

350\\1310 DOT - Volcano Kulan Road Intersection\Drawings\Structural\AutoCAD_format\2010-12-16_1310_Volcano ADD 2\\1310_S-1_ADD2.dwg, 2/4/2011 3:25:47 PM, eduke

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HS-STP-011-2(38)	2010	ADD. 103	141

STRUCTURAL GENERAL NOTES

1. General:

- A. Workmanship and materials shall conform to the AASHTO LRFD Bridge Design Specification, 5th Edition, and the Hawaii Standard Specifications for Bridge and Road Construction (2005 Edition), and all applicable special provisions by the State of Hawaii Department of Transportation.
- B. The Contractor shall compare the Civil, Electrical and Structural drawings with each other and report in writing to the Engineer, inconsistencies or omissions.
- C. The Contractor shall take field measurements and verify field conditions and shall compare such field measurements and conditions with the drawings before commencing the work. Report in writing to the Engineer all inconsistencies or omissions.
- D. The Contractor shall be responsible for means and methods of construction, workmanship and job safety. The Contractor shall provide temporary shoring and bracing as required for stability of structural members and systems.
- E. Details noted as typical on structural drawings shall apply in all conditions unless specifically shown or noted otherwise.
- F. The Contractor shall be responsible for coordinating the work of all trades.
- G. The Contractor shall be responsible for protection of the adjacent properties, structures, streets, and utilities during the construction period. Any damage or deteriorated property shall be restored to the condition prior to the beginning of work or better at no cost to the State.
- H. Construction loading shall not exceed design live load unless special shoring is provided. Permitted construction loads shall be properly reduced in areas where the structure has not attained full design strength.

2. Design Criteria:

- A. Dead Load
Weight of all components of the structures, appurtenances attached thereto, and earth covers.
- B. Live Load
AASHTO HL-93 Loading
- C. Seismic
Seismic design is in accordance with the AASHTO Guide Specifications for LRFD Seismic Bridge Design (May 2007), as modified by the State of Hawaii Department of Transportation.
0.2-second spectral response acceleration coefficient, $S_s = 1.75$
1.0-second spectral response acceleration coefficient, $S_1 = 0.80$
Horizontal peak ground acceleration coefficient, $PGA = 0.85$ Δ
- D. Soil Properties
 - 1. Static Lateral Earth Pressure:
 - a. Active condition _____ = 40 pcf
 - 2. Dynamic Lateral Earth Pressure:
 - a. Structural design _____ = 210.0 H^2 pcf Δ
 - b. Overturning design _____ = 70.0 H^2 pcf ΔWhere: H = Height of retained soil or backfill in feet
 - 3. Bearing Pressure:
 - a. Extreme event limit state _____ = 4,500 pcf
 - b. Strength limit state _____ = 2,250 pcf
 - 4. Coefficient of Friction:
 - a. Extreme event limit state _____ = 0.55
 - b. Strength limit state _____ = 0.44
 - 5. Passive Earth Pressure:
 - a. Extreme event limit state _____ = 300 pcf
 - b. Strength limit state _____ = 150 pcf

3. Foundation:

- A. Contractor shall provide for de-watering of excavation from either surface water, ground water or seepage. NPDES permit required for discharging into State waters.
- B. Contractor shall provide for design and installation of all cofferdams, cribbing, sheeting, and shoring necessary for personnel safety and to preserve excavations and earth banks, and adjacent structures and property for damage.
- C. Excavation boundaries and grade elevations for footing shall be approved by the Engineer prior to placing the concrete and reinforcing.

Foundation (Continued):

- D. Backfill behind the retaining wall structures shall be Type A structural backfill, conforming to Section 703.20 of the Hawaii Standard Specifications for Roads, Bridges and Public Works Construction, 2005.
- E. Hard rock may be encountered during excavation.

4. Concrete:

- A. Concrete shall be regular weight concrete and shall have a 4,000 psi minimum 28-day compressive strength. All concrete shall have maximum w/c ratio of 0.45.
- B. All inserts, anchor bolts, plates, etc. embedded in concrete shall be hot-dip galvanized unless otherwise noted.
- C. Conduits, pipes, and sleeves passing through a wall not conforming to typical details shall be located and submitted to the Engineer for approval.
- D. Construction joints may be relocated by the Contractor and submitted to the Engineer for approval. Construction joints shall be made and relocated as not to impair the strength of the structure and to minimize shrinkage stresses. All construction joints shall be cleaned, laitance removed and wetted. See typical details for specific requirements.
- E. Non-shrink grouts shall be a premixed compound consisting of non-staining, non-metallic aggregate, cement, water reducing and plasticizing agents capable of developing minimum compressive strength of 4,000 psi in 3 days and 7,000 psi in 28 days.
- F. Unless otherwise noted, chamfer all exposed concrete edges 3/4".
- G. Concrete delivery tickets shall record all free water in the mix: at batching by plant, for consistency by driver, and any additional request by Contractor if permitted by the mix design.
- H. Reinforcing bars, anchor bolts, inserts and other items to be cast in the concrete shall be secured in position prior to placement of concrete.

5. Reinforcing Steel:

- A. Reinforcing steel shall be deformed bars conforming to ASTM A615, Grade 60, unless unless noted otherwise.
- B. Clear concrete coverage for reinforcing bars shall be as follows, unless otherwise noted:
 - a. Footing, grade beams, etc. cast against earth _____ 3"
 - b. Footing, grade beams, etc. formed and exposed to earth _____ 2"
 - c. Wall faces, slabs, etc. exposed to earth or weather _____ 2"
- C. Splices:
 - a. Reinforcing steel shall be spliced only where indicated on plans. Provide lap splice length per typical details and schedule sheet S-2, unless otherwise noted.
- D. Bar bends and hook shall be "standard hooks" in accordance with Typical Details on sheet S-2.

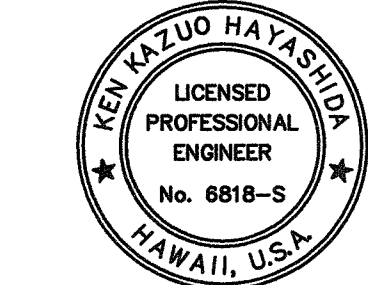
6. Structural Steel:

- A. Fabrication and erection of structural steel shall conform to the AASHTO LRFD Bridge Construction Specifications, Third Edition, including it's subsequent interim specifications.
- B. Structural steel shall conform to ASTM A36, unless otherwise noted.
- C. Stainless Steel shall conform to ASTM A240, Type 316L.
- D. Steel wide flange sections shall conform to ASTM A992.
- E. Steel pipes shall conform to ASTM A53, Grade B.
- F. Steel tubes shall conform to ASTM A500, Grade B.
- G. Bolts shall conform to ASTM A307, Grade A, unless otherwise noted.
- H. Welds and welding procedures shall conform to the structural welding code AWS D1.1 of the American Welding Society.
- I. Welding shall be performed by welders prequalified for welding procedures to be used.
- J. Welding electrodes shall be E70XX.

7. Metal Hand Railing:

- A. All metal pedestrian railings shall be hot-dip galvanized after fabrication and shop painted according to Paint Schedule, sheet S-3.

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



EXPIRATION DATE OF THE LICENSE 4/30/2012
THIS WORK WAS PREPARED BY
ME OR UNDER MY SUPERVISION
AND CONSTRUCTION OF THIS PROJECT
WILL BE UNDER MY OBSERVATION

Δ 01/27/11	Addendum 2, Revised Note 2.
DATE	REVISION
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
STRUCTURAL GENERAL NOTES	
Volcano Road Intersection and Drainage Improvements Federal-Aid Project No. HS-STP-011-2(38)	
Scale: As Noted	Date: November 2010
SHEET No. S-1 OF 141 SHEETS	

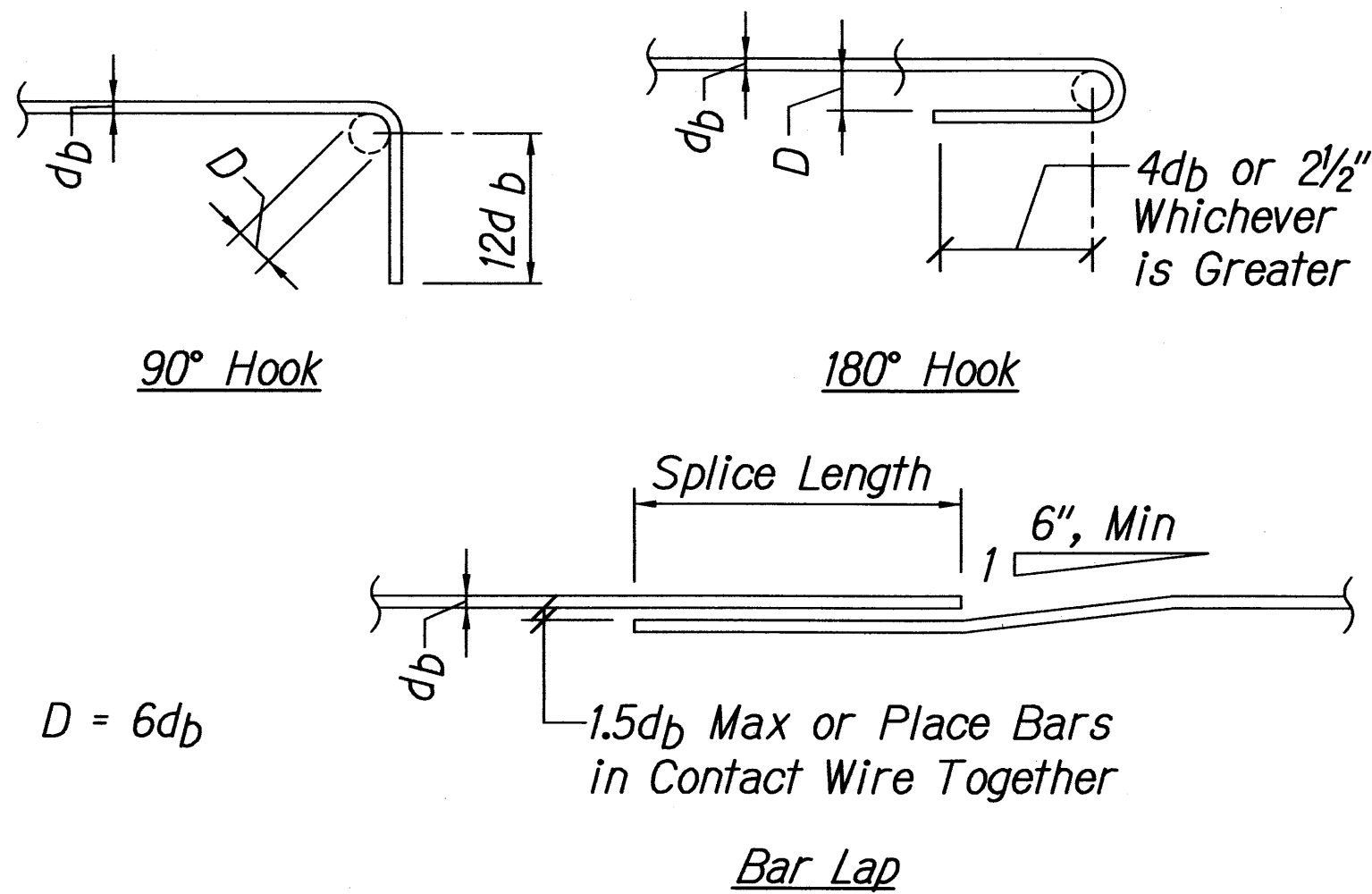
MINIMUM SPLICE & EMBEDMENT LENGTHS					
BAR SIZE	CONCRETE STRENGTH = 4,000 PSI				
	LAP SPLICE		EMBEDMENT		
	OTHER BARS	TOP BAR	STRAIGHT OTHER BARS	STRAIGHT TOP BAR	WITH STANDARD 90° HOOK
#3, #4	21"	29"	12"	17"	7"
#5	26"	36"	15"	21"	9"
#6	31"	43"	18"	26"	10"
#7	39"	54"	23"	32"	12"
#8	51"	71"	30"	42"	14"
#9	64"	90"	38"	53"	15"
#10	81"	114"	48"	67"	17"
#11	100"	140"	59"	82"	19"

Notes:

- "Top Bars" are horizontal bars with 12" or more of concrete cast below.
- Splice lengths may be reduced by multiplying the tabulated values by 0.765 if the centerline of splice of adjacent bars are staggered 6'-0" o.c. for #9 bar and smaller and 9'-0" o.c. for #10 bar and larger.
- Embedment lengths for straight bars may be reduced by multiplying the tabulated values by 0.80 if the bars are spaced laterally not less than 6" center-to-center, with not less than 3" clear cover measured in the direction of the spacing.
- Embedment lengths for bars with 90° hook are bars with side cover, normal to plane of hook, of not less than 2½" and cover on bar extension beyond hook not less than 2". Increase embedment length by 43% for bars not meeting these requirements.

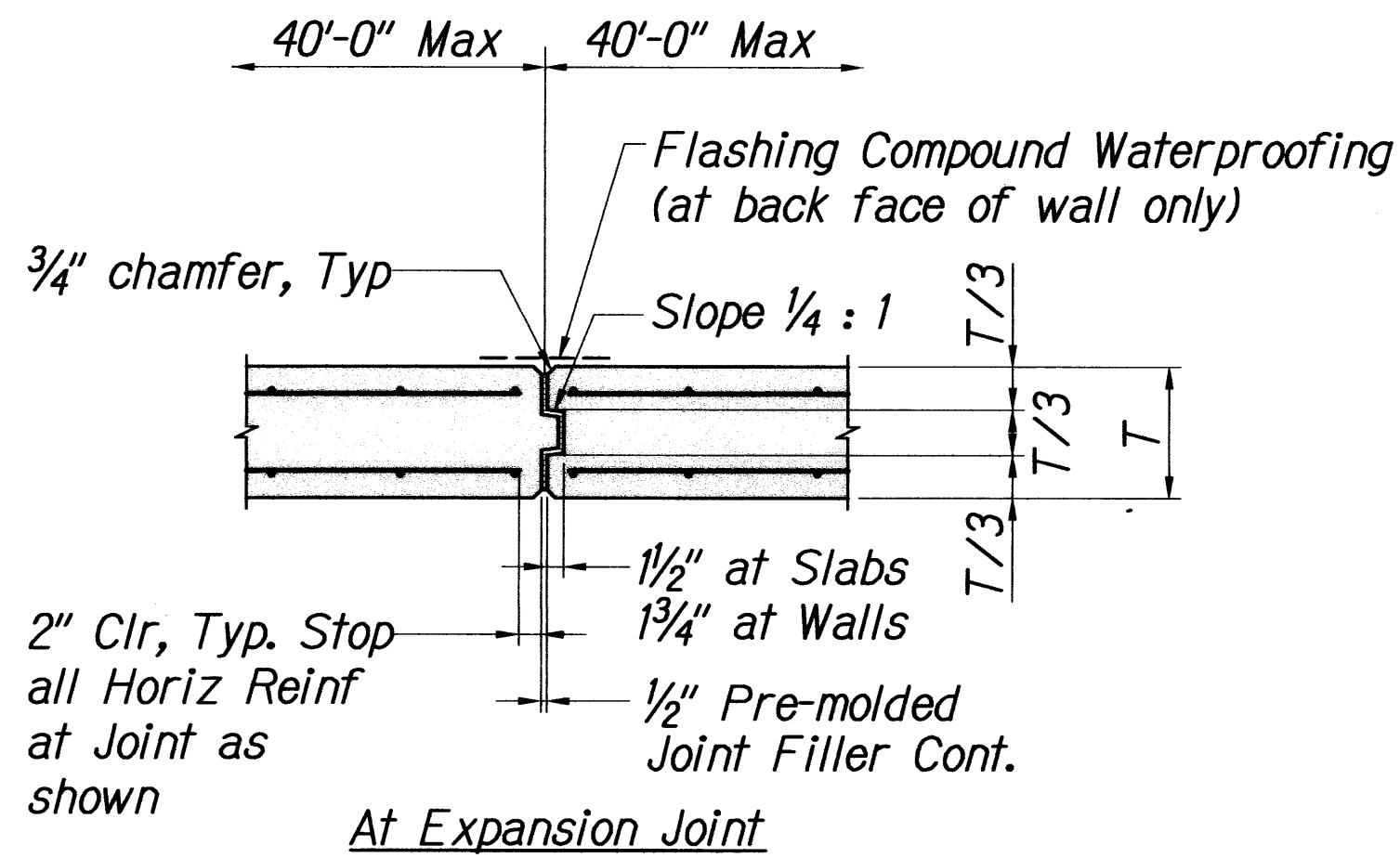
TYPICAL REBAR SPLICE AND EMBEDMENT LENGTH SCHEDULE

