F at the point of placement.
- (3) Shotcrete shall be cured using Sinak Lithium Cure or approved equivalent at a coverage rate of 100 sq. ft. per gallon.
- H. Grout for soil nails shall be a pre-bagged neat cement, non-shrink grout with silica fume admixture and anti-washout additive in conformance with ASTM C1107. Grout shall achieve minimum 8,000 psi compressive strength at 28-days such as Target 1118 Grout or approved equal. Additionally, 10 grams of an Amine Carboxylate Corrosion Inhibiting Admixture, such as Cortec Mini MCI Grenades or approved equal shall be added to each bag of grout. Grout shall be stable (bleed less than 2%) per ASTM C940. Temperature of grout shall not exceed 85°F at the end of the grouting hose coupling to fill tube.
- I. Soil nails shall be triple corrosion protected. Each threaded steel bar shall be ASTM A615-Grade 75 with ASTM A934 Epoxy Coating, and pregrouted in a corrugated PVC or HDPE sheathing. PregROUT, provided by manufacturer, shall contain Cortec MCI-2005 NS or approved equivalent corrosion inhibitor and shall be added at a dose of 24 oz. per cubic yard. Soil nails that are damaged shall either not be used or shall be repaired in accordance with Manufacturer's recommendations.
- J. Geocomposite drain strips shall be American Wick Drain Sitedrain C-184 or approved equal. Drain strips shall be taped at edges to prevent shotcrete from entering drain during placement.

3. Materials (Cont.):
- K. At the base of every chimney drain, the Contractor shall install a manufactured Geo Outlet, provided by the same manufacturer as the chimney drain, and solvent weld the Geo Outlet to the PVC drain pipe (weep hole). The Contractor shall not attempt to connect the chimney drain directly to the weep hole.
- L. PVC drain pipe shall be ASTM D 1785 Schedule 40, solid and perforated wall, cell classification 12454-B or 12354-C, wall thickness SDR 35, with solvent welded joints.
- M. If formwork is removed/stripped exposing concrete within 7 days of placement then concrete shall be cured. All exposed surfaces shall be cured using Sinak Lithium Cure 1000 or approved equal at a coverage rate of no less than 400 sq. ft. per gallon.
- N. Cure concrete as specified in the Contract Documents. Remove curing that may affect binding from all areas requiring future bonding unless a curing agent such as Sinak Lithium Cure or accepted equal that does not affect bond and provide equal or better curing is used.
- O. The final CIP facing shall receive an anti-graffiti coating such as Protectosil Antigraffiti, or approved equal. Coating shall be applied in three coats at a coverage rate of 125 sq. ft. per gallon. Anti-graffiti coating shall be incidental to respective concrete work.

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STATE OF HAWAII  
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HIGHWAYS DIVISION

STRUCTURAL GENERAL NOTES

KULA HIGHWAY,  
INTERSECTION IMPROVEMENTS  
AT OMAOPTO ROAD  
Project No. 37C-02-23

Scale: None      Date: Apr. 2024

SHEET No. 50.2 OF 8 SHEETS

STRUCTURAL GENERAL NOTES

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4. Structural Steel:

- A. All structural steel shall be hot-dip galvanized.
- B. Zinc (hot-dip galvanizing) coatings for structural iron and steel products made from rolled, pressed and forged shapes, castings, bars and plates including unfabricated and fabricated products shall conform to ASTM A123/A123M-17.
- C. Structural steel plates and bars shall conform to ASTM A36/A36M-14.
- D. Bearing plates, nuts, and welded shear connectors
- (1) Bearing plates: AASHTO M183/ASTM A36
- (2) Nuts: AASHTO M291, Grade B, hexagonal, fitted with beveled washers or spherical seat to provide uniform bearing
- (3) Shear Connectors: AASHTO LFRD Bridge Construction Specifications 3rd Edition Section 11.3.3.1

5. Reinforcement:

- A. All reinforcing steel shall be ASTM A615, Grade 60 unless otherwise noted.
- B. Reinforcing steel shall be ASTM A706, Type W, Grade 60 where welded connections are required.
- C. Reinforcing bars shall be placed and installed in accordance with the CRSI Manual of Standard Practice and CRSI Placing Reinforcing Bars, unless otherwise noted.
- D. The covering measured from the surface of the concrete to the face of any reinforcing bars shall be as follows, except as otherwise shown:
- (1) Shotcrete or concrete cast against and permanently exposed to earth = 3" unless otherwise noted
- (2) All others unless otherwise noted = 2"
- E. Minimum clear spacing between parallel bars shall be 1 1/2 times the diameter of bars (for nonbundled 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".
- F. All dimensions relating to reinforcing bars are to centers of bars unless otherwise noted.
- G. 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.
- H. For steel reinforcing, stagger all splices where possible.

5. Reinforcement (Cont.):

- I. Minimum lap splice length for steel reinforcing shall be 40 bar diameters or 2'-0", whichever is greater, for #8 bars or smaller. Minimum lap splice length for #9 bars or larger shall be 50 bar diameters. Increase lap length by multiplying the minimum lap splice length by 1.3 for bars having more than 12" of fresh concrete below bars. Increase lap length by 1.25 for ASTM A1035 reinforcing. Lap splices for bundled bars shall consist of individual bar splices within a bundle that do not overlap. Entire bundles shall not be lap spliced.
- J. Unless otherwise noted, reinforcing splices shall be staggered. Minimum distance between staggered lap splice shall be equal to the length required for the lap splice. Number of bars spliced at sections normal to axis of member shall not exceed 50 percent of the total main reinforcing in the member.
- K. All welding shall conform to AWS D1.5 Bridge Welding Code. All welds shall be ground smooth. Unless noted otherwise, all welding shall be shielded arc welding done with E70 electrodes.

6. Glass Fiber Reinforced Polymer Bar (ASTM D7957):

- A. Glass Fiber Reinforced Polymer (GFRP) rebar shall conform to ASTM D7957.
- B. Concrete cover for the GFRP bars shall be 1 1/2" unless otherwise noted.
- C. Minimum lap splice lengths for the GFRP bars shall be 42 bar diameter unless otherwise noted.
- D. All GFRP bars shall be securely tied in place. Tie wire shall be allow 302 or 304 stainless steel or non-metallic.
- E. The GFRP bars may be cut in the field with a masonry or diamond blade.
- F. All work including materials and bends shall follow Manufacturer's recommendations.

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 dimensions, elevations and azimuths, stream channel location, roads, roadway gutters, curbs and sidewalks, etc. Conditions may differ from those shown.

7. Construction Notes (Cont.):

- C. The Contractor shall be solely responsible for the protection of adjacent properties, utilities and existing and new structures from damage due to construction. Repairing any damage shall be at the Contractor's own expense, to the satisfaction of the Engineer.
- D. The Contractor shall verify the location of all utility lines and notify the respective owners before commencing with excavation, and any temporary piling or sheeting.
- E. Except as otherwise noted, all vertical dimensions are measured plumb.
- F. For concrete finish see Standard Specifications and Special Provisions. Construction joints may be relocated or additional ones added subject to the approval of the Engineer.
- G. Unless otherwise noted, all exposed concrete edges shall be chamfered 3/4" x 3/4".
- H. The Contractor shall unplug, clean and maintain existing drains during construction of the project.
- I. All footings and slabs shall bear on firm undisturbed natural soils or properly compacted structural fill.
- J. The Contractor shall conduct his work in such a manner and provide such temporary shoring or other measures as may be necessary to insure the safety of all concerned and to protect existing structures.
- K. In the event of over excavation, the space between the footing or footing key and the ground shall be filled with a minimum of Class D concrete at the Contractor's expense at no cost to the city.

8. General:

- A. GFRP bars shall be paid for under reinforcing steel.
- B. The cost of the waterproofing shall be considered as included in the cost of the concrete and shall not be paid for directly.
- C. Cost of CMP band and concrete collar shall be incidental to the cost of new 54" CMP.

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*Russ S. Miyahara* 4-30-26

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STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
STRUCTURAL GENERAL NOTES	
KULA HIGHWAY, INTERSECTION IMPROVEMENTS AT OMAOPTO ROAD Project No. 37C-02-23	
Scale: None	Date: Apr. 2024
SHEET No. 50.3 OF 8 SHEETS	



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SYMBOLS AND ABBREVIATIONS

⊕	And	E	East	L	Length	S	South
@	At	Ea.	Each	Lb., Lbs., Lbs.	Pound, Pounds	Sch.	Schedule
Ⓔ	Baseline	EF	Each Face	LF	Linear Feet/Foot	SDMH	Sewer Drain Manhole
Ⓒ	Centerline	EFH	Each Face Horizontal	Lin. Ft.	Linear Feet/Foot	SE	Super Elevation
∅	Diameter	EFV	Each Face Vertical	Longit.	Longitudinal	Sect.	Section
#	Number, Pound	EJ	Expansion Joint	LS	Lump Sum	SF	Square Feet
AB	Anchor Bolt	El., Elev.	Elevation	Ltg. Std.	Lighting Standard	Sht.	Sheet
Abbr.	Abbreviation	Elec.	Electrical			Sl.	Slope
Abut.	Abutment	Emb.	Embankment	M	Modified	Spc	Spacing
AC	Asphaltic Concrete	Embed.	Embedded, Embedment	Max.	Maximum	Sprd.	Spread
Add.	Additional, Added	EMH	Electrical Manhole	Mech.	Mechanical	Spec.	Specification
Alt.	Alternate	EP	Edge of Pavement	MH	Manhole	SRA	Shrinkage Reducing Admixture
Approx.	Approximate	EPS	Expanded Polystyrene	Min.	Minimum	SS, SSStl	Stainless Steel
Az.	Azimuth	Eq.	Equal	Misc.	Miscellaneous	Sta.	Station
		Est.	Estimated	MPH	Miles per Hour	Stagg.	Staggered
B, Bot., Bott.	Bottom	EVC	End of Vertical Curve			Std.	Standard
Bal.	Balance	EW	Each Way	N	North	Stiff.	Stiffener
Bet.	Between	Exc.	Excavation	NF	Near Face	Stirr.	Stirrup
BF	Both Faces, Back Face	Excl.	Excluding	NIC	Not In Contract	Str.	Straight
BFE	Bottom of Footing Elevation	Exist., Ex.	Existing	No.	Number	Struct.	Structure
Bk.	Back	Exp., (E)	Expansion	NTS	Not To Scale	SY	Square Yard
Blf.	Bolt	Ext.	Exterior			Symm.	Symmetrical
Bm.	Beam			OB, Outbnd.	Outbound		
BMP	Best Management Practices	(F)	Fixed	OC	On Center	T	Top
Br.	Bridge	FA	Force Account	OD	Outside Diameter	T#B	Top And Bottom
Brg., Brgs.	Bearing, Bearings	FB	Flat Bar	Opn'g	Opening	Tan.	Tangent
BVC	Beginning of Vertical Curve	F'c	Specified Strength of Concrete	O/S	Offset	Temp.	Temporary
BW	Both Ways	F'ci	Strength of Concrete at Time of Initial Prestress			TFE	Top of Footing Elevation
				PB	Pull Box	Thk.	Thick
Cant.	Cantilever	FF	Far Face, Front Face	PC	Point of Curvature	TOD	Top of Deck
CB	Catch Basin	Fig.	Figure	PCC	Portland Cement Concrete	Tot.	Total
CC	Center to Center	Fin. Gr.	Finish Grade	PCF	Pounds per Cubic Foot	TOW	Top of Wall
CF	Cubic Feet	Ft.	Feet, Foot	P(e)	Effective Or Working Prestressing Force	Transv.	Transverse
CFCW	Continuous Flashing Compound Waterproofing	Ftg.	Footing	Perf.	Perforated	TS	Structural Tubing
				PI	Point of Intersection of Tangents	Typ.	Typical
CG	Center of Gravity	Ga.	Gage, Gauge			Undergrd.	Underground
CGS	Center to Gravity of Strands	Galv.	Galvanized	PIVC	Point of Intersection of Vertical Curve	UNO	Unless Noted Otherwise
CIP	Cast-In-Place	GFRP	Glass Fiber Reinforced Polymer				
CJ	Control Joint	Gr.	Grade	PL	Plate	Var.	Varies
Cl.	Class	Grd.	Ground	PLF	Pounds per Linear Foot	VC	Vertical Curve
CLSM	Controlled Low Strength Material	GRP	Grouted Rubble Pavement	PP	Precast Plank	Vert., V	Vertical
				PRC	Point of Reverse Curvature		
Clr.	Clearance	H	Height	Prest.	Prestressed	W	West
Col.	Column	(H)	Hinge	P/S	Prestressed Strands	W/	With
Conc.	Concrete	HECO	Hawaiian Electric Company	PSF	Pounds per Square Foot	W/C	Water/Cement Ratio
Conn.	Connection	Horiz.	Horizontal	PSI	Pounds per Square Inch	WP	Work Point, Working Point
Const.	Construction	HS	High Strength	PT	Point of Tangency, Post Tensioned	WS	Water Surface
Const. Jt.	Construction Joint	HSS	Hollow Structural Section			WW	Wing Wall
Cont.	Continuous			Pt., Pts.	Point, Points	WWR	Welded Wire Reinforcing
CSL	Crosshole Sonic Logging	IB, Inbnd.	Inbound	PVC	Polyvinyl Chloride		
CY, Cu. Yd.	Cubic Yard	ID	Inside Diameter			Yr.	Year
		IF	Inside Face	Q	Flow Rate		
		In.	Inch				
		Int.	Interior	R, Rad.	Radius		
		Inv.	Invert	Rdwy.	Roadway		
				Rebar	Reinforcing Bar		
				Ref.	Reference		
		Jt.	Joint	Reinf.	Reinforced, Reinforcing, Reinforcement		
		K	Kips	Req'd.	Required		
		KF	Kip Foot	Ret.	Retaining		
		KSF	Kips per Square Foot	RF	Rear Face		
		KSI	Kips per Square Inch	ROW	Right of Way		
		KLF	Kips per Linear Foot				

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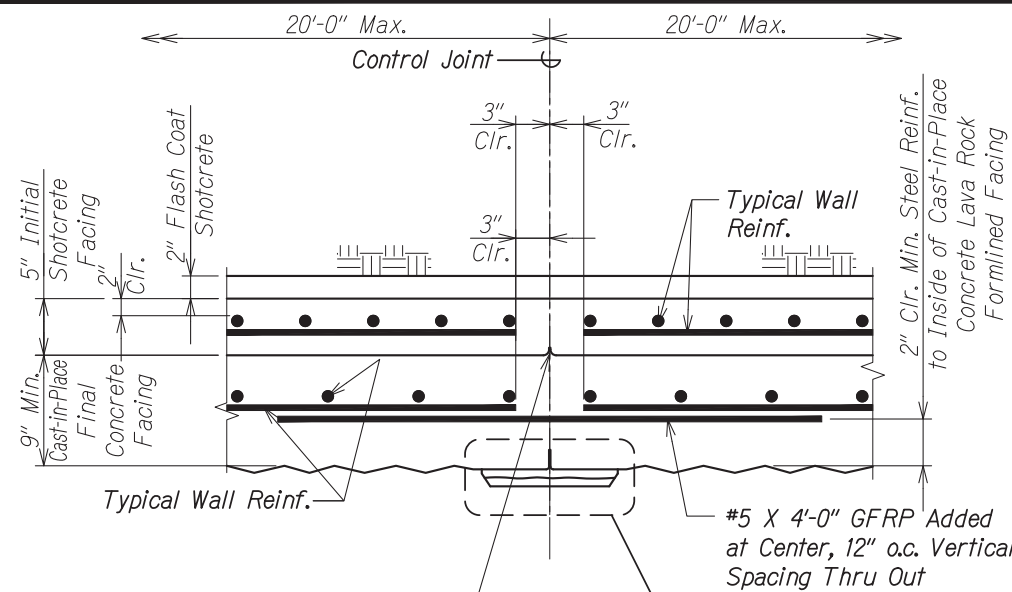
SYMBOLS AND ABBREVIATIONS

KULA HIGHWAY,  
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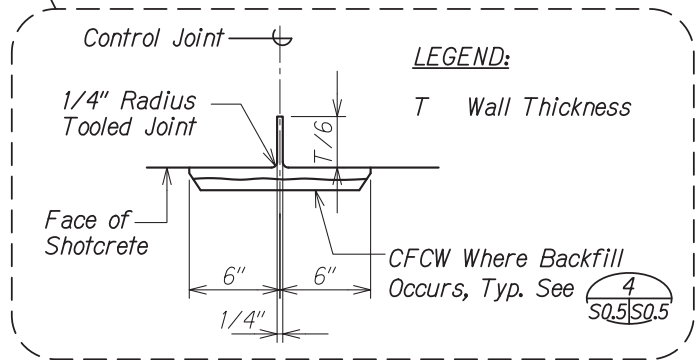
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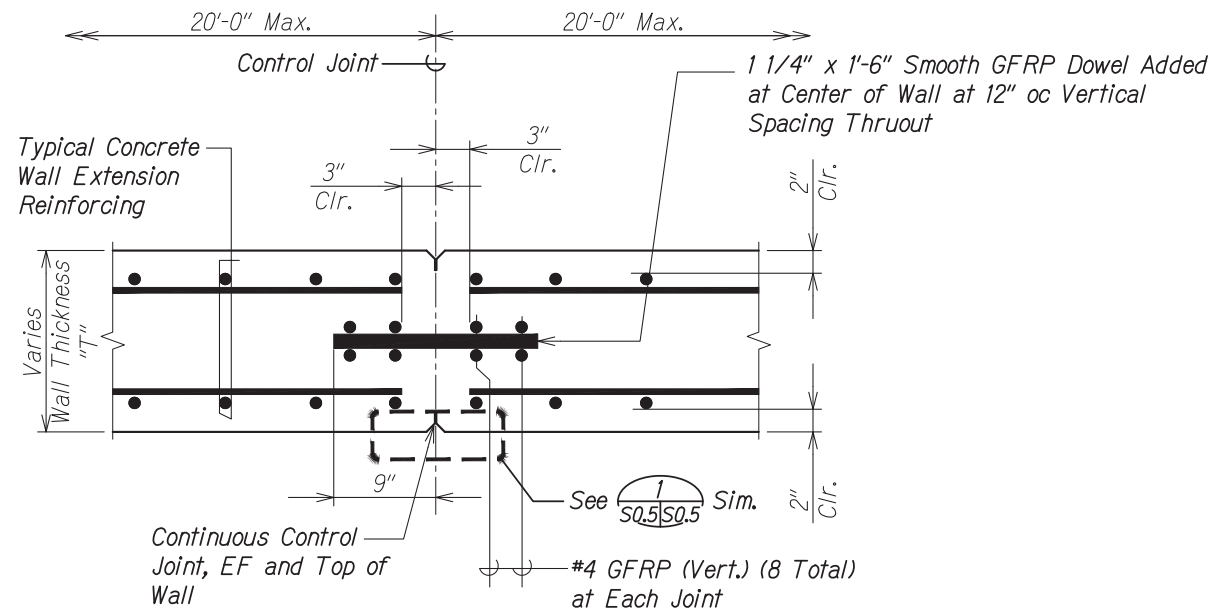


