

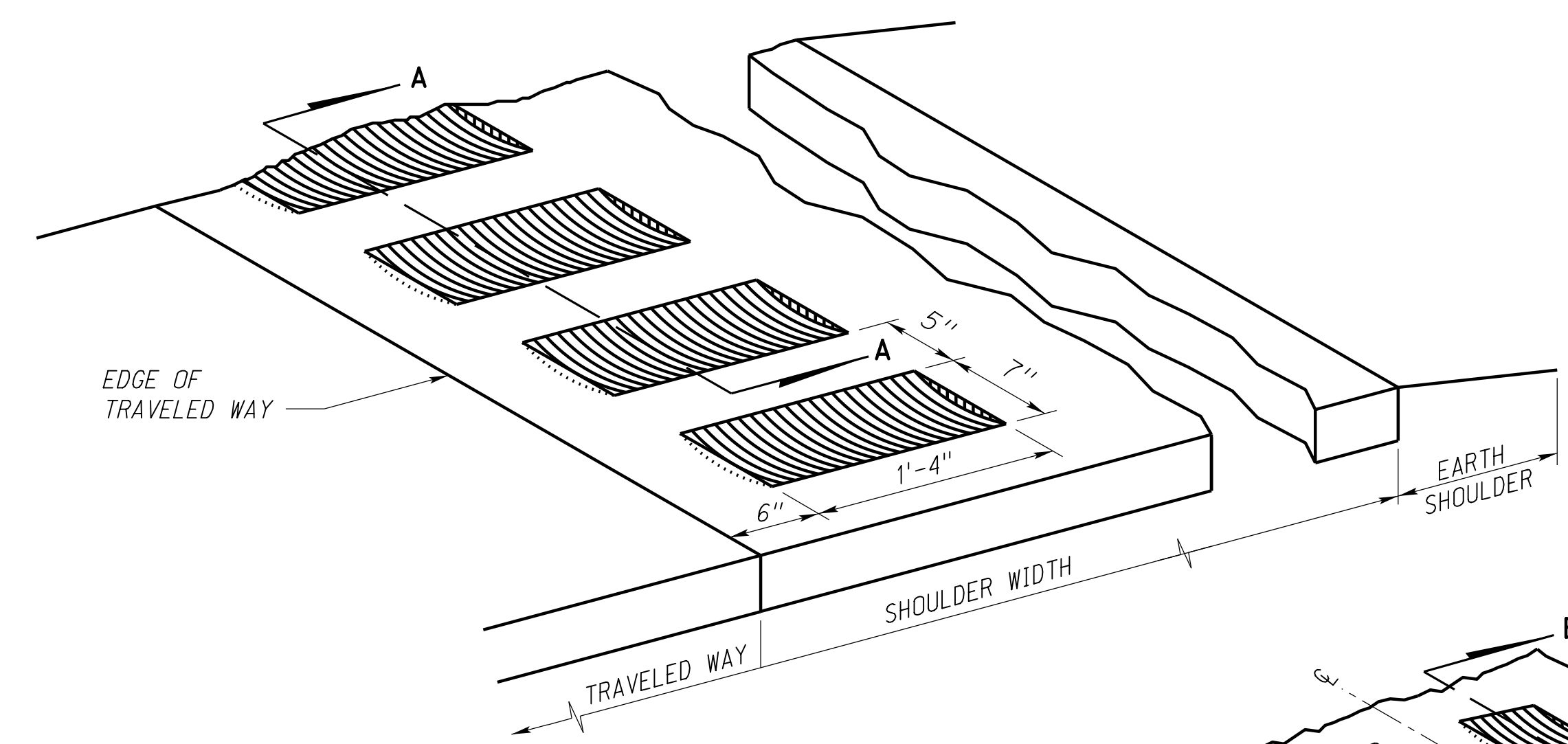
Special Plans

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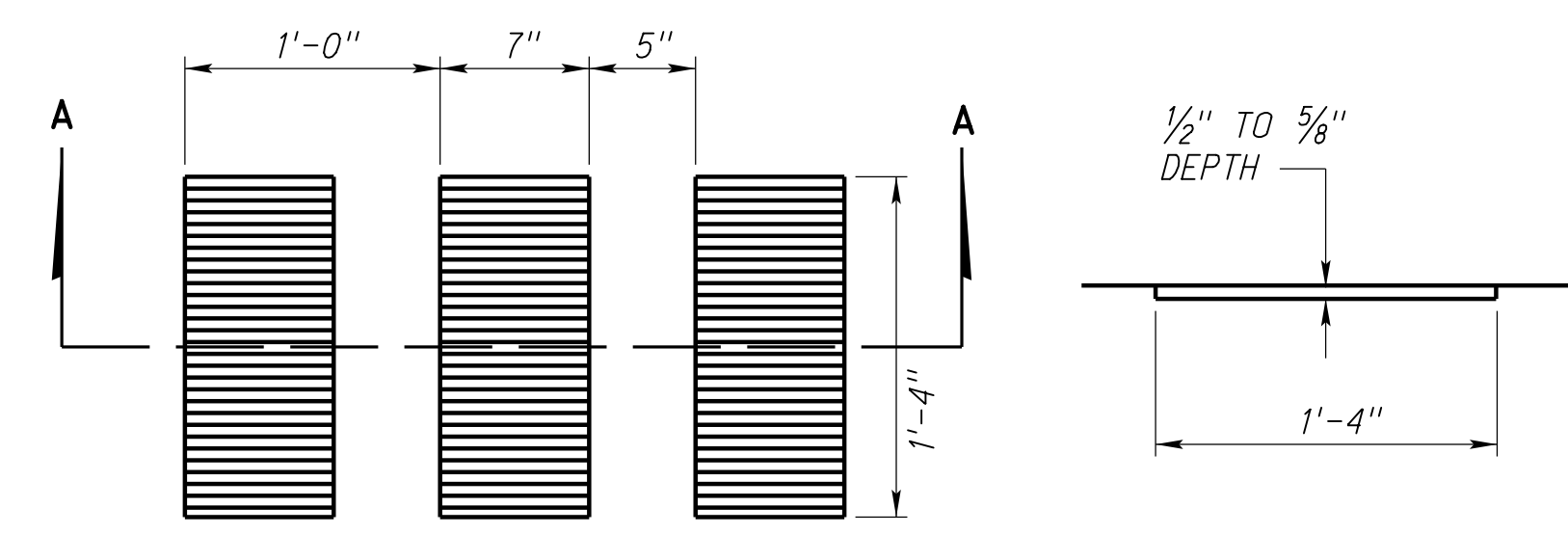
June 1, 2023

Plan No.	Title	Comments
3200 1 R1	Milled Rumble Strips	
3300 1 R2	6 to 8 Inch Concrete Pavement Less Than 8 Inch Concrete Pavement	JUNE 2023 - REVISION
4120 1 R2	Safety Sloped End Sections Corrugated Metal and Concrete Pipe	
4330 1 R1	Area Inlet with Bar	
4333 1 R0	Area Inlet with Grate	
4341 1 R3	Concrete Flume, Type I	
4342 1 R3	Concrete Flume, Type II	
4344 1 R4	Concrete Flume, Type IV	
4345 1 R4	Concrete Flume, Type V	
4346 1 R2	Concrete Flume, Type VI	
4440 1 R0	Reconstruct Gutter Depression For 2" Grade Raise	
5101 1 R0	Concrete Washout & Construction Exit	
5102 1 R0	Inlet Protection	
5103 1 R0	Temporary Pipe Slope Drain	
5104 1 R0	Silt Checks All Types	
7030 1 R0	Cable Guardrail to W-Beam Guardrail Transition - 31"	OBSOLETE
7040 1 R0	Cable Guardrail to MGS Transition	OBSOLETE
7300 1 R0	W-Beam Connect to Concrete Protection Barrier	JUNE 2023 - NEW PLAN
7390 1 R0	Bridge Approach Section 31" to Existing	
7490 1 R0	Weak Post Guardrail - 31"	

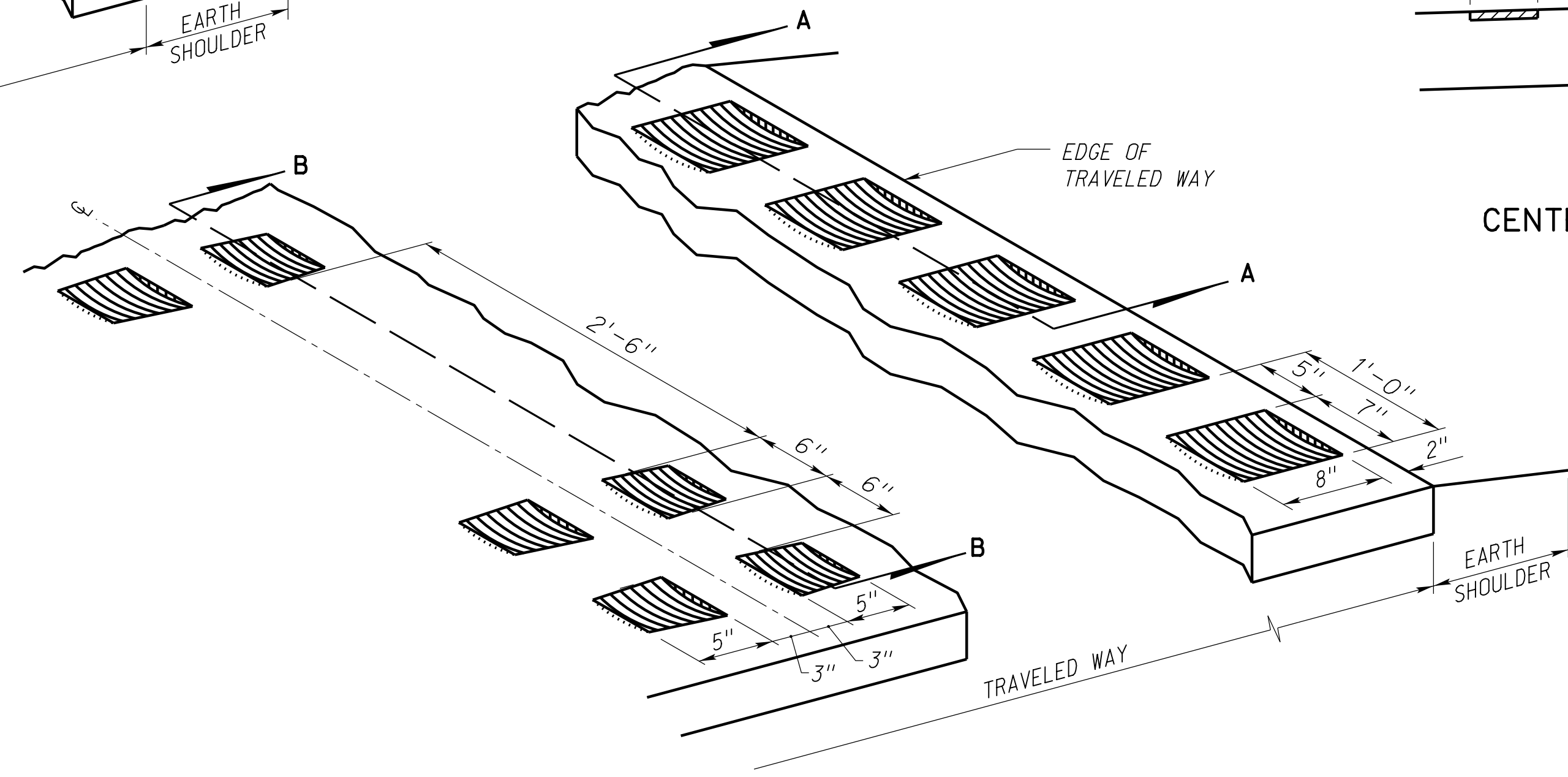
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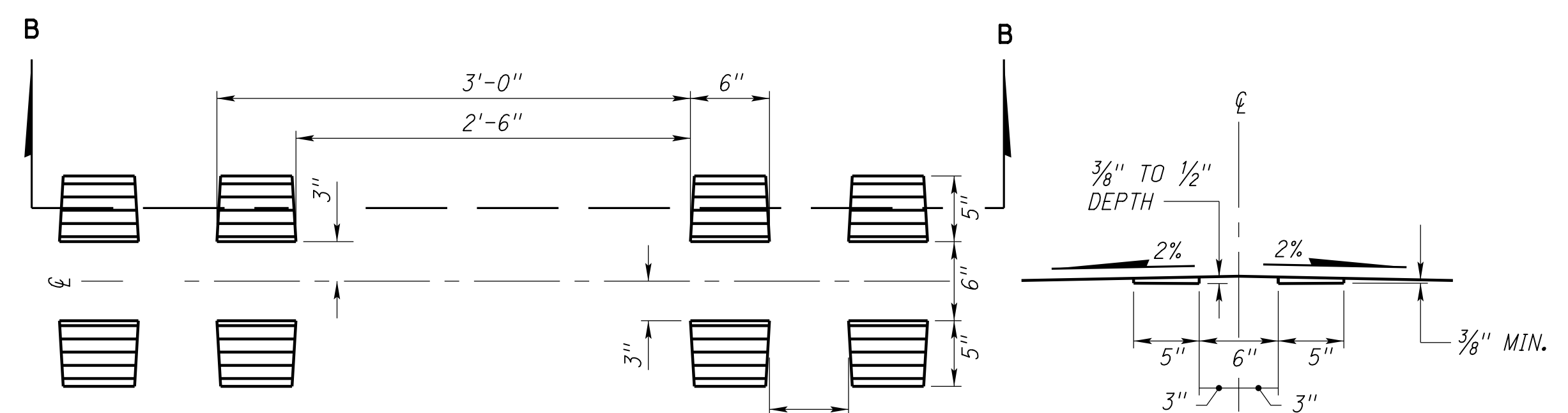
SHOULDER RUMBLE STRIPS DETAIL



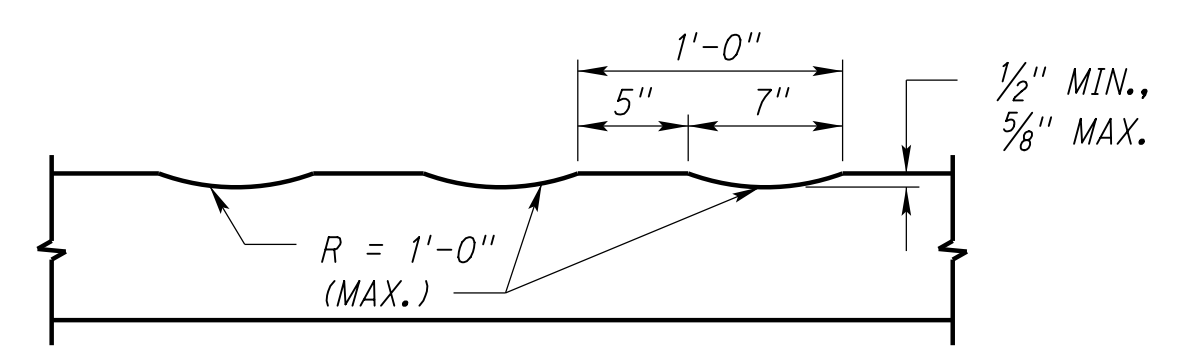
PLAN PROFILE
SHOULDER RUMBLE STRIPS SHAPE



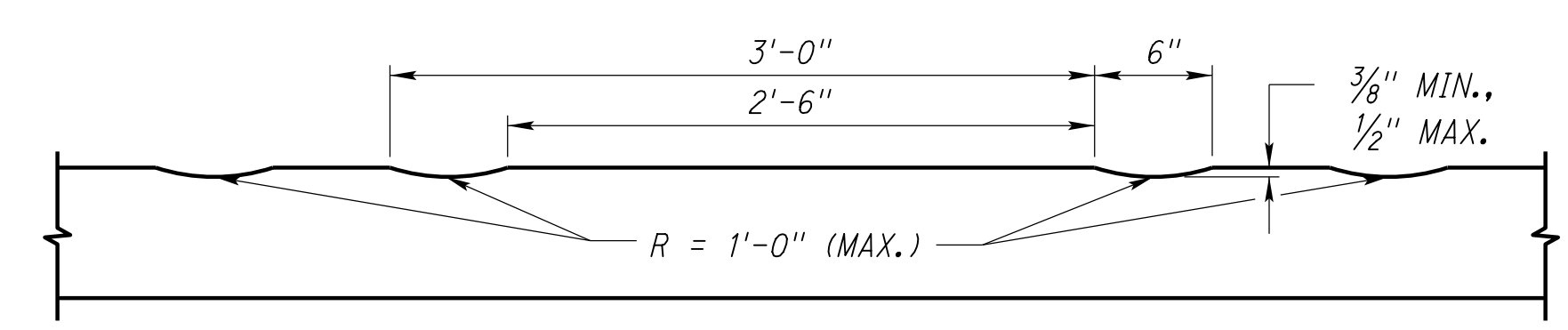
CENTERLINE RUMBLE STRIPS DETAIL



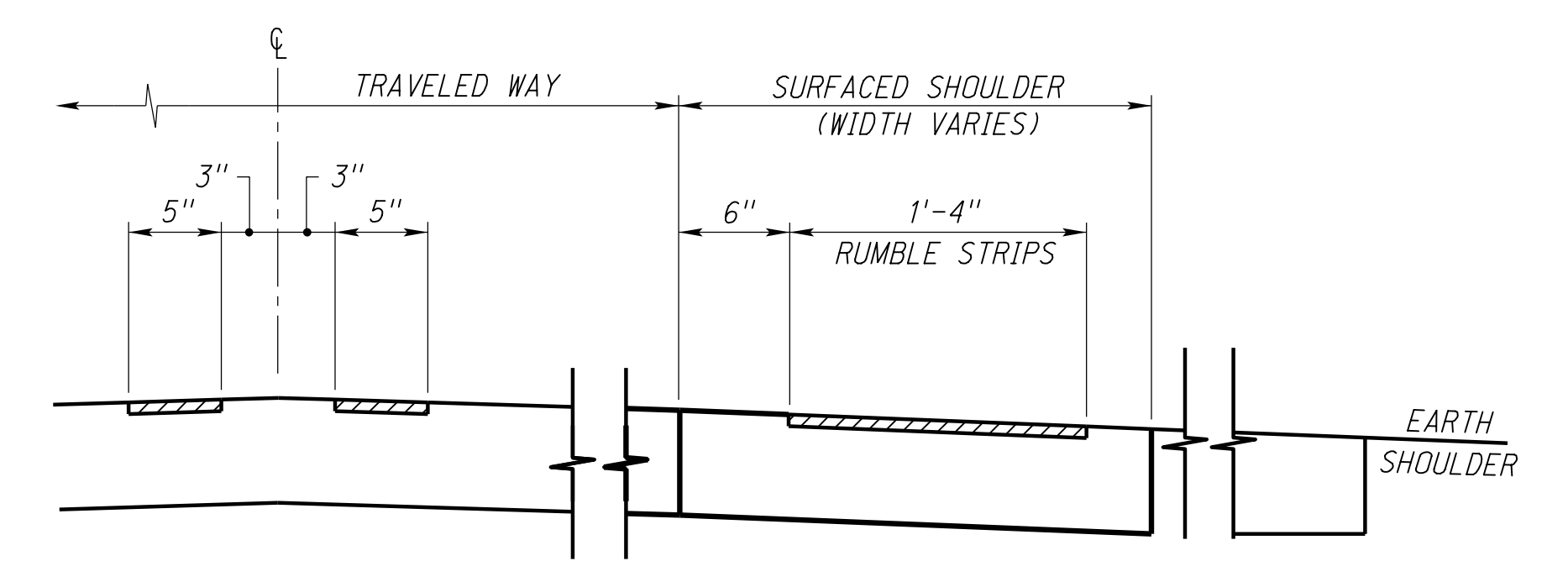
PLAN PROFILE
CENTERLINE RUMBLE STRIPS SHAPE



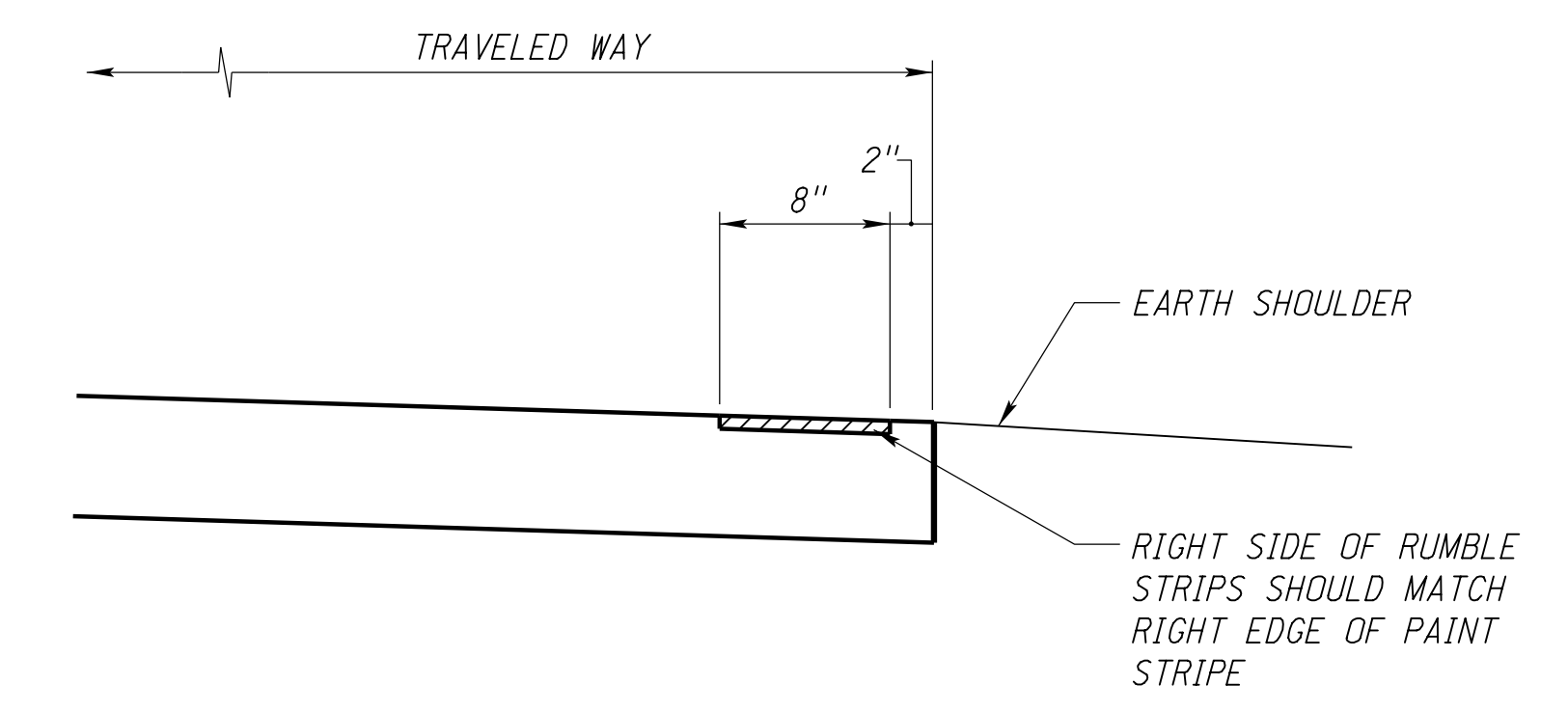
SHOULDER AND EDGELINE RUMBLE STRIPS SECTION A-A



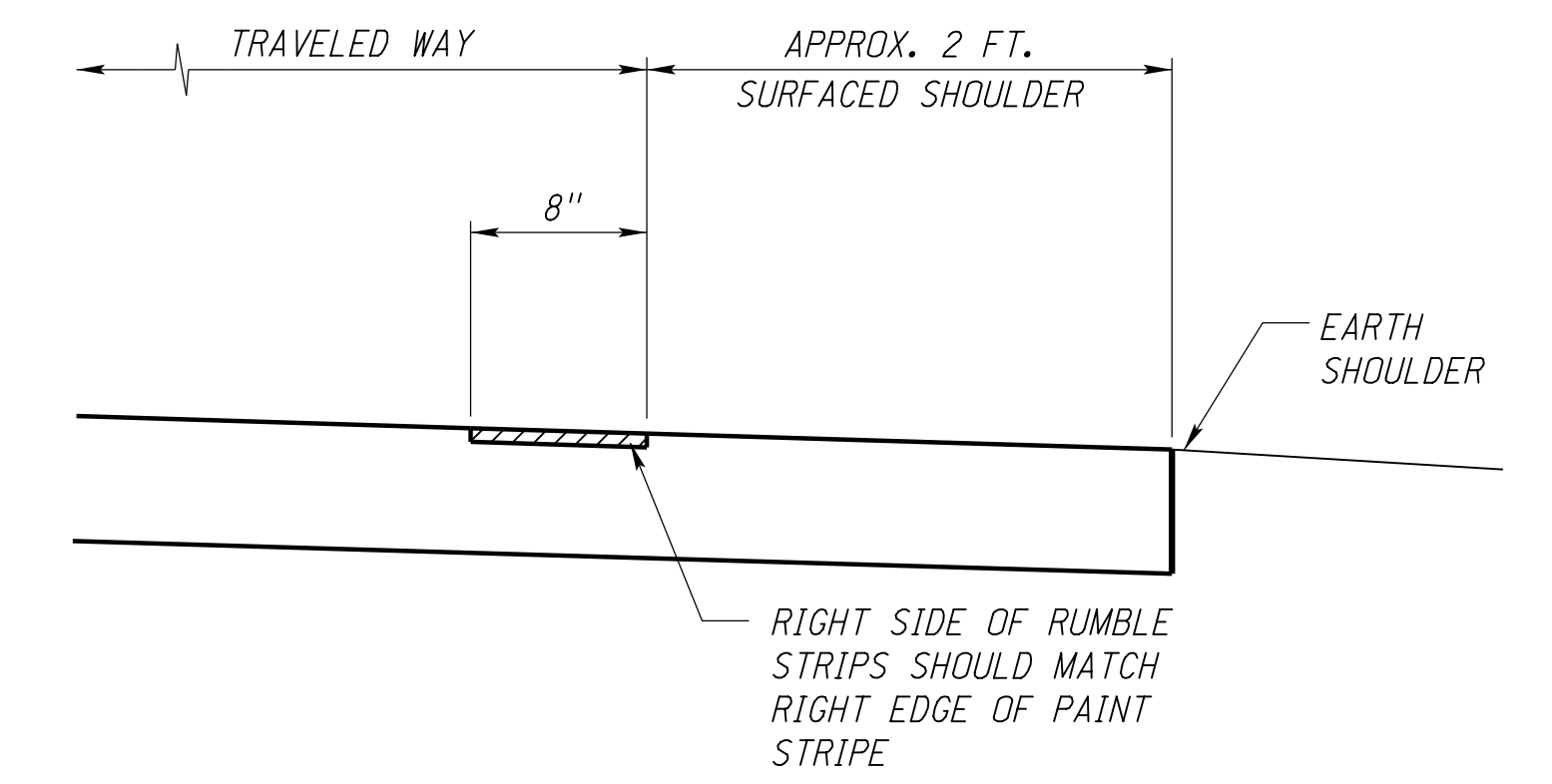
CENTERLINE RUMBLE STRIPS SECTION B-B



CENTERLINE SHOULDER

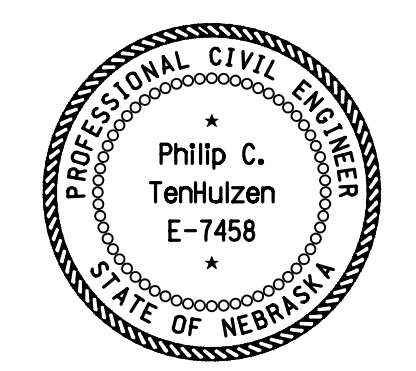


EDGELINE ON 24 FEET ROADWAY

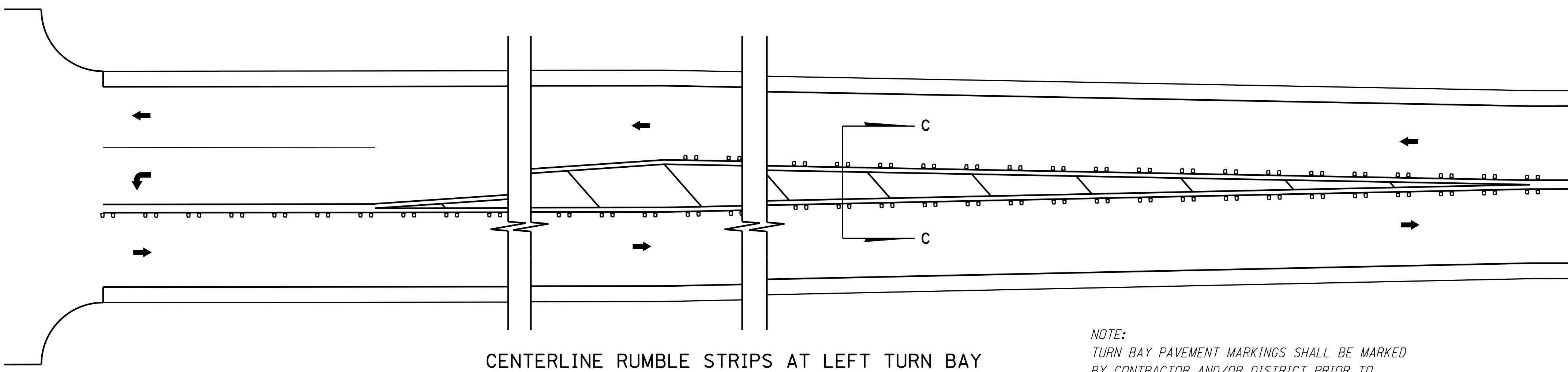


EDGELINE ON 28 FEET ROADWAY

NOTES:
RUMBLE STRIPS SHALL BE PLACED ON SHOULDERS AS INDICATED IN THIS PLAN AND IN ACCORDANCE WITH THE PROJECT PLANS. RUMBLE STRIPS ARE NOT NORMALLY REQUIRED ON CITY STREETS AND OTHER URBAN SHOULDERS ADJACENT TO CURB AND GUTTER UNLESS SPECIFICALLY NOTED IN THE PLANS.
RUMBLE STRIPS MAY BE CONTINUOUS THROUGH DRIVEWAYS AND SHALL BE OMITTED ACROSS INTERSECTING ROADWAYS AND BRIDGES.

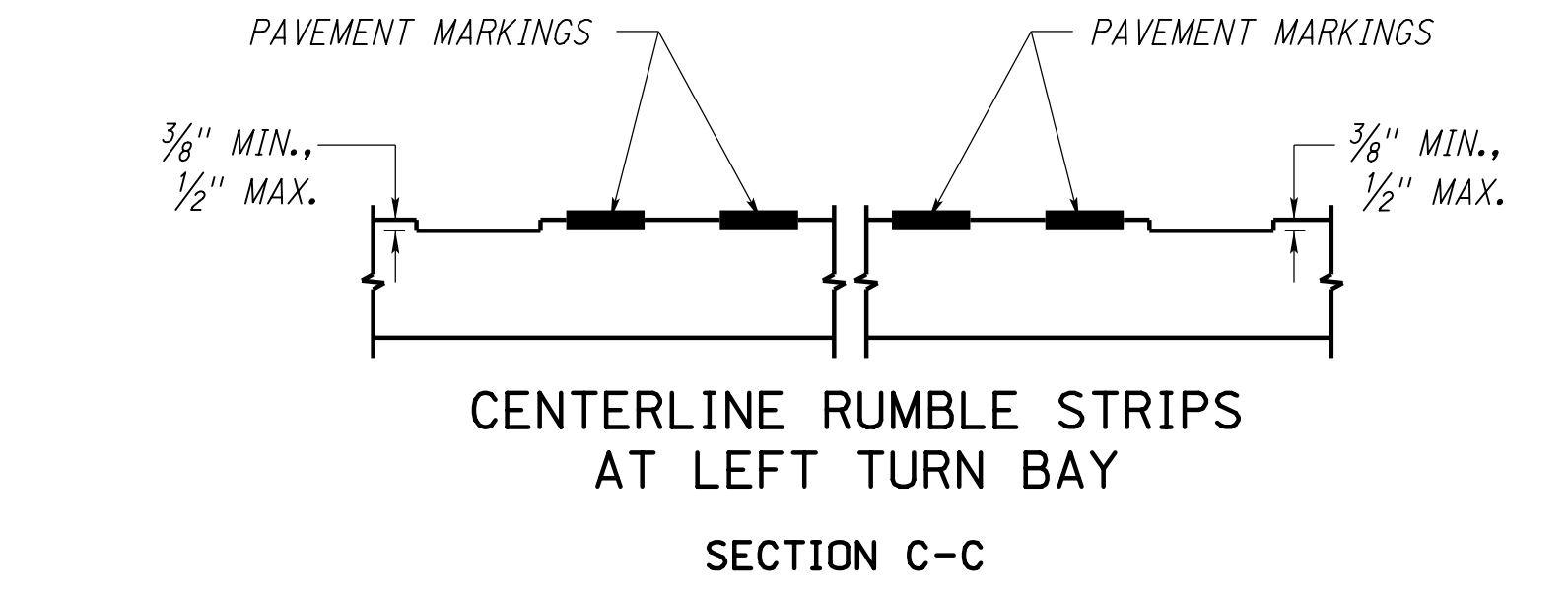


ROADWAY DESIGN DIVISION

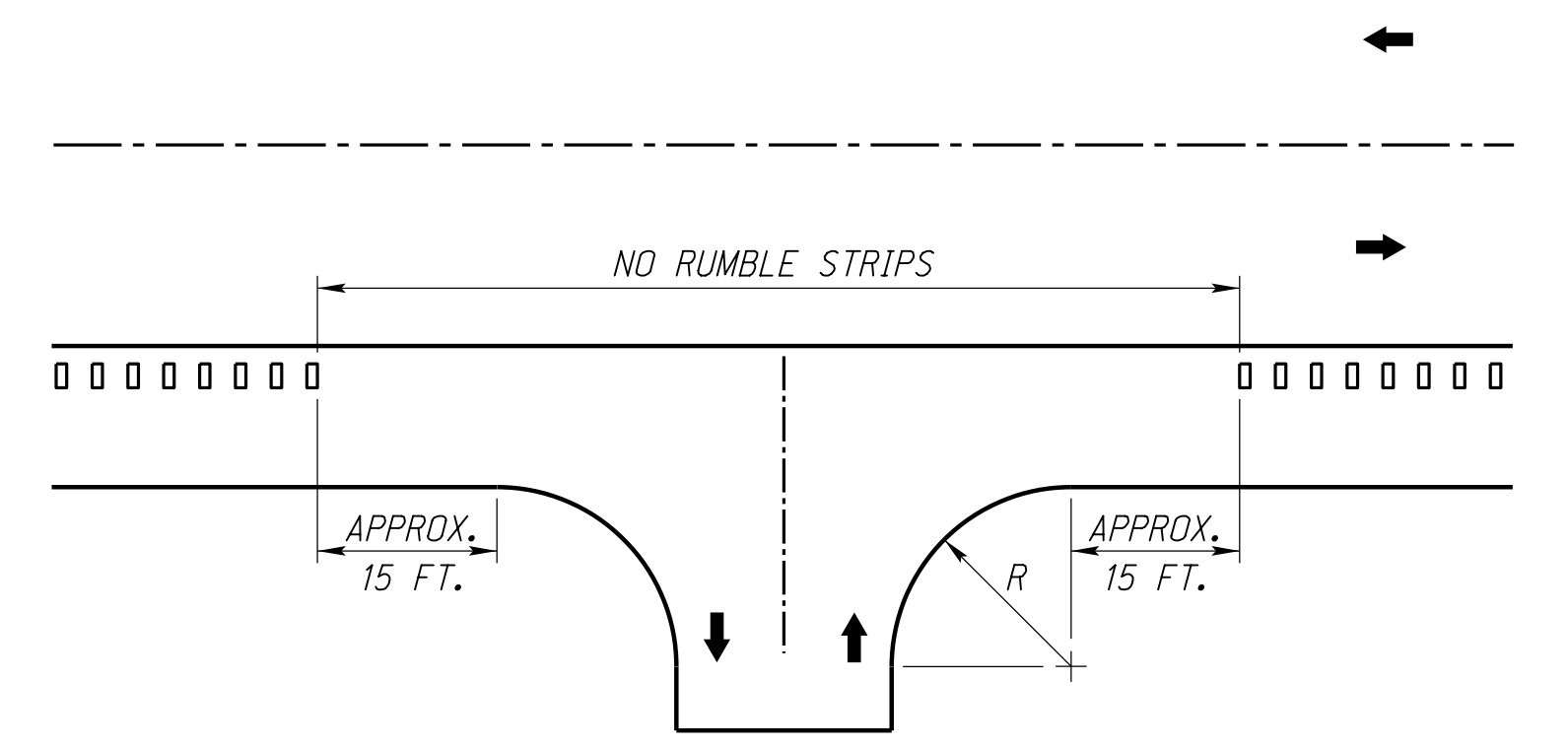
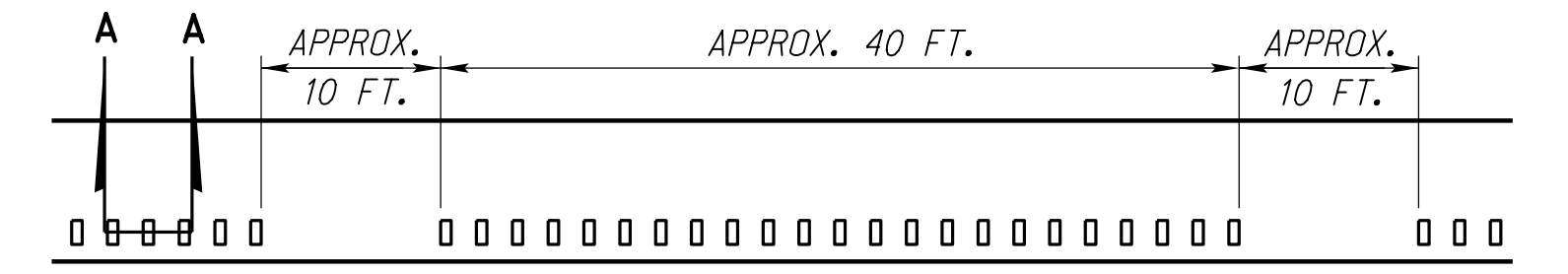


CENTERLINE RUMBLE STRIPS AT LEFT TURN BAY

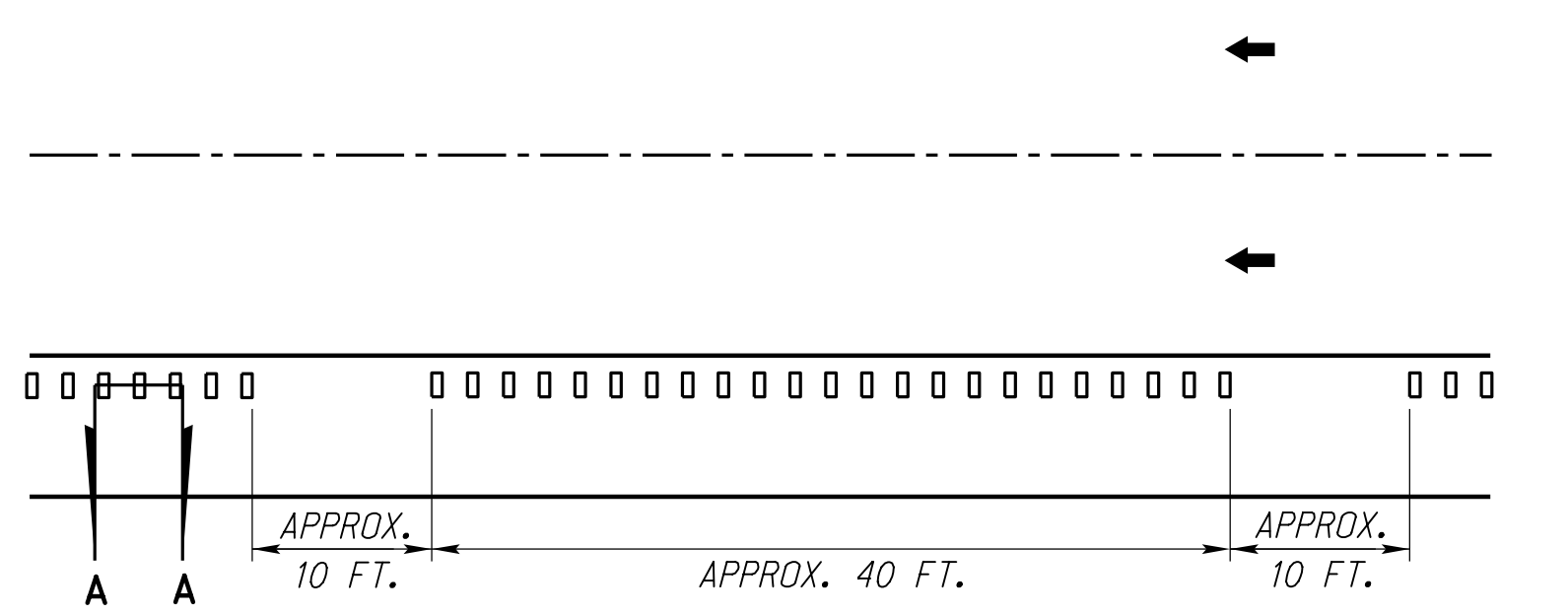
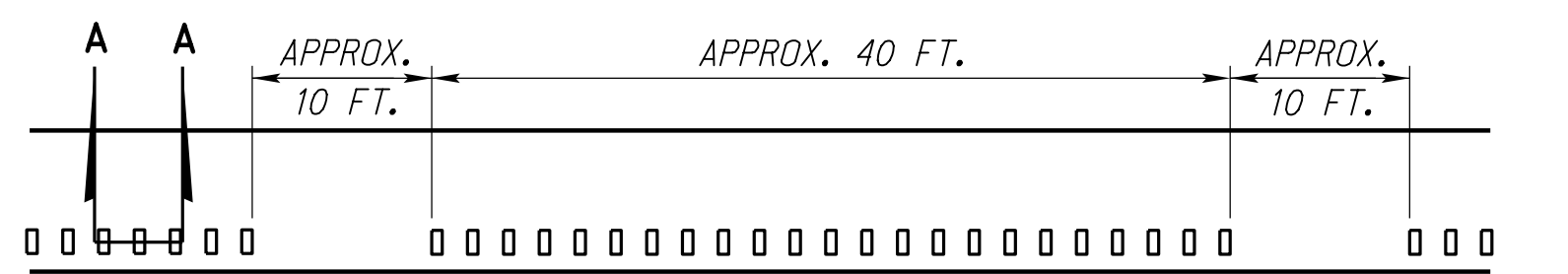
NOTE:
TURN BAY PAVEMENT MARKINGS SHALL BE MARKED
BY CONTRACTOR AND/OR DISTRICT PRIOR TO
CONSTRUCTION OF RUMBLE STRIPS.



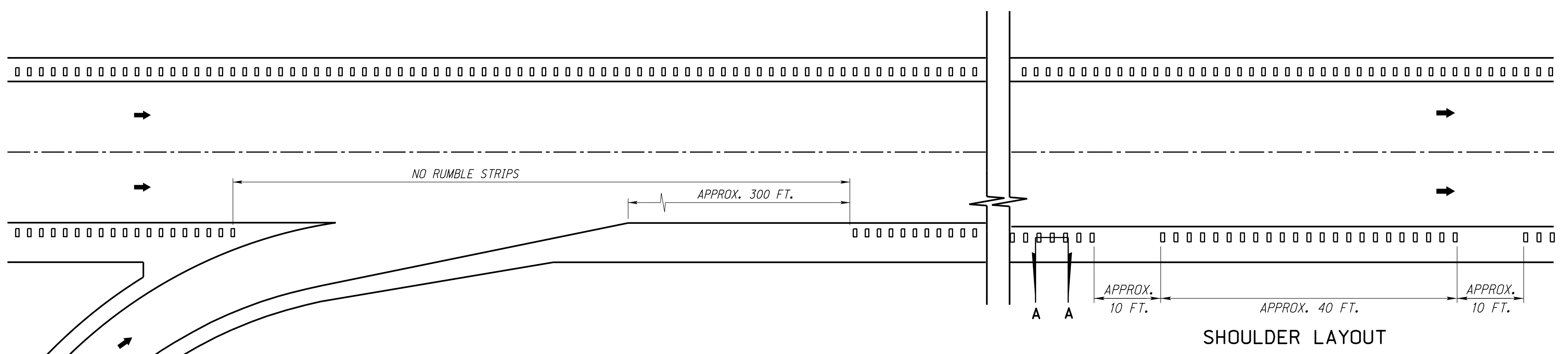
CENTERLINE RUMBLE STRIPS
AT LEFT TURN BAY
SECTION C-C



SHOULDER RUMBLE STRIPS PLACEMENT
ON 2-LANE HIGHWAY AT INTERSECTION



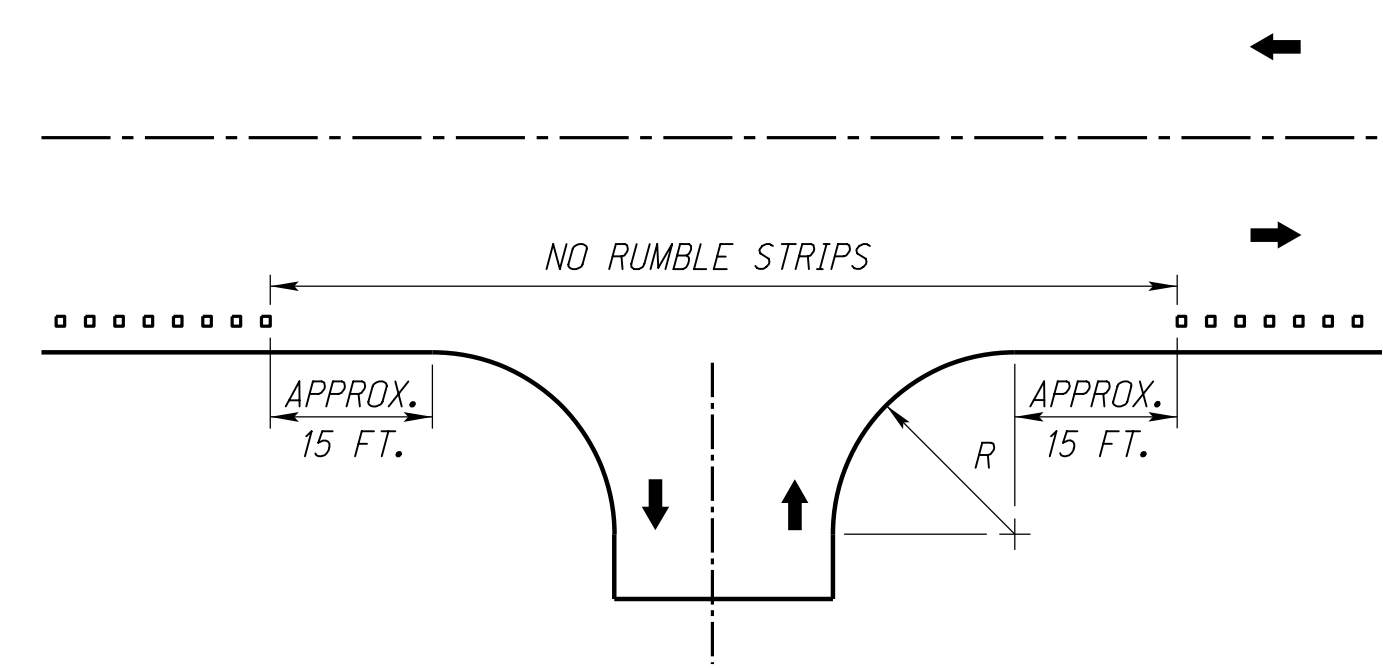
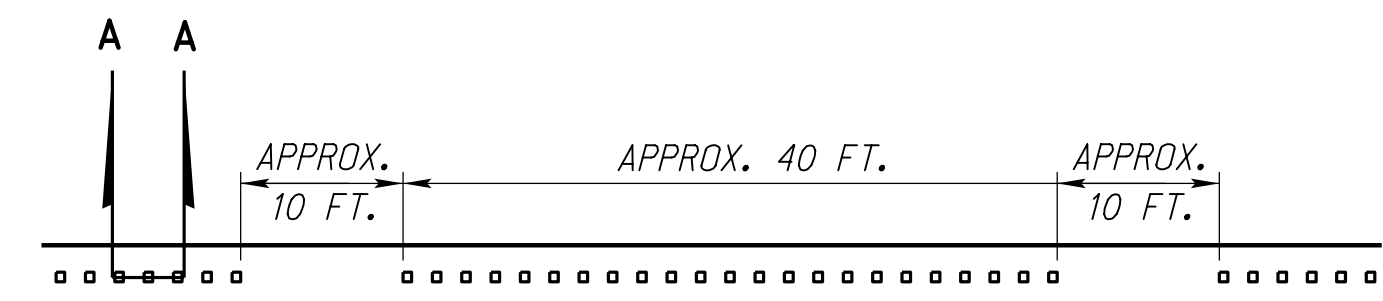
SHOULDER LAYOUT



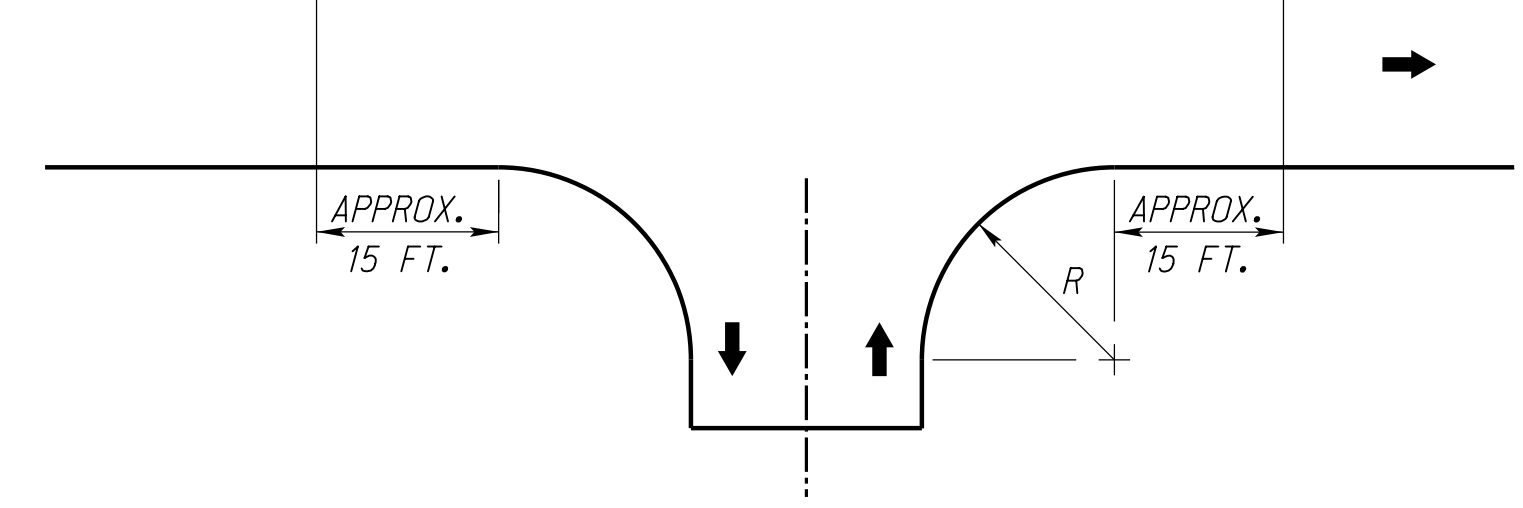
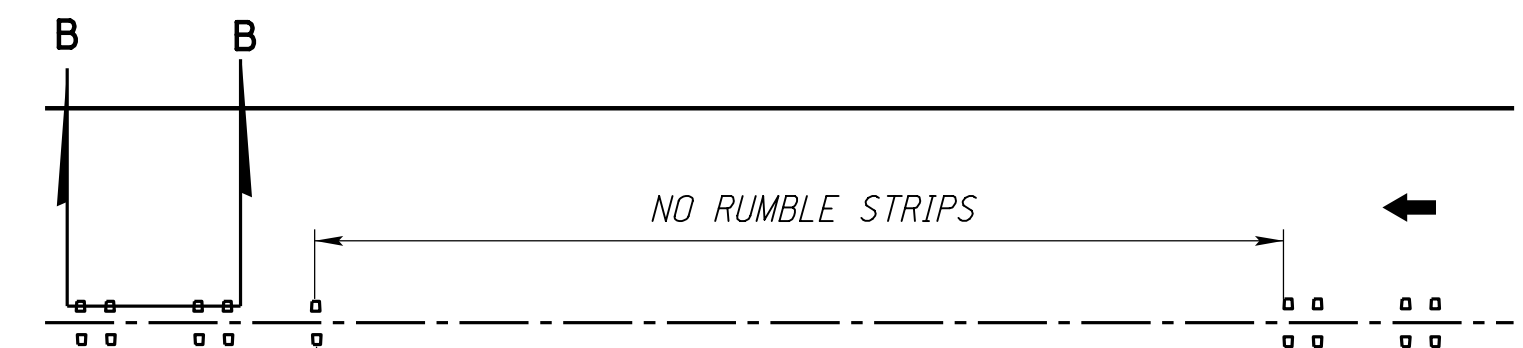
SHOULDER RUMBLE STRIPS PLACEMENT
ON DIVIDED HIGHWAY AT ENTRANCE/EXIT RAMP