Not to Scale



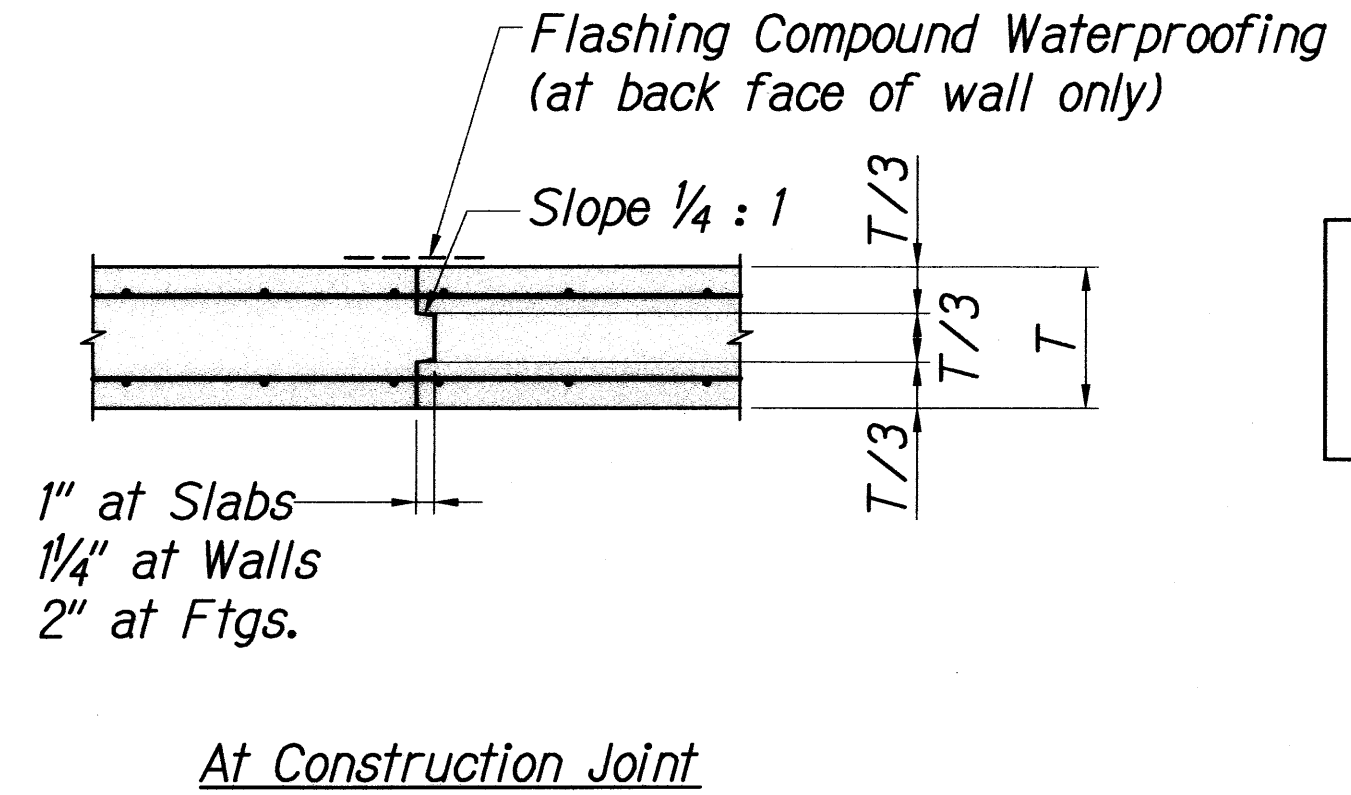
STANDARD HOOKS AND SPLICE DETAIL

Not to Scale



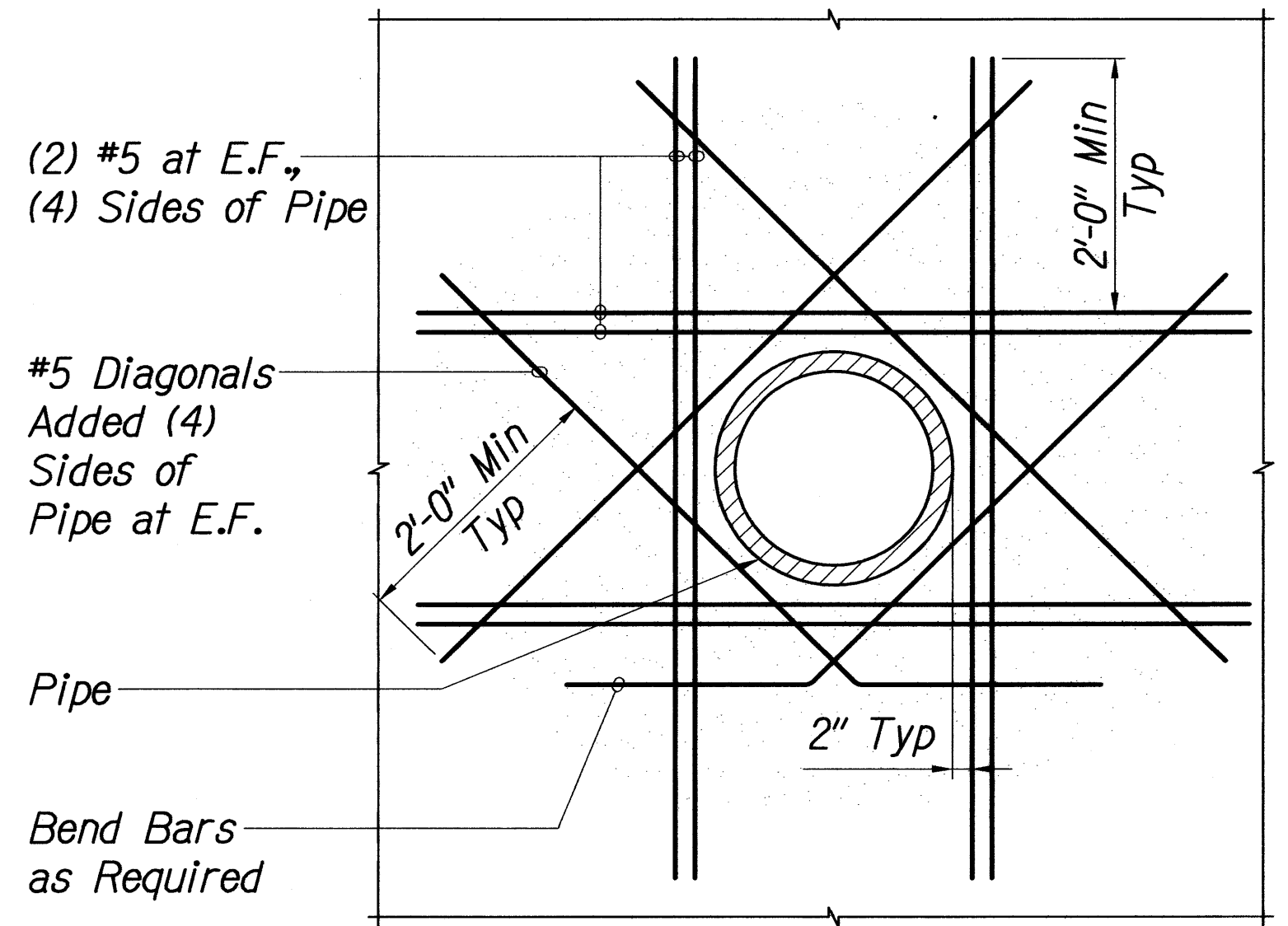
TYPICAL JOINT DETAILS

Not to Scale



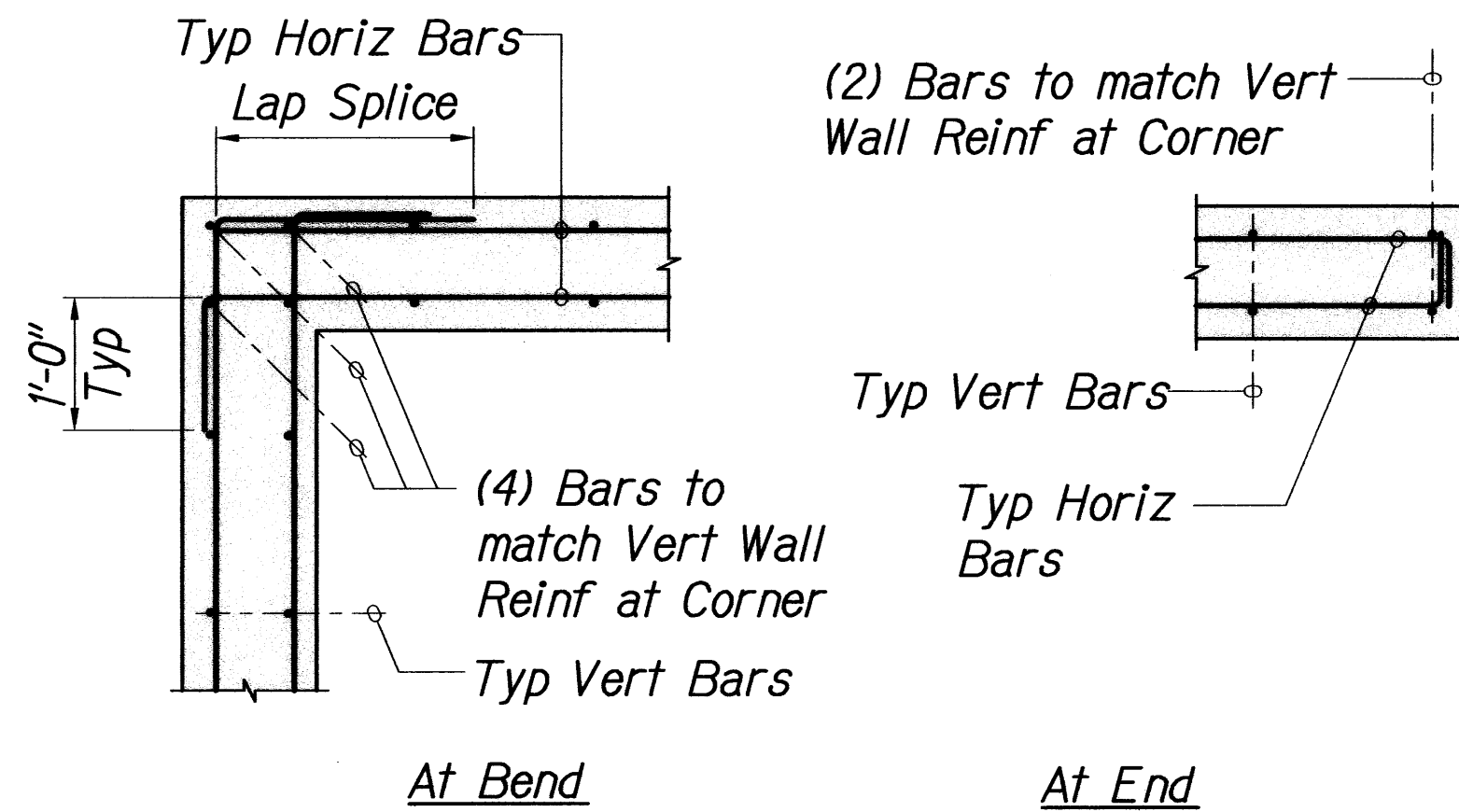
Note:

Expansion Joints shall not be allowed in Footings.



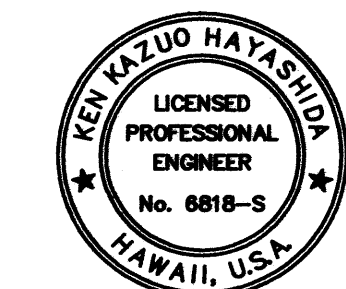
ADDED REBARS AT PIPE PENETRATIONS

Not to Scale



TYPICAL WALL HORIZONTAL REINFORCEMENT DETAILS

Not to Scale



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPICAL DETAILS

Volcano Road Intersection and
Drainage Improvements

Federal-Aid Project No. HS-STP-011-2(38)

Scale: As Noted

Date: November 2010

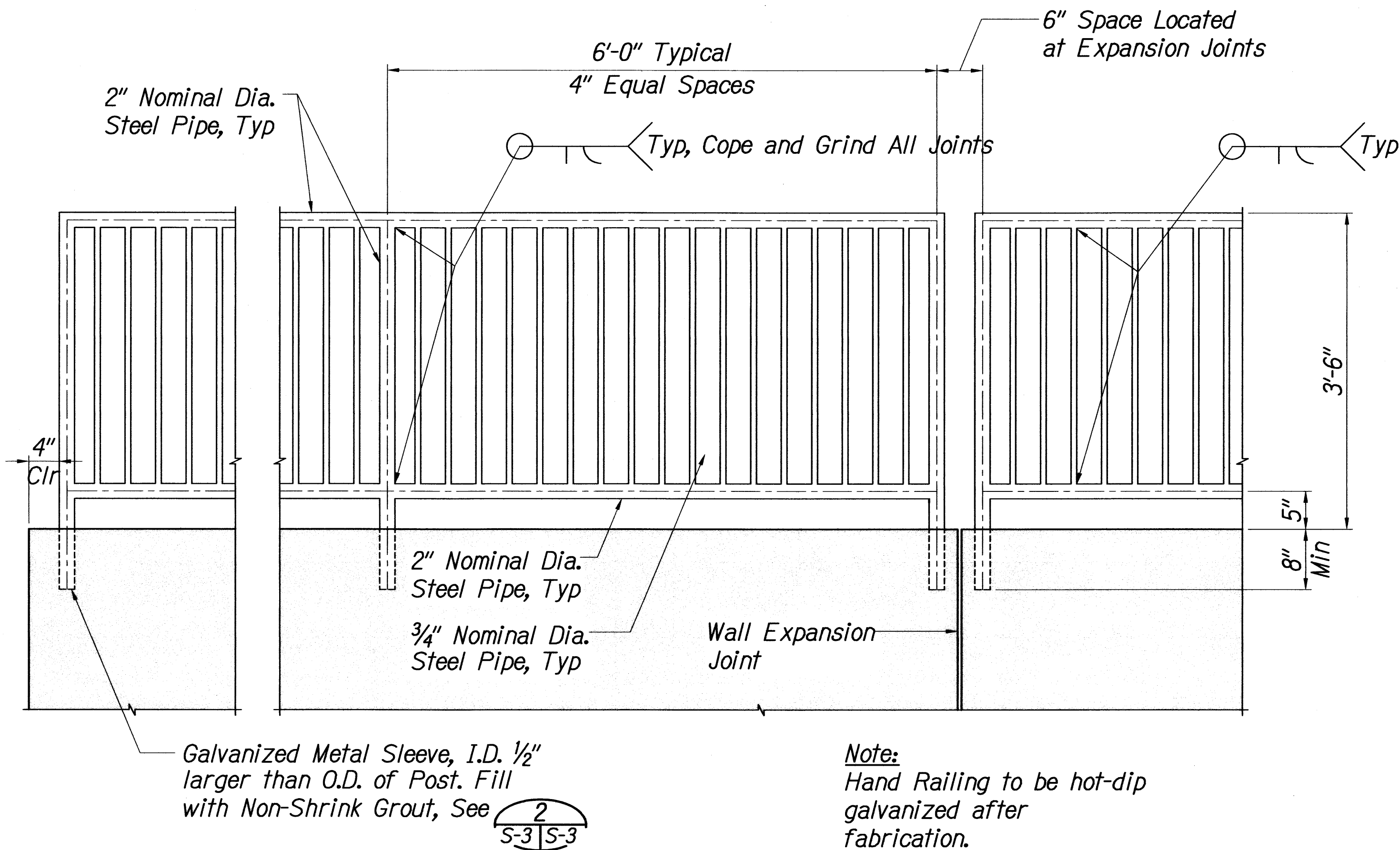
SHEET No. S-2 OF 141 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HS-STP-011-2(38)	2010	105	141

Painting Notes:

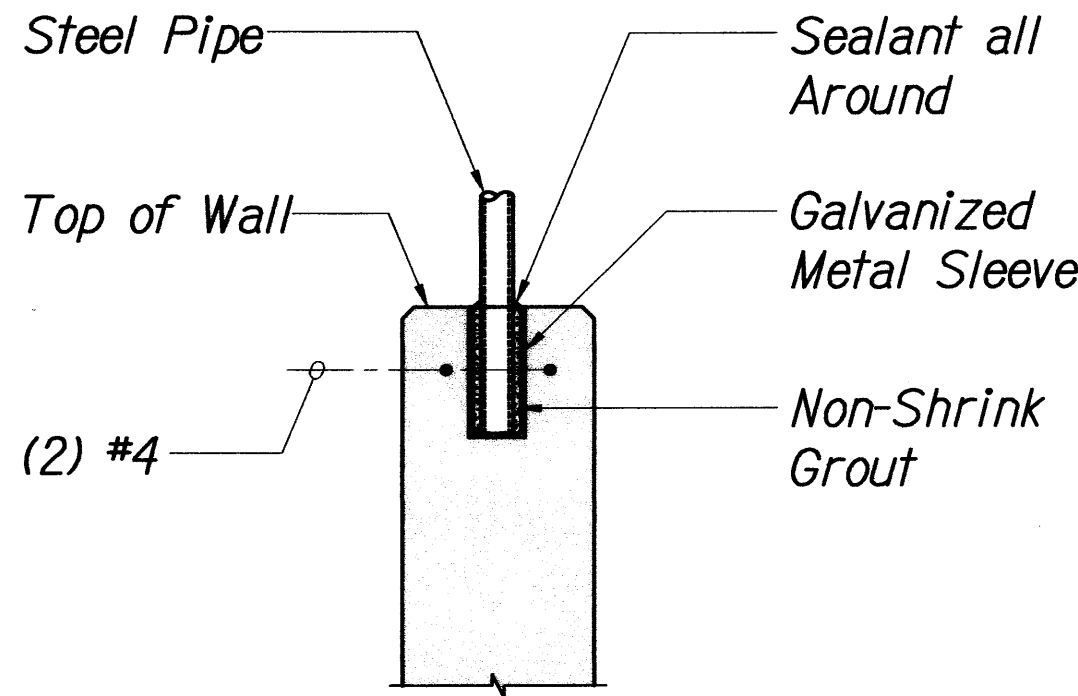
- Contractor shall shop coat all members. Field coating shall consist of touch up only.
- The touch up paint shall consist of the following:
 - Prepare surface per SSPC-SP1, solvent cleaning.
 - Apply first and second coat according to paint schedule.
- Color for top coat shall be an earthtone green, as proposed by the contractor and approved by the Engineer. Intermediate coat shall have contrasting light color. Finish for top coat shall not be gloss or high gloss.
- Multiple coats may be required to obtain minimum dry film thickness (DFT).
- All hot-dip galvanized coating that is damaged shall be repaired. The repairs shall consist of the following:
 - Prepare surface per SSPC-SP1, solvent cleaning.
 - Rust scale shall be cleaned per SSPC-SP3.
 - Apply (2) coats of cold applied, galvanizing compound containing 95% metallic zinc content by weight in dry film and 52% solids content by volume.
 - Application rate shall be 1.5 mils dry film thickness per coat.
 - The coating shall be applied at sufficient wet film thickness to achieve a minimum dry film.
 - The coating shall be well stirred before use so that it is completely homogeneous during application.
- Cost of shop painting and touch-up is incidental to metal railings.

METAL HAND RAIL PAINT SCHEDULE				
SPECIAL COATING SCHEDULE FOR ZINC COATED METAL HAND RAIL				
	OPTION 1	OPTION 2	OPTION 3	OPTION 4
PREPARATION:	Carboline thinner #2 or surface cleaner #3, per SSPC-SP1, Apply Rustbound Penetrating Sealer.	Solvent clean per SSPC-1, and as recommended by the manufacturer	Solvent clean per SSPC-SP1, and as recommended by the manufacturer	Solvent clean per SSPC-SP1. Apply Galvanized Zinc Treatment (Acid Etching)
1ST COAT:	Carboline Carboguard 890 epoxy DFT 5 mil (min) WFT 7 mil (min)	Tnemec High-Build Epoxoline II Series N69 DFT 5 mil (min) / WFT 7 mil (min)	Sherwin Williams Tile Clad High Solids B62 Series DFT 4 mil (min) / WFT 7 mil (min)	Ameron Amercoat 385 epoxy DFT 5 mil (min) WFT 8 mil (min)
RECOATING TIME:	8 HRS (min) 2 Days (max)	(min) 10 HRS (min) 2 Days (max)	8 HRS (min) 14 Days (max)	8 HRS (min) 2 Days (max)
TOP COAT:	Carboline Carbothane 133HB Alyphatic polyurethane DFT 5 mil (min) /WFT 7 mil (max)	Tnemec Endura-Shield Series 75 DFT 4 mil (min) WFT 7 mil (min)	Sherwin Williams Corothane II B65 W200 Series/B60V2 DFT 4 mil (min) / WFT 7 mil (min)	Ameron Amercoat 450 SA Polyurethane DFT 4 mil WFT 7 mil



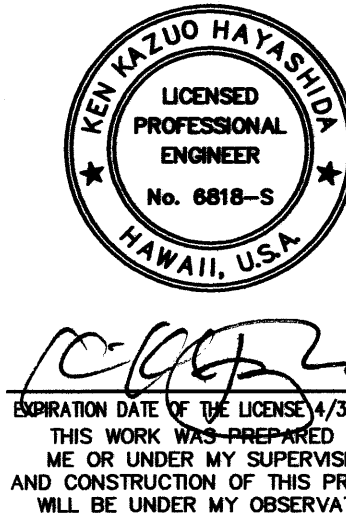
TYPICAL HAND RAILING DETAIL 1
Not to Scale S-3 S-3

Note:
Hand Railing to be hot-dip galvanized after fabrication.



TYPICAL POST DETAIL 2
Not to Scale S-3 S-3

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**PAINTING NOTES AND
TYPICAL HAND RAILING DETAILS**

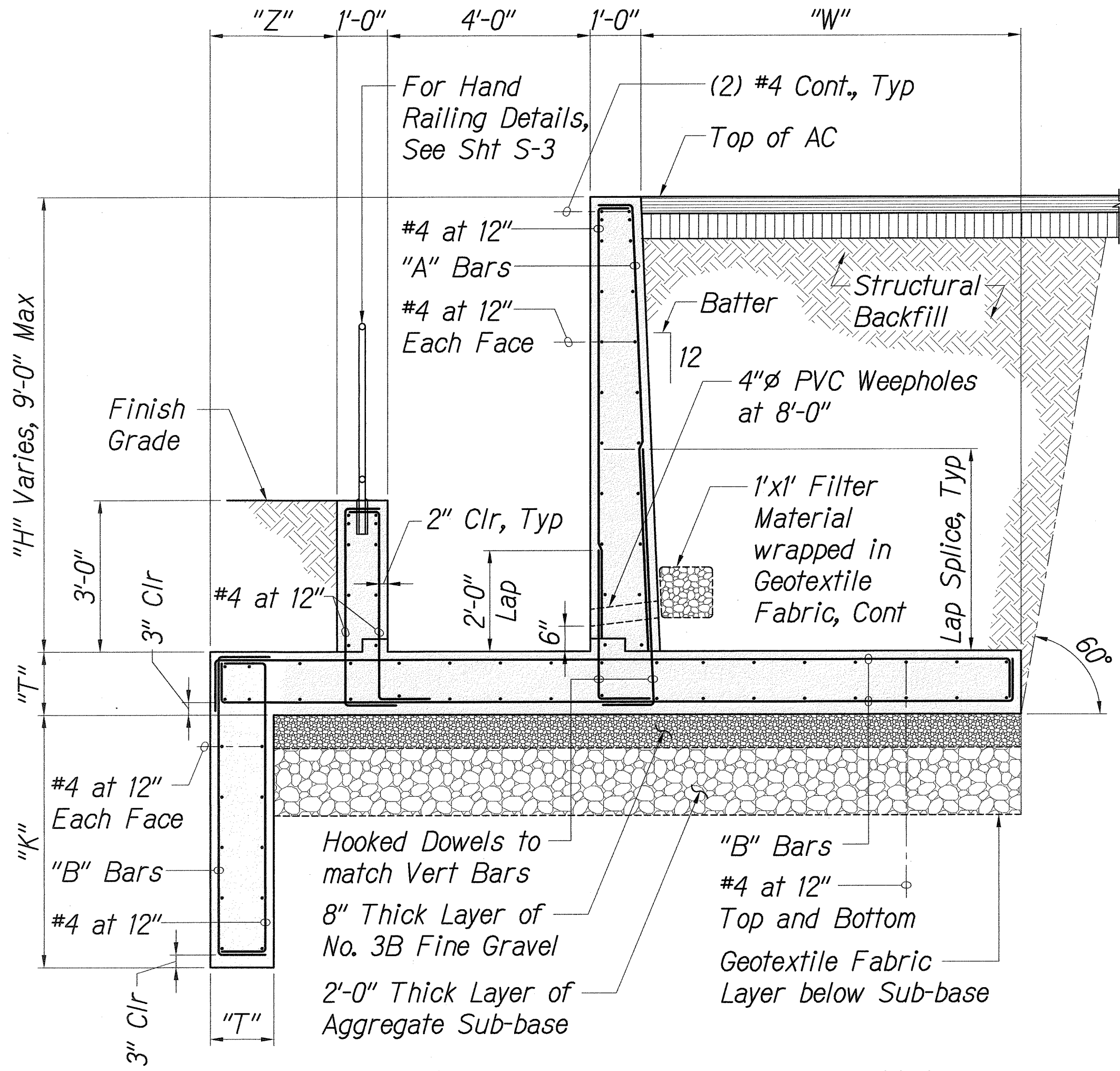
Volcano Road Intersection and
Drainage Improvements
Federal-Aid Project No. HS-STP-011-2(38)

Scale: As Noted Date: November 2010

SHEET No. S-3 OF 141 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HS-STP-011-2(38)	2010	ADD. 106	141

CONCRETE CHANNEL SCHEDULE							
HEIGHT "H"	"T"	"W"	"Z"	"K"	Batter	"A"	"B"
≤ 9'-0"	1'-6"	6'-0"	2'-6"	5'-0"	2 : 12	#6 at 4"	#8 at 4"
≤ 8'-0"	1'-6"	4'-6"	2'-6"	4'-0"	2 : 12	#6 at 6"	#8 at 6"
≤ 7'-0"	1'-3"	3'-0"	2'-6"	3'-0"	1 : 12	#6 at 6"	#7 at 6"
≤ 6'-0"	1'-3"	2'-0"	2'-6"	2'-6"	1 : 12	#5 at 6"	#6 at 6"
≤ 5'-0"	1'-0"	0'-6"	2'-6"	1'-6"	0 : 12	#5 at 6"	#5 at 6"
≤ 4'-0"	1'-0"	0'-0"	1'-6"	1'-0"	0 : 12	#4 at 6"	#4 at 6"

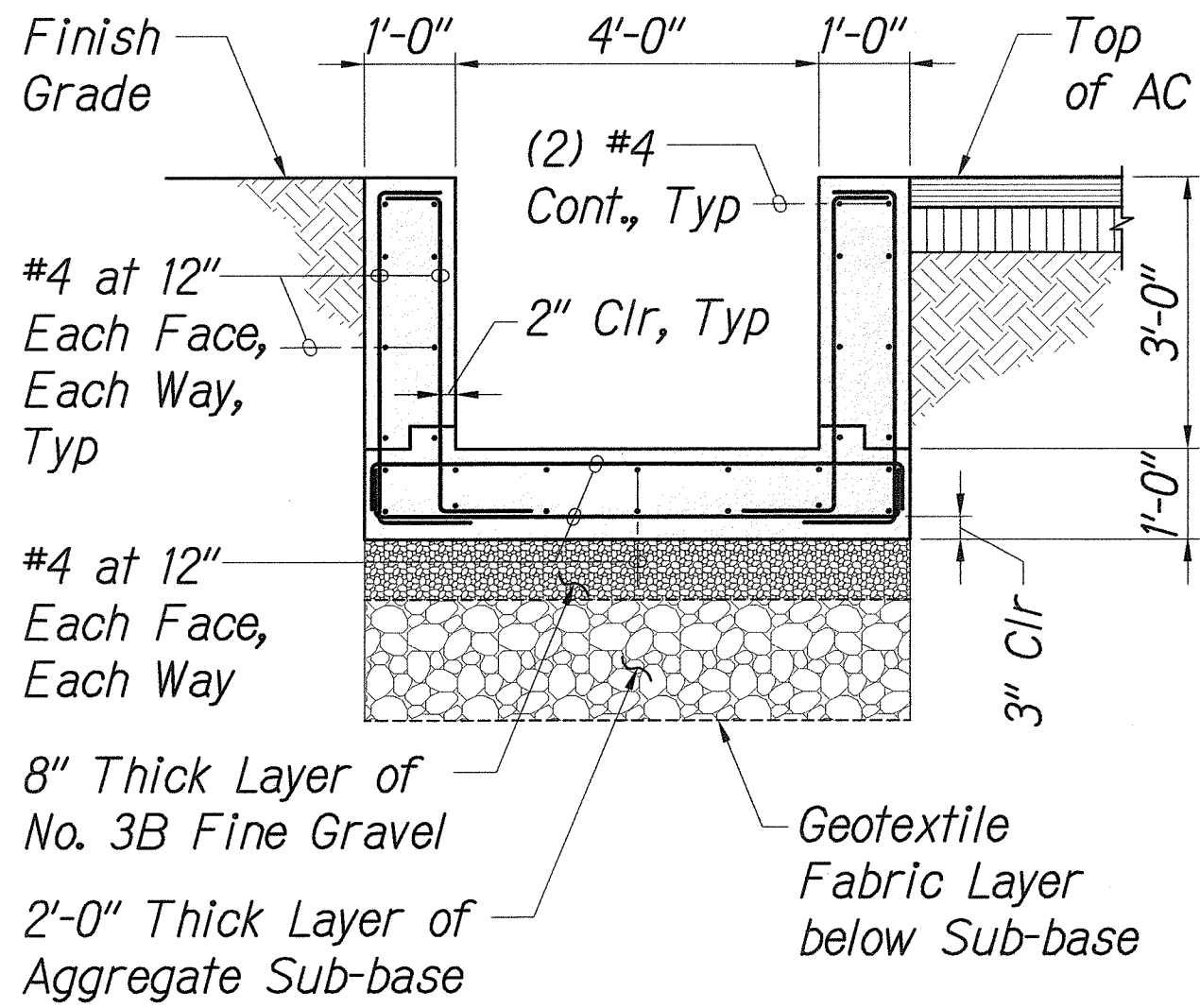


Notes:
1. See Civil Dwg for Elevations.
2. Wall Expansion Joints shall be located every 40'-0" maximum.

