

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER-24(003)	2023	85	100

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

DRAWING NAME: Z:\00 ONGOING\21-010.1-HAWALEI HILLS #2 (80-20 SPLIT)\01 CAD\09-01-22 OBLIGATION\HH2-S0001 INDEX.DWG PLOT TIME: 08-31-22, 12:00 PM)



SIGNATURE _____ EXPIRATION DATE OF THE LICENSE _____

SHEET No. *S0.1* OF *3* SHEETS

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER-24(003)	2023	86	100

STRUCTURAL GENERAL NOTES:

1. General Specifications:

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

2. Design Specifications:

- A. American Association of State Highway and Transportation Officials (AASHTO) 2020 "LRFD 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".

3. Design Loads:

- A. Dead Load: A weight of 25 psf for future wearing surface from curb to curb has been provided for in the design.
- B. Live Load: AASHTO HL-93 Vehicular Live Loading

4. Concrete:

- A. All concrete strengths 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)	Drain Inlets	5,000 psi	0.45	670	C
(2)	Support Block	4,000 psi	0.49	620	C
(3)	Box Culvert	5,000 psi	0.45	670	C
(4)	Except as noted otherwise, all others	4,000 psi	0.49	620	C

- B. The use of 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. If formwork is removed/stripped exposing concrete within 7 days of placement then concrete shall be cured.
- E. 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.
- F. All concrete shall include at least one of the three methods stated in Section 601 of the Special Provisions, or approved equal, to reduce the embodied carbon footprint in concrete.

5. Materials:

- A. Non-shrink grout shall be a pre-mixed product consisting of non-staining, non-metallic aggregate cement, water reducing and plasticizing agents capable of developing a minimum compressive strength of 4,000 psi in 3 days and 7,000 psi in 28 days. The non-shrink grout shall contain at least 10 grams of migrating amine carboxylate corrosion inhibiting admixture per 0.4 to 0.5 cubic feet of non-shrink grout.
- B. Stainless steel inserts cast into concrete, post-installed threaded rods, and fasteners shall conform to ASTM A269 or ASTM A276 Type 316 L/UNS designation S31603.
- C. Stainless steel anchor bolts shall conform to ASTM F1554 Grade 55.
- D. Stainless steel nuts shall conform to ASTM F594 Type 316 L/UNS designation S31603.
- E. Stainless steel plates and shapes shall conform to ASTM A276 or A666 Type 316 LN/UNS designation S31653.

6. Reinforcement:

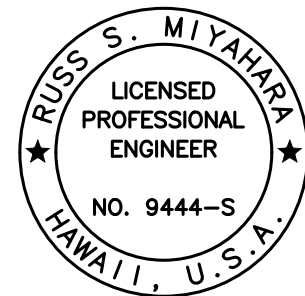
- A. All reinforcing steel shall be ASTM A 615, Grade 60 unless otherwise noted.
- B. Reinforcing steel shall be ASTM A 706, Type W, Grade 60 where welded connections are required.
- C. Epoxy-coated reinforcing steel shall be ASTM A775 where noted on the plans.
- D. Reinforcing bars shall be placed and installed in accordance with the CRSI Manual of Standard Practice and CRSI Placing Reinforcing Bars, unless otherwise noted.
- E. 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) Concrete cast against and permanently exposed to earth = 3"
- (2) All others unless otherwise noted = 2"
- F. 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.
- G. 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.

6. Reinforcement (Cont.):

- H. All dimensions relating to reinforcing bars are to centers of bars unless otherwise noted.
- I. 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".
- J. Reinforcing bars shall be securely tied at all intersections and lap splices except where the spacing of intersections is less than 1-foot in each direction, in which case alternate intersections shall be tied.
- K. Dissimilar metals in contact shall be avoided where possible. If unavoidable, wrap contact surface with several layers of a dielectric tape such as Teflon or polypropylene. Any type of reinforcing steel or prestressing strand in contact with stainless steel shall be considered a dissimilar metal contact.

7. General Construction Notes:

- A. The Contractor shall verify all site conditions and not rely upon these plans for existing elevations and azimuths, stream channel location, roads, roadway gutters, curbs and sidewalks, etc. Conditions may differ from those shown.
- B. 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.
- 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. Except as otherwise noted, all vertical dimensions are measured plumb.
- E. Unless otherwise noted, all exposed concrete edges shall be chamfered 3/4"x3/4".



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

Signature: Russ S. Miyahara
Date: 4-30-24
Signature Line: _____
Expiration Date of the License: _____

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STRUCTURAL GENERAL NOTES

KUHIO HIGHWAY
Emergency Slope Stabilization
for Hanalei Hills and Waikoko
F.A.P. Project No. ER-24(003)

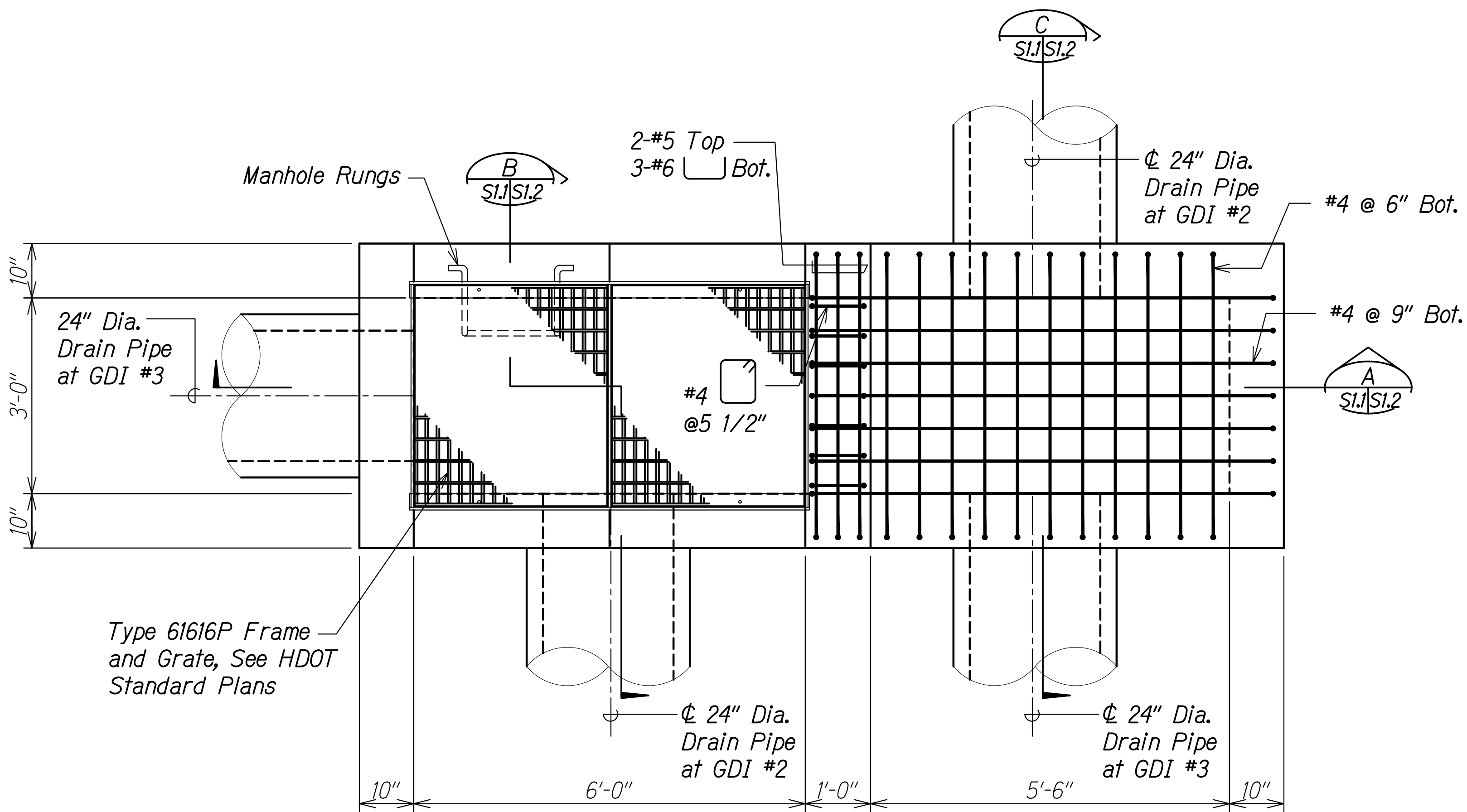
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SHEET No. S02 OF 3 SHEETS

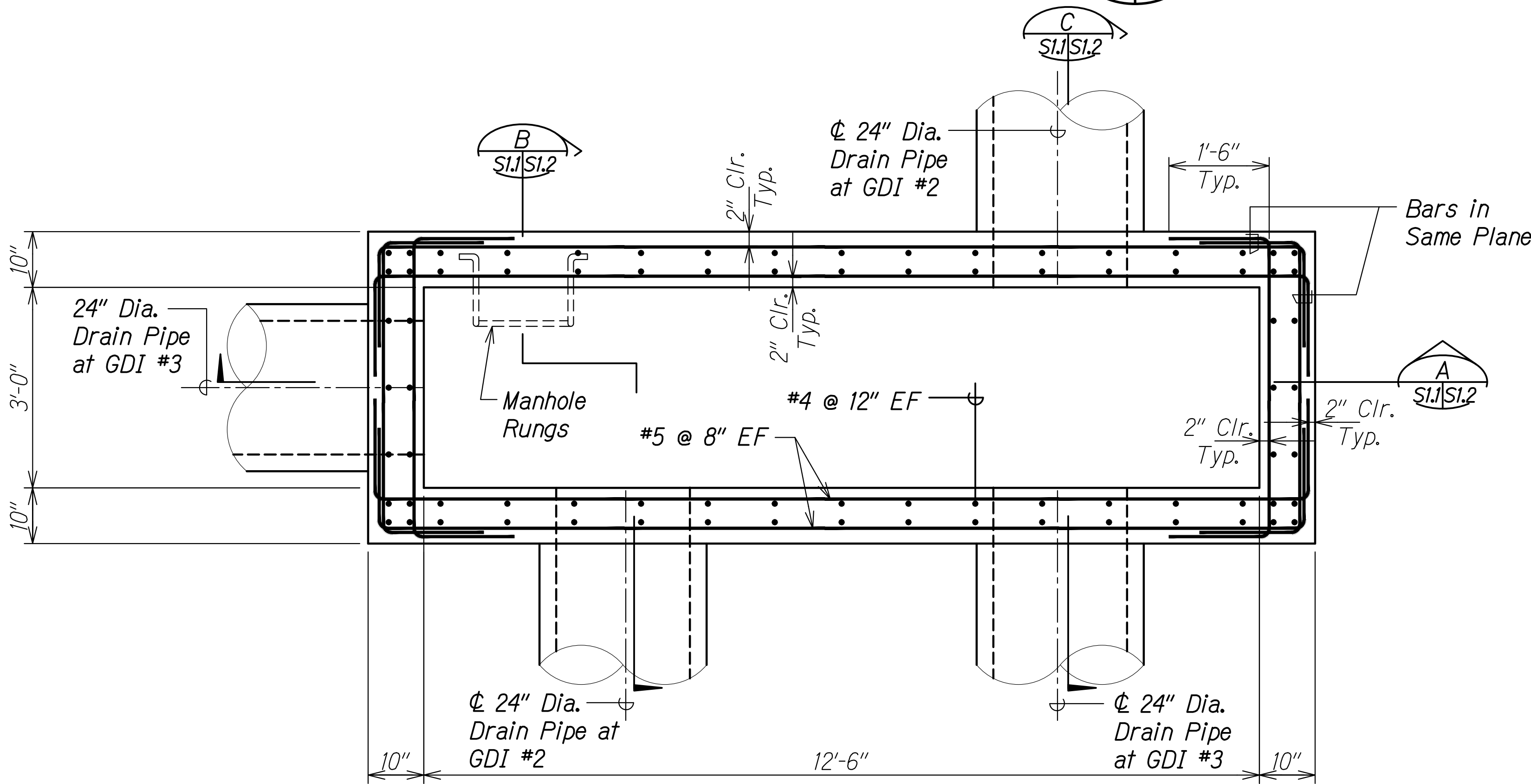
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	DRAWN BY	
	DESIGNED BY	
	NOTED BY	
NOTE BOOK	QUANTITIES BY	
	CHECKED BY	
No.		