SHOULDER LAYOUT

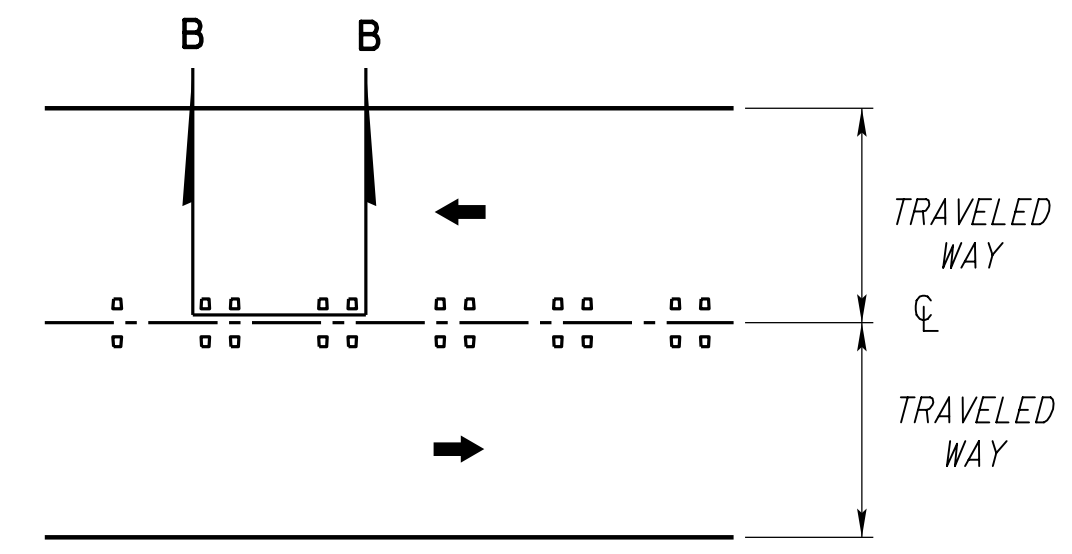
SHOULDER RUMBLE STRIPS PLACEMENT
ON DIVIDED HIGHWAY
(OMIT 10 FT. GAP ON
INTERSTATE AND FREEWAYS)



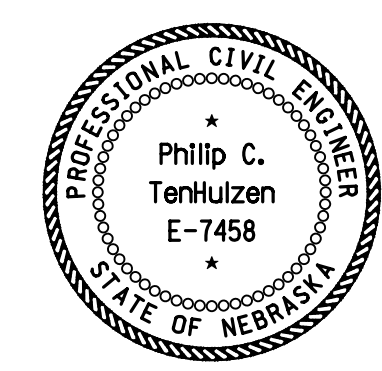
EDGE LINE RUMBLE STRIPS
PLACEMENT AT INTERSECTION



CENTERLINE RUMBLE STRIPS
PLACEMENT AT INTERSECTION



CENTERLINE LAYOUT

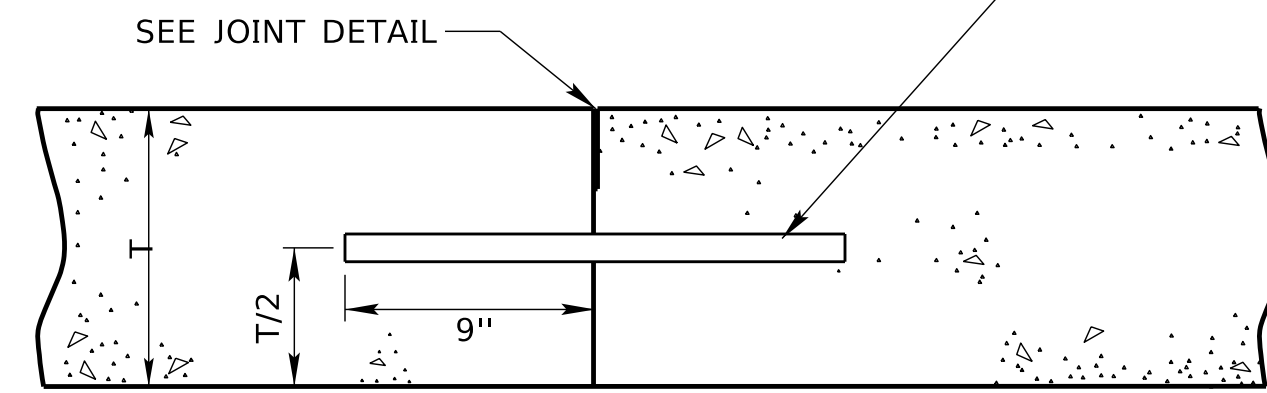


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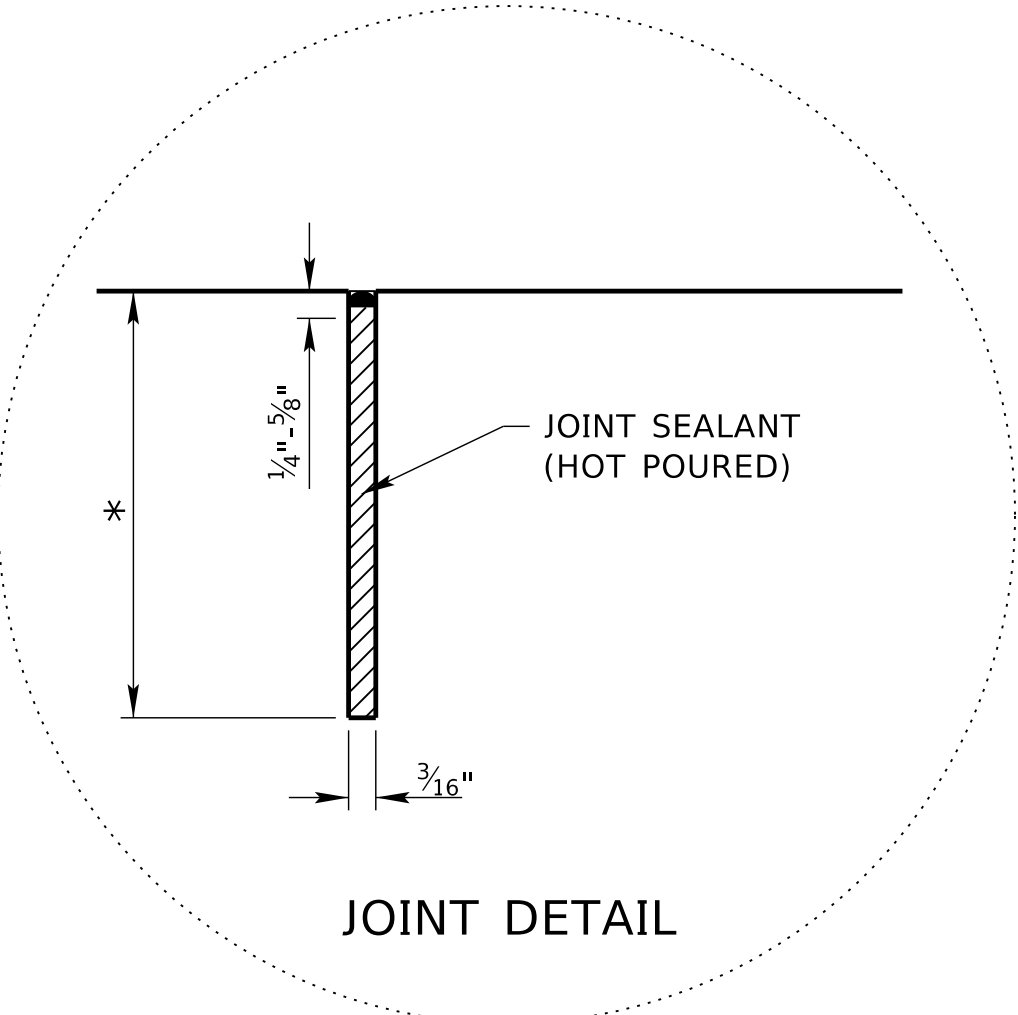
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SHEET 2 OF 2
3200-1-E-01

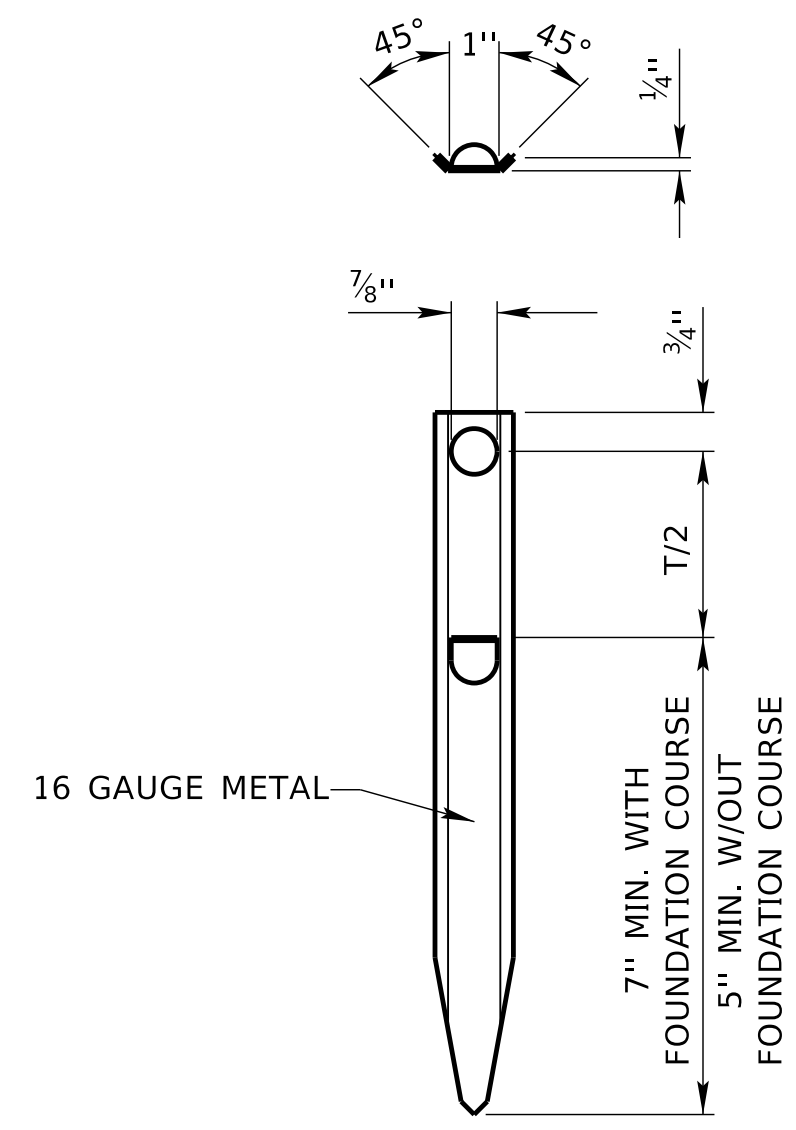
NO. 5 x 1'-6" TIE BARS (TIE BAR SPACING SHOWN ELSEWHERE ON PLANS) TO BE DRILLED AND EPOXIED INTO EXISTING SLAB



LONGITUDINAL CONSTRUCTION JOINT

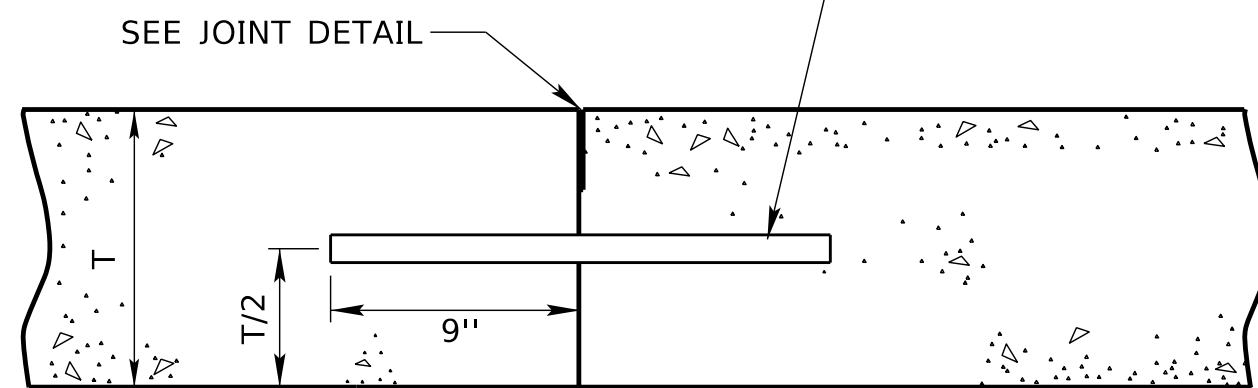


* CONTRACTION JOINTS ARE CONVENTIONAL SAWN T/4
ALL LONGITUDINAL JOINTS ARE SAWN T/3

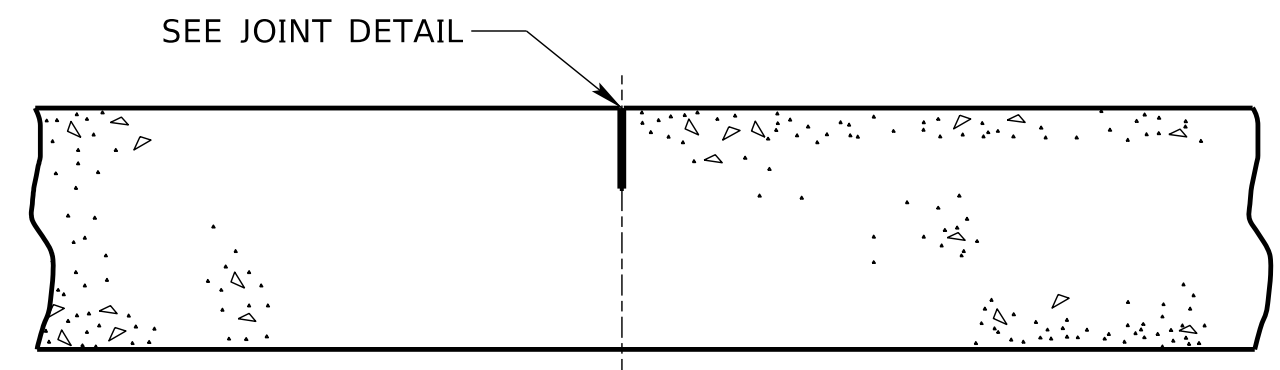


TIE BAR PIN

NO. 5 x 1'-6" TIE BARS ON APPROX. 1'-0" CTRS. TO BE DRILLED AND EPOXIED INTO EXISTING SLAB

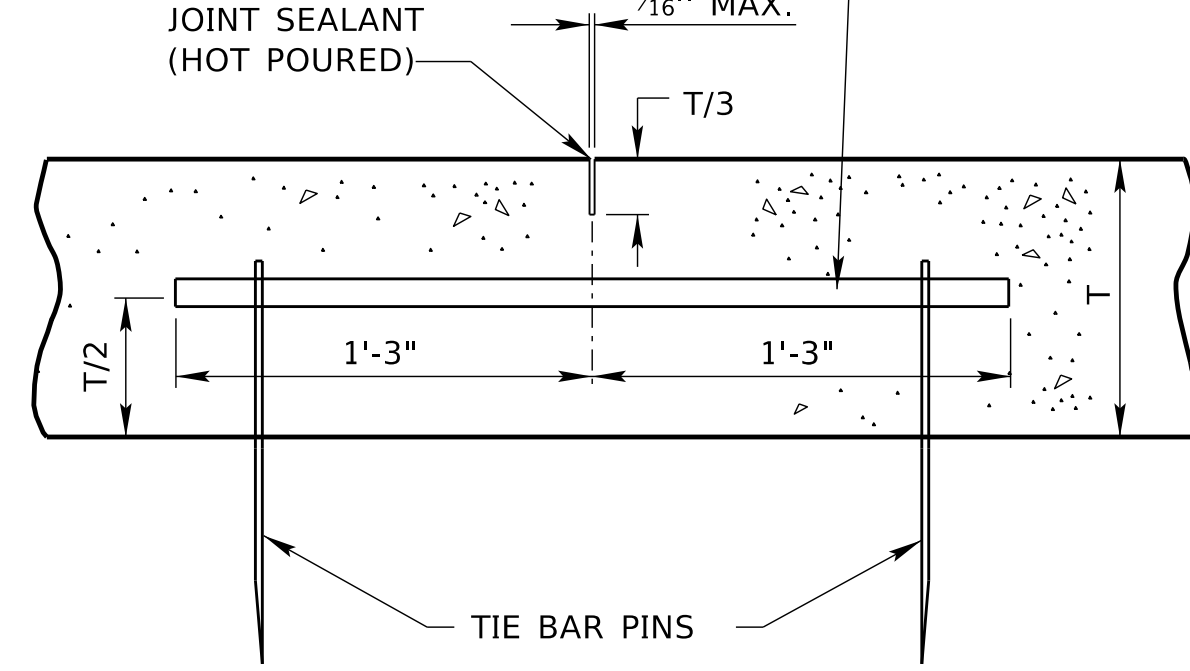


TRANSVERSE CONSTRUCTION JOINT



CONTRACTION JOINT

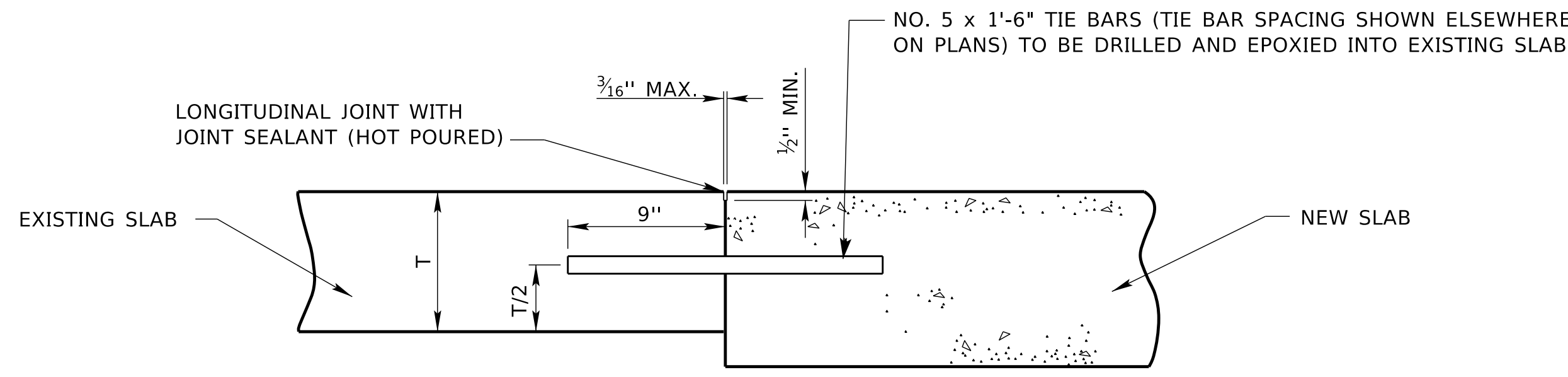
NO. 5 x 2'-6" TIE BARS ON APPROX. 2'-9" CTRS. WHEN T=6" TO 8"



SAWED

WHEN TWO ADJACENT LANES ARE PLACED AT THE SAME TIME, THE LONGITUDINAL JOINT COMMON TO THE LANES SHALL BE SAWED

LONGITUDINAL JOINTS



TIE BARS ARE TO BE INSTALLED WHERE NEW CONCRETE PAVEMENT IS PLACED ADJACENT TO EXISTING CONCRETE PAVEMENT

DETAILS OF TIE BAR

NOTES:

TIE BARS SHALL BE DEFORMED BARS.

TIE BARS SHALL CONFORM TO THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS.

THE CONTRACTOR MAY USE A MACHINE FOR PLACING THE LONGITUDINAL TIE BARS IN LIEU OF THE TIE BAR PINS. IF A MECHANICAL TIE BAR PLACEMENT MACHINE IS NOT USED, TIE BAR PINS AS SHOWN SHALL BE USED.

CONCRETE PAVEMENT SHALL BE TINED UNLESS OTHERWISE SHOWN IN THE PLANS.

PAVEMENT PLACED ADJACENT TO R.R. TRACKS REQUIRES 3-EXPANSION JOINTS SPACED AT APPROX. 49'-6" INTERVALS.

EXPANSION JOINTS SHALL NOT BE SKEWED.

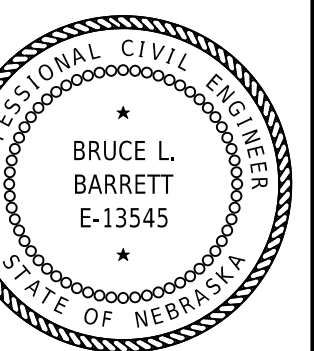
T= PAVEMENT THICKNESS

NOTE:
NO TIE BARS SHALL BE CLOSER THAN 1'-3" TO A TRANSVERSE JOINT. ALL LONGITUDINAL JOINTS BETWEEN LANES AND BETWEEN LANES AND SHOULDERS MUST BE TIED. MEDIAN SHOULD NOT BE TIED.

SPECIAL PLAN _C
1 OF 2
LESS THAN 8 INCH CONCRETE PAVEMENT



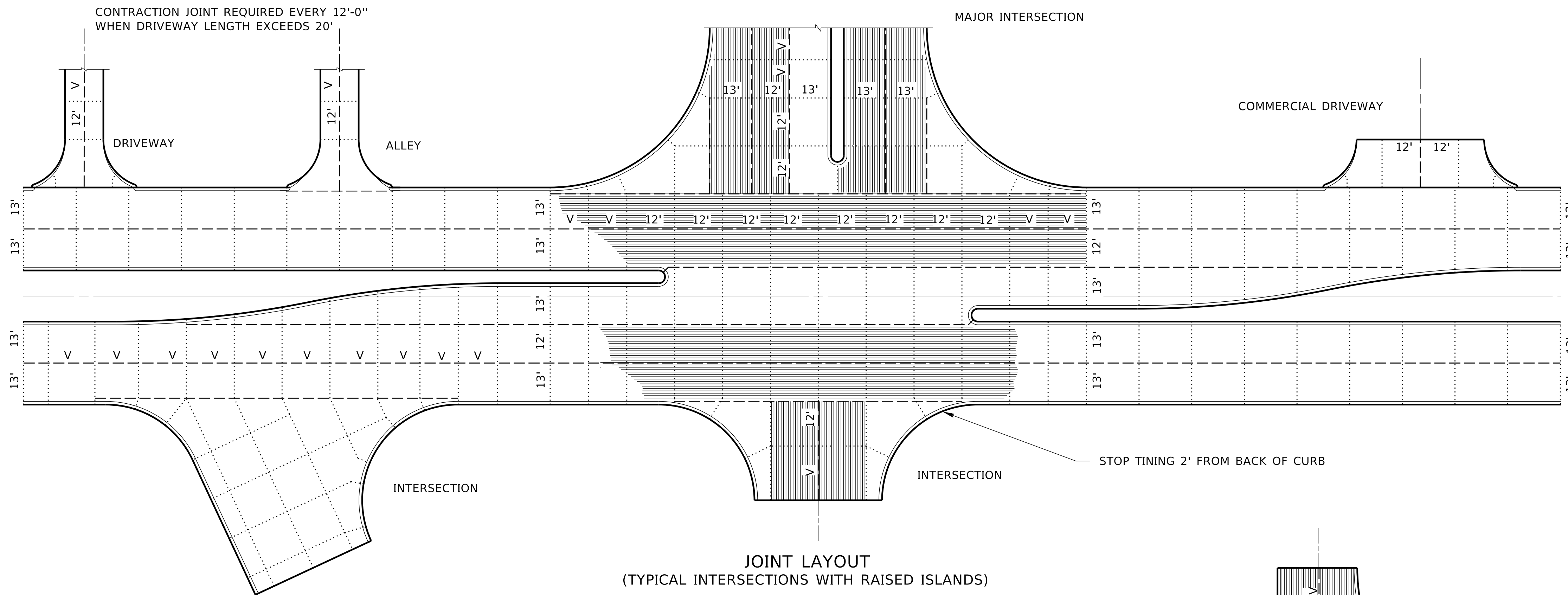
Roadway Design Division



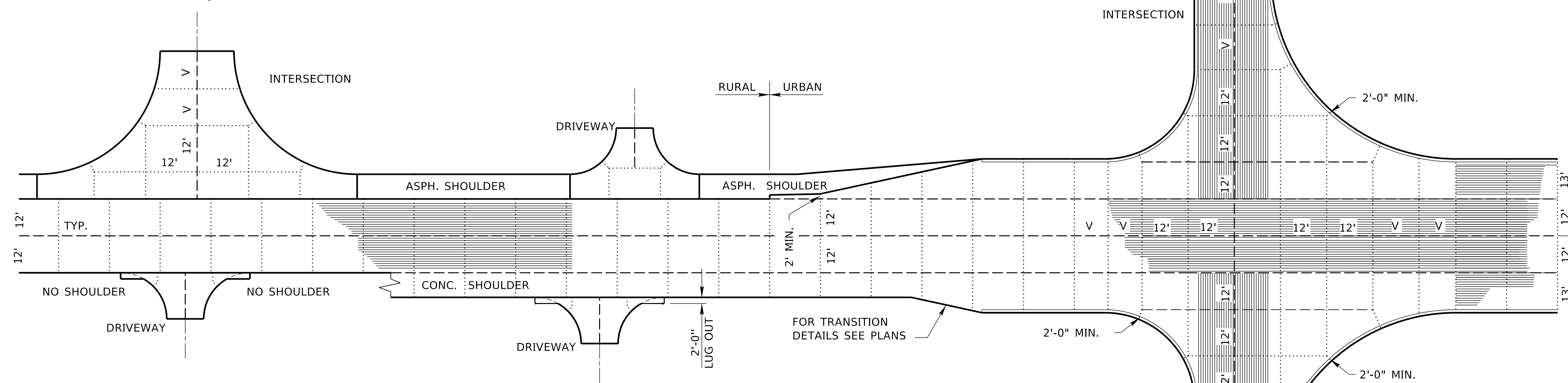
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JOINT LAYOUT
(TYPICAL INTERSECTIONS WITH RAISED ISLANDS)



JOINT LAYOUT
(TYPICAL INTERSECTIONS & DRIVES)

TINING LIMITS

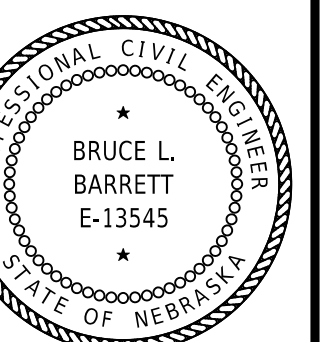
- LEGEND
- SAWED CONTRACTION JOINT
 - LONGITUDINAL JOINT

- NOTES:
- 12'-0" TRANSVERSE JOINT SPACING IS THE STANDARD SPACING REGARDLESS OF THE PAVEMENT THICKNESS.
 - V VARIES FROM 10'-0" TO MAX. 12'-0".
 - VARIABLE SPACING IS USED AROUND INTERSECTIONS AND LARGE DRIVEWAYS WHICH IS TIED TO THE CONCRETE LANES OR SHOULDERS TO MATCH THE JOINTS.
 - ALL CONCRETE SURFACES, NOT TINED, WILL REQUIRE TRANSVERSE BROOMING OR BURLAP DRAG. (NOT APPLICABLE TO SHOULDERS)
 - BEVELED EDGE SHALL BE USED WHEN PAVEMENT IS ADJACENT TO AN EARTH SHOULDER. CONCRETE SHOULDERS SHALL INCLUDE A BEVELED EDGE WHEN THE SHOULDER WIDTH IS LESS THAN 6'-0".

SPECIAL PLAN _C
2 OF 2
LESS THAN 8 INCH CONCRETE PAVEMENT



Roadway Design Division

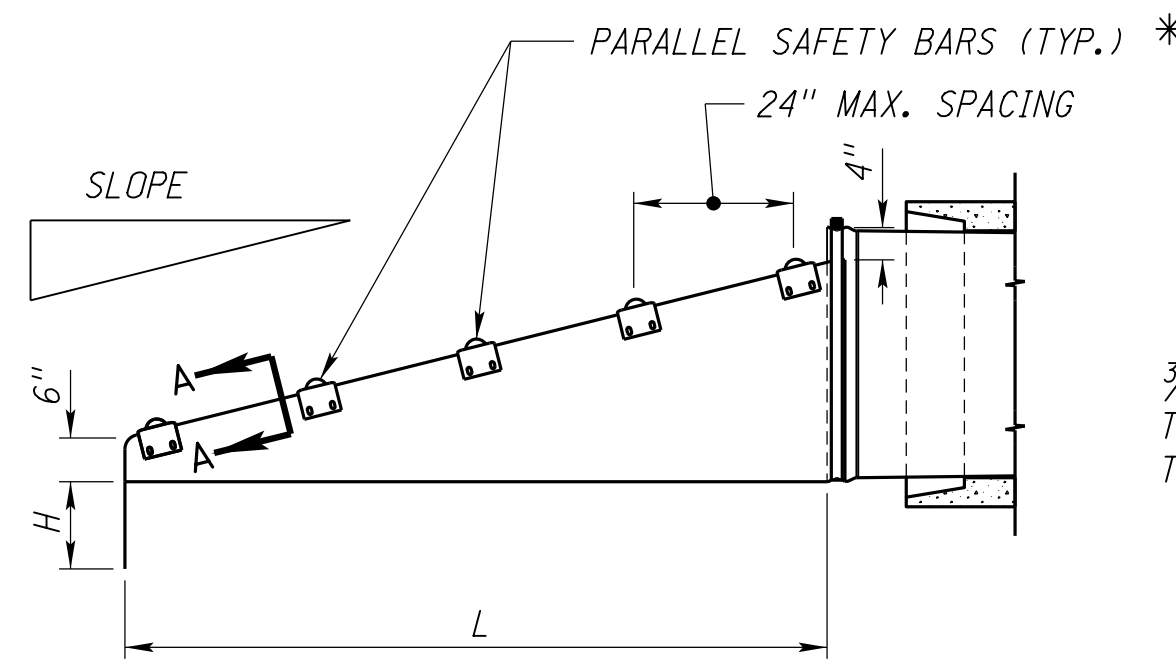


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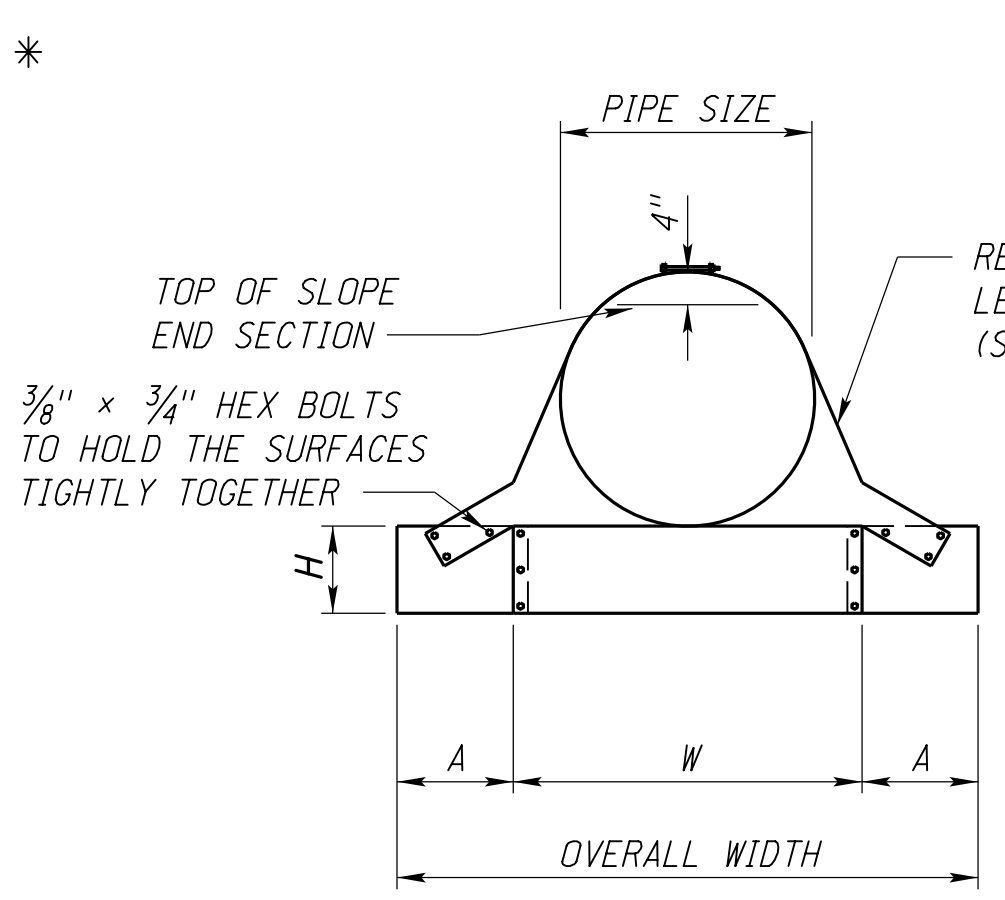
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ROADWAY DESIGN DIVISION

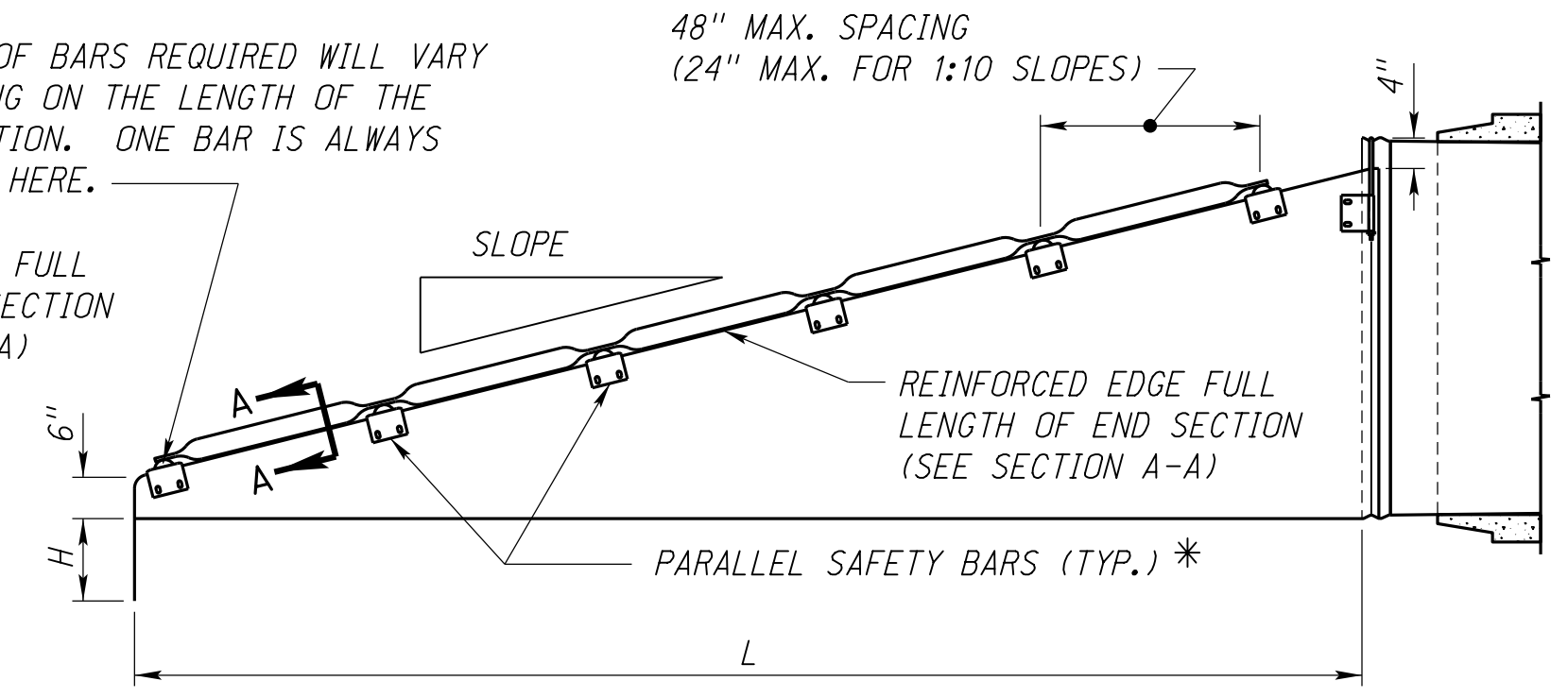


SIDE ELEVATION OF PARALLEL DRAINAGE STRUCTURE

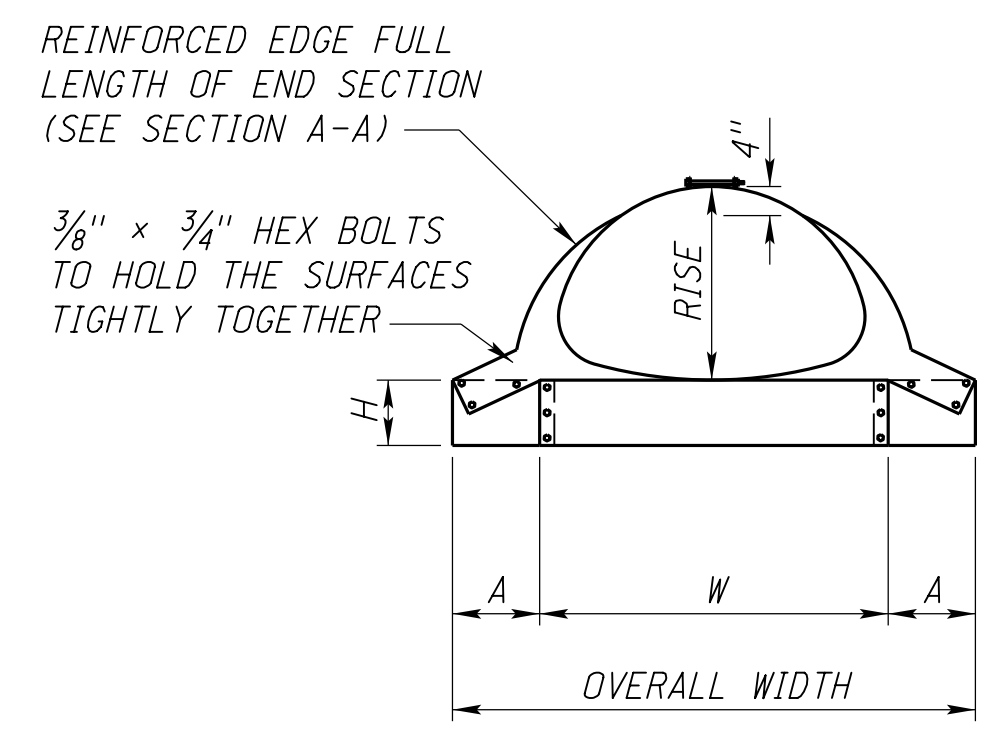


FRONT VIEW

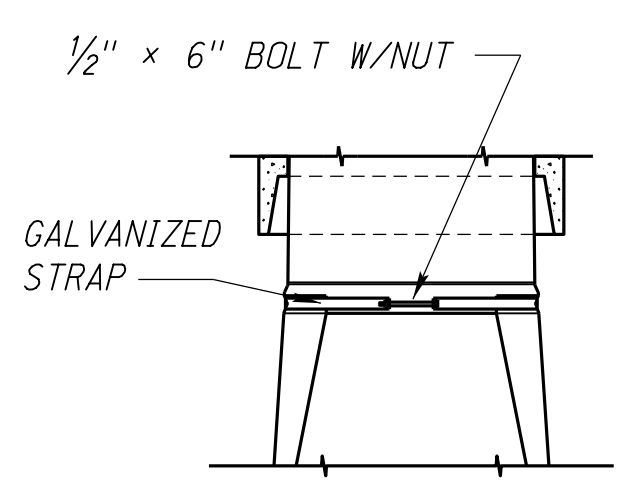
* NUMBER OF BARS REQUIRED WILL VARY DEPENDING ON THE LENGTH OF THE END SECTION. ONE BAR IS ALWAYS LOCATED HERE.



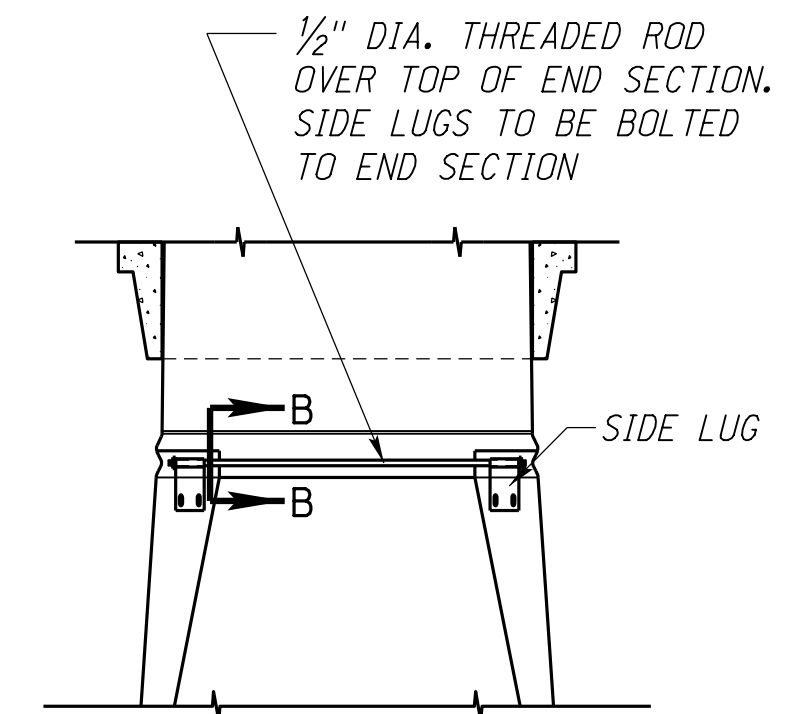
SIDE ELEVATION OF CROSS DRAINAGE STRUCTURE



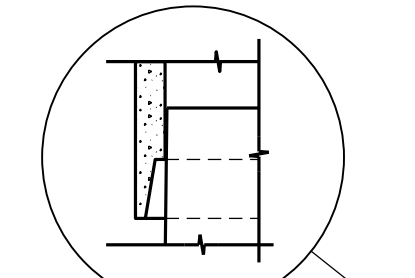
FRONT VIEW



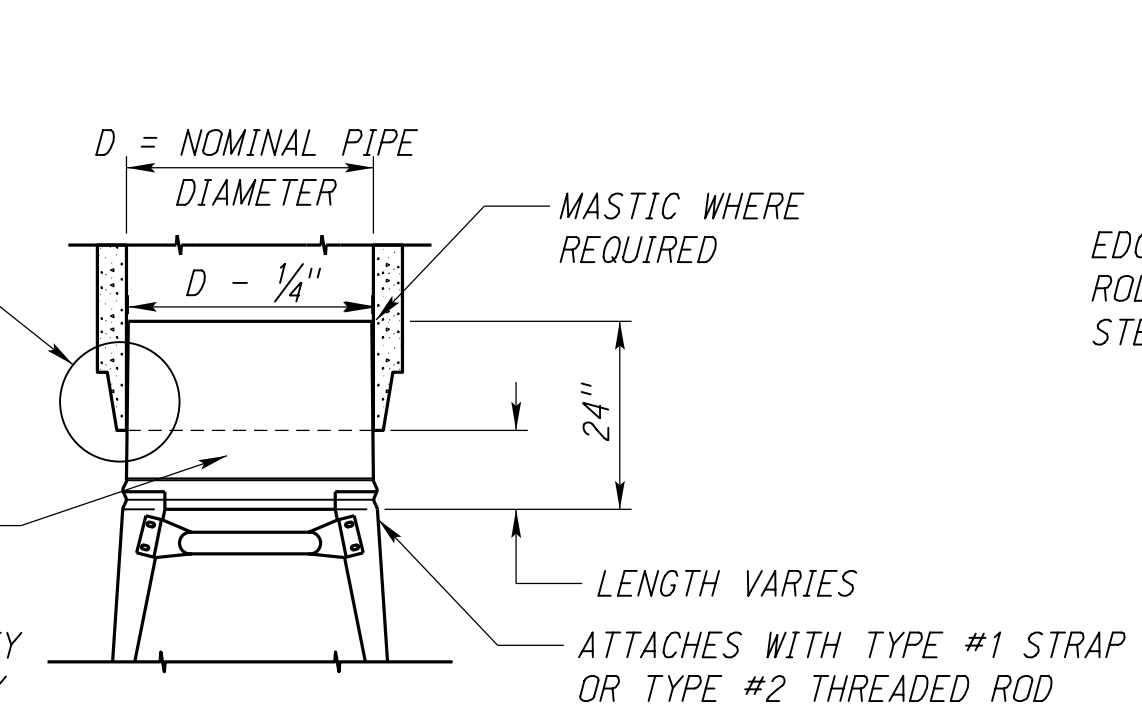
TYPE #1 CONNECTOR DETAILS THRU 24"



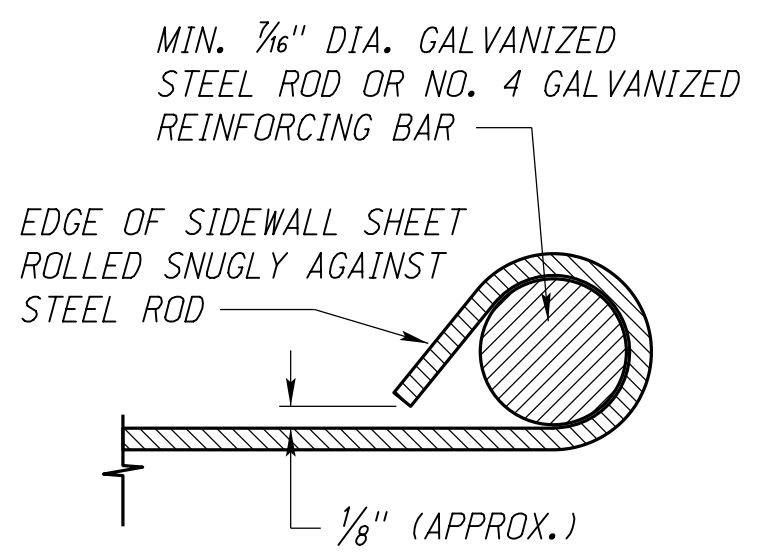
TYPE #2 CONNECTOR DETAILS FOR 27" AND LARGER



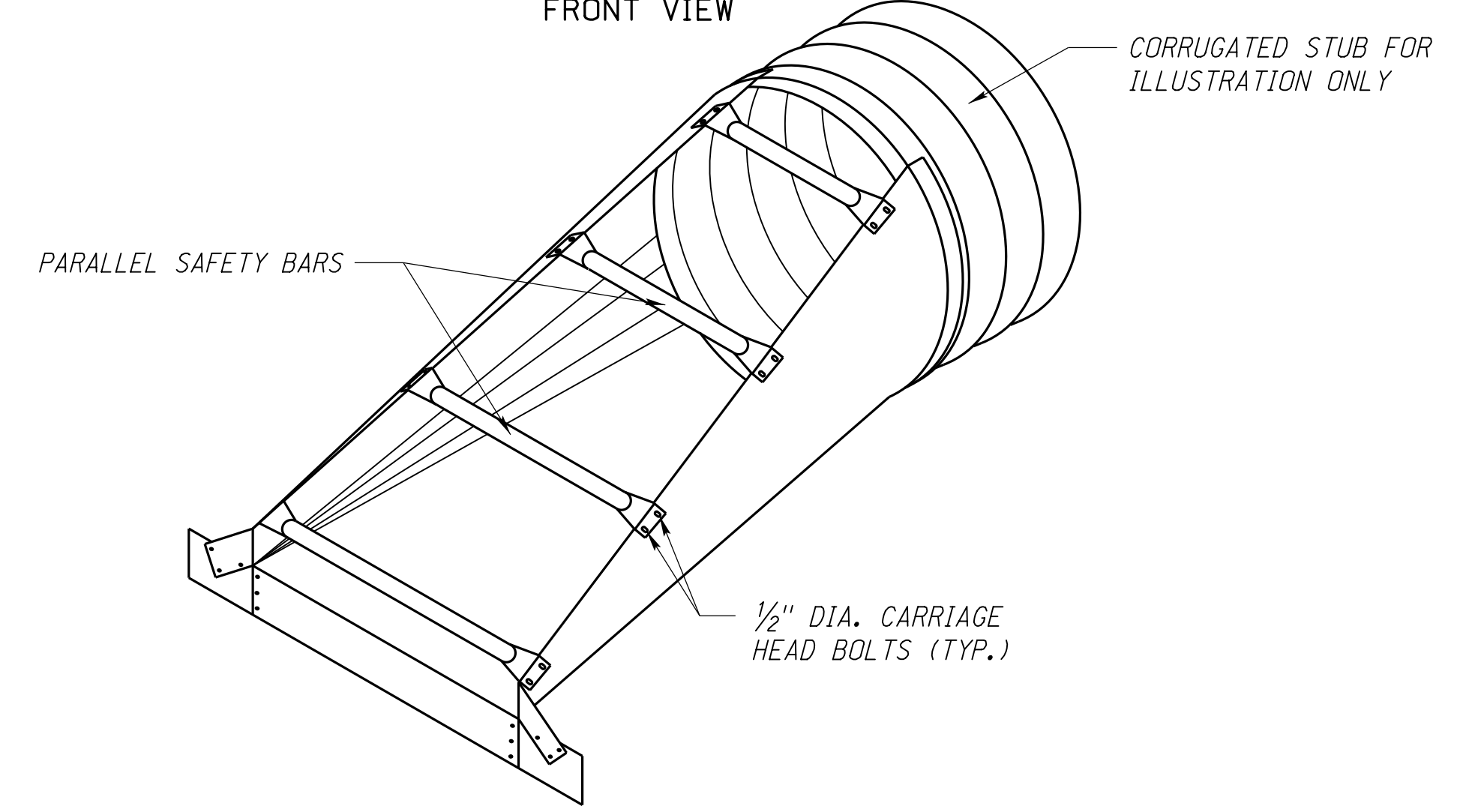
ALTERNATE VIEW FOR FEMALE END



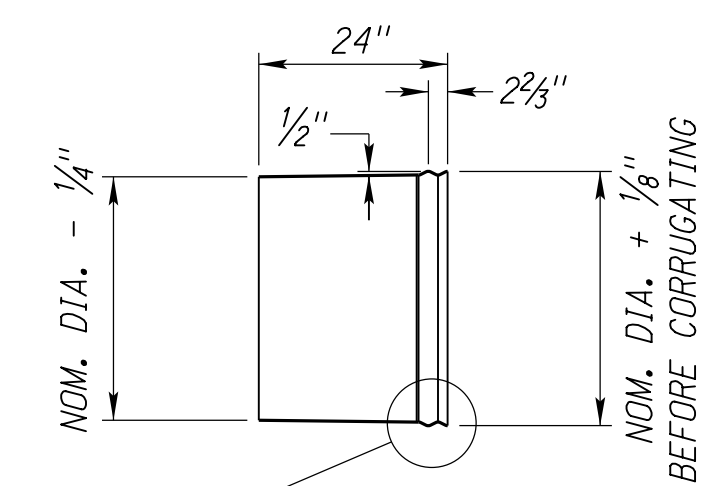
TAPERED SLEEVE FOR ATTACHING STEEL END SECTIONS TO CONCRETE PIPE



DETAIL OF CROSS DRAINAGE SAFETY BAR

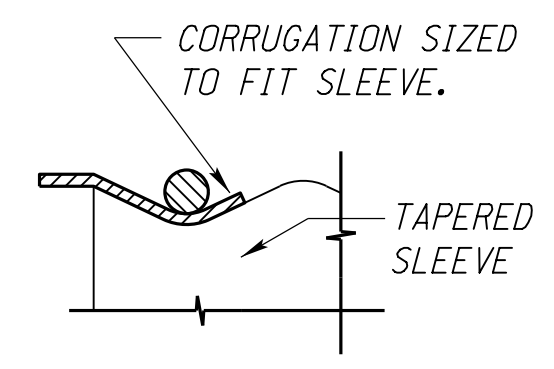


PARALLEL DRAINAGE STRUCTURE

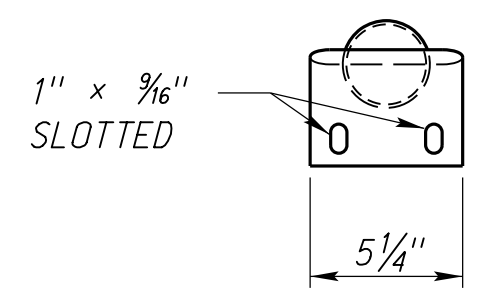


SMOOTH TAPERED SLEEVE DETAIL

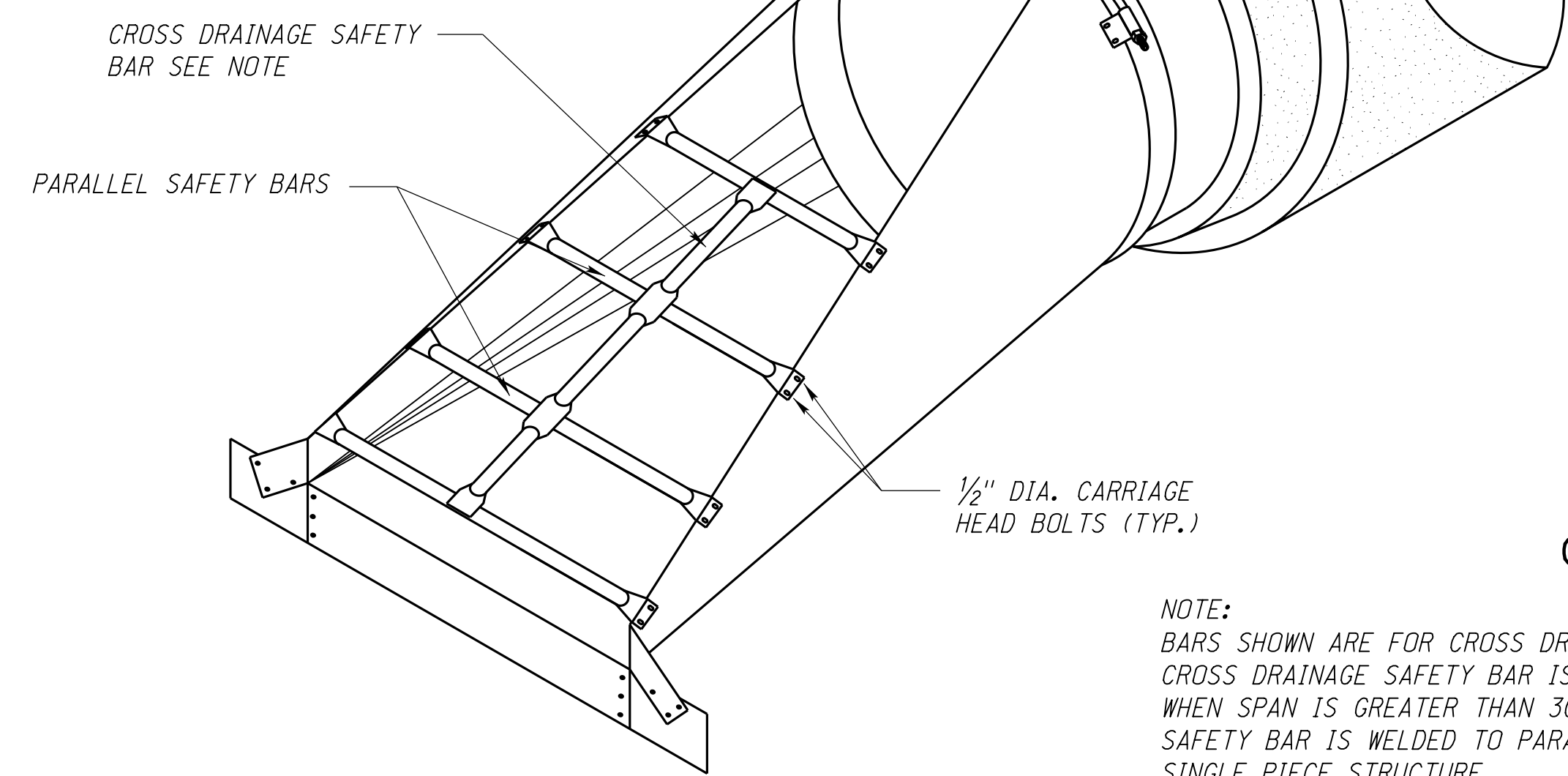
NOTE: METAL TO BE 12 GAUGE SMOOTH GALVANIZED IN ACCORDANCE WITH AASHTO M 218.