TYPICAL CONCRETE CHANNEL SECTION

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

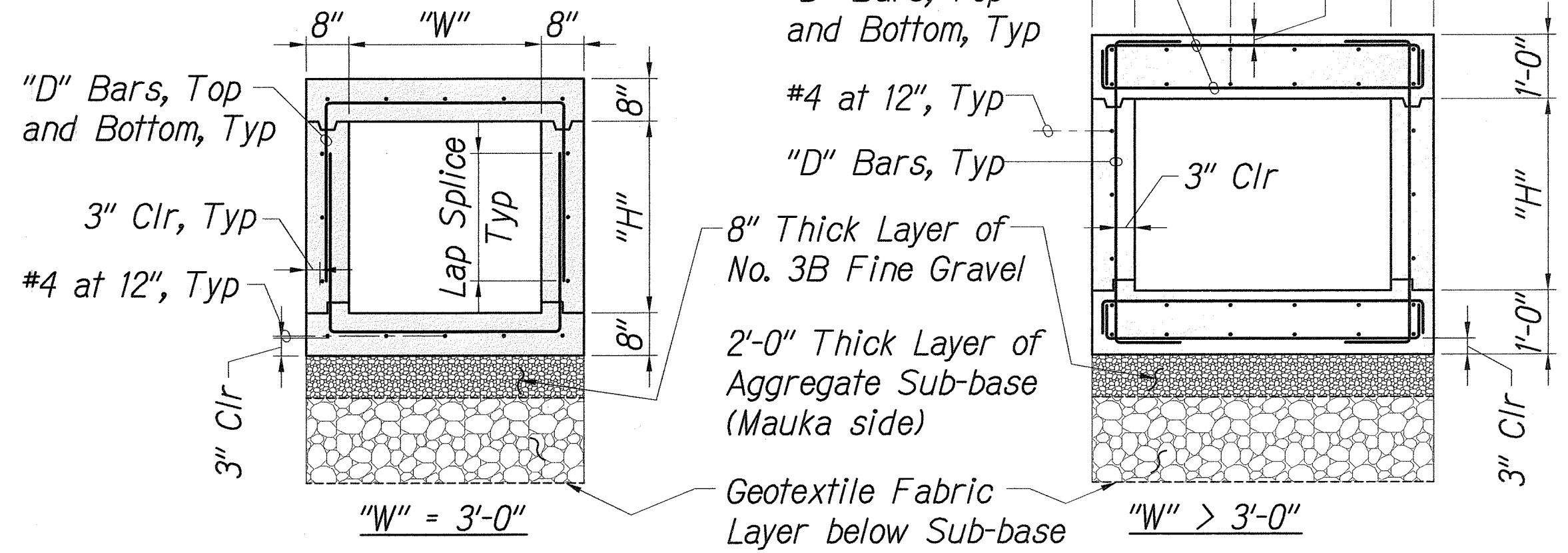
Notes:
1. See Civil Dwg for Elevations.
2. Wall Expansion Joints shall be located every 40'-0" maximum.



3' HIGH CONCRETE CHANNEL SECTION

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

CONCRETE CULVERT		
WIDTH "W"	"H"	"D"
6'-0"	2'-0"	#5 at 8"
5'-0"	3'-0"	#5 at 8"
4'-0"	3'-0"	#5 at 12"
4'-0"	2'-0"	#5 at 12"
3'-0"	3'-0"	#5 at 8"
3'-0"	2'-0"	#5 at 8"

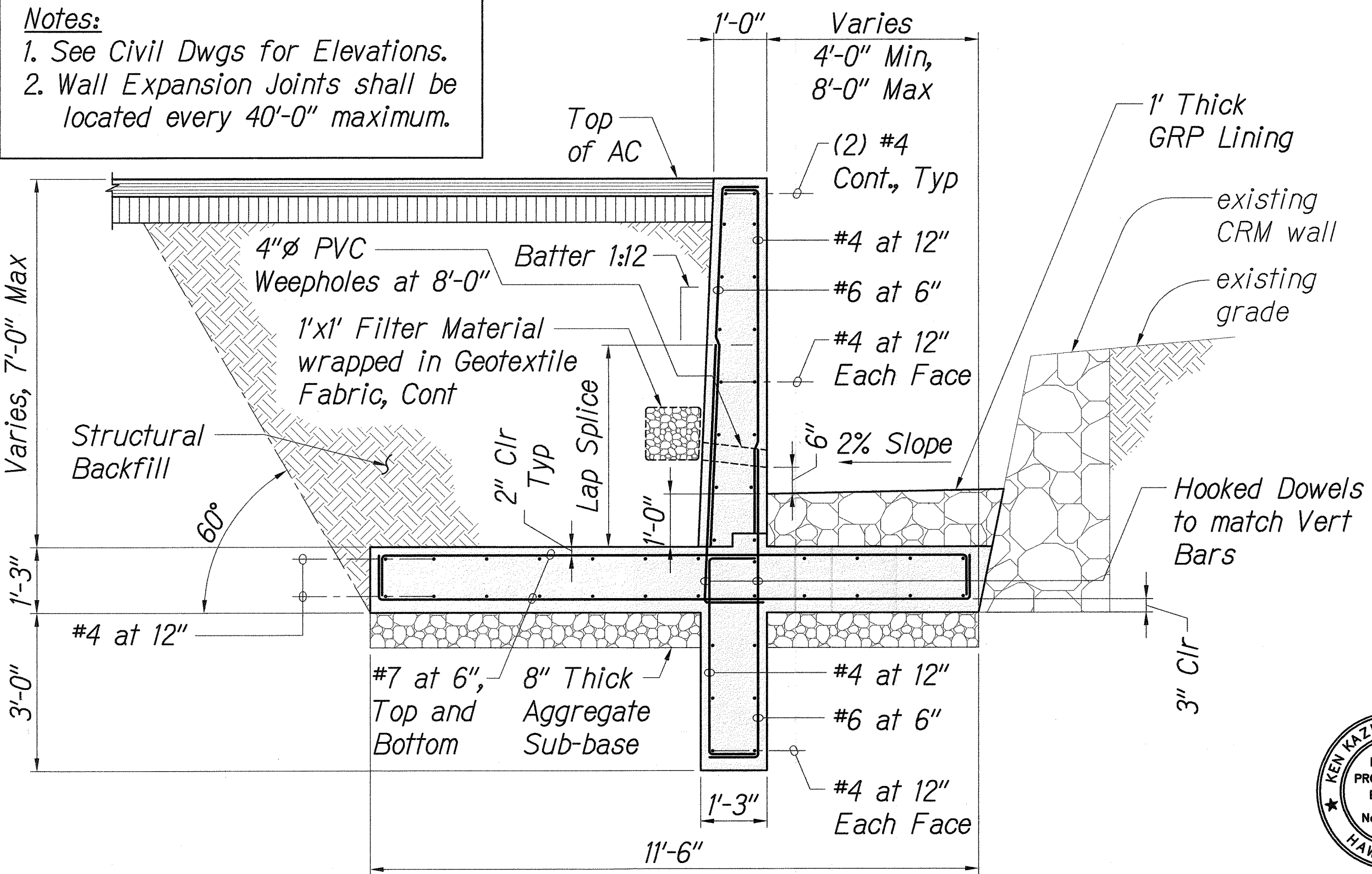


TYPICAL CONCRETE CULVERT SECTION

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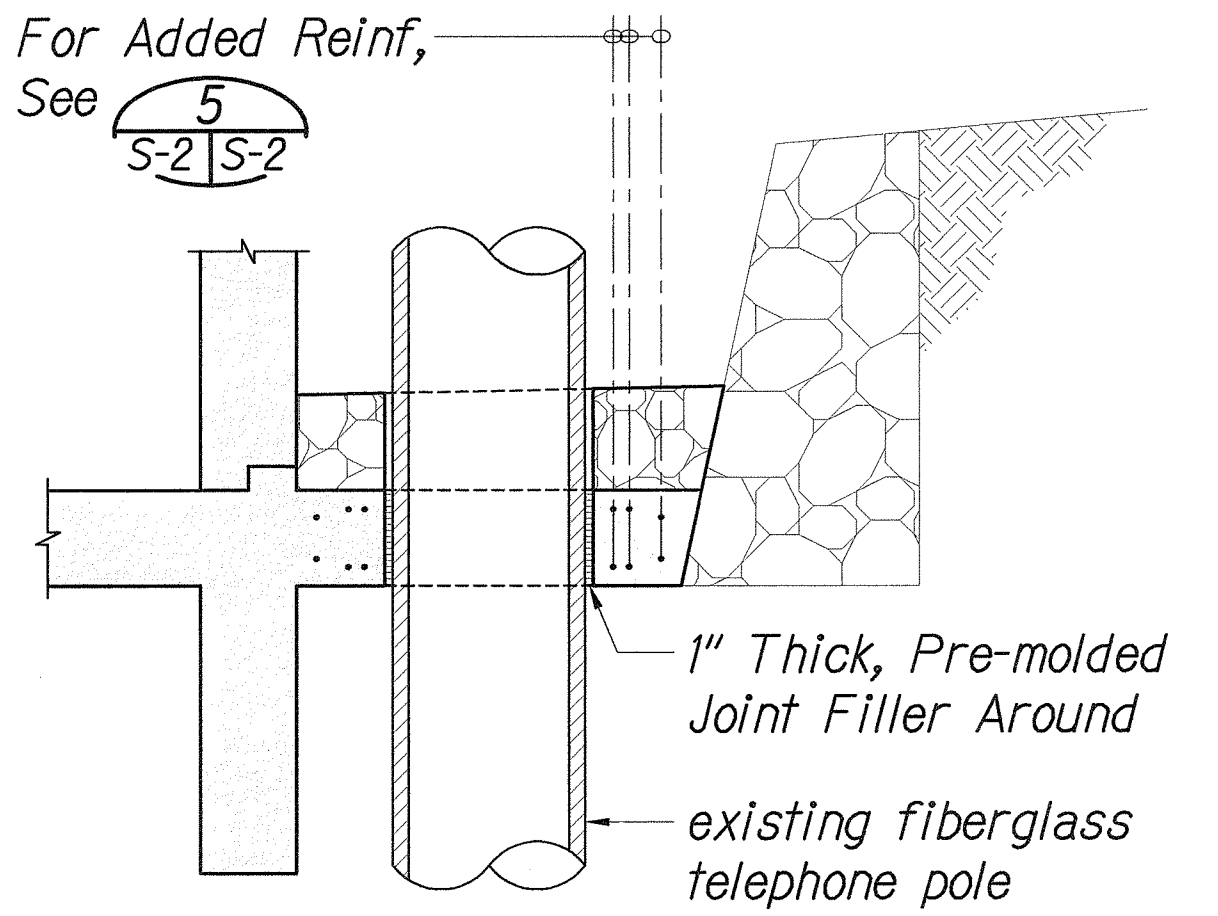
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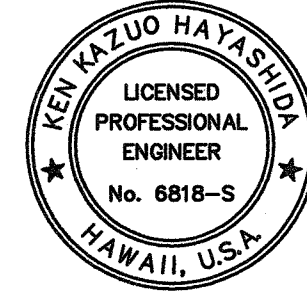
TYPICAL RETAINING WALL SECTION

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

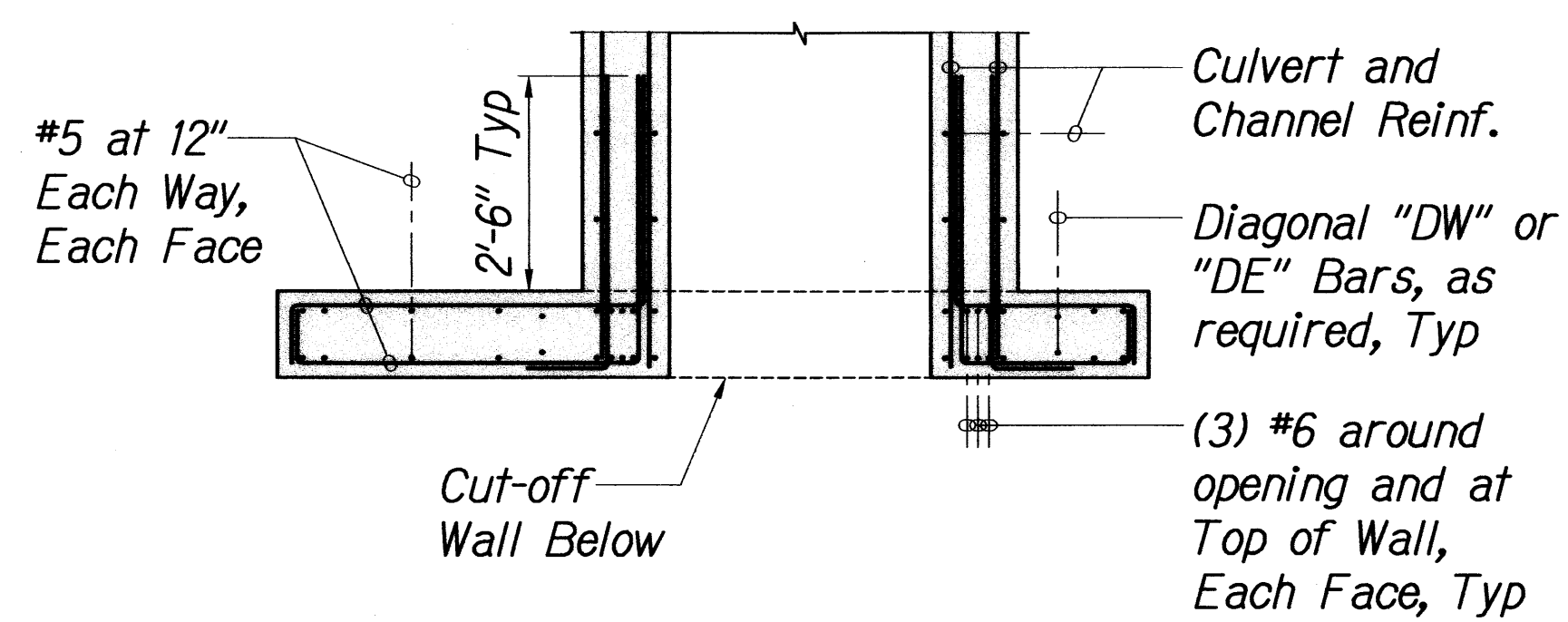
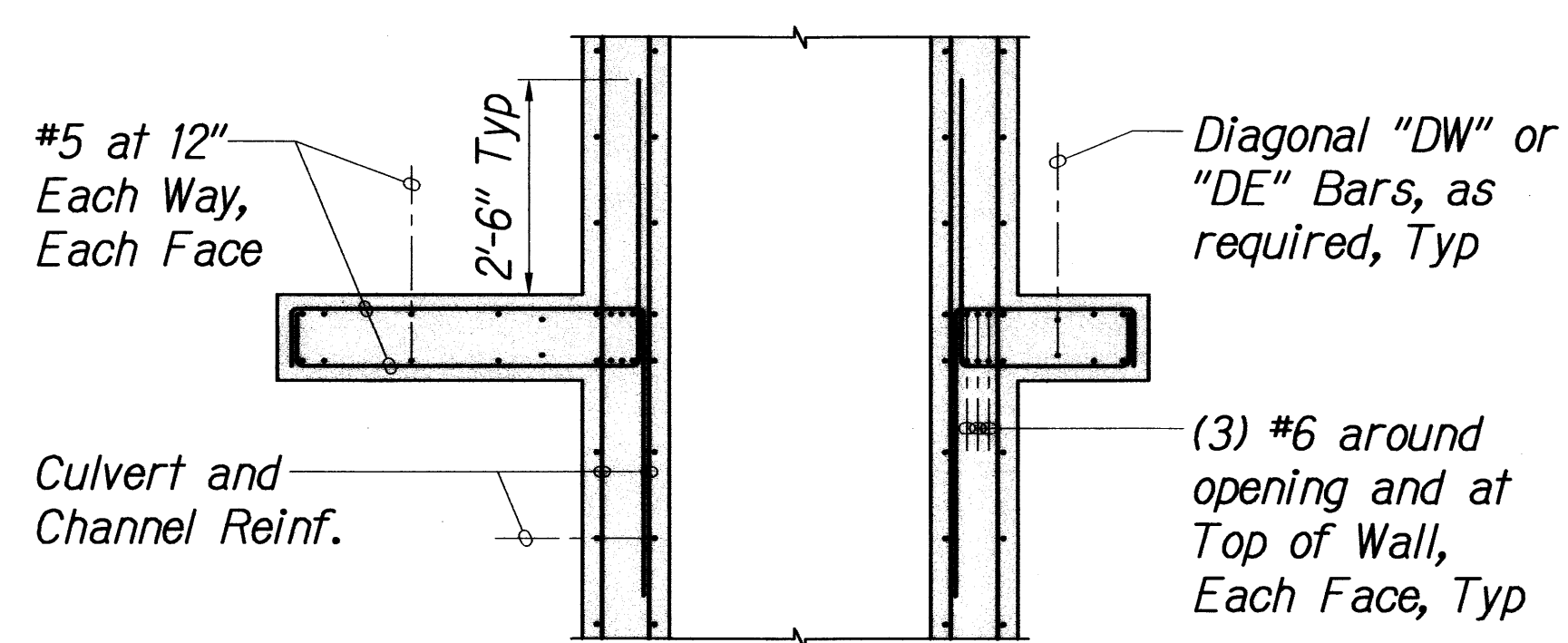
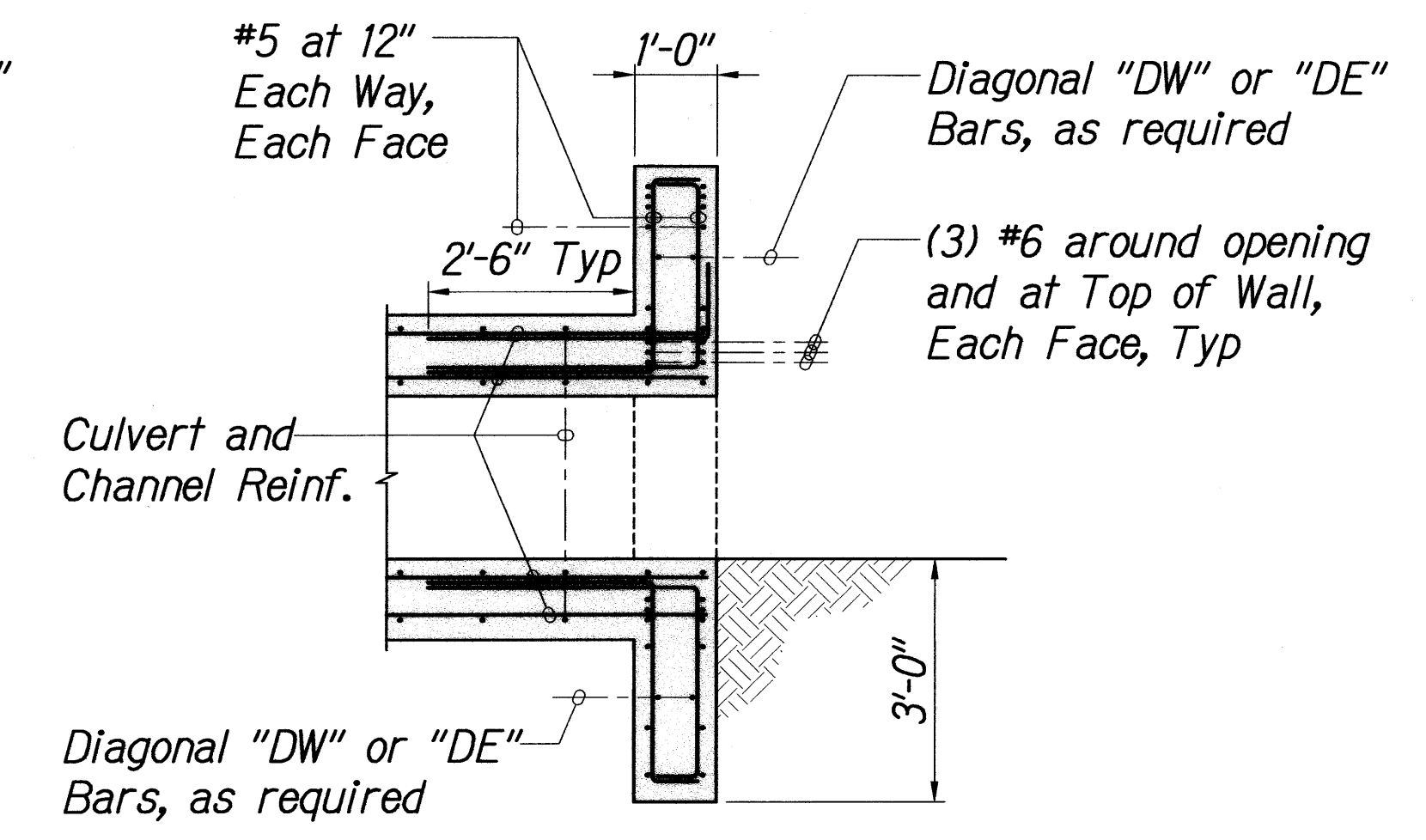
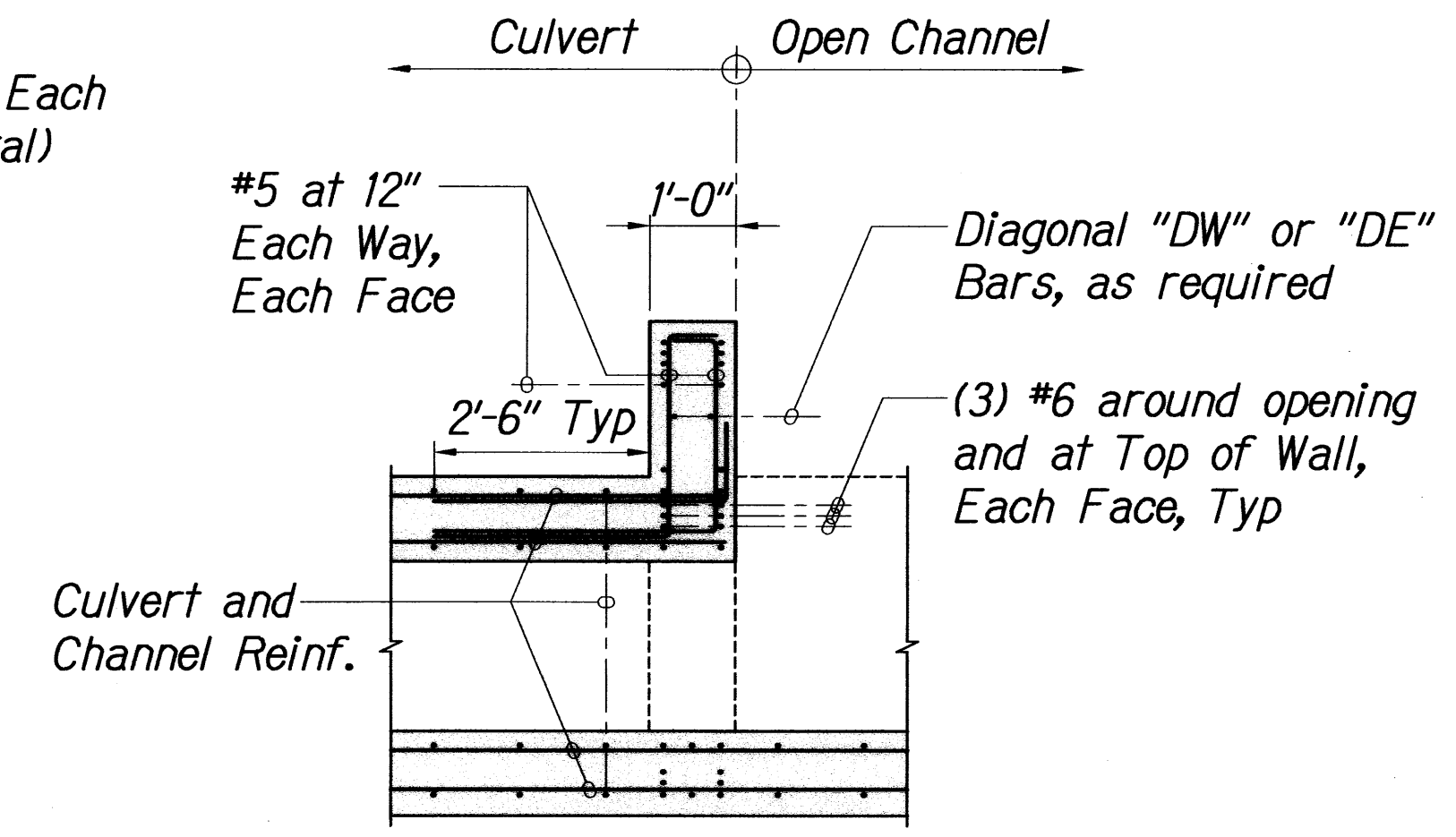
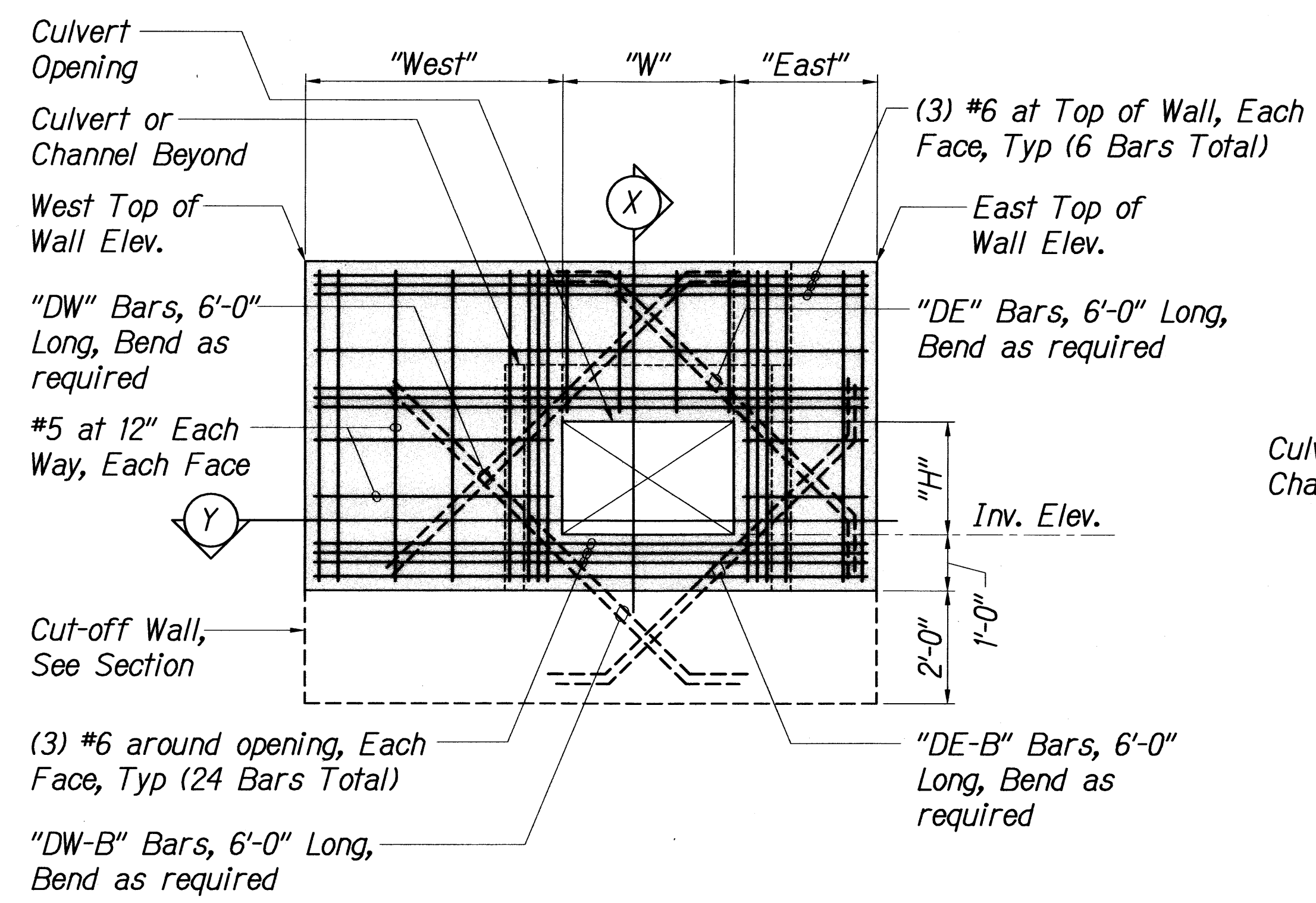