DRAWING NAME: Z:\00 ONGOING\21-010.1-HANALEI HILLS #2 (B0-20 SPLTY).01 CAD\09-01-22 OBLIGATION\HH2-S0002 GENNOTES.DWG PLOT TIME: 08-31-22, 12:00 PM

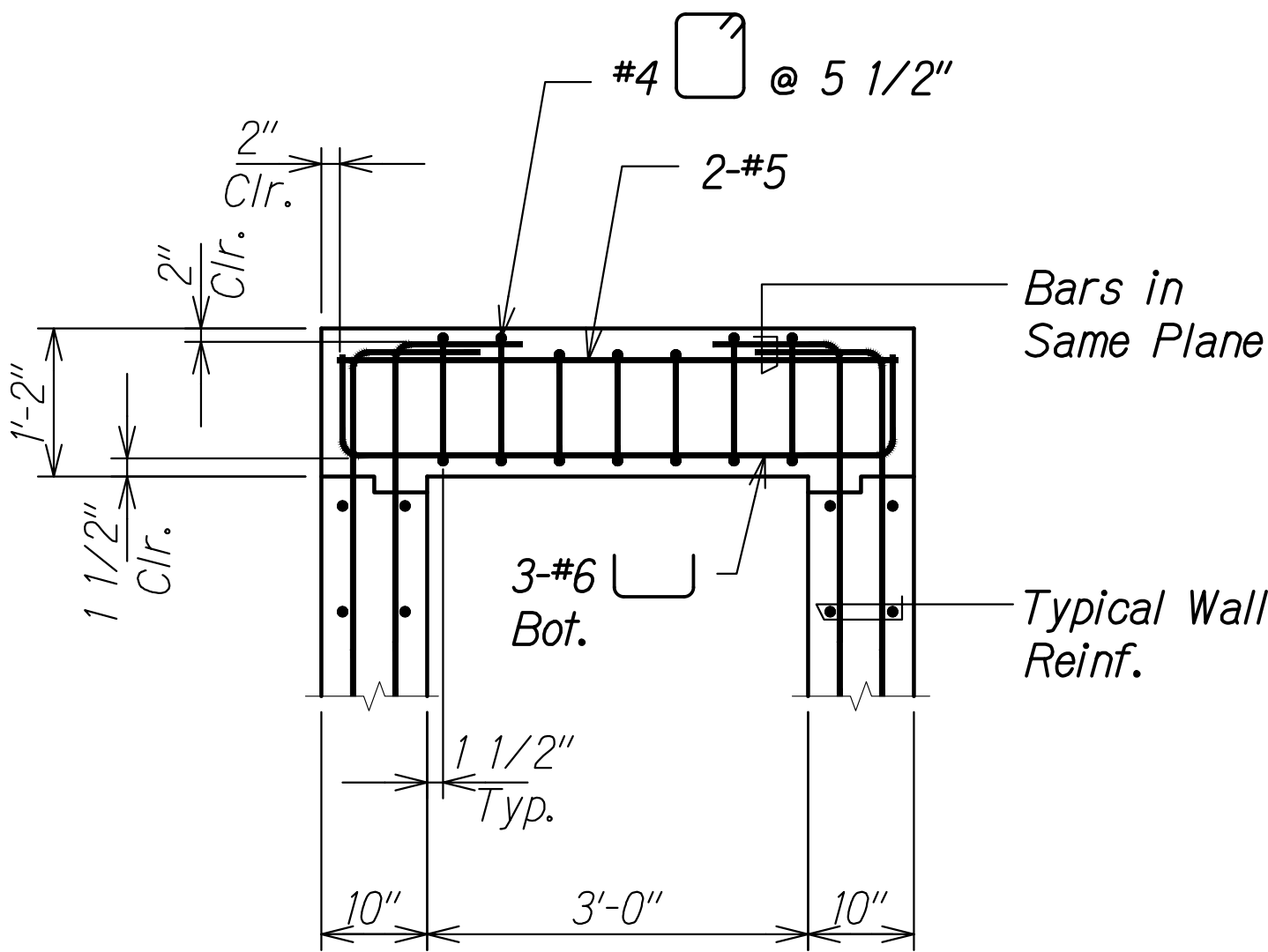
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER-24(003)	2023	88	100



PLAN - TOP SLAB REINF.
Scale: 3/4" = 1'-0"



PLAN - WALL REINF.
Scale: 3/4" = 1'-0"



SECTION
BEAM REINF.
Scale: 3/4" = 1'-0"

RUSS S. MIYAHARA
LICENSED PROFESSIONAL ENGINEER
NO. 9444-S
HAWAII, U.S.A.
THIS WORK WAS PREPARED BY
ME OR UNDER MY SUPERVISION.
SIGNATURE
EXPIRATION DATE OF THE LICENSE
4-30-24

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

SPECIAL GDI MODIFIED 61616P
PLANS AND SECTION
KUHIO HIGHWAY
Emergency Slope Stabilization
for Hanalei Hills and Waikoko
F.A.P. Project No. ER-24(003)

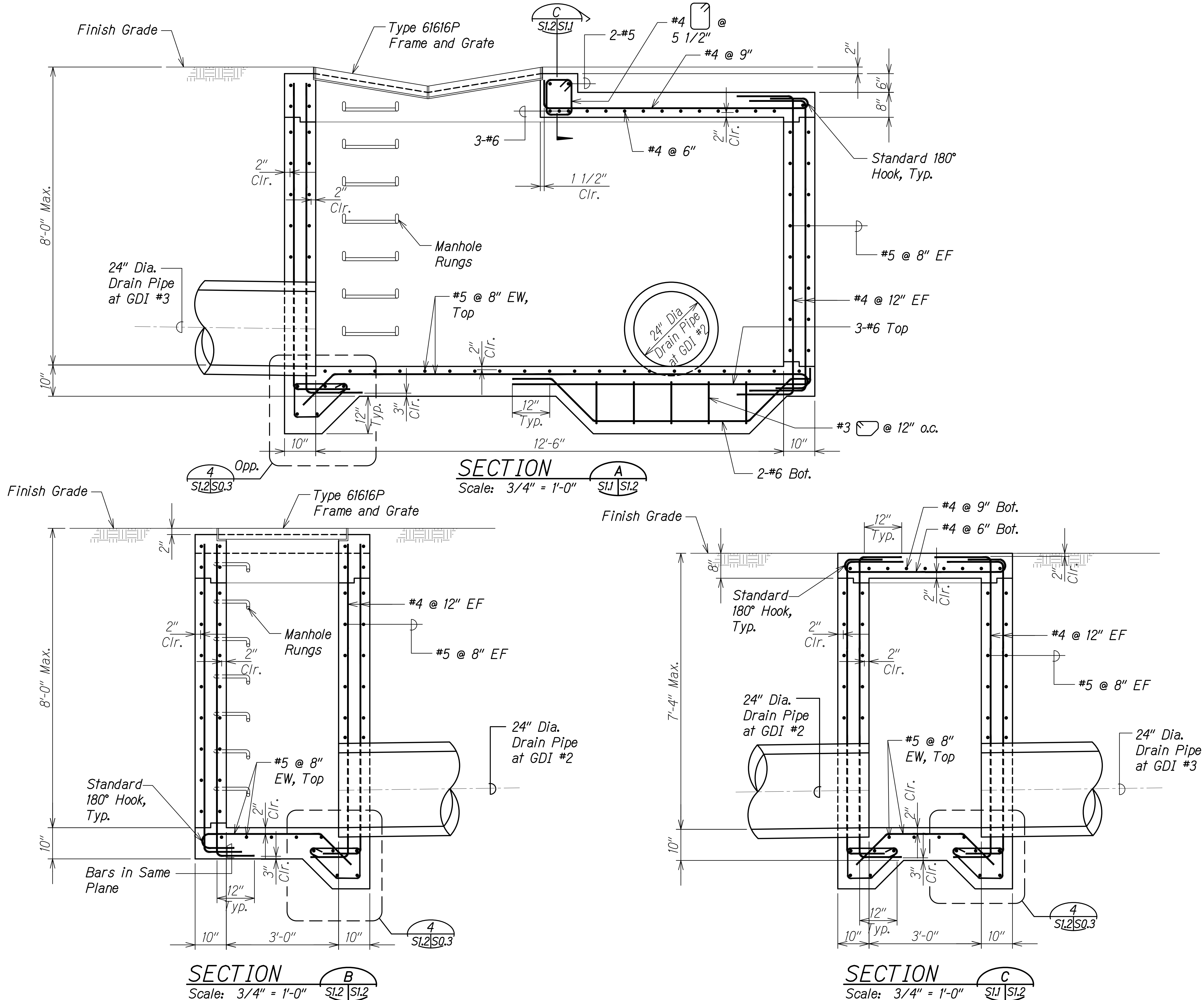
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Date: Sept. 2022

SHEET No. *SIJ* OF 5 SHEETS

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

DRAWING NAME: Z:\00 ONGOING\21-010.1-HANALEI HILLS #2 (80-20 SPLIT)\01 CAD\09-01-22 OBLIGATION\HH2-S0101 DRAIN BOX.DWG PLOT TIME: 08-31-22, 12:00 PM

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER-24(003)	2023	89	100



ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
	DESIGNED BY	
	QUANTITIES BY	
	CHECKED BY	

DRAWING NAME: Z:\00 ONGOING\21-010.1-HANALEI HILLS #2 (80-20 SPL)\1.01 CAD\09-01-22 OBLIGATION\HH2-S0101 DRAIN BOX.DWG PLOT TIME: 08-31-22, 12:01 PM

RUSS S. MIYAHARA
LICENSED PROFESSIONAL ENGINEER
NO. 9444-S
HAWAII, U.S.A.
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
SIGNATURE: *Russ S. Miyahara*
EXPIRATION DATE OF THE LICENSE: 4-30-24

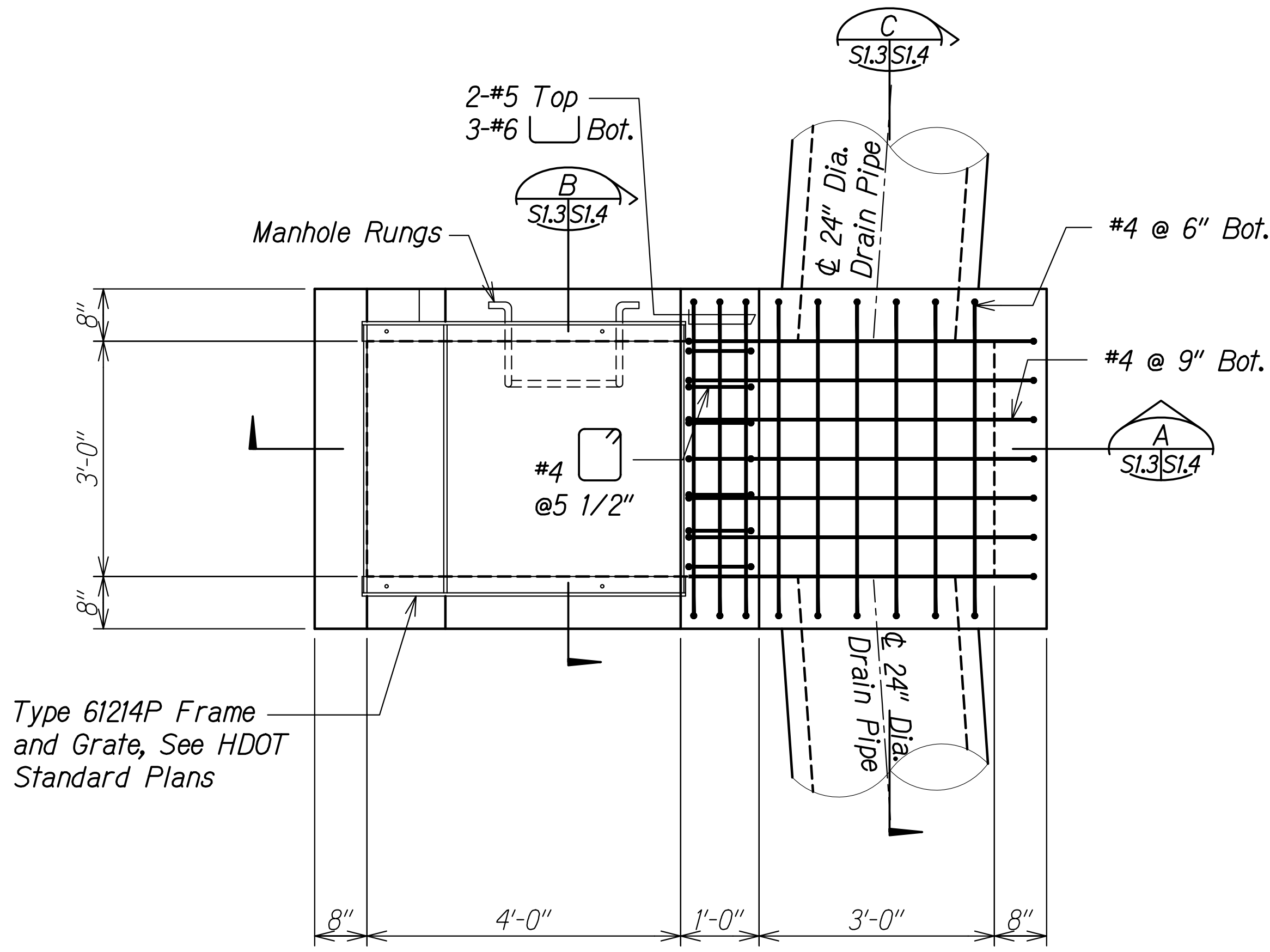
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