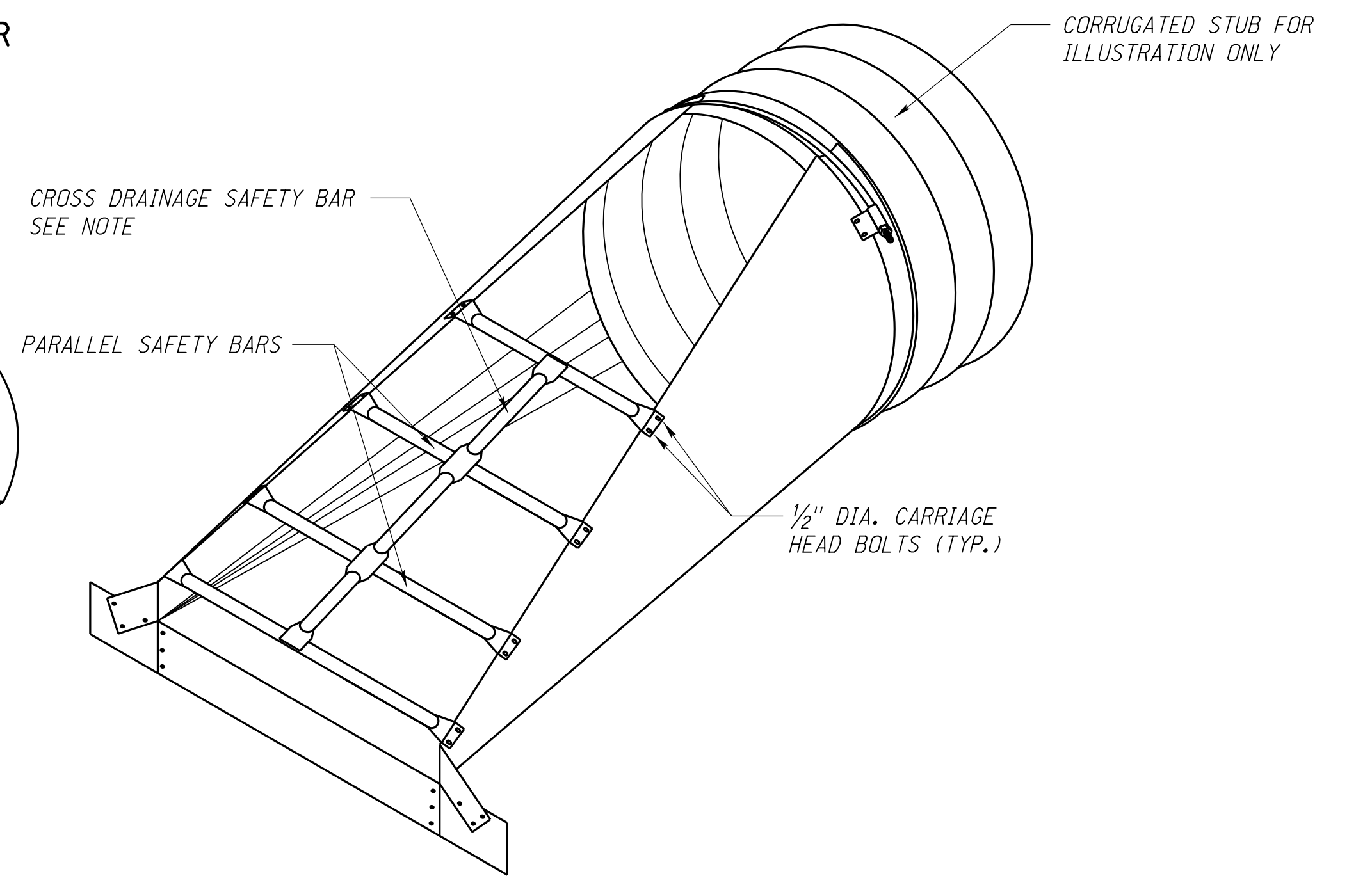
SECTION B-B



DETAIL OF PARALLEL SAFETY BARS



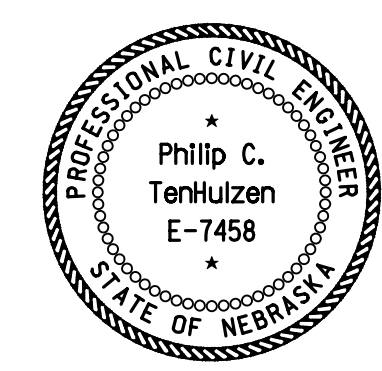
CROSS DRAINAGE STRUCTURE



CROSS DRAINAGE STRUCTURE

SAFETY SLOPED END SECTIONS CORRUGATED METAL AND CONCRETE PIPE

SHEET 1 OF 2
SPECIAL PLAN C



NOTE: BARS SHOWN ARE FOR CROSS DRAINAGE STRUCTURES. CROSS DRAINAGE SAFETY BAR IS REQUIRED ONLY WHEN SPAN IS GREATER THAN 30". CROSS DRAINAGE SAFETY BAR IS WELDED TO PARALLEL SAFETY BARS FOR SINGLE PIECE STRUCTURE.

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METAL END SECTIONS FOR CONCRETE PIPE										
PIPE DIA. (IN.)	MIN. THICK.		DIMENSIONS (IN.)				L DIMENSIONS			
	IN.	GAUGE	A	H	W	OVERALL WIDTH	SLOPE	LENGTH (IN.)	SLOPE	LENGTH (IN.)
15	.064	16	8	6	21	37	1:4	20	1:6	30
18	.064	16	8	6	24	40	1:4	32	1:6	48
24	.064	16	8	6	30	46	1:4	56	1:6	84
30	.109	12	12	9	36	60	1:4	80	1:6	120
36	.109	12	12	9	42	66	1:4	104	1:6	156
42	.109	12	16	12	48	80	1:4	128	1:6	192
48	.109	12	16	12	54	86	1:4	152	1:6	228
54	.109	12	16	12	60	92	1:4	176	1:6	264
60	.109	12	16	12	66	98	1:4	200	1:6	300

METAL END SECTIONS FOR ELLIPTICAL PIPE													
EQUIV. DIA. (IN.)	SPAN (IN.)	RISE (IN.)	MIN. THICK.		DIMENSIONS (IN.)				L DIMENSIONS				
			IN.	GAUGE	A	H	W	OVERALL WIDTH	SLOPE	LENGTH (IN.)	SLOPE	LENGTH (IN.)	
18	23	14	.064	16	8	6	29	45	1:4	16	1:6	24	
24	30	19	.064	16	8	6	36	52	1:4	36	1:6	54	
30	38	24	.079	14	12	9	44	68	1:4	56	1:6	84	
36	45	29	.109	12	16	12	51	83	1:4	76	1:6	114	
42	53	34	.109	12	16	12	59	91	1:4	96	1:6	144	
48	60	38	.109	12	16	12	66	98	1:4	112	1:6	168	
54	68	43	.109	12	16	12	74	106	1:4	132	1:6	198	
60	76	48	.109	12	16	12	80	112	1:4	152	1:6	228	

METAL END SECTIONS FOR CIRCULAR PIPE										
PIPE DIA. (IN.)	MIN. THICK.		DIMENSIONS (IN.)				L DIMENSIONS			
	IN.	GAUGE	A	H	W	OVERALL WIDTH	SLOPE	LENGTH (IN.)	SLOPE	LENGTH (IN.)
15	.064	16	8	6	21	37	1:4	20	1:6	30
18	.064	16	8	6	24	40	1:4	32	1:6	48
24	.064	16	8	6	30	46	1:4	56	1:6	84
30	.109	12	12	9	36	60	1:4	80	1:6	120
36	.109	12	12	9	42	66	1:4	104	1:6	156
42	.109	12	16	12	48	80	1:4	128	1:6	192
48	.109	12	16	12	54	86	1:4	152	1:6	228
54	.109	12	16	12	60	92	1:4	176	1:6	264
60	.109	12	16	12	66	98	1:4	200	1:6	300

METAL END SECTIONS FOR ARCHED PIPE													
EQUIV. DIA. (IN.)	SPAN (IN.)	RISE (IN.)	MIN. THICK.		DIMENSIONS (IN.)				L DIMENSIONS				
			IN.	GAUGE	A	H	W	OVERALL WIDTH	SLOPE	LENGTH (IN.)	SLOPE	LENGTH (IN.)	
18	21	15	.064	16	8	6	27	43	1:4	20	1:6	30	
24	28	20	.064	16	8	6	34	50	1:4	40	1:6	60	
30	35	24	.079	14	12	9	41	65	1:4	56	1:6	84	
36	42	29	.109	12	12	9	48	72	1:4	76	1:6	114	
42	49	33	.109	12	16	12	55	87	1:4	92	1:6	138	
48	57	38	.109	12	16	12	63	95	1:4	112	1:6	168	
54	64	43	.109	12	16	12	70	102	1:4	132	1:6	198	
60	71	47	.109	12	16	12	77	109	1:4	148	1:6	222	
72	83	57	.109	12	16	12	89	121	1:4	188	1:6	282	

METAL END SECTIONS FOR CIRCULAR PIPE									
PIPE DIA. (IN.)	MIN. THICK.		DIMENSIONS (IN.)				L DIMENSIONS		
	IN.	GAUGE	A	H	W	OVERALL WIDTH	SLOPE	LENGTH (IN.)	
15	.109	12	8	6	21	37	1:10	70	
18	.109	12	8	6	24	40	1:10	100	
24	.109	12	8	6	30	46	1:10	160	

METAL END SECTIONS FOR ARCHED PIPE										
EQUIV. DIA. (IN.)	SPAN (IN.)	RISE (IN.)	MIN. THICK.		DIMENSIONS (IN.)				L DIMENSIONS	
			IN.	GAUGE	A	H	W	OVERALL WIDTH	SLOPE	LENGTH (IN.)
18	21	15	.109	12	8	6	27	43	1:10	70
24	28	20	.109	12	8	6	34	50	1:10	120

NOTES:

STEEL:

GALVANIZED STEEL SHALL MEET AASHTO SPECIFICATIONS.

CONNECTORS:

ROUND SIZES THRU 24" ATTACH TO PIPE WITH TYPE #1 STRAPS. ALL OTHER SIZES ATTACH WITH TYPE #2 RODS AND LUGS.

TOE PLATE EXTENSIONS:

WHEN REQUIRED, TOE PLATE EXTENSIONS ARE TO BE THE SAME GAUGE AS END SECTION. DIMENSIONS SHALL BE OVERALL WIDTH LESS 6 INCHES BY 8 INCHES HIGH.

SAFETY BARS:

SAFETY BARS SHALL BE SCHEDULE 40 GALVANIZED STEEL PIPE. PIPE TO BE GALVANIZED AFTER FORMING.

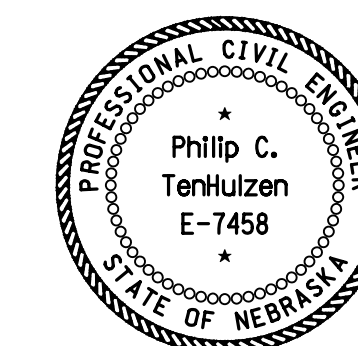
MISCELLANEOUS DETAILS:

SLOTTED HOLES FOR SAFETY BAR ATTACHMENT SHALL BE PROVIDED FOR ALL END SECTIONS.

SAFETY SLOPED END SECTIONS
CORRUGATED METAL AND
CONCRETE PIPE

SHEET 2 OF 2

SPECIAL PLAN C



QUANTITIES TABLE					
X	CONCRETE (CU. YDS.)	STEEL (LBS.)	X	CONCRETE (CU. YDS.)	STEEL (LBS.)
2'-0"	0.7	49	5'-0"	1.4	96
2'-6"	0.8	61	5'-6"	1.5	107
3'-0"	0.9	65	6'-0"	1.6	111
3'-6"	1.0	76	6'-6"	1.7	123
4'-0"	1.1	80	7'-0"	1.8	127
4'-6"	1.3	92	7'-6"	1.9	138

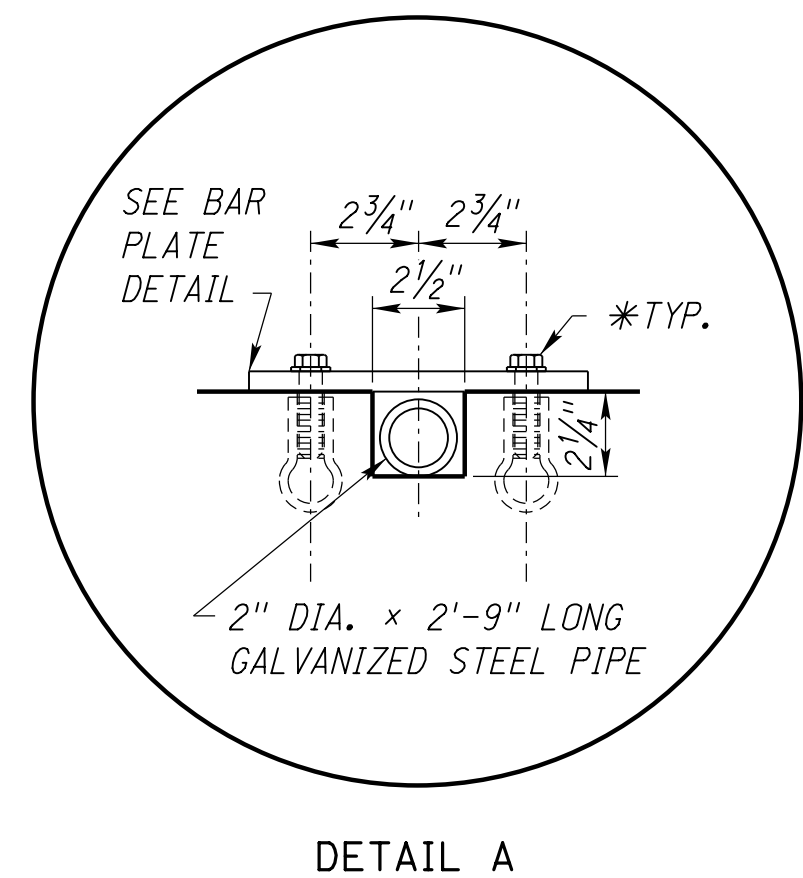
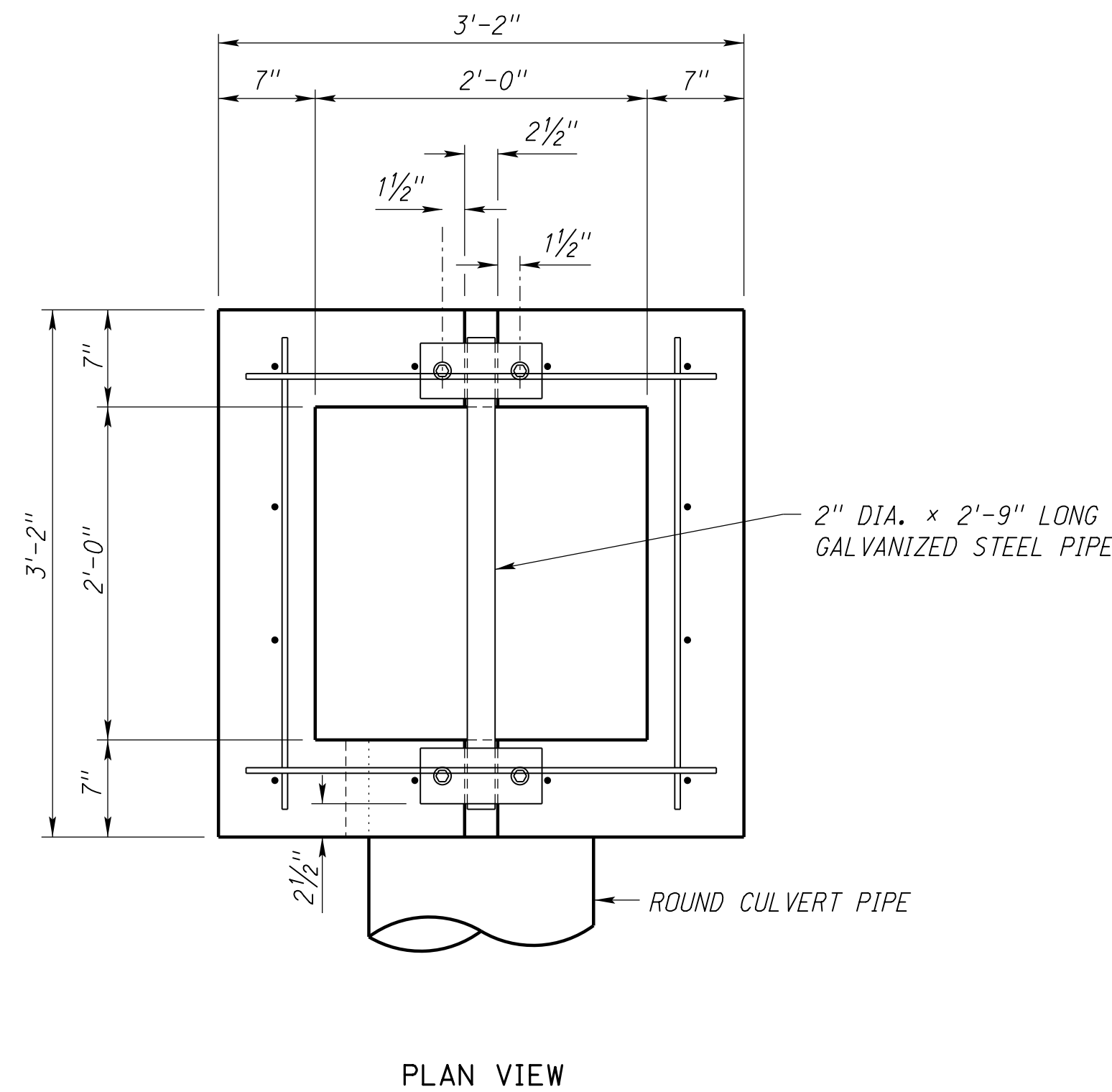
THE MINIMUM X VALUE ALLOWED FOR 15" DIA. PIPE IS 2'-0"
 THE MINIMUM X VALUE ALLOWED FOR 18" DIA. PIPE IS 2'-3"
 THE MINIMUM X VALUE ALLOWED FOR 24" DIA. PIPE IS 2'-9"
 THE MAXIMUM SIZE PIPE THAT MAY BE USED IS 24" DIA.

ROADWAY DESIGN DIVISION

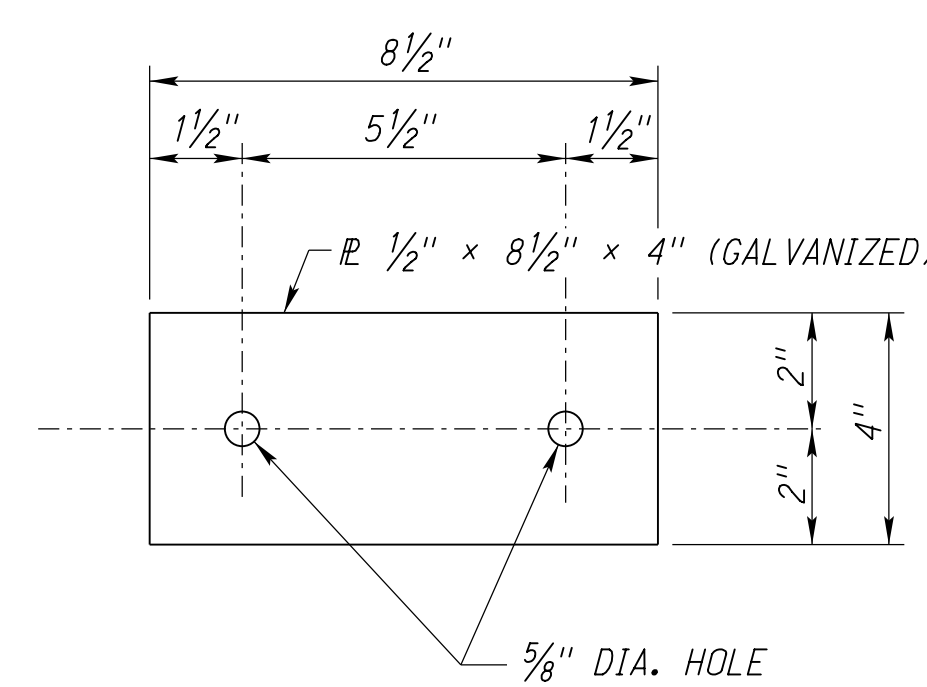
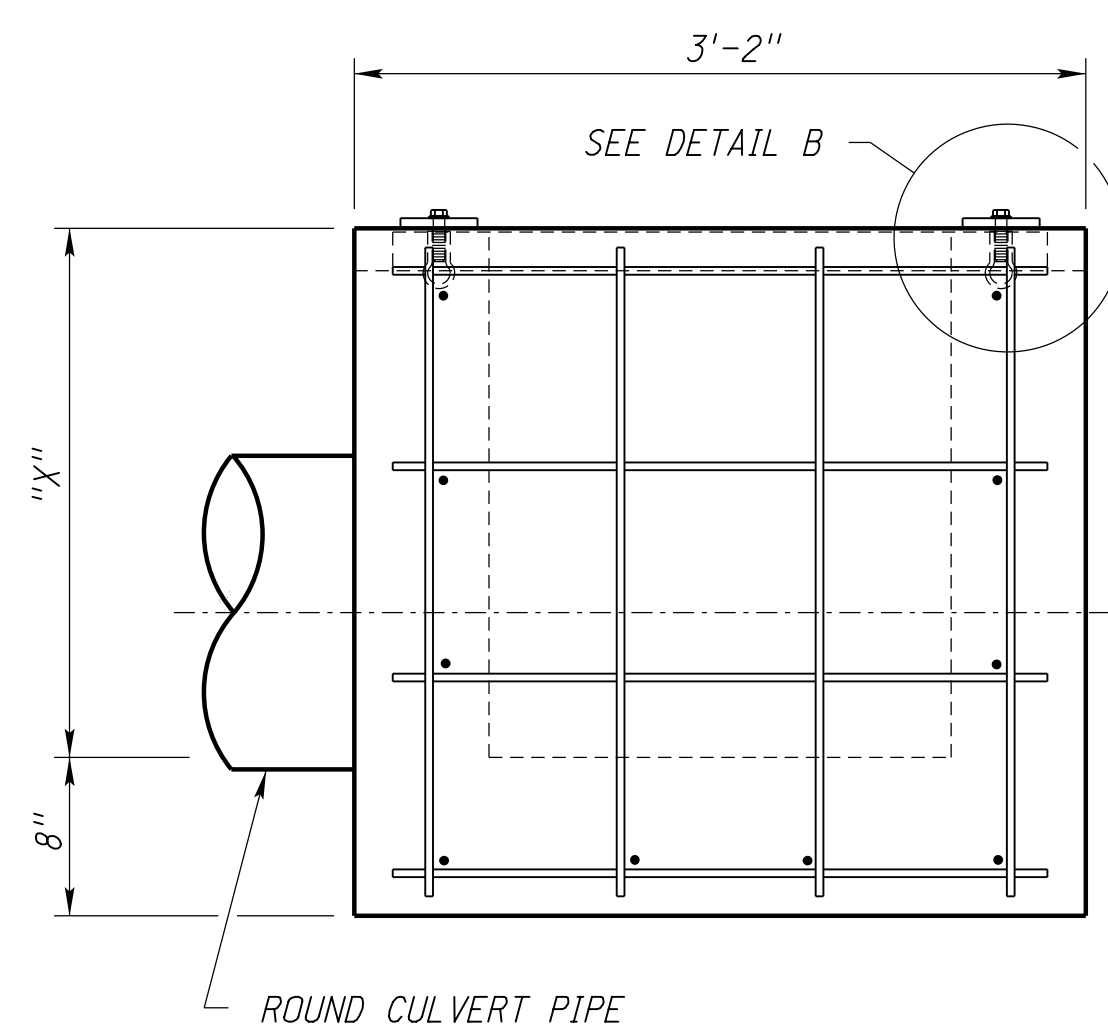
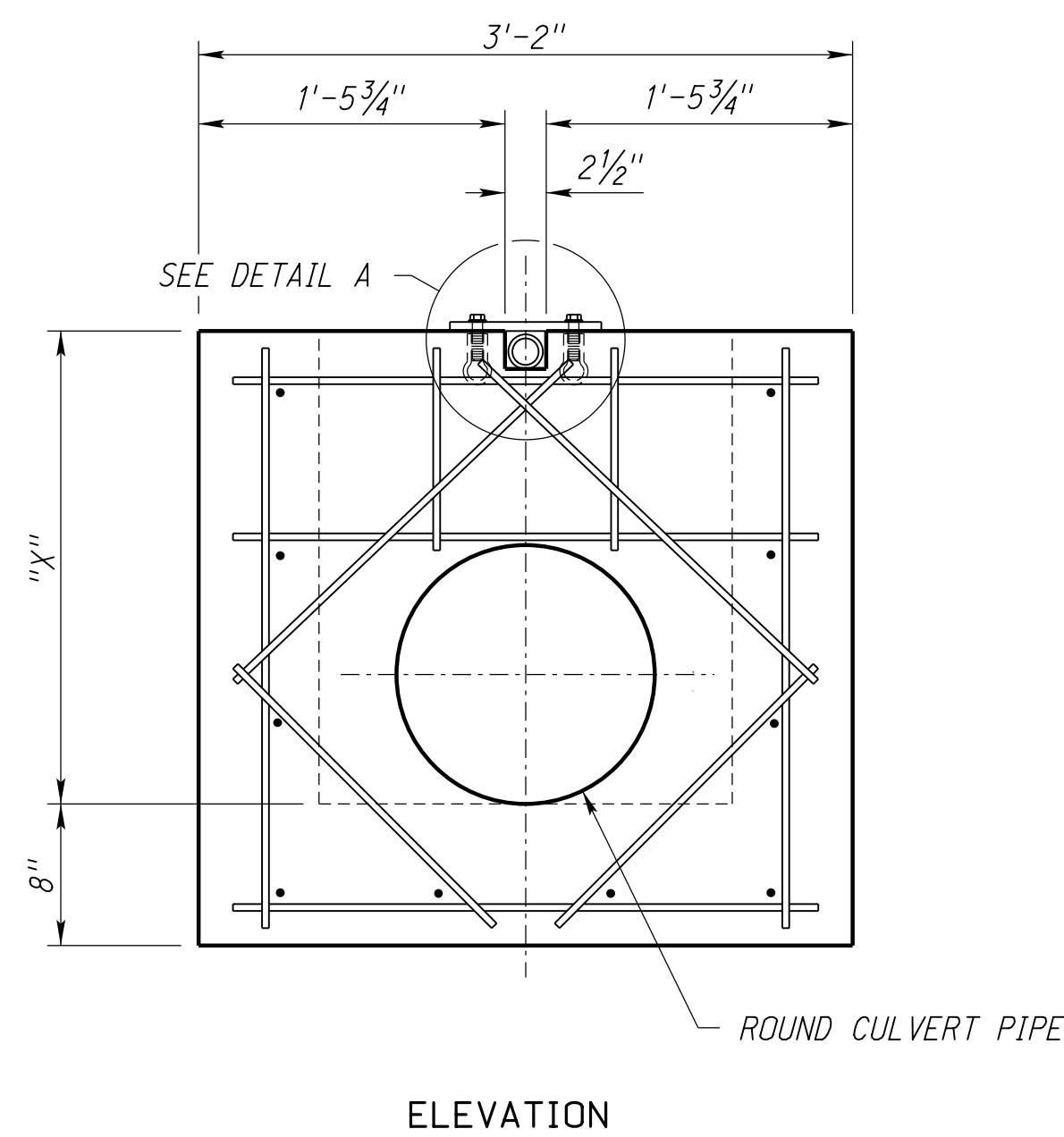
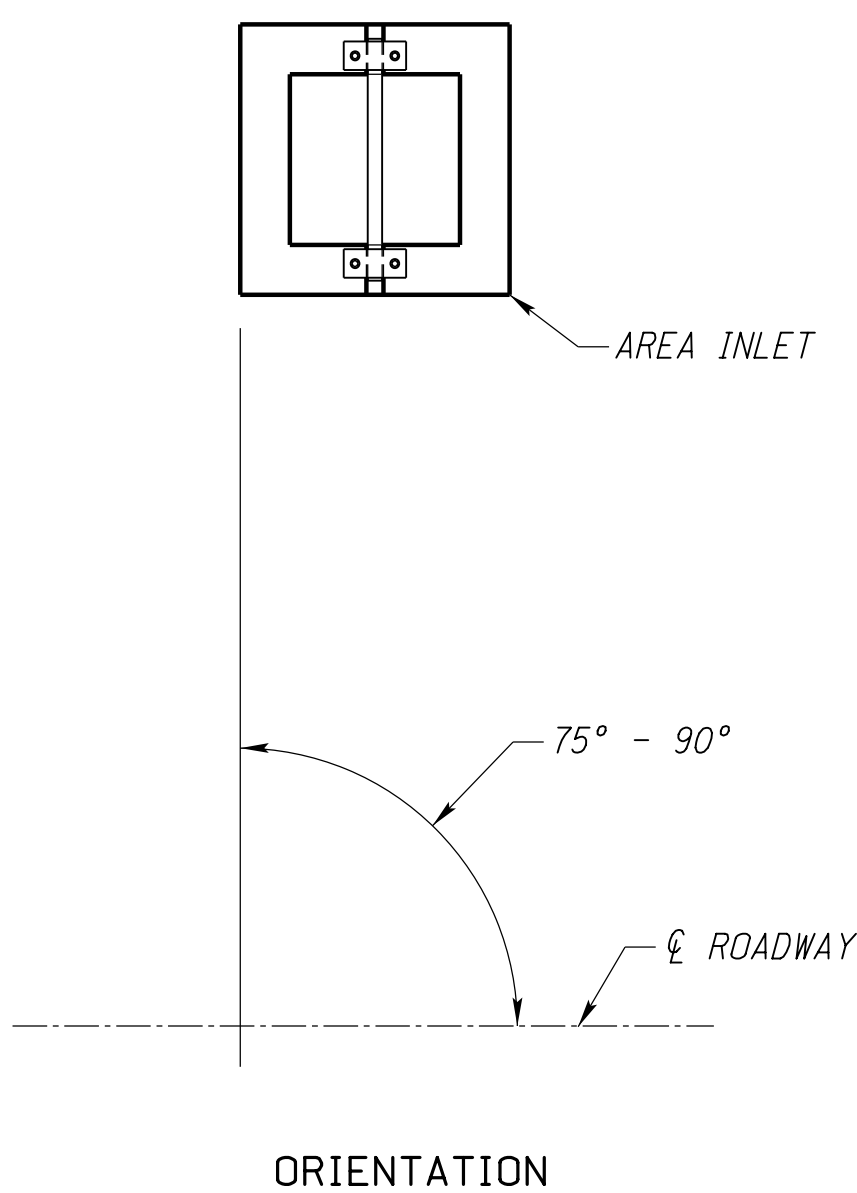
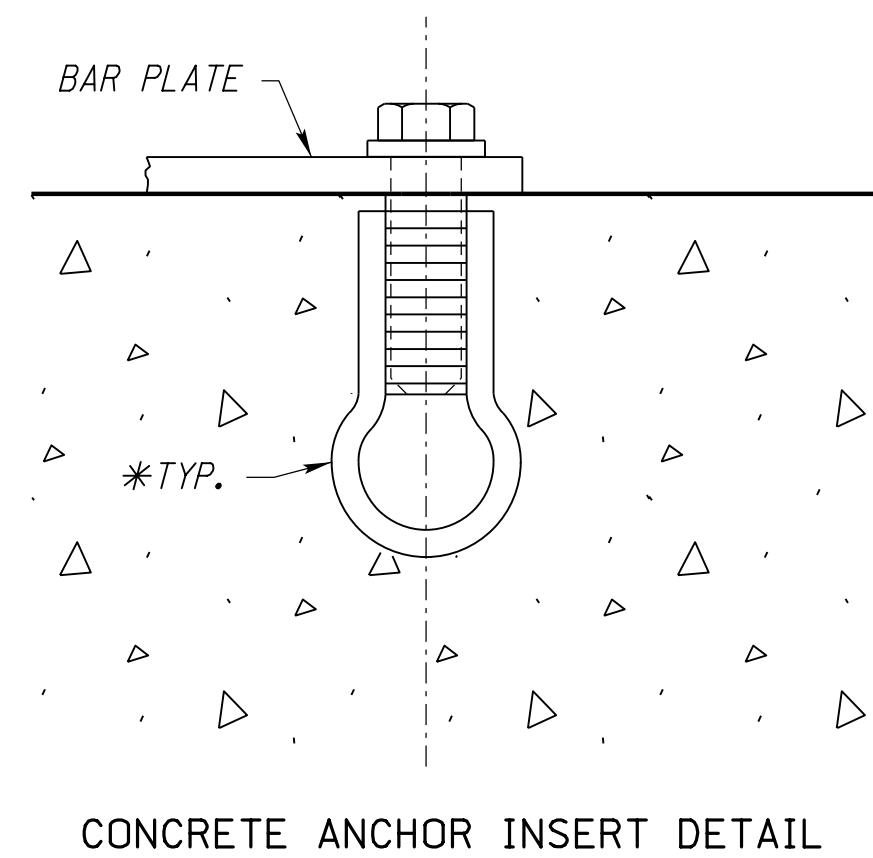
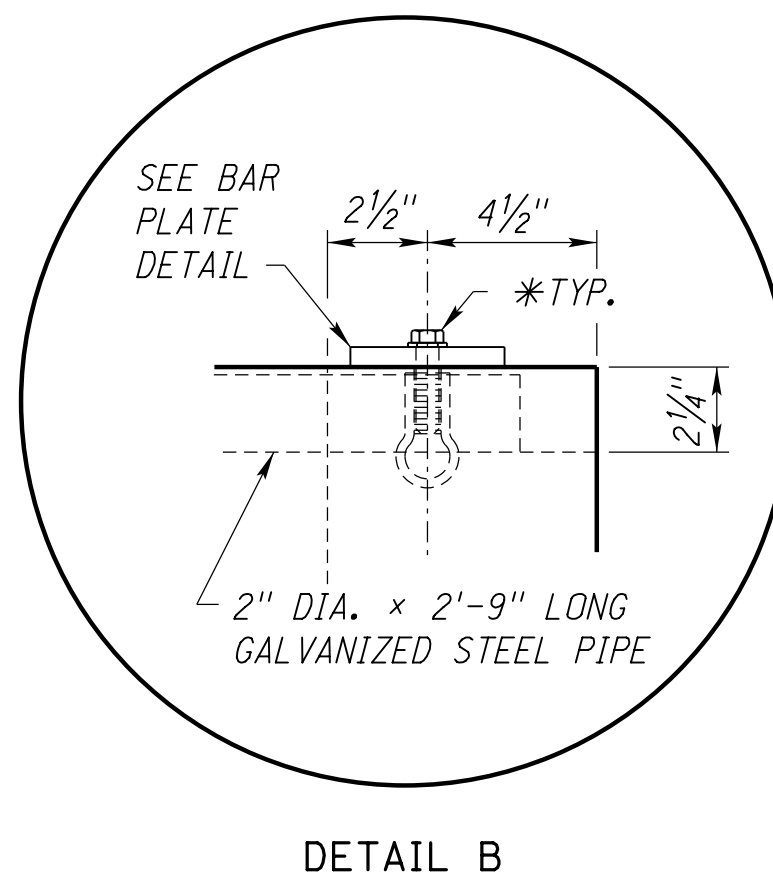
Computer: NDDTDESIGN134

Date: 18-MAY-2021 12:27

File: 43301e01.dgn SHEET 1 OF 1 4330-1-E-01



* 1/2" DIA. DAYTON/RICHMOND FERRULE LOOP INSERT OR APPROVED EQUAL



NOTES:

ALL CONCRETE USED SHALL BE CLASS 47B-3000 AND SHALL BE PAID FOR UNDER THE ITEM "CLASS 47B-3000 CONCRETE FOR INLET AND JUNCTION BOX".

THE MINIMUM COVERING, MEASURED FROM THE FACE OF THE CONCRETE TO THE SURFACE OF ANY REINFORCING BAR SHALL BE 2" UNLESS OTHERWISE NOTED.

ALL REINFORCING STEEL USED SHALL CONFORM TO THE REQUIREMENTS OF ASTM A615 GRADE 60, SHALL BE NO. 4 BARS PLACED AT 1'-0" CENTERS (MAXIMUM) AND SHALL BE PAID FOR UNDER THE ITEM "REINFORCING STEEL FOR INLET AND JUNCTION BOX".

FIELD BEND AND/OR CLIP REINFORCING STEEL TO MAINTAIN MINIMUM COVERING.

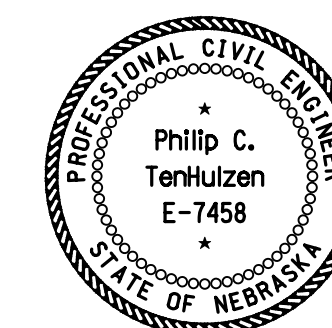
THE 2" DIA. X 2'-9" PIPE, TRASH BAR PLATES AND ALL ASSOCIATED HARDWARE SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH THE REQUIREMENTS OF ASTM A123.

ALL DIAGONAL BARS, PREPARATION, MATERIALS, EQUIPMENT, TOOLS, LABOR, AND INCIDENTALS NECESSARY TO COMPLETE THE WORK THAT ARE NOT PAID FOR DIRECTLY, SHALL BE CONSIDERED SUBSIDIARY TO OTHER ITEMS FOR WHICH PAYMENT IS MADE.

NO DEDUCTIONS HAVE BEEN MADE IN THE QUANTITIES FOR PIPE OPENINGS.

IF A PIPE IS ENTERING THE BOX ON A SKEW, THE OUTSIDE HORIZONTAL DIAMETER OF THE PIPE MUST NOT EXCEED THE INSIDE WIDTH OF THE BOX AND IT MUST ENTER THE BOX BETWEEN THE OUTSIDE CORNERS OF THE BOX.

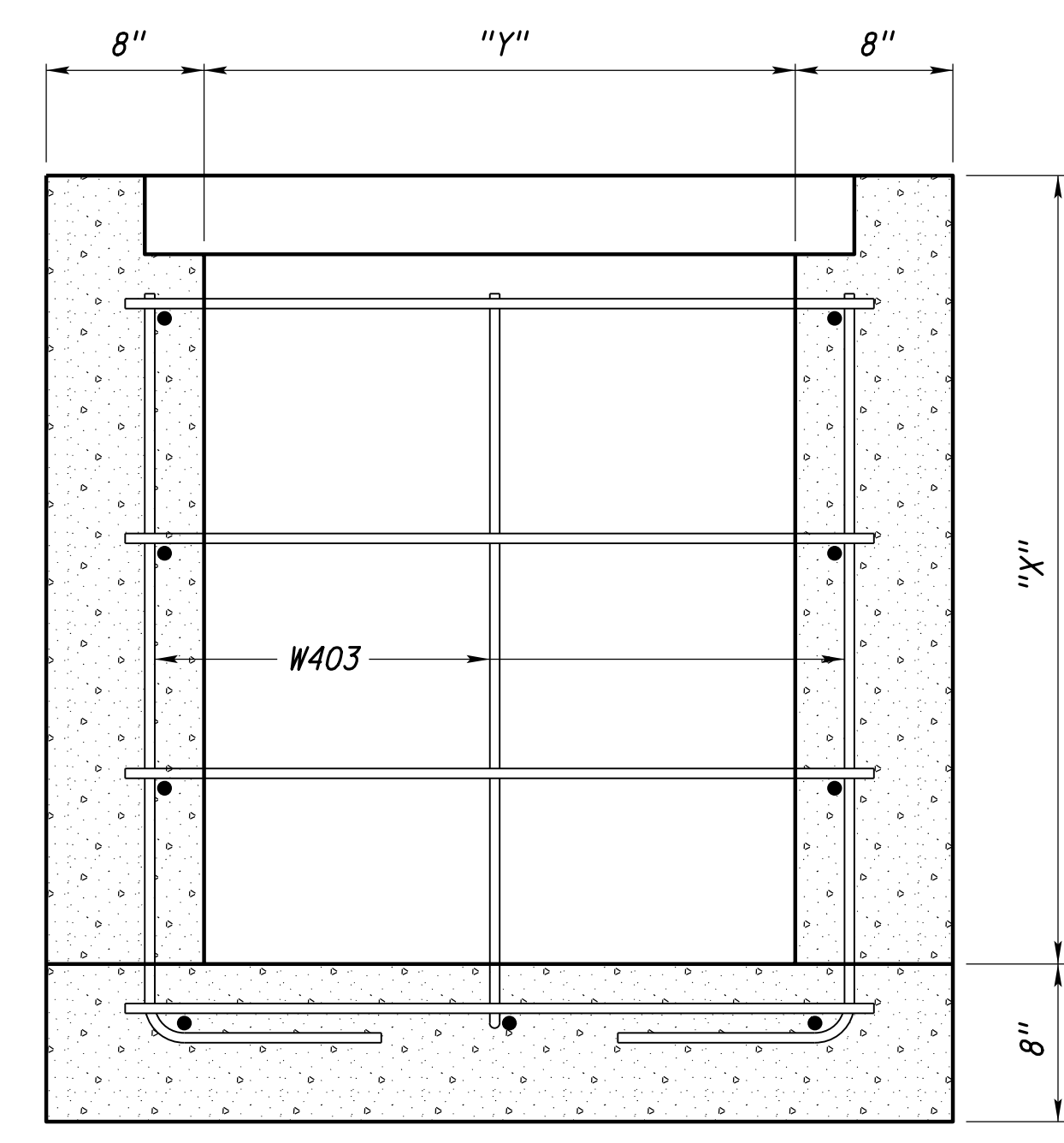
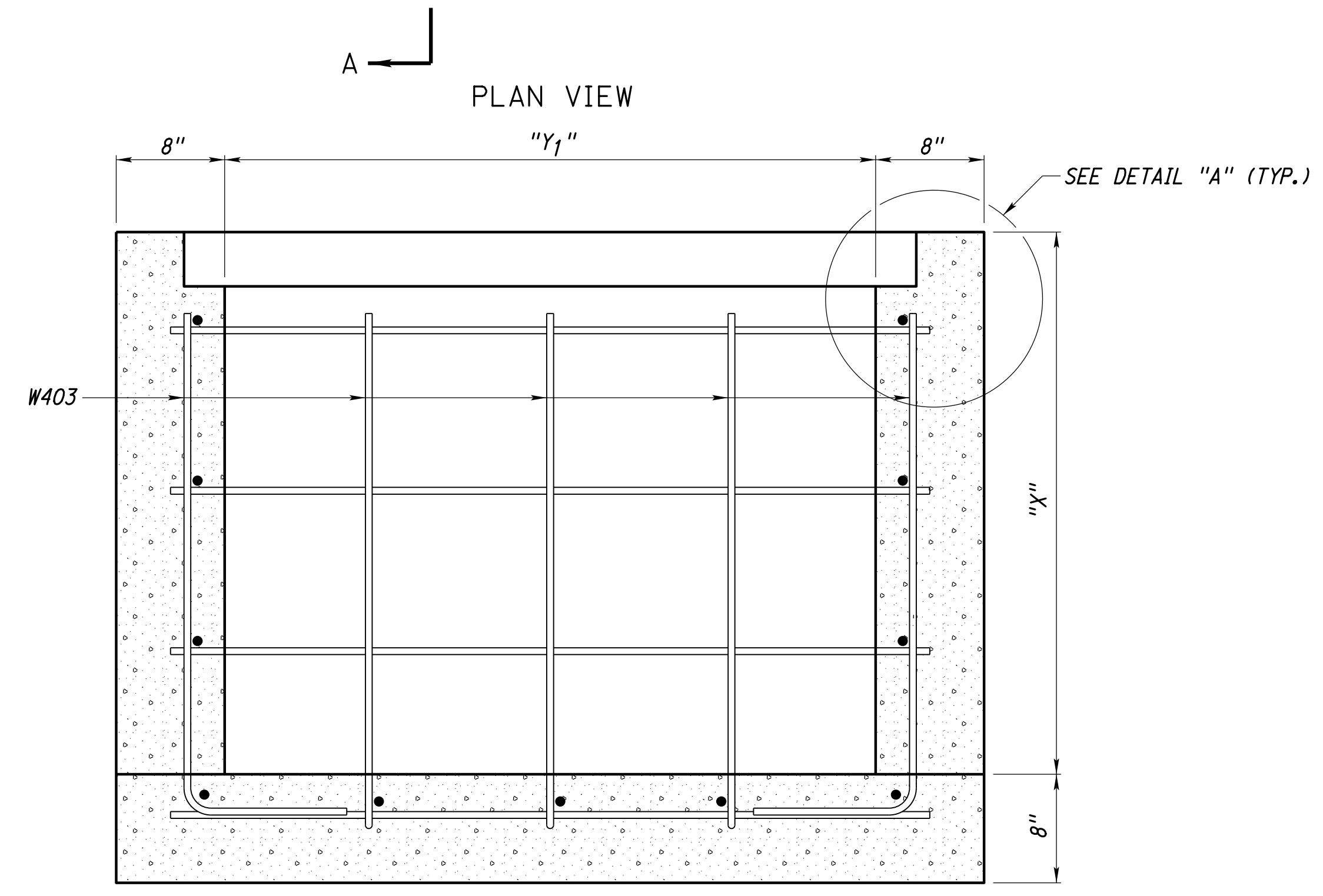
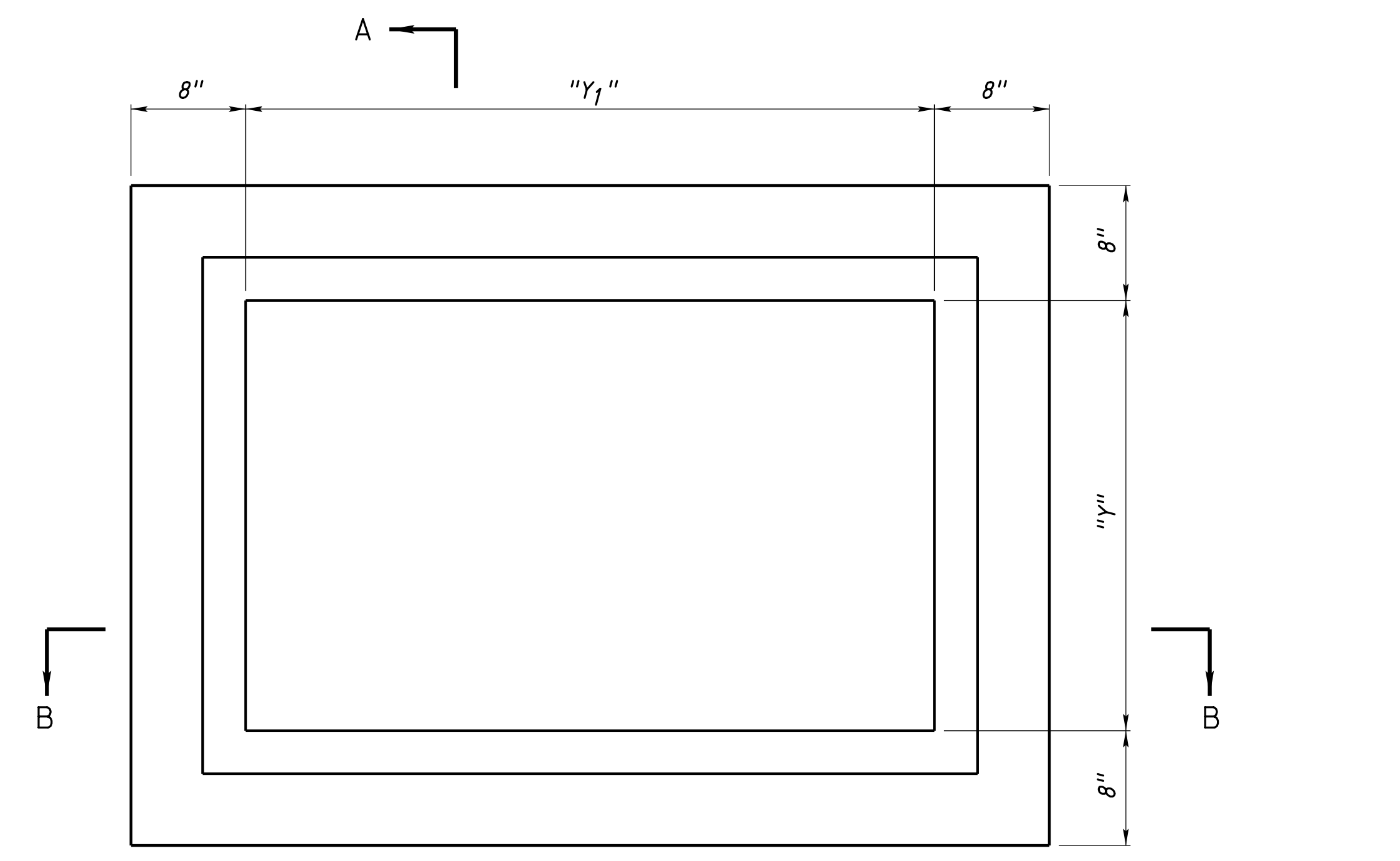
CULVERT PIPE SHOWN FOR ORIENTATION PURPOSES ONLY.