Tooled Joint in Initial Facing to Match Control Joint Location, 1" Depth



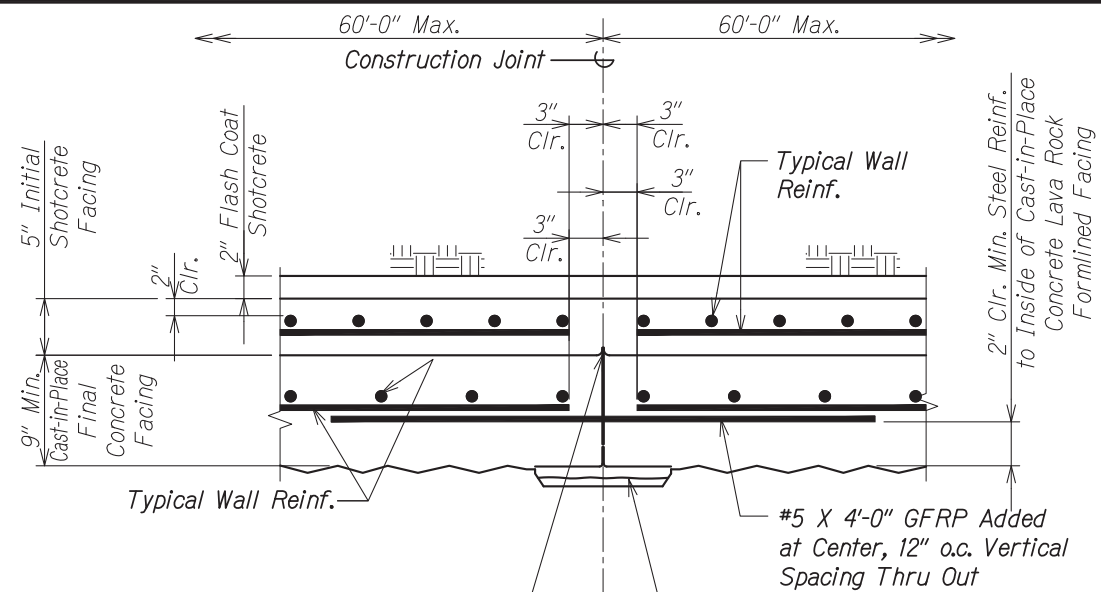
CONTROL JOINT AT SOIL NAIL WALL  
Scale: 1 1/2" = 1'-0"

1  
SQ.5 | SQ.5



TYPICAL CAST-IN-PLACE CONCRETE WALL EXTENSION CONTROL JOINT  
Scale: 1 1/2" = 1'-0"

3  
SQ.5 | SQ.5

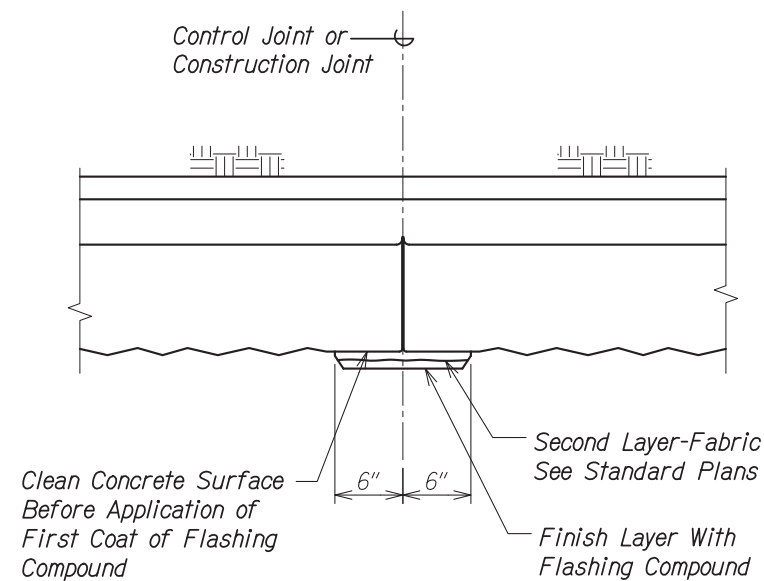


Tooled Joint in Initial Facing to Match Control Joint Location, 1" Depth

CFCW Where Backfill Occurs, See 4/SQ.5 | SQ.5

CONSTRUCTION JOINT AT CONTROL JOINT LOCATION IN SOIL NAIL WALL  
Scale: 1 1/2" = 1'-0"

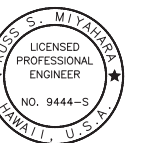
2  
SQ.5 | SQ.5



CONTINUOUS FLASHING COMPOUND WATERPROOFING (CFCW) DETAIL  
Scale: 1 1/2" = 1'-0"

4  
SQ.5 | SQ.5

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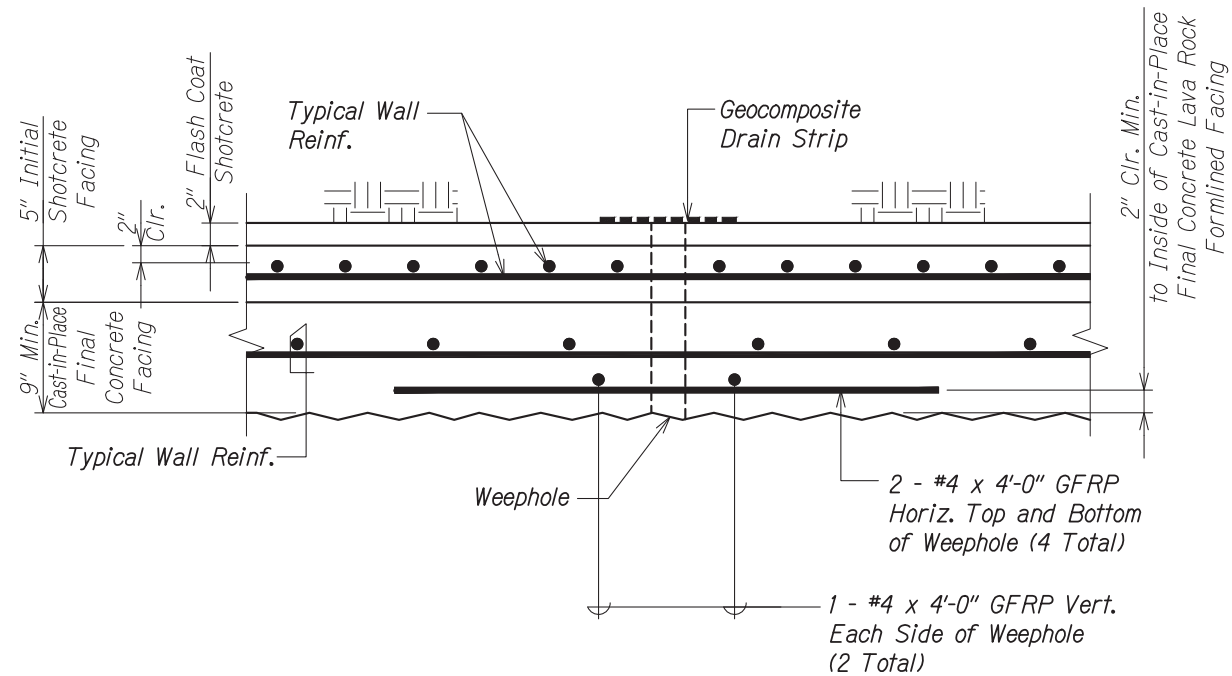


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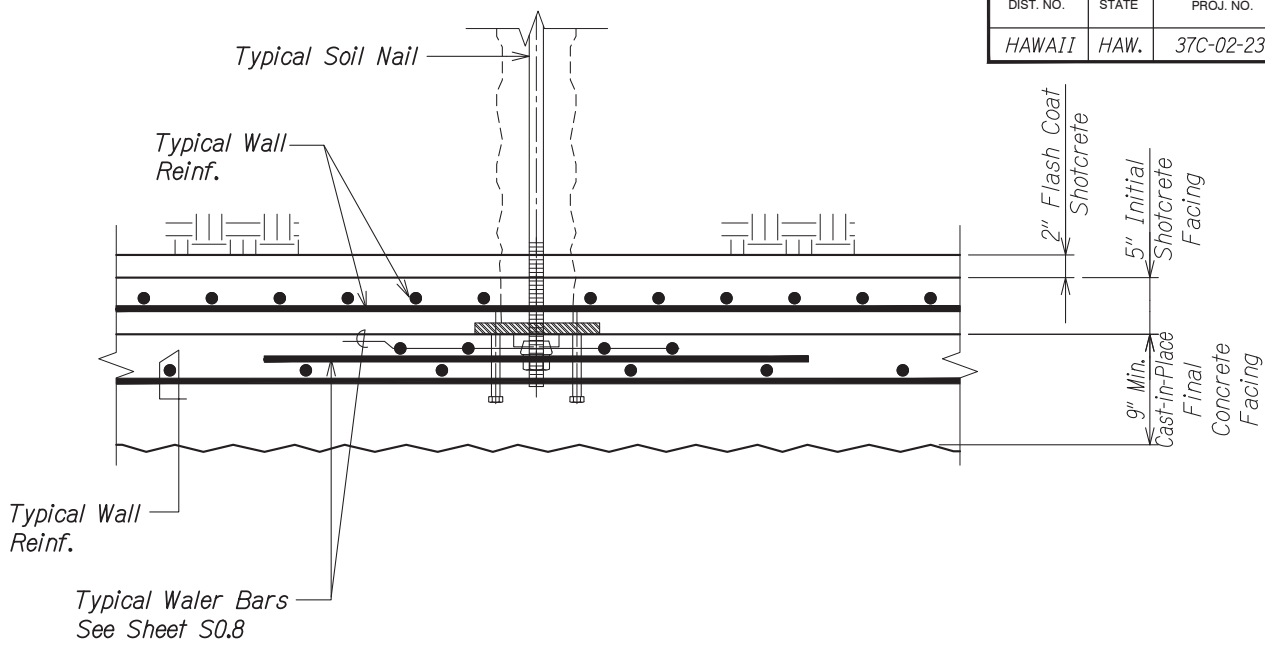
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HIGHWAYS DIVISION

**TYPICAL JOINT DETAILS**  
  
**KULA HIGHWAY,  
INTERSECTION IMPROVEMENTS  
AT OMAOPTO ROAD  
Project No. 37C-02-23**  
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SHEET No. 50.5 OF 8 SHEETS

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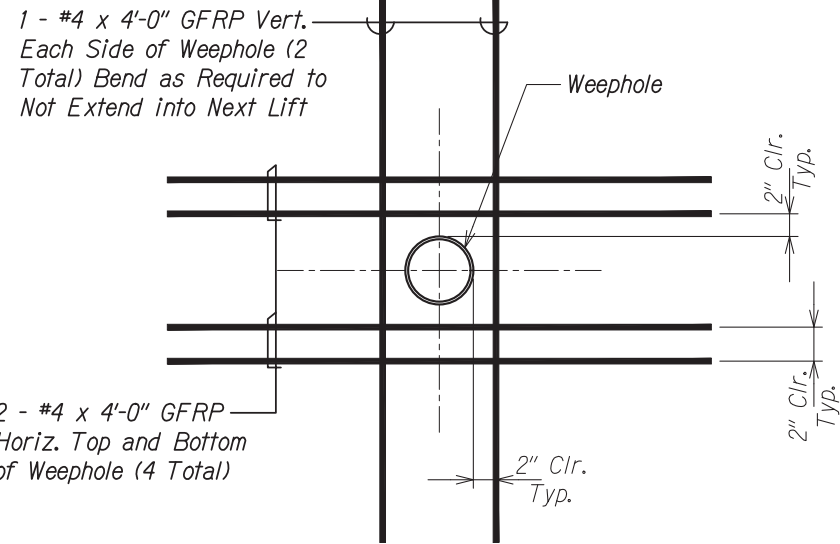
PLAN



# ADDED REINFORCING AT SOIL NAIL

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

2  
S0.6 S0.6



ELEVATION

NOTE:

Shift bars as required to fit added bars.

# ADDED REINFORCING AT WEEPHOLES

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

1  
S0.6 S0.6

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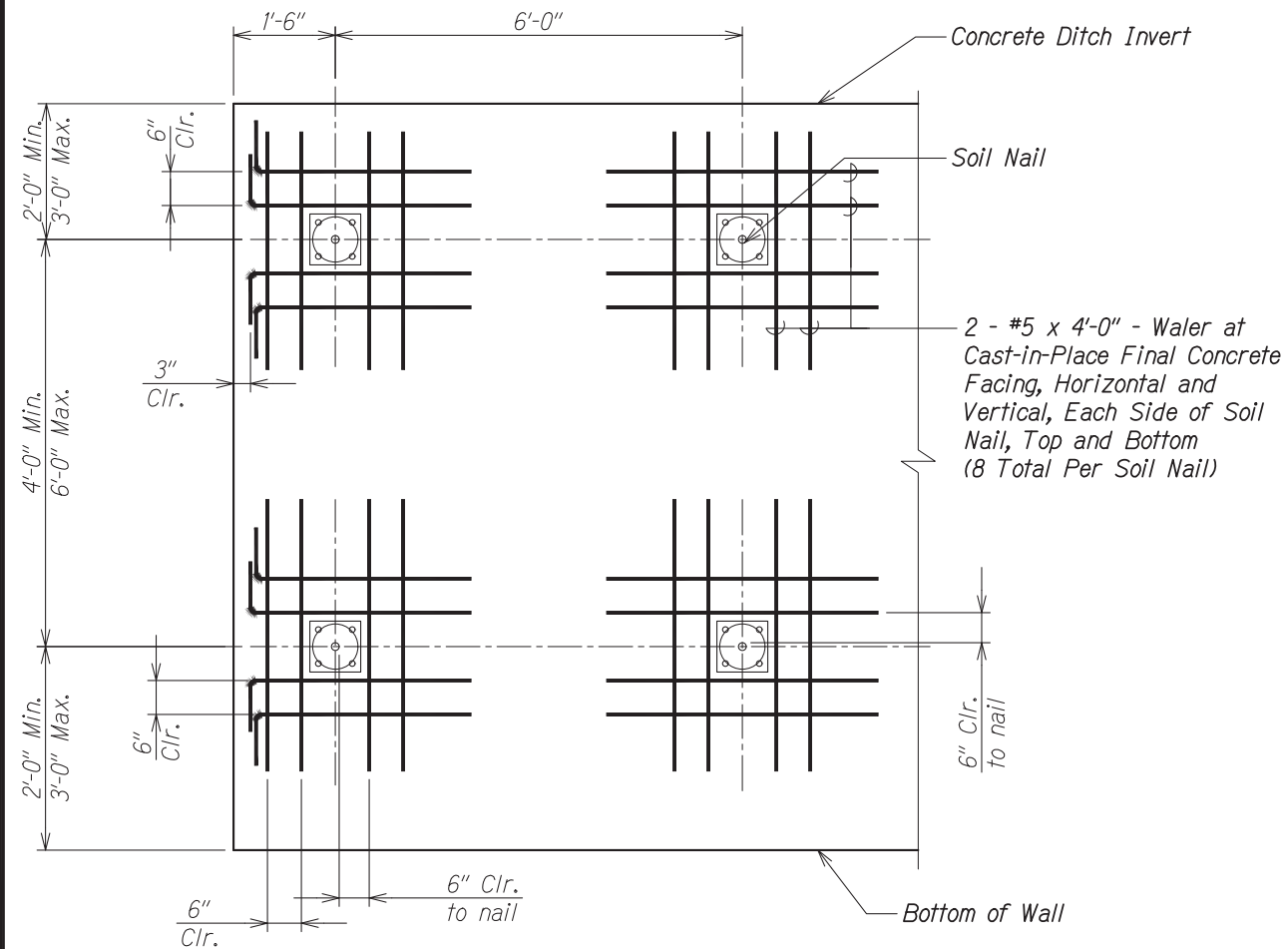
## ADDED REINFORCING DETAILS

### KULA HIGHWAY, INTERSECTION IMPROVEMENTS AT OMAOPTO ROAD Project No. 37C-02-23

Scale: As Noted Date: Apr. 2024

SHEET No. S0.6 OF 8 SHEETS

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**TYPICAL WALER BAR DETAIL** 1  
Scale: 3/4" = 1'-0" S0.7 | S0.7

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HIGHWAYS DIVISION

**TYPICAL WALER BAR DETAIL**

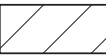

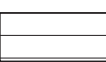
KULA HIGHWAY,  
INTERSECTION IMPROVEMENTS  
AT OMAOPIO ROAD  
Project No. 37C-02-23

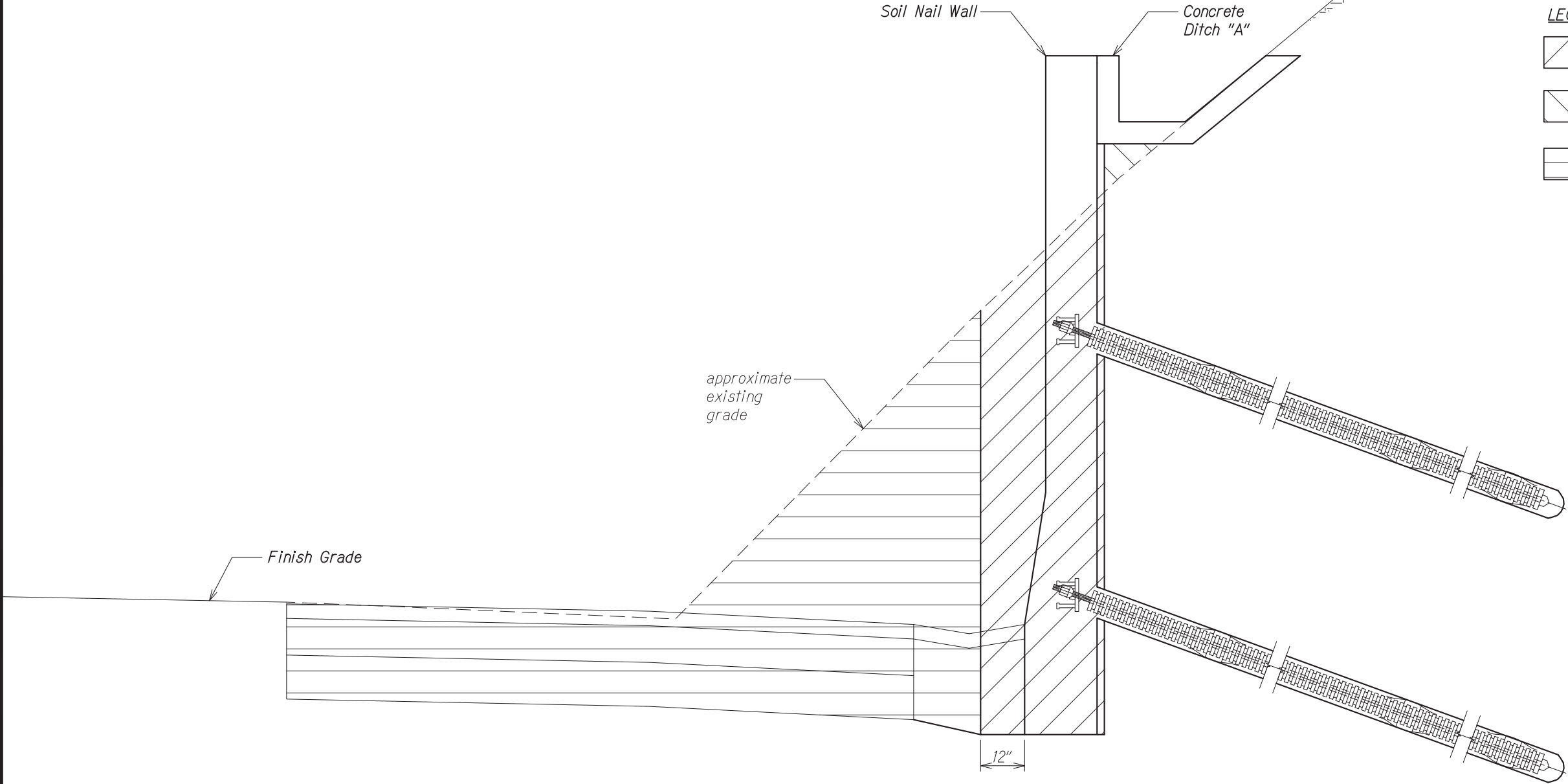
Scale: As Noted Date: Apr. 2024

SHEET No. S0.7 OF 8 SHEETS

DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	37C-02-23	2024	76	115

LEGEND:

-  Structure Excavation
-  Structure Backfill  
(Incidental to Concrete for Ditch A)
-  Roadway Excavation



EXCAVATION AND BACKFILL  
PAY LIMIT SECTION

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



SURVEY PLOTTED BY	DATE
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QUANTITIES BY	
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STATE OF HAWAII  
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HIGHWAYS DIVISION