SPECIAL GDI MODIFIED 61616P
SECTIONS
KUHIO HIGHWAY
Emergency Slope Stabilization
for Hanalei Hills and Waikoko
F.A.P. Project No. ER-24(003)

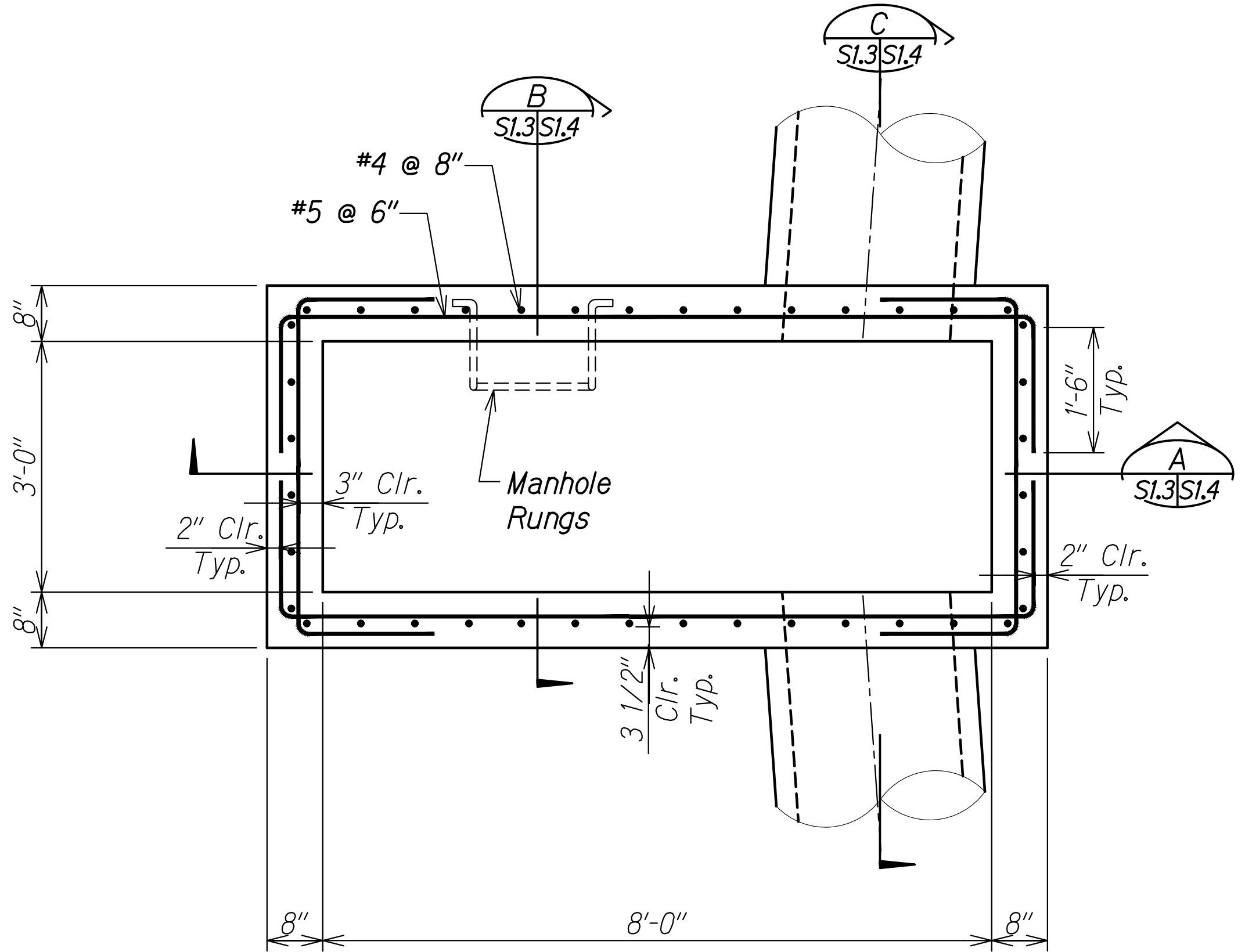
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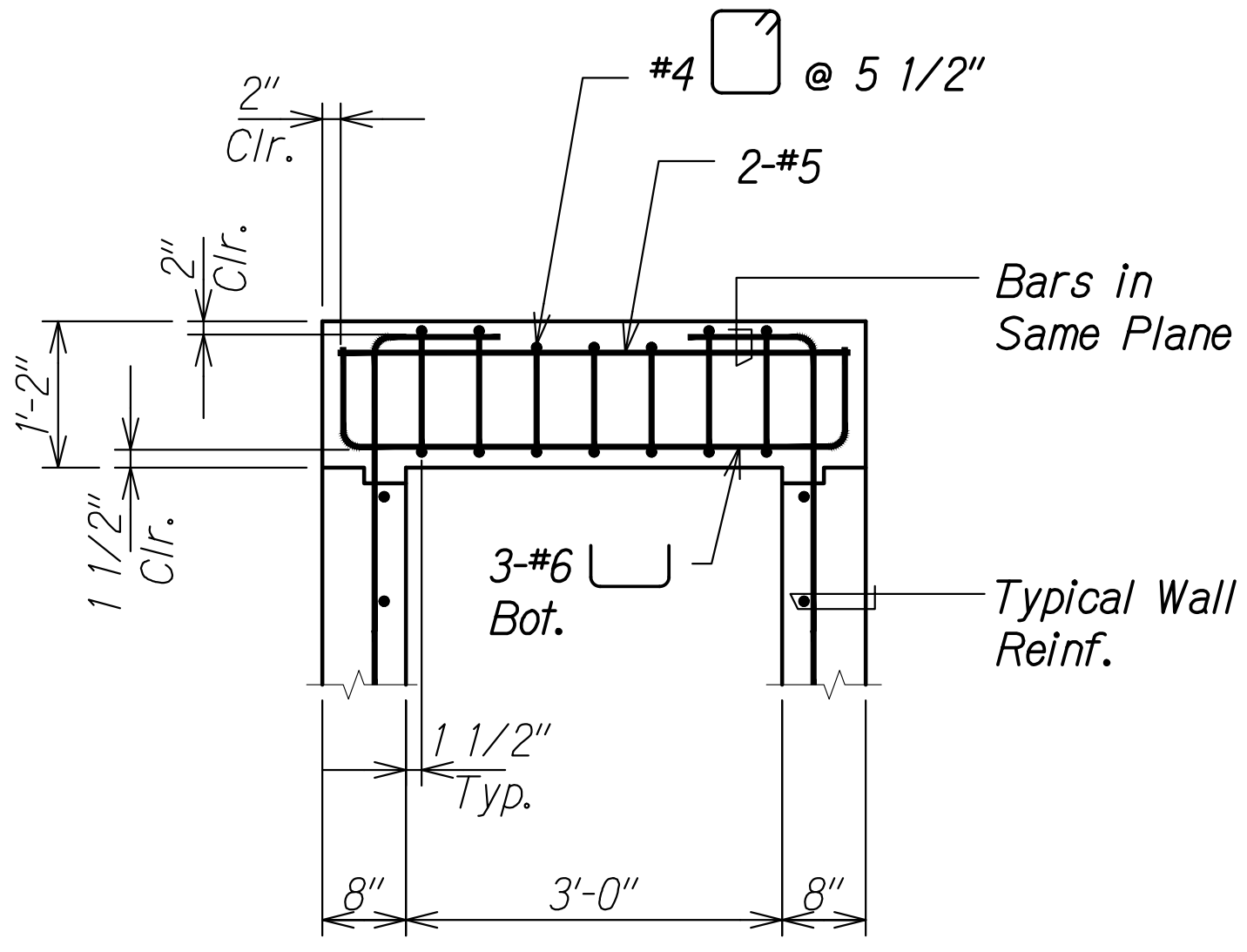
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER-24(003)	2023	90	100



PLAN - TOP SLAB REINF. A
SL.3 | SL.4
Scale: 3/4" = 1'-0"



PLAN - WALL REINF. B
SL.3 | SL.3
Scale: 3/4" = 1'-0"



SECTION BEAM REINF. C
SL.4 | SL.3
Scale: 3/4" = 1'-0"

RUSS S. MIYAHARA

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

THIS WORK WAS PREPARED BY
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SIGNATURE EXPIRATION DATE OF THE LICENSE: 4-30-24

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

SPECIAL GDI MODIFIED 61214P
PLANS AND SECTION

KUHIO HIGHWAY
Emergency Slope Stabilization
for Hanalei Hills and Waikoko
F.A.P. Project No. ER-24(003)

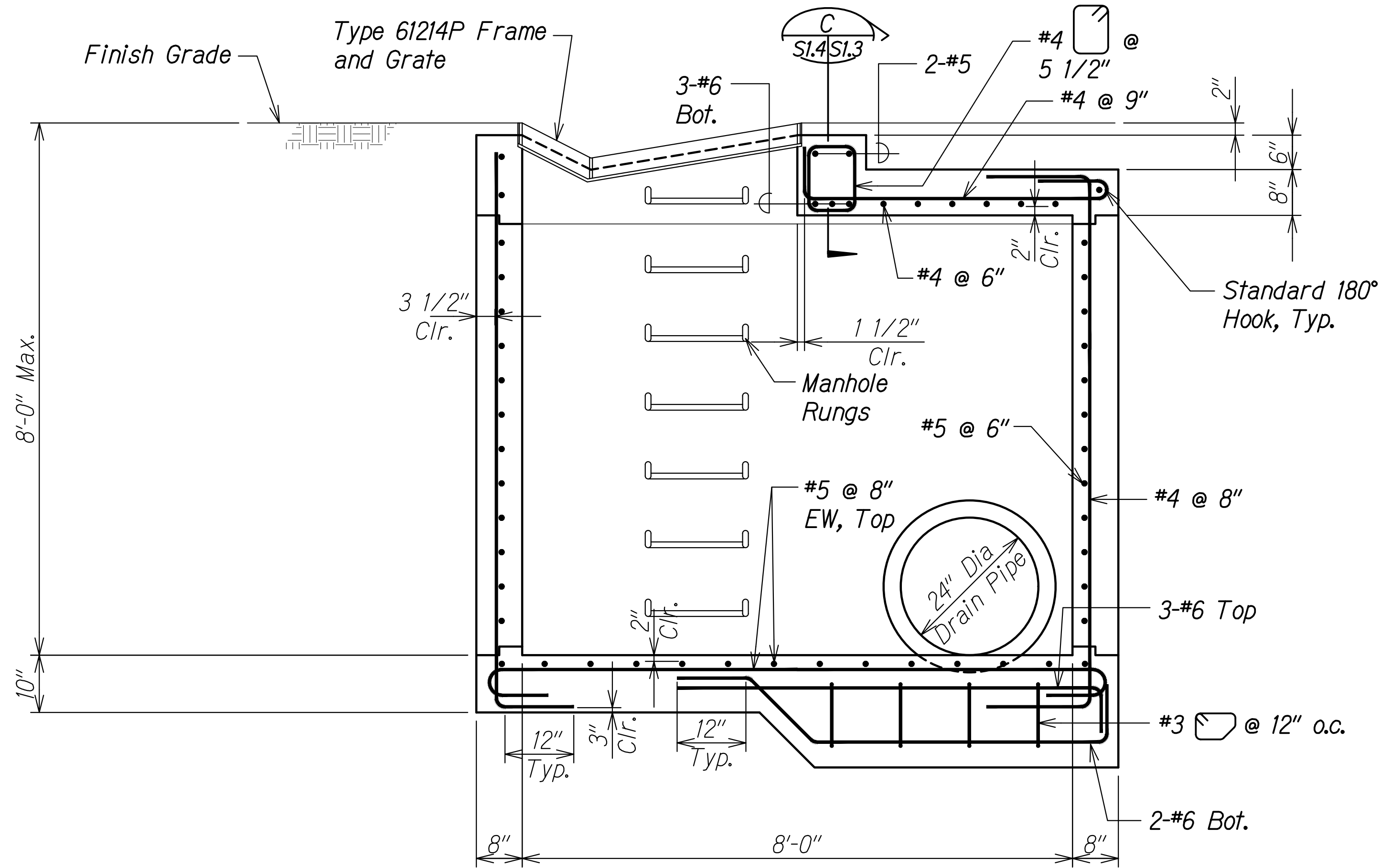
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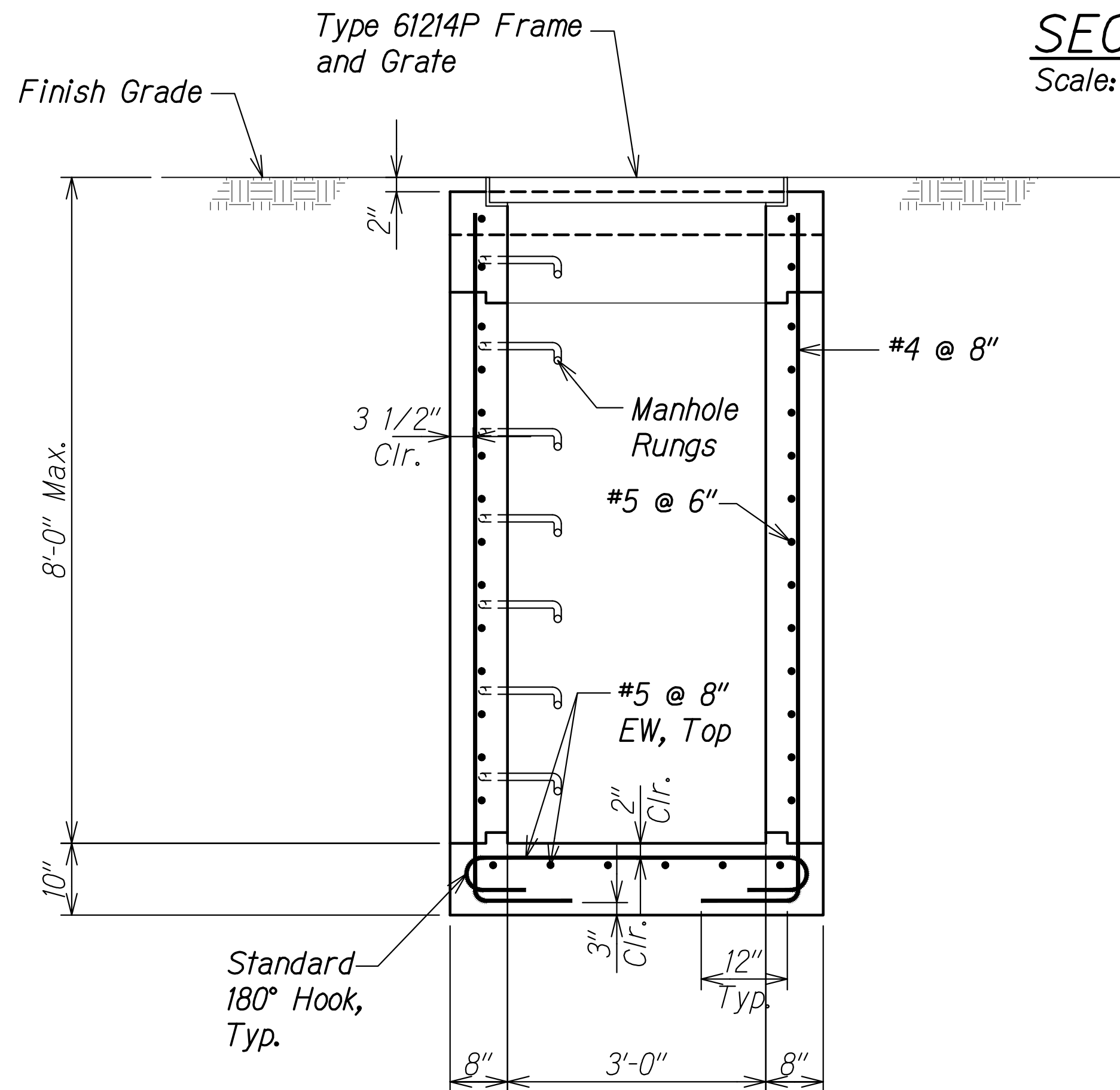
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NOTE BOOK	DRAWN BY	
No.	DESIGNED BY	
	QUANTITIES BY	
	CHECKED BY	