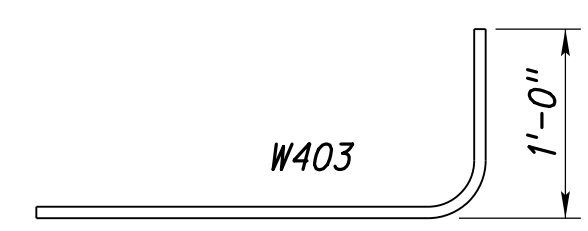
AREA INLET WITH BAR
 SHEET 1 OF 1
SPECIAL PLAN C

PIPE DIA. (IN.)	MIN. "X" VALUE
15	2'-0"
18	2'-3"
21	2'-9"
24	3'-0"
30	3'-6"
36	4'-0"
42	4'-6"
48	5'-0"

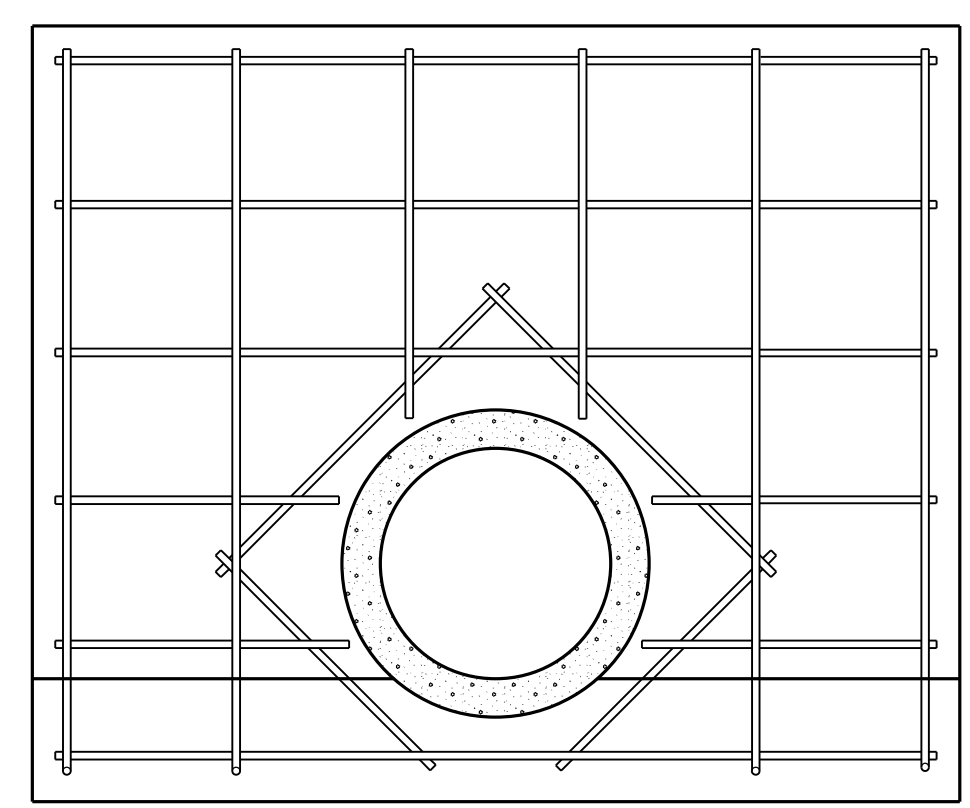
INLET QUANTITIES													
"X" VALUE	GRATE TYPE "A" "Y"=3'-0", "Y ₁ "=3'-0"		GRATE TYPE "B" "Y"=3'-6", "Y ₁ "=3'-6"		GRATE TYPE "C" "Y"=2'-6", "Y ₁ "=4'-0"		GRATE TYPE "D" "Y"=1'-8", "Y ₁ "=3'-8"		GRATE TYPE "E" "Y"=2'-0", "Y ₁ "=2'-0"		GRATE TYPE "F" "Y"=1'-6", "Y ₁ "=1'-6"		
	CONCRETE (CU. YDS.)	STEEL (LBS.)	CONCRETE (CU. YDS.)	STEEL (LBS.)	CONCRETE (CU. YDS.)	STEEL (LBS.)	CONCRETE (CU. YDS.)	STEEL (LBS.)	CONCRETE (CU. YDS.)	STEEL (LBS.)	CONCRETE (CU. YDS.)	STEEL (LBS.)	
2'-0"	1.2	65	1.4	80	1.3	70	1.0	60	0.8	40	0.6	35	
2'-6"	1.4	65	1.6	85	1.5	75	1.2	60	0.9	45	0.7	40	
3'-0"	1.6	80	1.8	105	1.7	90	1.4	75	1.1	55	0.8	45	
3'-6"	1.7	85	2.0	110	1.9	95	1.5	80	1.2	55	0.9	50	
4'-0"	1.9	100	2.2	125	2.1	110	1.7	90	1.3	65	1.1	60	
4'-6"	2.1	100	2.4	130	2.2	115	1.9	95	1.5	70	1.2	60	
5'-0"	2.3	115	2.6	145	2.4	130	2.0	110	1.6	80	1.3	70	
5'-6"	2.5	120	2.8	150	2.6	135	2.2	110	1.7	80	1.4	70	
6'-0"	2.6	135	3.0	170	2.8	150	2.3	125	1.9	90	1.5	80	
6'-6"	2.8	140	3.3	175	3.0	155	2.5	130	2.0	95	1.6	85	
7'-0"	3.0	150	3.5	190	3.2	170	2.7	140	2.1	105	1.7	90	



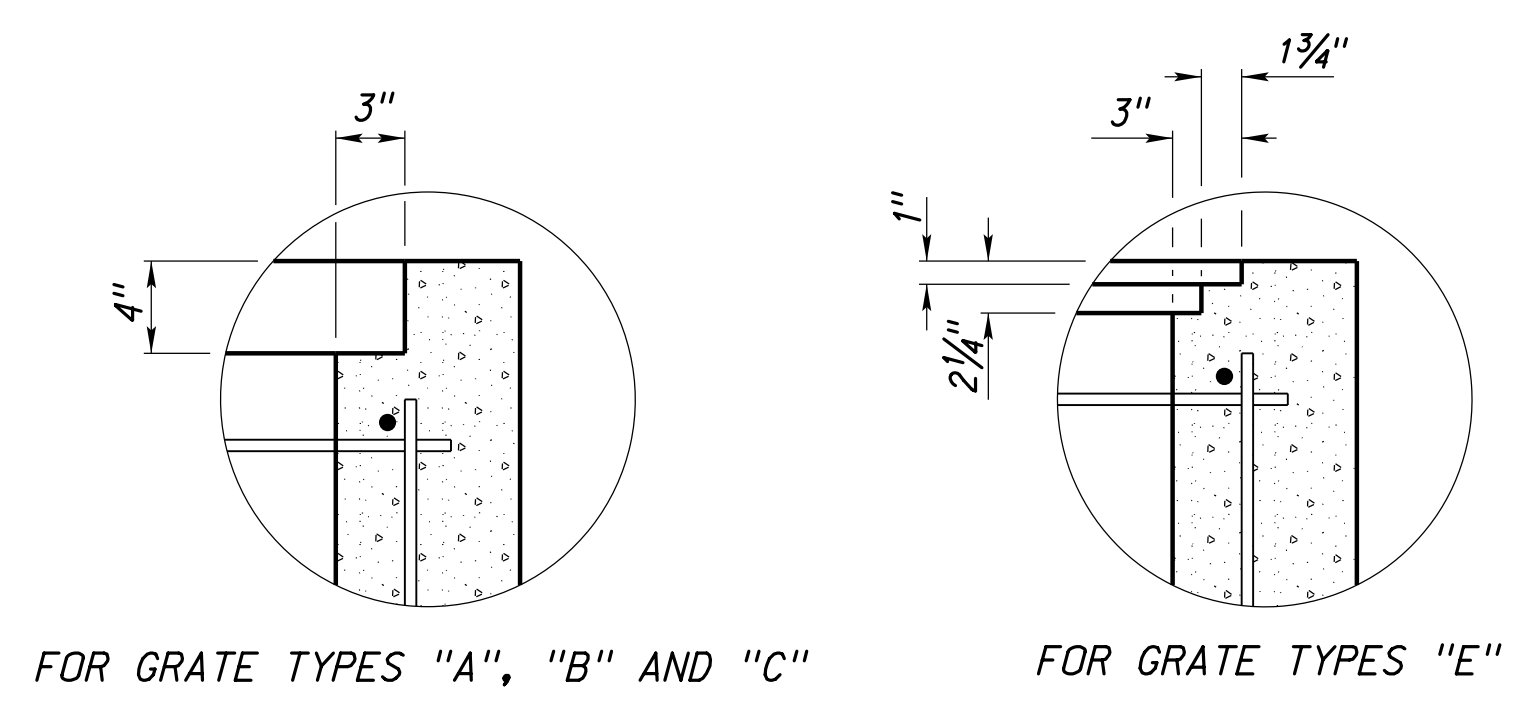
SECTION A-A



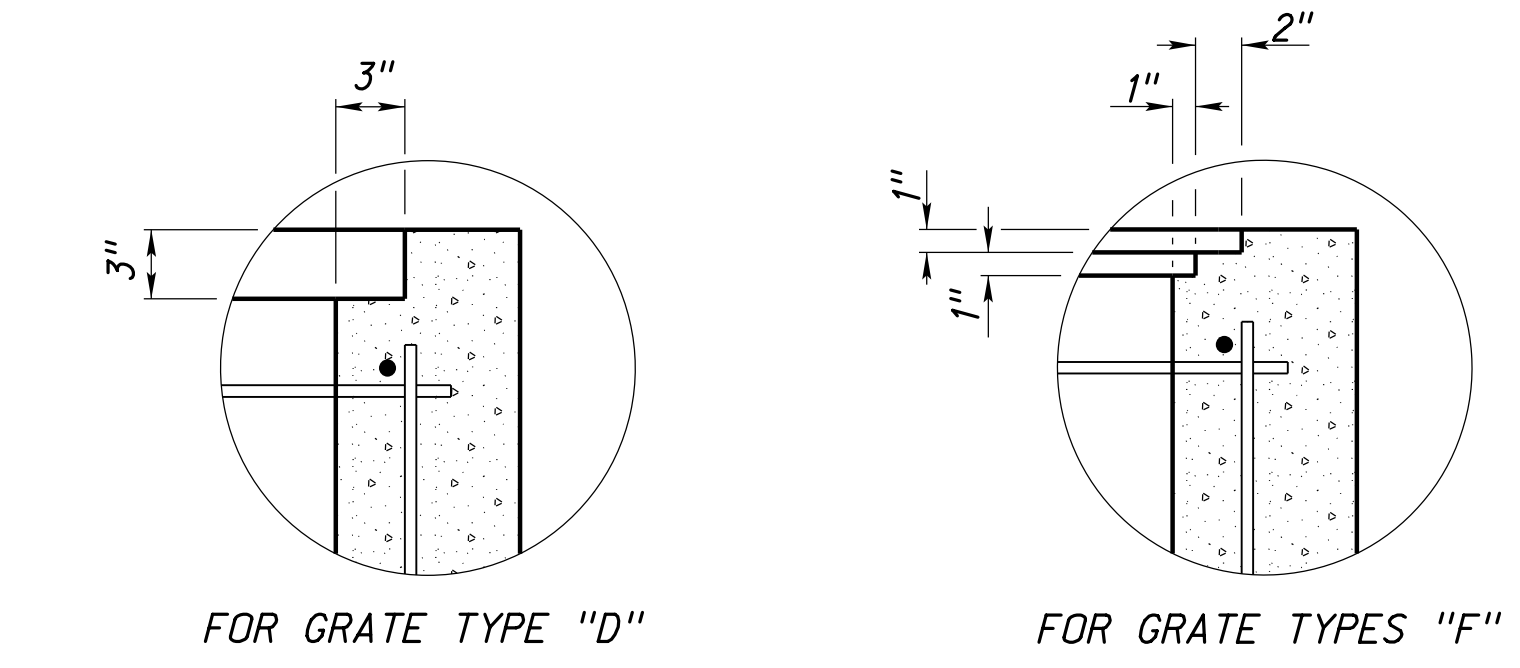
BENDING DIAGRAM



DETAIL "B"
USE FOR PLACEMENT OF DIAGONAL BARS ONLY



FOR GRATE TYPES "A", "B" AND "C"



FOR GRATE TYPE "D"

FOR GRATE TYPES "F"

DETAIL "A"

NOTES:

IN NO CASE SHALL THE SPAN OF THE PIPE PLUS THE ADDITIONAL ALLOWANCE FOR THE SKEW OF THE PIPE BE GREATER THAN THE "Y" OR "Y₁" DIMENSION OF THE INLET WALL IT IS INTENDED TO PENETRATE.

ALL CONCRETE USED SHALL BE CLASS 47B-3000 AND SHALL BE PAID FOR UNDER THE ITEM "CLASS 47B-3000 CONCRETE FOR INLET AND JUNCTION BOX".

ALL REINFORCING STEEL USED SHALL CONFORM TO THE REQUIREMENTS OF ASTM DESIGNATION A615, GRADE 60. ALL REINFORCING STEEL SHALL BE NO. 4 BARS AT 12" CENTERS (MAX.) UNLESS NOTED OTHERWISE.

PLACE DIAGONAL REINFORCING AROUND PIPE OPENINGS AS SHOWN IN DETAIL "B".

THE MINIMUM COVERING, MEASURED FROM THE FACE OF THE CONCRETE TO THE SURFACE OF ANY REINFORCING BAR, SHALL BE 2", EXCEPT AS SHOWN.

FIELD BEND AND/OR CLIP REINFORCING STEEL TO ALLOW FOR MINIMUM CLEARANCE AND TO CLEAR PIPE OPENINGS.

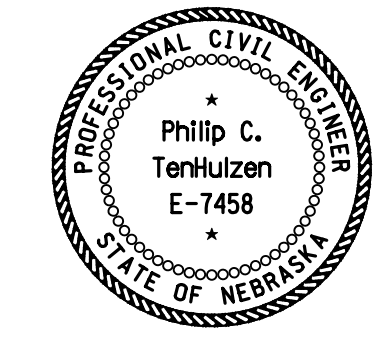
THE CAST IRON GRATES AND FRAMES SHALL CONFORM TO THE SPECIAL PLAN AND STANDARD SPECIFICATIONS AND SHALL BE PAID FOR UNDER THE ITEM "CAST IRON GRATE AND FRAME".

EXCAVATION, BACKFILL AND DIAGONAL REINFORCING STEEL SHALL NOT BE PAID FOR DIRECTLY, BUT SHALL BE CONSIDERED SUBSIDIARY TO OTHER ITEMS FOR WHICH PAYMENT IS MADE.

NO DEDUCTIONS HAVE BEEN MADE IN THE QUANTITIES FOR PIPE OPENINGS.

ALL PIPES USED SHALL BE ROUND CORRUGATED METAL, REINFORCED CONCRETE, OR PLASTIC PIPE.

SEE SHEET 2 OF 2 FOR GRATE DETAILS.



AREA INLET WITH GRATE
SHEET 1 OF 2
SPECIAL PLAN C

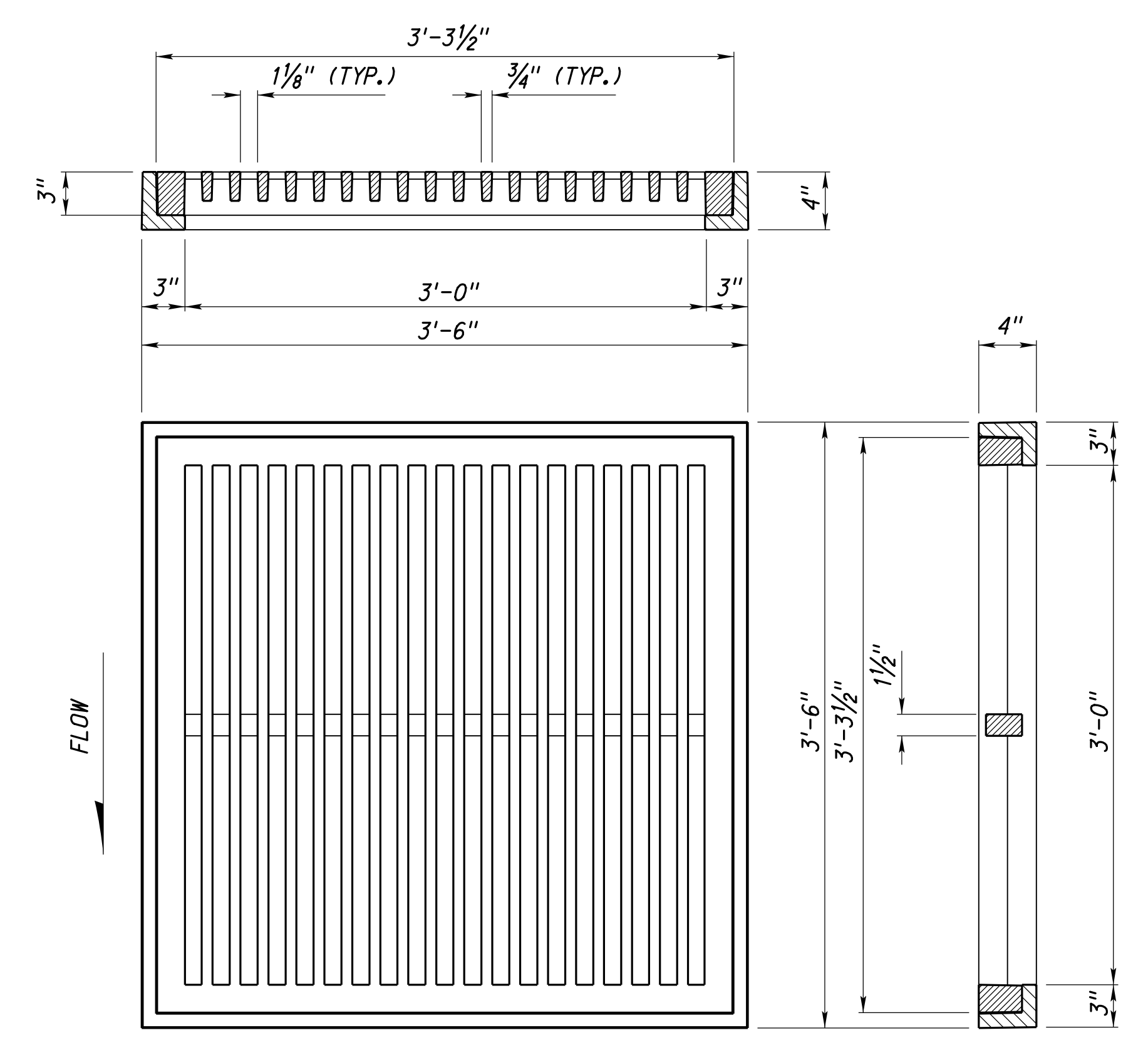
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SHEET 1 OF 2 4533-1-E-00

ROADWAY DESIGN DIVISION

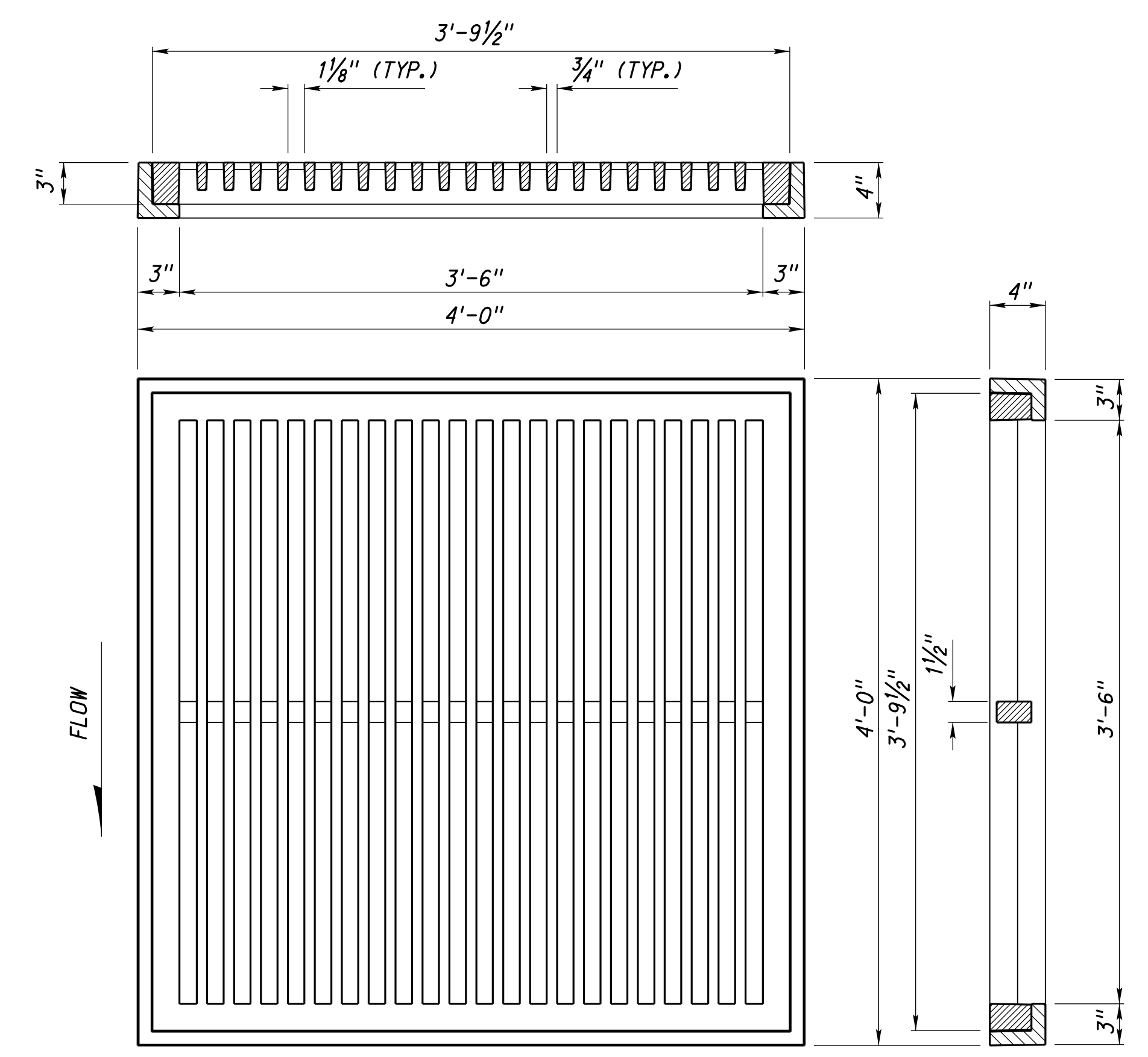
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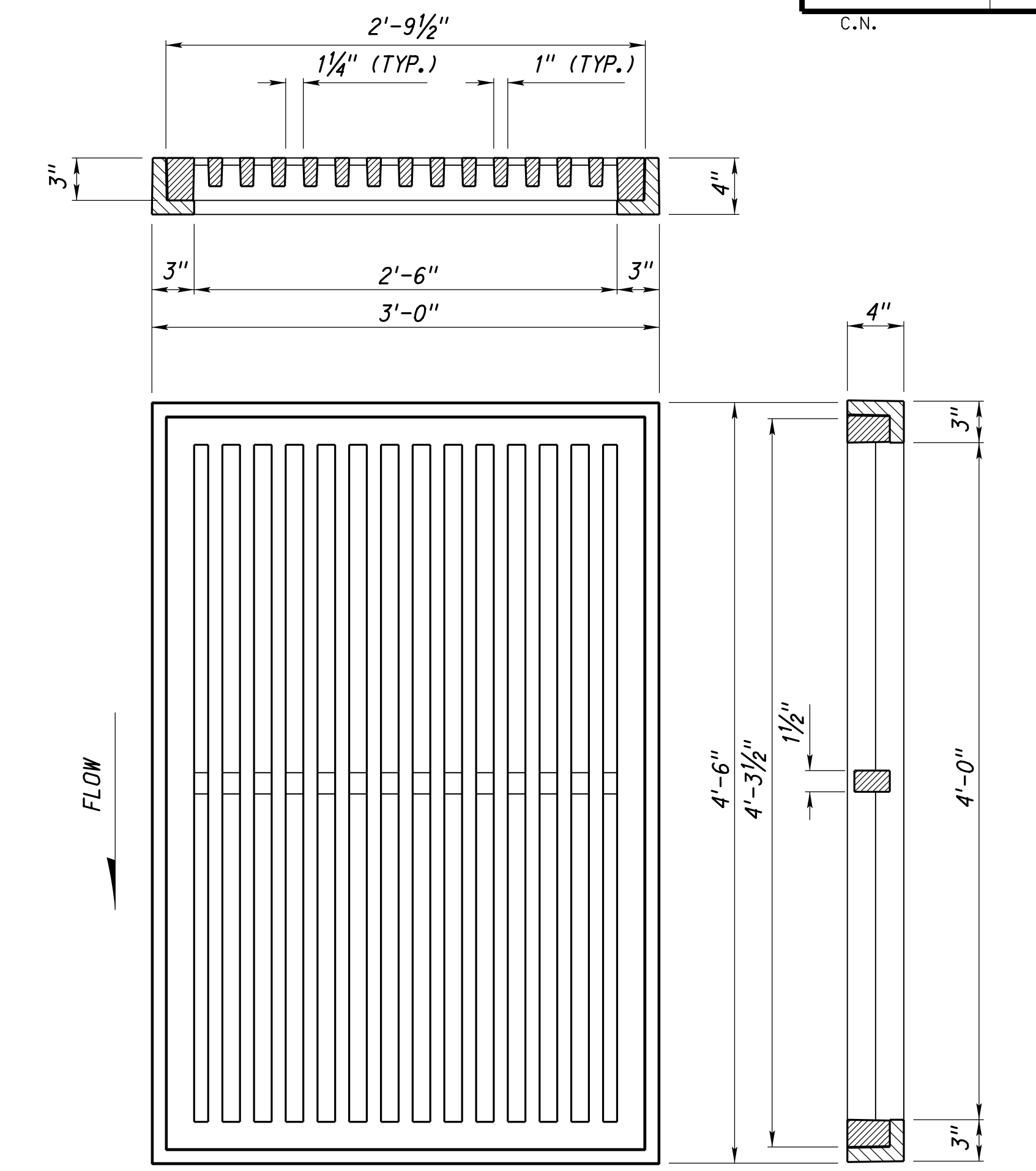
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SHEET 2 OF 2 4333-1-E-00



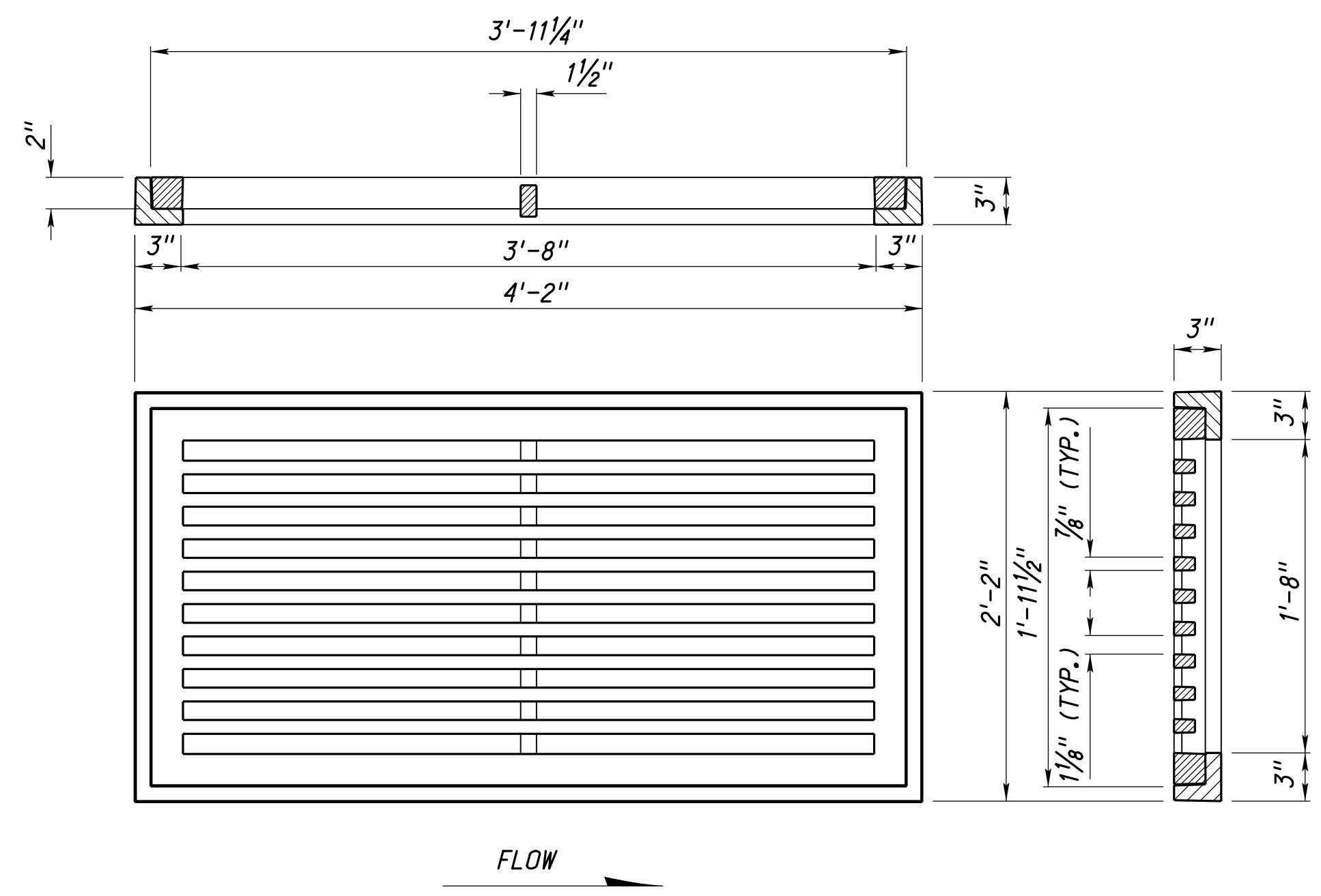
GRATE TYPE "A"
CLEAR OPENING 5.1 SQ. FT.
WEIGHT CAST IRON 745 LBS.



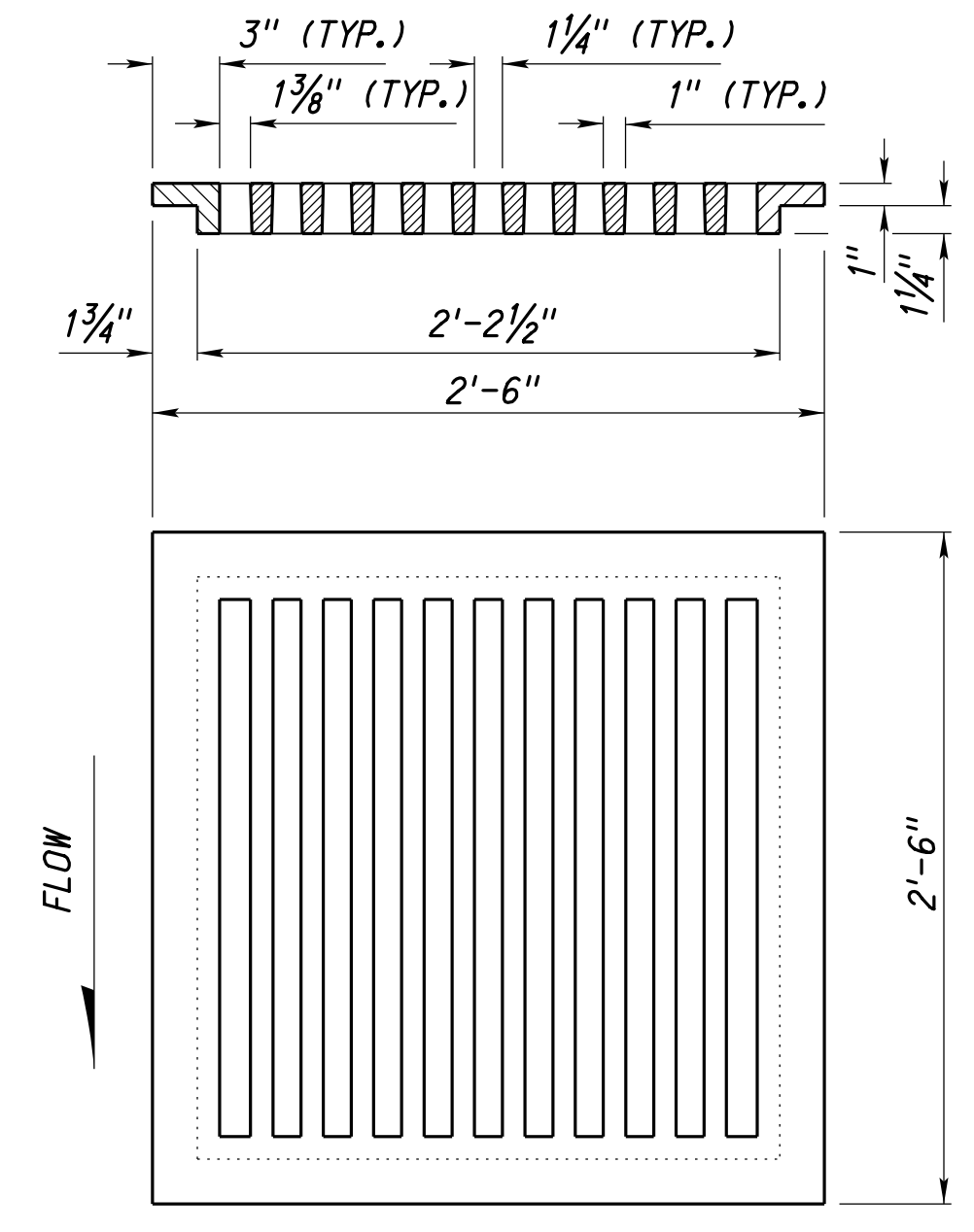
GRATE TYPE "B"
CLEAR OPENING 6.6 SQ. FT.
WEIGHT CAST IRON 990 LBS.



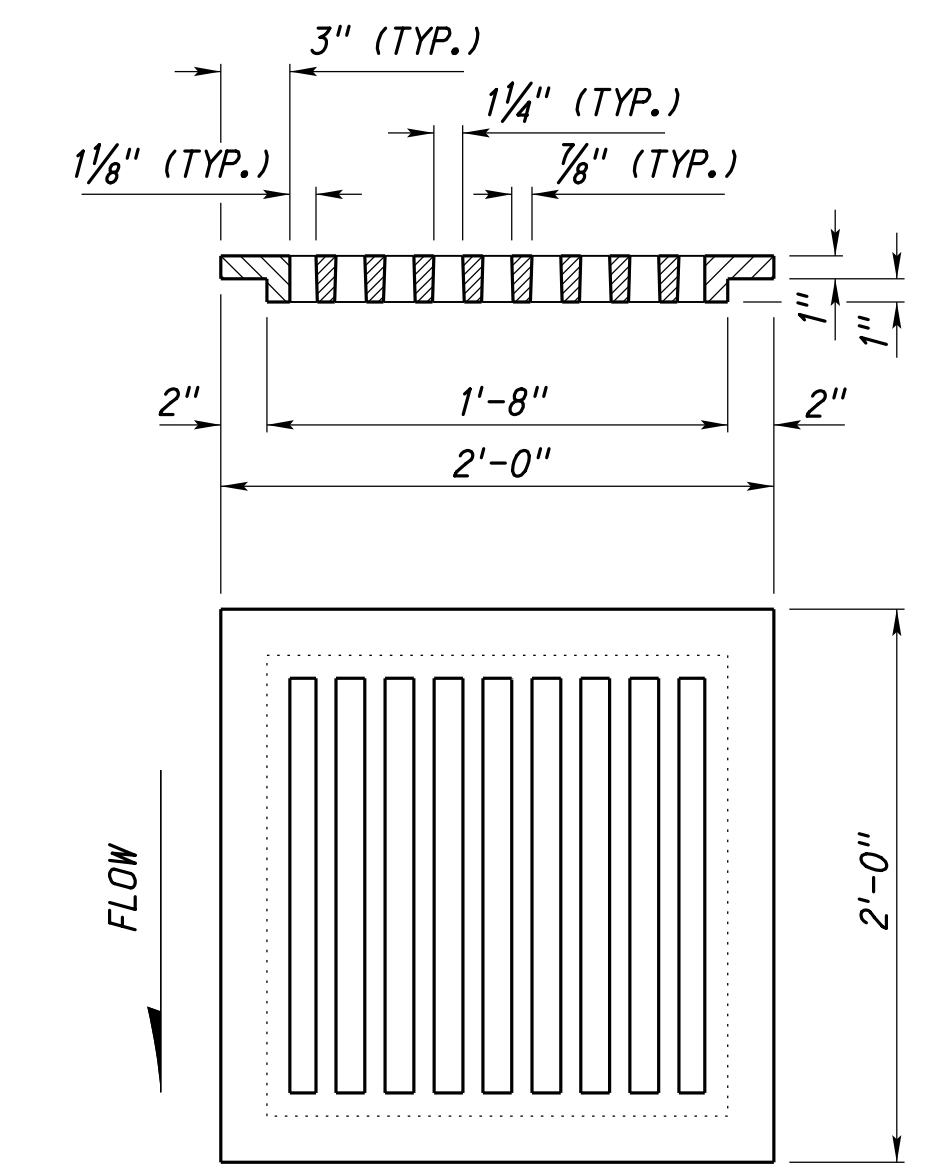
GRATE TYPE "C"
CLEAR OPENING 5.5 SQ. FT.
WEIGHT CAST IRON 825 LBS.



GRATE TYPE "D"
CLEAR OPENING 3.4 SQ. FT.
WEIGHT CAST IRON 555 LBS.

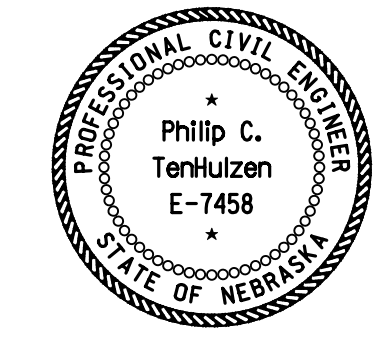


GRATE TYPE "E"
CLEAR OPENING 2.3 SQ. FT.
WEIGHT CAST IRON 265 LBS.



GRATE TYPE "F"
CLEAR OPENING 1.3 SQ. FT.
WEIGHT CAST IRON 175 LBS.

NOTE:
THESE GRATES ARE NOT TO BE USED IN
AREAS THAT ALLOW BICYCLE TRAFFIC.



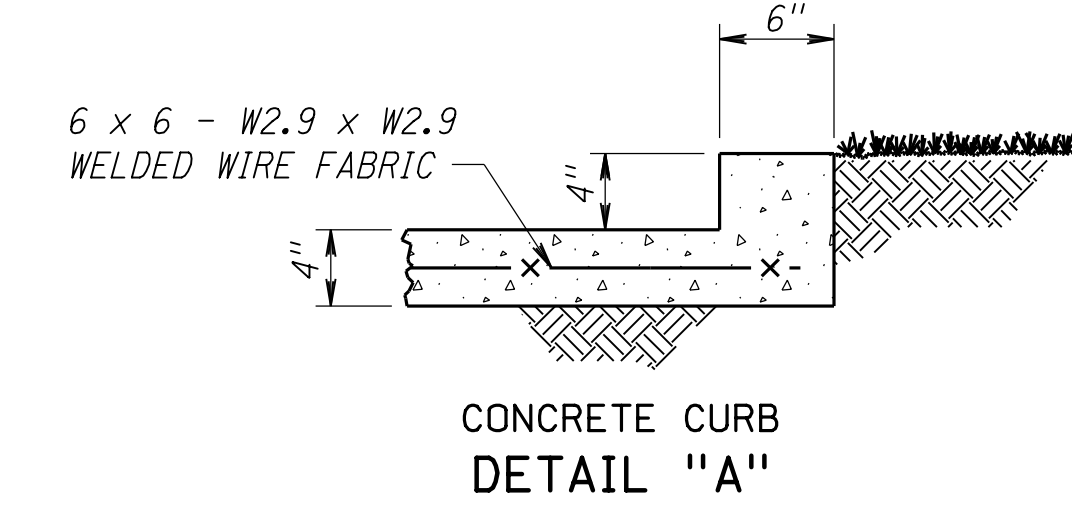
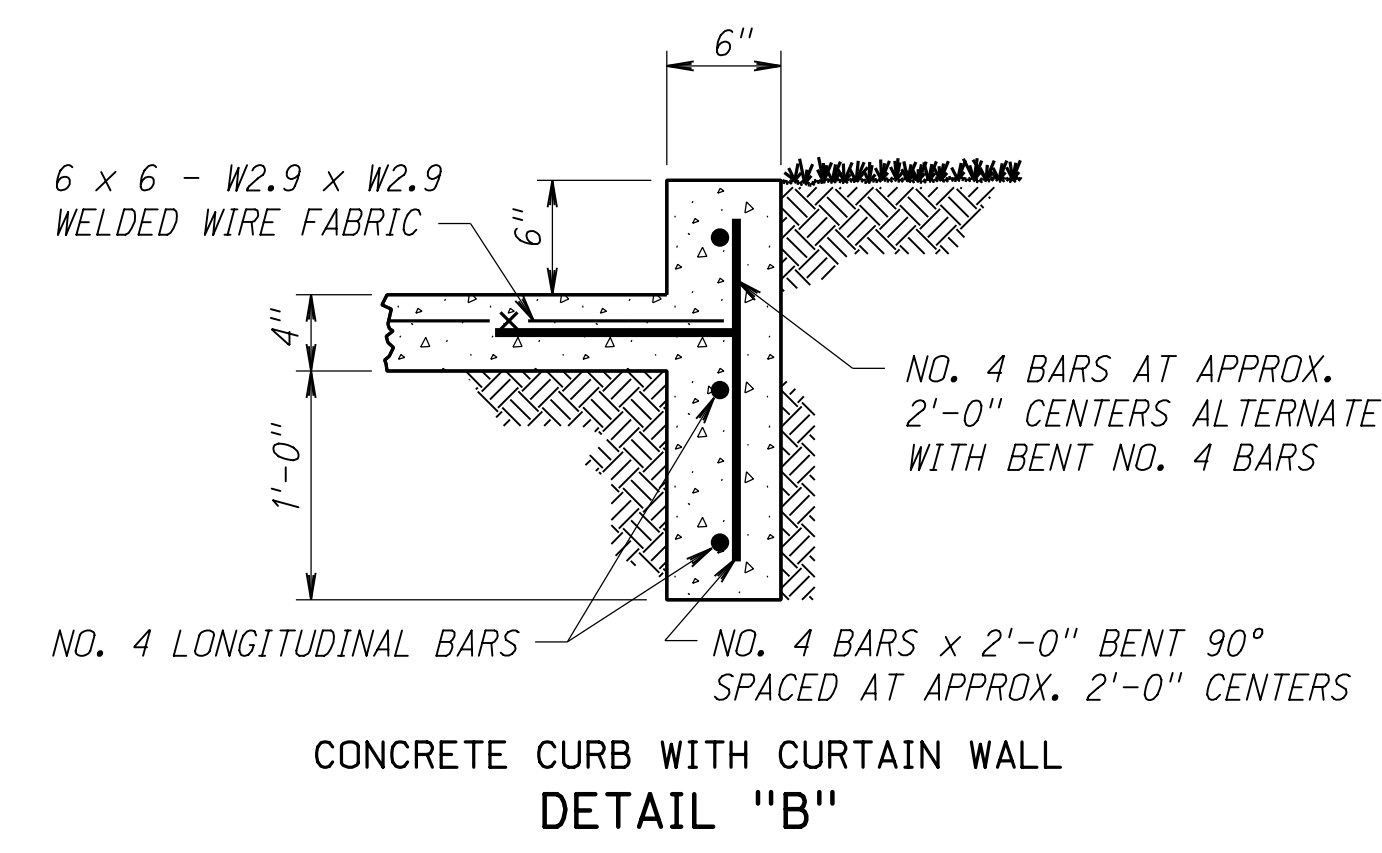
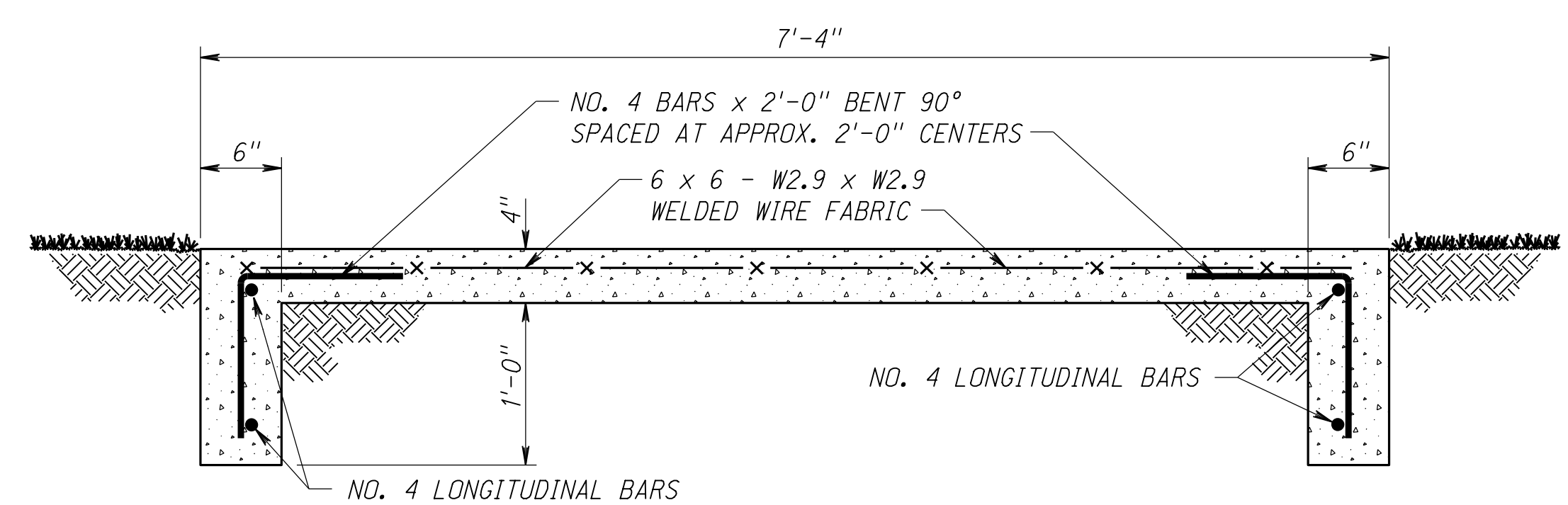
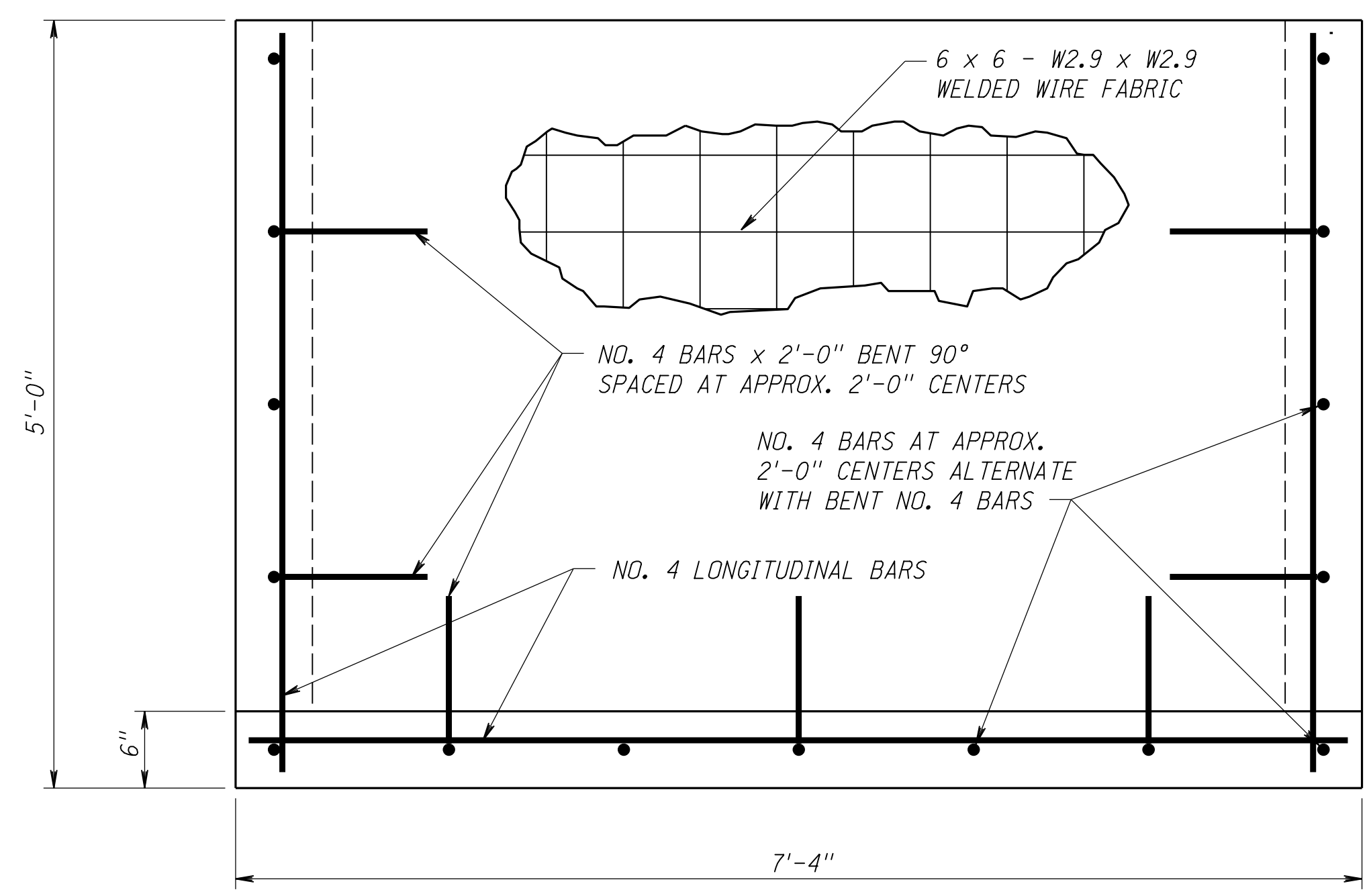
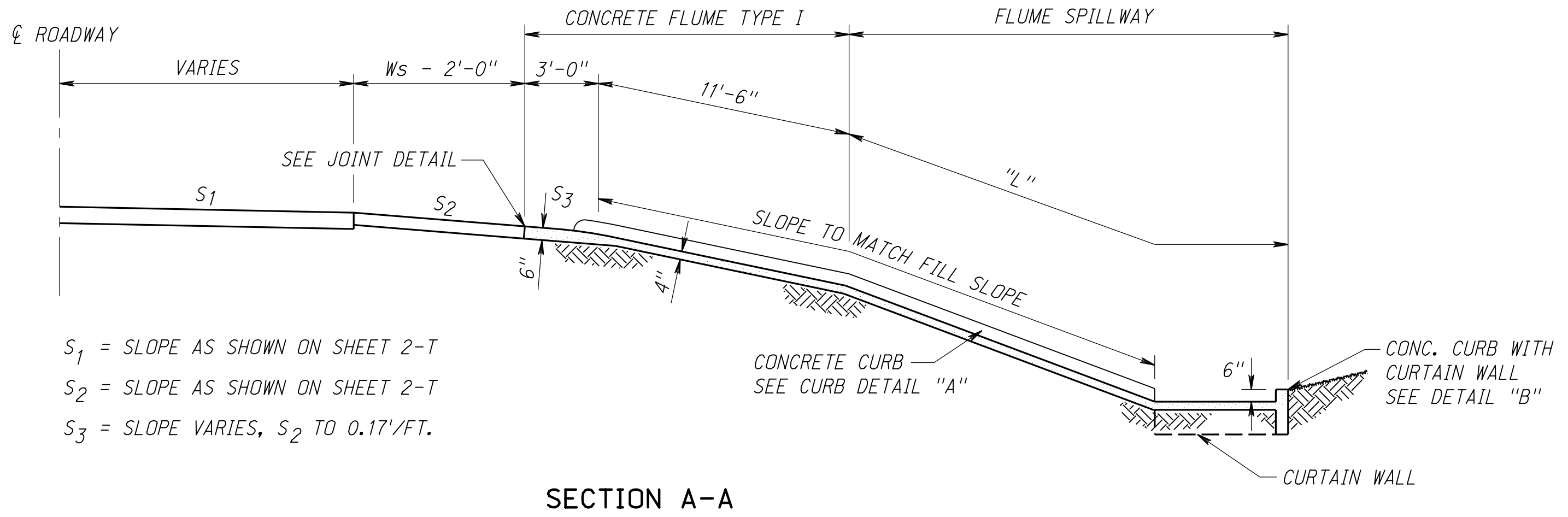
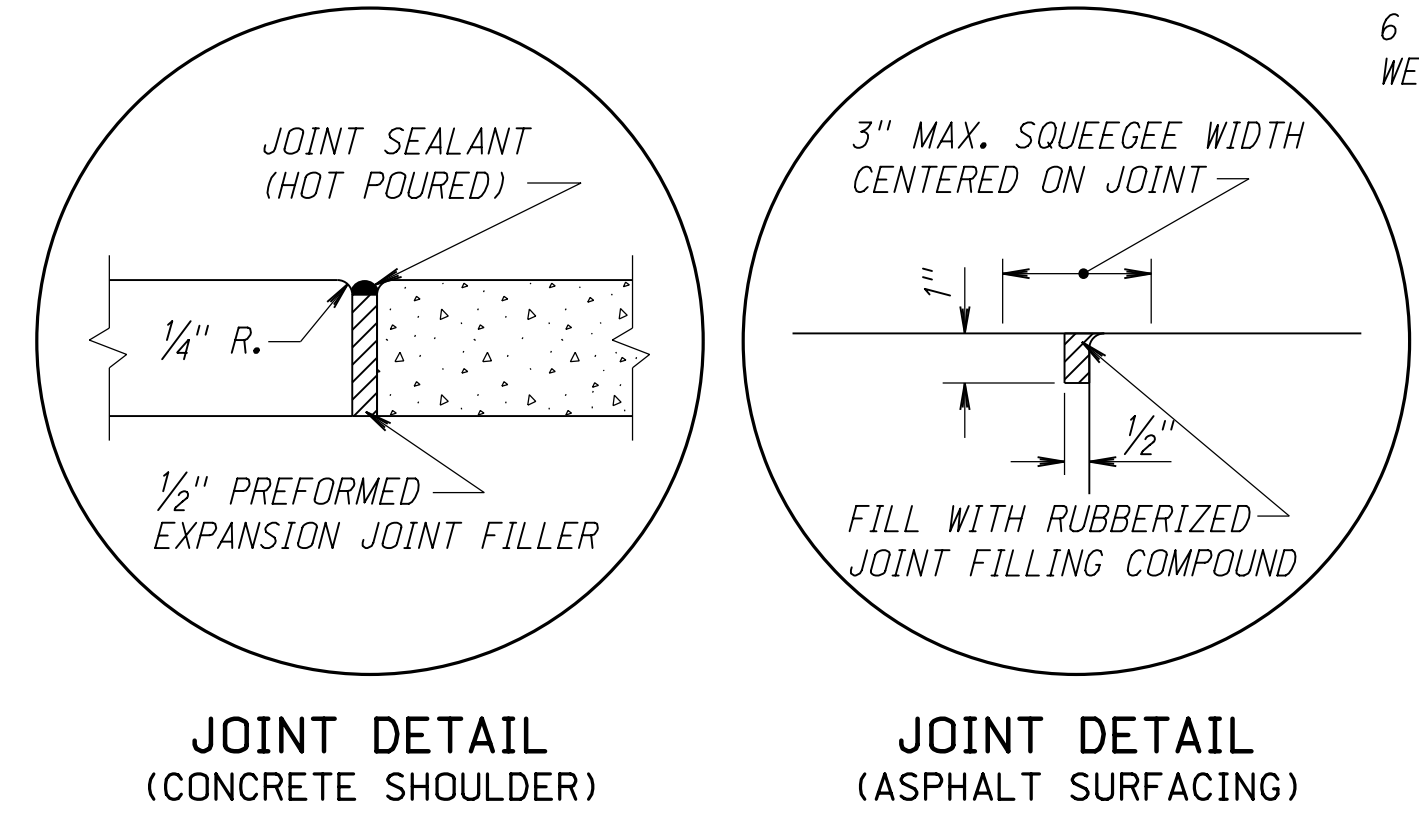
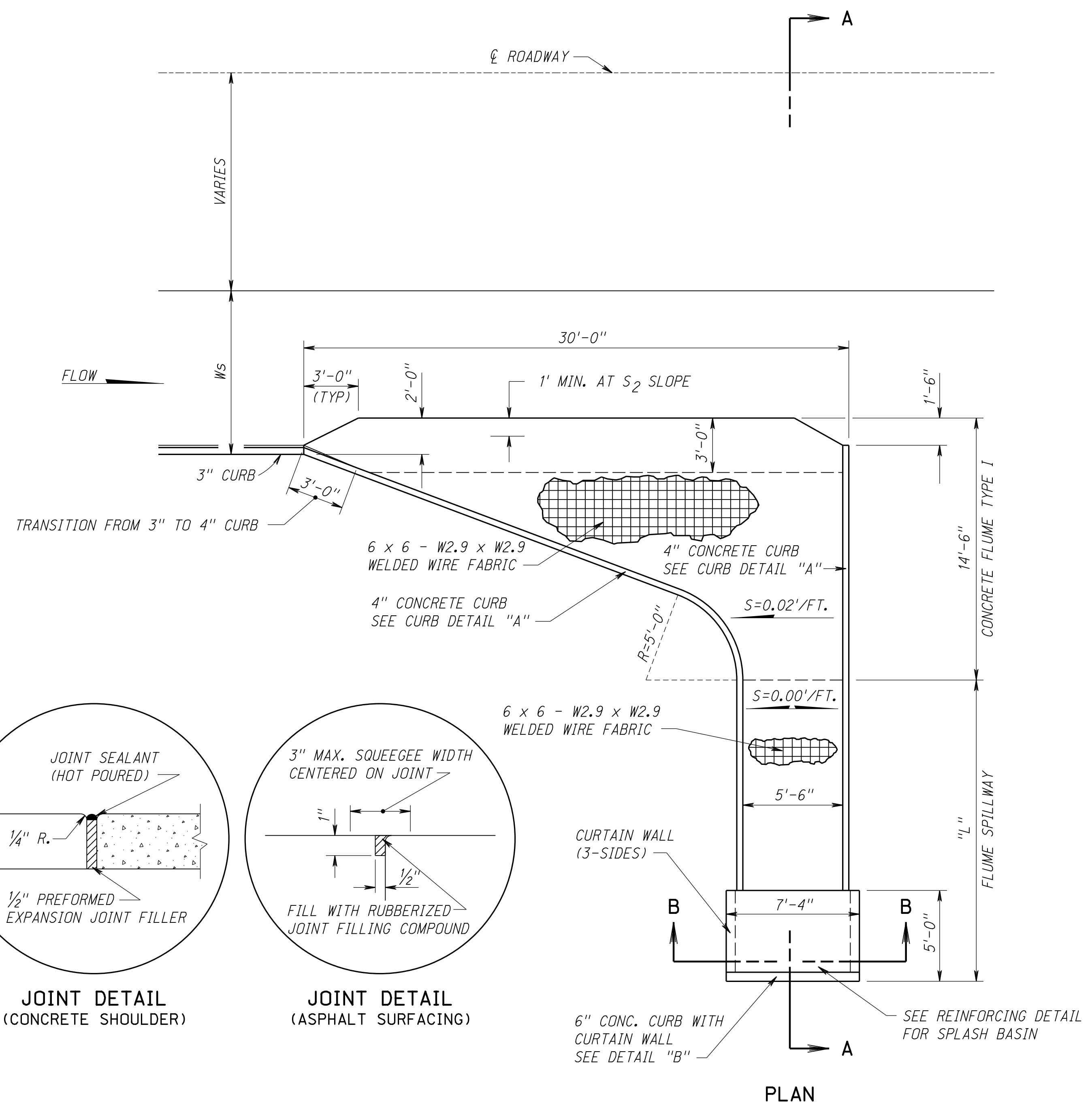
AREA INLET WITH GRATE
SHEET 2 OF 2
SPECIAL PLAN C