**PAY LIMITS**

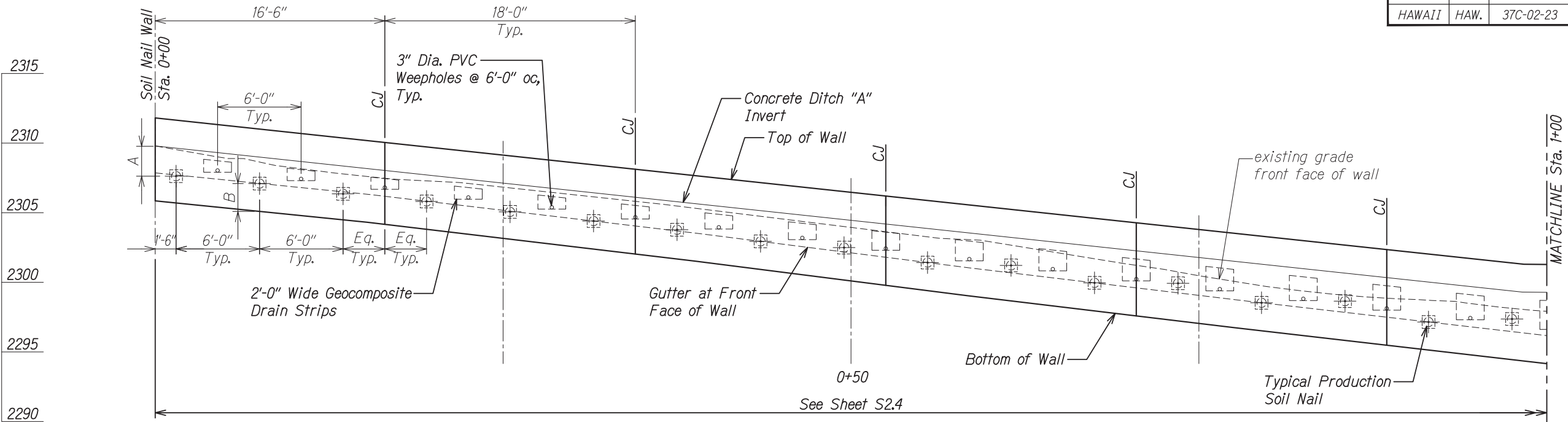
**KULA HIGHWAY,  
INTERSECTION IMPROVEMENTS  
AT OMAOPTO ROAD  
Project No. 37C-02-23**

Scale: As Noted Date: Apr. 2024

SHEET No. *S0.8* OF 8 SHEETS



DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	37C-02-23	2024	77	115

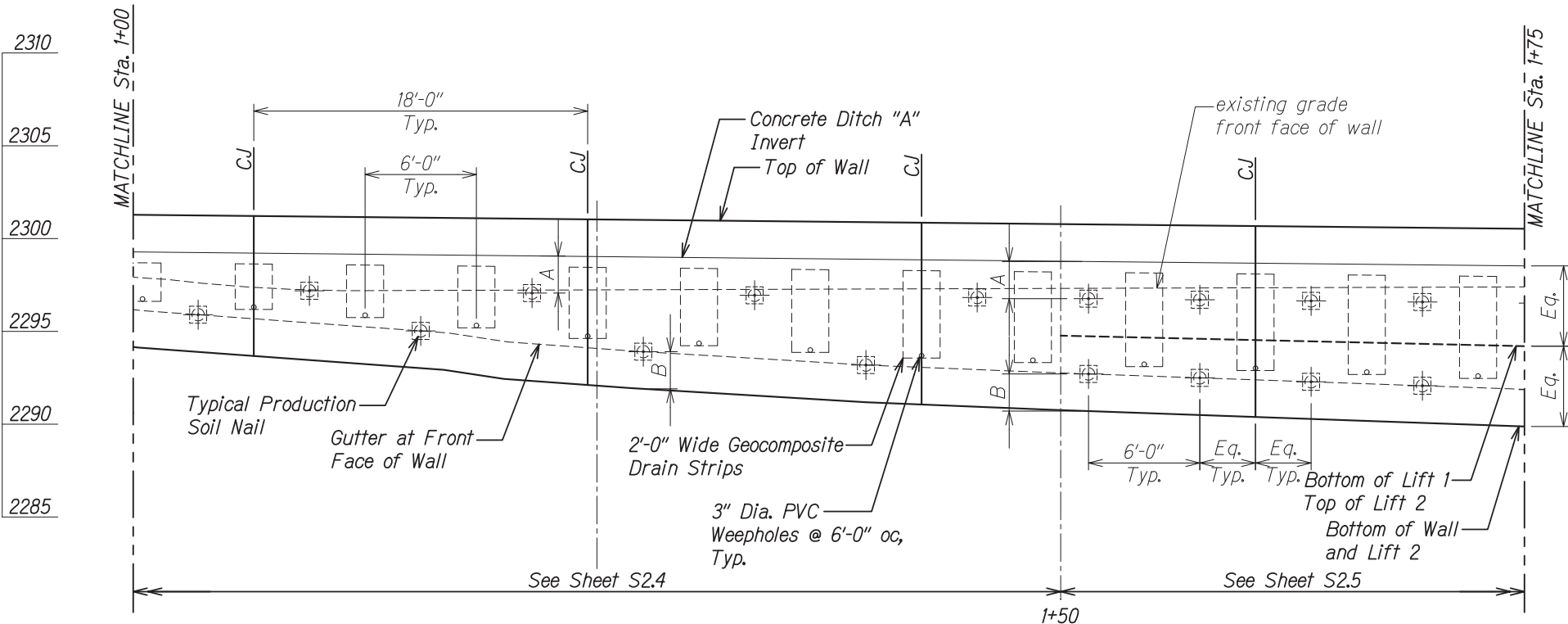


SOIL NAIL WALL PROFILE - STA. 0+00 TO 1+00 A  
 Scale: 1/4" = 1'-0" S.I. S.I.

- NOTE:**
- See Civil Plans for Wall Alignment.
  - | Location             | Soil Nail Vertical Distance |
|----------------------|-----------------------------|
| a) Sta. 0+00 to 1+50 | A = 2'-0"                   |
| Sta. 7+50 to 9+27    | B = 2'-0"                   |
| b) Sta. 1+50 to 2+25 | A = 2'-0"                   |
| Sta. 6+50 to 7+50    | B = 2'-0"                   |
| c) Sta. 2+25 to 6+50 | A = 3'-0"                   |
|                      | B = 3'-0"                   |

A = Distance from Concrete Ditch "A" Invert to Soil Nail  
 B = Distance from Soil Nail to Bottom of Wall

**LEGEND:**  
 CJ Control Joint



SOIL NAIL WALL PROFILE - STA. 1+00 TO 1+75 B  
 Scale: 1/4" = 1'-0" S.I. S.I.

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

SOIL NAIL WALL PROFILE

KULA HIGHWAY,  
INTERSECTION IMPROVEMENTS  
AT OMAOPTO ROAD  
Project No. 37C-02-23

Scale: As Noted      Date: Apr. 2024

SHEET No. *S.I.* OF 12 SHEETS

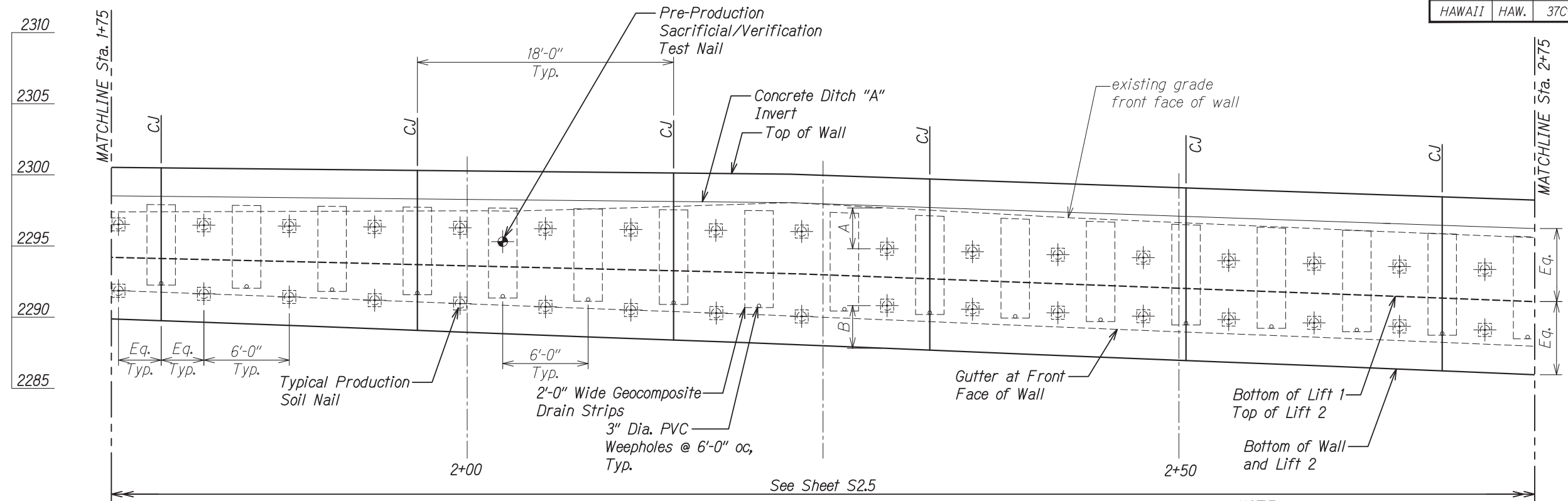
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LICENSED PROFESSIONAL ENGINEER  
NO. 9444-S  
HAWAII, U.S.A.

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SIGNATURE      EXPIRATION DATE OF THE LICENSE

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DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	37C-02-23	2024	78	115



**SOIL NAIL WALL PROFILE - STA. 1+75 TO 2+75**  
Scale: 1/4" = 1'-0"  
A  
SI.2 SI.2

**NOTE:**

- See Civil Plans for Wall Alignment.
- | Location             | Soil Nail Vertical Distance |
|----------------------|-----------------------------|
| a) Sta. 0+00 to 1+50 | A = 2'-0"                   |
| Sta. 7+50 to 9+27    | B = 2'-0"                   |
| b) Sta. 1+50 to 2+25 | A = 2'-0"                   |
| Sta. 6+50 to 7+50    | B = 2'-0"                   |
| c) Sta. 2+25 to 6+50 | A = 3'-0"                   |
|                      | B = 3'-0"                   |

A = Distance from Concrete Ditch "A" Invert to Soil Nail

B = Distance from Soil Nail to Bottom of Wall

**LEGEND:**

- CJ Control Joint
- ⊙ Pre-Production Sacrificial/Verification Test Nail



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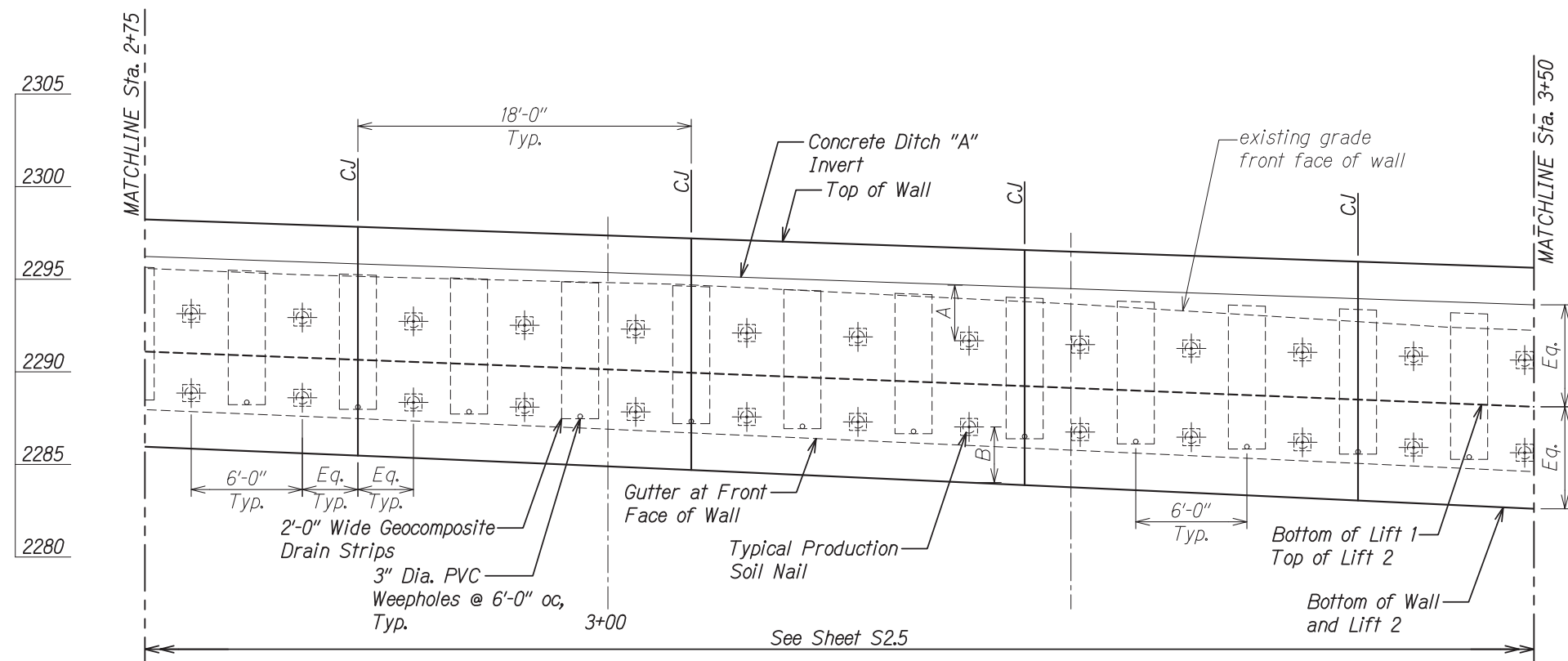
*Russ S. Miyahara* 4-30-26  
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DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**SOIL NAIL WALL PROFILE**  
**KULA HIGHWAY,  
INTERSECTION IMPROVEMENTS  
AT OMAOPTO ROAD  
Project No. 37C-02-23**

Scale: As Noted Date: Apr. 2024

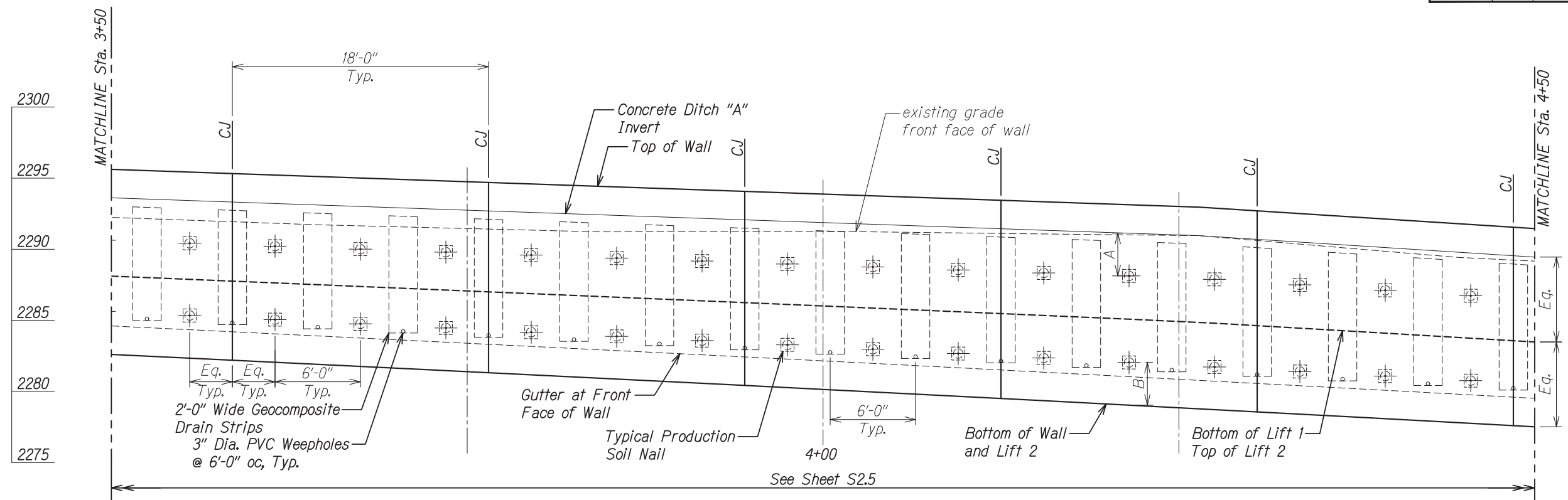
SHEET No. SI.2 OF 12 SHEETS



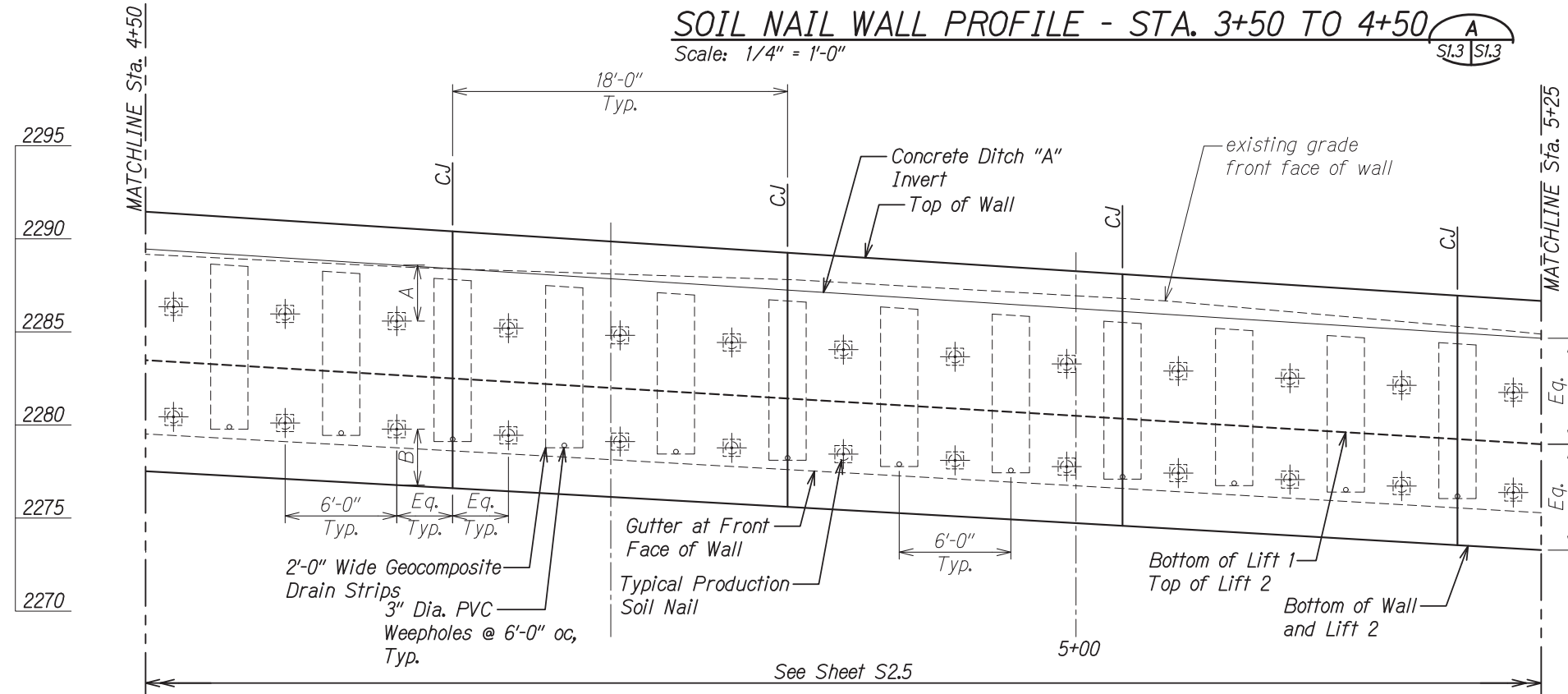
**SOIL NAIL WALL PROFILE - STA. 2+75 TO 3+50**  
Scale: 1/4" = 1'-0"  
B  
SI.2 SI.2