DRAWING NAME: Z:\00 ONGOING\21-010.1-HANALEI HILLS #2 (80-20 SPL)\01 CAD\10-04-22 RE\01\HH2-50103 DRAIN BOX2.DWG PLOT TIME: 10-04-22, 8:43 AM

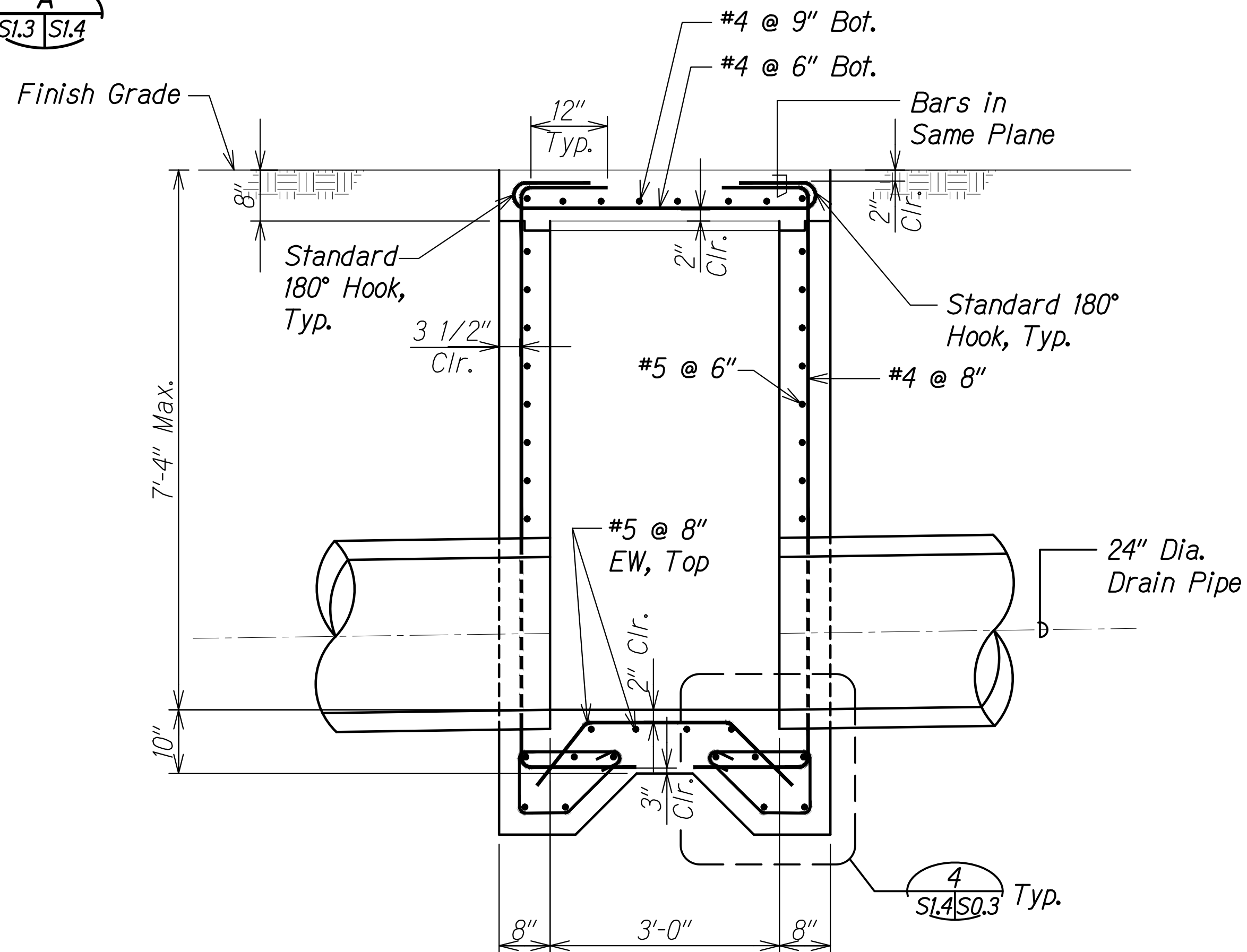
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER-24(003)	2023	91	100



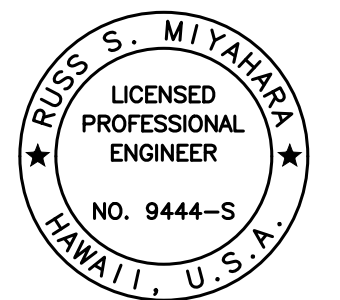
SECTION A
Scale: 3/4" = 1'-0" S1.3 S1.4



SECTION B
Scale: 3/4" = 1'-0" S1.3 S1.4



SECTION C
Scale: 3/4" = 1'-0" S1.3 S1.4



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Signature: Russ S. Miyahara
4-30-24

EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

SPECIAL GDI MODIFIED 61214P
SECTIONS
KUHIO HIGHWAY
Emergency Slope Stabilization
for Hanalei Hills and Waikoko
F.A.P. Project No. ER-24(003)

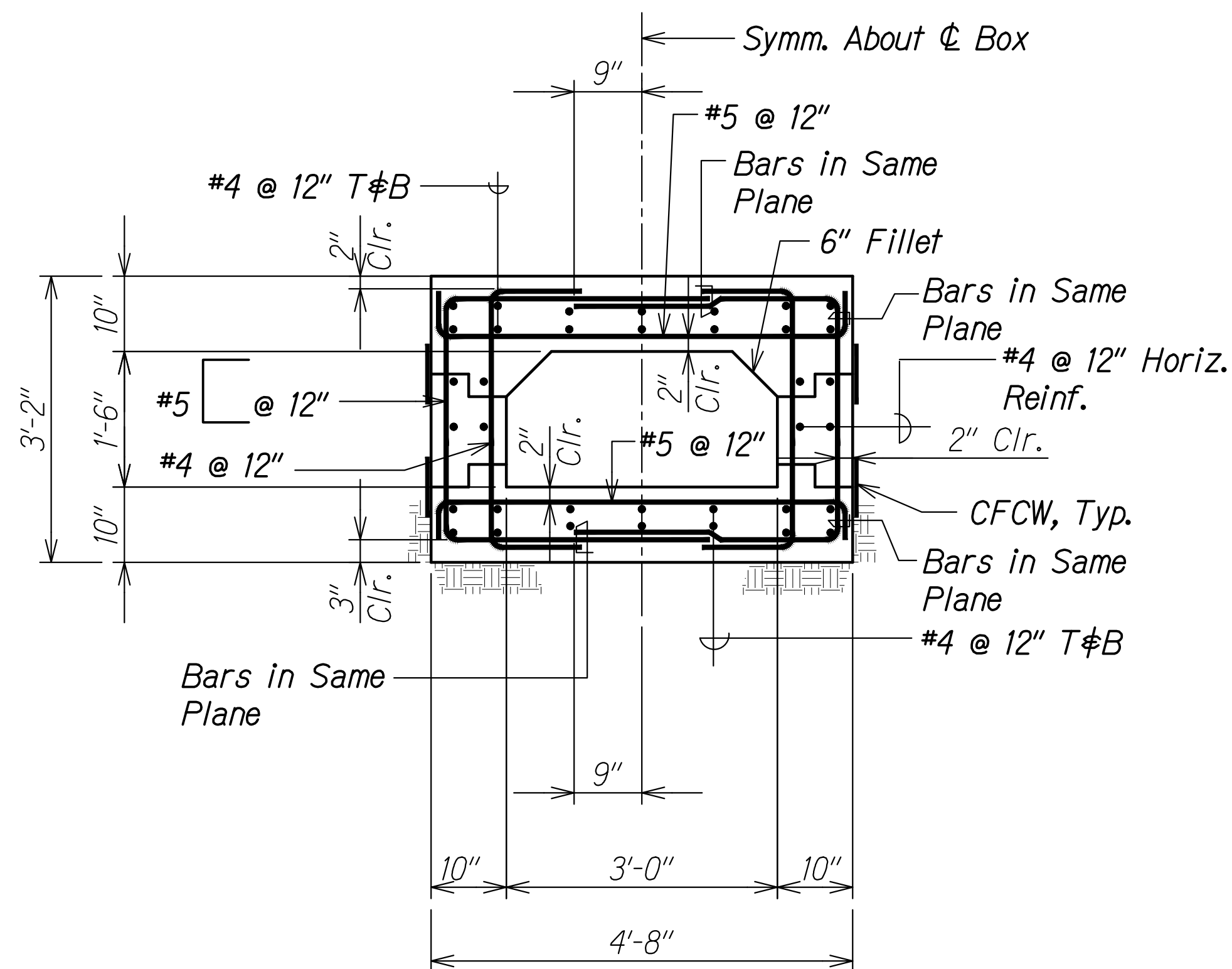
Scale: As Noted Date: Sept. 2022

SHEET No. S1.4 OF 5 SHEETS

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
	DESIGNED BY	
	QUANTITIES BY	
	CHECKED BY	