ROADWAY DESIGN DIVISION

Computer: NDOTDESIGN134

Date: 18-MAY-2021 12:27

File: 4341e03.dgn
SHEET 1 OF 1 4341-1-E-03



NOTES:

WS = SURFACED SHOULDER WIDTH

"L" DIMENSION SHALL BE AS SHOWN IN THE PLANS UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

FINAL LOCATION OF FLUME TO BE DETERMINED BY THE ENGINEER.

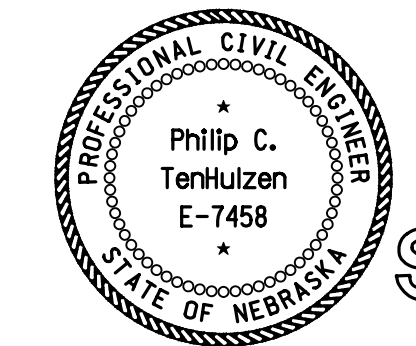
CONCRETE FLUME TYPE I SHALL BE PAID FOR AS ONE EACH.

THE FLUME SPILLWAY SHALL BE SURFACE MEASURED AND PAID FOR BY THE LINEAR FOOT FOR THE ITEM "FLUME SPILLWAY".

JOINT FILLER AND SEALANT MATERIALS ARE SUBSIDIARY TO THE FLUME.

ALL REINFORCING STEEL TO CONFORM TO A615/A615M, GRADE 60.

ALL CONCRETE USED SHALL BE CLASS 47B-3000.



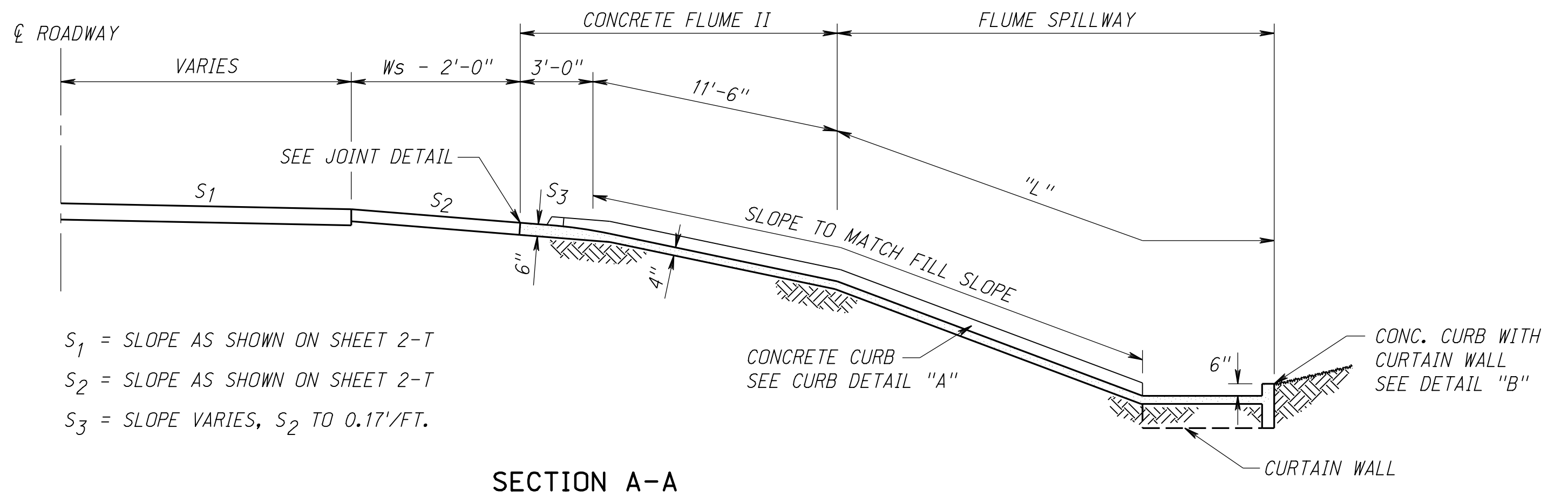
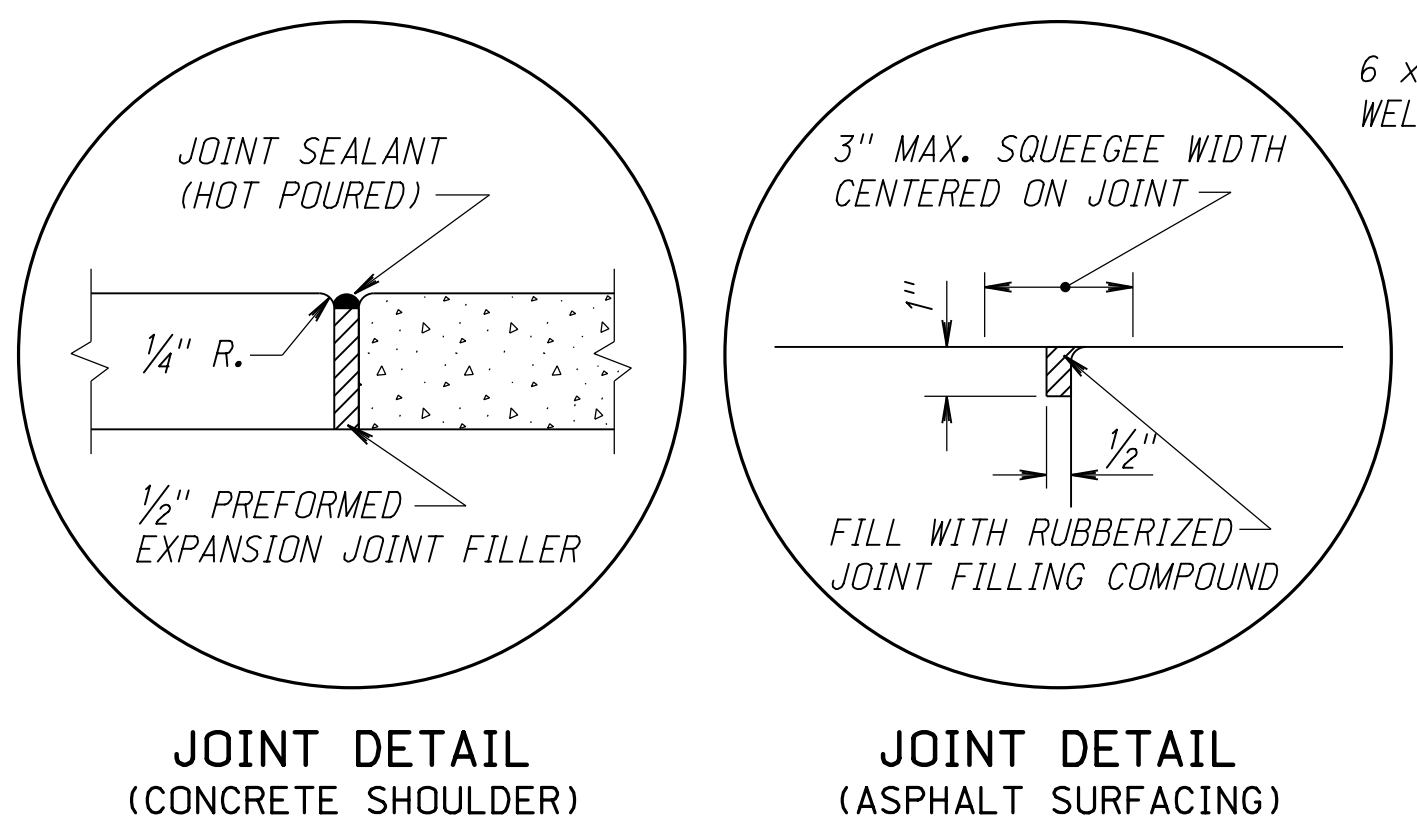
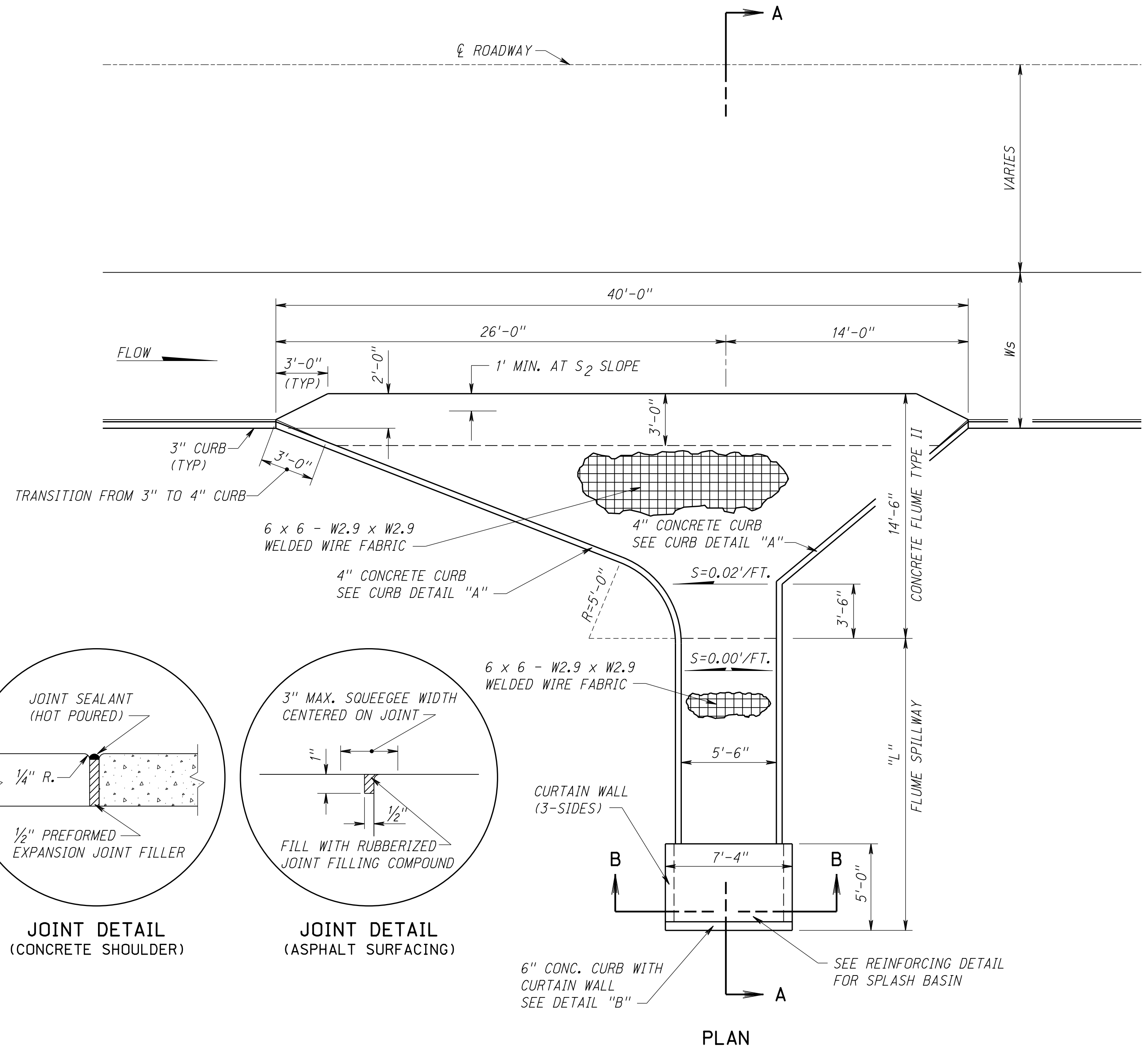
CONCRETE FLUME, TYPE I
SHEET 1 OF 1
SPECIAL PLAN C

ROADWAY DESIGN DIVISION

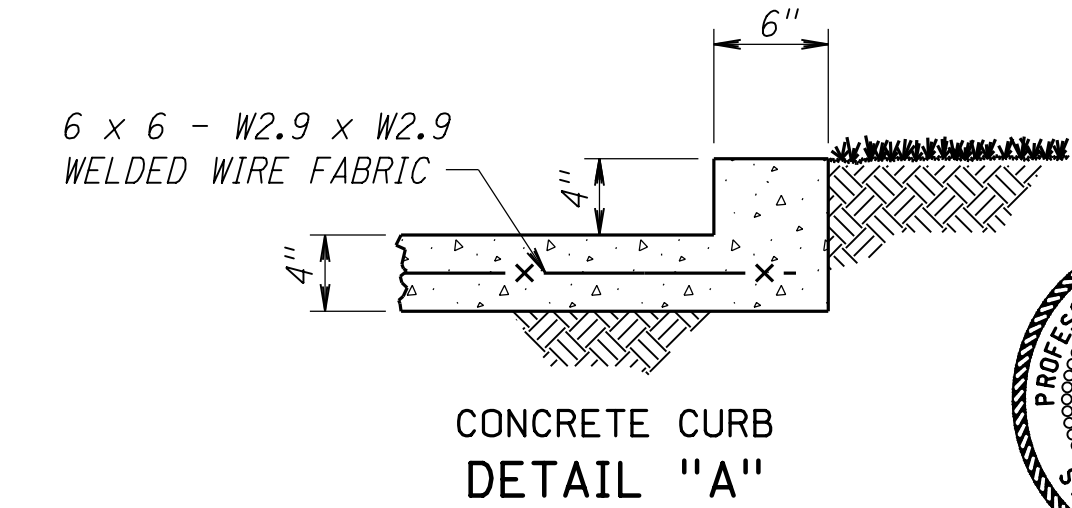
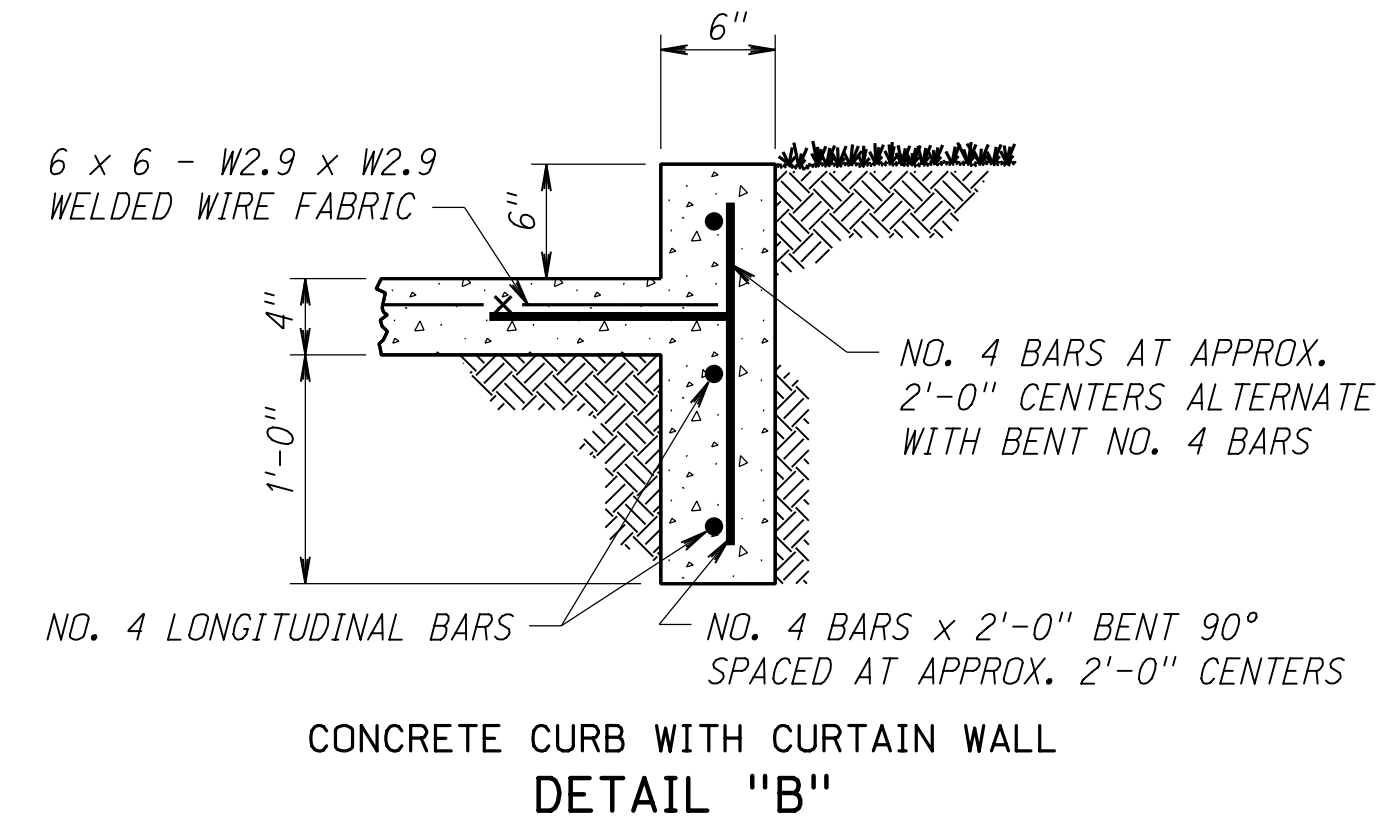
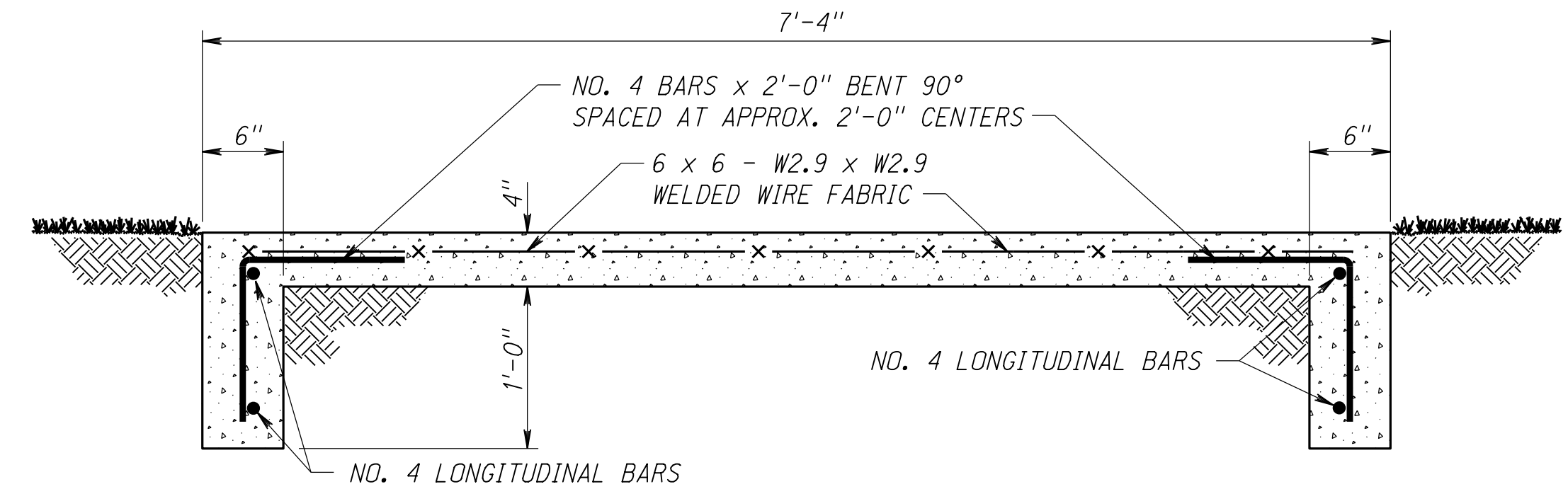
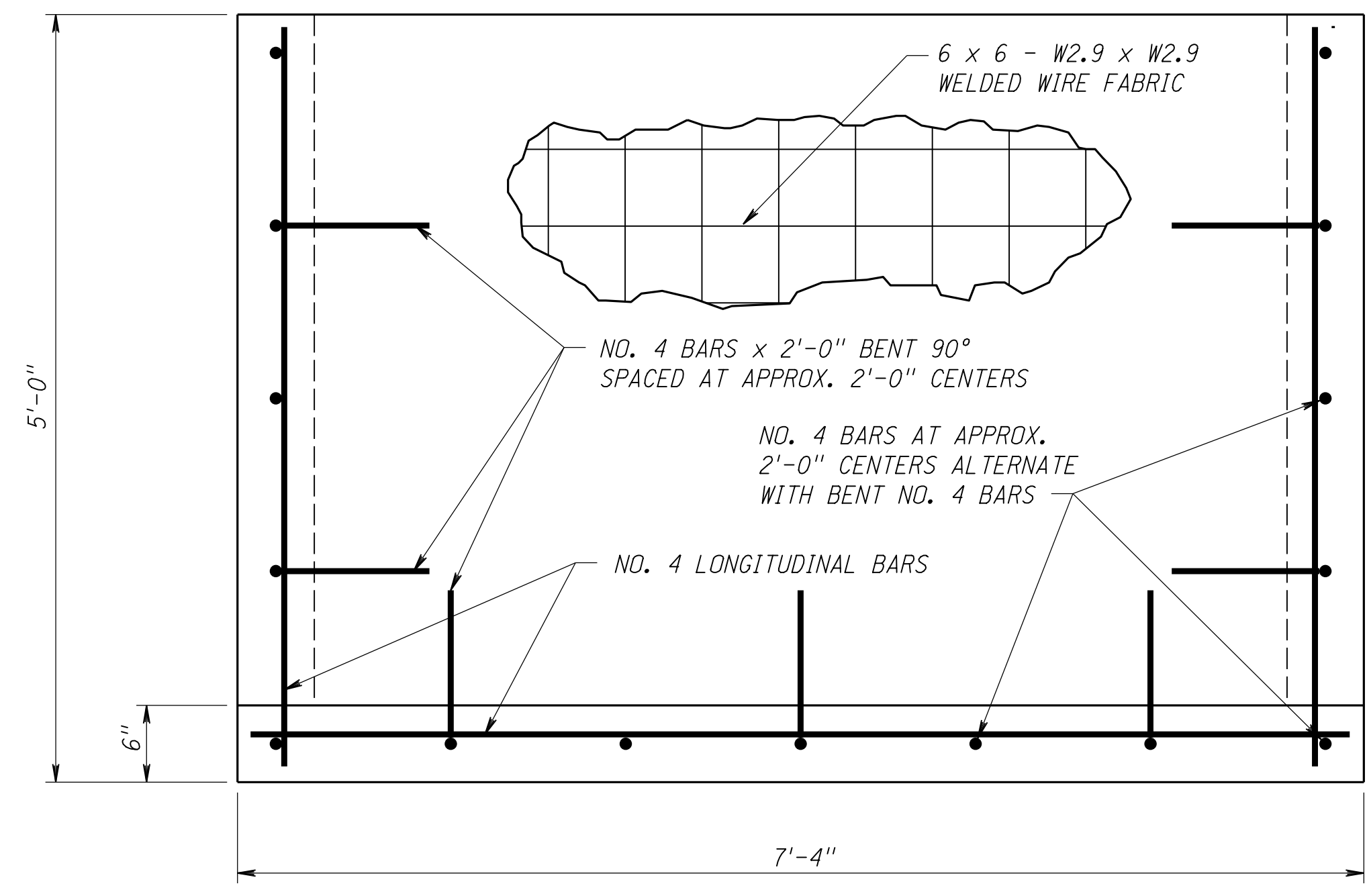
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Date: 18-MAY-2021 12:56

File: 43421e03.dgn
SHEET 1 OF 1 43421-E-03



S₁ = SLOPE AS SHOWN ON SHEET 2-T
 S₂ = SLOPE AS SHOWN ON SHEET 2-T
 S₃ = SLOPE VARIES, S₂ TO 0.17'/FT.



NOTES:

Ws = SURFACED SHOULDER WIDTH

"L" DIMENSION SHALL BE AS SHOWN IN THE PLANS UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

FINAL LOCATION OF FLUME TO BE DETERMINED BY THE ENGINEER.

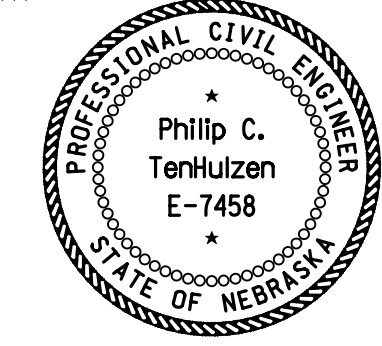
CONCRETE FLUME TYPE II SHALL BE PAID FOR AS ONE EACH.

THE FLUME SPILLWAY SHALL BE SURFACE MEASURED AND PAID FOR BY THE LINEAR FOOT FOR THE ITEM "FLUME SPILLWAY".

JOINT FILLER AND SEALANT MATERIALS ARE SUBSIDIARY TO THE FLUME.

ALL REINFORCING STEEL TO CONFORM TO A615/A615M, GRADE 60.

ALL CONCRETE USED SHALL BE CLASS 47B-3000.



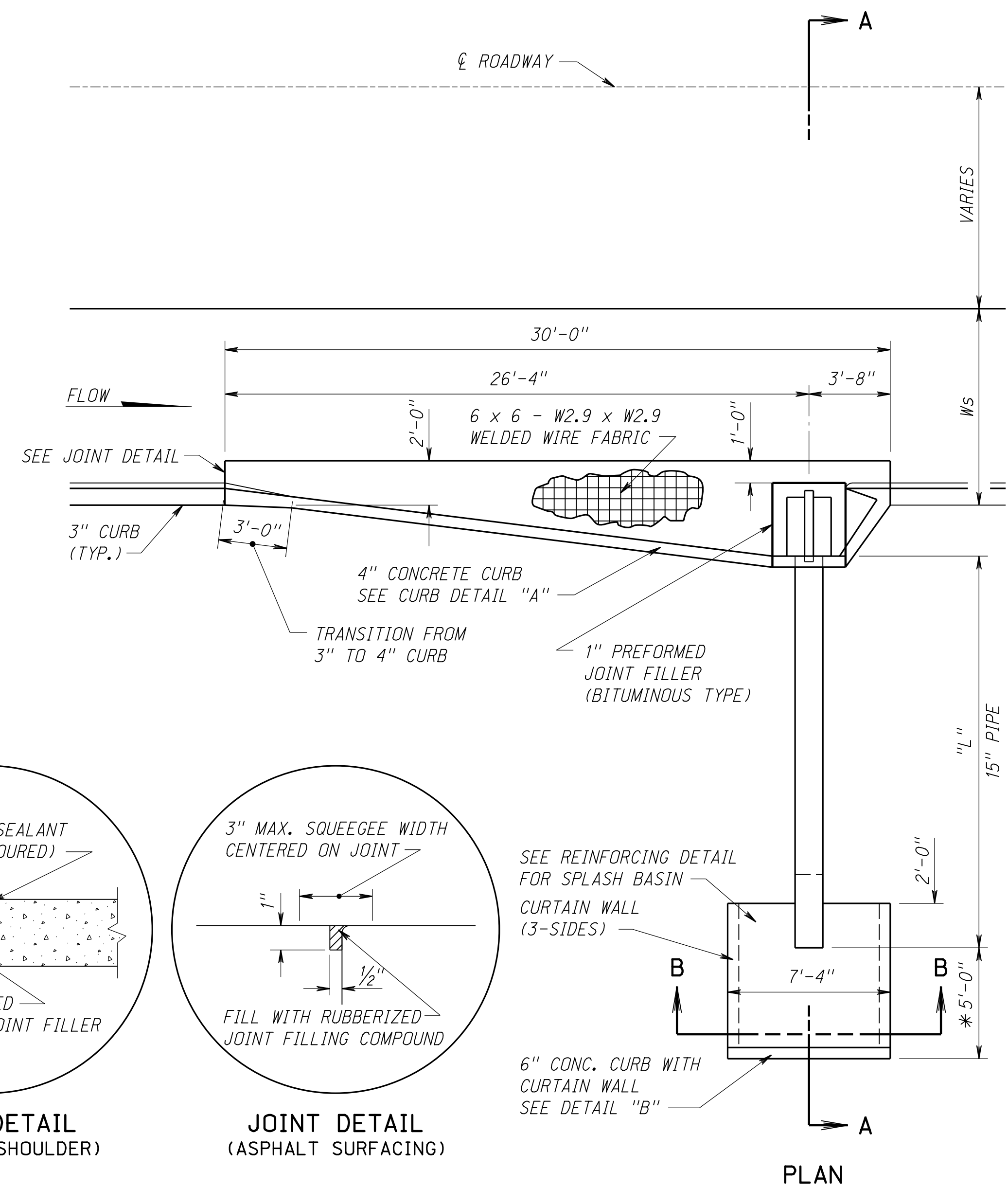
CONCRETE FLUME, TYPE II
 SHEET 1 OF 1
SPECIAL PLAN C

ROADWAY DESIGN DIVISION

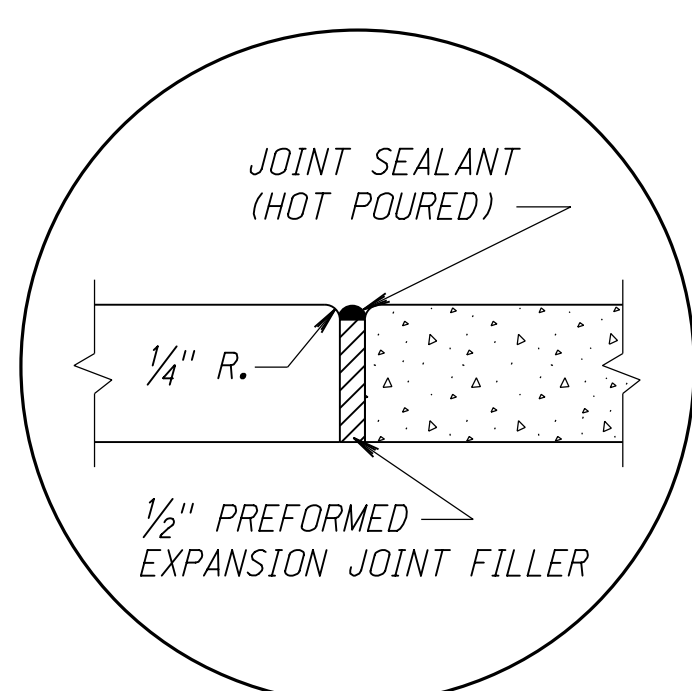
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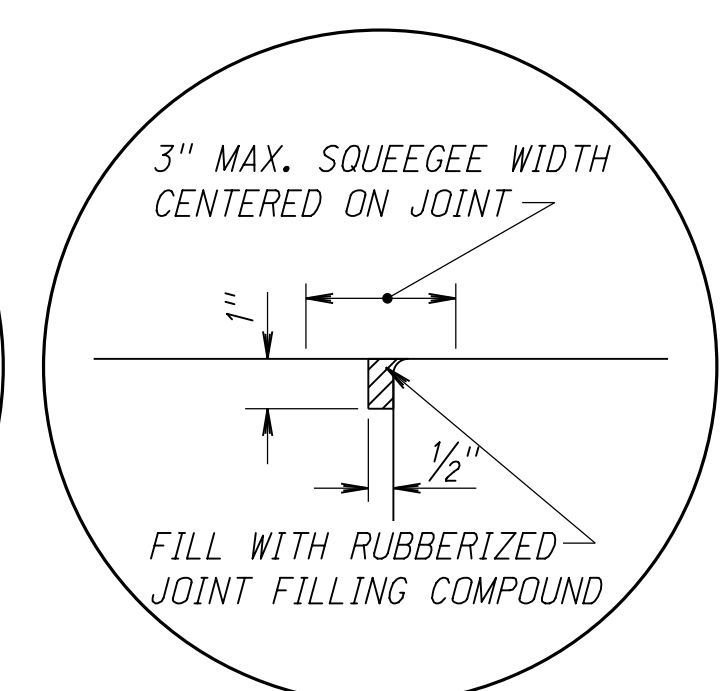
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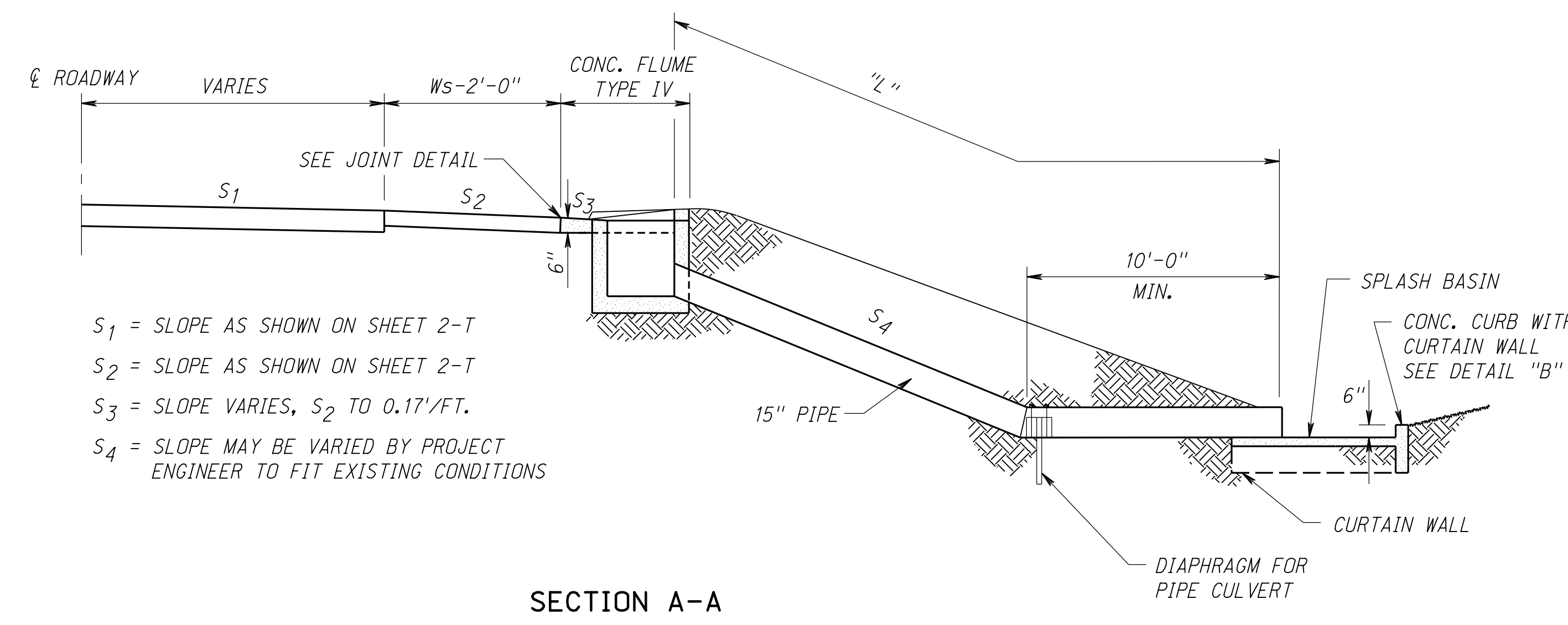
* SPLASH BASIN IN A FILL SECTION: CONSTRUCT AS SHOWN.
SPLASH BASIN IN A CUT SECTION: WIDEN BASIN TO THE TOE OF THE BACK SLOPE.



JOINT DETAIL
(CONCRETE SHOULDER)

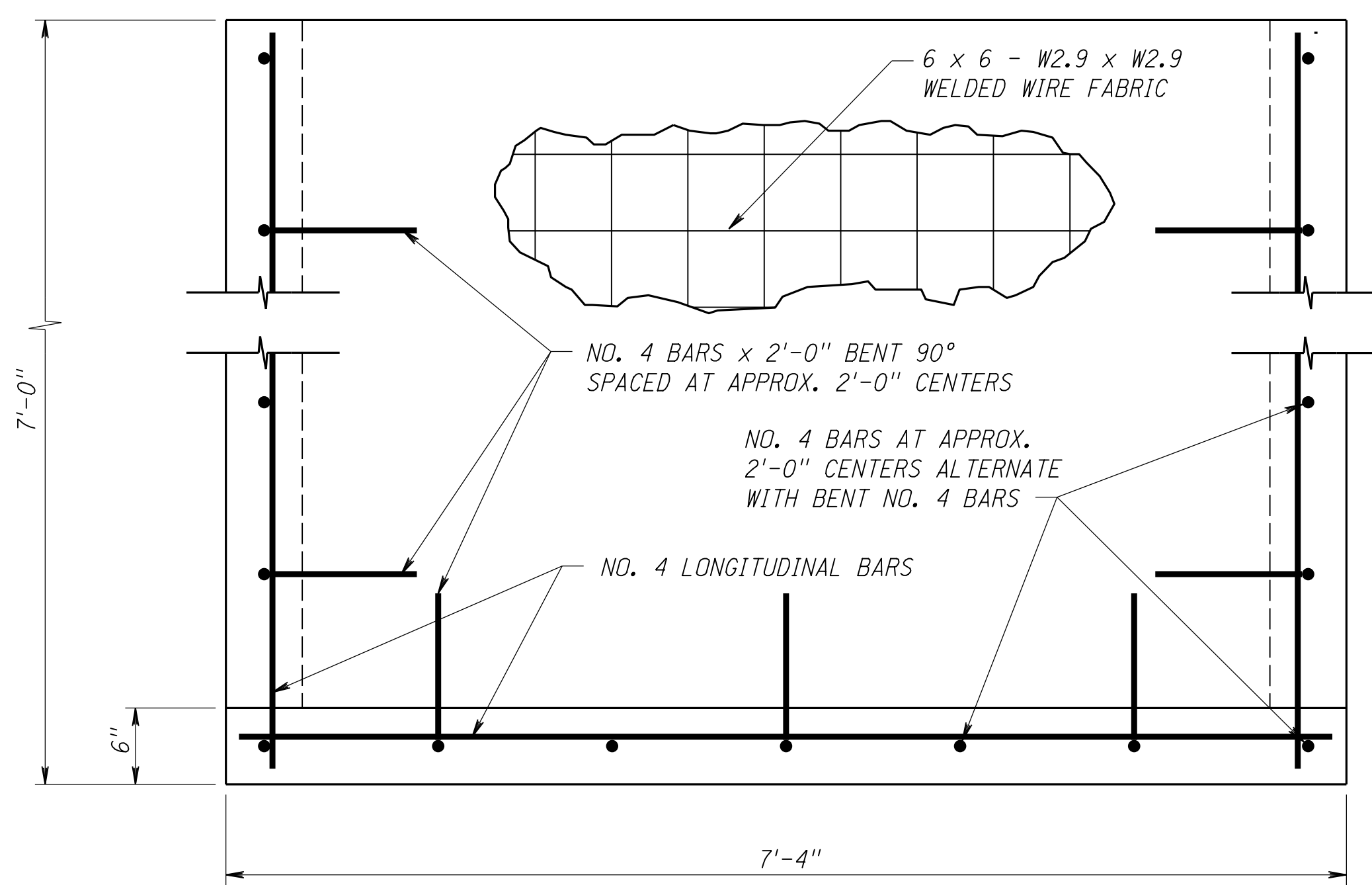


JOINT DETAIL
(ASPHALT SURFACING)

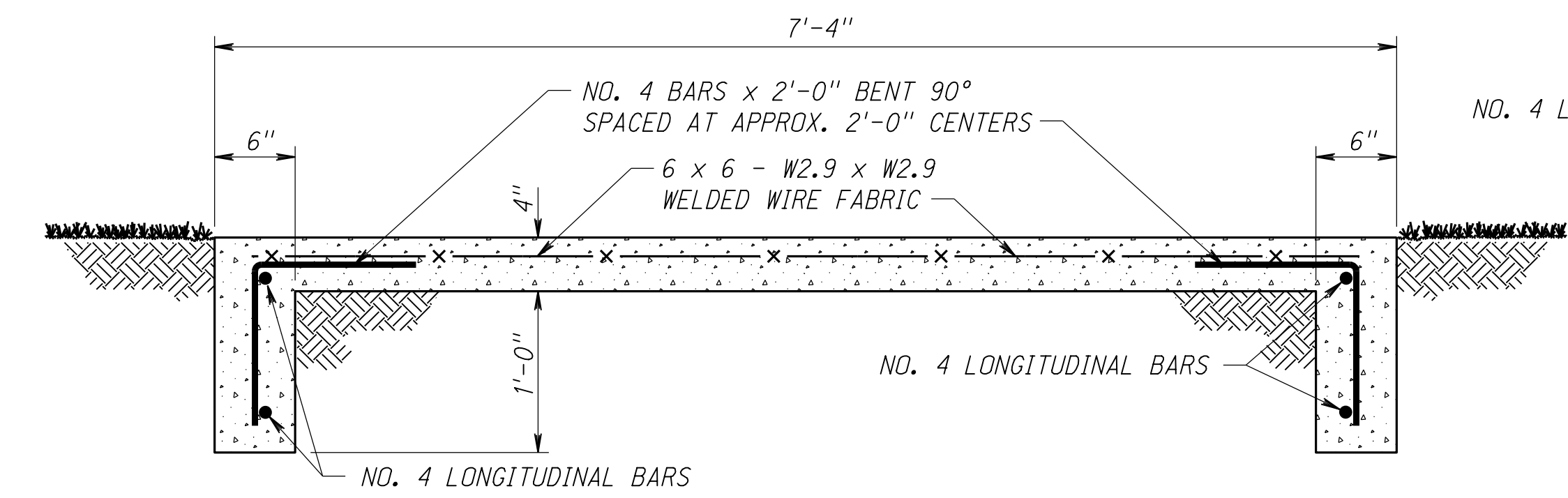


S₁ = SLOPE AS SHOWN ON SHEET 2-T
S₂ = SLOPE AS SHOWN ON SHEET 2-T
S₃ = SLOPE VARIES, S₂ TO 0.17'/FT.
S₄ = SLOPE MAY BE VARIED BY PROJECT ENGINEER TO FIT EXISTING CONDITIONS