SURVEY PLOTTED BY	DATE
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QUANTITIES BY	
CHECKED BY	
ORIGINAL PLAN	
NOTE BOOK	
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DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	37C-02-23	2024	79	115



SOIL NAIL WALL PROFILE - STA. 3+50 TO 4+50  
Scale: 1/4" = 1'-0"



SOIL NAIL WALL PROFILE - STA. 4+50 TO 5+25  
Scale: 1/4" = 1'-0"

NOTE:

- See Civil Plans for Wall Alignment.
- | Location                                  | Soil Nail Vertical Distance |
|---|-----------------------------|
| a) Sta. 0+00 to 1+50<br>Sta. 7+50 to 9+27 | A = 2'-0"<br>B = 2'-0"      |
| b) Sta. 1+50 to 2+25<br>Sta. 6+50 to 7+50 | A = 2'-0"<br>B = 2'-0"      |
| c) Sta. 2+25 to 6+50                      | A = 3'-0"<br>B = 3'-0"      |

A = Distance from Concrete Ditch "A" Invert to Soil Nail

B = Distance from Soil Nail to Bottom of Wall

LEGEND:

CJ Control Joint



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Date: Apr. 2024

STATE OF HAWAII  
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HIGHWAYS DIVISION

SOIL NAIL WALL PROFILE

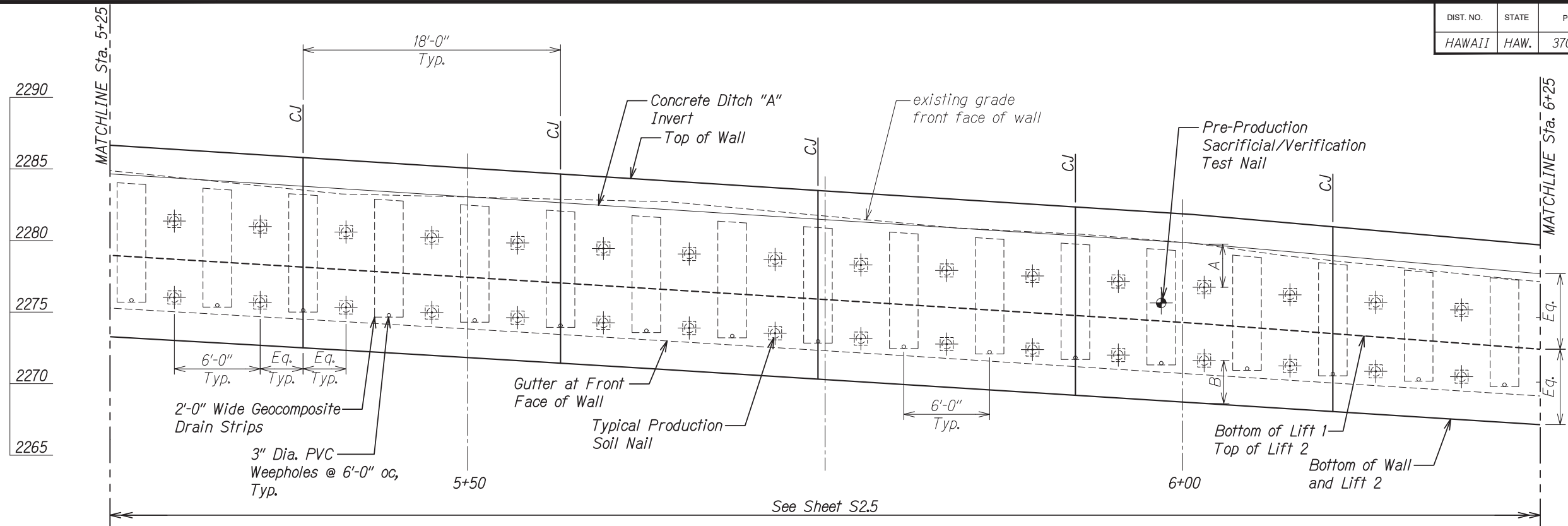
KULA HIGHWAY,  
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AT OMAOPTO ROAD  
Project No. 37C-02-23

Scale: As Noted Date: Apr. 2024

SHEET No. S1.3 OF 12 SHEETS

SURVEY PLOTTED BY	DATE
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TRACED BY	
CHECKED BY	
ORIGINAL PLAN	
NOTE BOOK	
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DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	37C-02-23	2024	80	115



**SOIL NAIL WALL PROFILE - STA. 5+25 TO 6+25** A  
Scale: 1/4" = 1'-0"

**NOTE:**

- See Civil Plans for Wall Alignment.
- | Location                                  | Soil Nail Vertical Distance |
|---|-----------------------------|
| a) Sta. 0+00 to 1+50<br>Sta. 7+50 to 9+27 | A = 2'-0"<br>B = 2'-0"      |
| b) Sta. 1+50 to 2+25<br>Sta. 6+50 to 7+50 | A = 2'-0"<br>B = 2'-0"      |
| c) Sta. 2+25 to 6+50                      | A = 3'-0"<br>B = 3'-0"      |

A = Distance from Concrete Ditch "A" Invert to Soil Nail

B = Distance from Soil Nail to Bottom of Wall

**LEGEND:**

- CJ Control Joint
- ⊕ Pre-Production Sacrificial/Verification Test Nail



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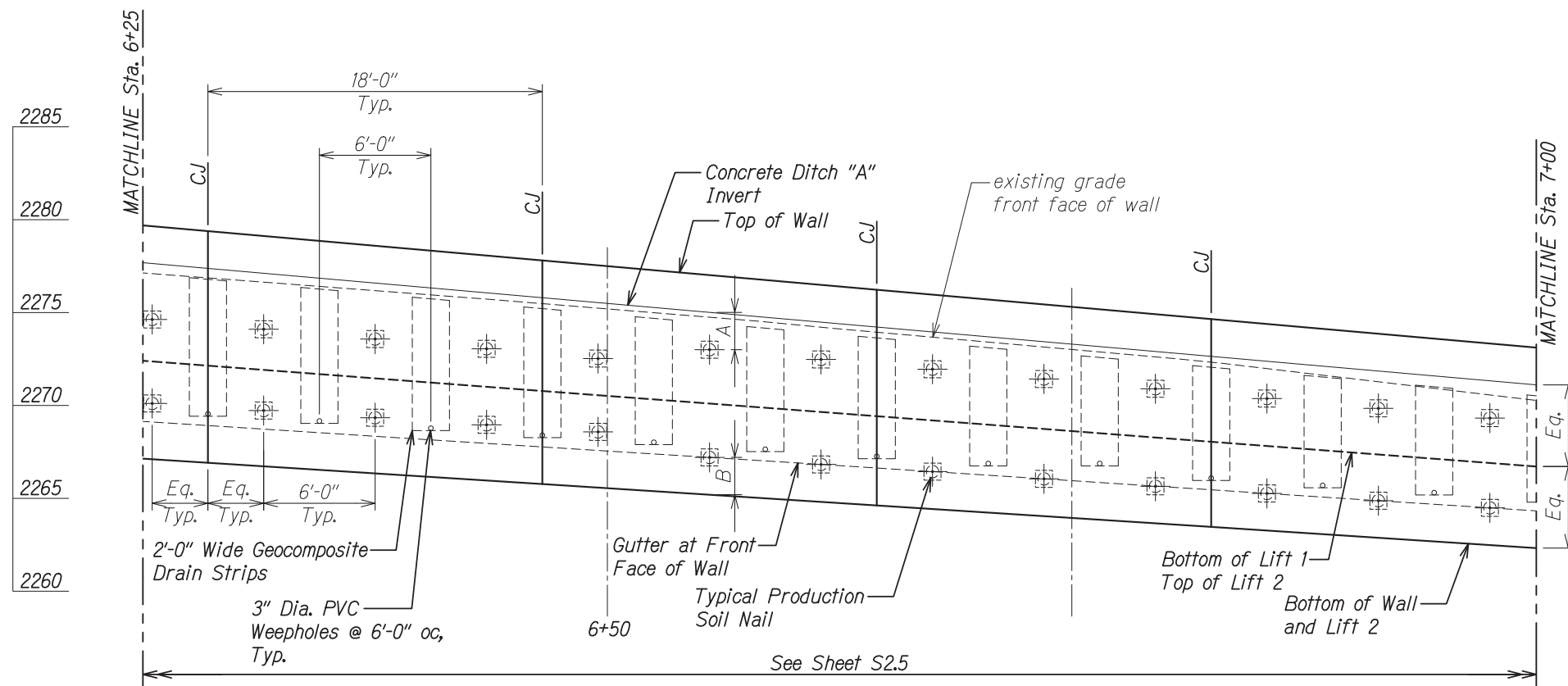
*Russ S. Miyahara* 4-30-26  
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HIGHWAYS DIVISION

**SOIL NAIL WALL PROFILE**  
**KULA HIGHWAY,  
INTERSECTION IMPROVEMENTS  
AT OMAOPIO ROAD  
Project No. 37C-02-23**

Scale: As Noted Date: Apr. 2024

SHEET No. **SI.4** OF 12 SHEETS

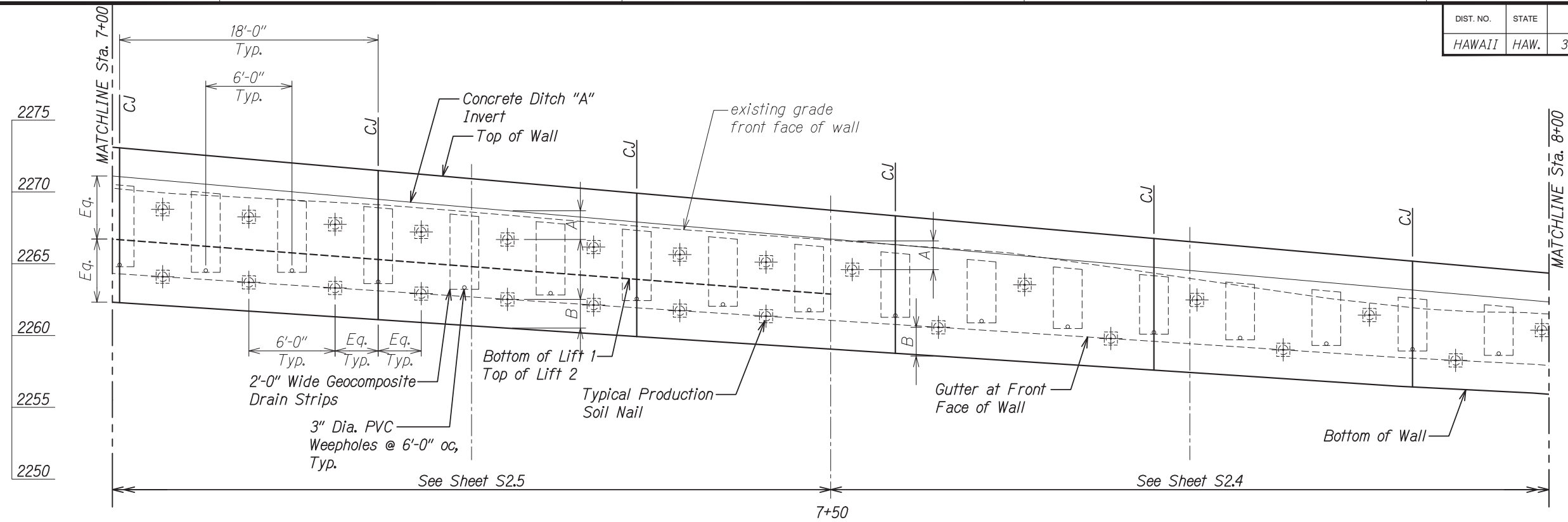


**SOIL NAIL WALL PROFILE - STA. 6+25 TO 7+00** B  
Scale: 1/4" = 1'-0"

SURVEY PLOTTED BY	DATE
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ORIGINAL PLAN	
NOTE BOOK	
No.	



DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	37C-02-23	2024	81	115



**SOIL NAIL WALL PROFILE - STA. 7+00 TO 8+00** A  
Scale: 1/4" = 1'-0"

**NOTE:**

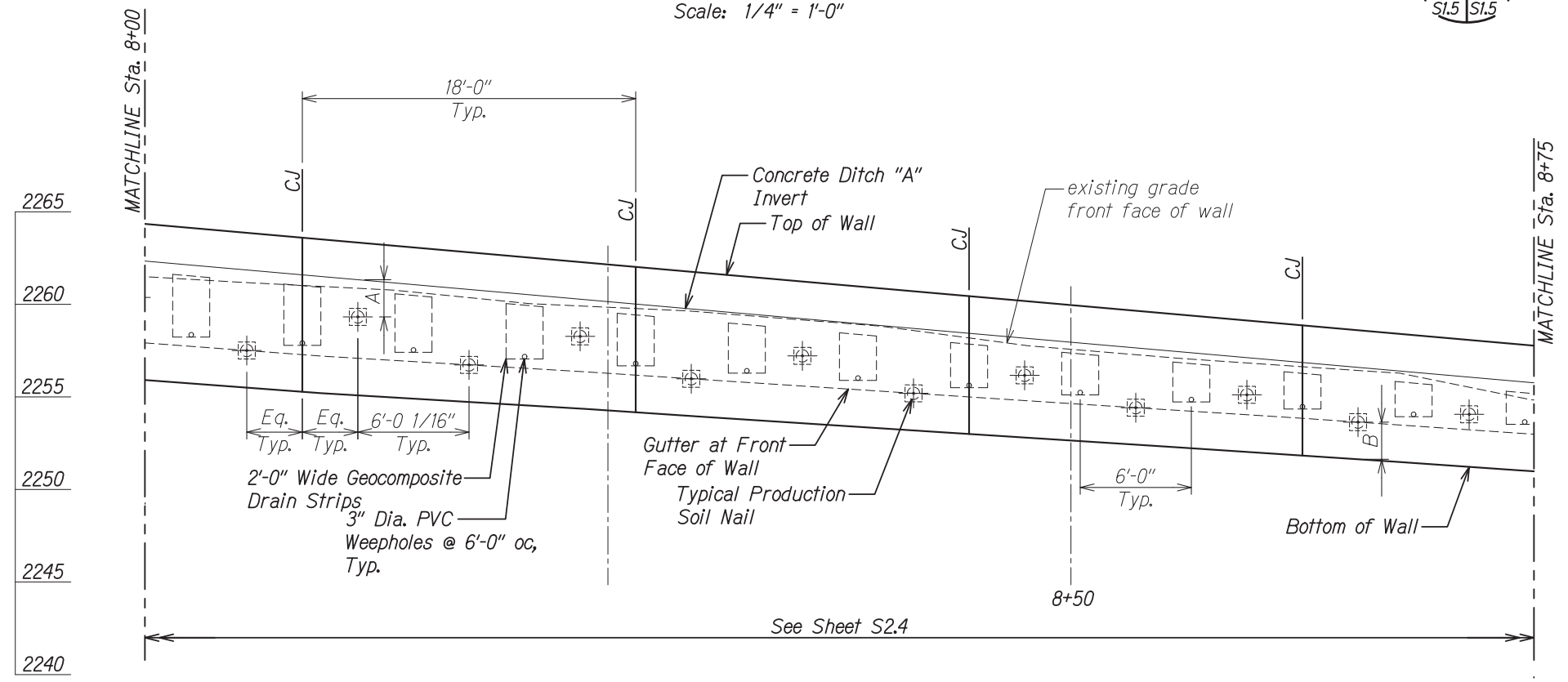
- See Civil Plans for Wall Alignment.
- | Location             | Soil Nail Vertical Distance |
|----------------------|-----------------------------|
| a) Sta. 0+00 to 1+50 | A = 2'-0"                   |
| Sta. 7+50 to 9+27    | B = 2'-0"                   |
| b) Sta. 1+50 to 2+25 | A = 2'-0"                   |
| Sta. 6+50 to 7+50    | B = 2'-0"                   |
| c) Sta. 2+25 to 6+50 | A = 3'-0"                   |
|                      | B = 3'-0"                   |

A = Distance from Concrete Ditch "A" Invert to Soil Nail

B = Distance from Soil Nail to Bottom of Wall

**LEGEND:**

CJ Control Joint



**SOIL NAIL WALL PROFILE - STA. 8+00 TO 8+75** B  
Scale: 1/4" = 1'-0"



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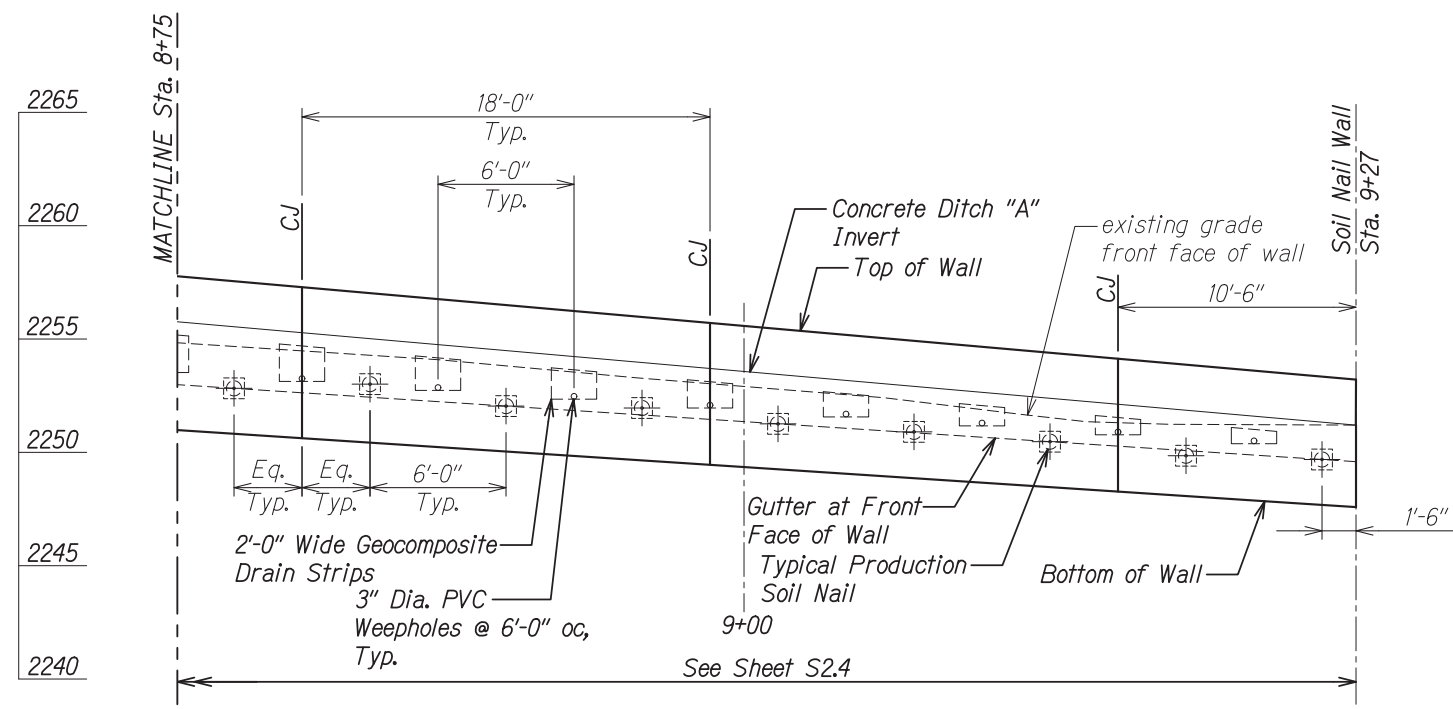
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HIGHWAYS DIVISION

**SOIL NAIL WALL PROFILE**  
**KULA HIGHWAY,  
INTERSECTION IMPROVEMENTS  
AT OMAOPTO ROAD  
Project No. 37C-02-23**

Scale: As Noted Date: Apr. 2024  
SHEET No. **S1.5** OF 12 SHEETS

SURVEY PLOTTED BY	DATE
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ORIGINAL PLAN	
NOTE BOOK	
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DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	37C-02-23	2024	82	115



**SOIL NAIL WALL PROFILE - STA. 8+75 TO 9+27**  
Scale: 1/4" = 1'-0"  
A  
S1.6 S1.6

**NOTE:**

- See Civil Plans for Wall Alignment.
- | Location                                  | Soil Nail Vertical Distance |
|---|-----------------------------|
| a) Sta. 0+00 to 1+50<br>Sta. 7+50 to 9+27 | A = 2'-0"<br>B = 2'-0"      |
| b) Sta. 1+50 to 2+25<br>Sta. 6+50 to 7+50 | A = 2'-0"<br>B = 2'-0"      |
| c) Sta. 2+25 to 6+50                      | A = 3'-0"<br>B = 3'-0"      |

A = Distance from Concrete Ditch "A" Invert to Soil Nail

B = Distance from Soil Nail to Bottom of Wall

**LEGEND:**

CJ Control Joint

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ORIGINAL PLAN	No.
NOTE BOOK	

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LICENSED PROFESSIONAL ENGINEER  
NO. 9444-S  
HAWAII, U.S.A.