Section at Footing Penetration

DATE	REVISION
01/27/11	Addendum 2, Revision of Details
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
TYPICAL CHANNEL, CULVERT, AND RETAINING WALL SECTIONS	
Volcano Road Intersection and Drainage Improvements	
Federal-Aid Project No. HS-STP-011-2(38)	
Scale: As Noted Date: November 2010	
SHEET No. S-4 OF 141 SHEETS	



EXPIRATION DATE OF THE LICENSE: 4/30/2012
THIS WORK WAS PREPARED BY
ME OR UNDER MY SUPERVISION
AND CONSTRUCTION OF THIS PROJECT
WILL BE UNDER MY OBSERVATION



CONCRETE HEADWALL DIMENSIONS											
Headwall	West TOW Elev.	East TOW Elev.	INV. ELEV.	"H"	"West"	"W"	"East"	"DW"	"DW-B"	"DE"	"DE-B"
1A	1378.51	1378.51	1376.48	1'-6"	1'-8"	1'-6"	2'-11"	-	-	-	-
1B	1377.50	1377.50	1374.50	3'-0"	2'-2"	4'-0"	1'-0"	-	-	-	-
2A	See Sheet S-6 for Plans		1366.27	3'-0"	See Sheet S-6 for Plans						
2B	See Sheet S-6 for Plans and Elevations										
3A	1365.92	1367.15	1359.15	3'-0"	2'-0"	4'-0"	2'-0"	-	-	-	-
3B	1365.42	1366.71	1359.00	3'-0"	3'-2"	4'-0"	1'-2"	(2) #5	-	-	-
4A	1370.04	1370.04	1366.91	2'-0"	3'-6"	3'-0"	1'-6"	-	(2) #5	-	-
4B	1369.81	1369.81	1366.30	2'-0"	See Sheet S-6 for Plans						
5A	1366.14	1366.14	1362.30	2'-0"	5'-4"	3'-0"	3'-5"	(2) #5	(2) #5	(2) #5	(2) #5
5B	1366.23	1366.23	1361.84	2'-0"	5'-6"	3'-0"	2'-6"	(2) #5	(2) #5	(2) #5	(2) #5
6A	1361.41	1362.61	1356.04	3'-0"	1'-9"	4'-0"	1'-0"	-	-	-	-
6B	1361.60	1363.11	1355.57	3'-0"	4'-4"	4'-0"	1'-0"	(2) #5	-	-	-
7A	1358.92	1358.92	1351.64	3'-0"	6'-7"	4'-0"	1'-0"	(2) #5	-	-	-
7B	1358.31	1358.31	1351.27	3'-0"	6'-0"	4'-0"	1'-0"	(2) #5	-	-	-
8A	1361.49	1361.49	1356.81	2'-0"	3'-4"	3'-0"	3'-0"	(2) #5	(2) #5	(2) #5	(2) #5
8B	1360.68	1360.68	1356.36	2'-0"	1'-0"	3'-0"	4'-9"	-	-	(2) #5	(2) #5
9A	1356.97	1356.97	1353.37	2'-0"	See Sheet S-6 for Plans						

TYPICAL CONCRETE HEADWALL DETAILS
Scale: 1/2" = 1'-0"

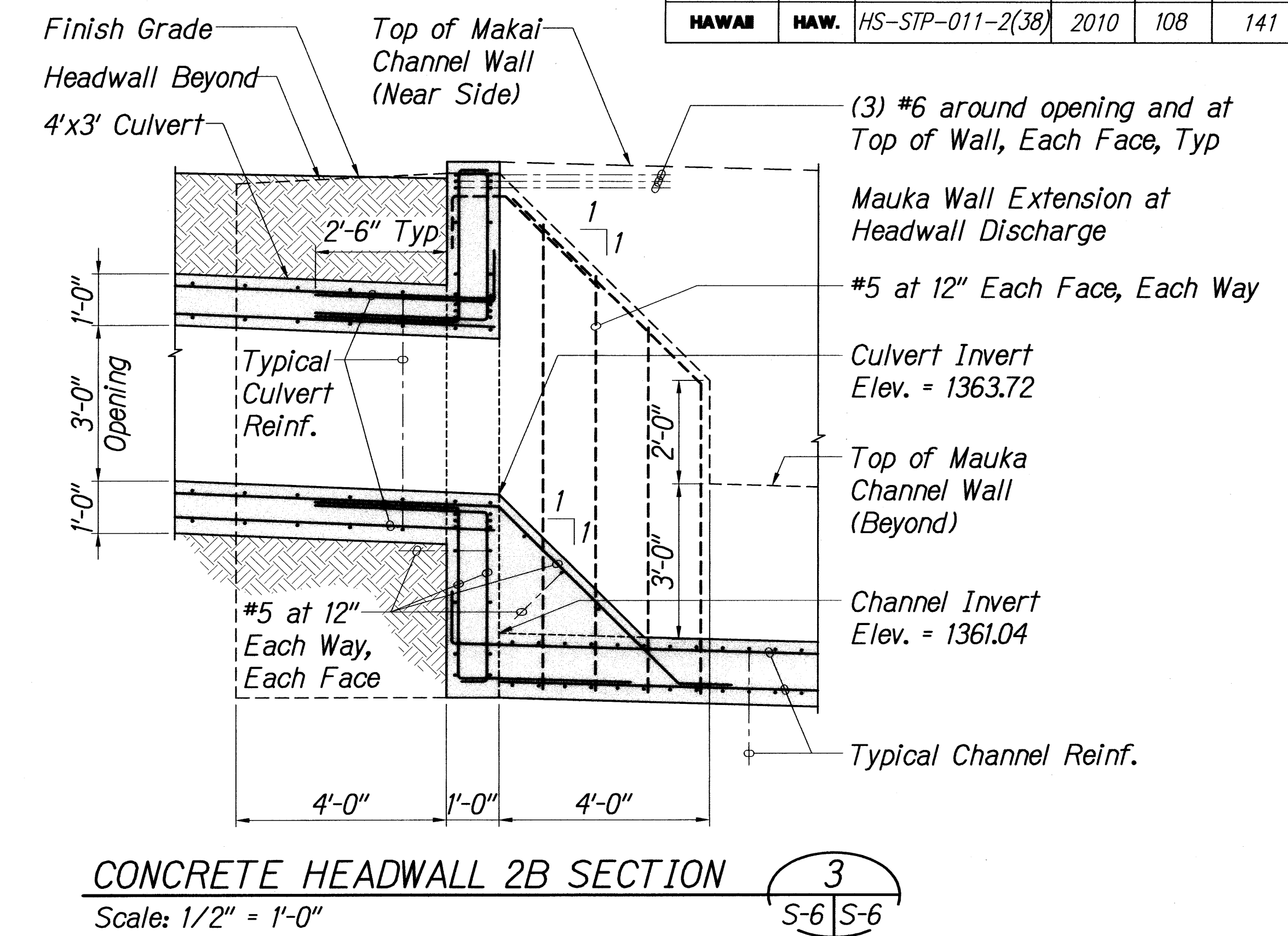
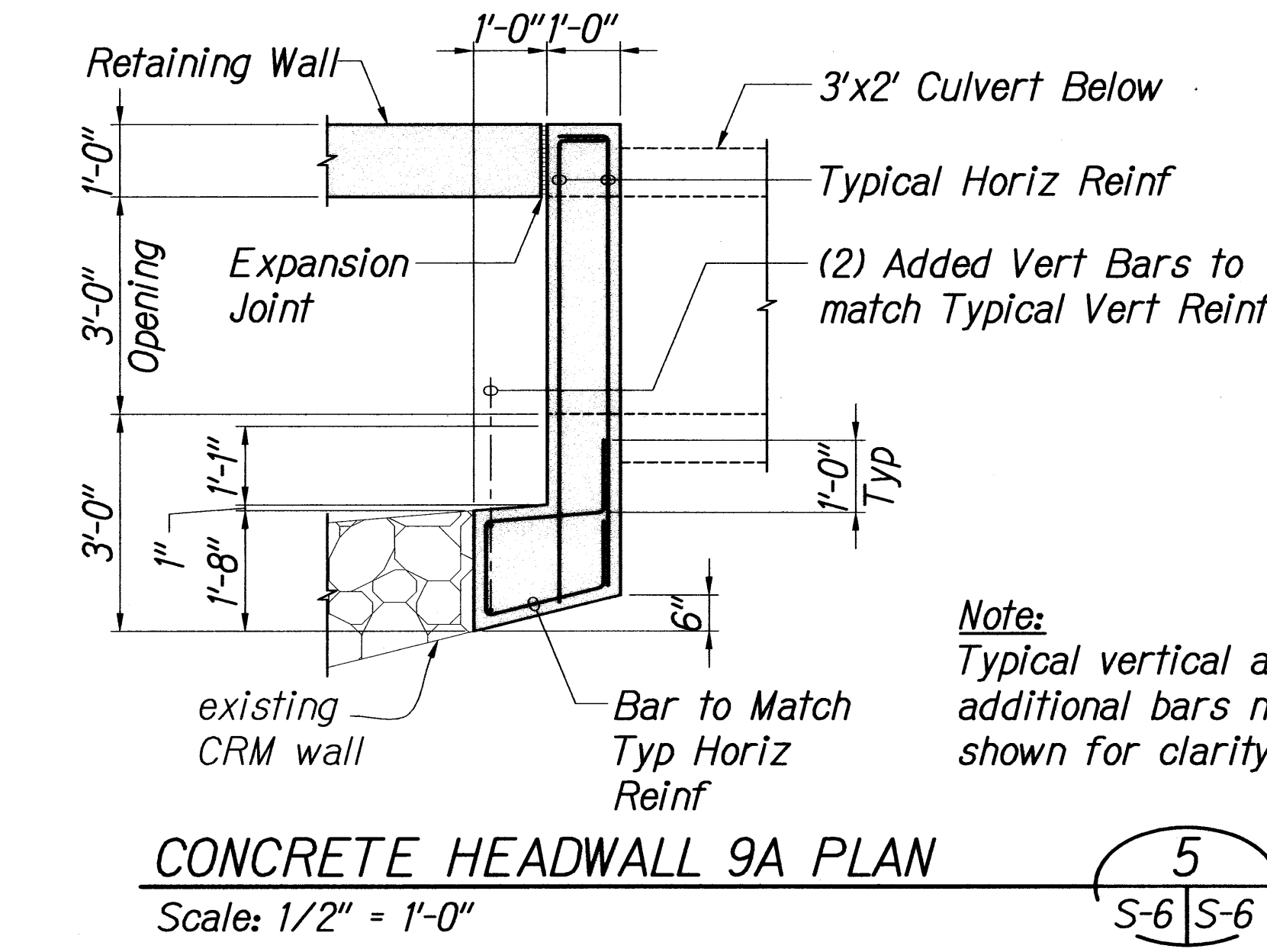
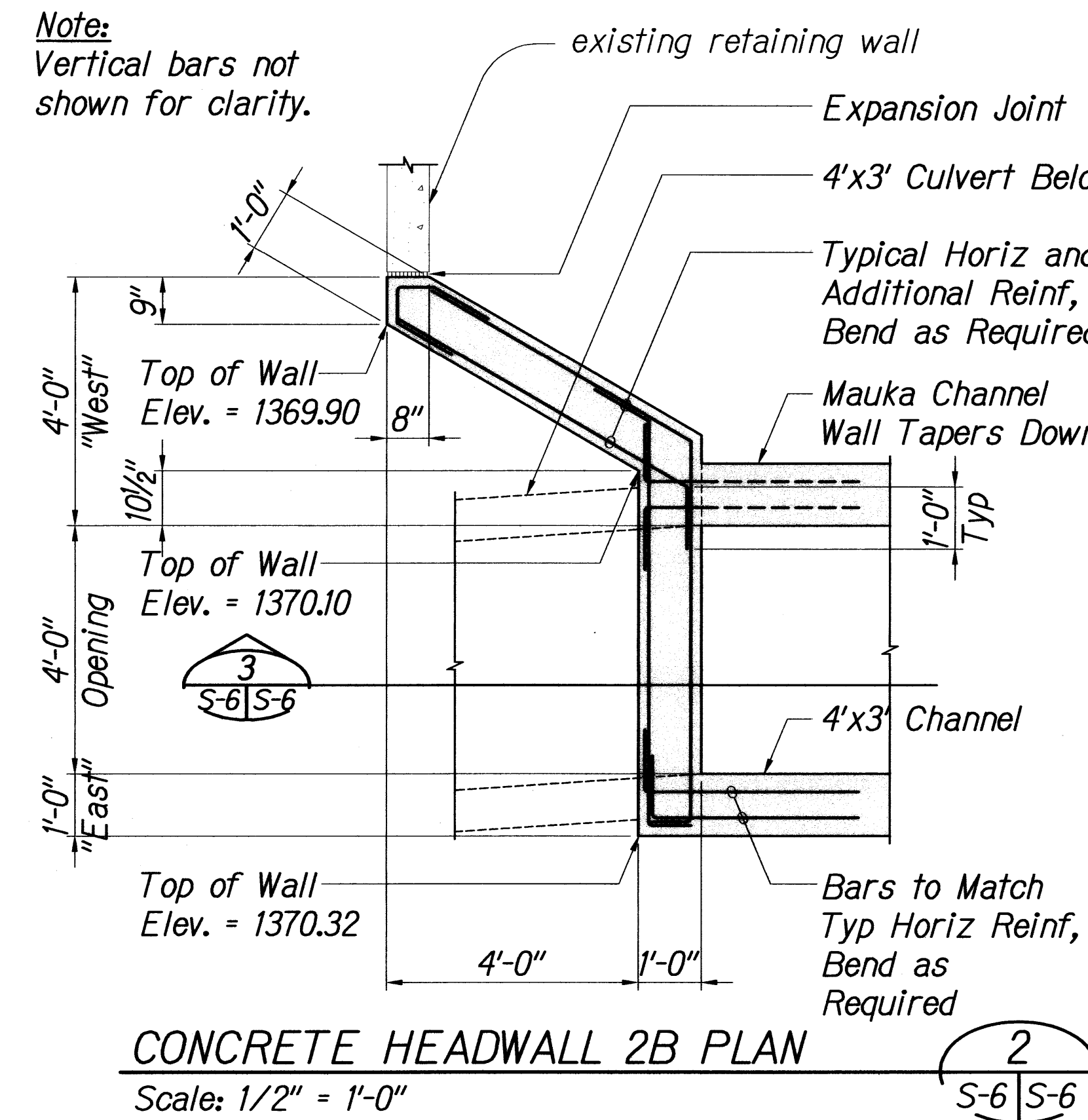
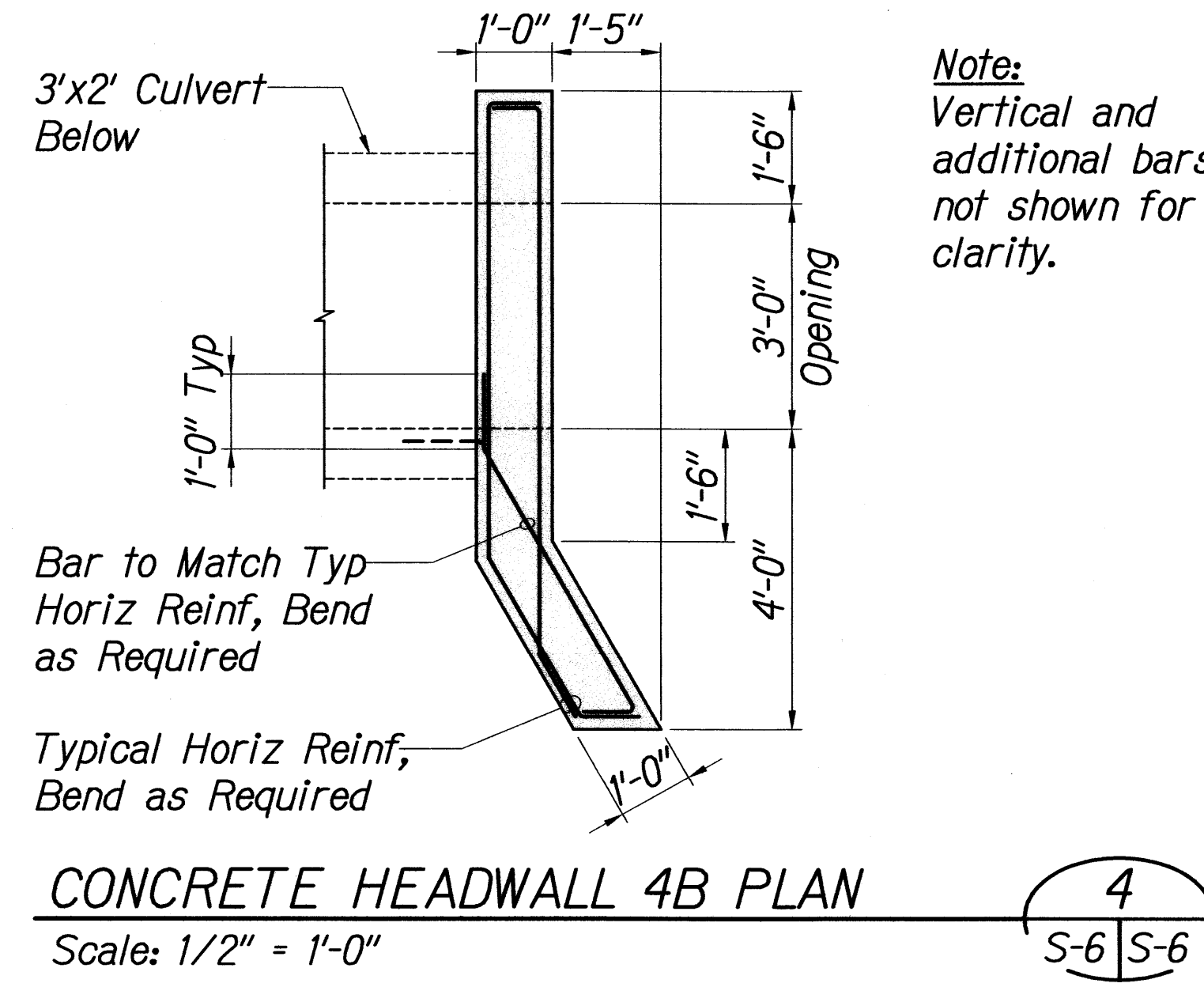
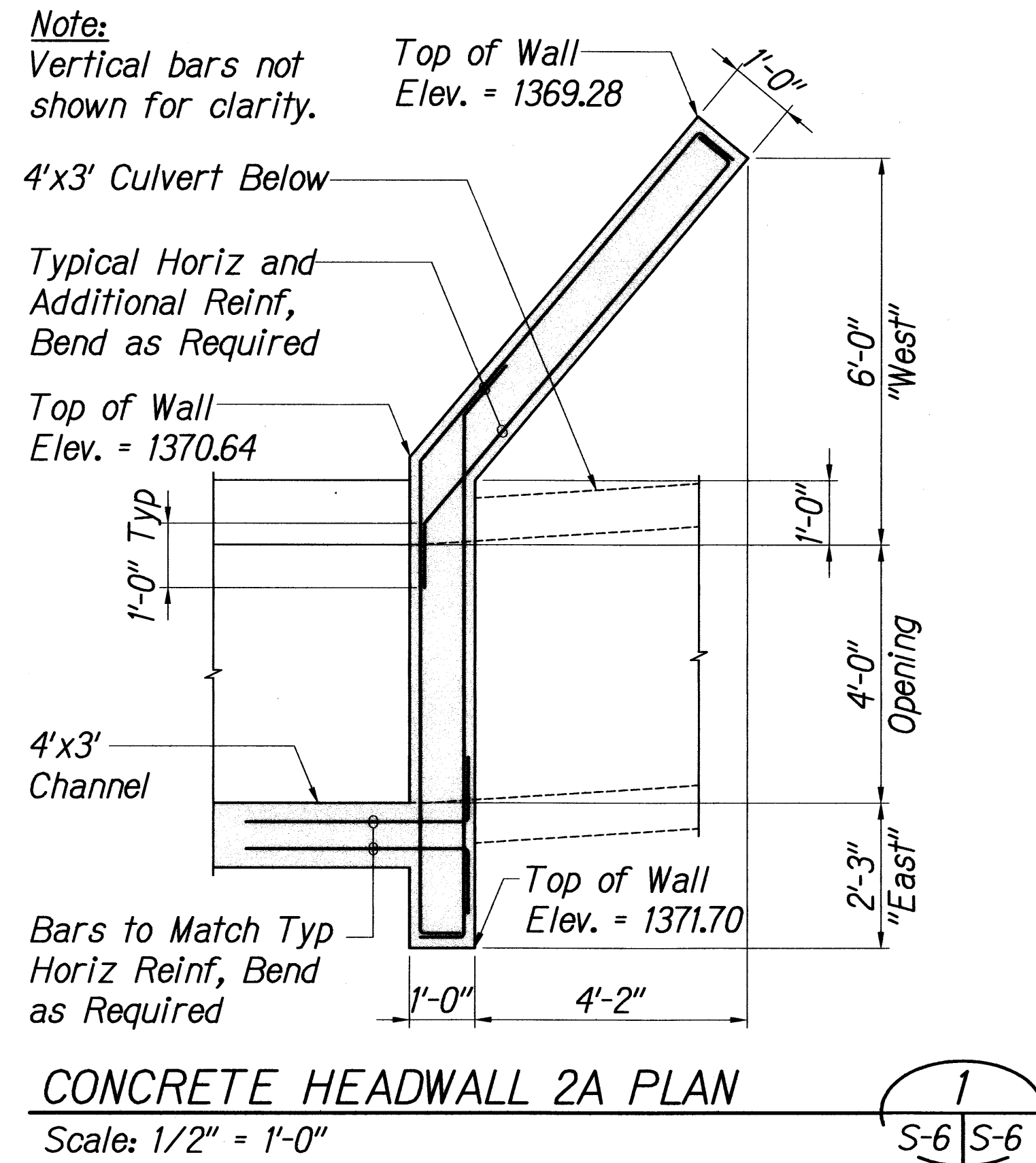
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S-5 S-5