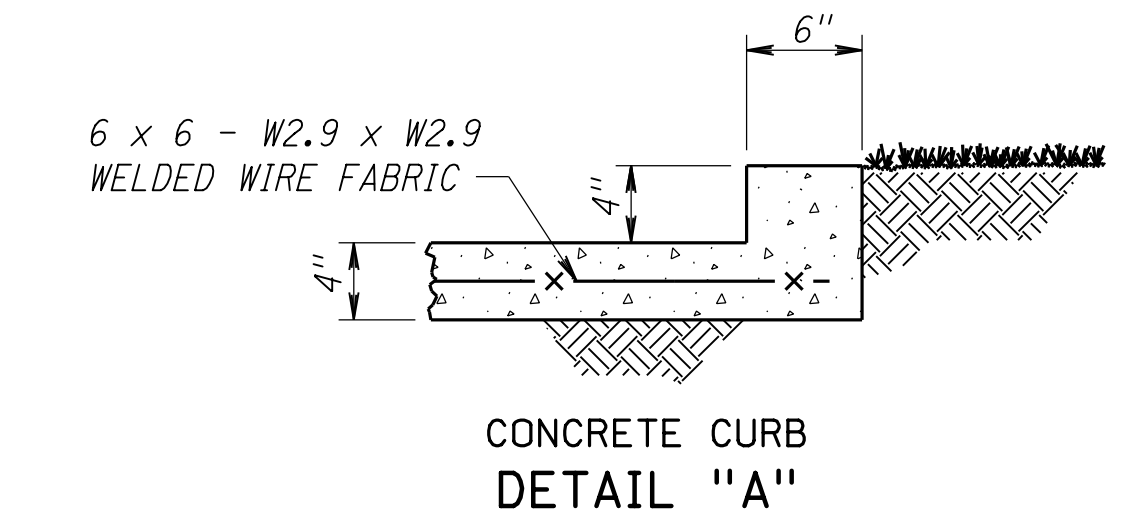
SECTION A-A



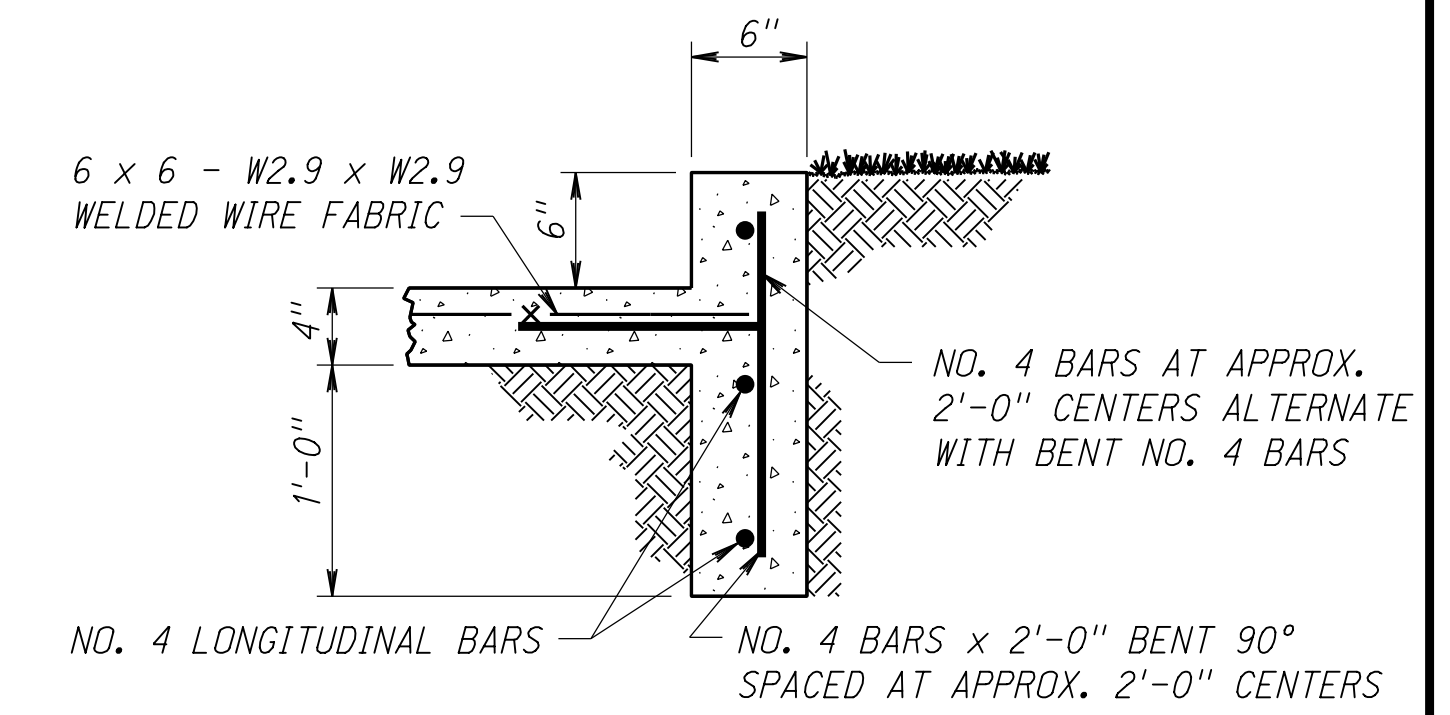
REINFORCING DETAIL FOR SPLASH BASIN



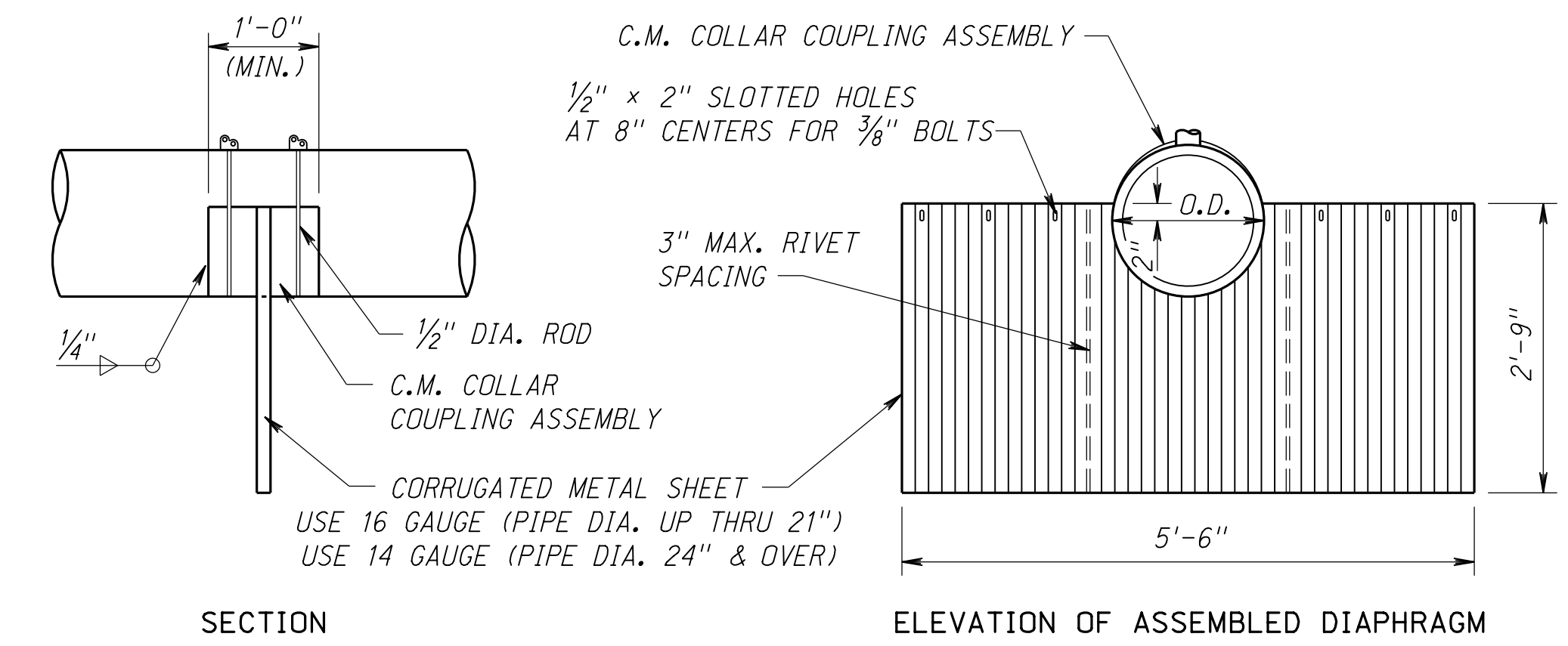
SECTION B-B



CONCRETE CURB
DETAIL "A"

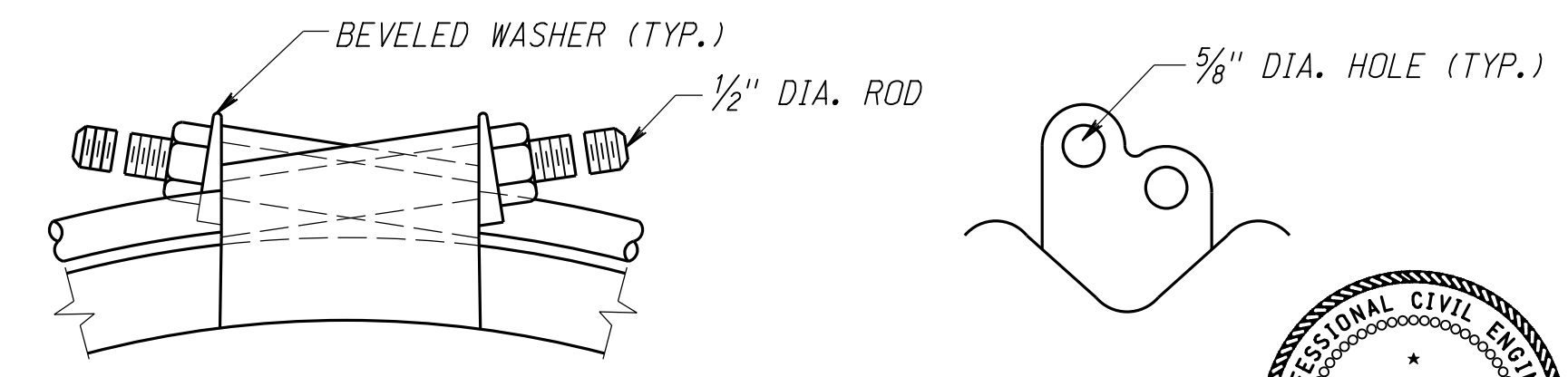


CONCRETE CURB WITH CURTAIN WALL
DETAIL "B"



SECTION

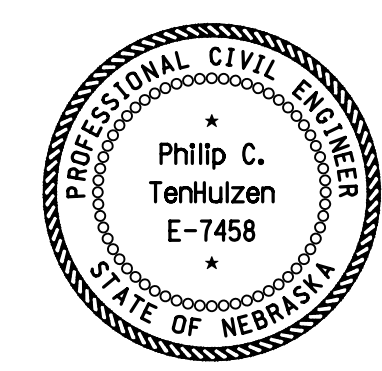
ELEVATION OF ASSEMBLED DIAPHRAGM



ELEVATION

END VIEW

STANDARD TANK LUG DETAILS
METAL DIAPHRAGM DETAILS



NOTES:

- Ws = SURFACED SHOULDER WIDTH
- "L" DIMENSION SHALL BE AS SHOWN IN THE PLANS UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
- FINAL LOCATION OF FLUME TO BE DETERMINED BY THE ENGINEER.
- COLLAR COUPLING BAND SHALL BE COATED WITH 1/2" BITUMINOUS MASTIC PRIOR TO INSTALLATION. WHEN AIR TEMPERATURE IS 50° F. OR LOWER, HEAT SHALL BE APPLIED TO SOFTEN THE MASTIC.
- EXCAVATION FOR THE FLUME, SPLASH BASIN, DIAPHRAGM AND CULVERT PIPE IS SUBSIDIARY TO OTHER PAY ITEMS FOR WHICH DIRECT PAYMENT IS MADE.
- DIAPHRAGM AND SPLASH BASIN ARE SUBSIDIARY TO OTHER PAY ITEMS FOR WHICH DIRECT PAYMENT IS MADE.
- JOINT FILLER AND THE SEALANT MATERIALS ARE SUBSIDIARY TO THE FLUME.
- ALL REINFORCING STEEL TO CONFORM TO A615/A615M, GRADE 60.
- ALL CONCRETE USED SHALL BE CLASS 47B-3000.

CONCRETE FLUME, TYPE IV
SHEET 1 OF 2

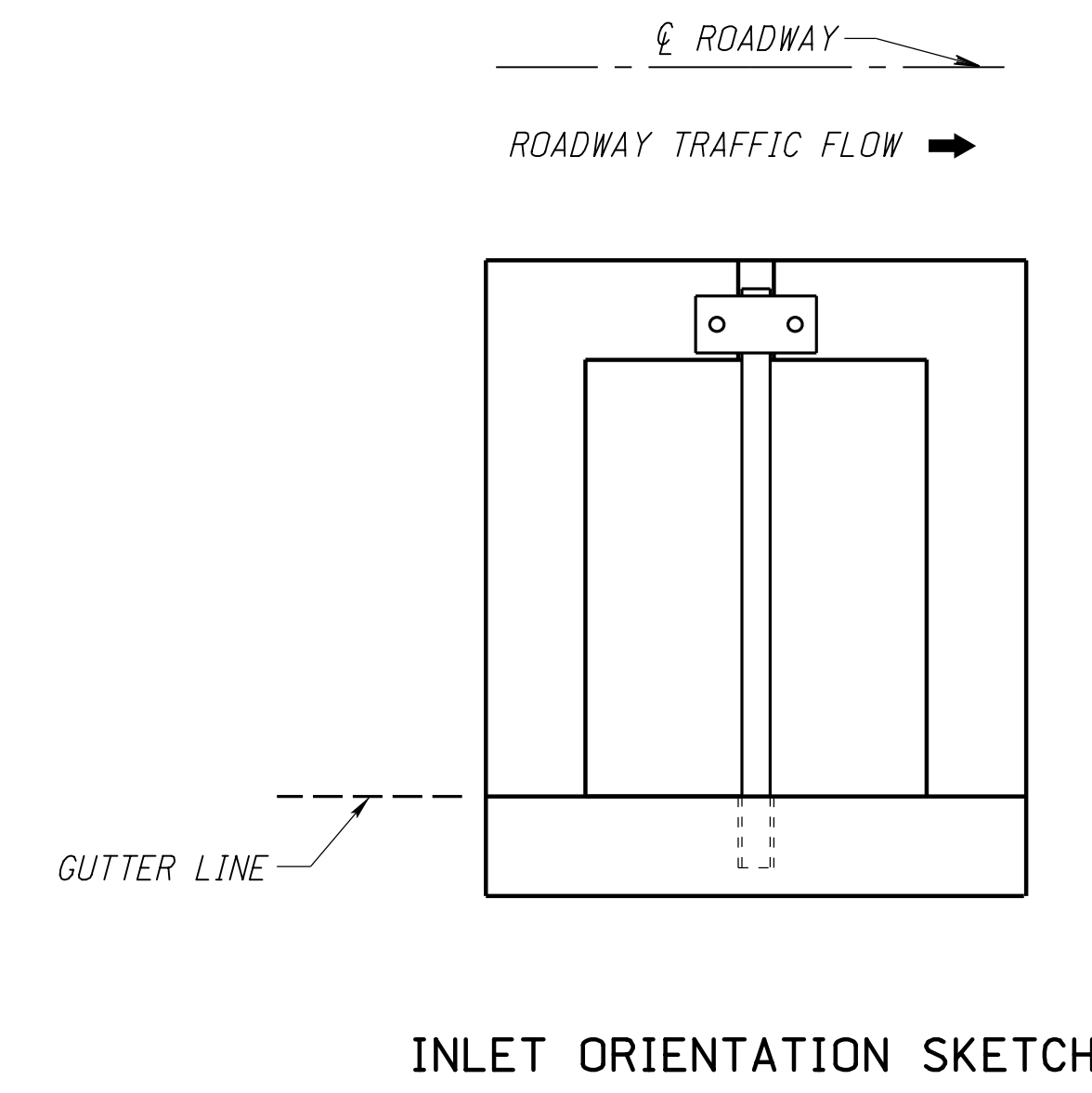
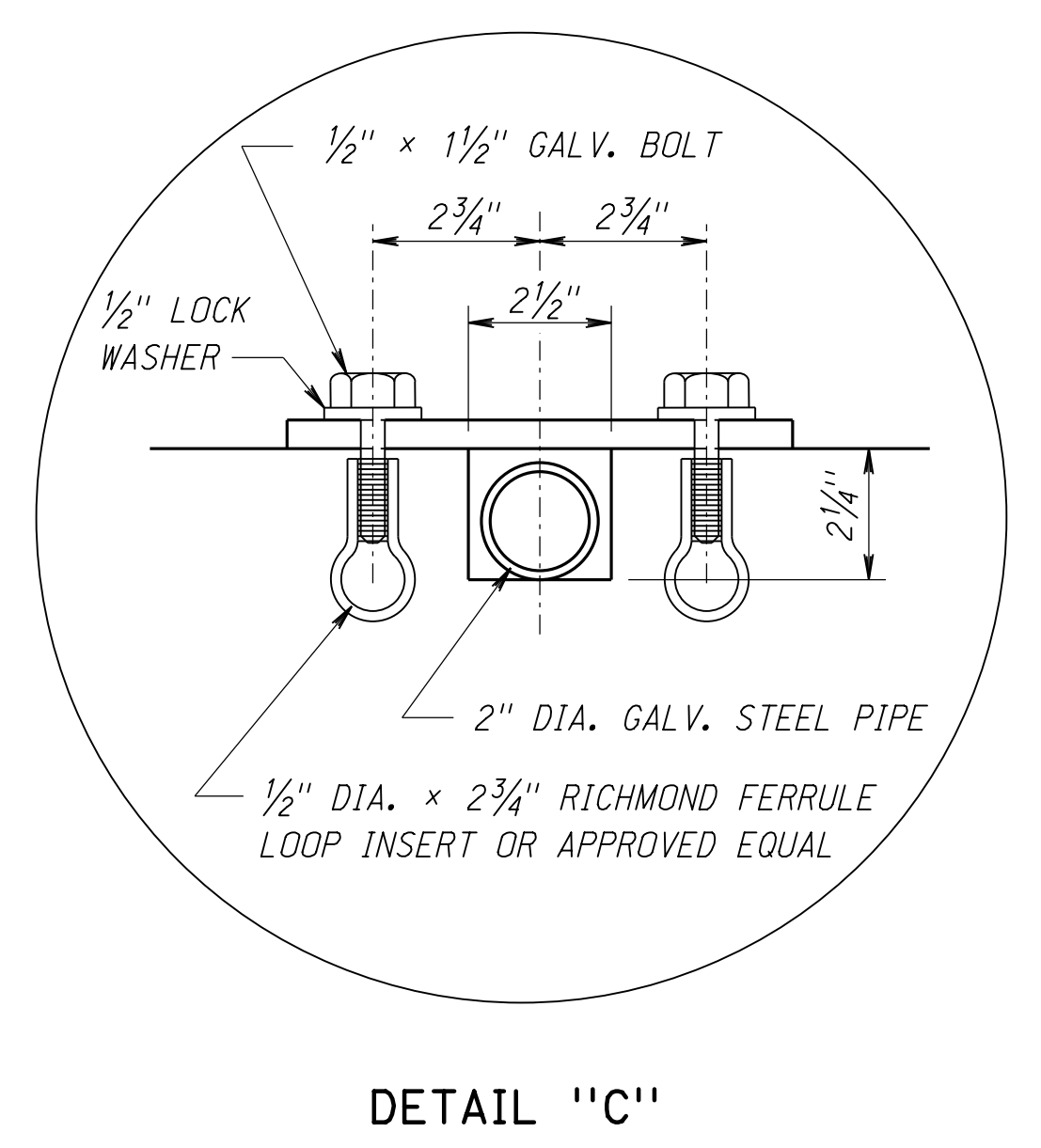
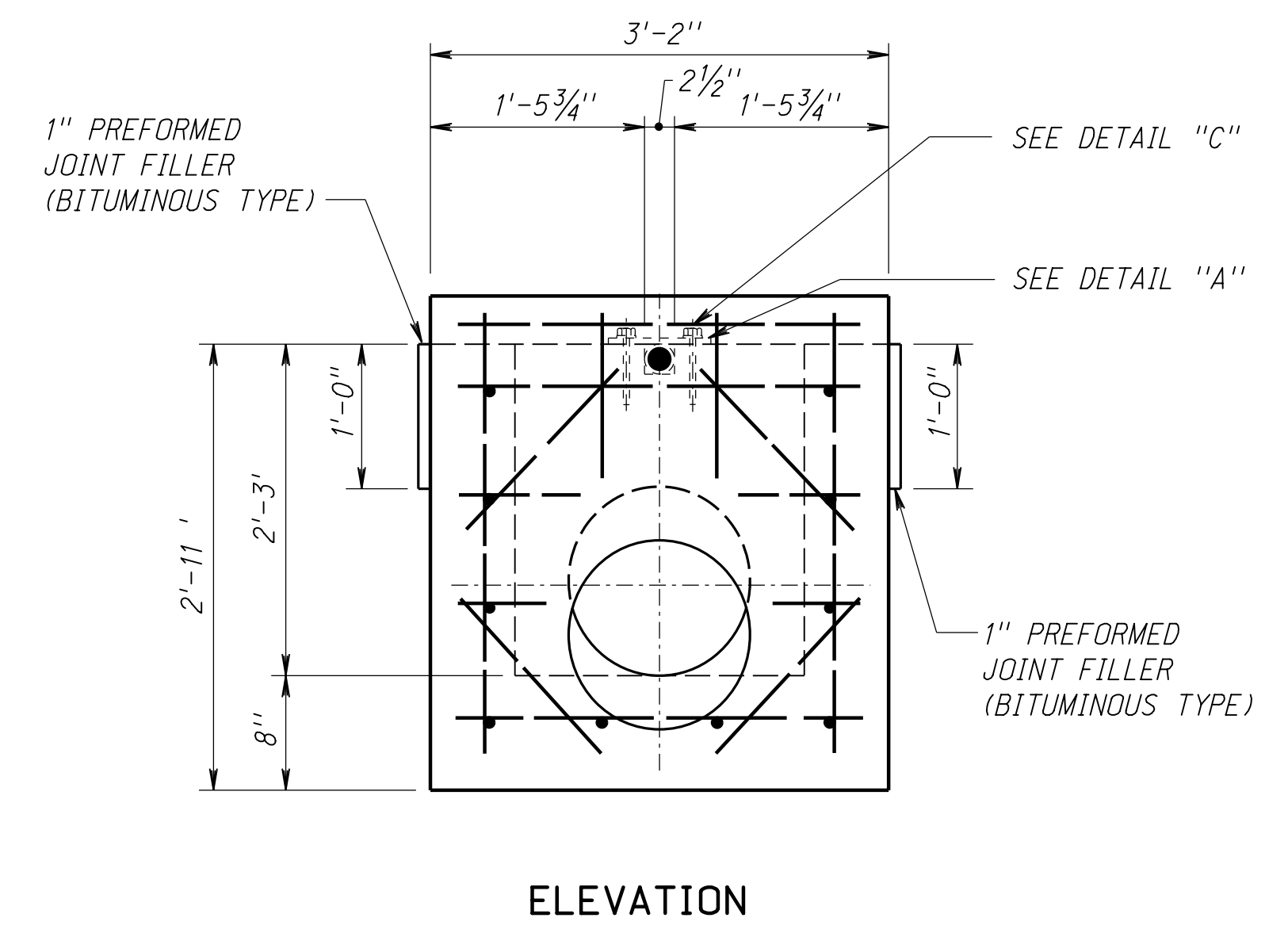
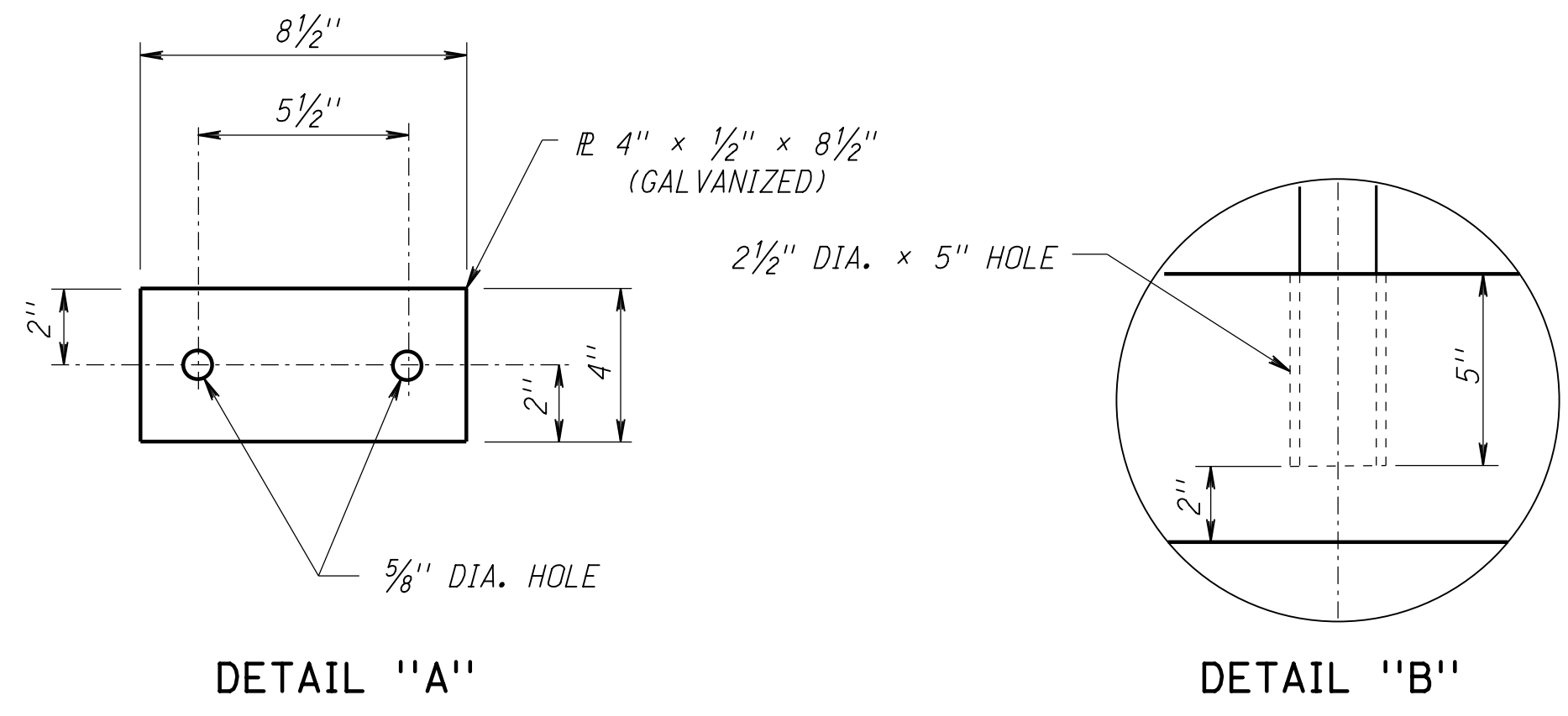
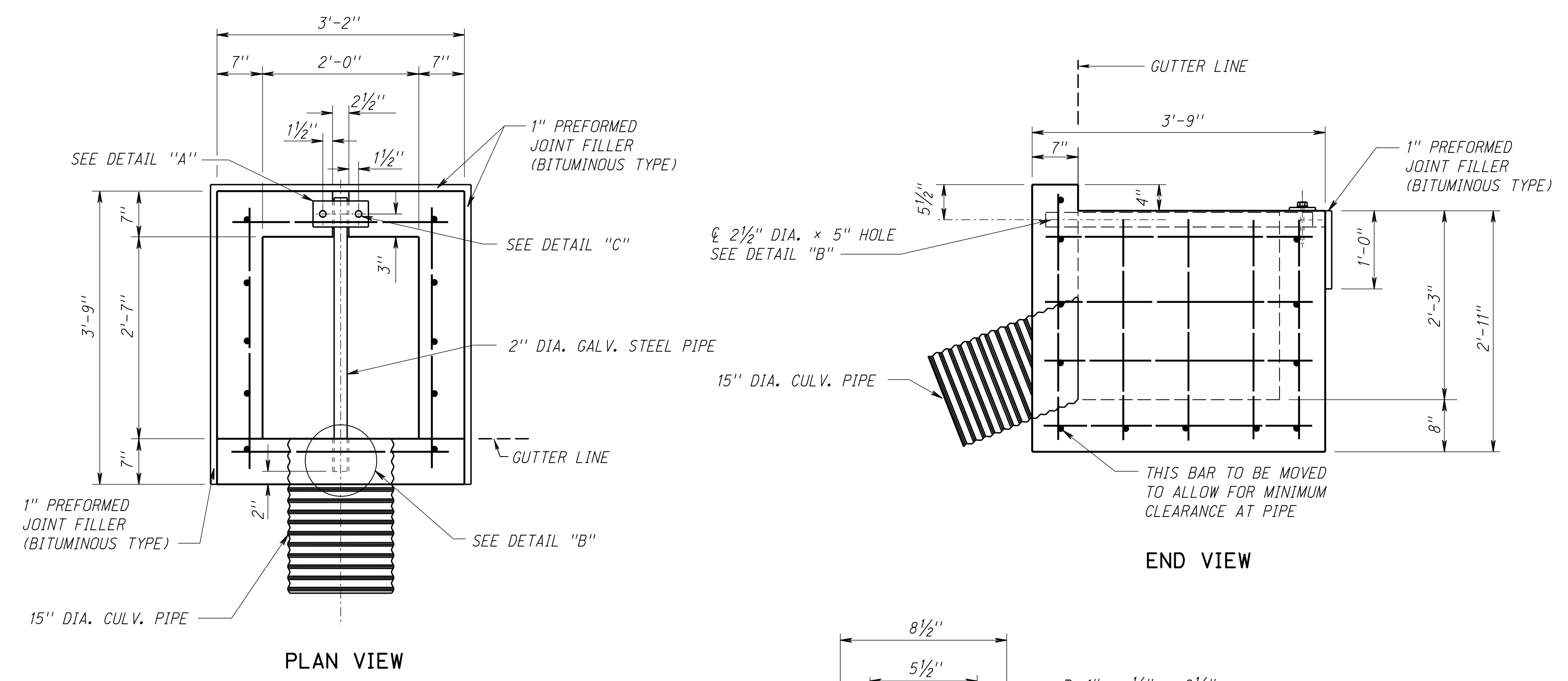
SPECIAL PLAN C

ROADWAY DESIGN DIVISION

Computer: NDDTDESIGN134

Date: 18-MAY-2021 13:00

File: 43441e04.dgn
SHEET 2 OF 2 4344-1-E-04



NOTES:

ALL CONCRETE USED SHALL BE CLASS 47B-3000.

ALL REINFORCING STEEL USED SHALL BE NO. 4 BARS AT 12" CENTERS (MAX.) AND SHALL CONFORM TO THE REQUIREMENTS OF ASTM DESIGNATION A615/A615M GRADE 60.

THE MINIMUM COVERING, MEASURED FROM THE FACE OF THE CONCRETE TO THE SURFACE OF ANY REINFORCING BAR SHALL BE 2" UNLESS NOTED OTHERWISE.

FIELD BEND AND/OR CLIP REINFORCING STEEL TO MAINTAIN MINIMUM CLEARANCE AND TO CLEAR PIPE OPENINGS.

ALL PREPARATION, MATERIALS, EQUIPMENT, TOOLS, LABOR AND INCIDENTALS NECESSARY TO COMPLETE THE WORK THAT IS NOT PAID FOR DIRECTLY, SHALL BE CONSIDERED SUBSIDIARY TO THE ITEMS FOR WHICH DIRECT PAYMENT IS MADE.

ALL CONCRETE SURFACES TO BE IN CONTACT WITH THE NEW WORK SHALL BE THOROUGHLY CLEANED BEFORE PLACING NEW CONCRETE.

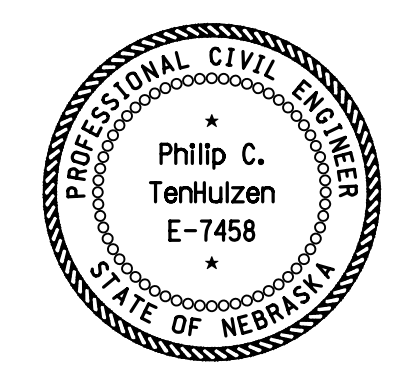
DEDUCTIONS FOR PIPE OPENINGS HAVE BEEN INCLUDED IN THE "QUANTITIES FOR INFORMATION ONLY".

FERRULE LOOPS SHALL HAVE WORKING LOAD REQUIREMENTS OF 1,320 LBS. IN SHEAR AND 2,000 LBS. IN TENSION.

**QUANTITIES
- FOR INFORMATION ONLY -**

CONCRETE	0.85 CU. YDS.
REINFORCED STEEL	75 LBS.
2" GALVANIZED STEEL PIPE	3.50 LIN. FT.

(THE ABOVE ITEMS ARE SUBSIDIARY TO OTHER PAY ITEMS FOR WHICH DIRECT PAYMENT IS MADE.)



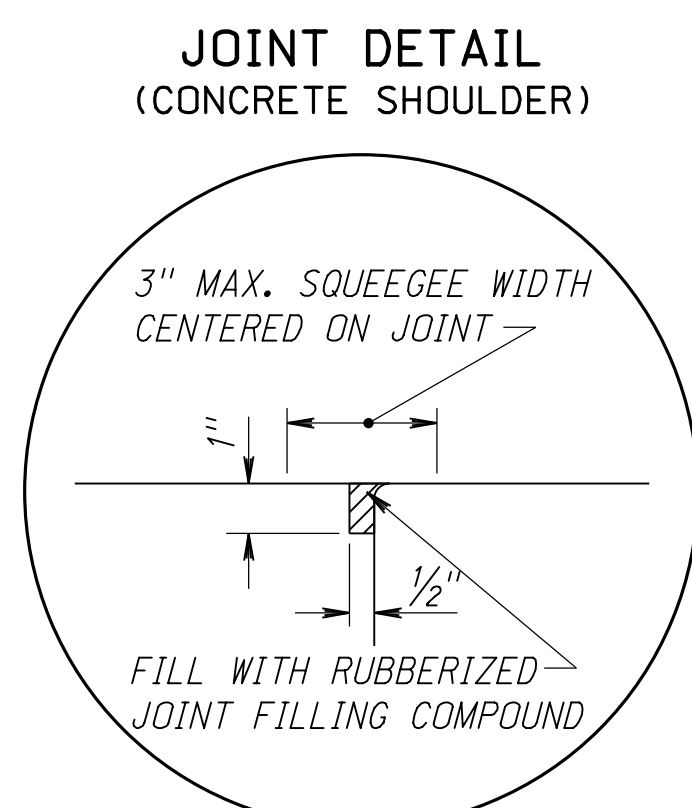
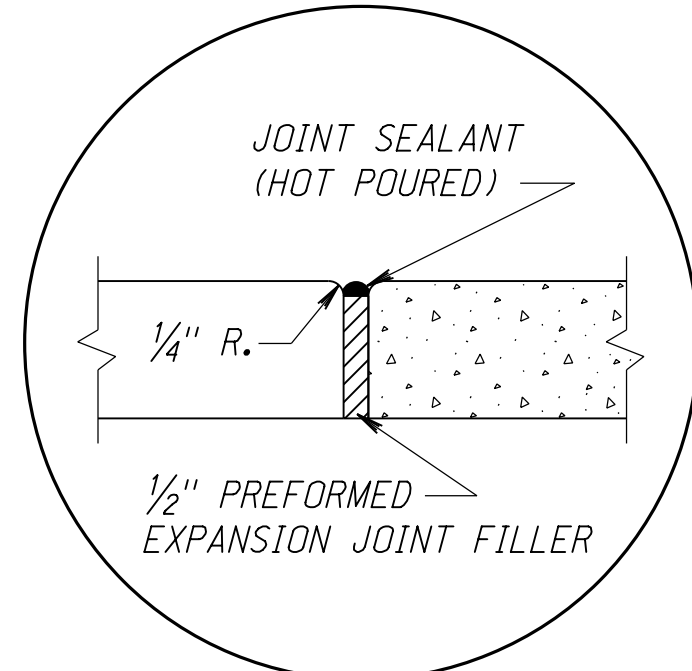
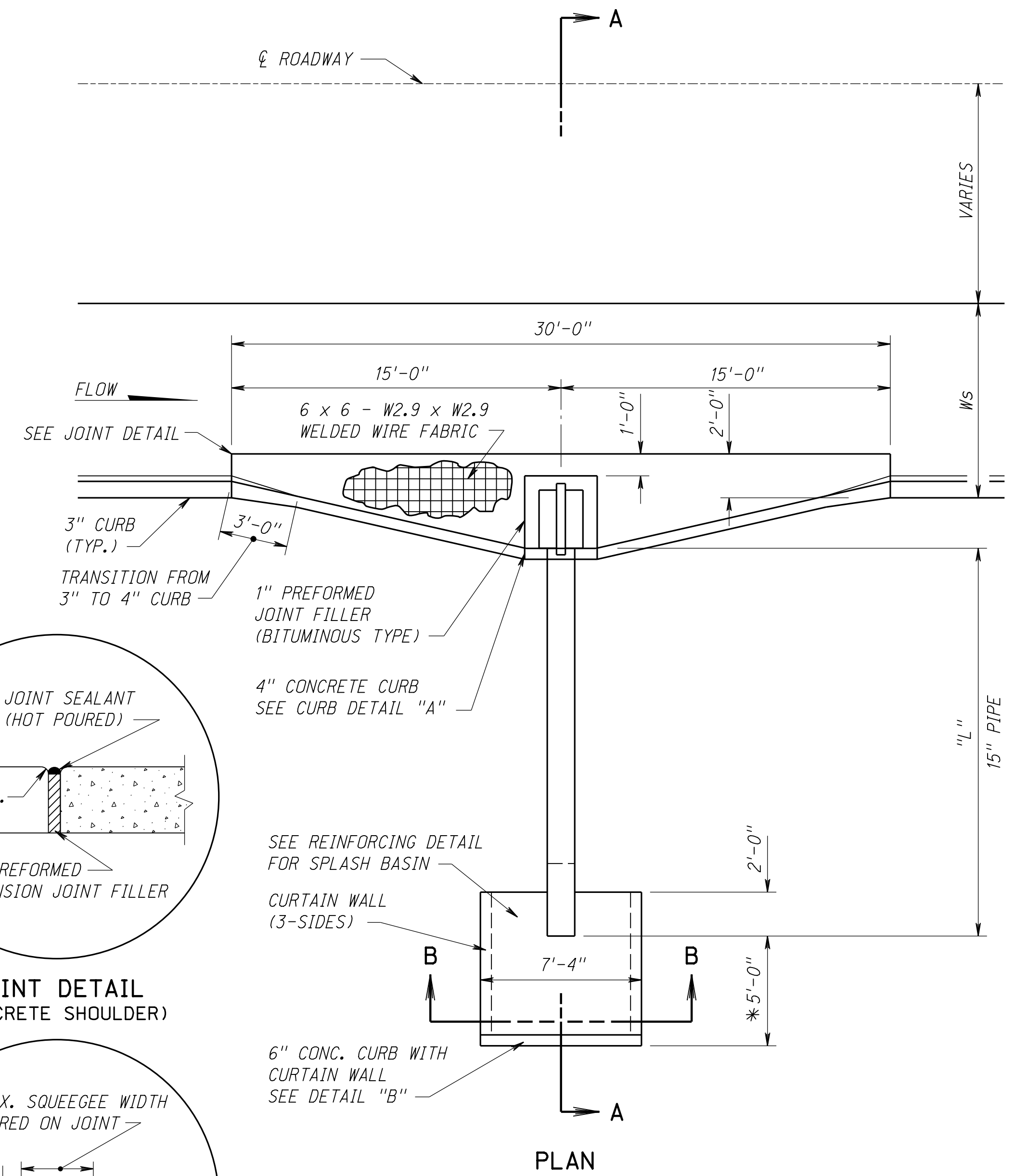
CONCRETE FLUME, TYPE IV
SHEET 2 OF 2
SPECIAL PLAN C

ROADWAY DESIGN DIVISION

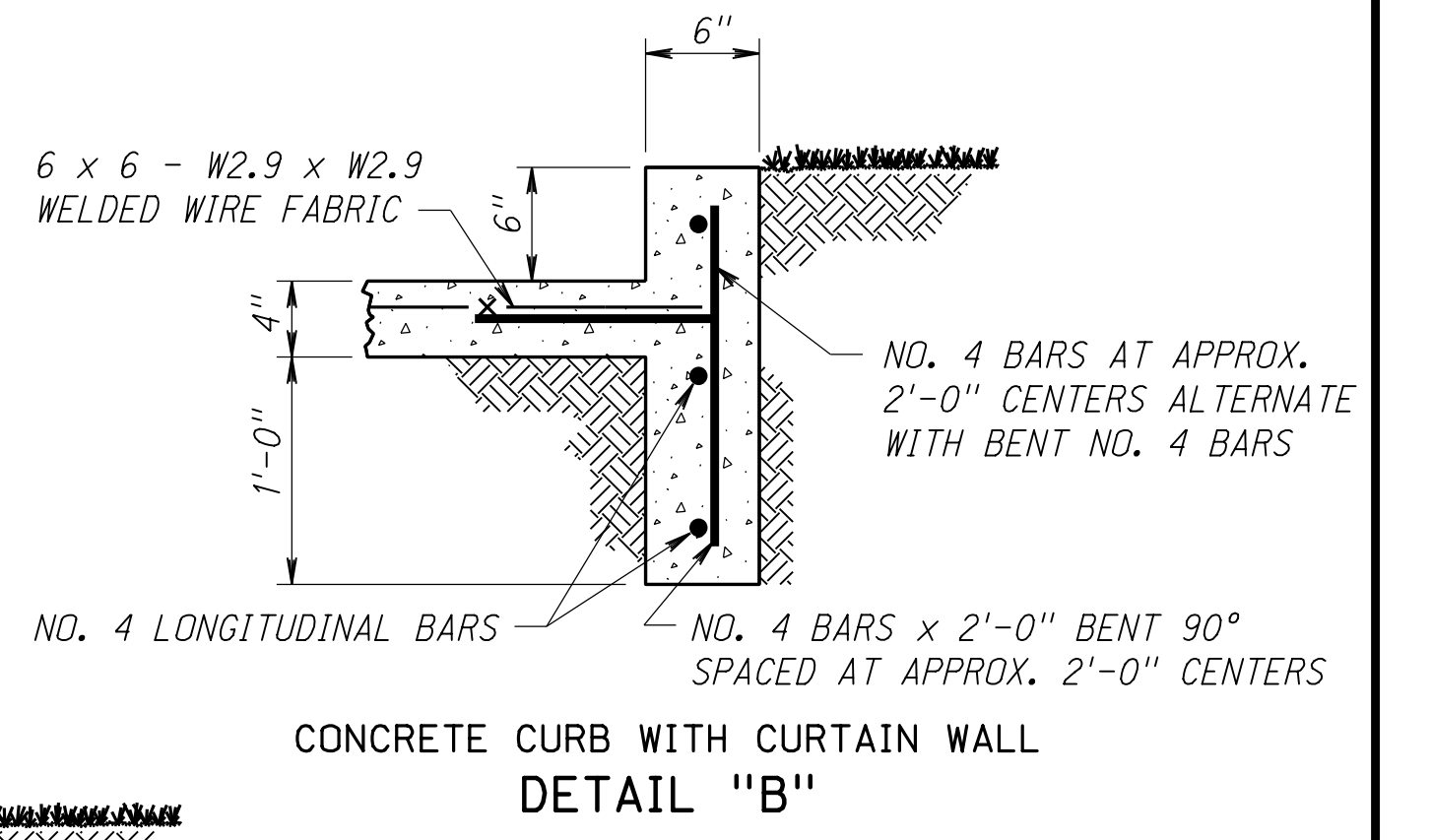
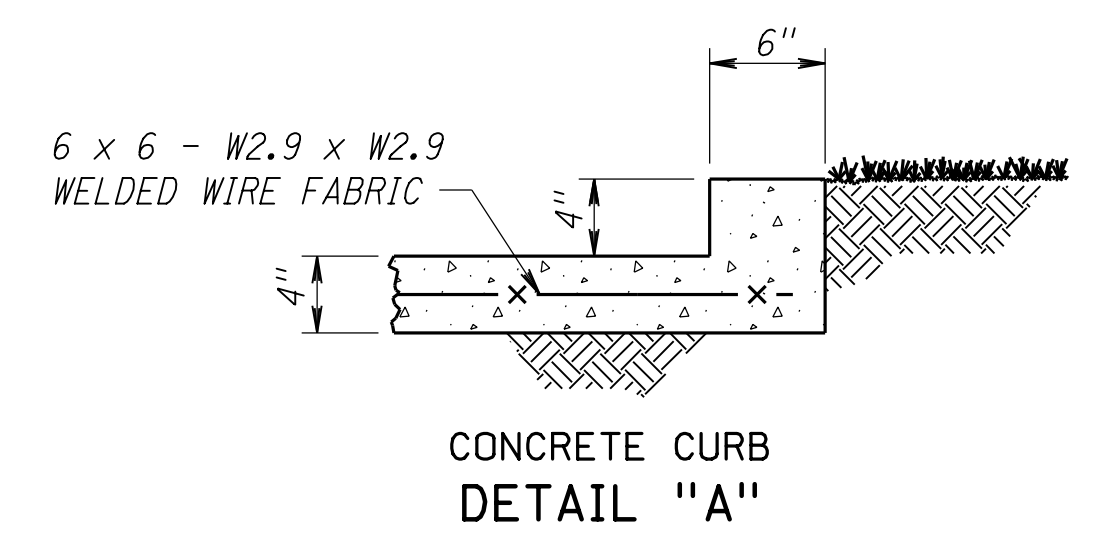
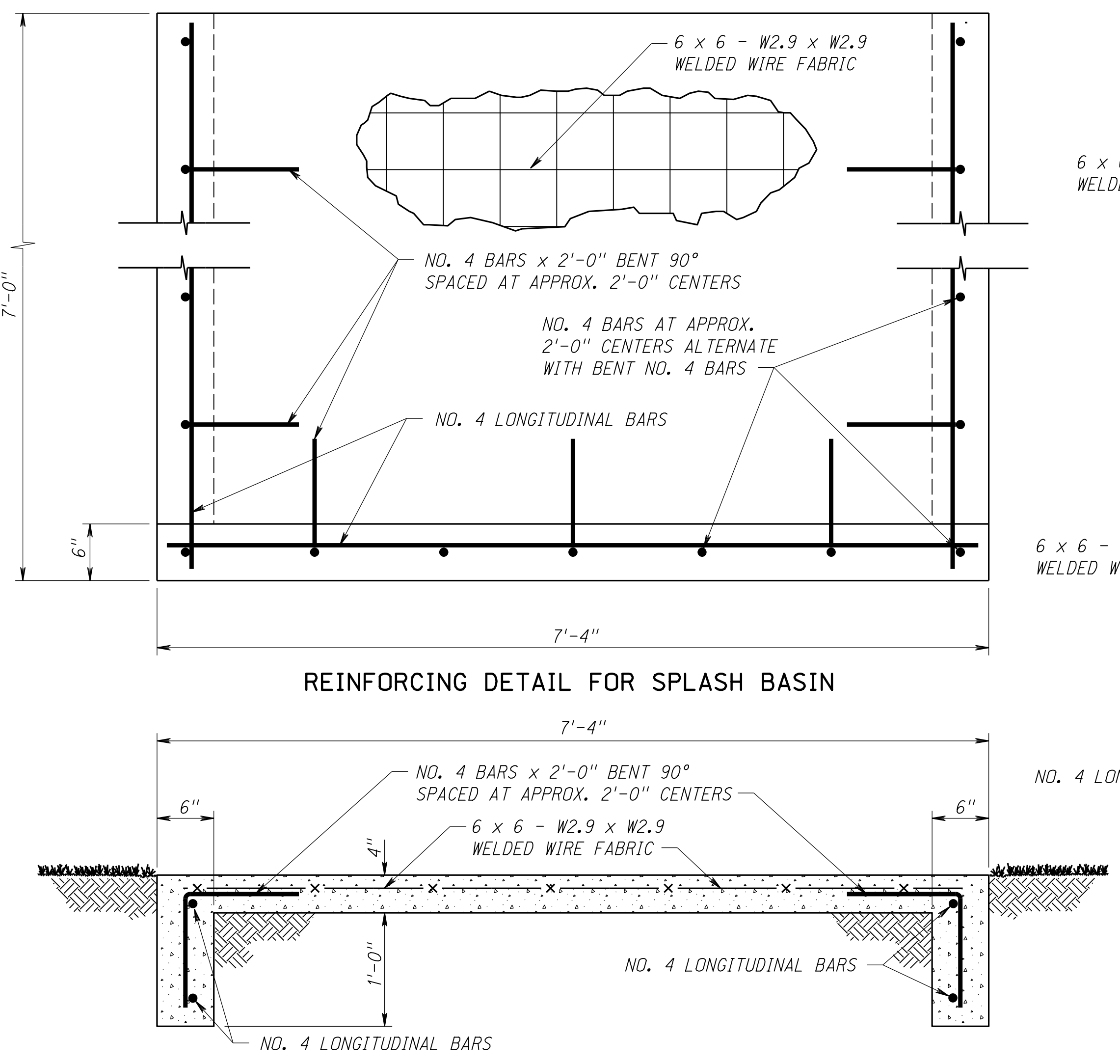
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Date: 18-MAY-2021 12:56

File: 43451604.dgn SHEET 1 OF 2 43451-E-04



* SPLASH BASIN IN A FILL SECTION: CONSTRUCT AS SHOWN.
SPLASH BASIN IN A CUT SECTION: WIDEN BASIN TO THE TOE OF THE BACK SLOPE.



NOTES:

Ws = SURFACED SHOULDER WIDTH

"L" DIMENSION SHALL BE AS SHOWN IN THE PLANS UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

FINAL LOCATION OF FLUME TO BE DETERMINED BY THE ENGINEER.

COLLAR COUPLING BAND SHALL BE COATED WITH 1/2" BITUMINOUS MASTIC PRIOR TO INSTALLATION. WHEN AIR TEMPERATURE IS 50° F. OR LOWER, HEAT SHALL BE APPLIED TO SOFTEN THE MASTIC.

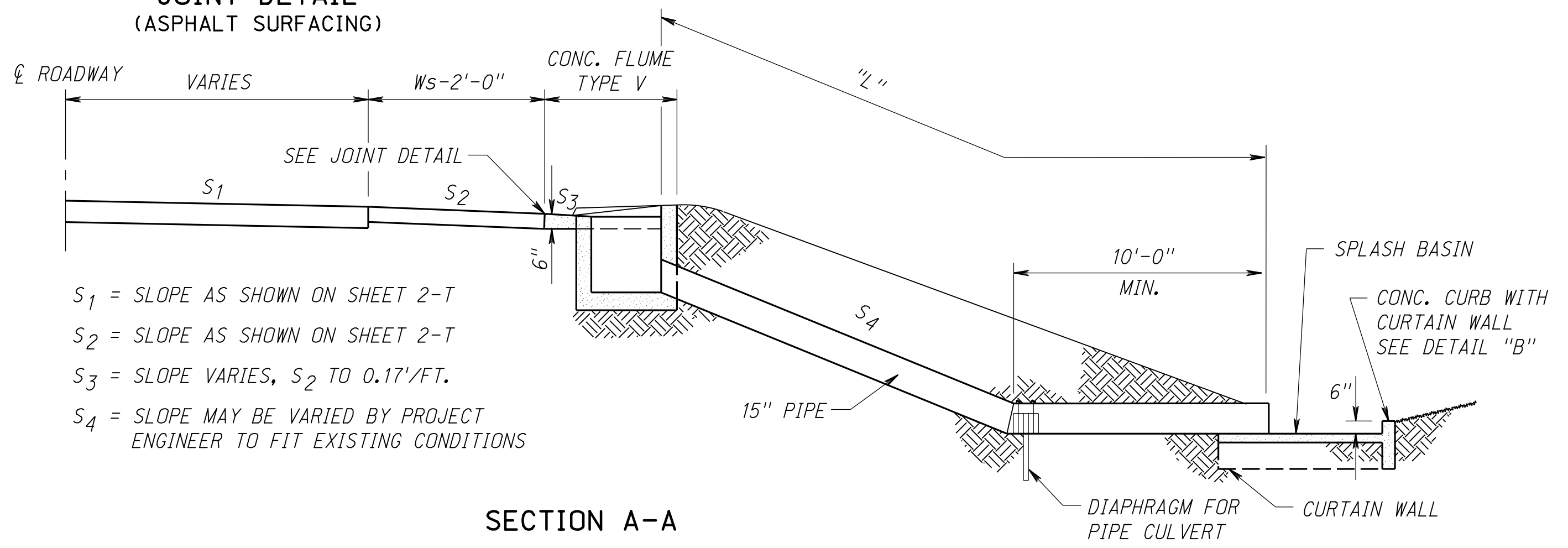
EXCAVATION FOR THE FLUME, SPLASH BASIN, DIAPHRAGM AND CULVERT PIPE IS SUBSIDIARY TO OTHER PAY ITEMS FOR WHICH DIRECT PAYMENT IS MADE.

DIAPHRAGM AND SPLASH BASIN ARE SUBSIDIARY TO OTHER PAY ITEMS FOR WHICH DIRECT PAYMENT IS MADE.