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HIGHWAYS DIVISION

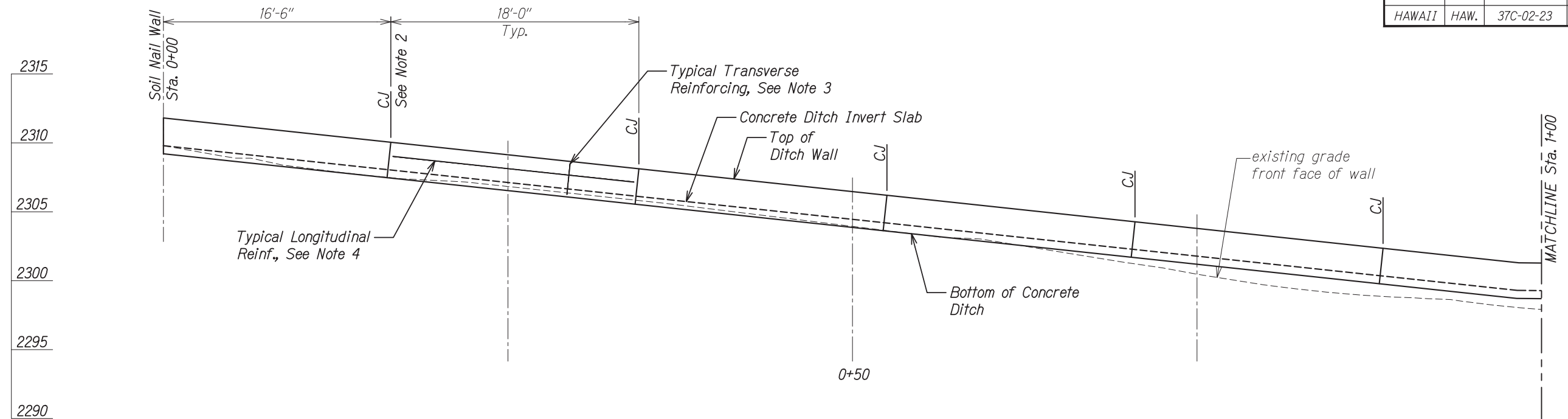
**SOIL NAIL WALL PROFILE**

**KULA HIGHWAY,  
INTERSECTION IMPROVEMENTS  
AT OMAOPTO ROAD  
Project No. 37C-02-23**

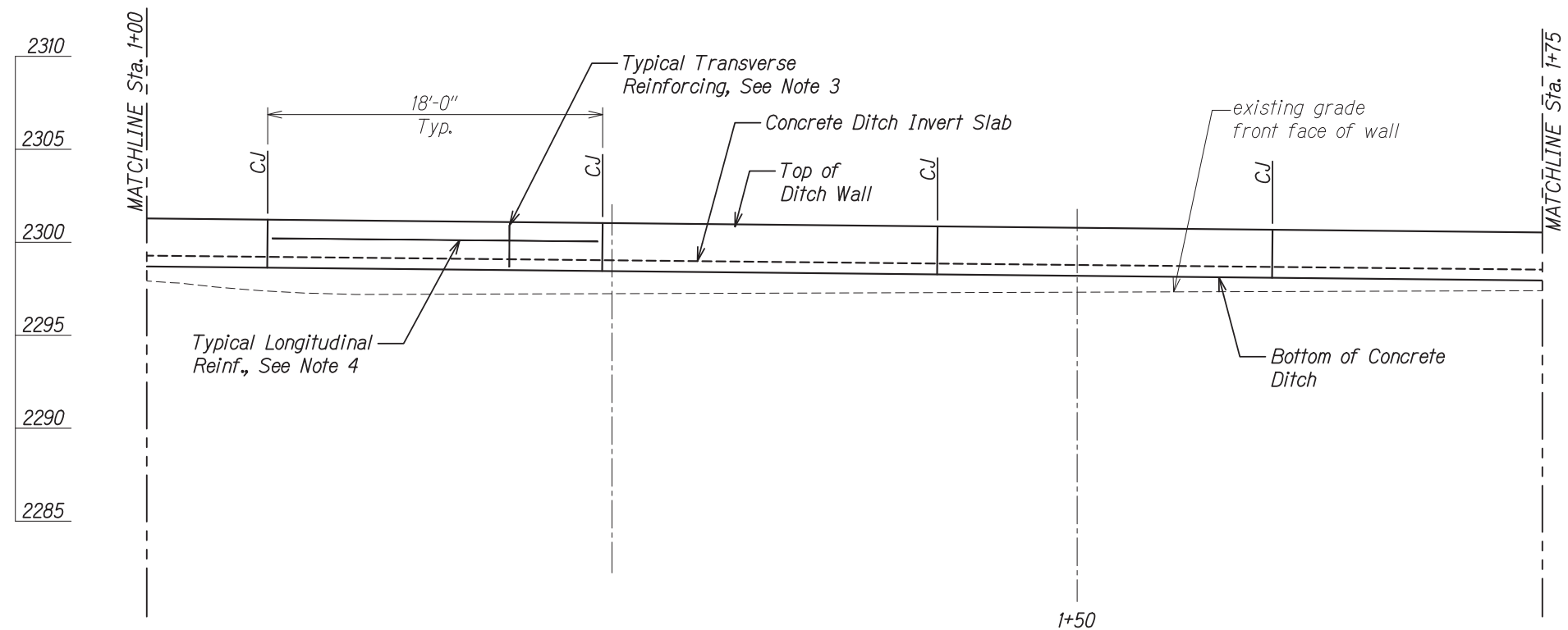
Scale: As Noted Date: Apr. 2024

SHEET No. S1.6 OF 12 SHEETS

DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	37C-02-23	2024	83	115



CONCRETE DITCH "A" PROFILE - STA. 0+00 TO 1+00 A  
SI.7 SI.7  
Scale: 1/4" = 1'-0"



CONCRETE DITCH "A" PROFILE - STA. 1+00 TO 1+75 B  
SI.7 SI.7  
Scale: 1/4" = 1'-0"

**NOTES:**

- See Sheet A/S2.6 for concrete ditch section.
- Control joints shall be perpendicular to the channel, see 1/S2.6 for control joint reinforcing.
- Transverse reinforcing shall be perpendicular to the invert slab.
- Longitudinal reinforcing shall be parallel to the invert slab.

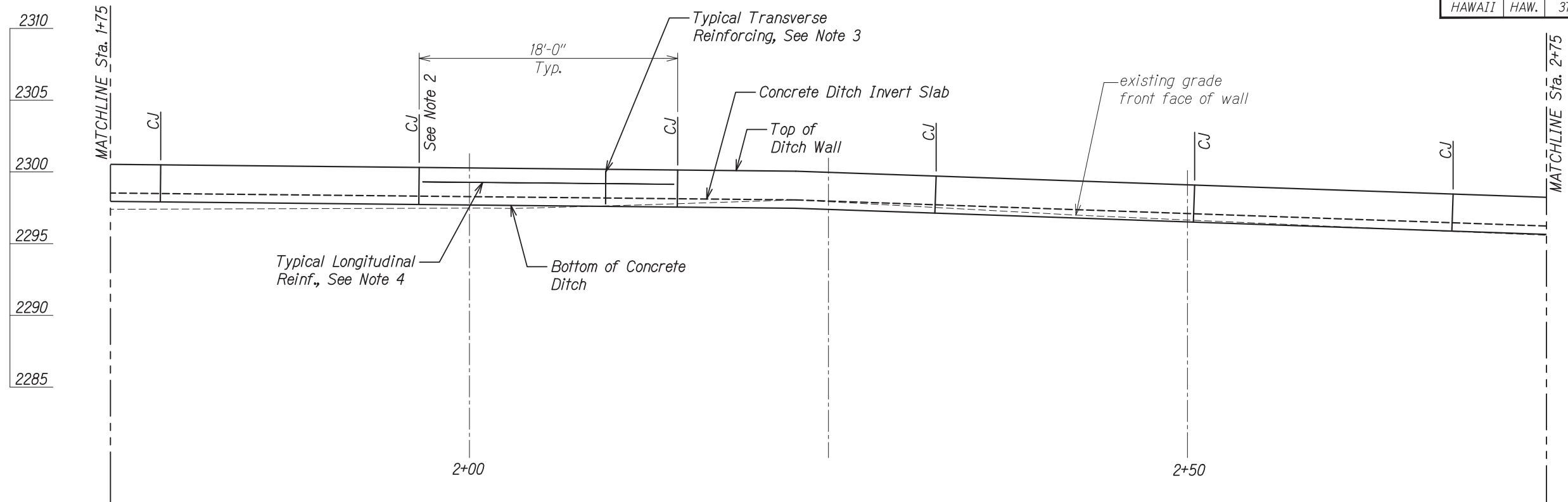


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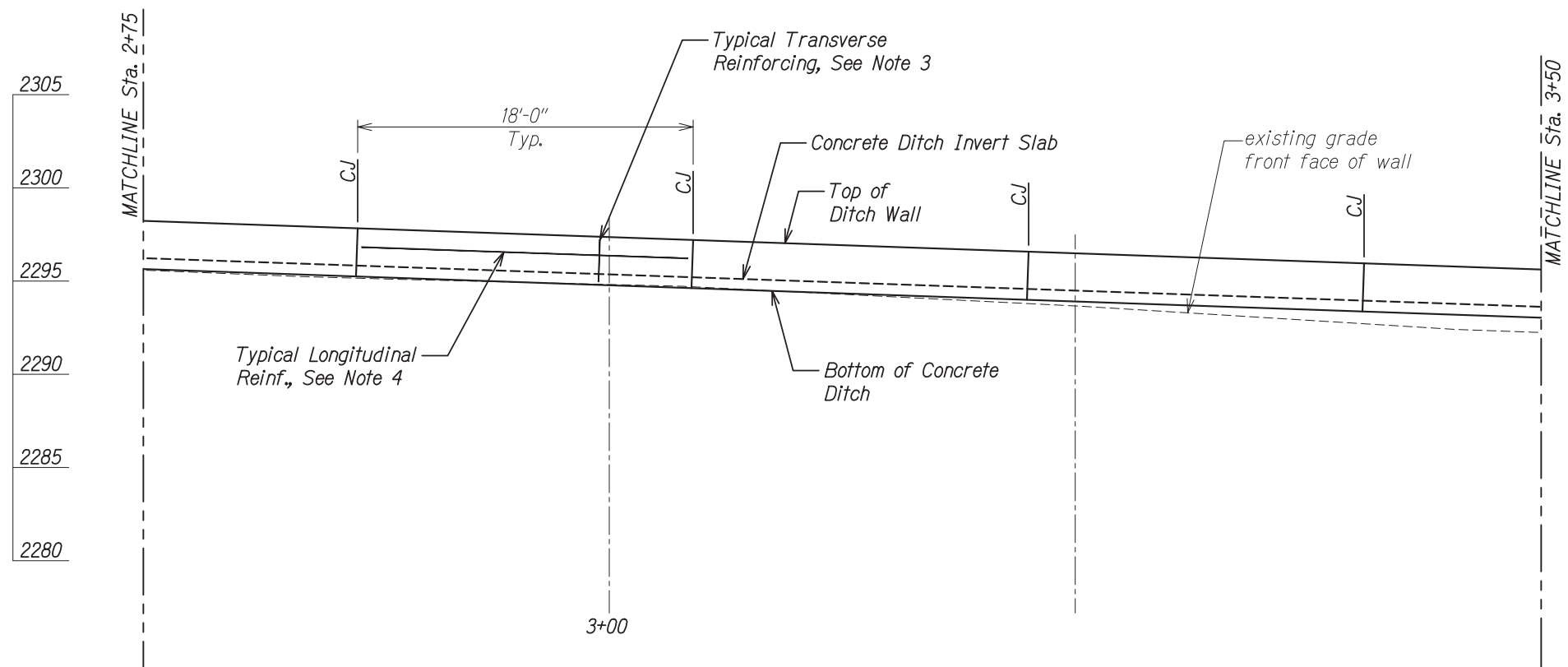
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
<b>CONCRETE DITCH "A" PROFILE</b>	
<b>KULA HIGHWAY, INTERSECTION IMPROVEMENTS AT OMAOPIO ROAD Project No. 37C-02-23</b>	
Scale: As Noted	Date: Apr. 2024
SHEET No. SI.7 OF 12 SHEETS	

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No.	

DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	37C-02-23	2024	84	115



CONCRETE DITCH "A" PROFILE - STA. 1+75 TO 2+75 A  
Scale: 1/4" = 1'-0"



CONCRETE DITCH "A" PROFILE - STA. 2+75 TO 3+50 B  
Scale: 1/4" = 1'-0"

NOTES:

1. See Sheet A/S2.6 for concrete ditch section.
2. Control joints shall be perpendicular to the channel, see 1/S2.6 for control joint reinforcing.
3. Transverse reinforcing shall be perpendicular to the invert slab.
4. Longitudinal reinforcing shall be parallel to the invert slab.



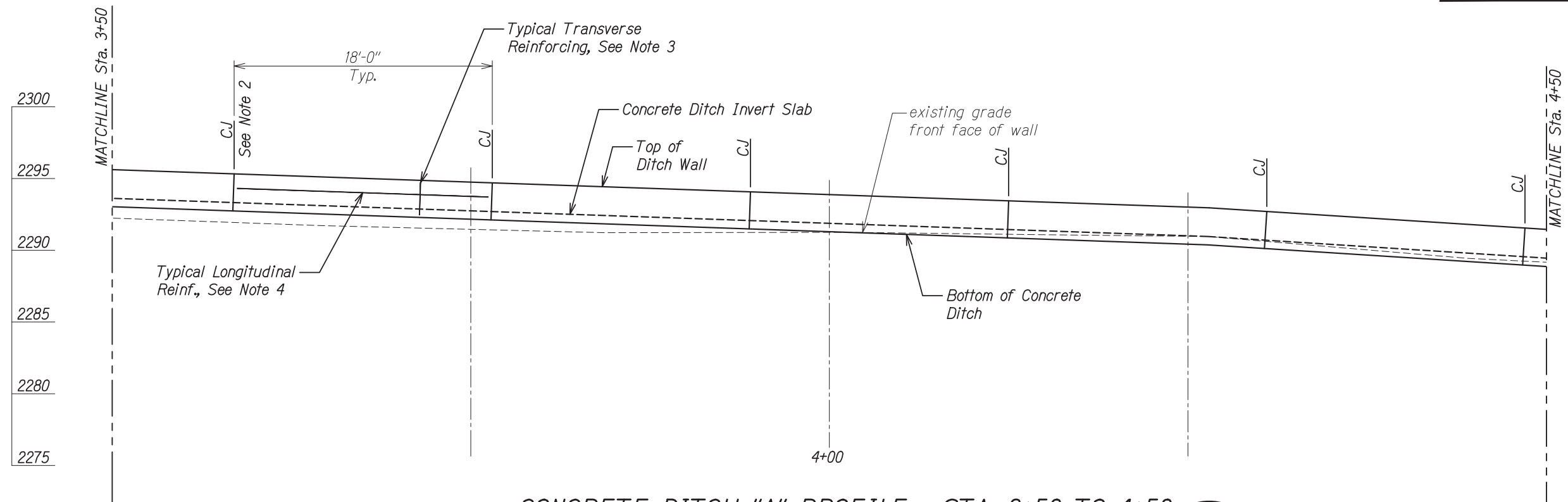
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STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
<b>CONCRETE DITCH "A" PROFILE</b>	
<b>KULA HIGHWAY, INTERSECTION IMPROVEMENTS AT OMAOPIO ROAD Project No. 37C-02-23</b>	
Scale: As Noted	Date: Apr. 2024
SHEET No. <i>SI.8</i> OF 12 SHEETS	

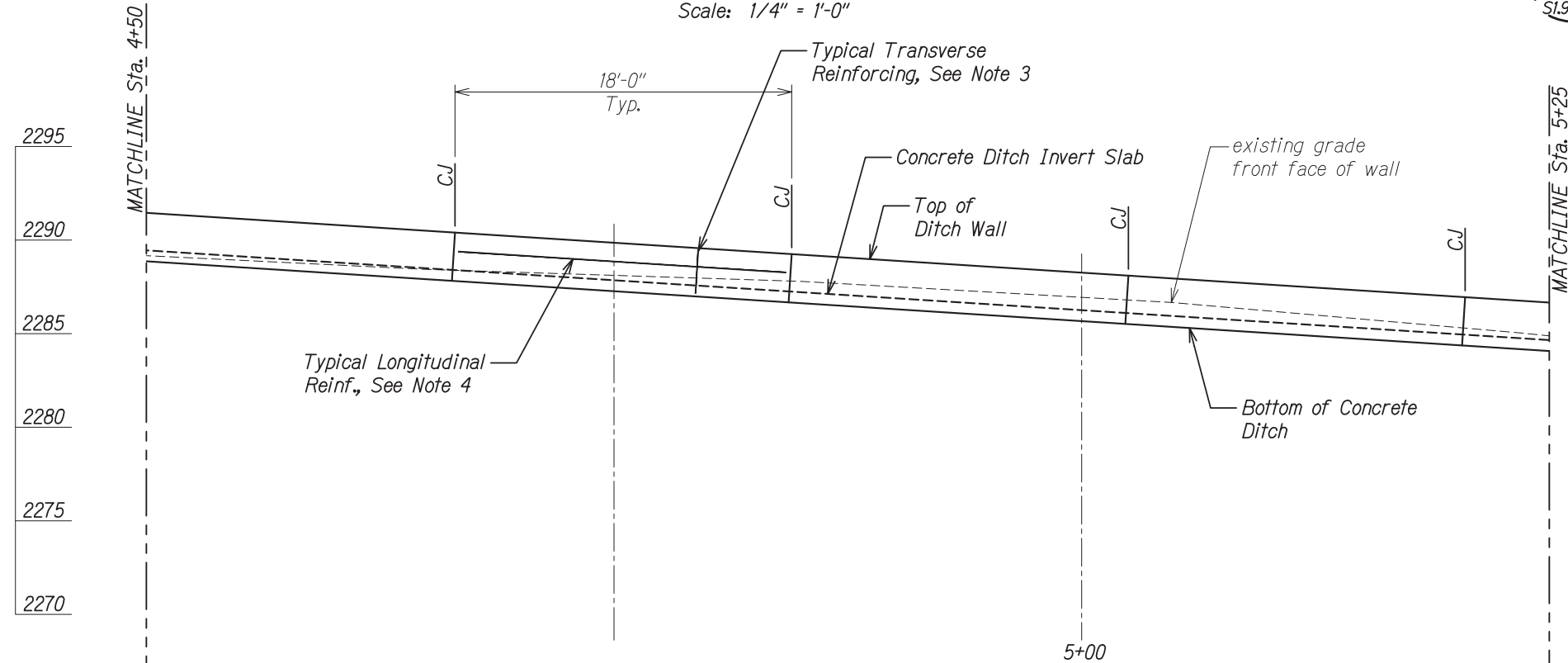
SURVEY PLOTTED BY	DATE
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CHECKED BY	
NOTE BOOK	
No.	



DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	37C-02-23	2024	85	115



CONCRETE DITCH "A" PROFILE - STA. 3+50 TO 4+50  
Scale: 1/4" = 1'-0"



CONCRETE DITCH "A" PROFILE - STA. 4+50 TO 5+25  
Scale: 1/4" = 1'-0"

NOTES:

1. See Sheet A/S2.6 for concrete ditch section.
2. Control joints shall be perpendicular to the channel, see 1/S2.6 for control joint reinforcing.
3. Transverse reinforcing shall be perpendicular to the invert slab.
4. Longitudinal reinforcing shall be parallel to the invert slab.

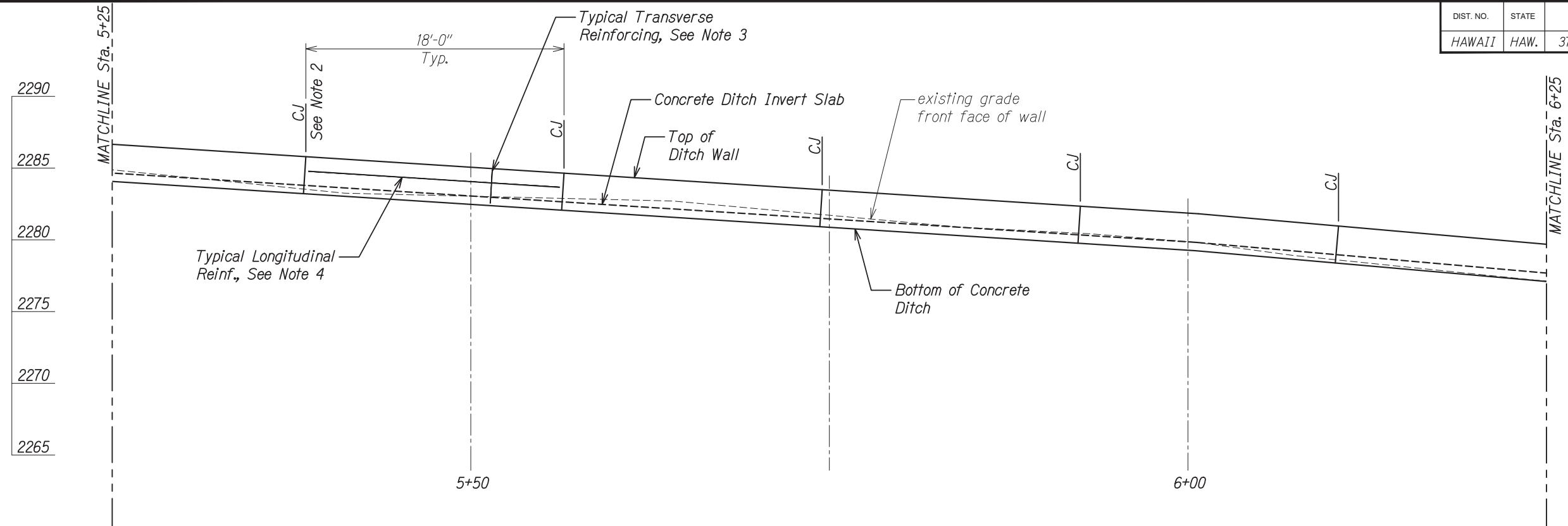


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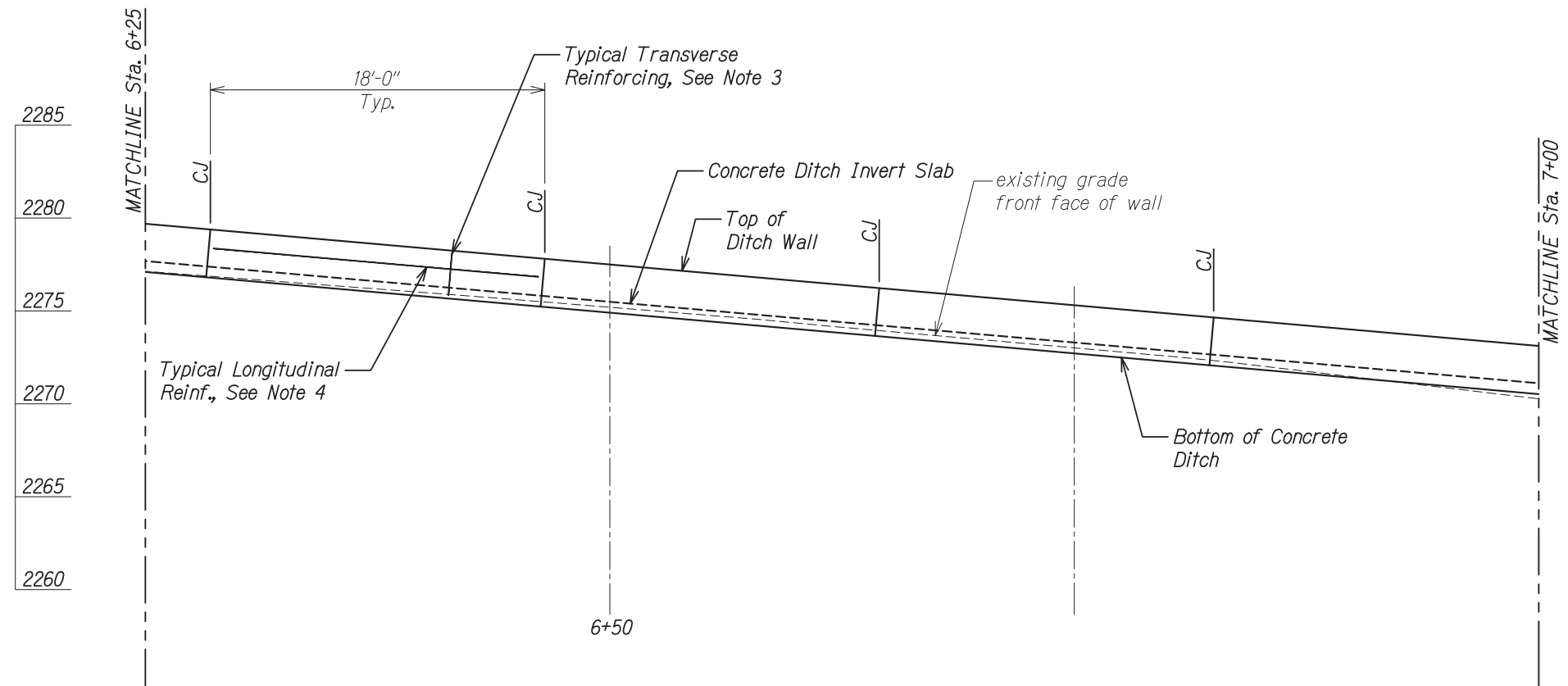
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
<b>CONCRETE DITCH "A" PROFILE</b>	
<b>KULA HIGHWAY, INTERSECTION IMPROVEMENTS AT OMAOPIO ROAD Project No. 37C-02-23</b>	
Scale: As Noted	Date: Apr. 2024
SHEET No. <i>SI.9</i> OF 12 SHEETS	

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ORIGINAL PLAN	
NOTE BOOK	
No.	

DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	37C-02-23	2024	86	115



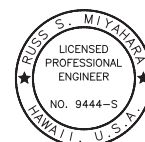
CONCRETE DITCH "A" PROFILE - STA. 5+25 TO 6+25 A  
Scale: 1/4" = 1'-0" SI.10 SI.10



CONCRETE DITCH "A" PROFILE - STA. 6+25 TO 7+00 B  
Scale: 1/4" = 1'-0" SI.10 SI.10

**NOTES:**

1. See Sheet A/S2.6 for concrete ditch section.
2. Control joints shall be perpendicular to the channel, see 1/S2.6 for control joint reinforcing.
3. Transverse reinforcing shall be perpendicular to the invert slab.
4. Longitudinal reinforcing shall be parallel to the invert slab.



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STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

CONCRETE DITCH "A" PROFILE

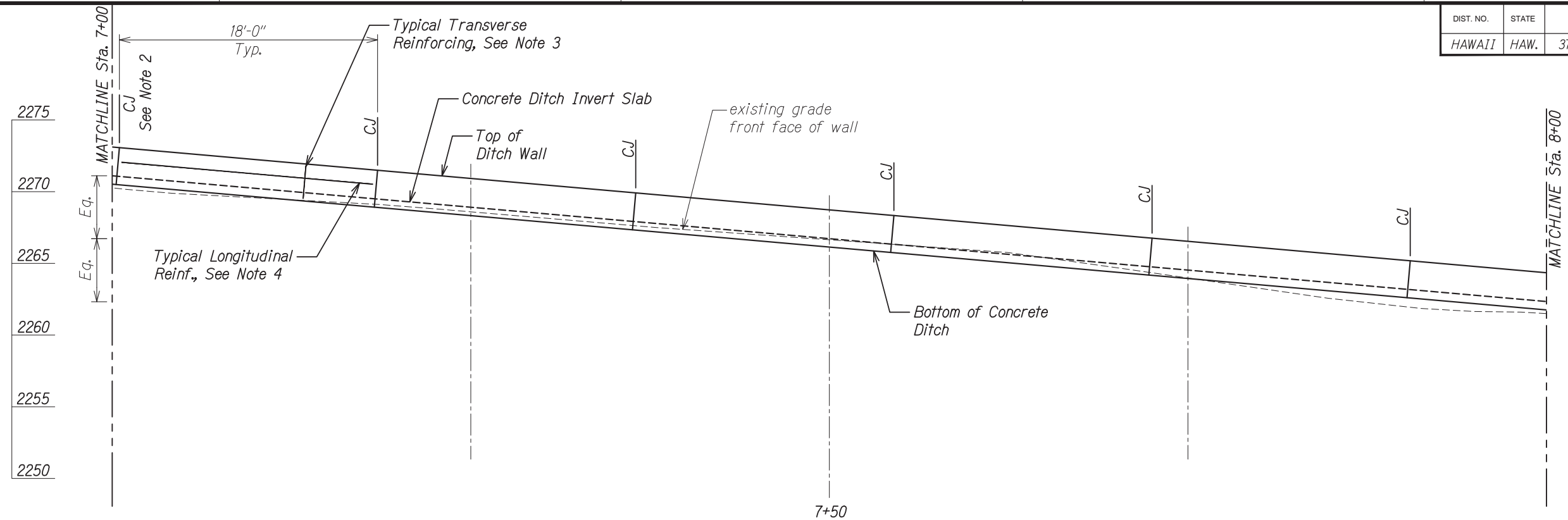
KULA HIGHWAY,  
INTERSECTION IMPROVEMENTS  
AT OMAOPIO ROAD  
Project No. 37C-02-23

Scale: As Noted Date: Apr. 2024

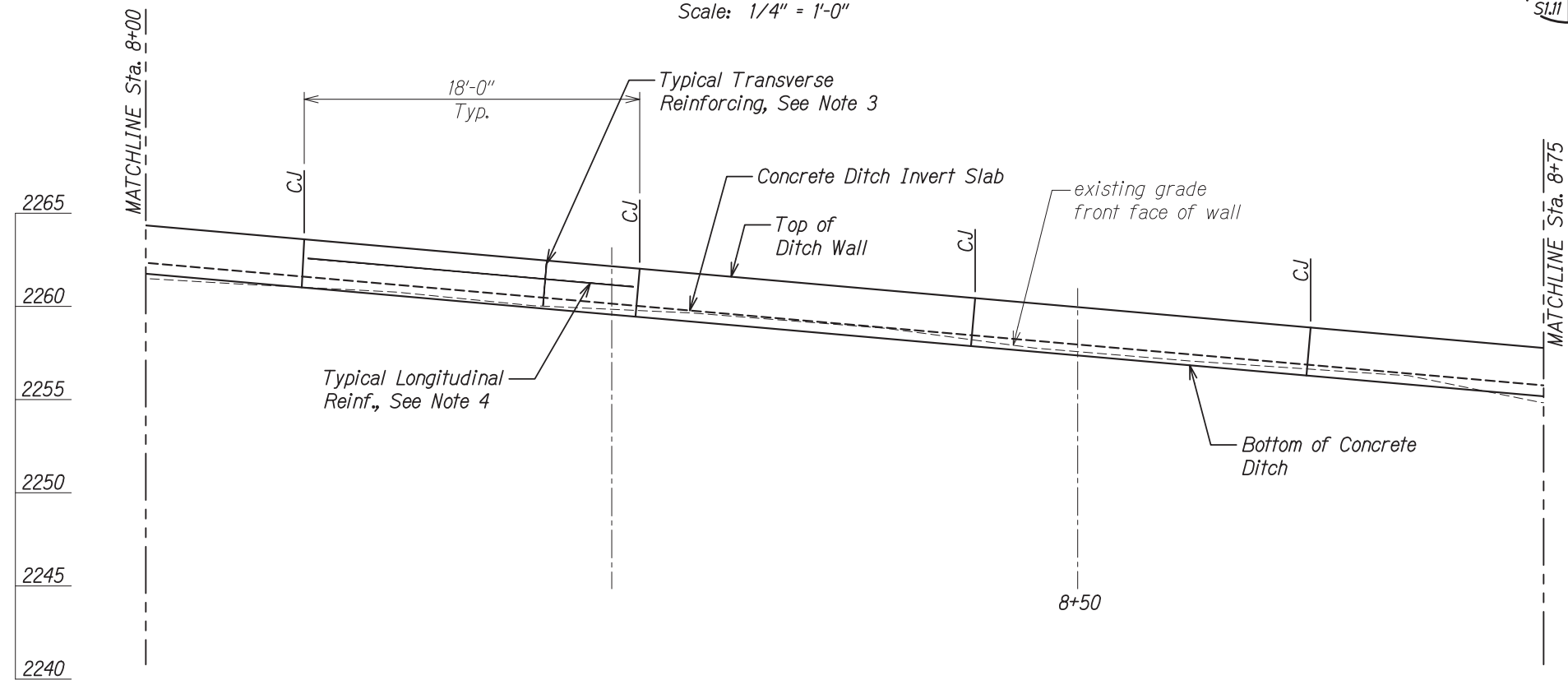
SHEET No. SI.10 OF 12 SHEETS

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

DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	37C-02-23	2024	87	115



CONCRETE DITCH "A" PROFILE - STA. 7+00 TO 8+00  
Scale: 1/4" = 1'-0" A  
SI.11 SI.11



CONCRETE DITCH "A" PROFILE - STA. 8+00 TO 8+75  
Scale: 1/4" = 1'-0" B  
SI.11 SI.11

NOTES:

1. See Sheet A/S2.6 for concrete ditch section.
2. Control joints shall be perpendicular to the channel, see 1/S2.6 for control joint reinforcing.
3. Transverse reinforcing shall be perpendicular to the invert slab.
4. Longitudinal reinforcing shall be parallel to the invert slab.



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STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

CONCRETE DITCH "A" PROFILE

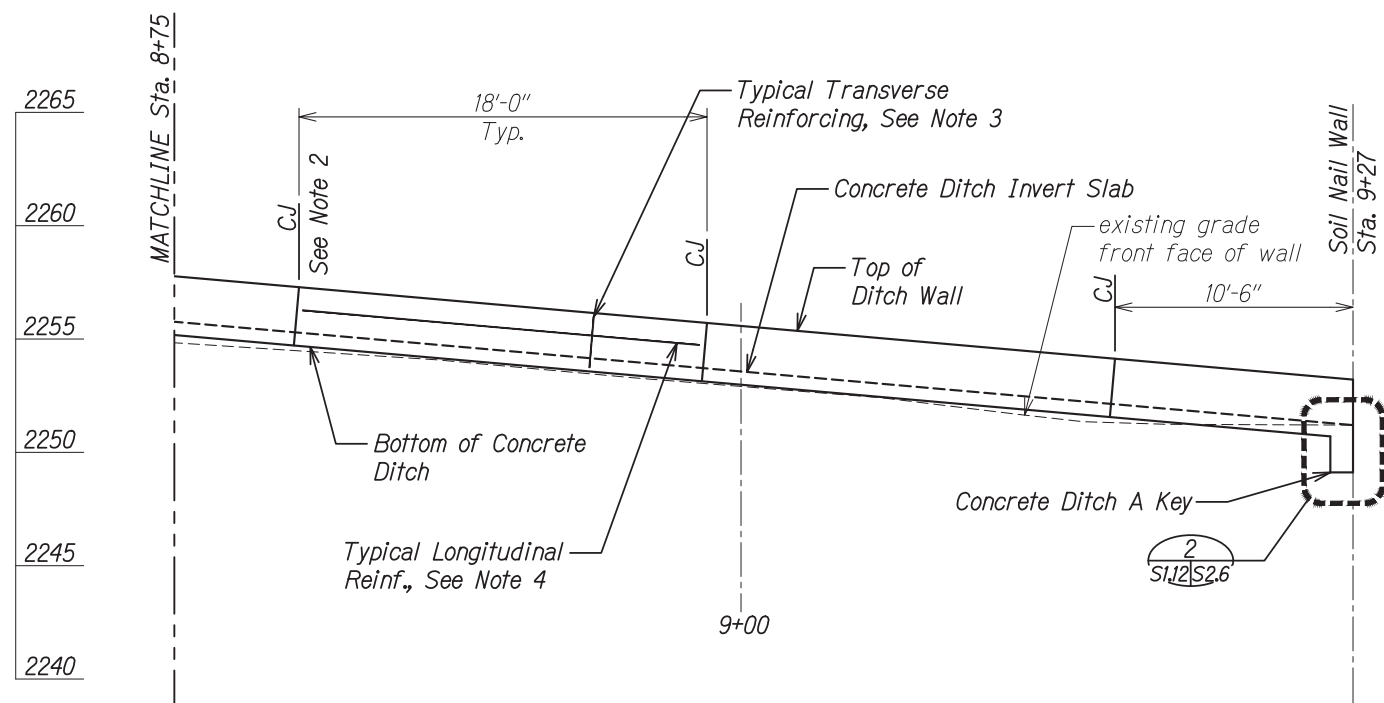
KULA HIGHWAY,  
INTERSECTION IMPROVEMENTS  
AT OMAOPIO ROAD  
Project No. 37C-02-23

Scale: As Noted Date: Apr. 2024

SHEET No. SI.11 OF 12 SHEETS

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NOTE BOOK	
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DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	37C-02-23	2024	88	115



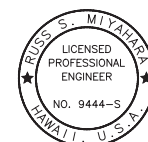
CONCRETE DITCH "A" PROFILE - STA. 8+75 TO 9+27  
Scale: 1/4" = 1'-0"

NOTES:

- See Sheet A/S2.6 for concrete ditch section.
- Control joints shall be perpendicular to the channel, see 1/S2.6 for control joint reinforcing.
- Transverse reinforcing shall be perpendicular to the invert slab.
- Longitudinal reinforcing shall be parallel to the invert slab.