SURVEY PLOTTED BY: _____ DATE: _____
DRAWN BY: _____
CHECKED BY: _____
DESIGNED BY: _____
NOTE BOOK: _____
QUANTITIES BY: _____
CHECKED BY: _____
No. _____

KEN TAZUO HAYASHIDA
LICENSED PROFESSIONAL ENGINEER
No. 8818-S
HAWAII, U.S.A.
EXPIRATION DATE OF THE LICENSE 4/30/2012
THIS WORK WAS PREPARED BY
ME OR UNDER MY SUPERVISION
AND CONSTRUCTION OF THIS PROJECT
WILL BE UNDER MY OBSERVATION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
TYPICAL CONCRETE HEADWALL
SECTIONS AND DETAILS
Volcano Road Intersection and
Drainage Improvements
Federal-Aid Project No. HS-STP-011-2(38)
Scale: As Noted Date: November 2010
SHEET No. S-5 OF 141 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**CONCRETE HEADWALL 9A AND 9C
PLANS, ELEVATIONS, AND DETAILS**

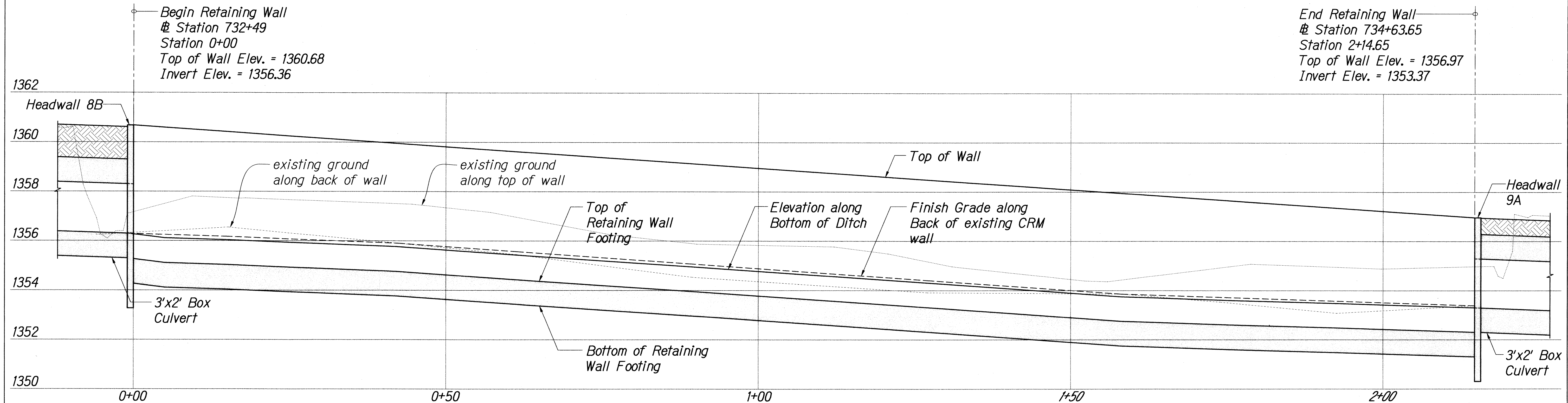
Volcano Road Intersection and
Drainage Improvements

Federal-Aid Project No. HS-STP-011-2(38)

Scale: As Noted Date: November 2010

SHEET No. S-6 OF 141 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HS-STP-011-2(38)	2010	109	141



MAKAI RETAINING WALL PROFILE 1
Horizontal Scale: 1/8" = 1'-0"
Vertical Scale: 1/2" = 1'-0"

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

KEN KAZUO HAYASHIDA
LICENSED PROFESSIONAL ENGINEER
No. 6818-S
HAWAII, U.S.A.

K. Hayashida
EXPIRATION DATE: 4/30/2012
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AND CONSTRUCTION OF THIS PROJECT
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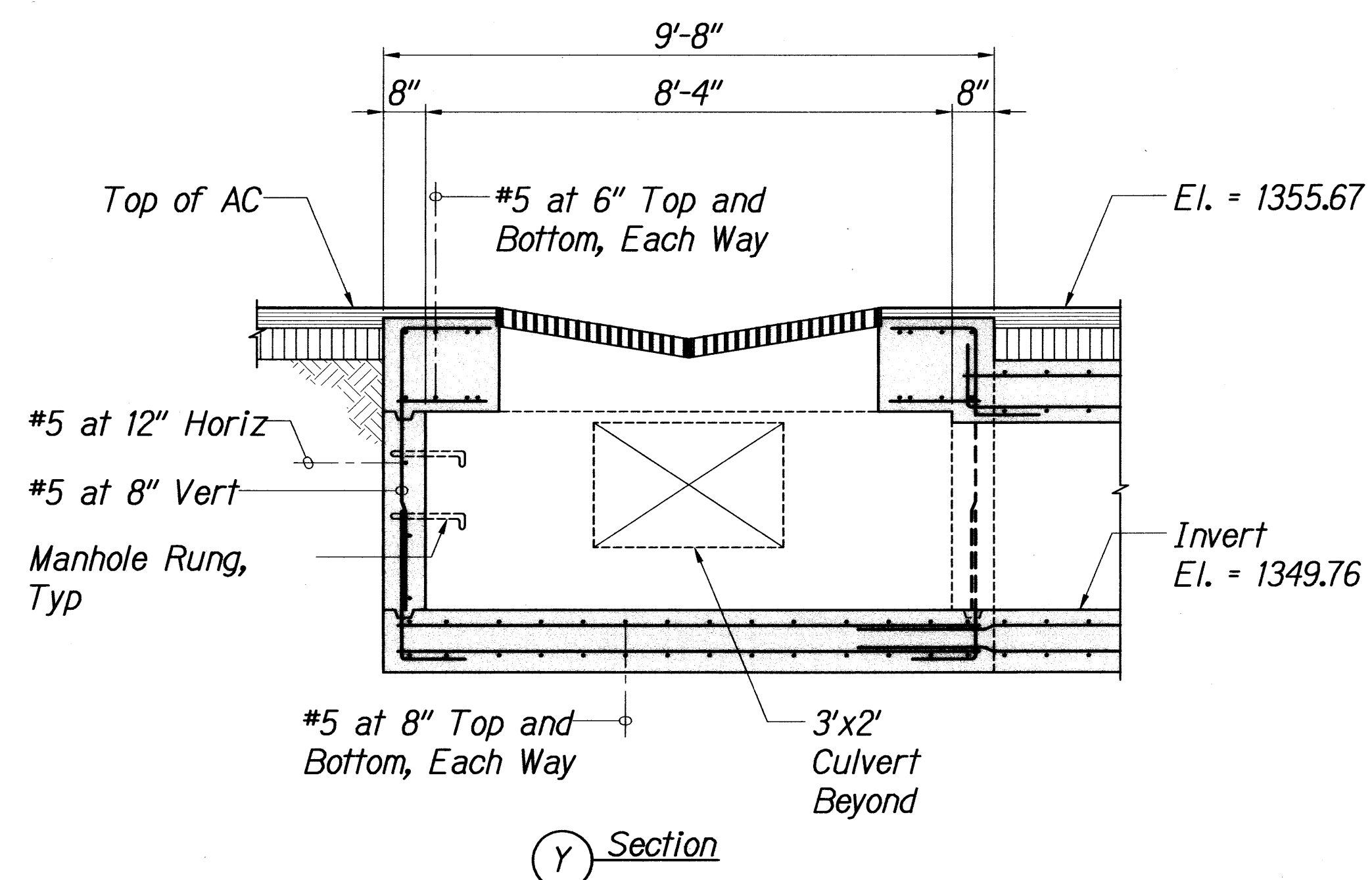
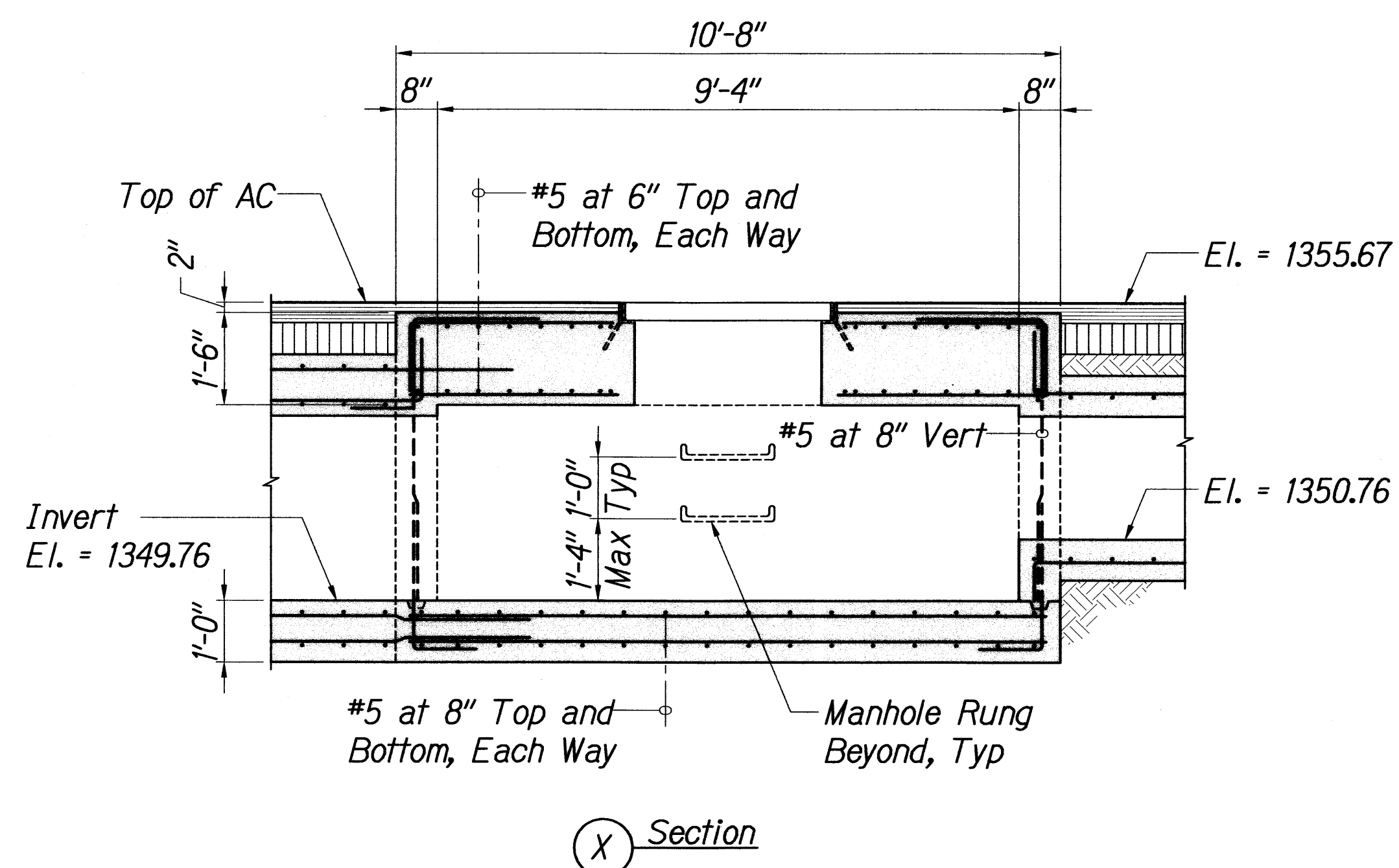
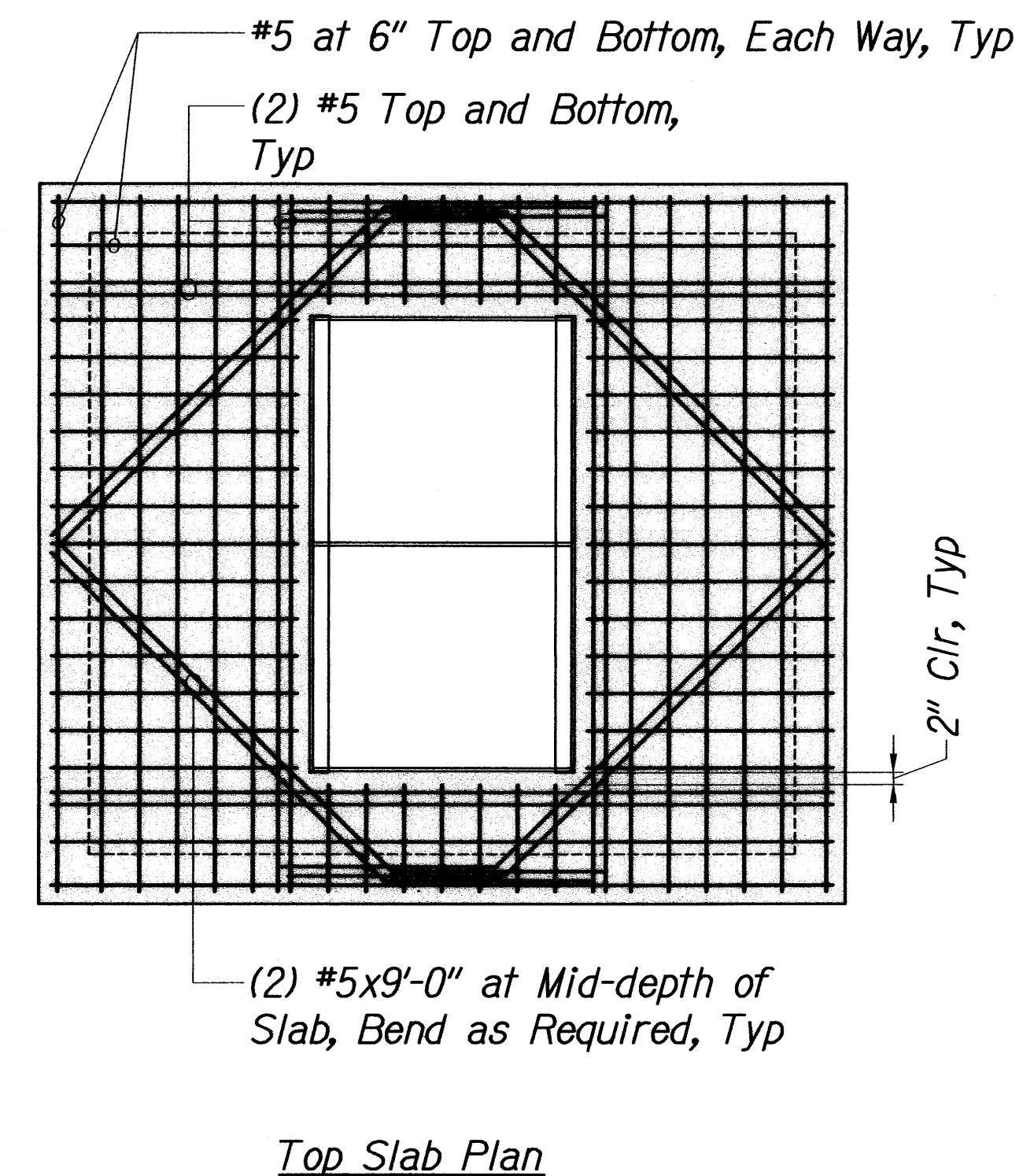
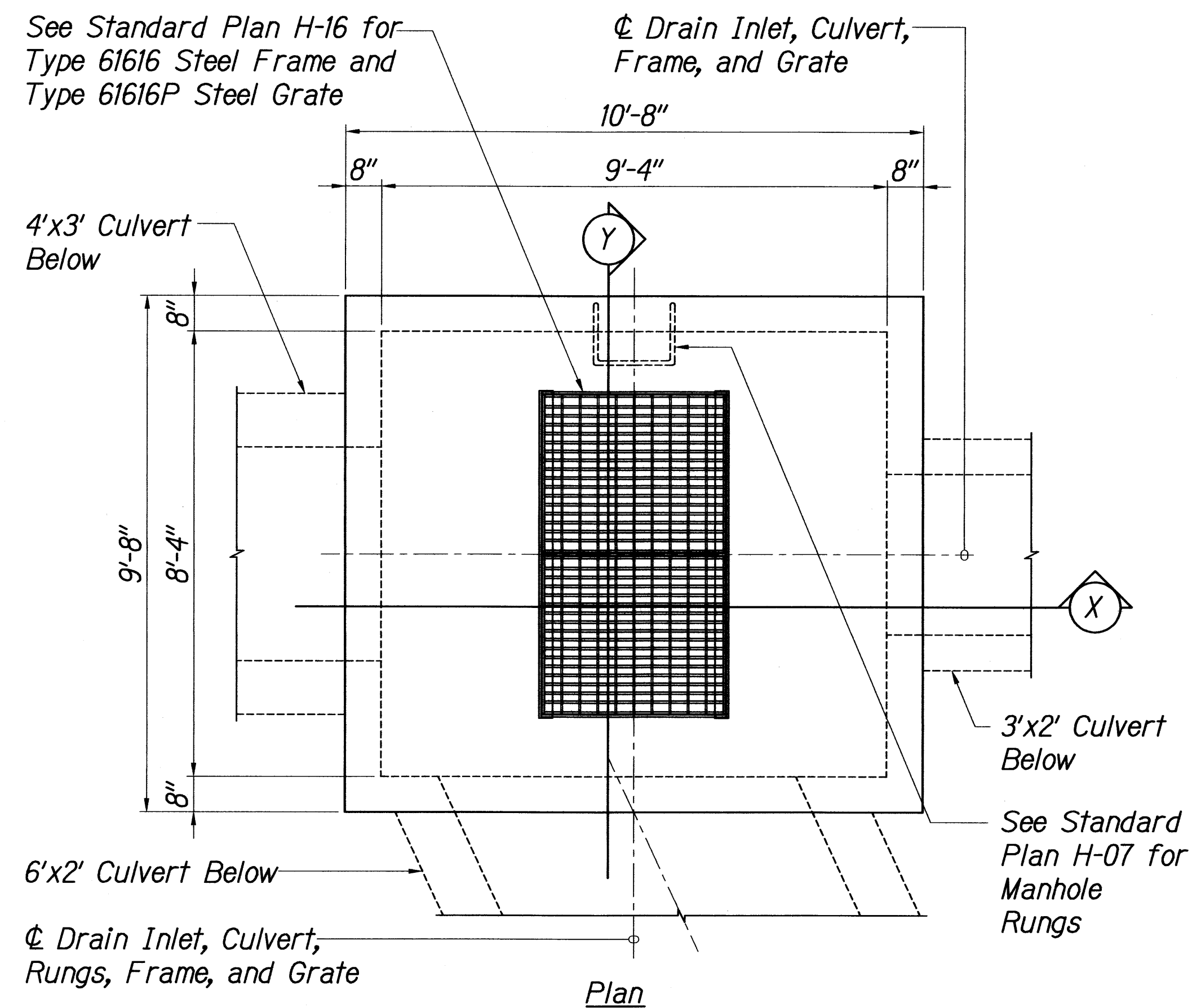
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