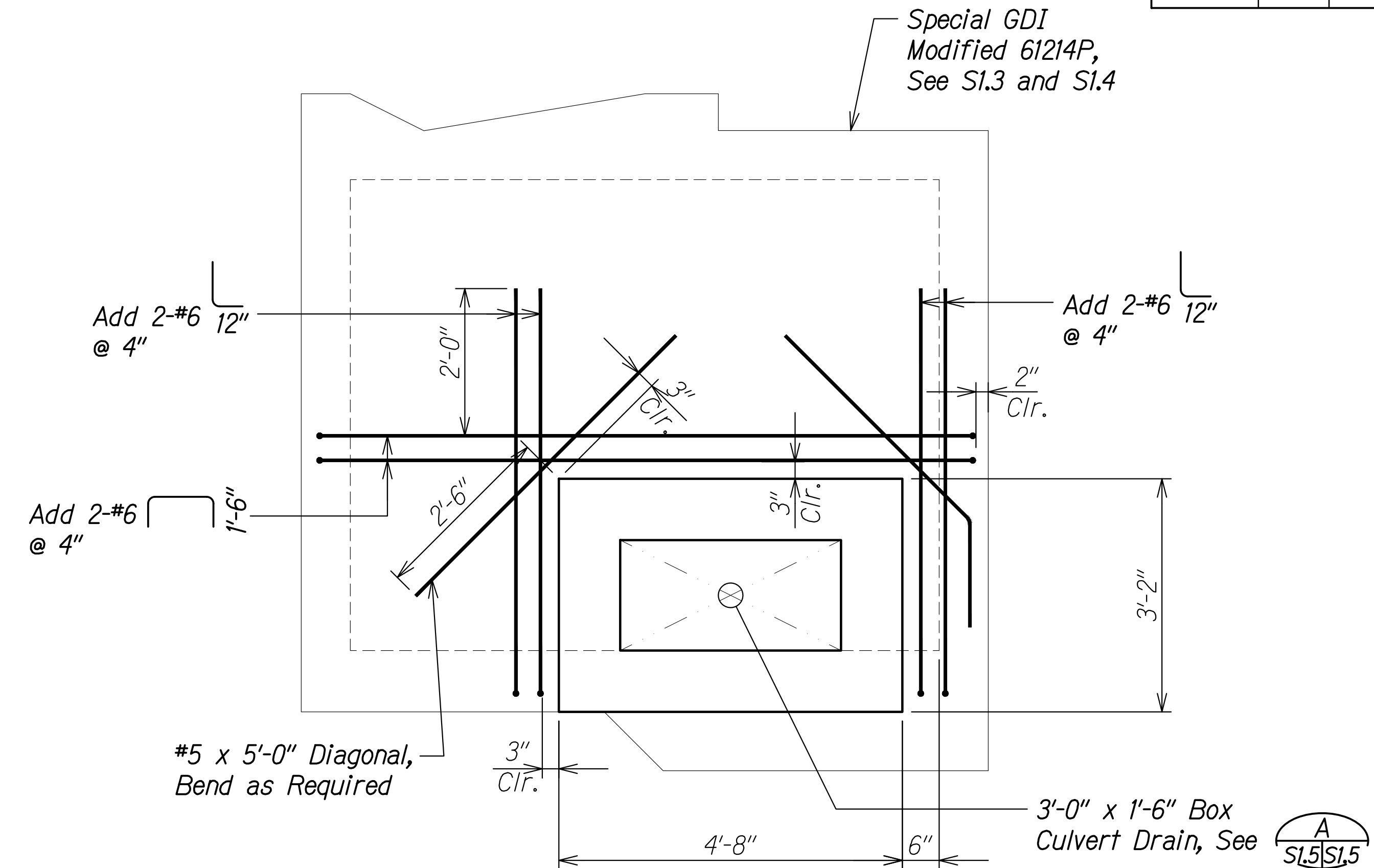
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FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER-24(003)	2023	92	100



3'-0" X 1'-6" BOX CULVERT DRAIN
TYPICAL CROSS SECTION
Scale: 3/4" = 1'-0"

A
S1.5 S1.5

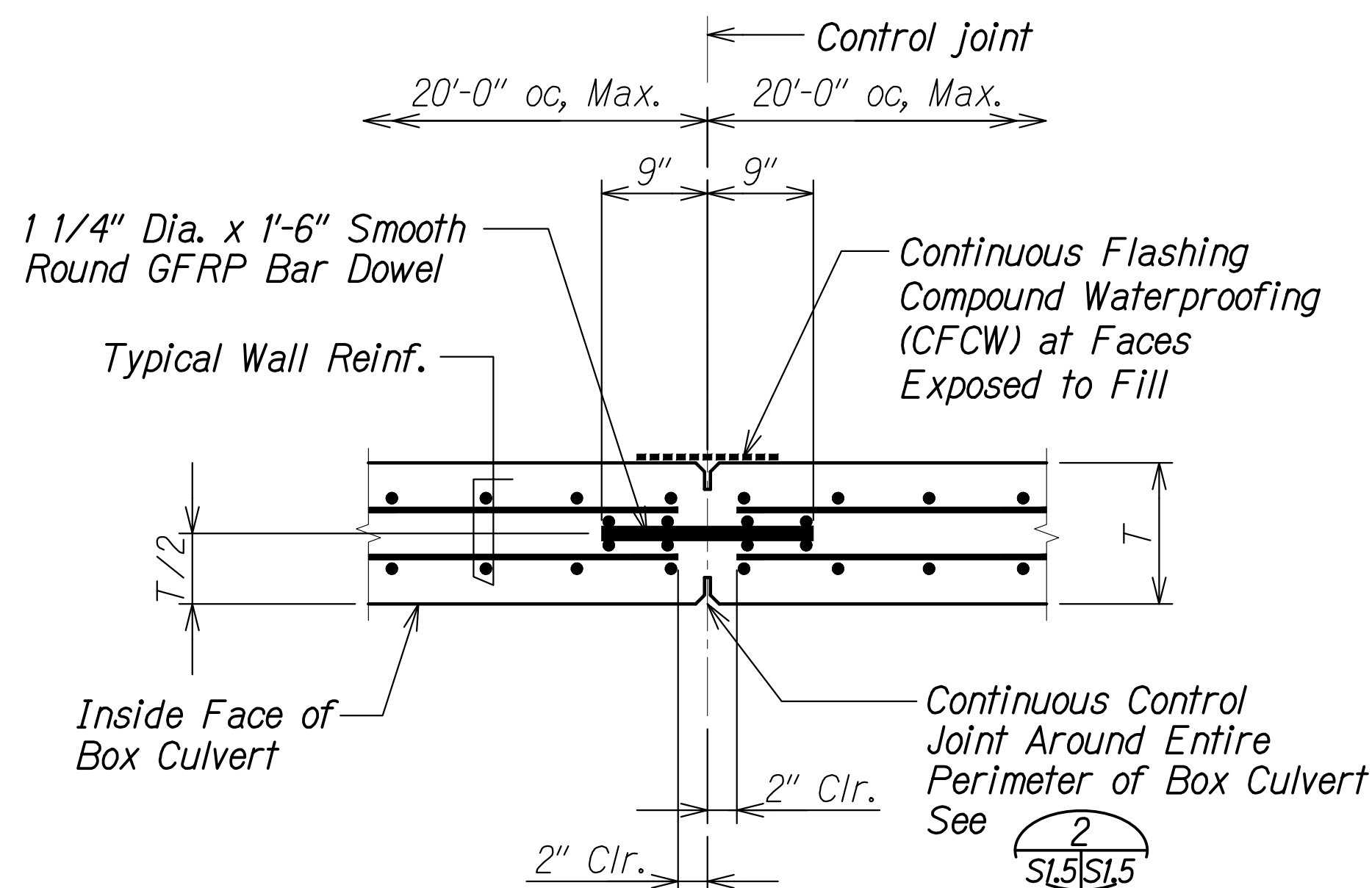


ADDED REINFORCING
FOR BOX CULVERT
Scale: 3/4" = 1'-0"

B
S1.5 S1.5

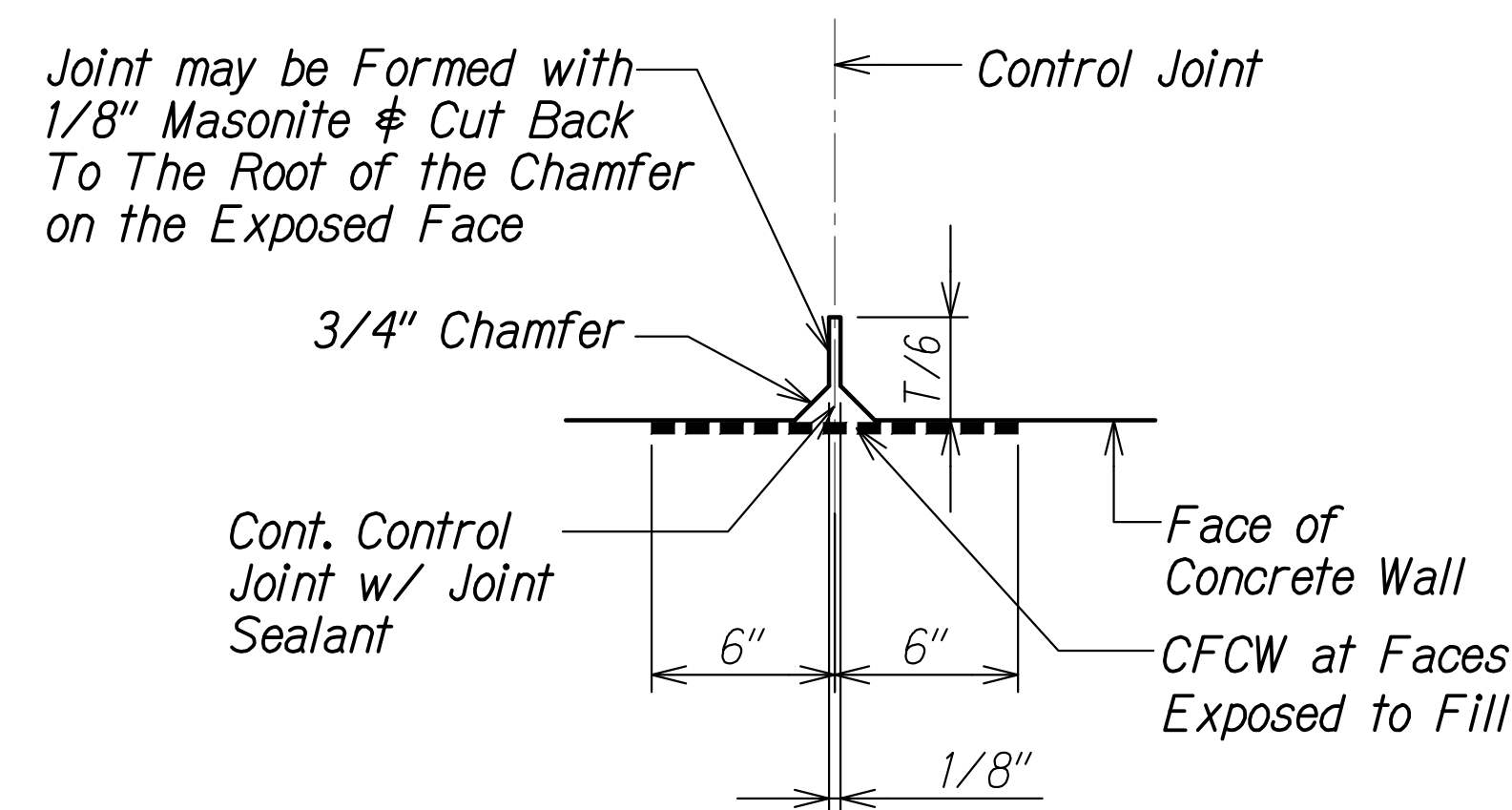
Notes:

- Cost for concrete and reinforcing for the box culvert shall be paid under Item No. 603.8000 - 3.0 ft. Wide x 1.5 ft. High Box Culvert.
- Cost for excavation and backfill of the box culvert shall be paid for under Section 206.