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4-30-26

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**CONCRETE DITCH "A" PROFILE**

**KULA HIGHWAY,  
INTERSECTION IMPROVEMENTS  
AT OMAOPTO ROAD  
Project No. 37C-02-23**

Scale: As Noted Date: Apr. 2024

SHEET No. S112 OF 12 SHEETS



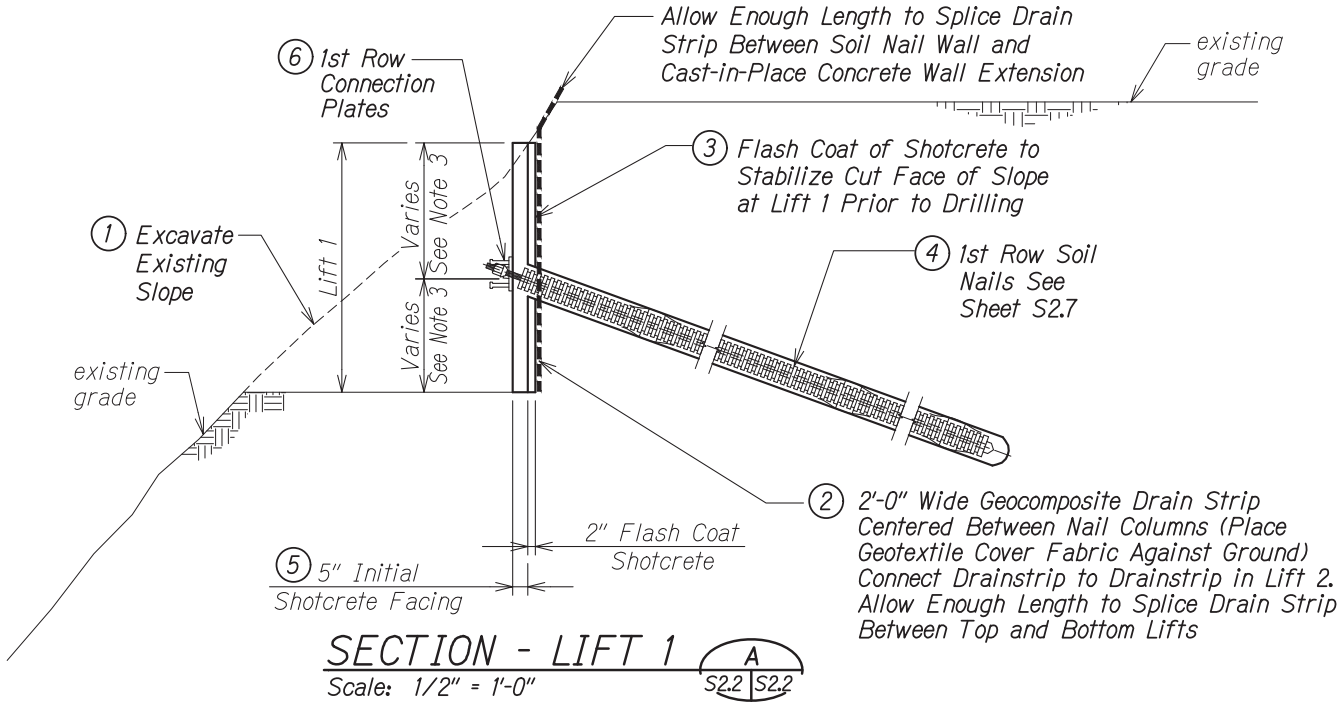


DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	37C-02-23	2024	90	115

INITIAL SHOTCRETE SECTION (LIFT 1):

NOTES:

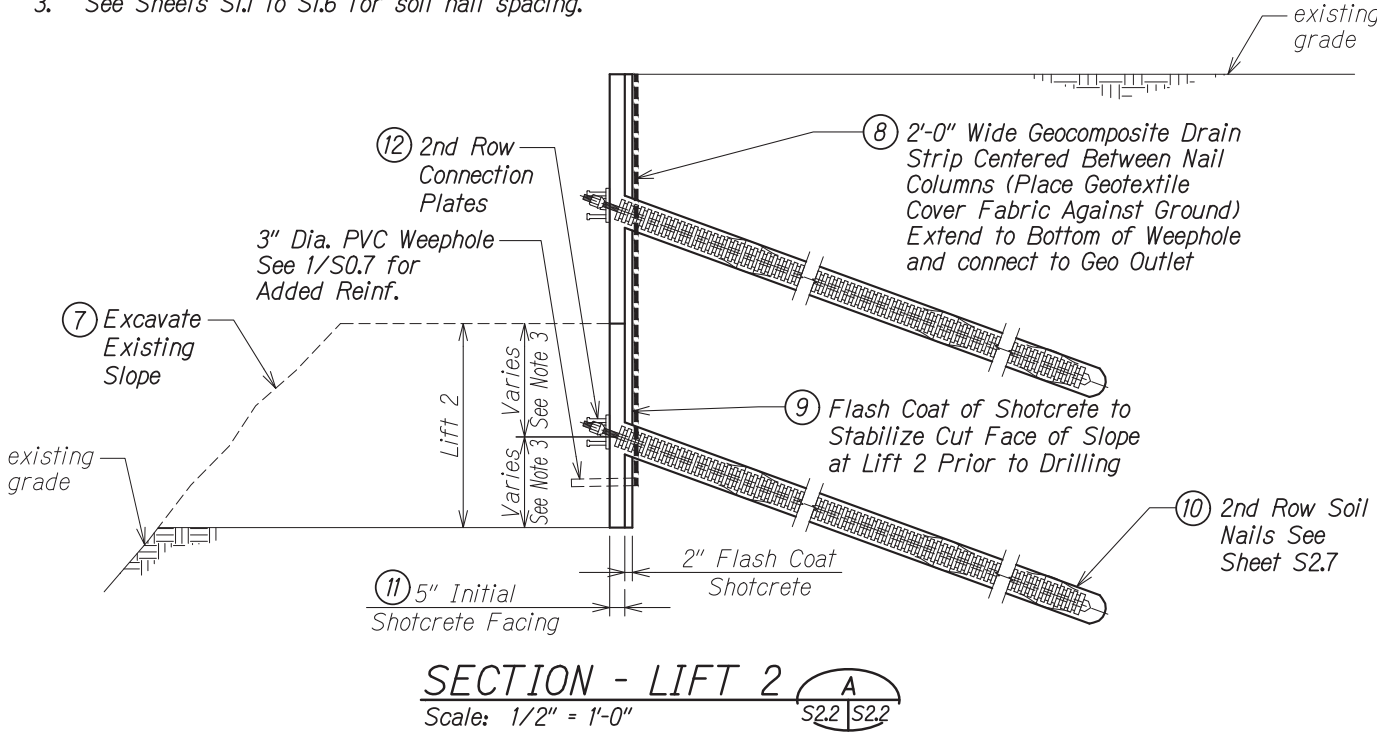
- See B/S2.2 and A/S2.3 for additional details.
- Contractor may need to apply extra shotcrete as fill in case the face of the cut slope is not vertical.
- See Sheets S1.1 to S1.6 for soil nail spacing.



INITIAL SHOTCRETE SECTION (LIFT 2):

NOTES:

- See A/S2.2 and A/S2.3 for additional details.
- Contractor may need to apply extra shotcrete as fill in case the face of the cut slope is not vertical.
- See Sheets S1.1 to S1.6 for soil nail spacing.



CONSTRUCTION SEQUENCE:

- Excavate to Required 1st Lift.
- Install Geocomposite Drain Strips.
- Apply Flash Coat Shotcrete.
- Drill, Install, and Grout 1st Row of Soil Nails; Run Any Necessary Performance/Proof Tests.
- Place Reinforcing and Apply Lift 1 Initial Shotcrete Facing. Reinforcing Shall Extend into Cast-in-Place Concrete Wall Extension.
- Install Studded Connection Plates on 1st Row.
- Excavate to Required 2nd Lift.
- Extend Geocomposite Drain Strips to Location Shown on Sheets S1.1 to S1.6 and Install PVC Weepholes. Cover Weepholes with Tape Before Applying Shotcrete Wall Facing.
- Apply Flash Coat Shotcrete.
- Drill, Install, and Grout 2nd Row of Soil Nails; Run Any Necessary Performance/Proof Tests.
- Place Reinforcing and Apply Lift 2 Initial Shotcrete Facing.
- Install Studded Connection Plates on 2nd Row.
- Place Reinforcing and Pour Cast-in-Place Concrete Facing.
- Extend Geocomposite Drain Strips to Bottom of Concrete Ditch, Place Reinforcing and Cast-in-Place Final Concrete Wall Extension.
- Place Reinforcing and Pour Concrete Ditch.

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STATE OF HAWAII  
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HIGHWAYS DIVISION

**2-ROWS SOIL NAIL WALL SECTION**  
**CONSTRUCTION SEQUENCE**

**KULA HIGHWAY,  
INTERSECTION IMPROVEMENTS  
AT OMAOPTO ROAD  
Project No. 37C-02-23**

Scale: As Noted Date: Apr. 2024

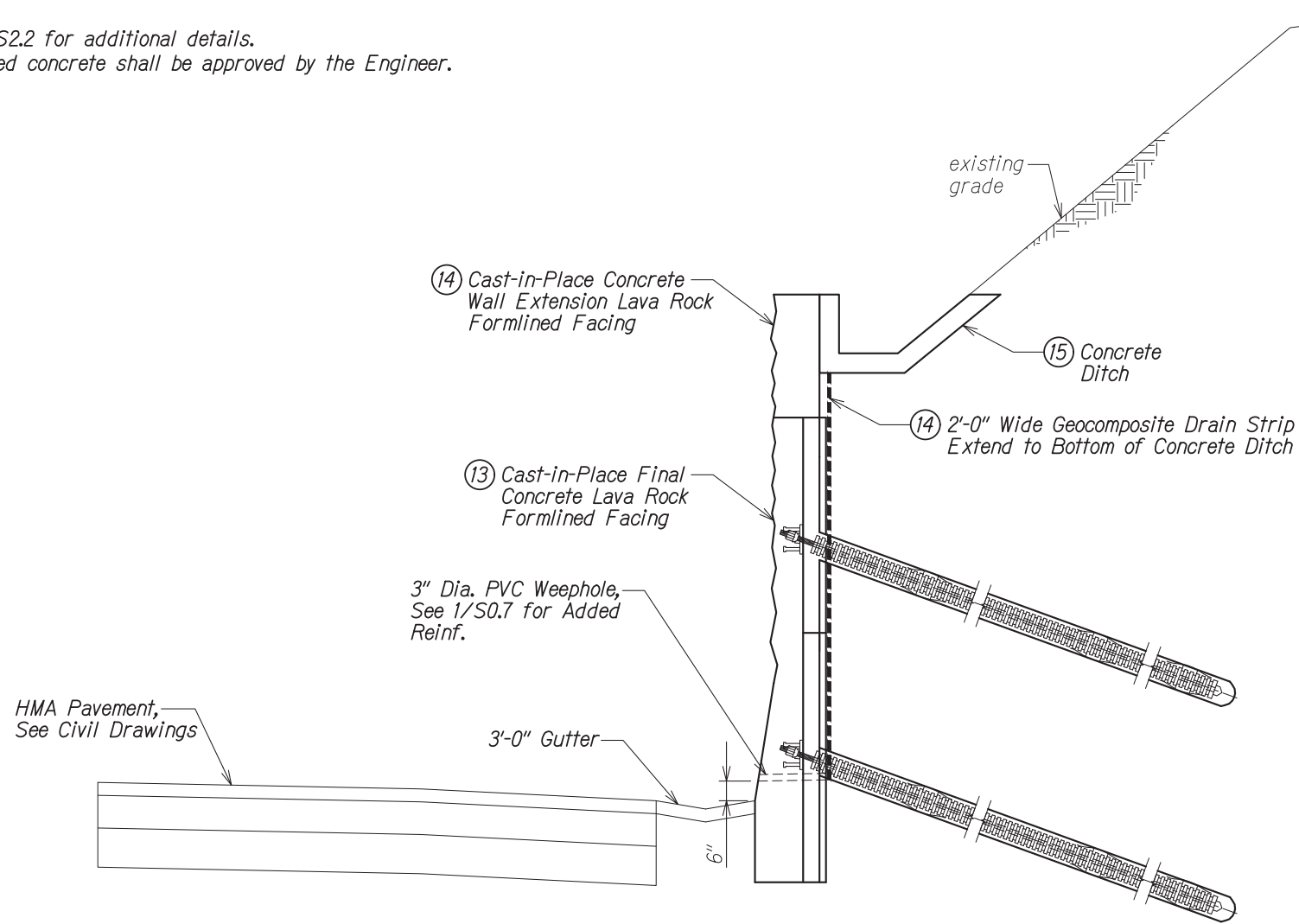
SHEET No. S2.2 OF 7 SHEETS

CAST-IN-PLACE FINAL CONCRETE SECTIONS:

NOTES:

1. See A/S2.2 and B/S2.2 for additional details.
2. Formliner and colored concrete shall be approved by the Engineer.

DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	37C-02-23	2024	91	115



**SECTION - FINAL FACING** A  
Scale: 1/2" = 1'-0" S2.3 | S2.3

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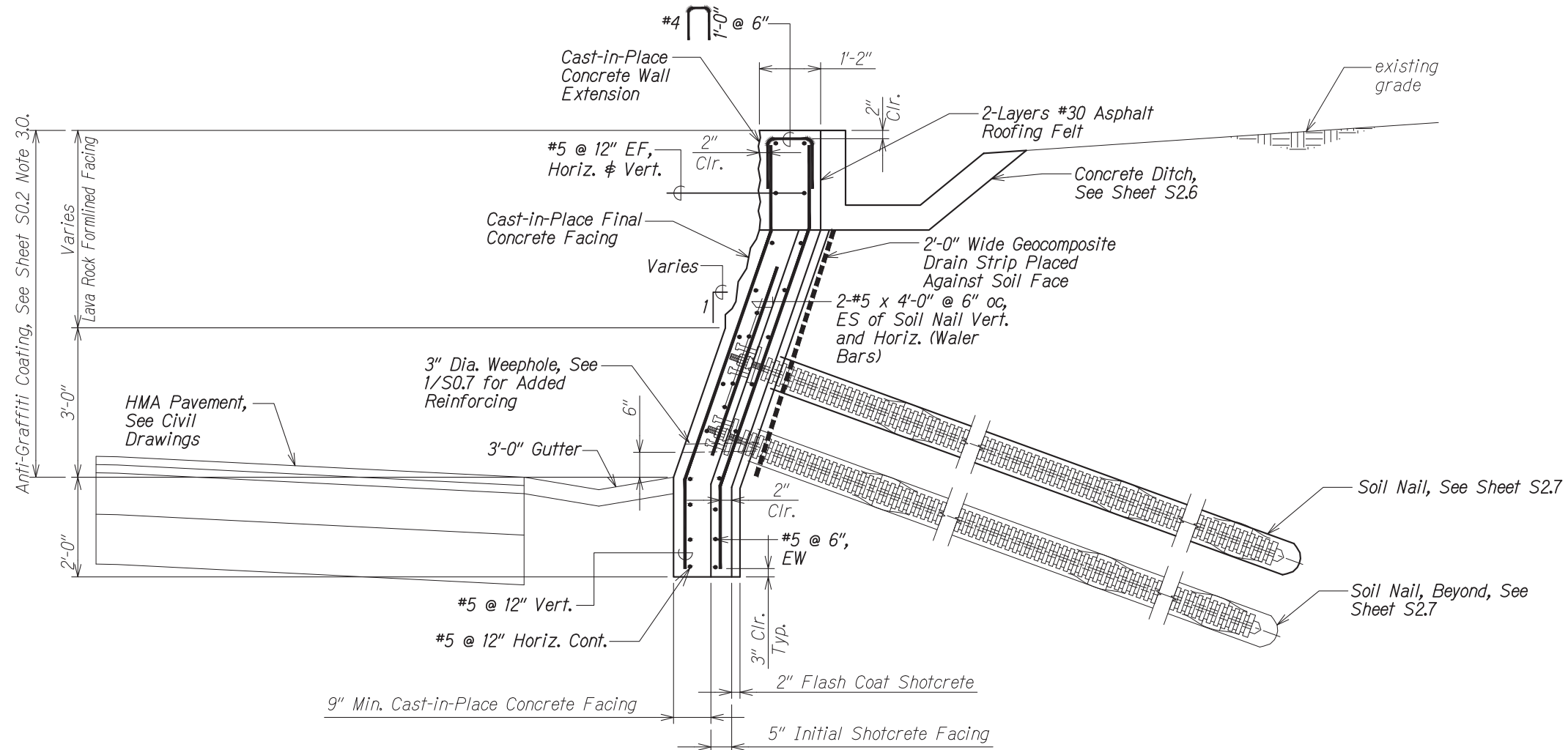
**2-ROWS SOIL NAIL WALL SECTION**  
**CONSTRUCTION SEQUENCE**

**KULA HIGHWAY,**  
**INTERSECTION IMPROVEMENTS**  
**AT OMAOPTO ROAD**  
**Project No. 37C-02-23**

Scale: As Noted Date: Apr. 2024

SHEET No. S2.3 OF 7 SHEETS

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HAWAII	HAW.	37C-02-23	2024	92	115



1 ROW SOIL NAIL WALL SECTION  
REINFORCING DETAIL

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



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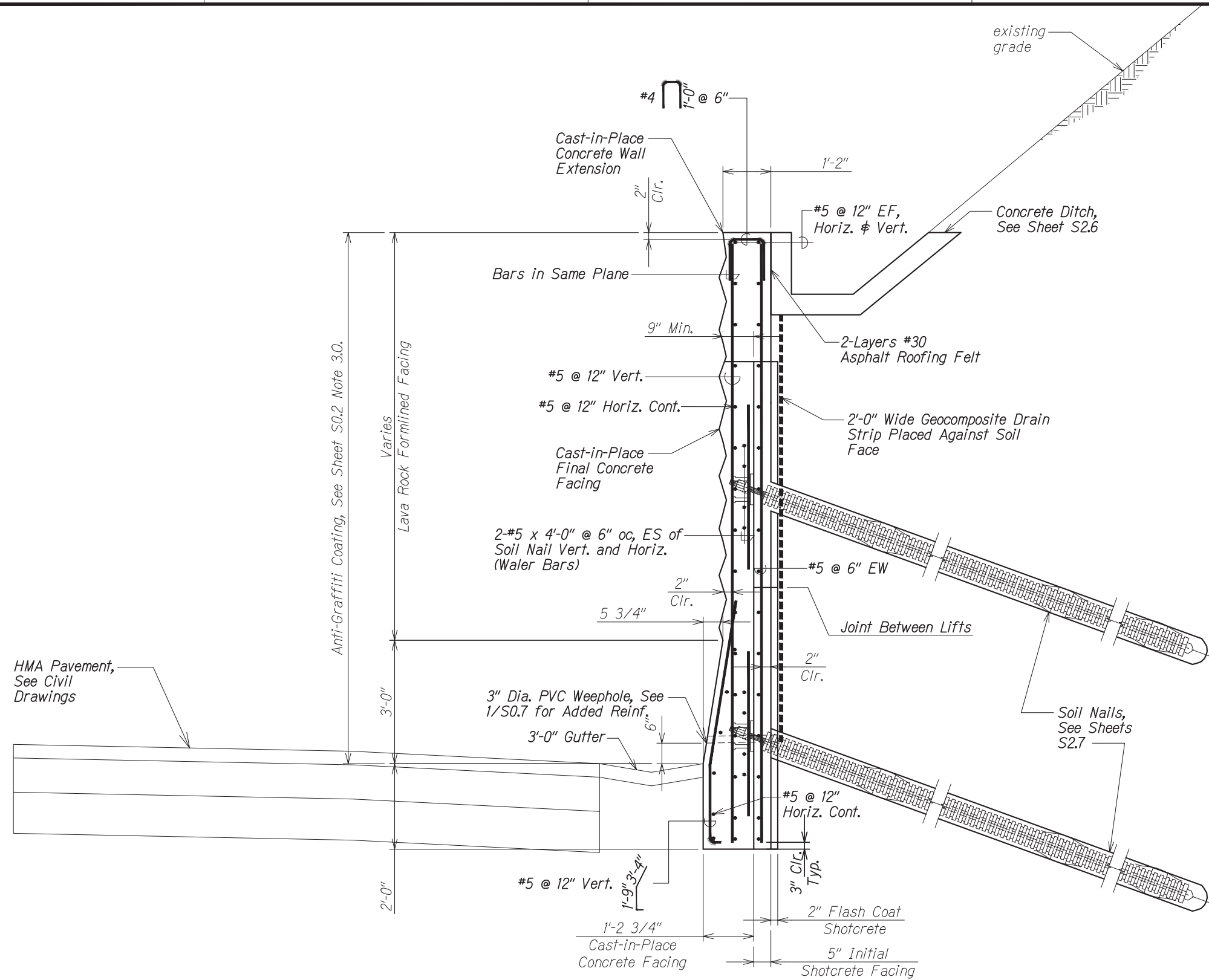


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HIGHWAYS DIVISION  
**1-ROW SOIL NAIL WALL SECTION  
REINFORCING DETAIL**  
**KULA HIGHWAY,  
INTERSECTION IMPROVEMENTS  
AT OMAOPTO ROAD  
Project No. 37C-02-23**  
Scale: As Noted Date: Apr. 2024  
SHEET No. S2.4 OF 7 SHEETS



DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	37C-02-23	2024	93	115



2 ROWS SOIL NAIL WALL SECTION  
REINFORCING DETAIL  
Scale: 3/4" = 1'-0"

A  
S2.5 S2.5



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HIGHWAYS DIVISION

**2-ROWS SOIL NAIL WALL SECTION  
REINFORCING DETAIL**

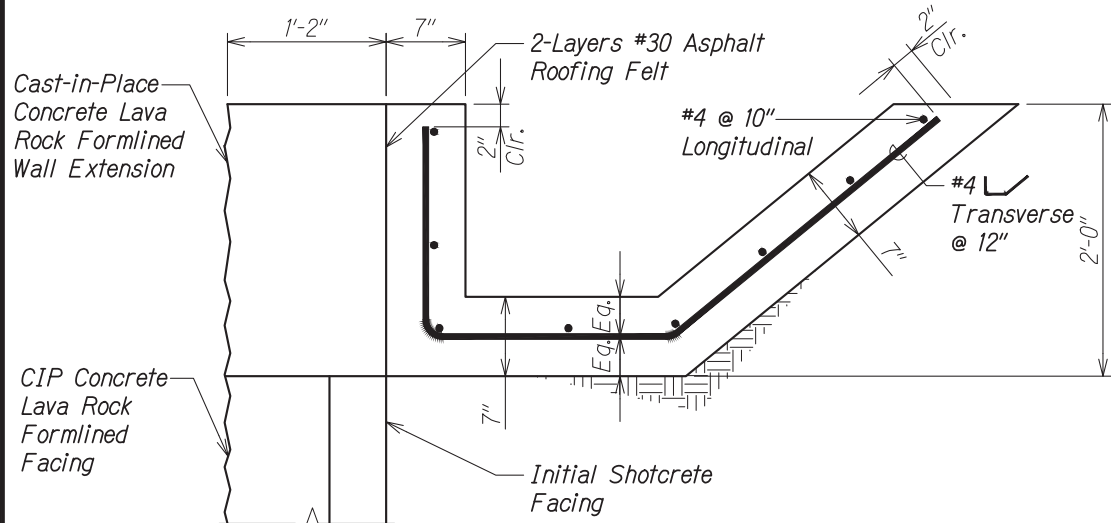
**KULA HIGHWAY,  
INTERSECTION IMPROVEMENTS  
AT OMAOPTO ROAD  
Project No. 37C-02-23**

Scale: As Noted Date: Apr. 2024

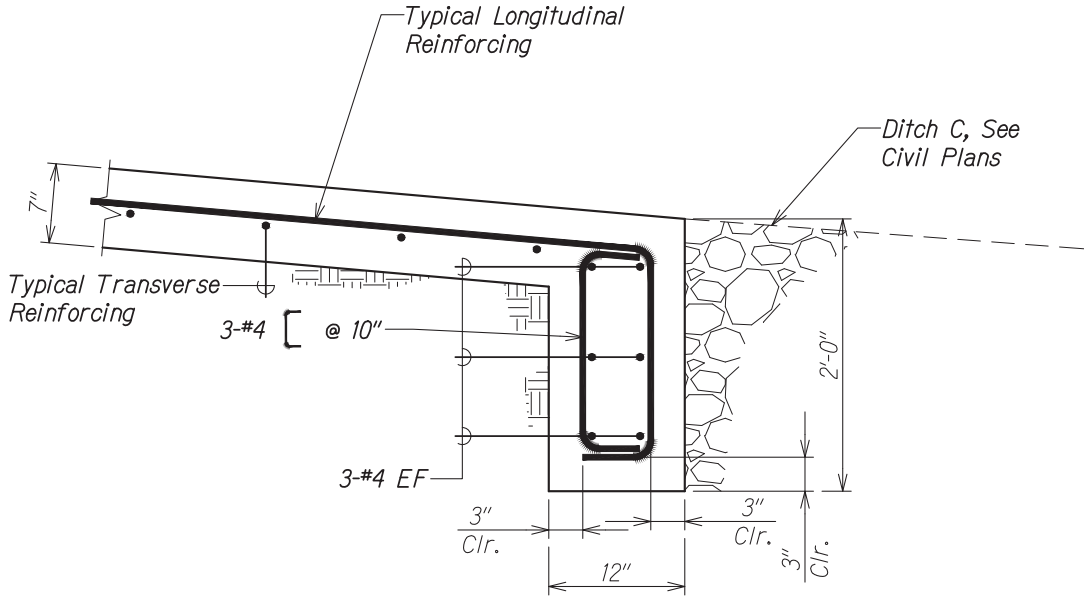
SHEET No. S2.5 OF 7 SHEETS

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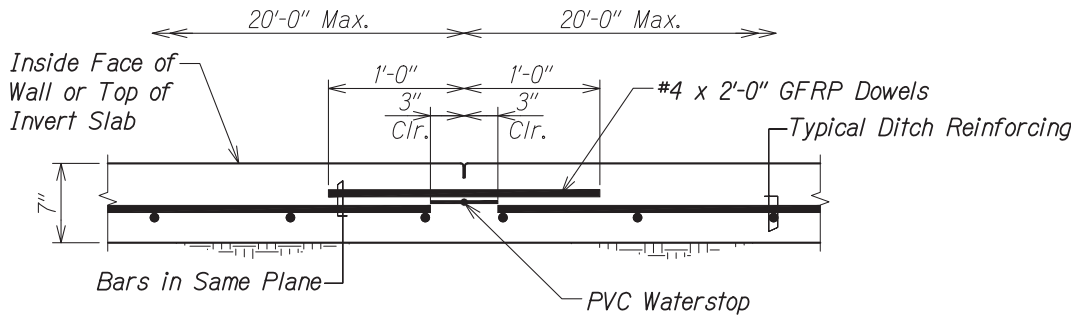
DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	37C-02-23	2024	94	115



CONCRETE DITCH "A" SECTION A  
 Scale: 1 1/2" = 1'-0" S2.6 S2.6



CONCRETE DITCH "A" KEY DETAIL 2  
 Scale: 1 1/2" = 1'-0" S1.2 S2.6



TYPICAL CONCRETE DITCH "A"  
 CONTROL JOINT DETAIL 1  
 Scale: 1 1/2" = 1'-0" S2.6 S2.6

**NOTES:**

- Concrete ditch control joints shall match cast-in-place concrete wall extension control joints.
- Concrete Ditch "A" shall be poured monolithic.
- See Civil Drawings for additional information.

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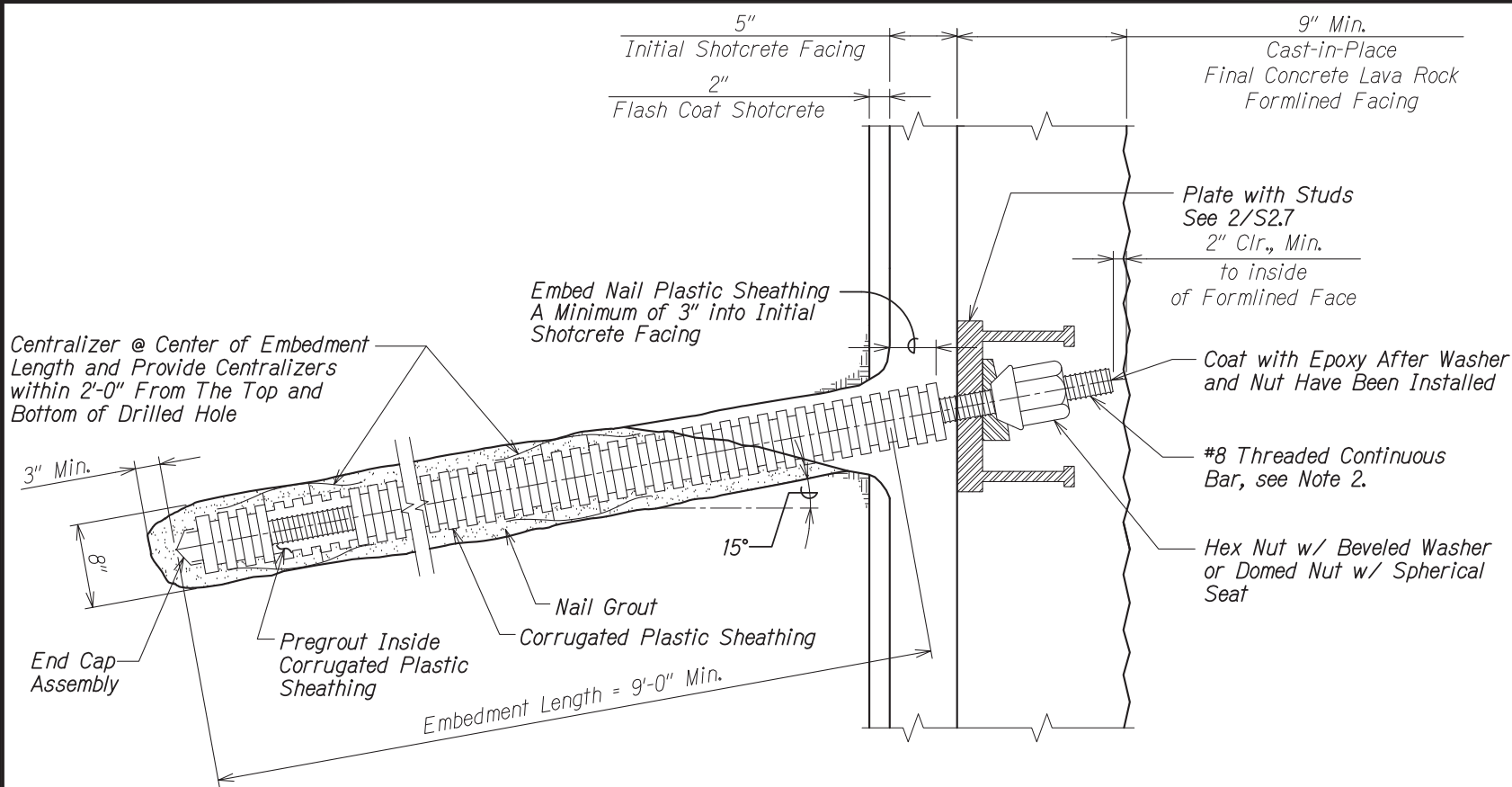
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 HIGHWAYS DIVISION

**CONCRETE DITCH "A" DETAILS**  
  
**KULA HIGHWAY,  
 INTERSECTION IMPROVEMENTS  
 AT OMAOPTO ROAD  
 Project No. 37C-02-23**

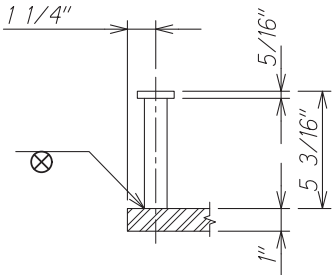
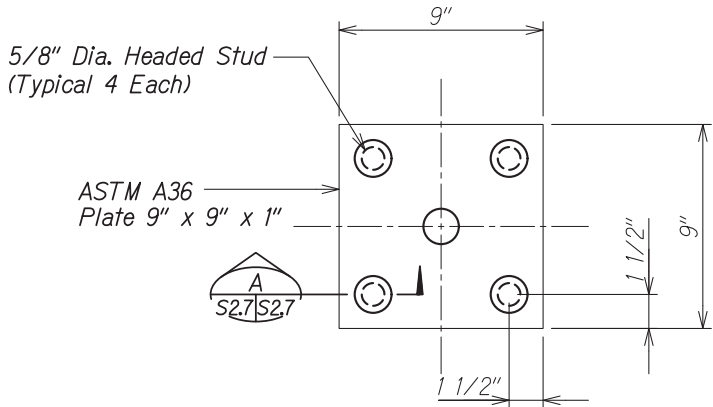
Scale: As Noted      Date: Apr. 2024  
 SHEET No. S2.6 OF 7 SHEETS

DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	37C-02-23	2024	95	115



- NOTES:**
- Reinforcing not shown for clarity. See Sheets S2.4 and S2.5.
  - Soil nail shall conform to ASTM A615 - Grade 75, ASTM A934 - Epoxy Coated, Deformed Bar.
  - Contractor shall handle all epoxy coated soil nails with care and shall avoid damaging in accordance with ASTM D3963. All damages shall be patched using a two-part epoxy repair material, approved by the coating Manufacturer.
  - Design Test Load : 20 Kips

**ENCAPSULATED PRODUCTION SOIL NAIL DETAIL**  
 Scale: 1 1/2" = 1'-0"  
 1  
 S2.7 S2.7



**CONNECTION PLATE WITH STUD DETAIL**  
 Scale: 3" = 1'-0"  
 2  
 S2.7 S2.7

**SECTION A**  
 Scale: 3" = 1'-0"  
 S2.7 S2.7

**NOTE:**  
 All plates, nuts, washers, and shear connectors shall be hot dip galvanized after fabrication.



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STATE OF HAWAII  
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HIGHWAYS DIVISION  
**SOIL NAIL AND CONNECTION PLATE DETAIL**  
**KULA HIGHWAY, INTERSECTION IMPROVEMENTS AT OMAOPTO ROAD**  
**Project No. 37C-02-23**  
Scale: As Noted Date: Apr. 2024  
SHEET No. S2.7 OF 7 SHEETS

95

TRAFFIC SIGNAL AND LIGHT POLE FOUNDATION GENERAL NOTES:

DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	37C-02-23	2024	96	115

1. Design Specifications:

A. American Association of State Highway and Transportation Officials (AASHTO) 2020 LRFD Bridge Design Specifications, 9th Edition, as amended by Hawaii Department of Transportation (HDOT) document dated August 8, 2014 with subject title "Design Criteria for Bridges and Structures" and HDOT memorandum dated January 8, 2018 with subject title "Changes to Design Criteria for Bridges and Structures".

B. Design shall conform with the AASHTO LRFD Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, First Edition 2015 with 2020 Interim Revisions.

C. See Structural General Notes on Sheet S0.2 to S0.4 for additional information.
2. Loads:

A. Basic Wind Speed: 145 mph.

B. Recurrence Interval of 1700 years.

C. Fatigue importance factor,  $I_f$ , shall be based on Fatigue Category I for cantilevered traffic signal structures.

D. Vortex shedding induced loads shall be considered for cantilevered mast arms and pole shafts that do not have tapers or have tapers of less than 0.14 in/ft.

E. Traffic signal and light pole structures shall be designed for a truck induced gust based on a truck speed of 20 mph over the posted speed.

F. Galloping and natural wind gusts shall be considered for cantilevered traffic signal and light pole structures.

G. Natural Wind Gusts shall be considered for all traffic signal structures.
3. Materials:

A. Concrete for traffic signal and light pole foundation shall develop a minimum 28-day compressive strength of 4,500 psi with a maximum w/c ratio of 0.45.

B. All concrete shall contain a water-based amine carboxylate migrating corrosion inhibitor or approved equal. Dosage shall be 24 ounces per cubic yard of concrete or recommended by the manufacturer.

C. All reinforcing steel shall be ASTM A615 Grade 60 deformed bars unless otherwise noted.

D. All connection bolts shall be AASHTO M164 bolts and anchor bolts shall be AASHTO M314-105 bolt.

E. Aluminum members and surfaces in contact with structural steel shall be isolated with neoprene material as approved by the Engineer.
4. General:

A. The recommendations of the traffic pole manufacturer shall be followed. Manufacturer shall select pole, anchor bolts, etc. based on criteria given in the contract documents. The Contractor shall submit catalog cuts and calculations to the Engineer for approval.

B. The Contractor shall use templates while installing the anchor bolts. Anchor bolts shall be vertical.

C. The Contractor shall adjust the spiral vertical spacing to allow installation of anchor bolts and plates.

D. For all traffic signals, wire cloth shall be galvanized steel standard grade plain weave 2x2 mesh 0.063 inch diameter wires. Wrap around base plate perimeter with 3" minimum lap. Fasten with 1/4" diameter capscrew ASTM F593 with SS washer spaced at approximately 9" o.c., drilled and tapped into perimeter of base plate.

E. Drilled shaft diameters were determined based on assumed pole designs with parameters such as the bolt circles and base plate diameters. The Contractor is responsible for verifying that the drilled shaft designs, as shown on this sheet, are compatible with the manufacturer's provided pole designs. If it is found incompatible, alternate pole designs are recommended. Otherwise, the contractor is responsible for alternate drilled shaft designs, and is required to submit alternate drilled shaft designs to the Engineer for approval. The shafts shall not be installed until the pole and shaft designs have been finalized and verified for their compatibility.

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	TRACED BY _____	
	CHECKED BY _____	
NOTE BOOK	QUANTITIES BY _____	
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HIGHWAYS DIVISION

TRAFFIC SIGNAL AND LIGHT POLE  
FOUNDATION NOTES

KULA HIGHWAY,  
INTERSECTION IMPROVEMENTS  
AT OMAOPTO ROAD  
Project No. 37C-02-23

Scale: As Noted Date: Apr. 2024

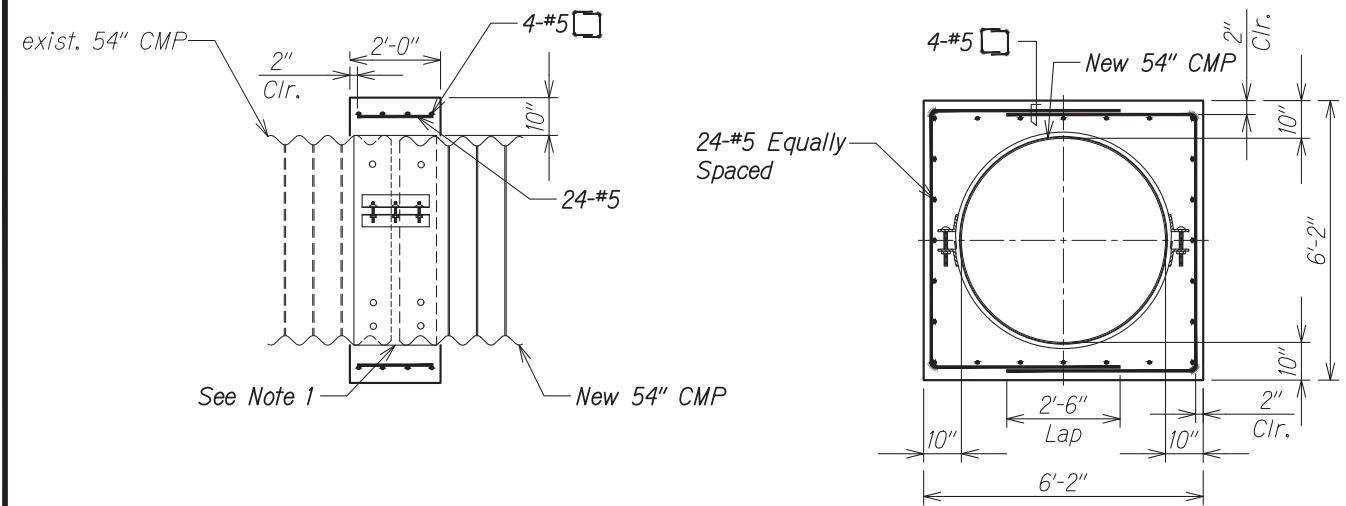
SHEET No. S31 OF 3 SHEETS







DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	37C-02-23	2024	99	115



NOTES:

- Joint shall be externally banded and meet AASHTO R82 6.2.3 and AASHTO LRFD Bridge Construction Specifications, Section 26 for Erodible Soils.
- See Civil Drawings for additional information.

CMP JOINT DETAIL 1  
Scale: 1/2" = 1'-0" S4.1 S4.1

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	CHECKED BY	
No.		

RUSS S. MIYAHARA

LICENSED PROFESSIONAL ENGINEER

NO. 9444-S

HAWAII, U.S.A.

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CMP JOINT DETAIL

KULA HIGHWAY,  
INTERSECTION IMPROVEMENTS  
AT OMAOPTO ROAD  
Project No. 37C-02-23

Scale: As Noted

Date: Apr. 2024

SHEET No. S4.1

OF 1

SHEETS