MAKAI RETAINING WALL PROFILE

Volcano Road Intersection and
Drainage Improvements
Federal-Aid Project No. HS-STP-011-2(38)

Scale: As Noted Date: November 2010

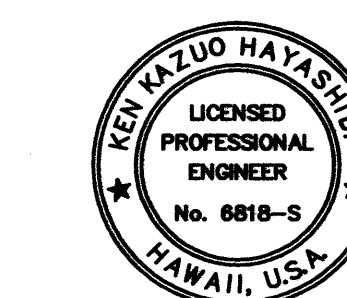
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HS-STP-011-2(38)	2010	111	141



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

DRAIN INLET D2
Scale: 1/2" = 1'-0"

1
S-9 S-9



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STATE OF HAWAII
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HIGHWAYS DIVISION

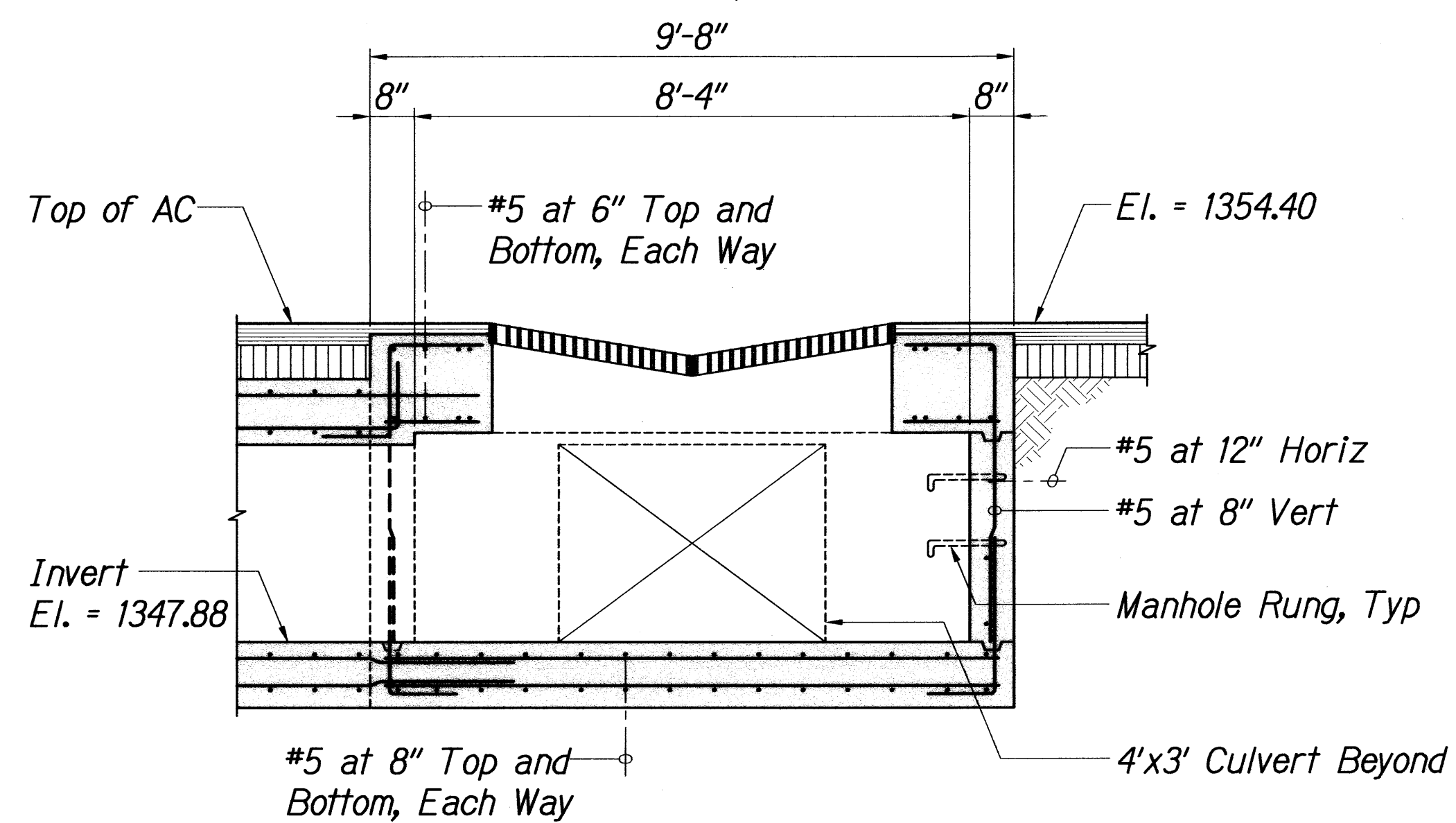
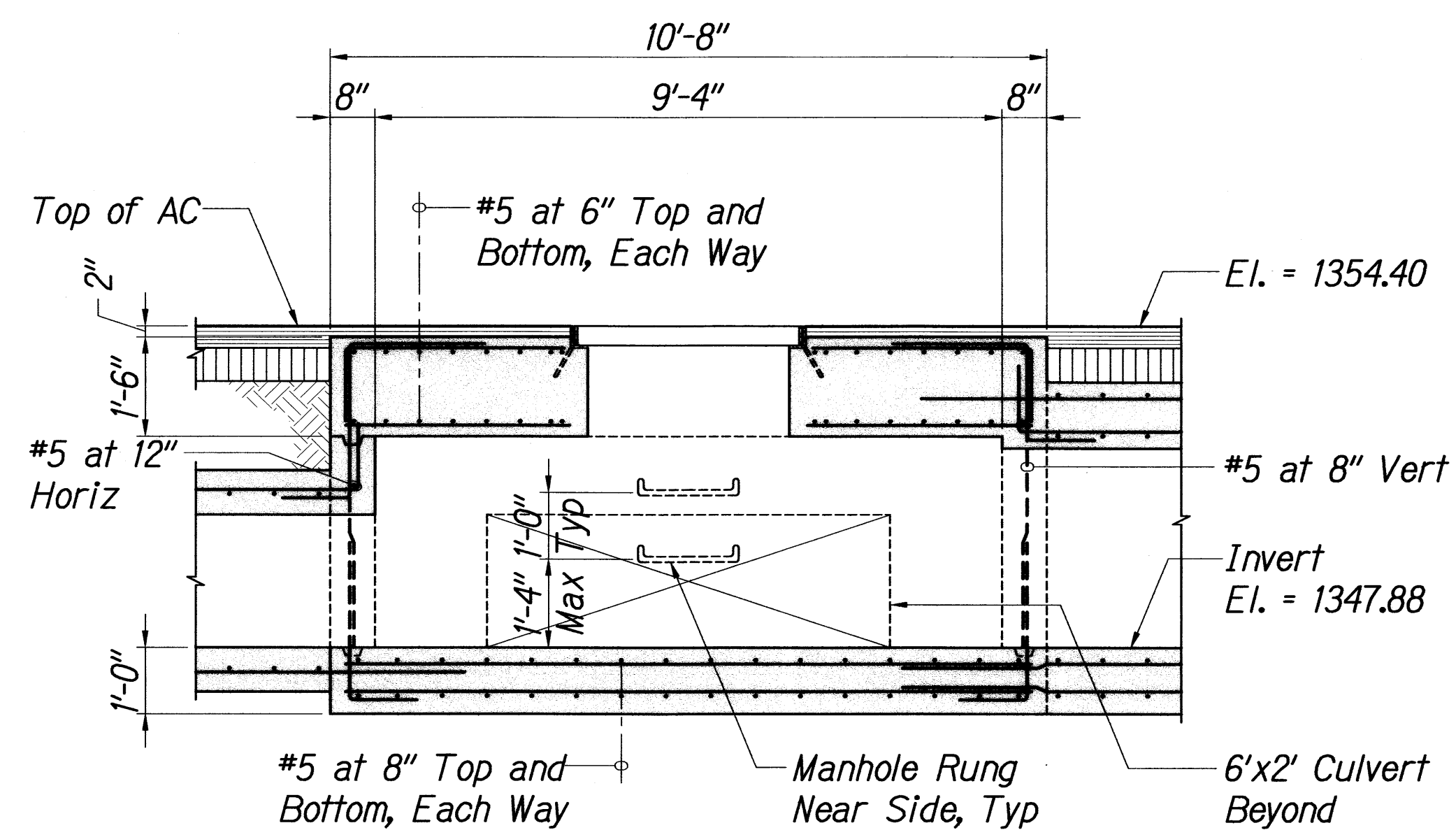
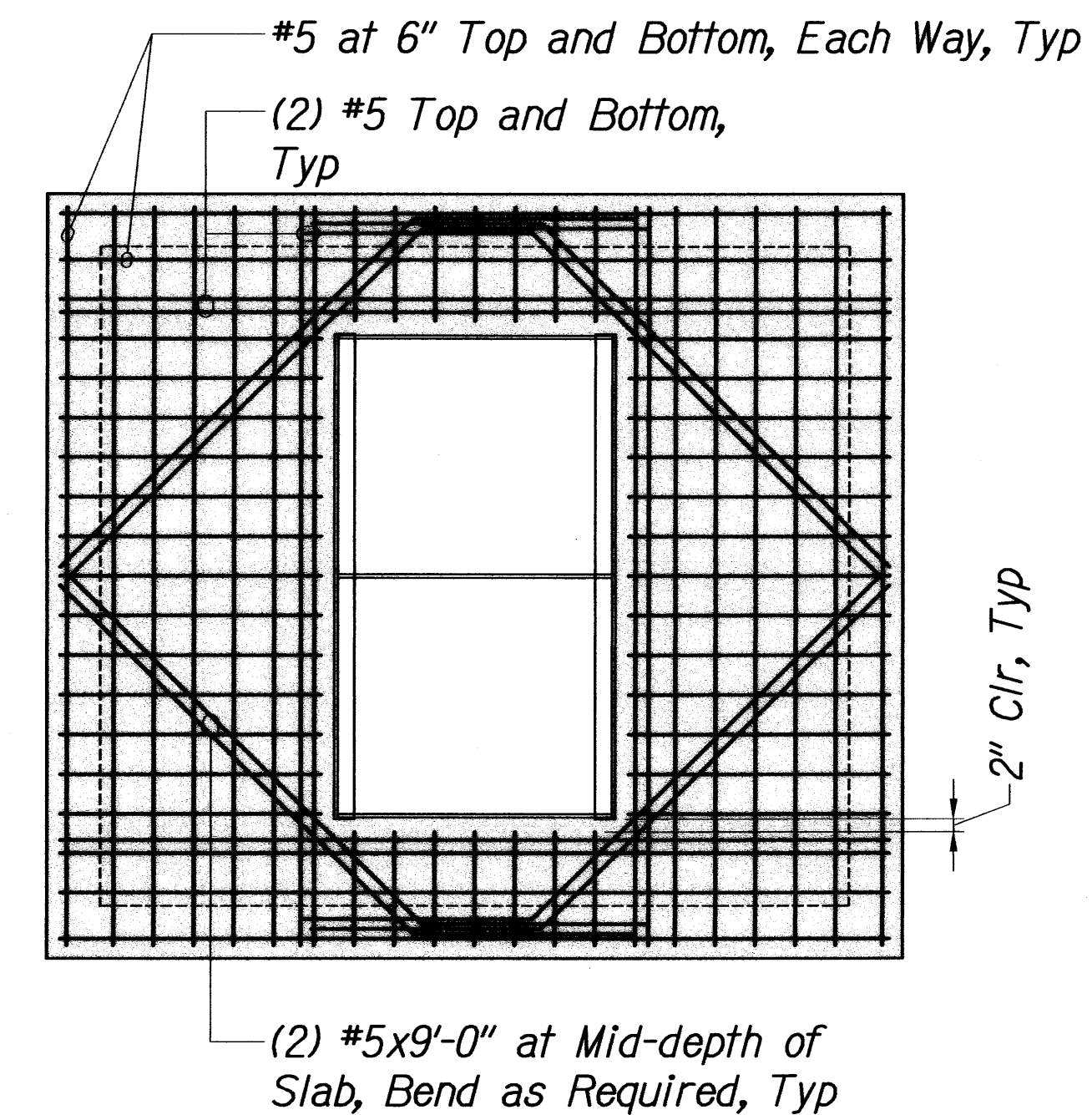
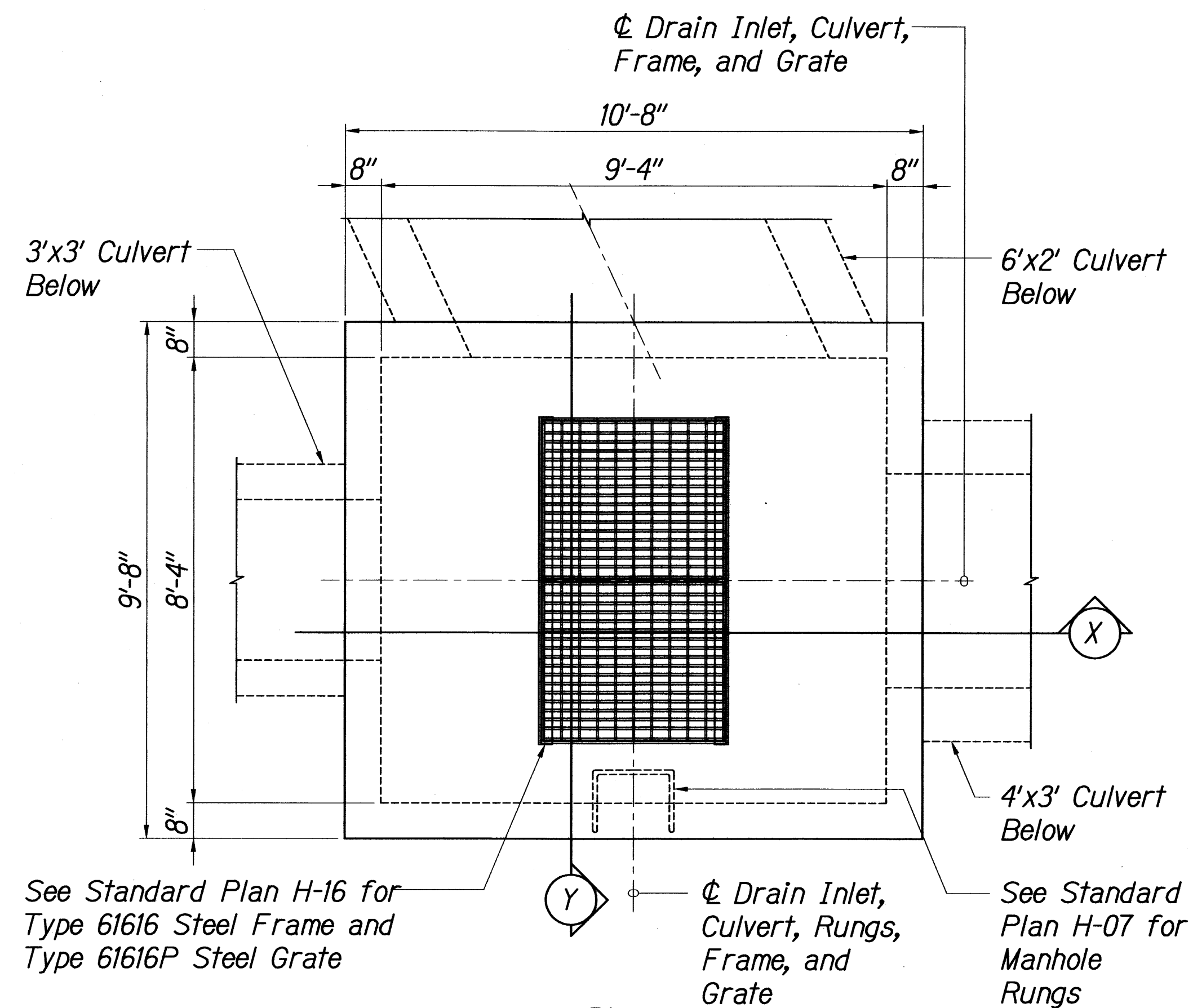
DRAIN INLET D2 PLANS

Volcano Road Intersection and
Drainage Improvements
Federal-Aid Project No. HS-STP-011-2(38)

Scale: As Noted Date: November 2010

SHEET No. S-9 OF 141 SHEETS

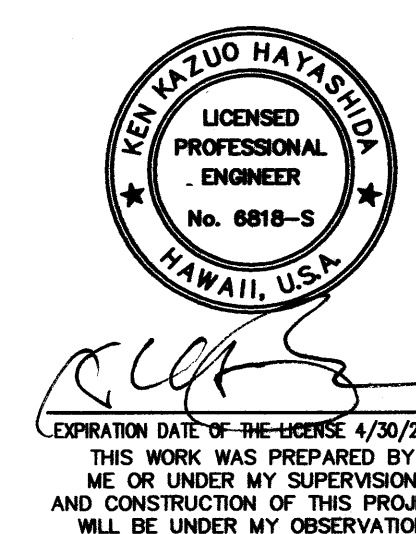
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HAWAII	HAW.	HS-STP-011-2(38)	2010	112	141



DRAIN INLET D4
Scale: 1/2" = 1'-0"

1
S-10 S-10

SURVEY PLOTTED BY	DATE
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TRACED BY	
CHECKED BY	
NOTE BOOK	
QUANTITIES BY	
CHECKED BY	
No.	