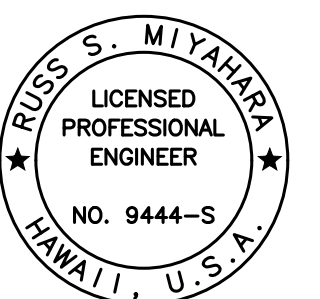
CONTROL JT. OR CONST. JT. DETAIL AT
CONTROL JT. LOCATION
Scale: 1" = 1'-0"

1
S1.5 S1.5



CONTROL JOINT DETAIL
Scale: 3" = 1'-0"

2
S1.5 S1.5

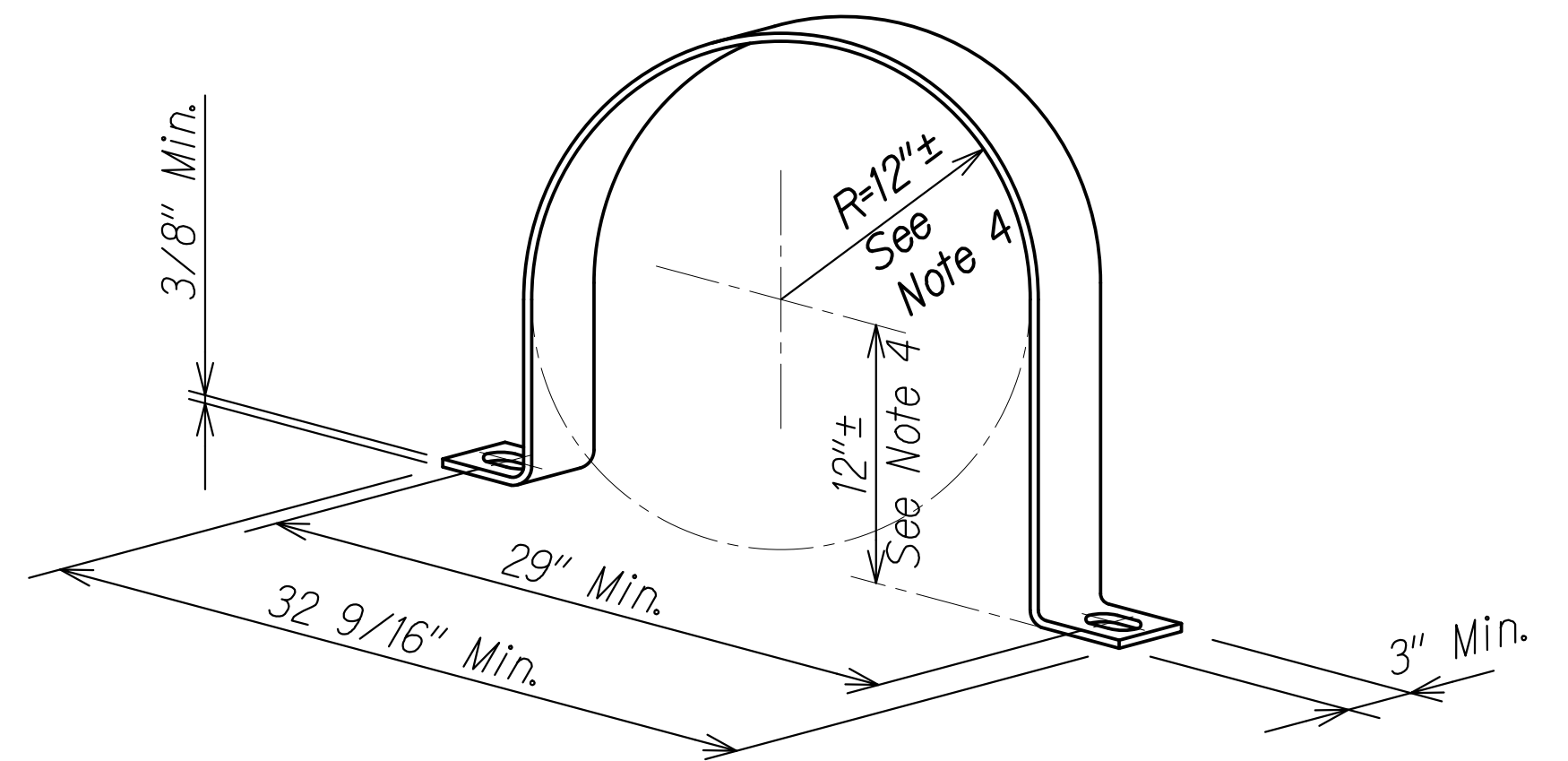
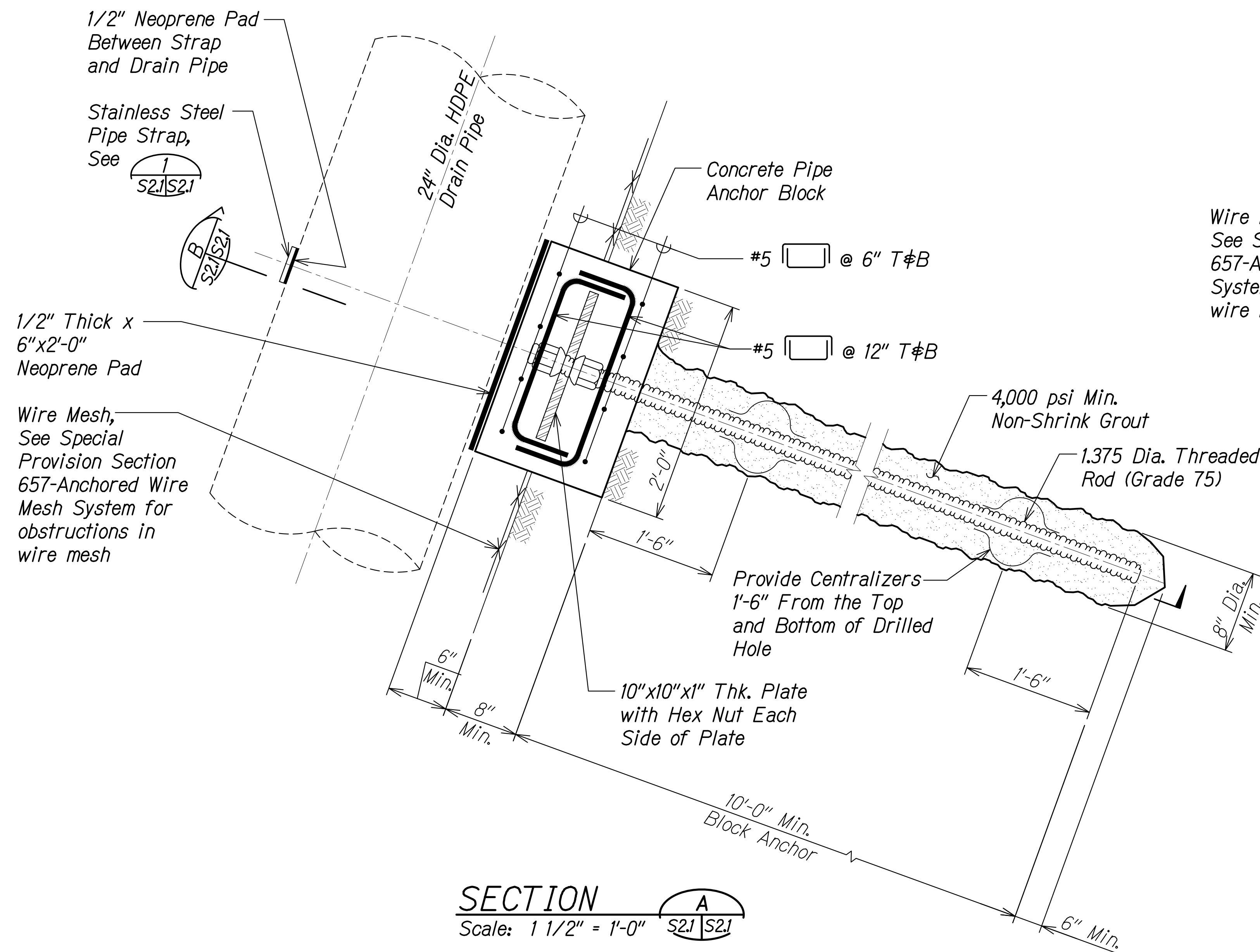


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Signature: Russ S. Miyahara
Date: 4-30-24
Signature: _____
Expiration Date of the License: _____

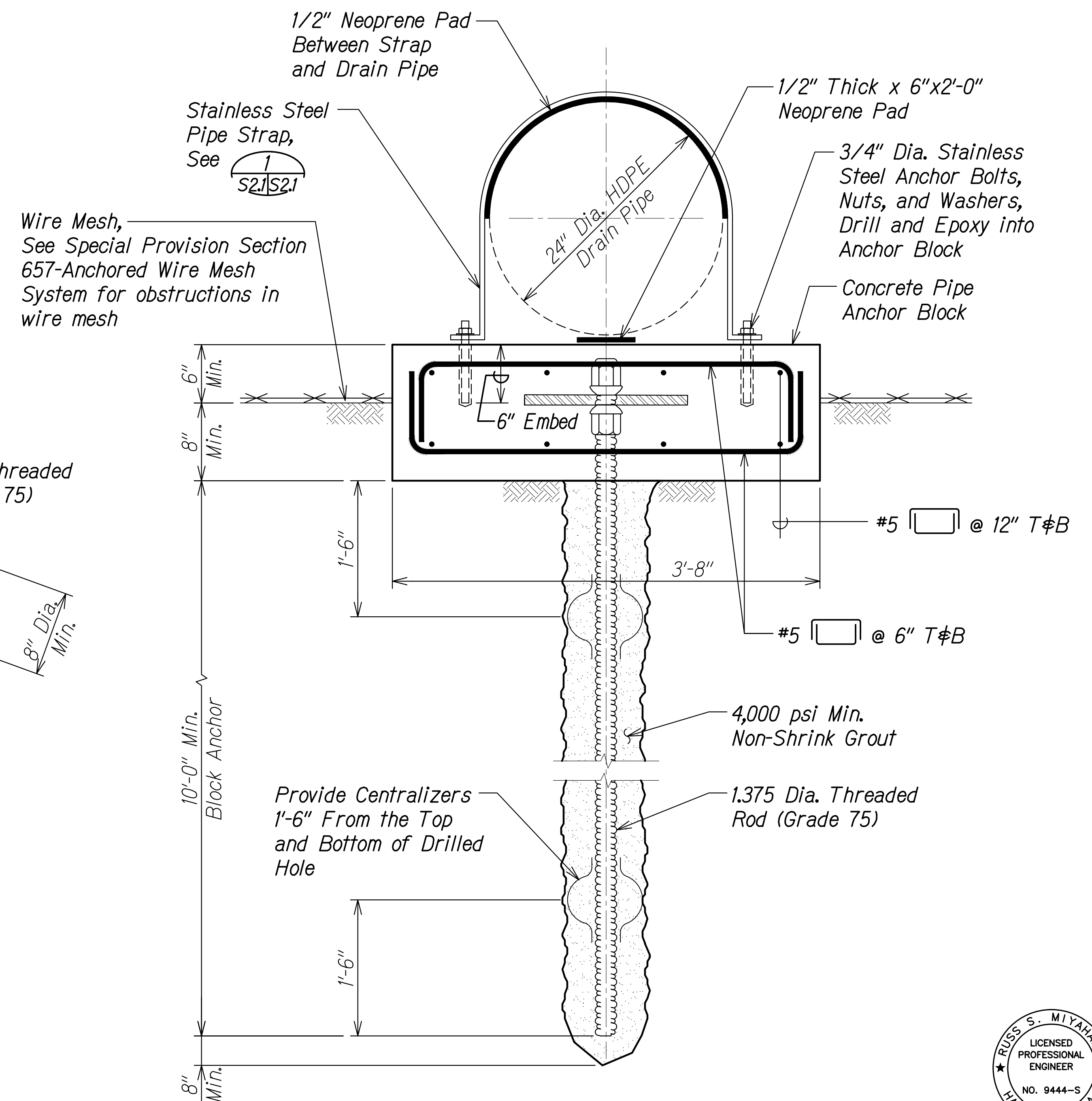
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
TYPICAL 3'-0" x 1'-6"
BOX CULVERT SECTION
KUHIO HIGHWAY
Emergency Slope Stabilization
for Hanalei Hills and Waikoko
F.A.P. Project No. ER-24(003)
Scale: As Noted Date: Sept. 2022
SHEET No. S1.5 OF 5 SHEETS

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER-24(003)	2023	93	100



STAINLESS STEEL PIPE STRAP DETAIL

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

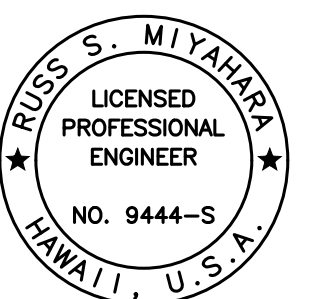


Notes:

- Contractor shall install pipe anchor block assembly at 12'-0" oc max, with a minimum of one anchor block assembly per drain pipe segment.
- Cost for anchor block assembly shall be incidental to the 24" diameter drain pipe.
- Pipe anchor block assembly consist of concrete anchor block, reinforcing, block anchor, pipe strap, and all material necessary to secure drain pipe to hillside
- Dimension shown relate to the inside diameter of the pipe. Contractor shall consider the pipe thickness and neoprene pad when fabricating strap.