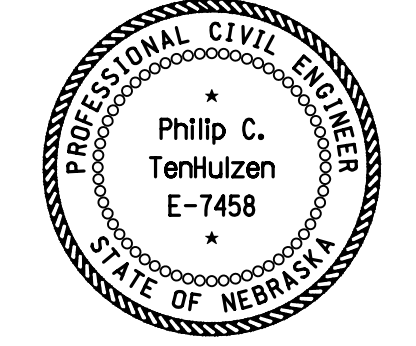
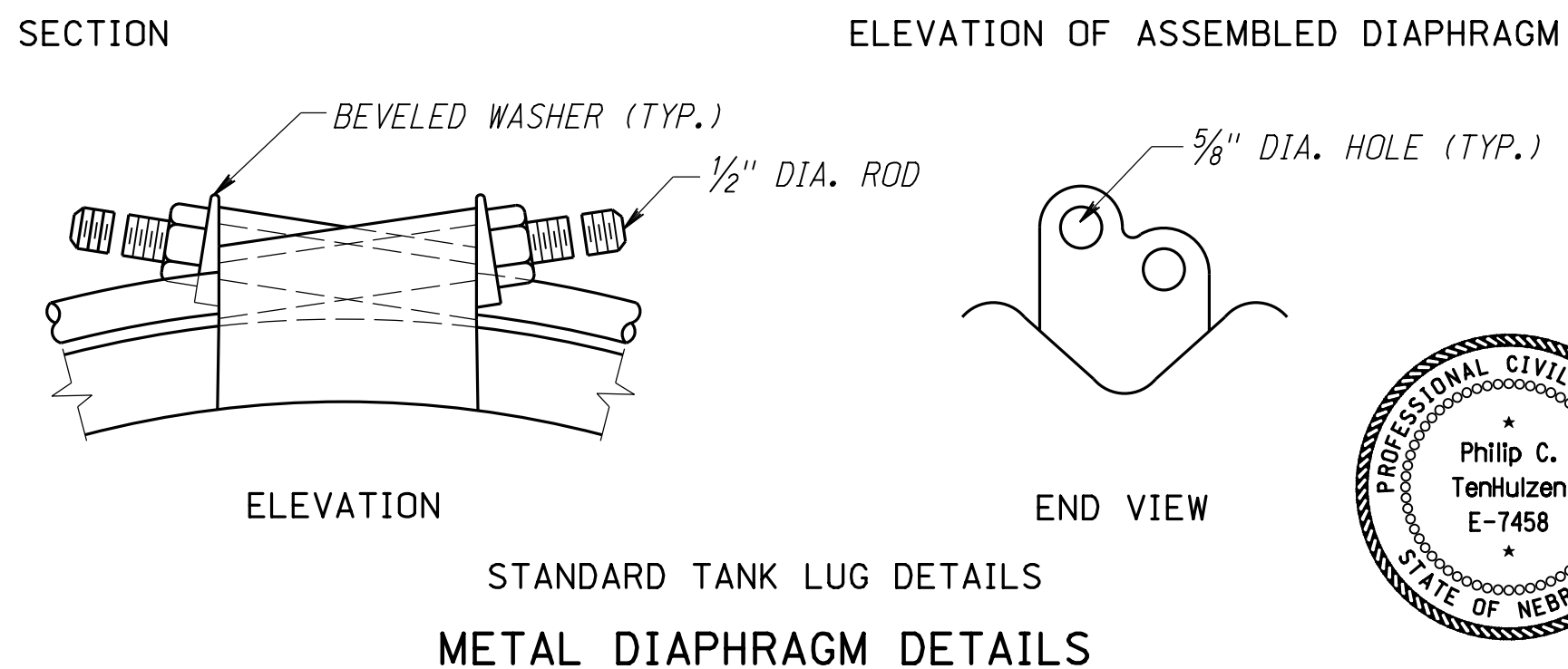
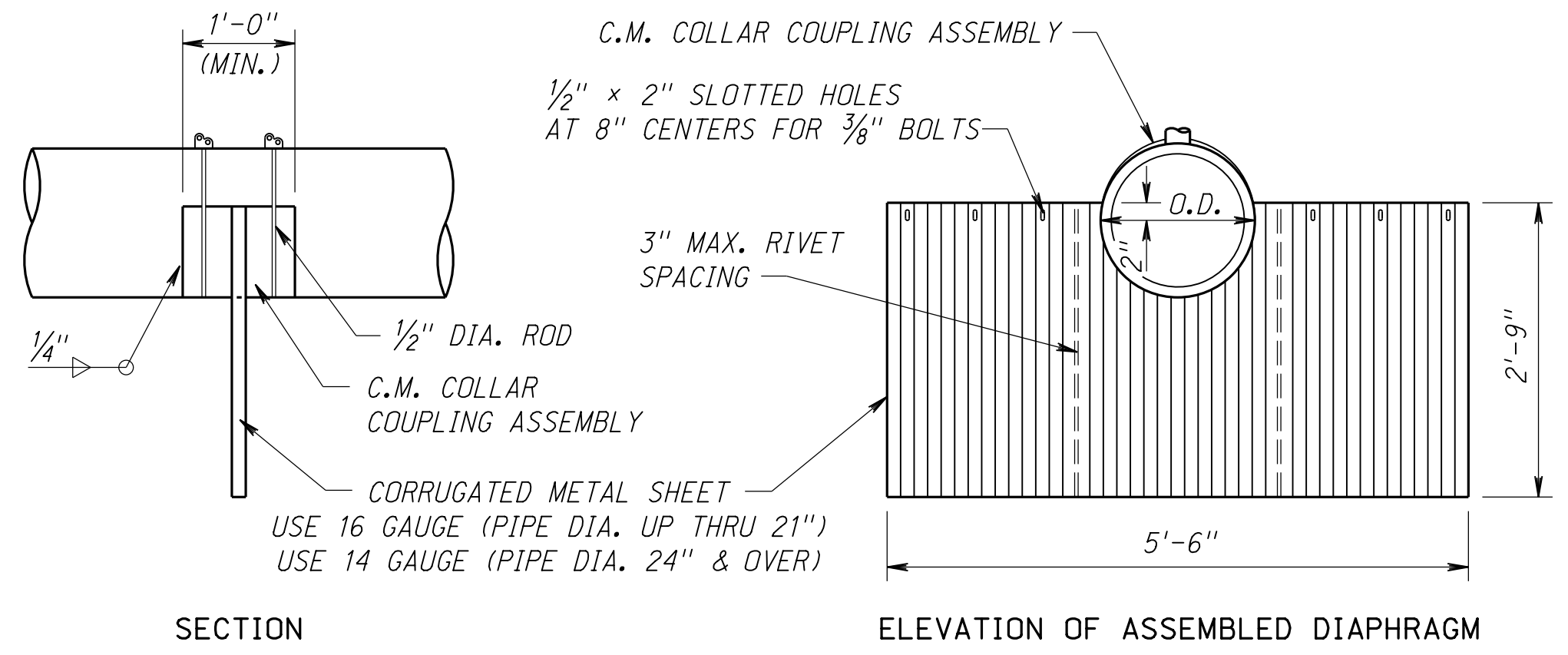
JOINT FILLER AND THE SEALANT MATERIALS ARE SUBSIDIARY TO THE FLUME.

ALL REINFORCING STEEL TO CONFORM TO A615/A615M, GRADE 60.

ALL CONCRETE USED SHALL BE CLASS 47B-3000.



S₁ = SLOPE AS SHOWN ON SHEET 2-T
S₂ = SLOPE AS SHOWN ON SHEET 2-T
S₃ = SLOPE VARIES, S₂ TO 0.17'/FT.
S₄ = SLOPE MAY BE VARIED BY PROJECT ENGINEER TO FIT EXISTING CONDITIONS



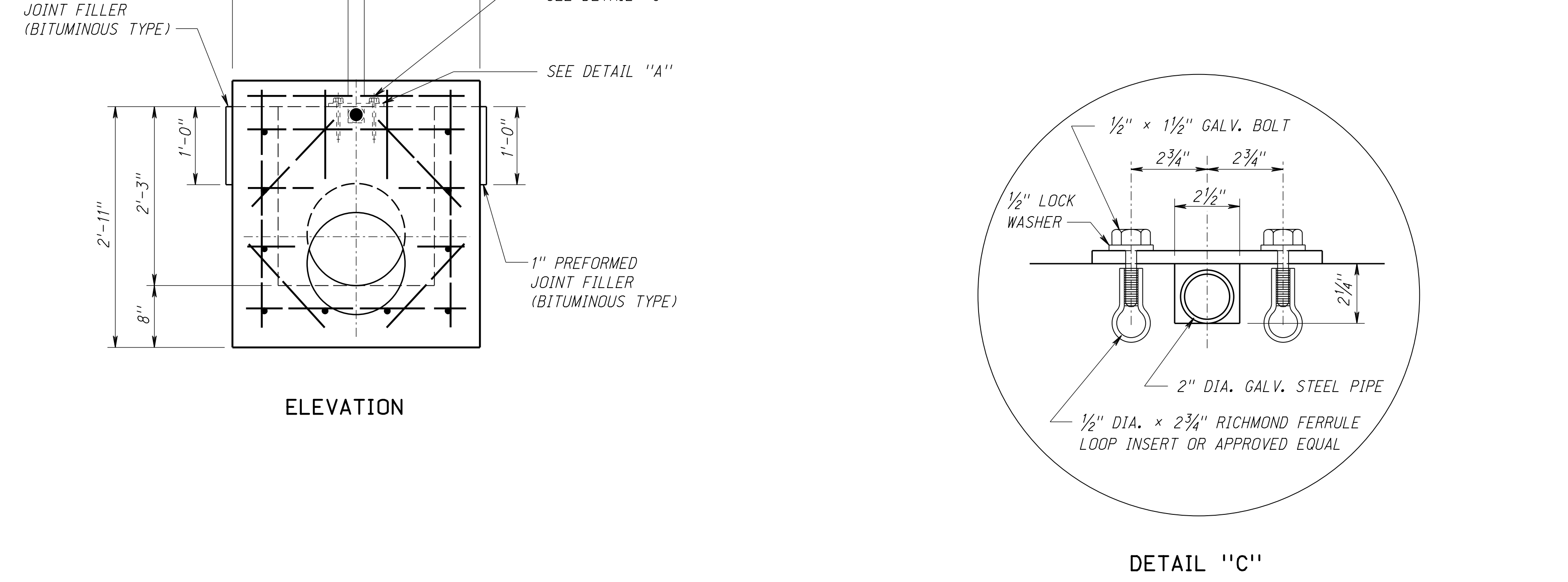
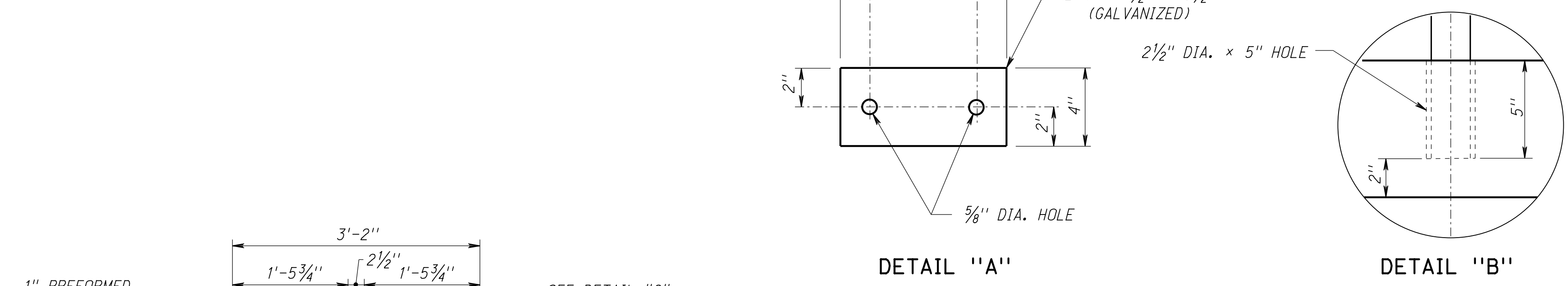
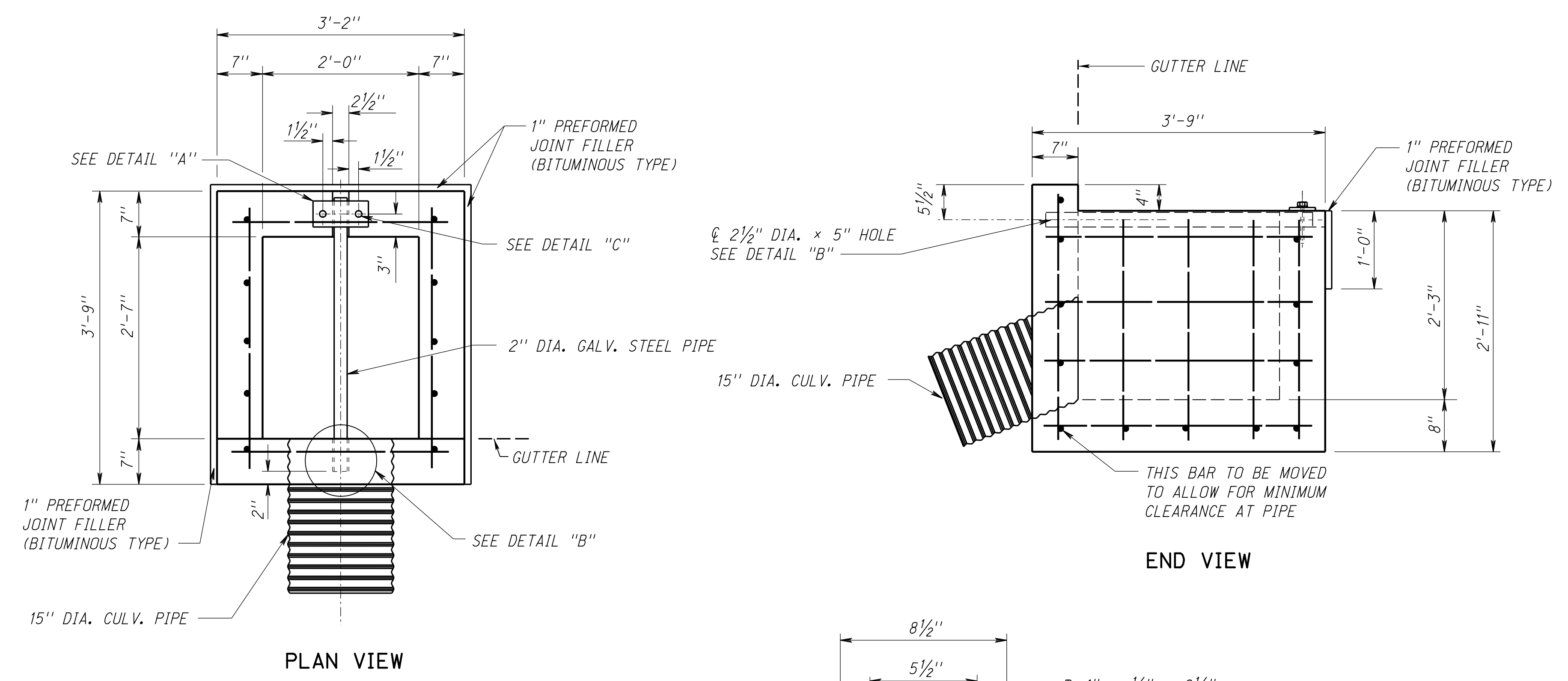
CONCRETE FLUME, TYPE V
SHEET 1 OF 2
SPECIAL PLAN C

ROADWAY DESIGN DIVISION

Computer: NDDTDESIGN134

Date: 18-MAY-2021 12:56

File: 43451604.dgn
SHEET 2 OF 2 4345-1-E-04



NOTES:

ALL CONCRETE USED SHALL BE CLASS 47B-3000.

ALL REINFORCING STEEL USED SHALL BE NO. 4 BARS AT 12" CENTERS (MAX.) AND SHALL CONFORM TO THE REQUIREMENTS OF ASTM DESIGNATION A615/A615M GRADE 60.

THE MINIMUM COVERING, MEASURED FROM THE FACE OF THE CONCRETE TO THE SURFACE OF ANY REINFORCING BAR SHALL BE 2" UNLESS NOTED OTHERWISE.

FIELD BEND AND/OR CLIP REINFORCING STEEL TO MAINTAIN MINIMUM CLEARANCE AND TO CLEAR PIPE OPENINGS.

ALL PREPARATION, MATERIALS, EQUIPMENT, TOOLS, LABOR AND INCIDENTALS NECESSARY TO COMPLETE THE WORK THAT IS NOT PAID FOR DIRECTLY, SHALL BE CONSIDERED SUBSIDIARY TO THE ITEMS FOR WHICH DIRECT PAYMENT IS MADE.

ALL CONCRETE SURFACES TO BE IN CONTACT WITH THE NEW WORK SHALL BE THOROUGHLY CLEANED BEFORE PLACING NEW CONCRETE.

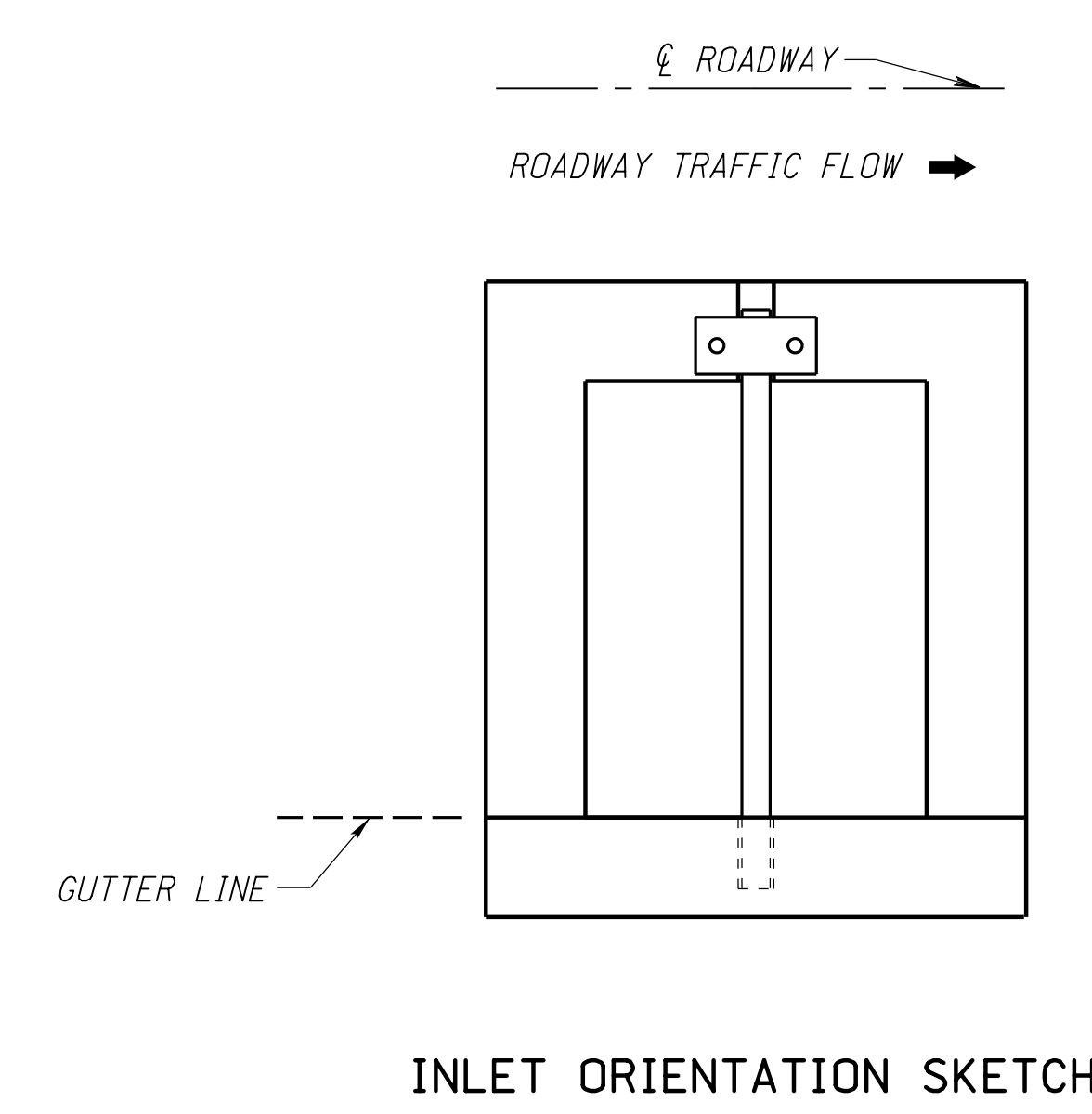
DEDUCTIONS FOR PIPE OPENINGS HAVE BEEN INCLUDED IN THE "QUANTITIES FOR INFORMATION ONLY".

FERRULE LOOPS SHALL HAVE WORKING LOAD REQUIREMENTS OF 1,320 LBS. IN SHEAR AND 2,000 LBS. IN TENSION.

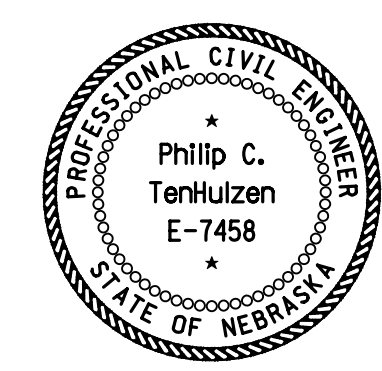
QUANTITIES - FOR INFORMATION ONLY -

CONCRETE	0.85 CU. YDS.
REINFORCED STEEL	75 LBS.
2" GALVANIZED STEEL PIPE	3.50 LIN. FT.

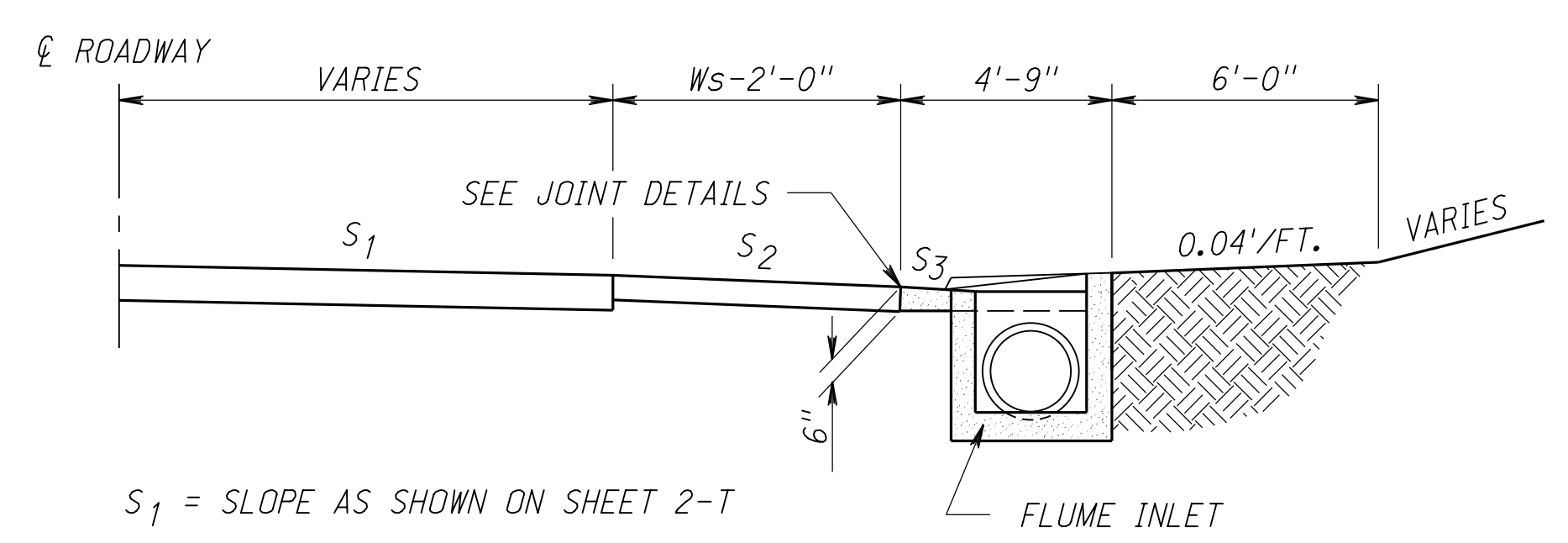
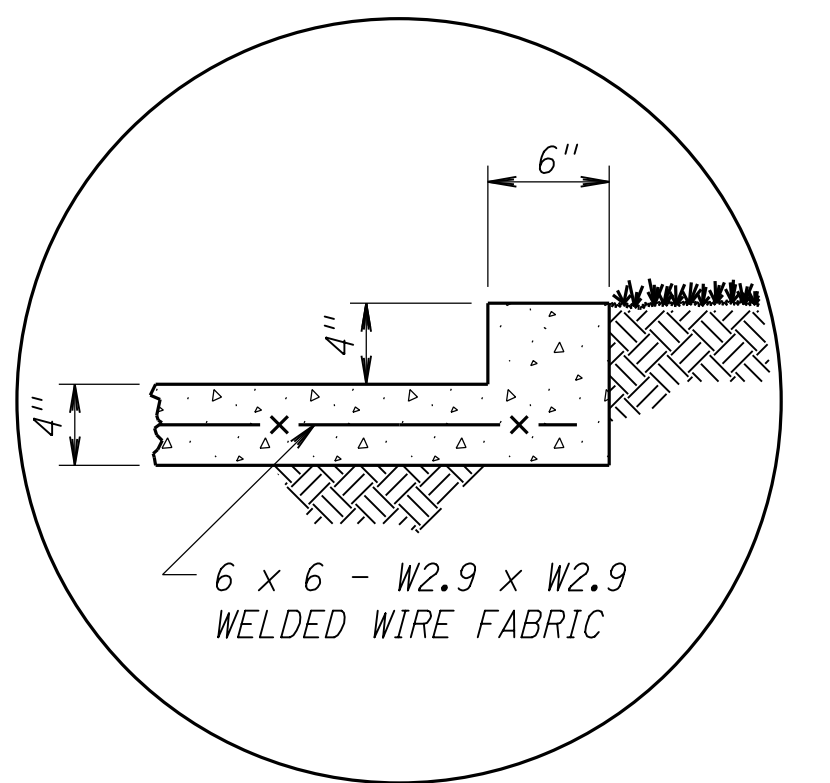
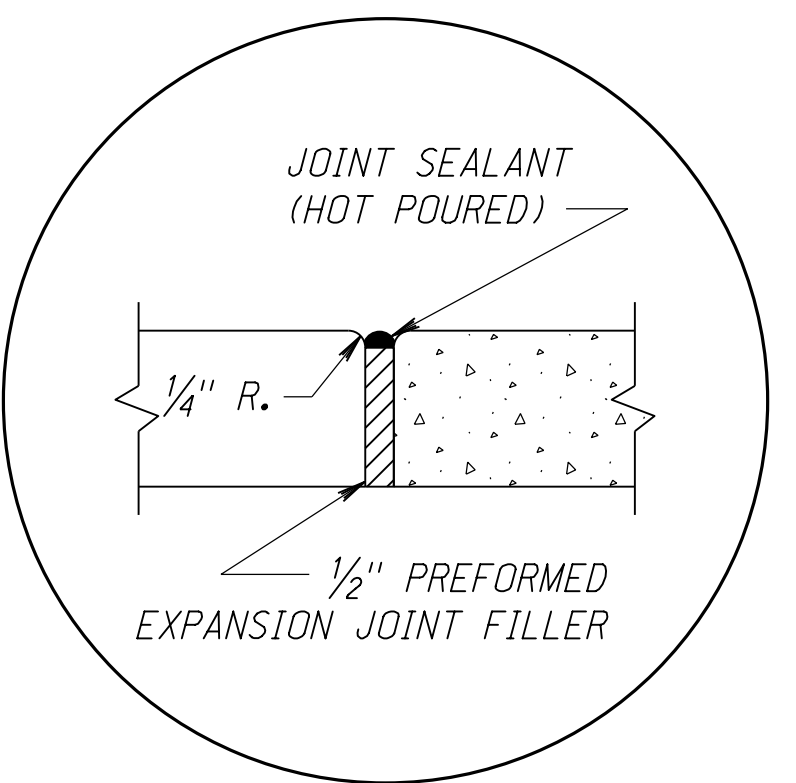
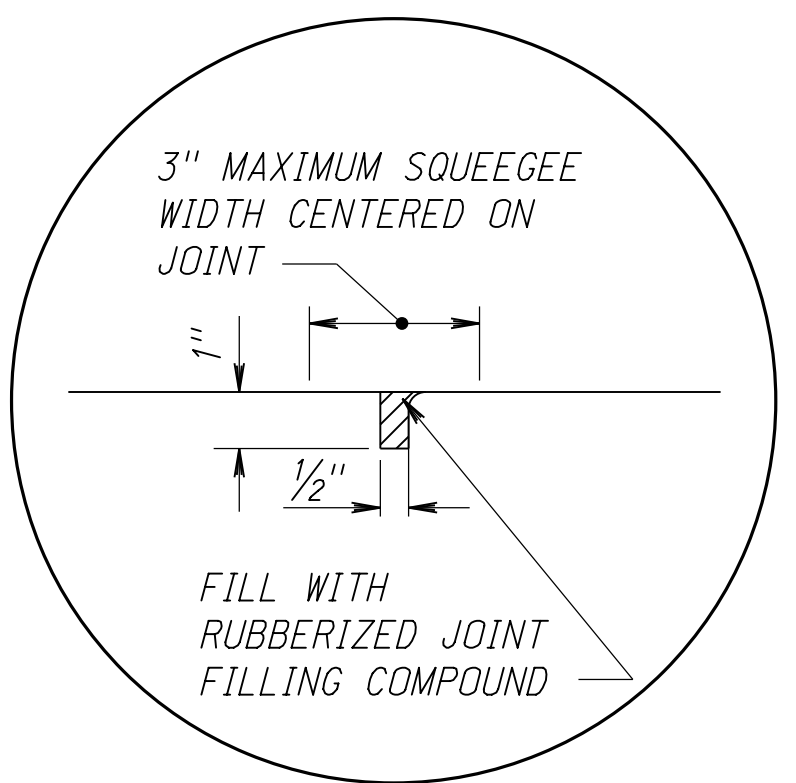
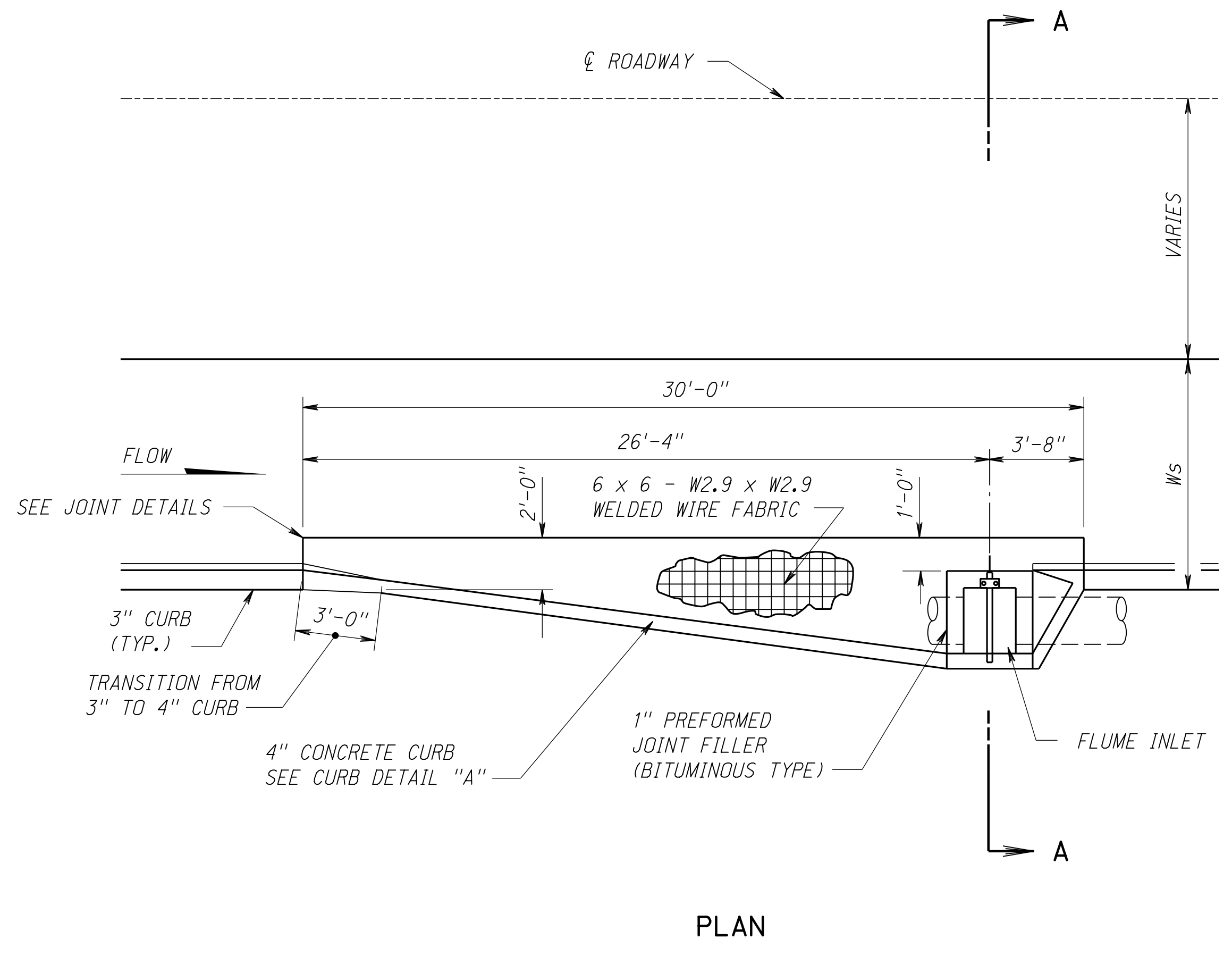
(THE ABOVE ITEMS ARE SUBSIDIARY TO OTHER PAY ITEMS FOR WHICH DIRECT PAYMENT IS MADE.)



CONCRETE FLUME, TYPE V
SHEET 2 OF 2
SPECIAL PLAN C



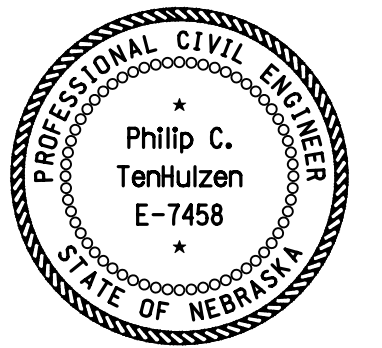
ROADWAY DESIGN DIVISION



S₁ = SLOPE AS SHOWN ON SHEET 2-T
 S₂ = SLOPE AS SHOWN ON SHEET 2-T
 S₃ = SLOPE VARIES, S₂ TO 0.17'/FT.

NOTES:

- Ws = SURFACED SHOULDER WIDTH
- FINAL LOCATION OF FLUME TO BE DETERMINED BY THE ENGINEER.
- EXCAVATION FOR THE FLUME IS SUBSIDIARY TO OTHER PAY ITEMS FOR WHICH DIRECT PAYMENT IS MAKE.
- JOINT FILLER AND THE SEALANT MATERIALS ARE SUBSIDIARY TO THE FLUME.
- ALL REINFORCING STEEL TO CONFORM TO A615/A615M, GRADE 60.
- ALL CONCRETE USED SHALL BE CLASS 47B-3000.



CONCRETE FLUME, TYPE VI
 SHEET 1 OF 2
SPECIAL PLAN C

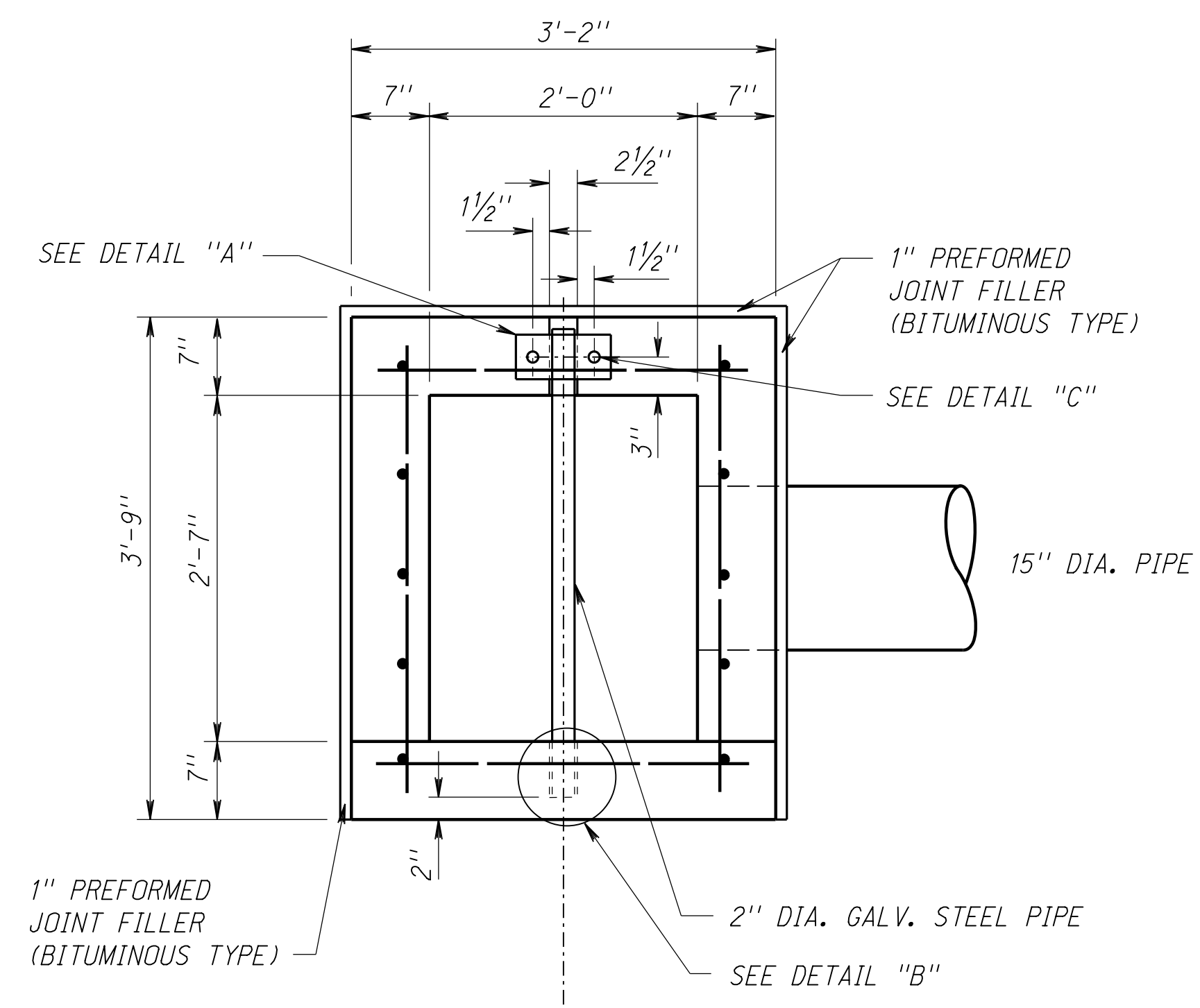
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 SHEET 1 OF 2 4346-1-E-02

ROADWAY DESIGN DIVISION

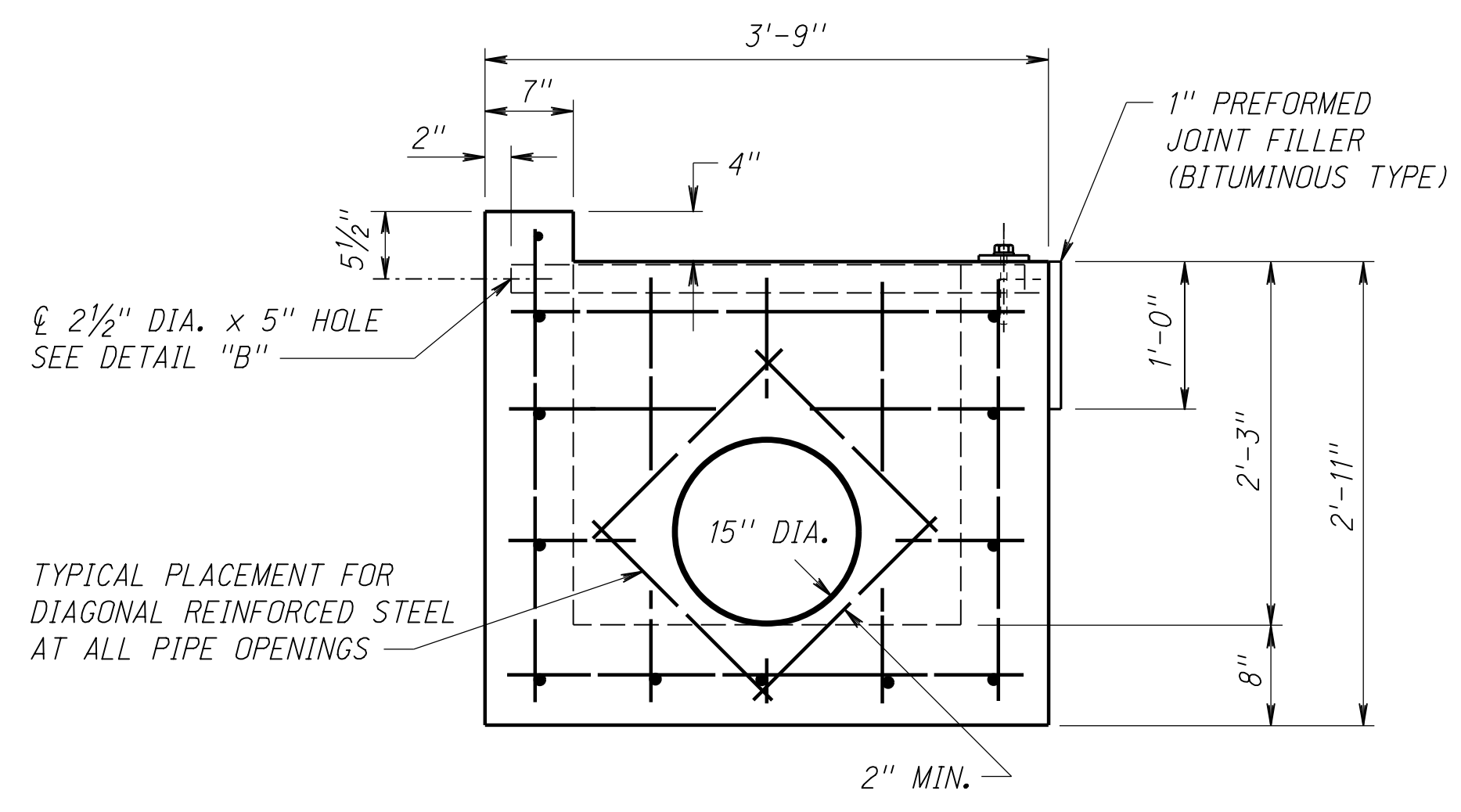
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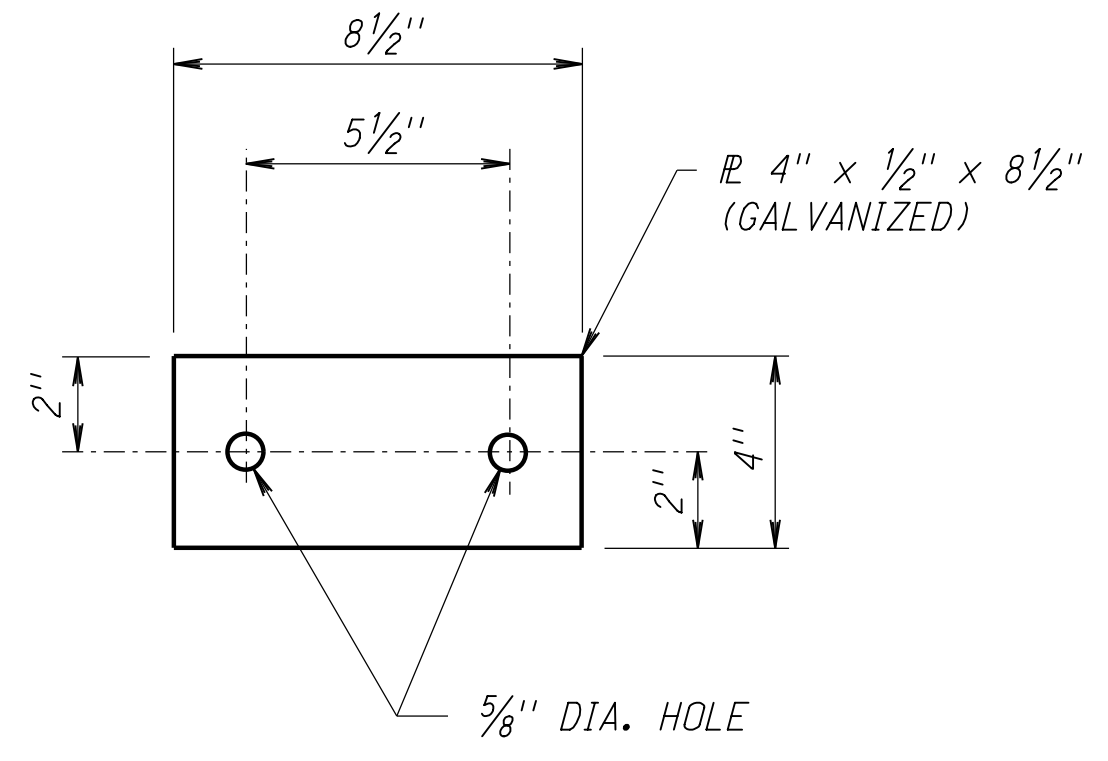
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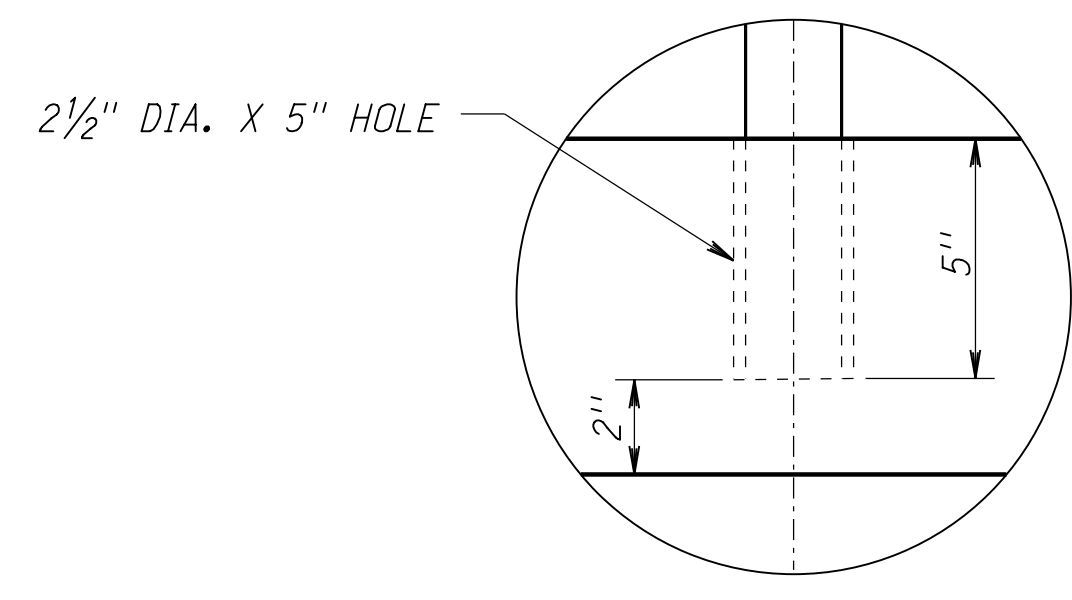
PLAN VIEW



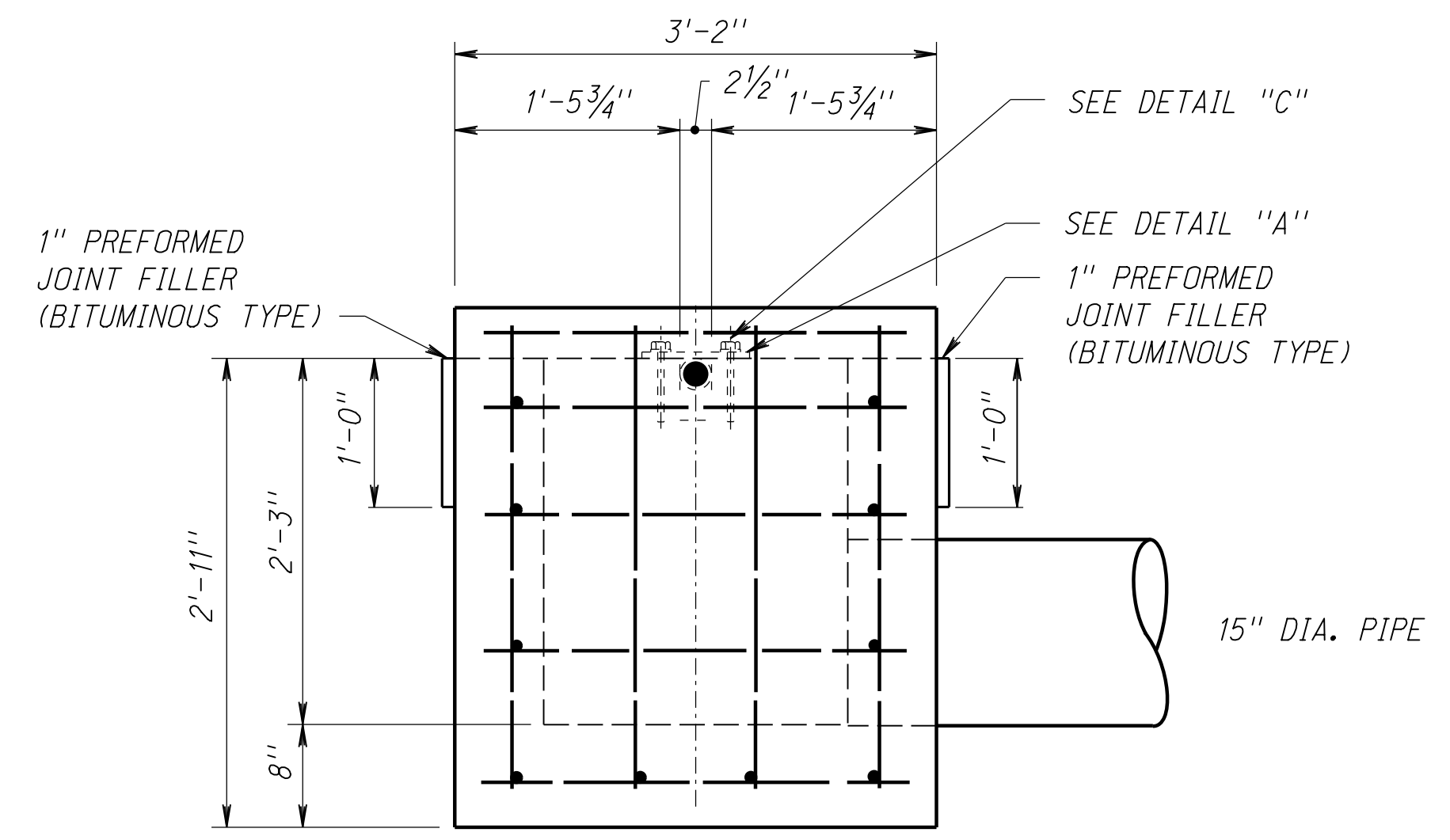
END VIEW



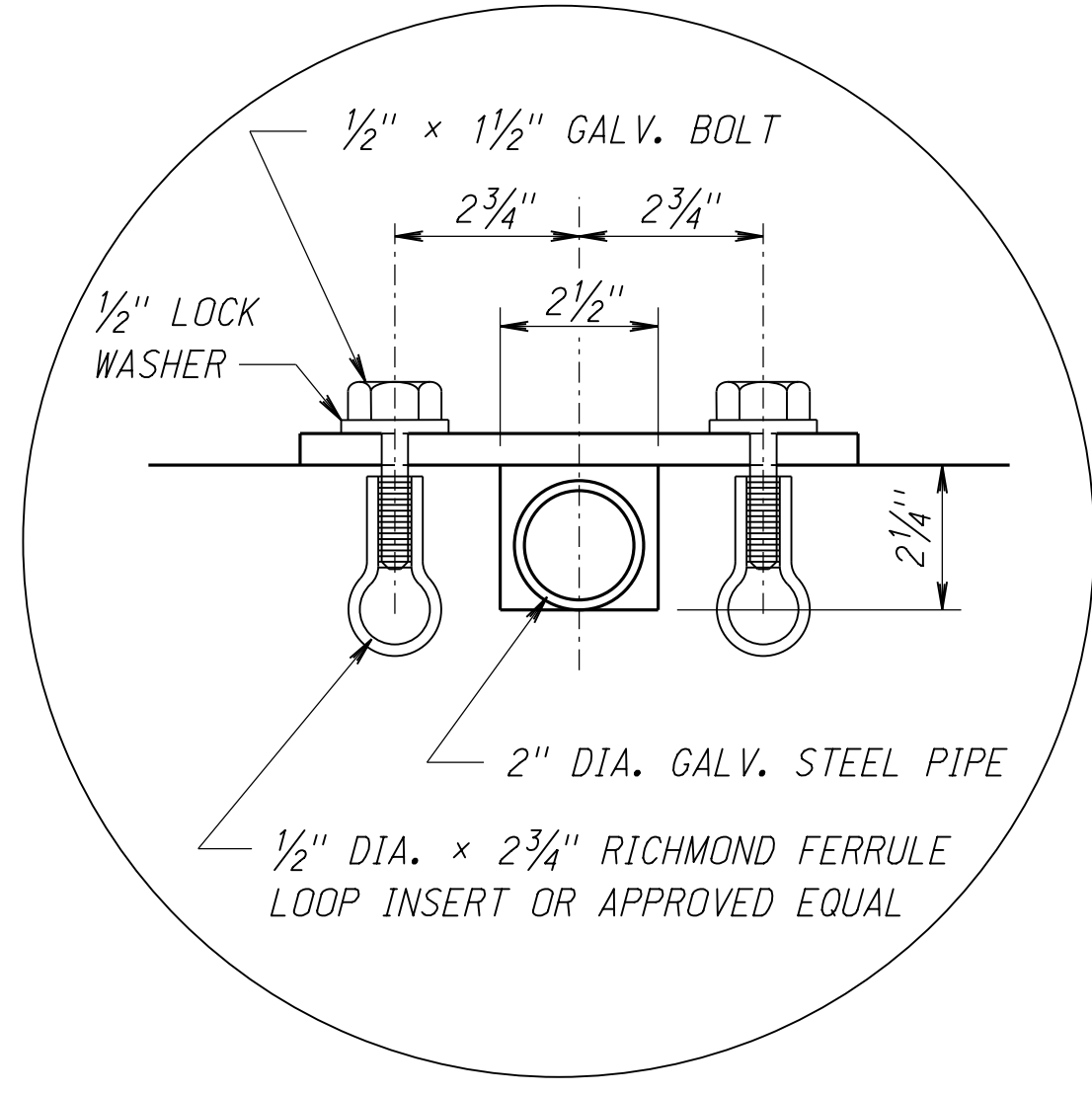
DETAIL "A"



DETAIL "B"



ELEVATION



DETAIL "C"

NOTES:

ALL REINFORCING STEEL USED SHALL BE NO. 4 BARS AT 12" CENTERS (MAX.) AND SHALL CONFORM TO THE REQUIREMENTS OF ASTM DESIGNATION A615/A615M GRADE 60.