STATE OF HAWAII
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HIGHWAYS DIVISION

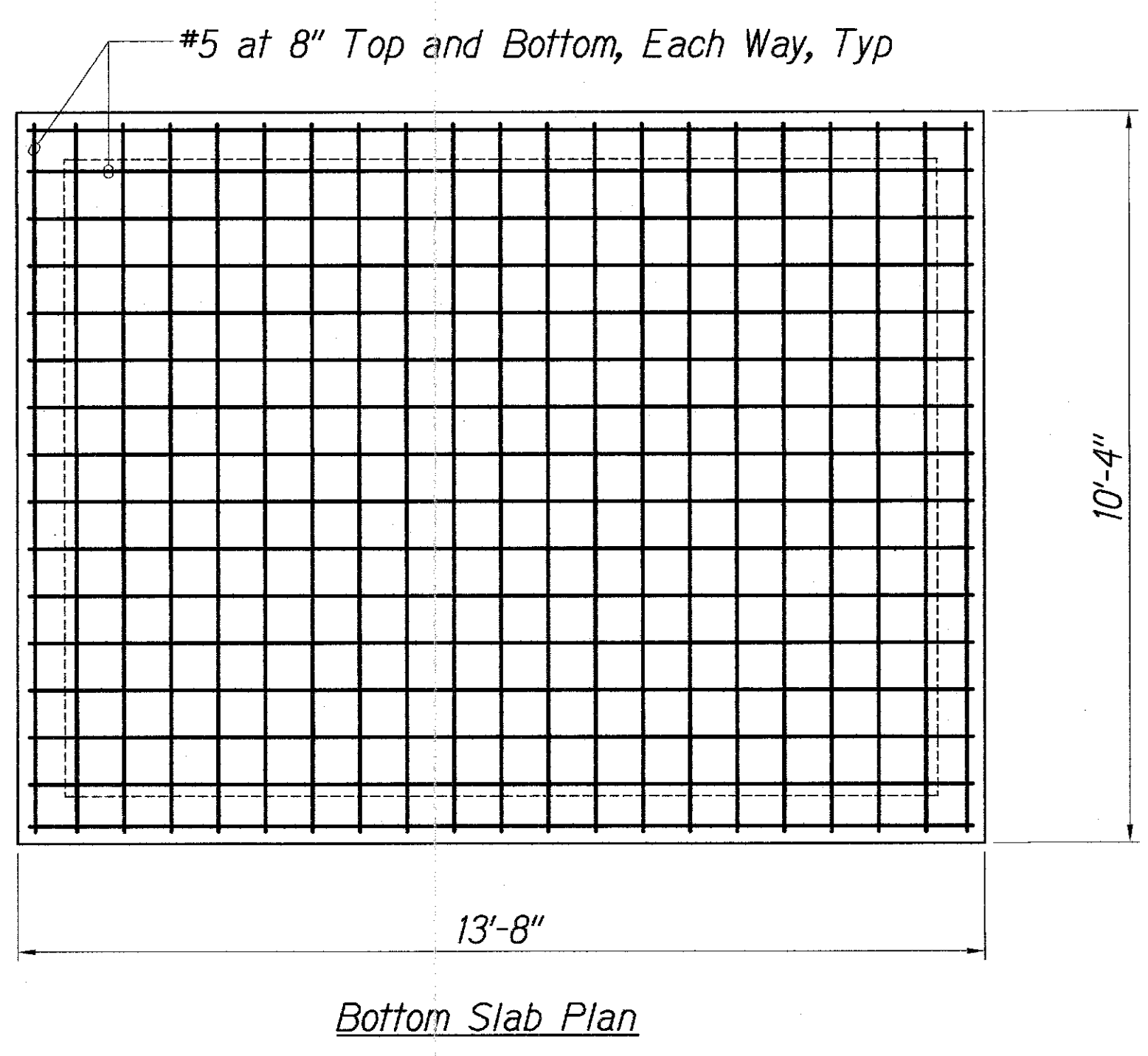
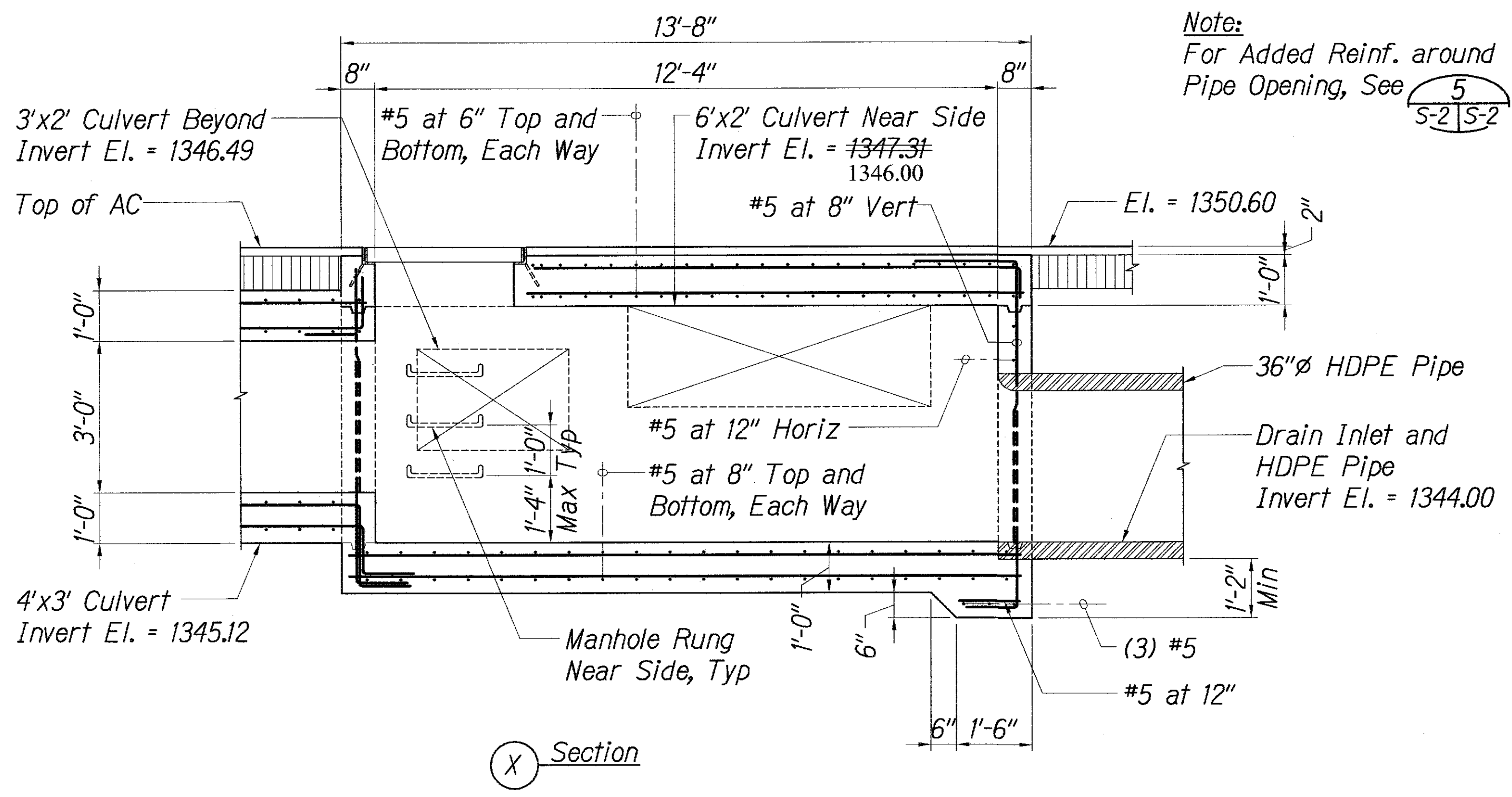
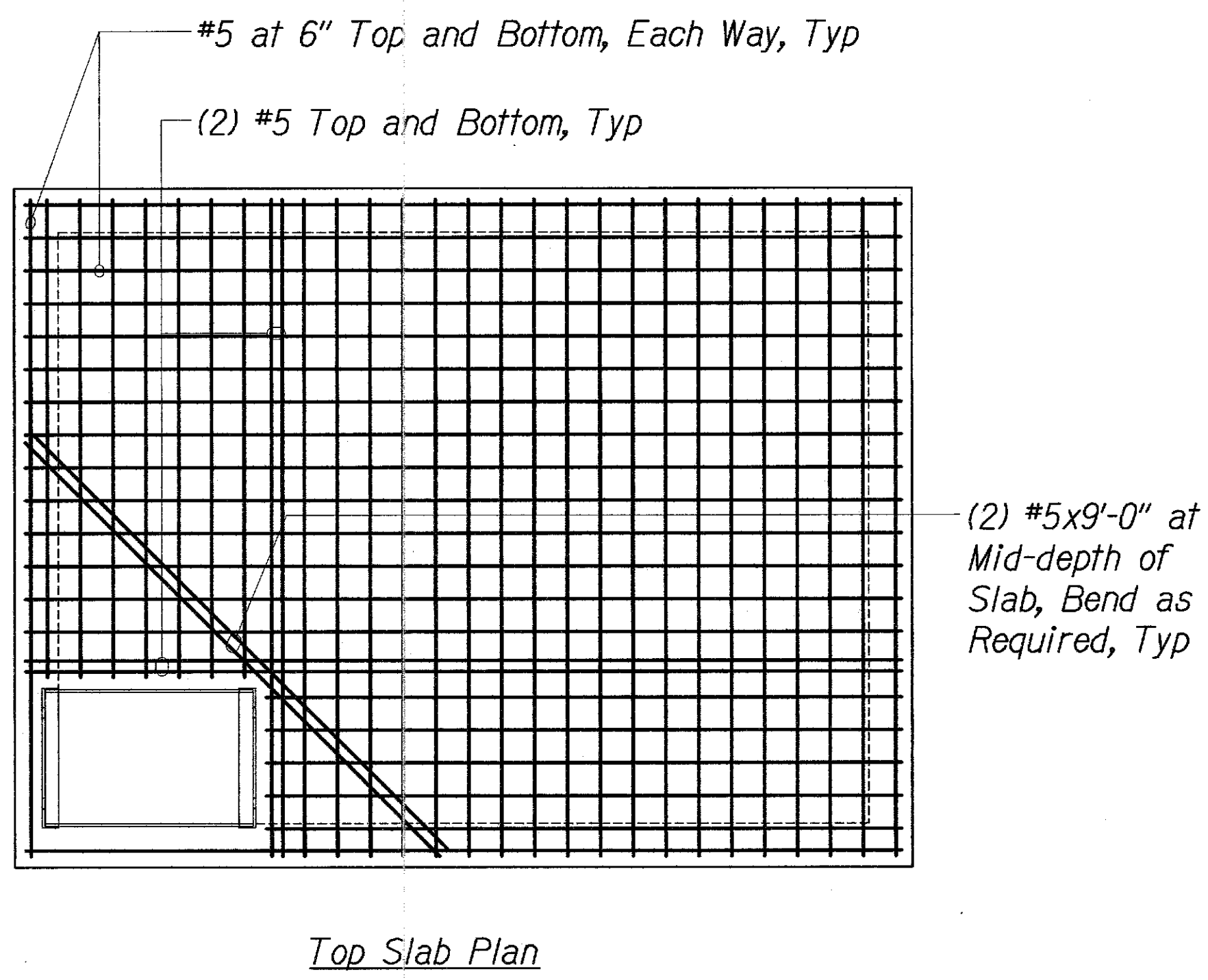
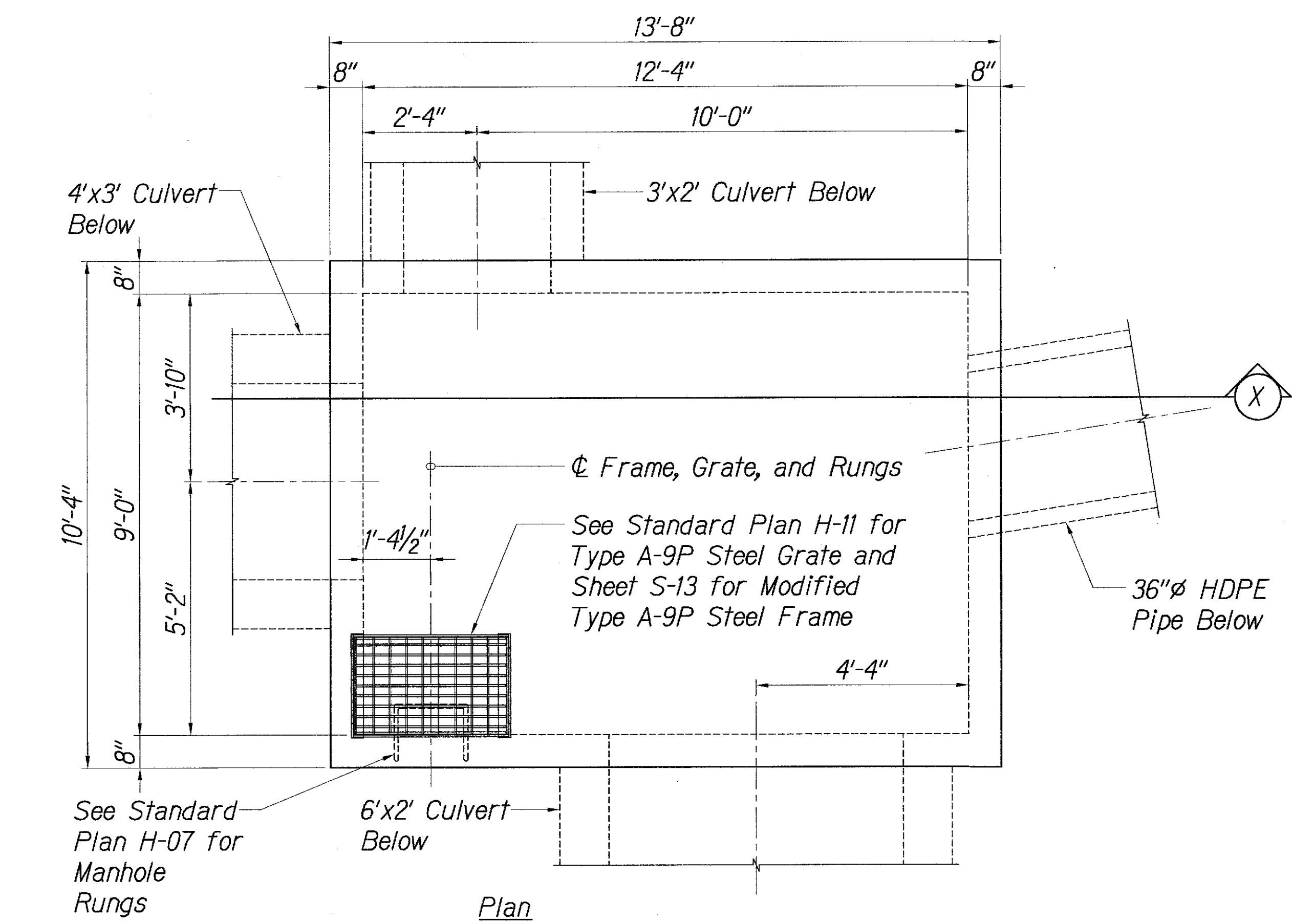
DRAIN INLET D4 PLANS

*Volcano Road Intersection and
Drainage Improvements*
Federal-Aid Project No. HS-STP-011-2(38)

Scale: As Noted Date: November 2010

SHEET No. S-10 OF 141 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HS-STP-011-2(38)	2010	113	141



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

DRAIN INLET D5
Scale: 1/2" = 1'-0"

1
S-11 S-11

LEGEND FOR AS-BUILT POSTINGS	
	Squiggly line for as-built deletion
	Double line for as-built deletion
Roadway	Text for as-built posting



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HIGHWAYS DIVISION

DRAIN INLET D5 PLANS

Volcano Road Intersection and
Drainage Improvements
Federal-Aid Project No. HS-STP-011-2(38)