SECTION B

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



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SIGNATURE: Russ S. Miyahara
EXPIRATION DATE OF THE LICENSE: 4-30-24

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

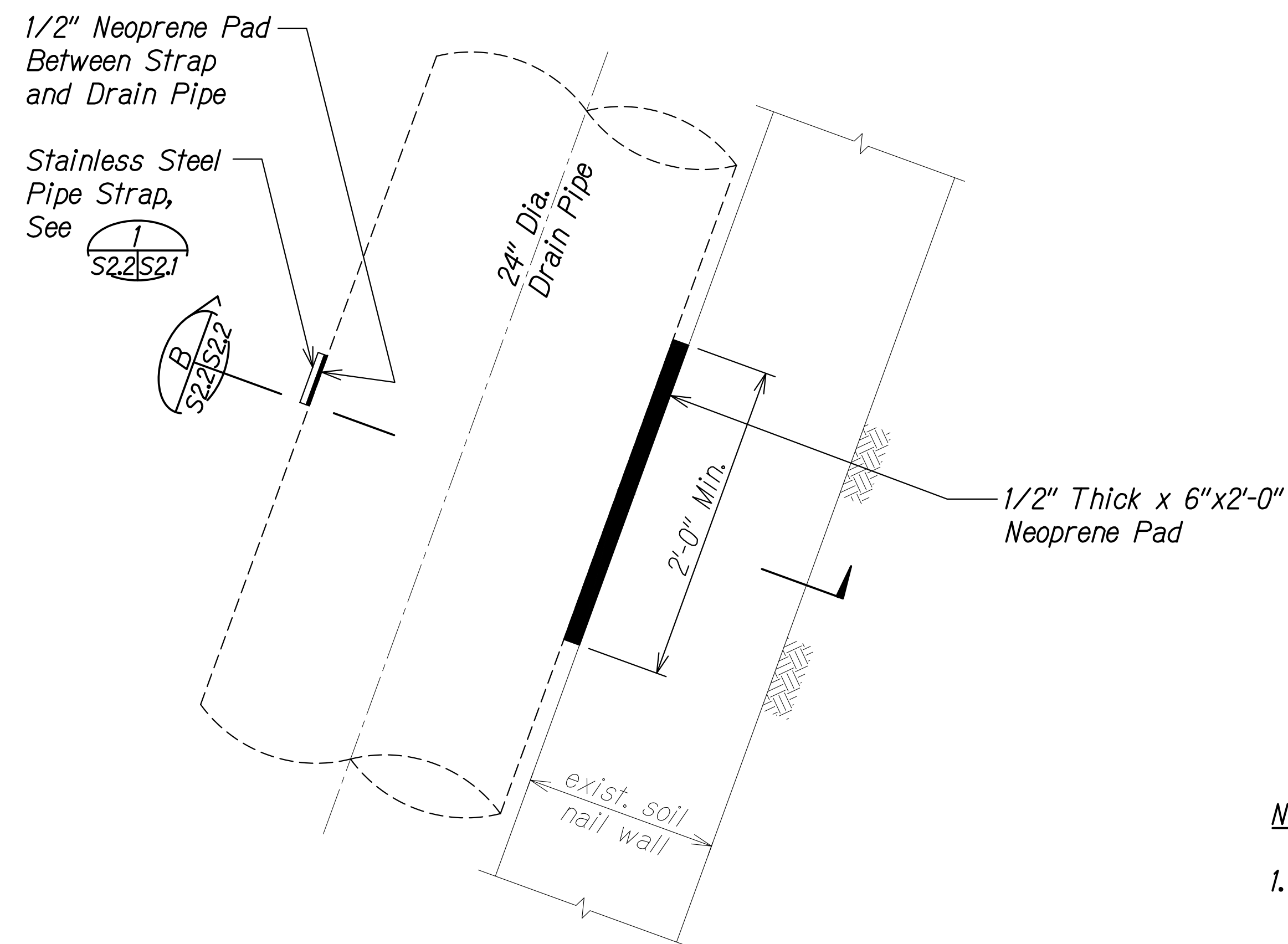
**CONC. PIPE ANCHOR BLOCK DETAILS
AT ANCHORED WIRE MESH**

**KUHIO HIGHWAY
Emergency Slope Stabilization
for Hanalei Hills and Waikoko
F.A.P. Project No. ER-24(003)**

Scale: As Noted Date: Sept. 2022

SHEET No. S2.1 OF 2 SHEETS

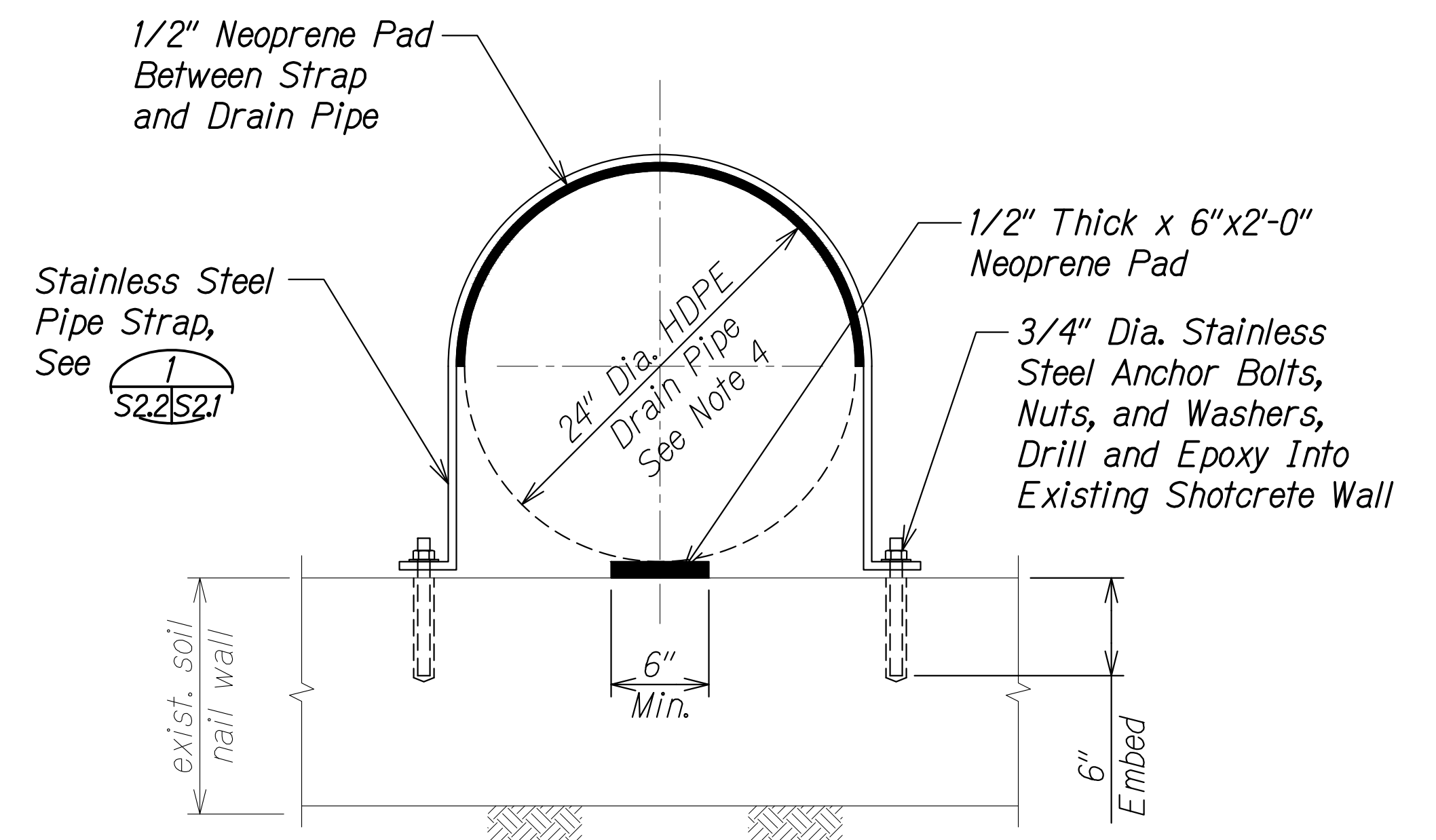
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER-24(003)	2023	94	100



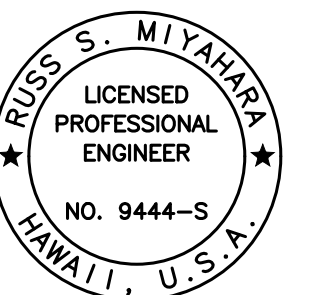
SECTION A
Scale: 1 1/2" = 1'-0" S2.2 | S2.2

Notes:

1. Contractor shall install pipe strap assembly at 12'-0" oc max, with a minimum of one pipe strap assembly per drain pipe segment.
2. Cost of pipe strap assembly shall be incidental to the 24" diameter drain pipe.
3. Pipe strap assembly consist of all material necessary to secure drain pipe to shotcrete.
4. Dimension shown is the inside diameter of the pipe. Contractor shall consider the pipe thickness and neoprene pad when fabricating strap.



SECTION B
Scale: 1 1/2" = 1'-0" S2.2 | S2.2



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ME OR UNDER MY SUPERVISION.

Russ S. Miyahara
SIGNATURE EXPIRATION DATE OF THE LICENSE 4-30-24

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**PIPE STRAP DETAILS
AT SOIL NAIL WALL**

**KUHIO HIGHWAY
Emergency Slope Stabilization
for Hanalei Hills and Waikoko
F.A.P. Project No. ER-24(003)**

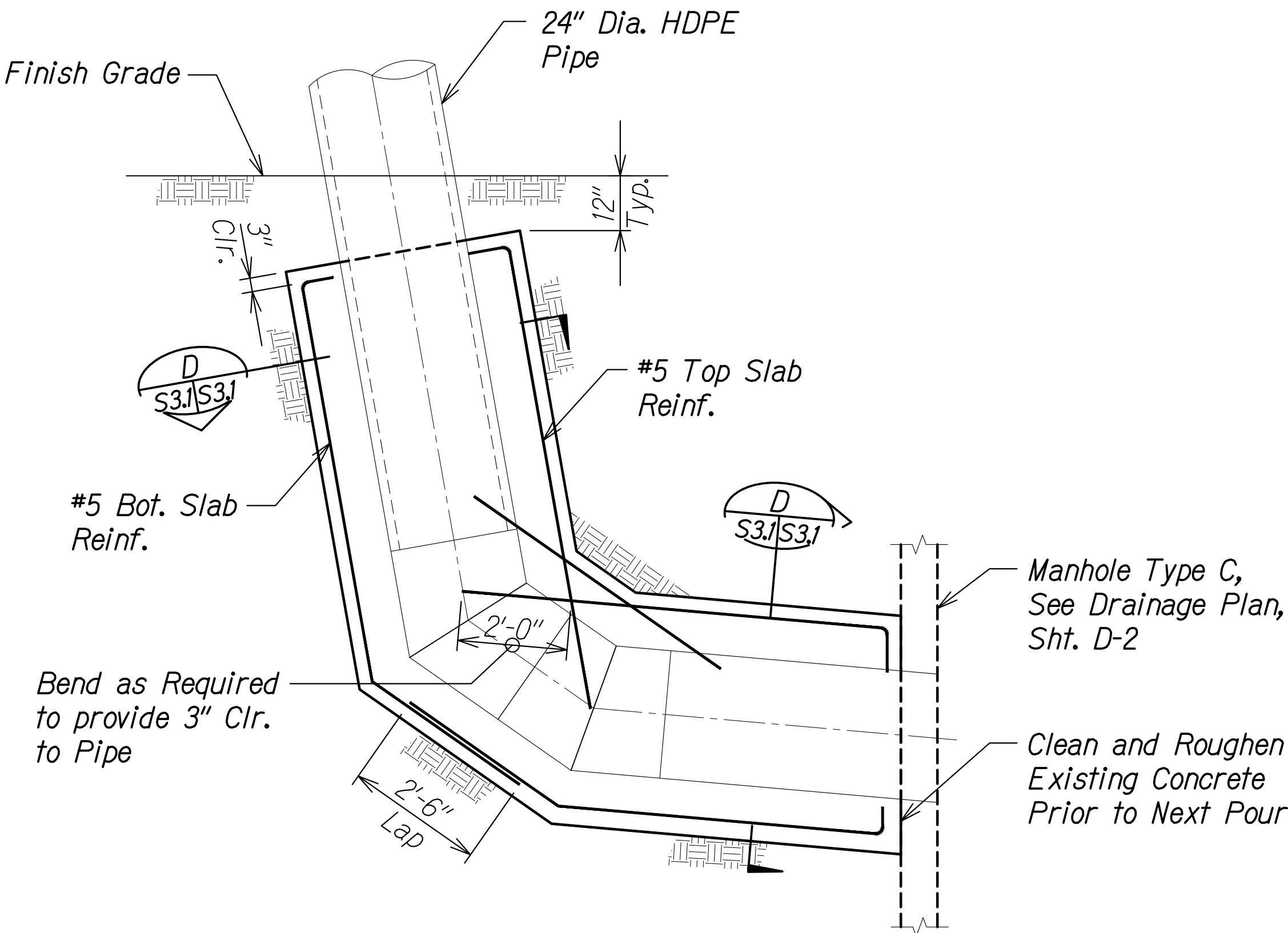
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SHEET No. S2.2 OF 2 SHEETS

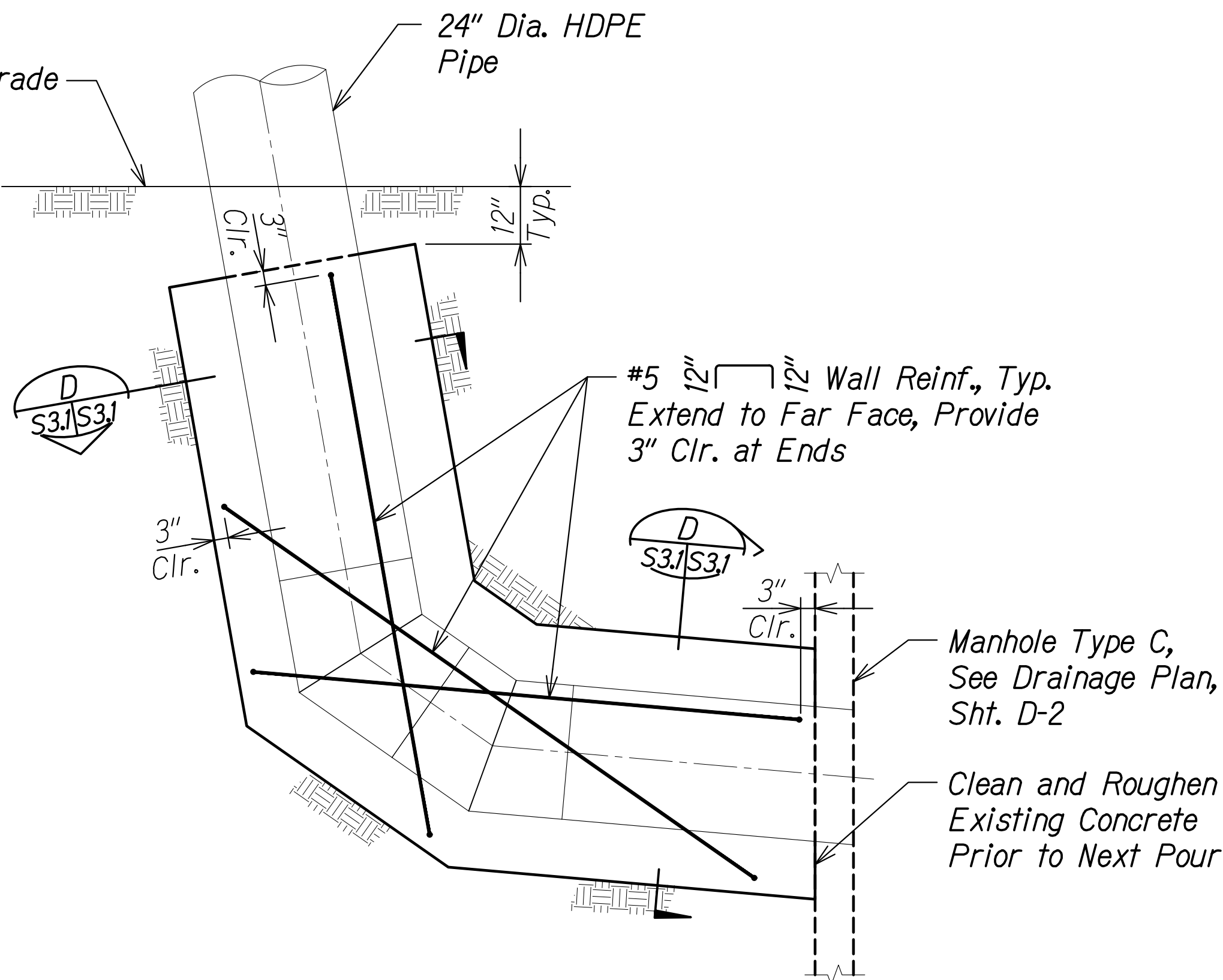
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER-24(003)	2023	95	100

Notes:

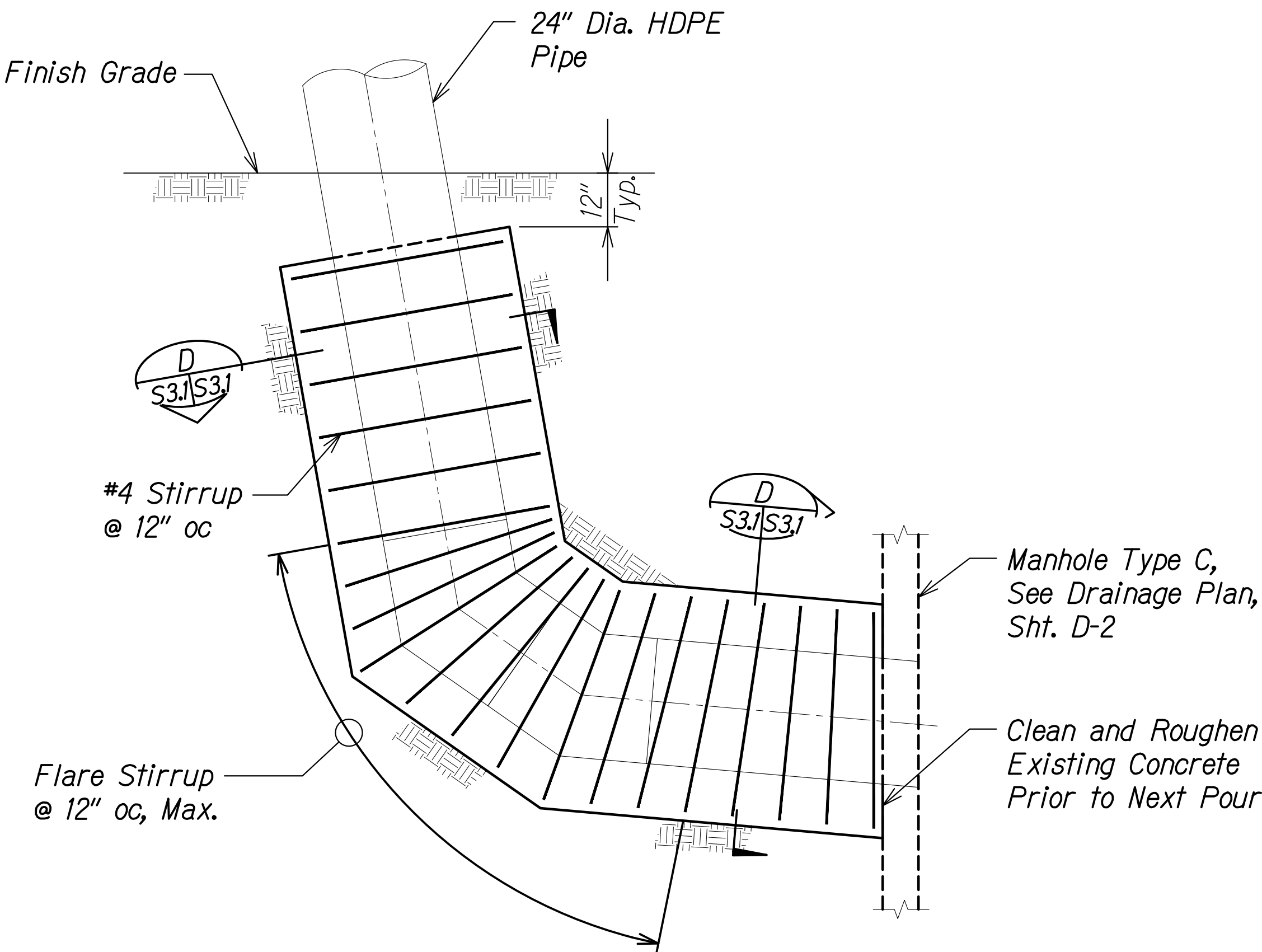
- Concrete shall develop a minimum 28-Day compressive strength of 4,000 psi, unless shown otherwise.
- Any soft soil encountered during excavation shall be removed to firm soil and replaced with compacted fill.
- 90 degree maximum bottom vertical bends.
- Cost for reinforcing and concrete for the pipe jacket shall be incidental to the 24" diameter drain pipe.



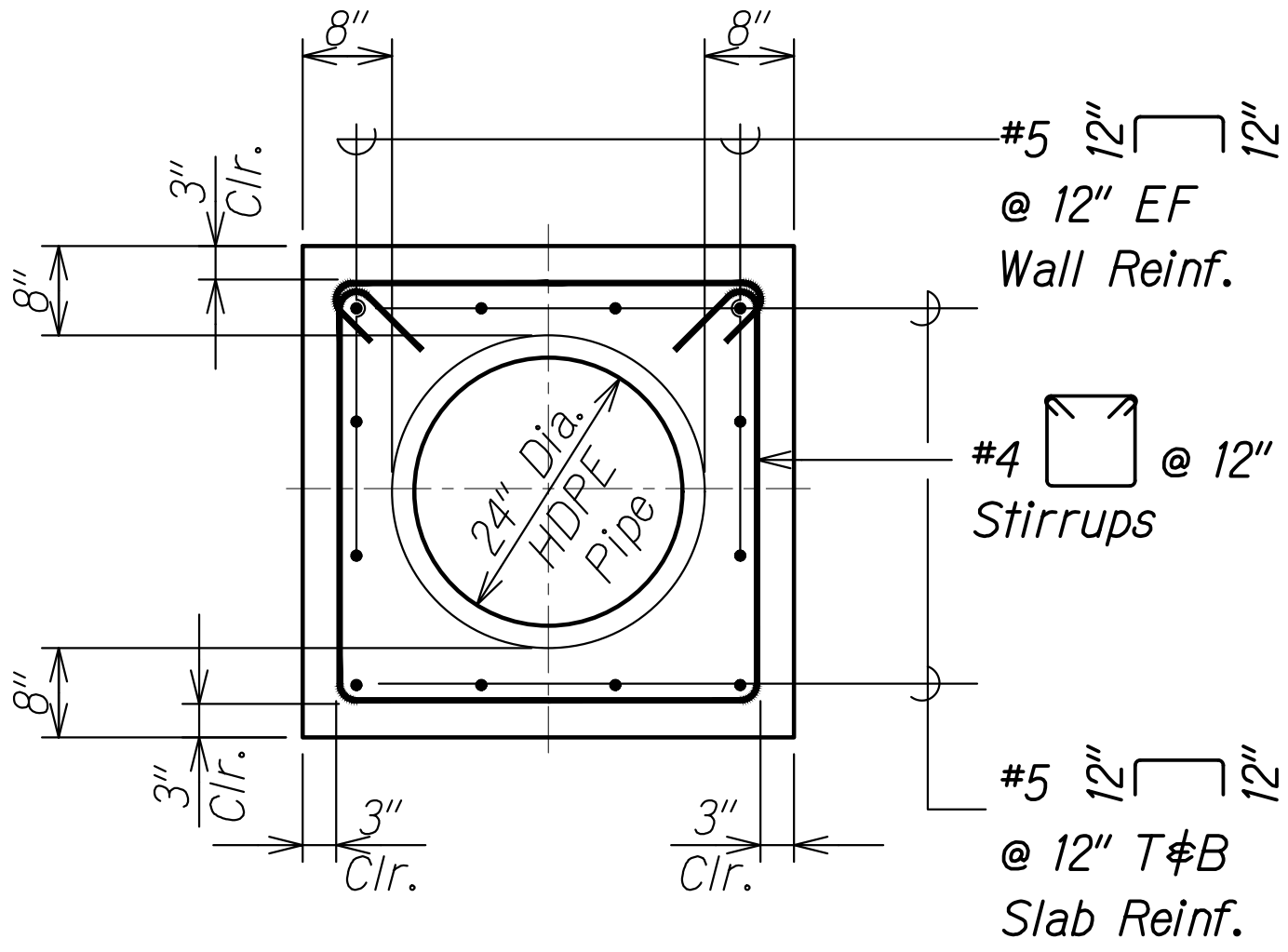
TOP AND BOTTOM SLAB REINF. A
Scale: 1/2" = 1'-0"



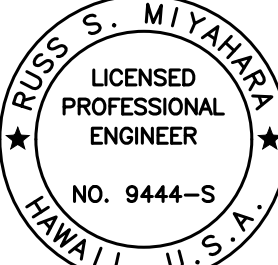
WALL REINFORCING B
Scale: 1/2" = 1'-0"



STIRRUP REINFORCING C
Scale: 1/2" = 1'-0"



TYP. PIPE JACKET SECTION D
Scale: 3/4" = 1'-0"



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ME OR UNDER MY SUPERVISION.
Signature: Russ S. Miyahara
EXPIRATION DATE OF THE LICENSE: 4-30-24

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**VERTICAL BEND
PIPE JACKET DETAILS**

**KUHIO HIGHWAY
Emergency Slope Stabilization
for Hanalei Hills and Waikoko
F.A.P. Project No. ER-24(003)**

Scale: As Noted Date: Sept. 2022

SHEET No. S3/ OF 1 SHEETS