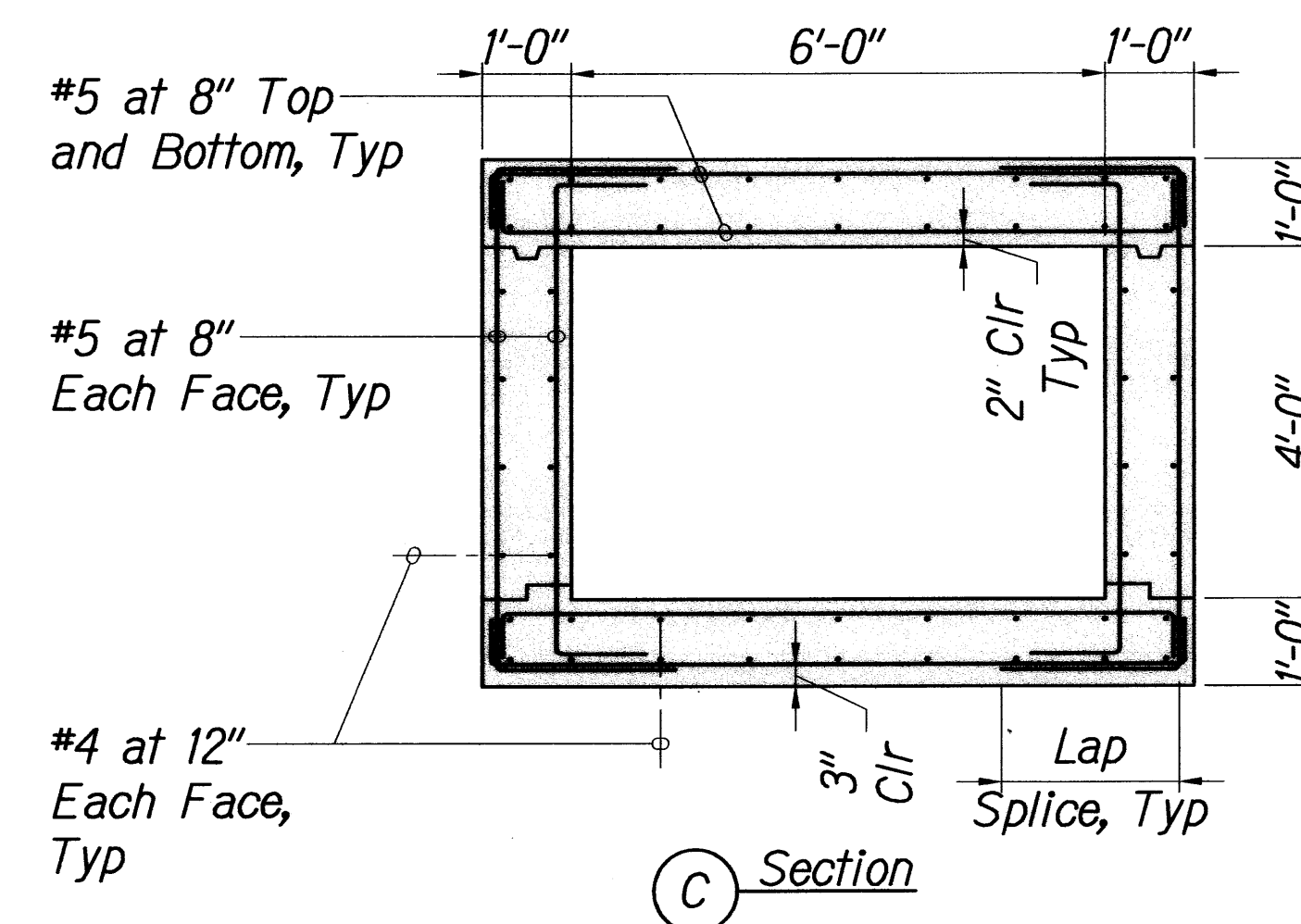
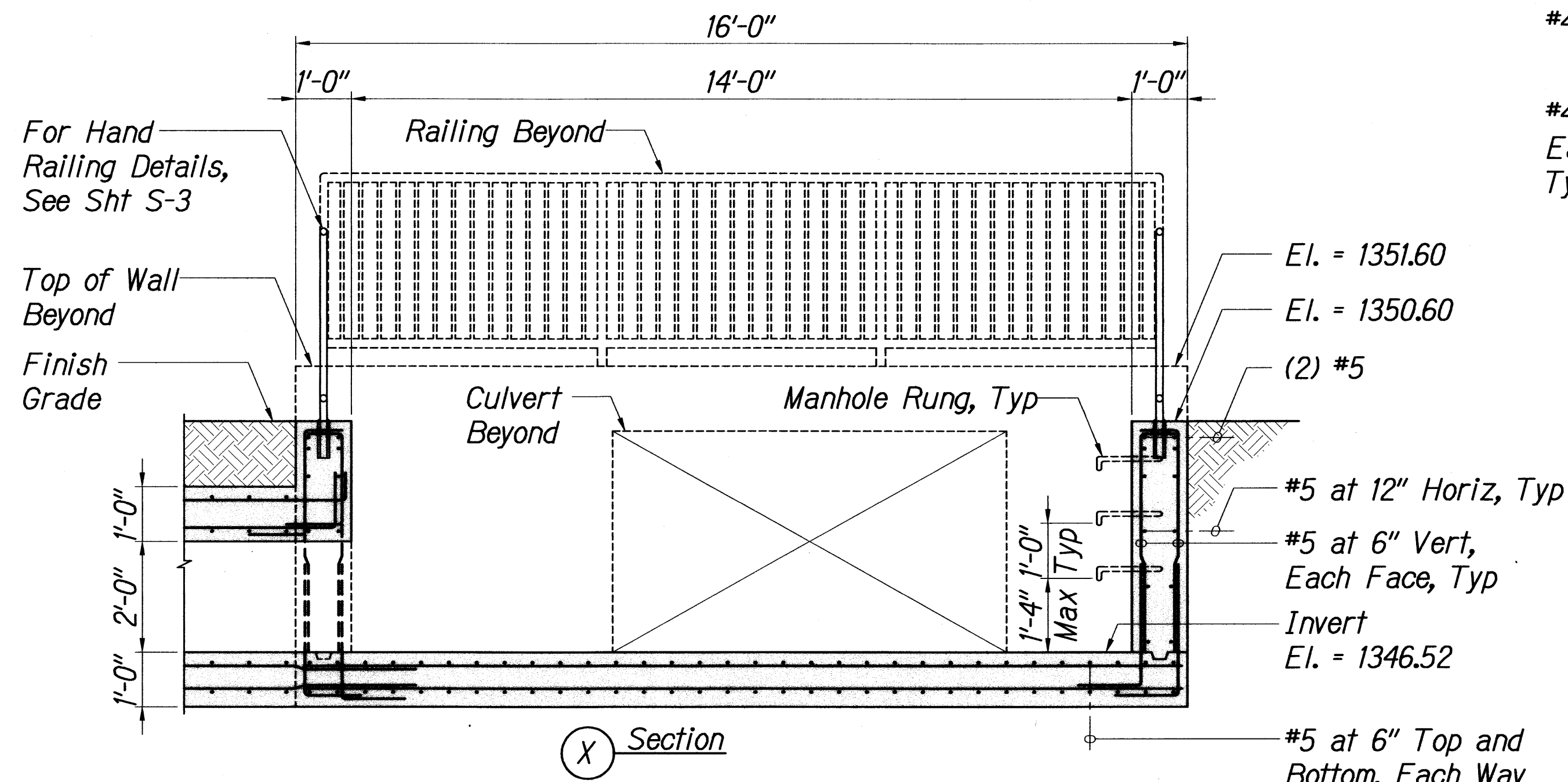
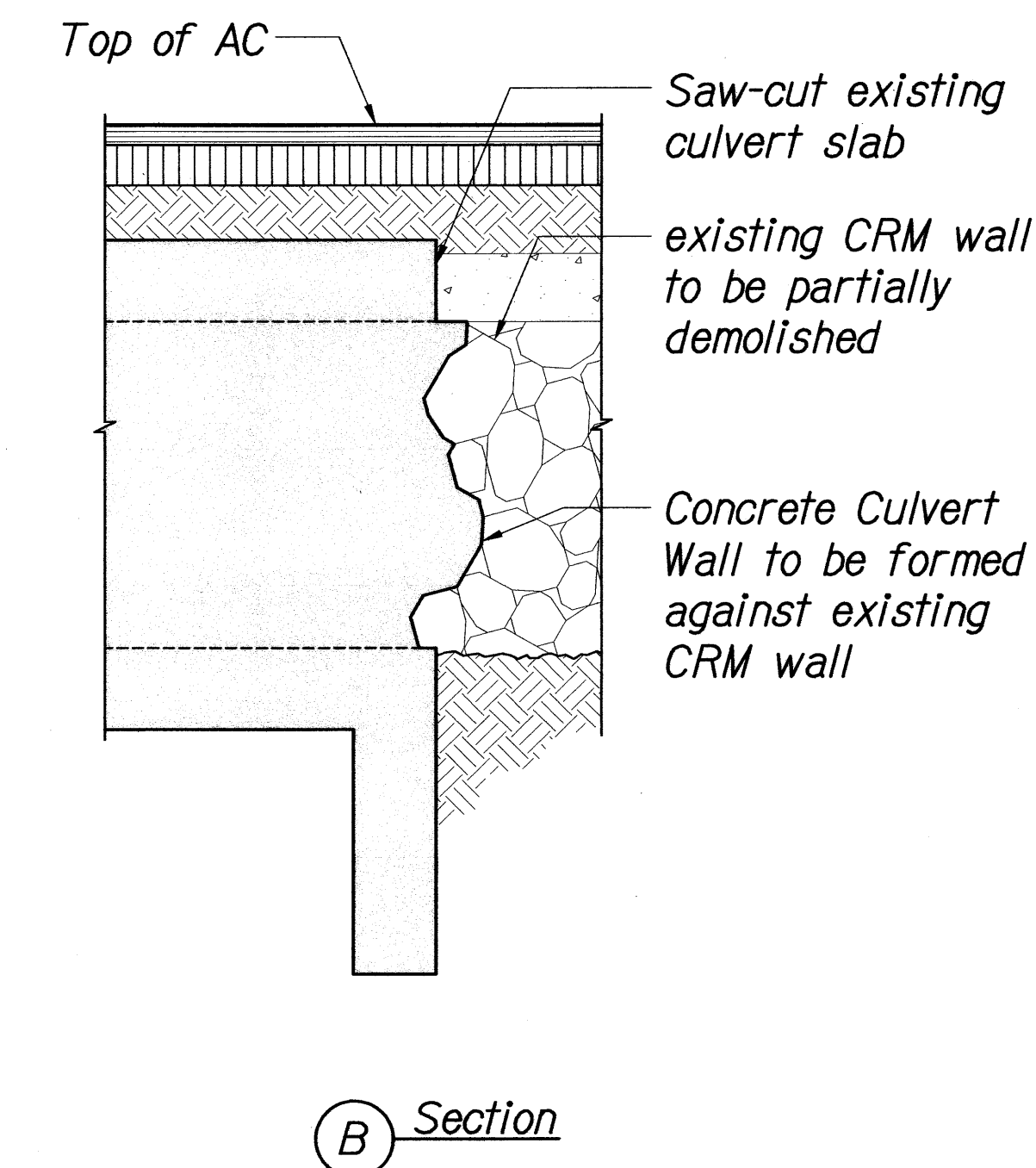
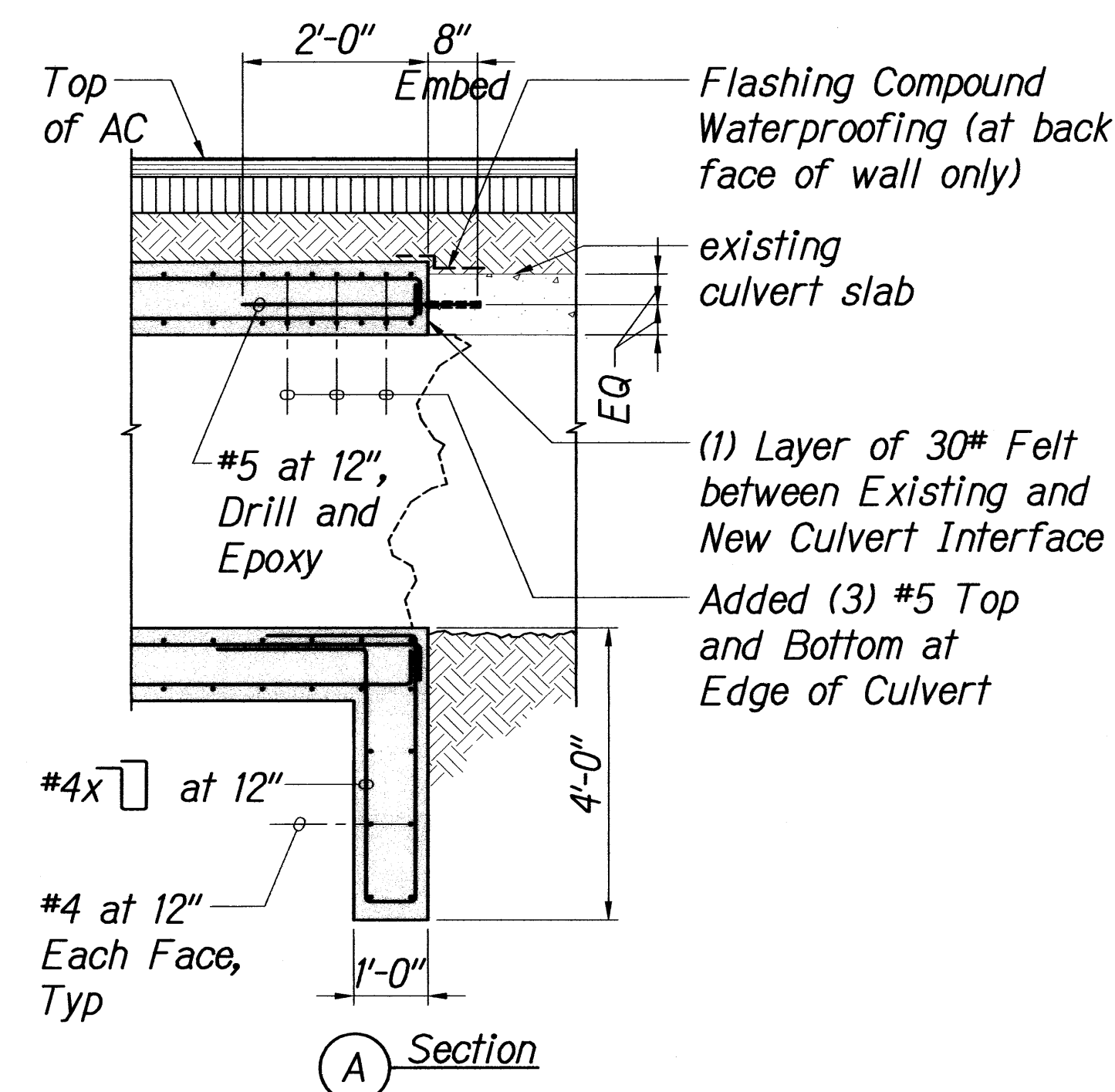
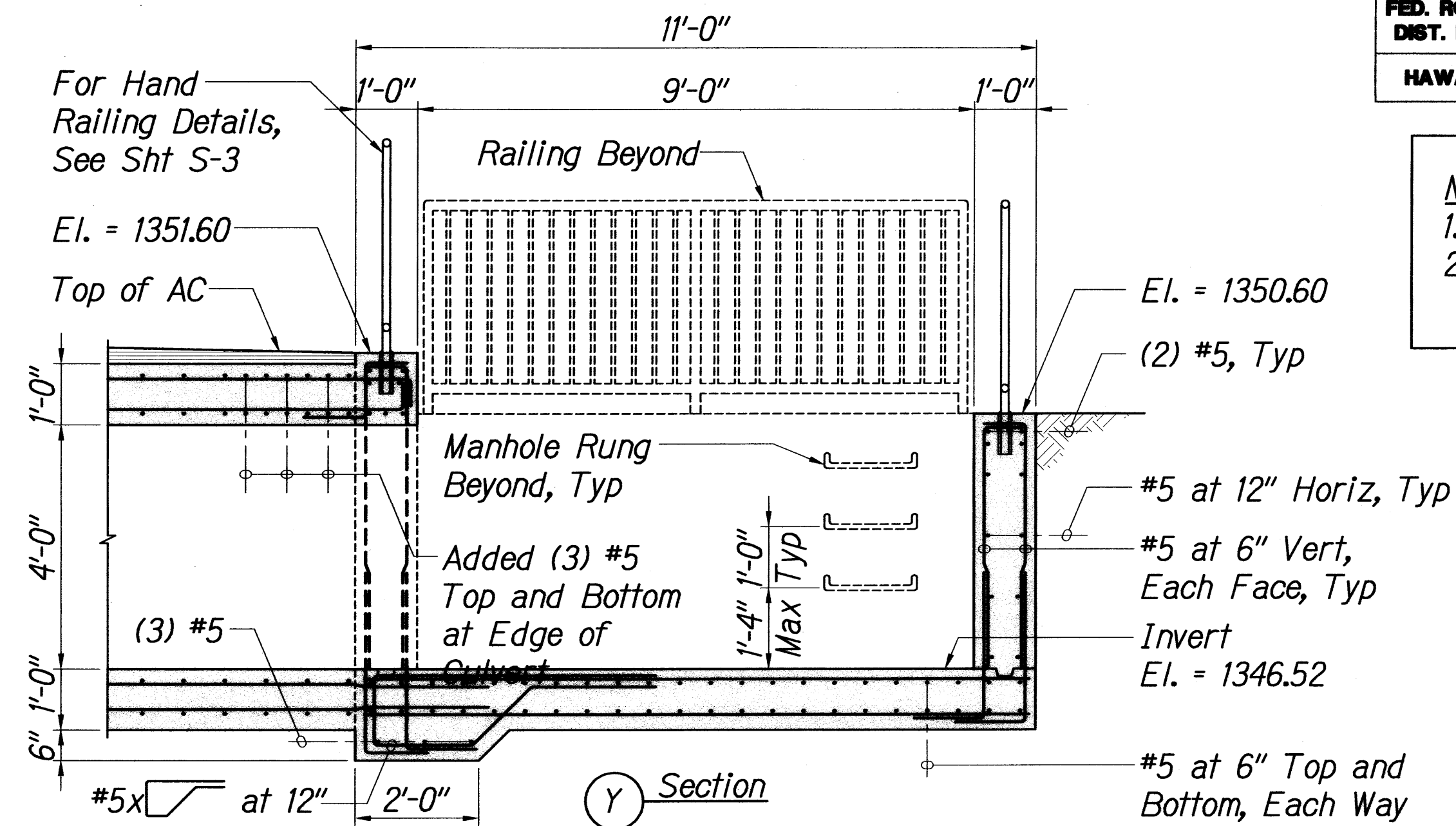
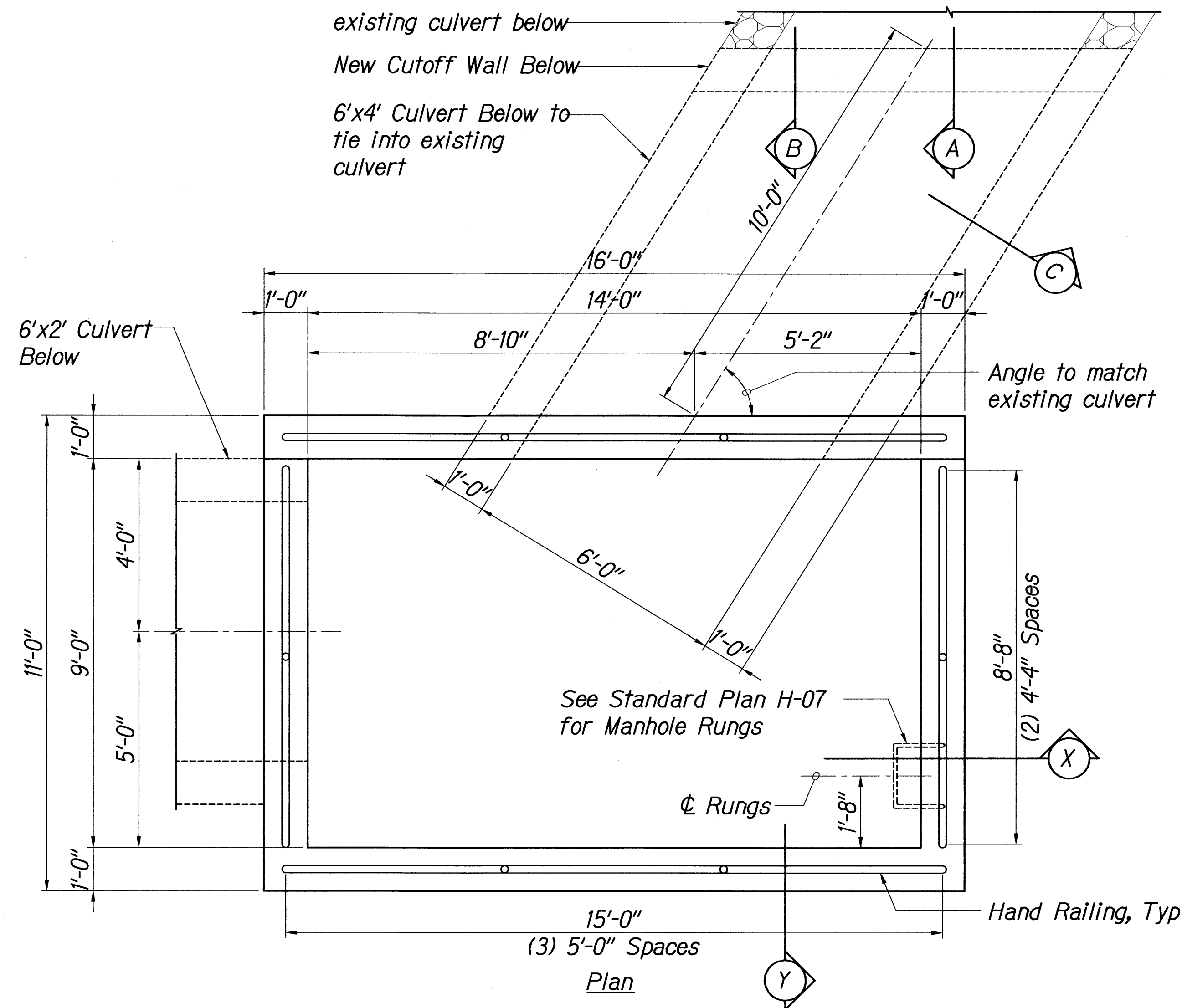
Scale: As Noted Date: November 2010

SHEET No. S-11 OF 141 SHEETS

"AS-BUILT"

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HS-STP-011-2(38)	2010	114	141

Notes:
 1. See Civil Dwg's for culvert elevations.
 2. Expansion/Contraction Joints shall not be constructed in culvert sections.



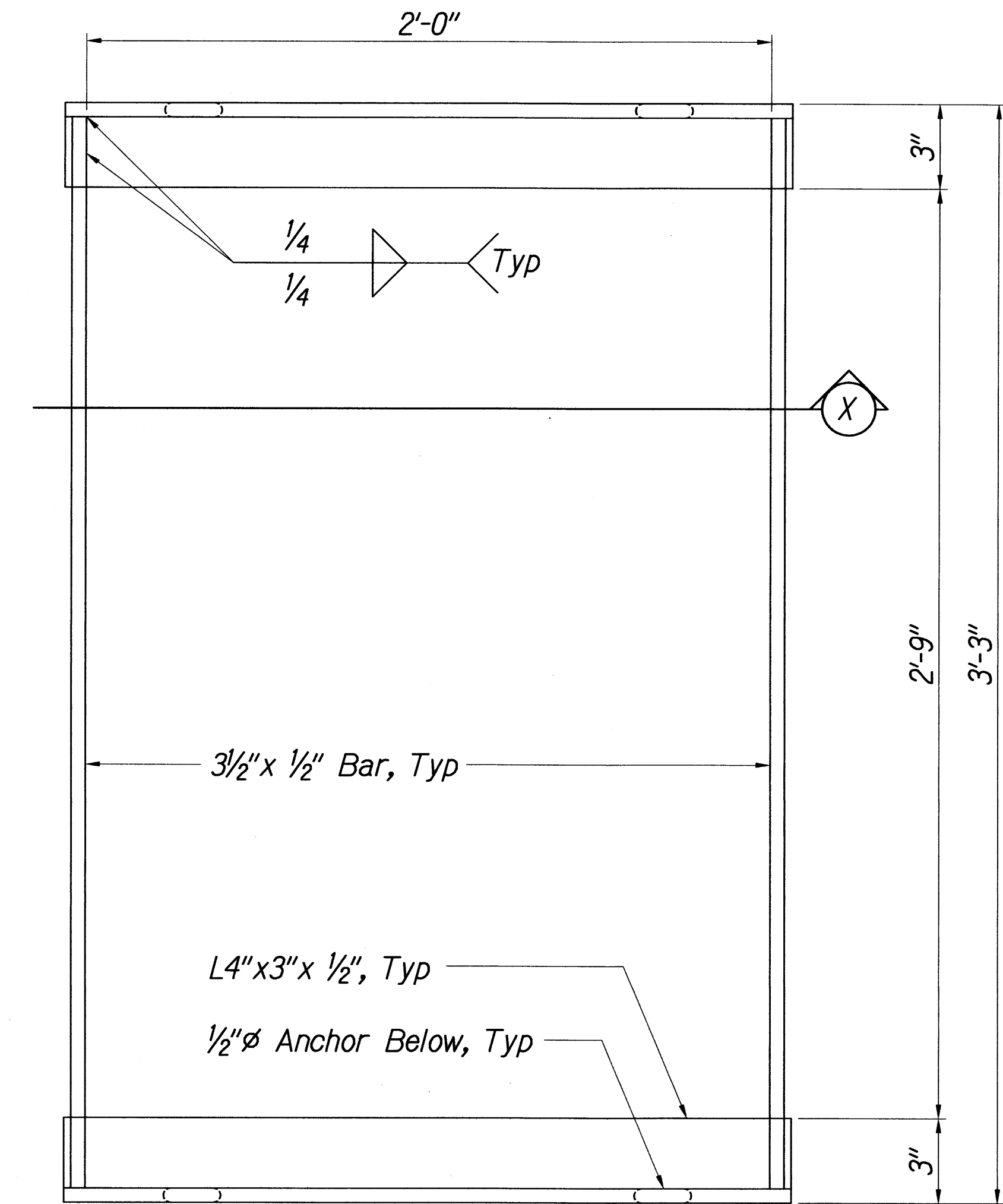
SURVEY PLOTTED BY	DATE
DRAWN BY	
CHECKED BY	
NOTED BY	
QUANTITIES BY	
CHECKED BY	
ORIGINAL PLAN	
NOTE BOOK	
NO.	

DRAIN INLET D6
 Scale: 1/2" = 1'-0"

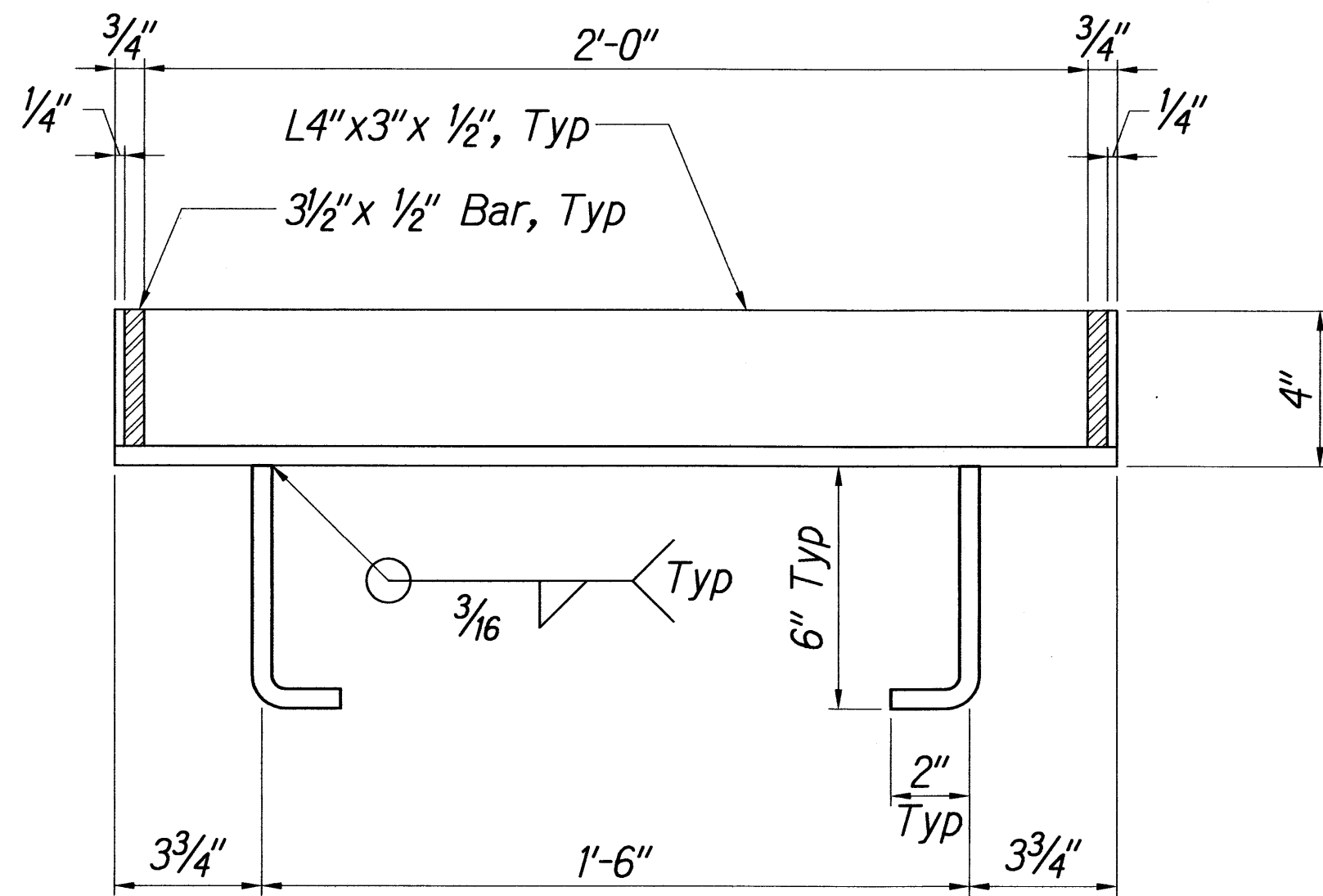
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 S-12 S-12

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION
DRAIN INLET D6 PLANS
 Volcano Road Intersection and Drainage Improvements
 Federal-Aid Project No. HS-STP-011-2(38)
 Scale: As Noted Date: November 2010
 SHEET No. S-12 OF 141 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HS-STP-011-2(38)	2010	115	141



Plan



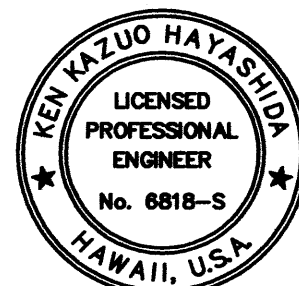
Section

MODIFIED TYPE A-9P STEEL FRAME DETAIL

Scale: 3" = 1'-0"

1
S-13 S-13

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
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	QUANTITIES BY	
	CHECKED BY	



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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
**MODIFIED TYPE A-9P
STEEL FRAME DETAIL**
Volcano Road Intersection and
Drainage Improvements
Federal-Aid Project No. HS-STP-011-2(38)
Scale: As Noted Date: November 2010
SHEET No. S-13 OF 141 SHEETS