THE MINIMUM COVERING, MEASURED FROM THE FACE OF THE CONCRETE TO THE SURFACE OF ANY REINFORCING BAR SHALL BE 2" UNLESS NOTED OTHERWISE.

FIELD BEND AND/OR CLIP REINFORCING STEEL TO MAINTAIN MINIMUM CLEARANCE AND TO CLEAR PIPE OPENINGS.

ALL PREPARATION, MATERIALS, EQUIPMENT, TOOLS, LABOR AND INCIDENTALS NECESSARY TO COMPLETE THE WORK THAT IS NOT PAID FOR DIRECTLY, SHALL BE CONSIDERED SUBSIDIARY TO THE ITEMS FOR WHICH DIRECT PAYMENT IS MADE.

ALL CONCRETE SURFACES TO BE IN CONTACT WITH THE NEW WORK SHALL BE THOROUGHLY CLEANED BEFORE PLACING NEW CONCRETE.

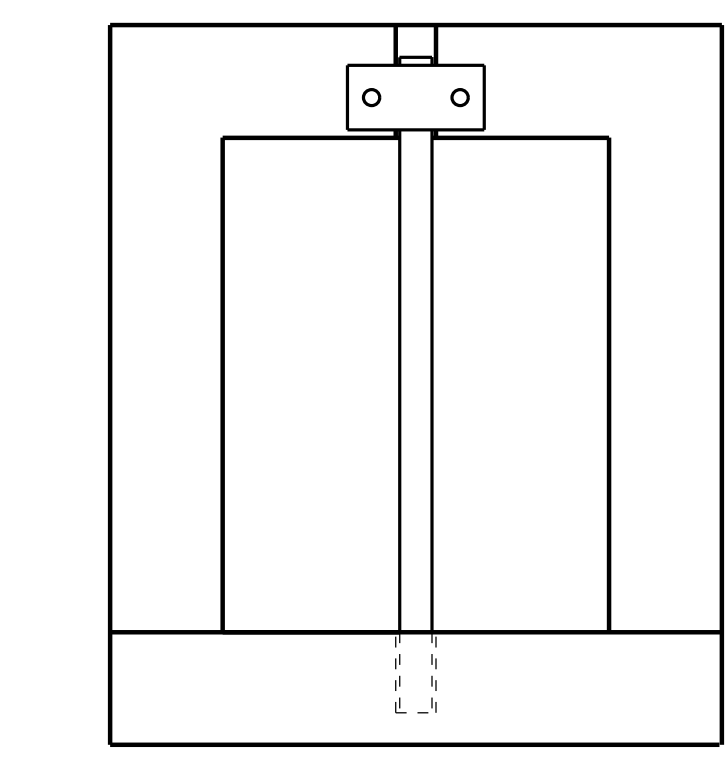
NO DEDUCTIONS FOR PIPE OPENINGS HAVE BEEN INCLUDED IN THE "QUANTITIES FOR INFORMATION ONLY".

FERRULE LOOPS SHALL HAVE WORKING LOAD REQUIREMENTS OF 1,320 LBS. IN SHEAR AND 2,000 LBS. IN TENSION.

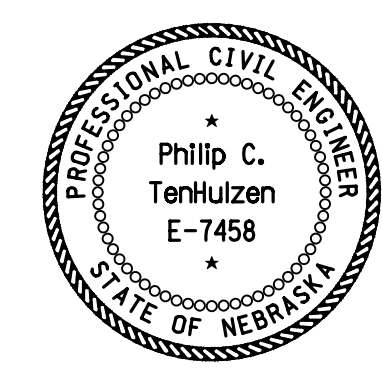
QUANTITIES
- FOR INFORMATION ONLY -

CONCRETE	0.88 CU. YDS.
REINFORCED STEEL	75 LBS.
2" GALVANIZED STEEL PIPE	3.50 LIN. FT.

(THE ABOVE ITEMS ARE SUBSIDIARY TO OTHER PAY ITEMS FOR WHICH DIRECT PAYMENT IS MADE.)



INLET ORIENTATION SKETCH



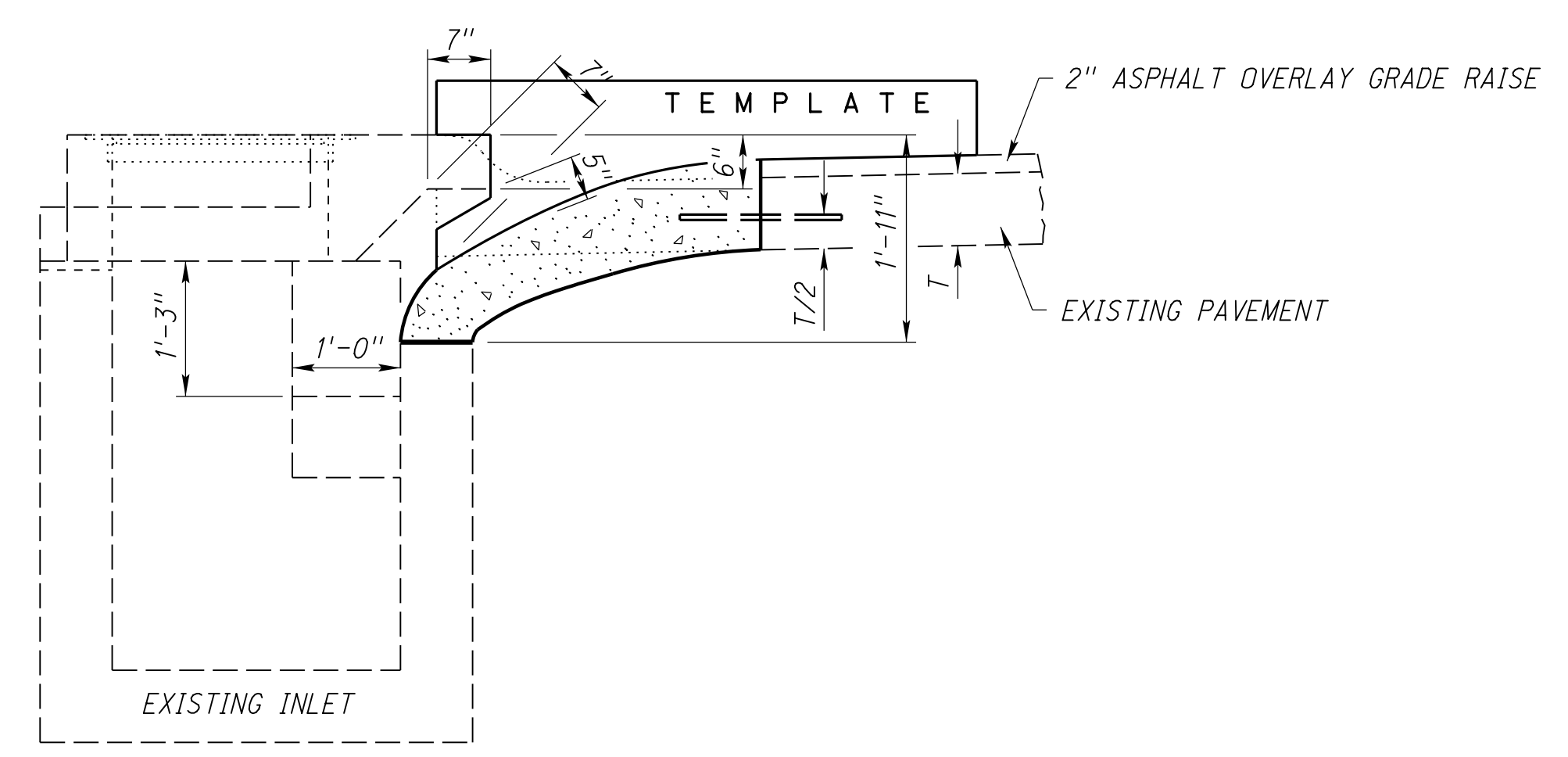
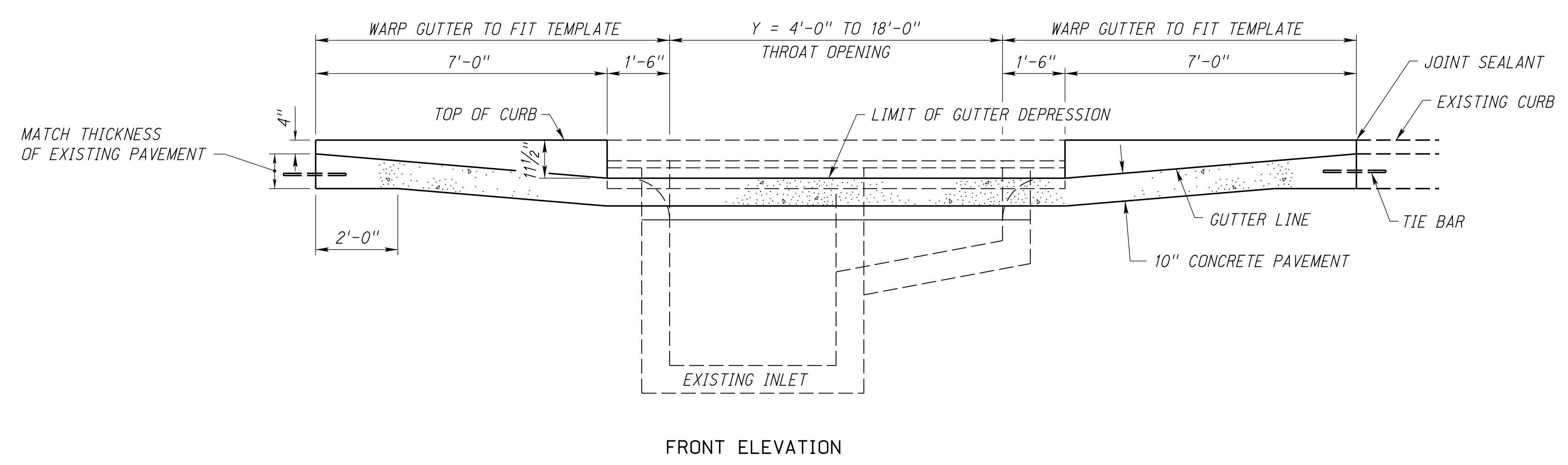
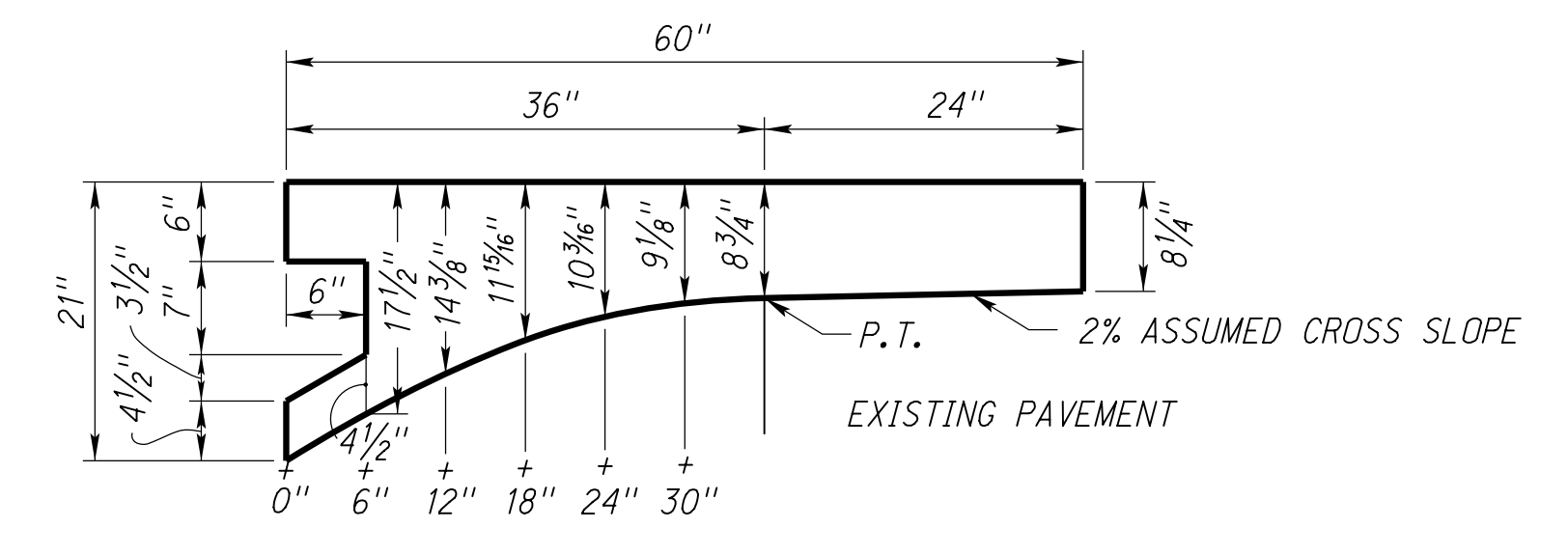
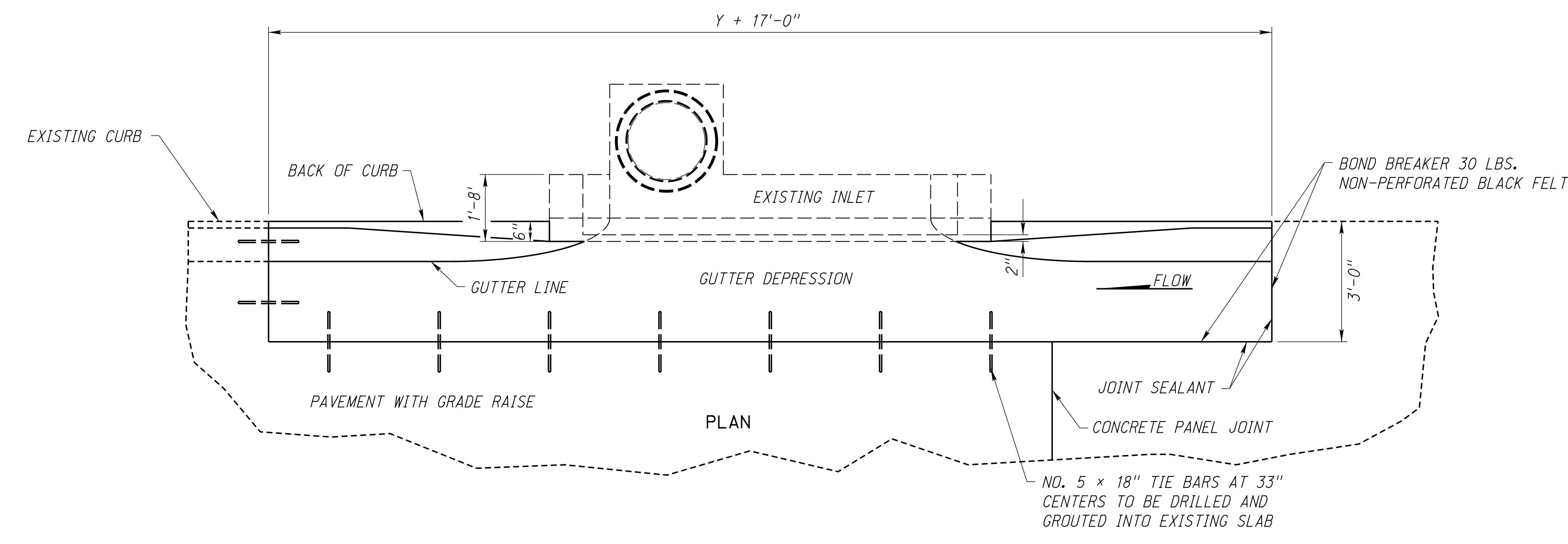
CONCRETE FLUME, TYPE VI
SHEET 2 OF 2
SPECIAL PLAN C

ROADWAY DESIGN DIVISION

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File: 44401e00.dgn
SHEET 1 OF 1 4440-1-8-00



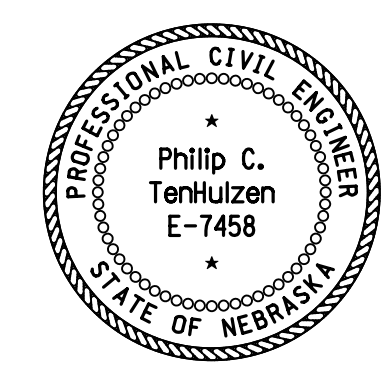
NOTES:

TIE BARS ARE REQUIRED WHEREVER THE NEW GUTTER DEPRESSION ABUTS EXISTING CONCRETE.

ALL CONCRETE SHALL BE CLASS 47B-3500

THE GUTTER DEPRESSION TEMPLATE SHALL BE USED THROUGHOUT THE THROAT OPENING.

THIS PLAN IS USED TO RECONSTRUCT GUTTER DEPRESSIONS FOR OVERLAYS 2" ABOVE THE ORIGINAL FINISH GRADE.



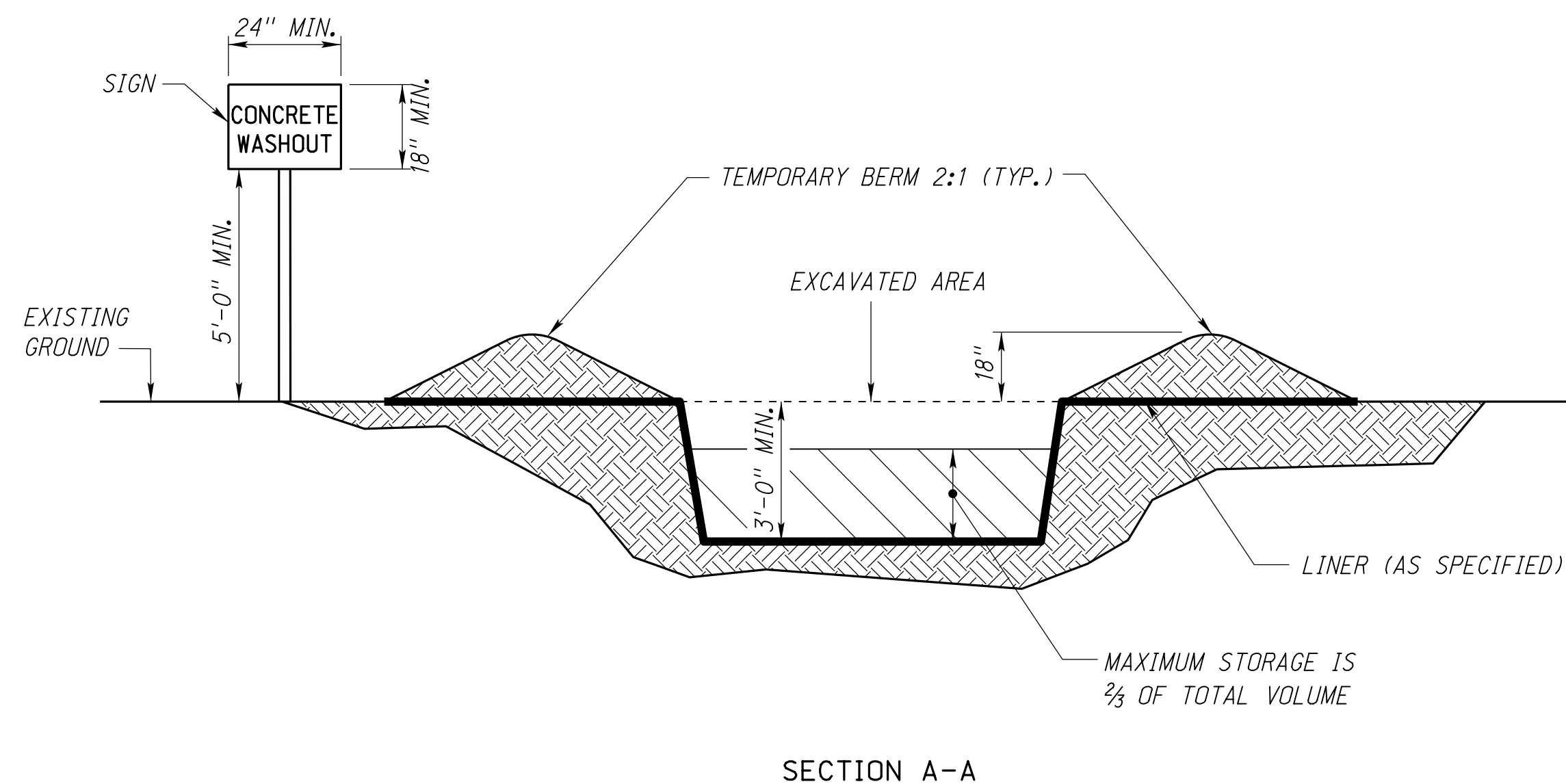
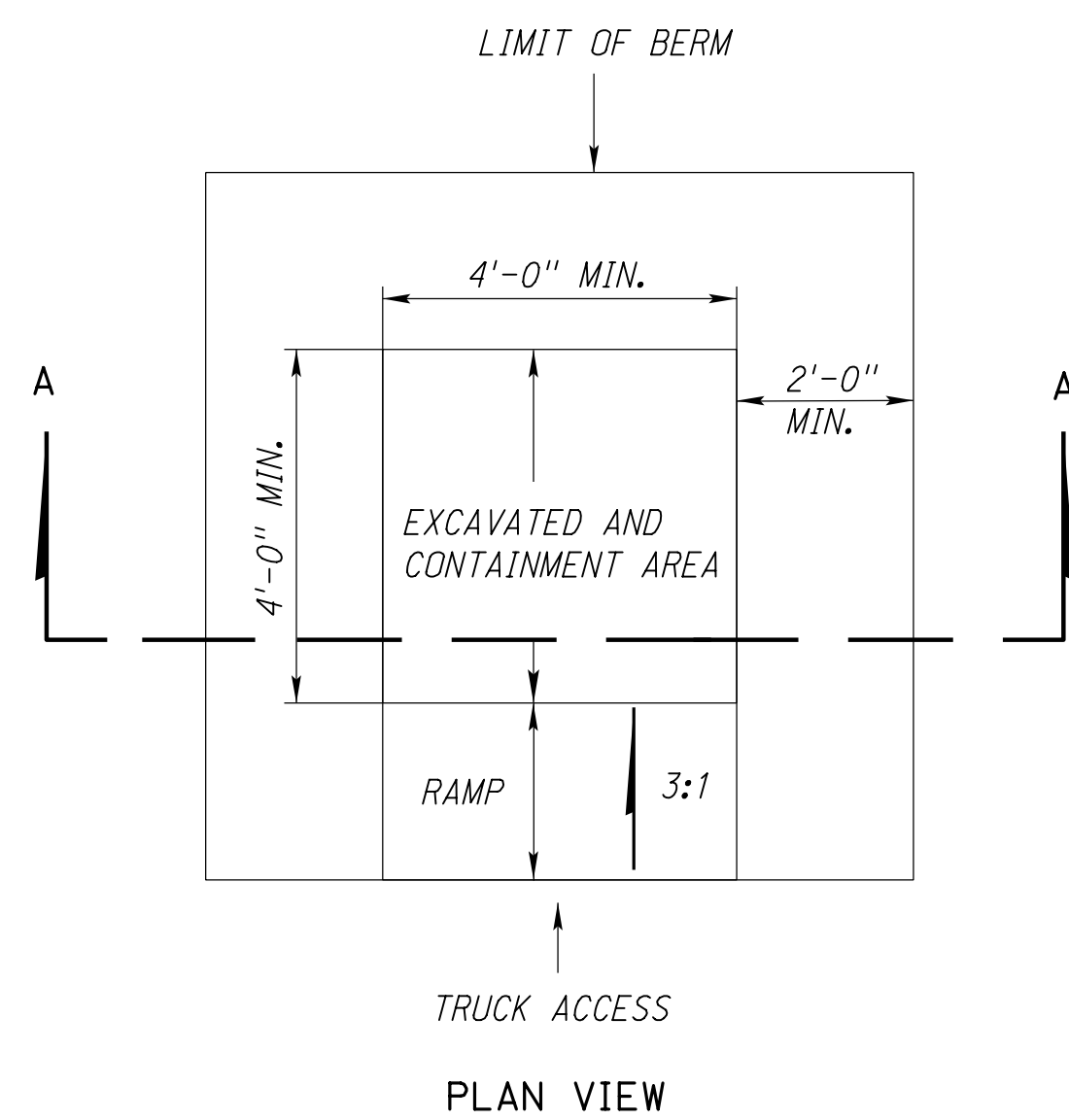
RECONSTRUCT GUTTER DEPRESSION FOR 2" GRADE RAISE
SHEET 1 OF 1
SPECIAL PLAN C

ROADWAY DESIGN DIVISION

Computer: NDDTDESIGN134

Date: 18-MAY-2021 12:56

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SHEET 1 OF 1

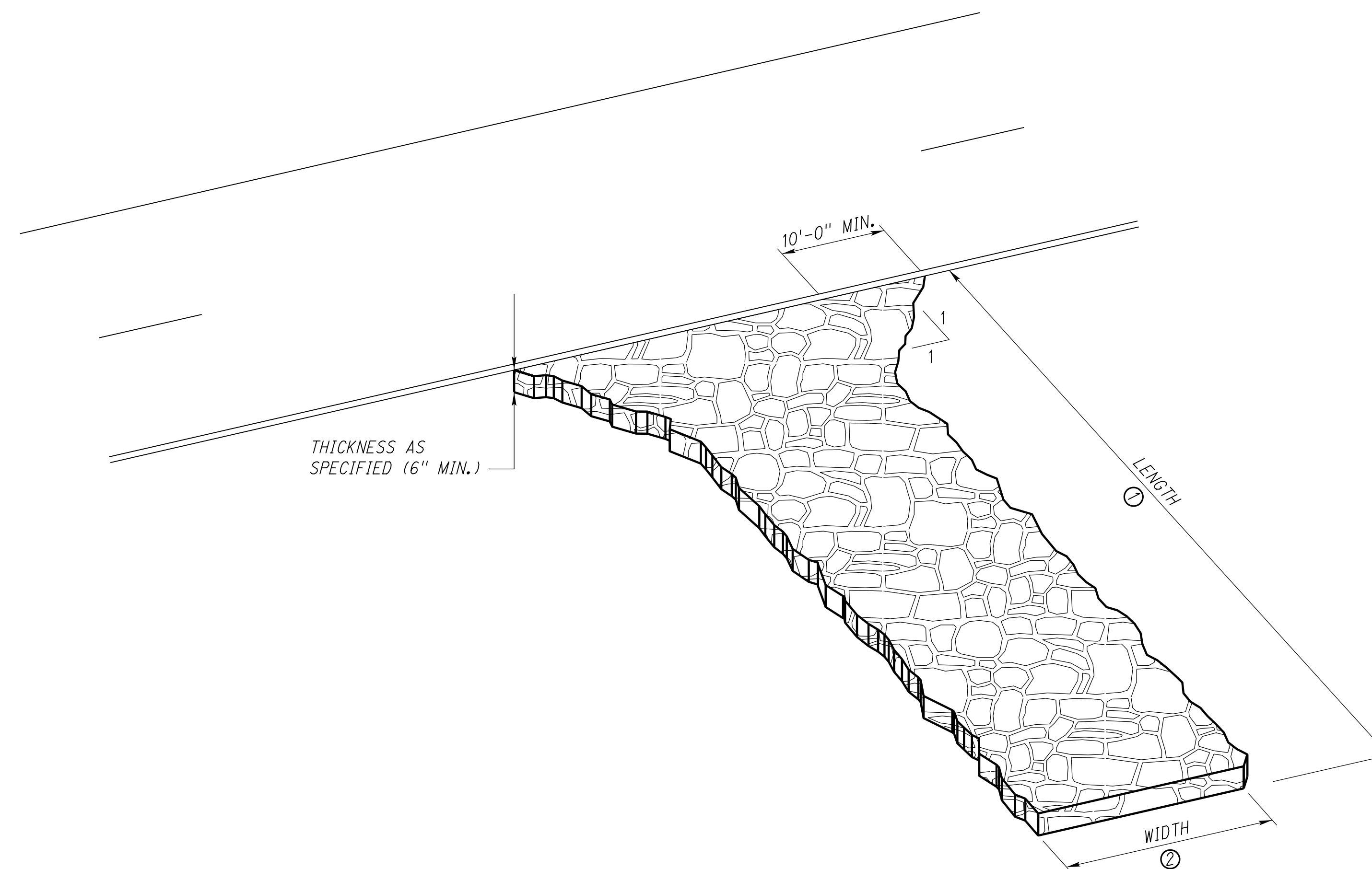


NOTES:
EROSION BALES MAY BE USED AS AN ALTERNATIVE FOR THE BERM AREA, EXCEPT AT THE OPENING.

THE CONCRETE WASHOUT SIGN SHALL HAVE LETTERS AT LEAST 3 INCHES HIGH.

STRUCTURE MUST BE LINED WITH MATERIAL NOTED IN SPECIAL PROVISIONS.

CONCRETE WASHOUT STRUCTURE



NOTES:

REMOVE VEGETATION AND EXCAVATE SOFT SOILS FROM EXIT AREA. THOROUGHLY COMPACT SUBGRADE PRIOR TO PLACING STONE.

INSTALL CULVERT UNDER EXIT IF NECESSARY TO MAINTAIN DRAINAGE.

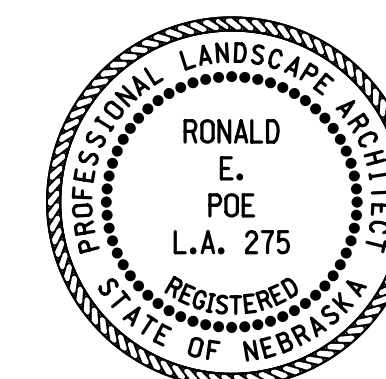
GRADE EXIT TO PREVENT RUNOFF FROM FLOWING ONTO STREET. DIRECT ALL RUNOFF FROM EXIT TO A SEDIMENT RETENTION DEVICE.

WHEN SPECIFIED, INSTALL SUBGRADE STABILIZATION FABRIC PRIOR TO PLACING CRUSHED STONE.

INSTALL LAYER OF CRUSHED STONE TO THE THICKNESS (6 INCH MINIMUM) AND DIMENSIONS SPECIFIED.

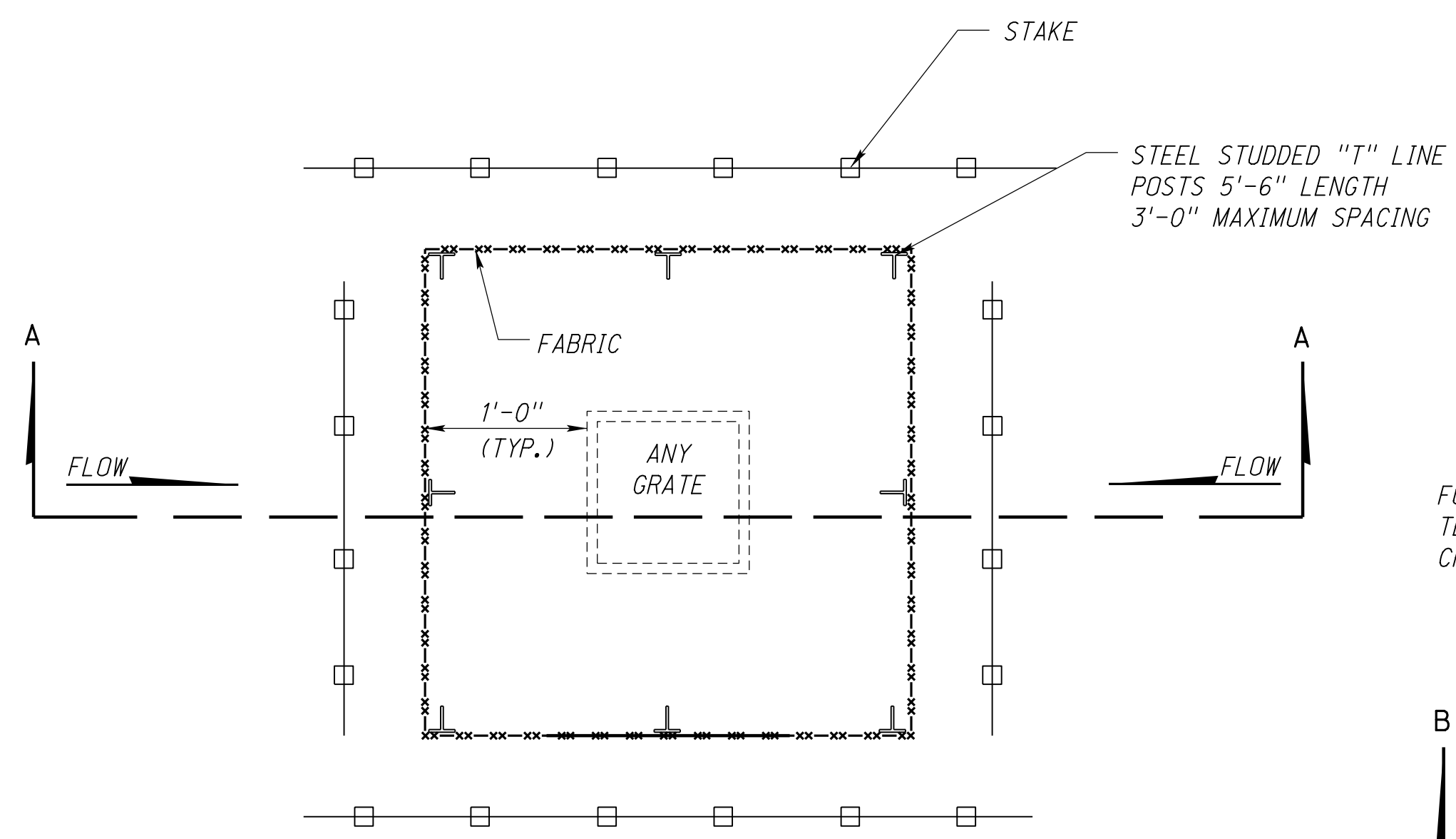
- ① EXIT LENGTH: 30 FT. MINIMUM OR AS SPECIFIED. LENGTH OF EXIT MAY BE INCREASED IF SEDIMENT TRACK-OUT OCCURS.
- ② EXIT WIDTH: 20 FT. MINIMUM.

STABILIZED CONSTRUCTION EXIT

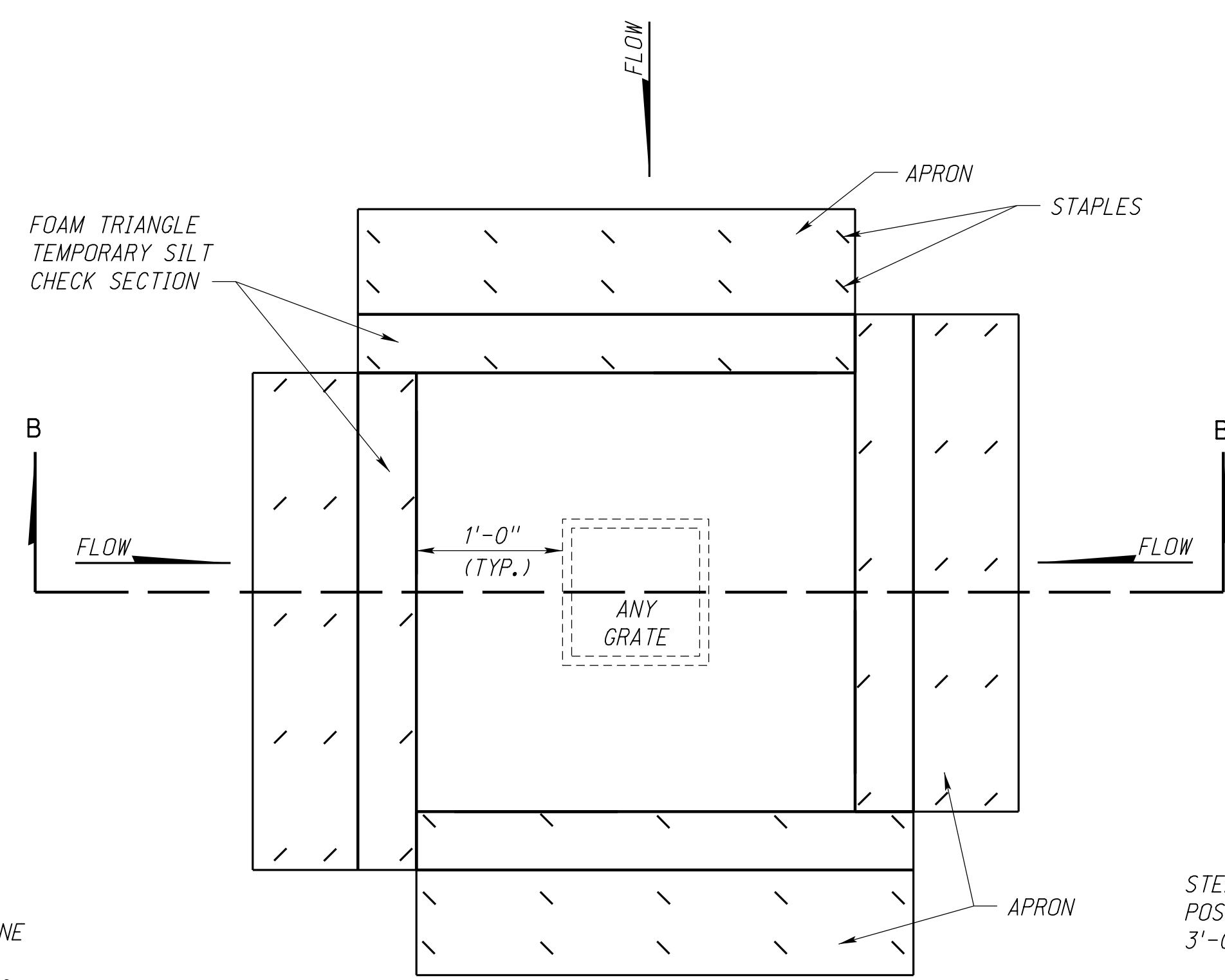


CONCRETE WASHOUT &
CONSTRUCTION EXIT
SHEET 1 OF 1
SPECIAL PLAN C

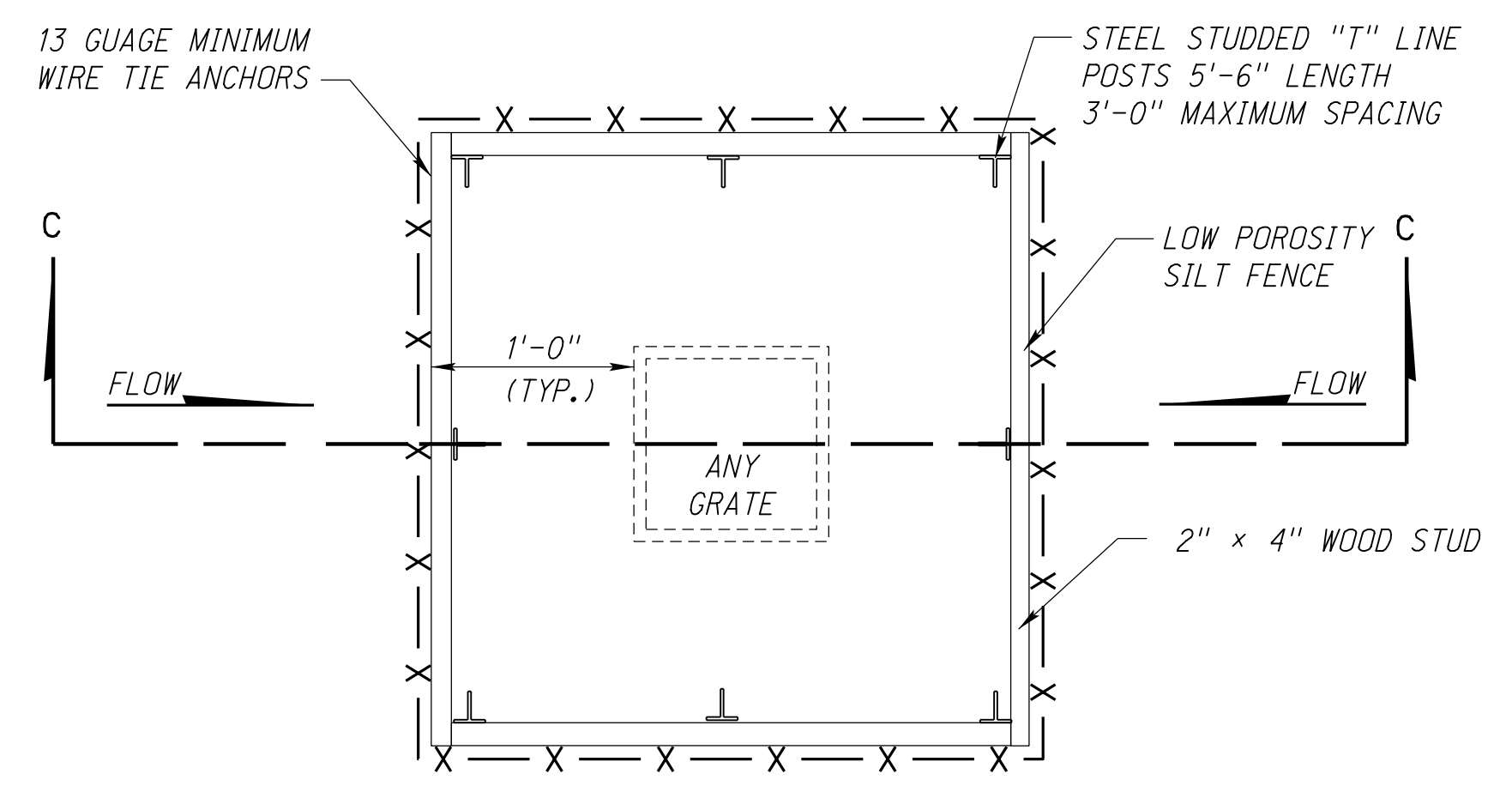
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SHEET 1 OF 2 31021e00



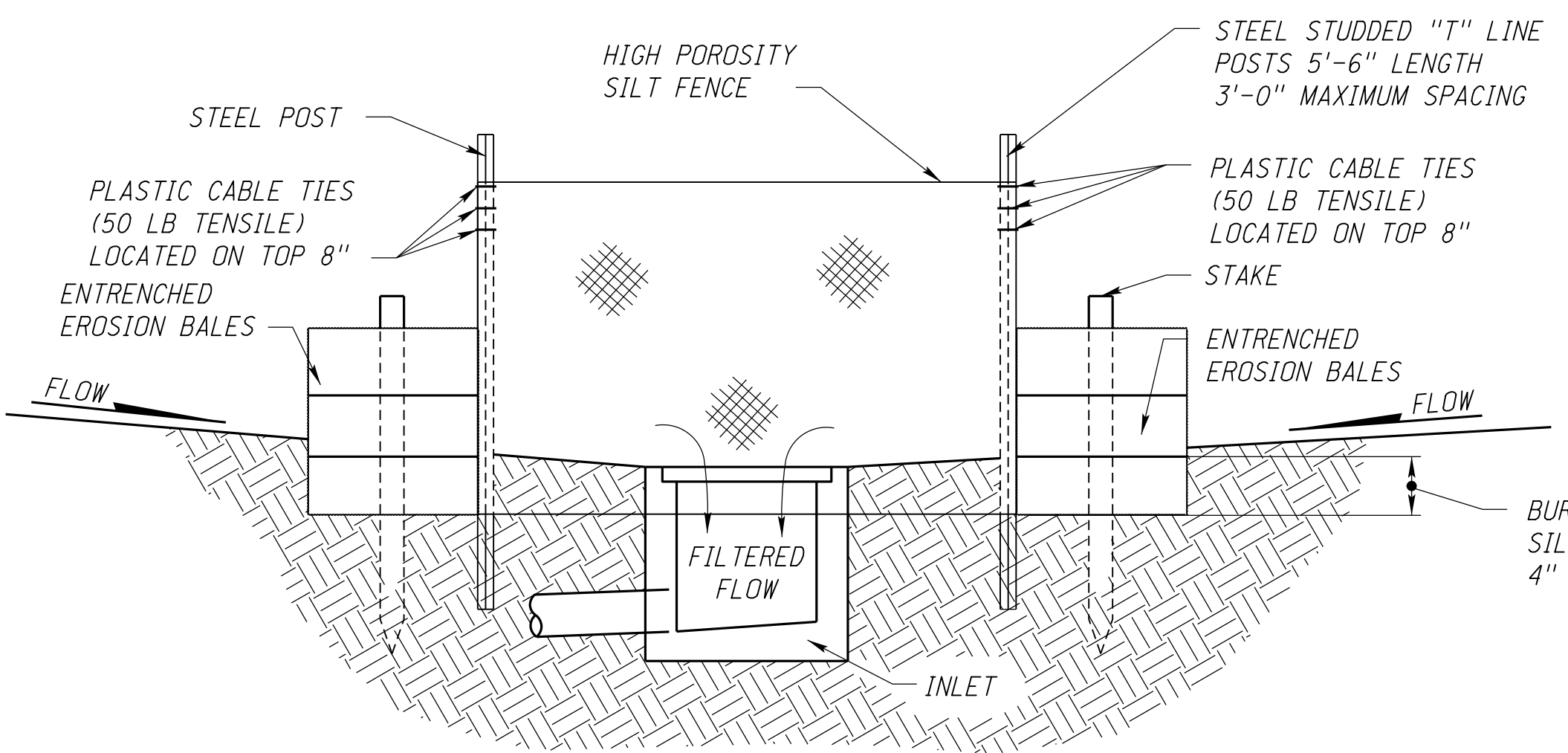
PLAN VIEW



PLAN VIEW

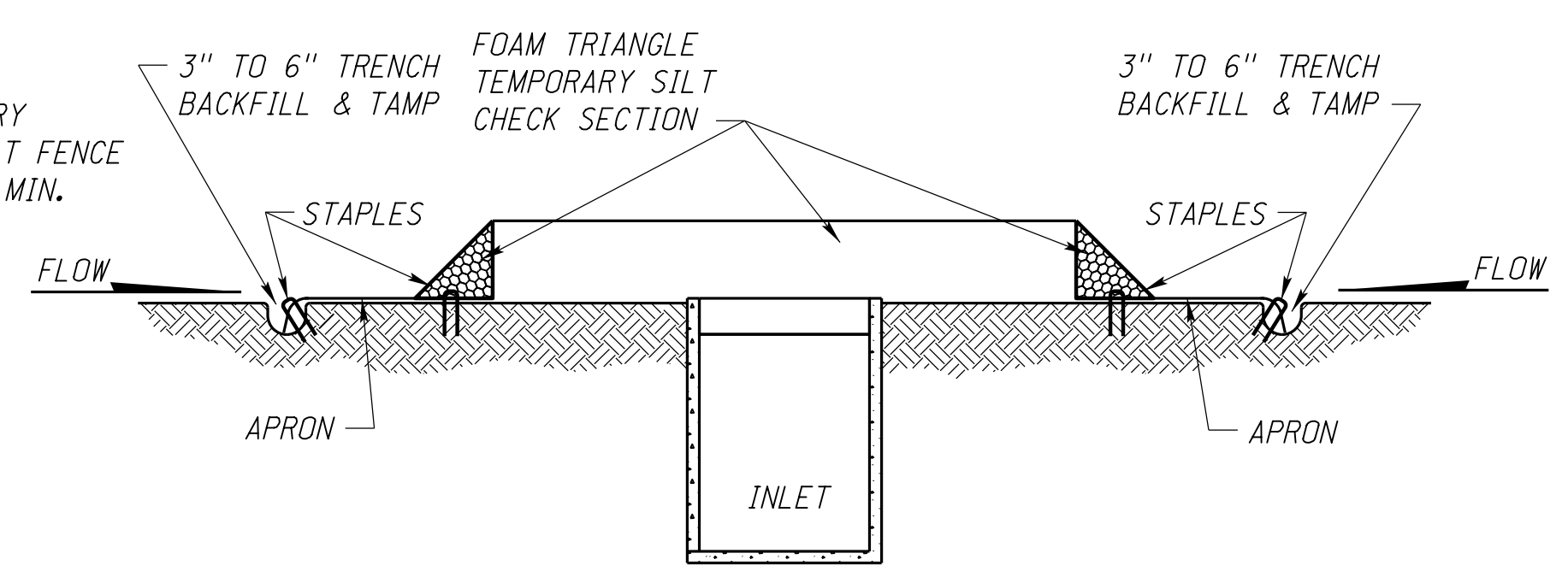


PLAN VIEW



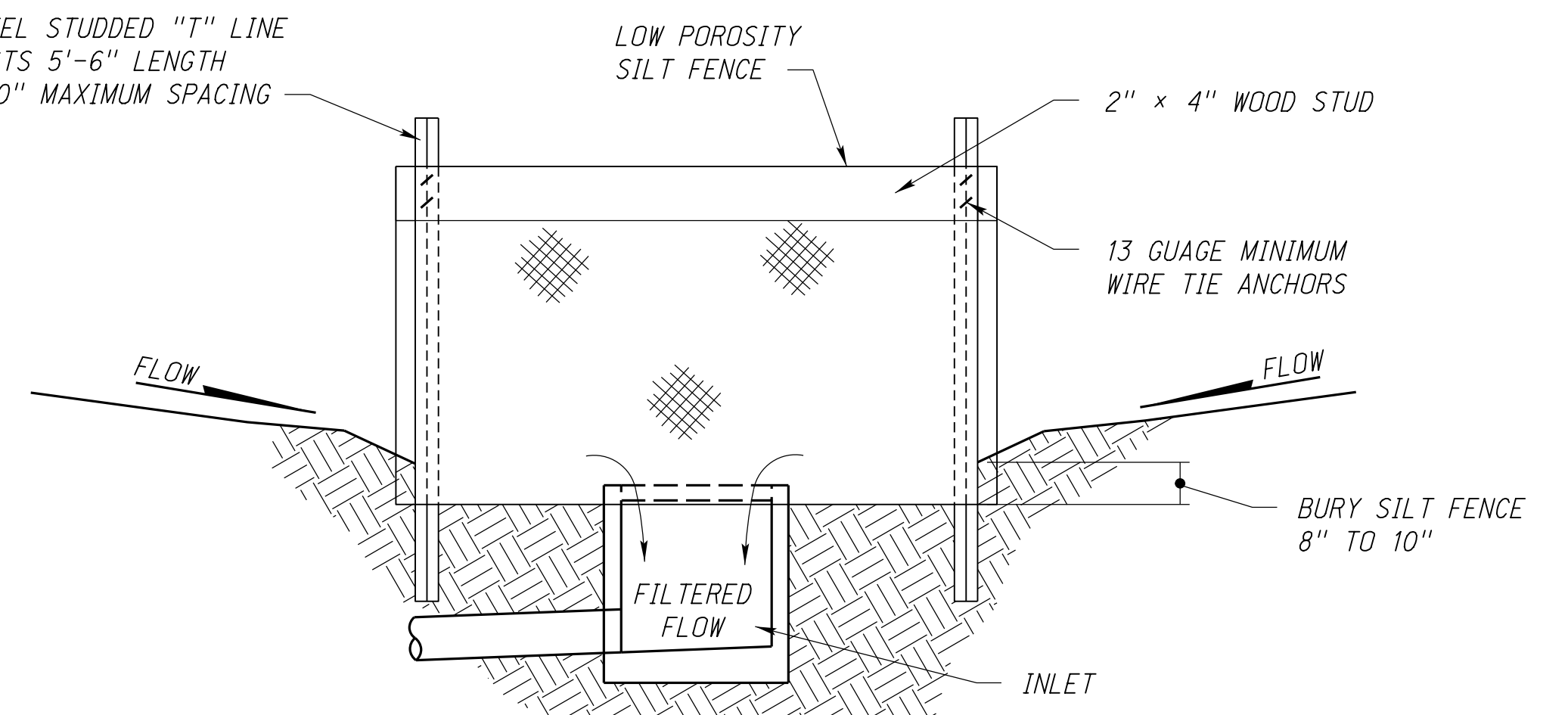
SECTION A-A

EROSION BALE AND SILT FENCE FILTER AT INLET



SECTION B-B

FOAM TRIANGLE FILTER AT INLET

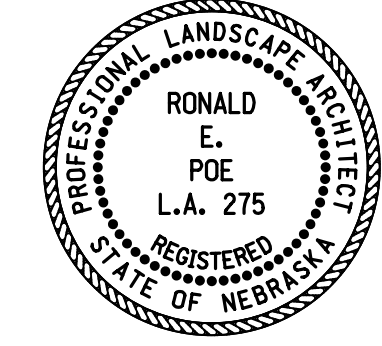


ELEVATION SECTION C-C

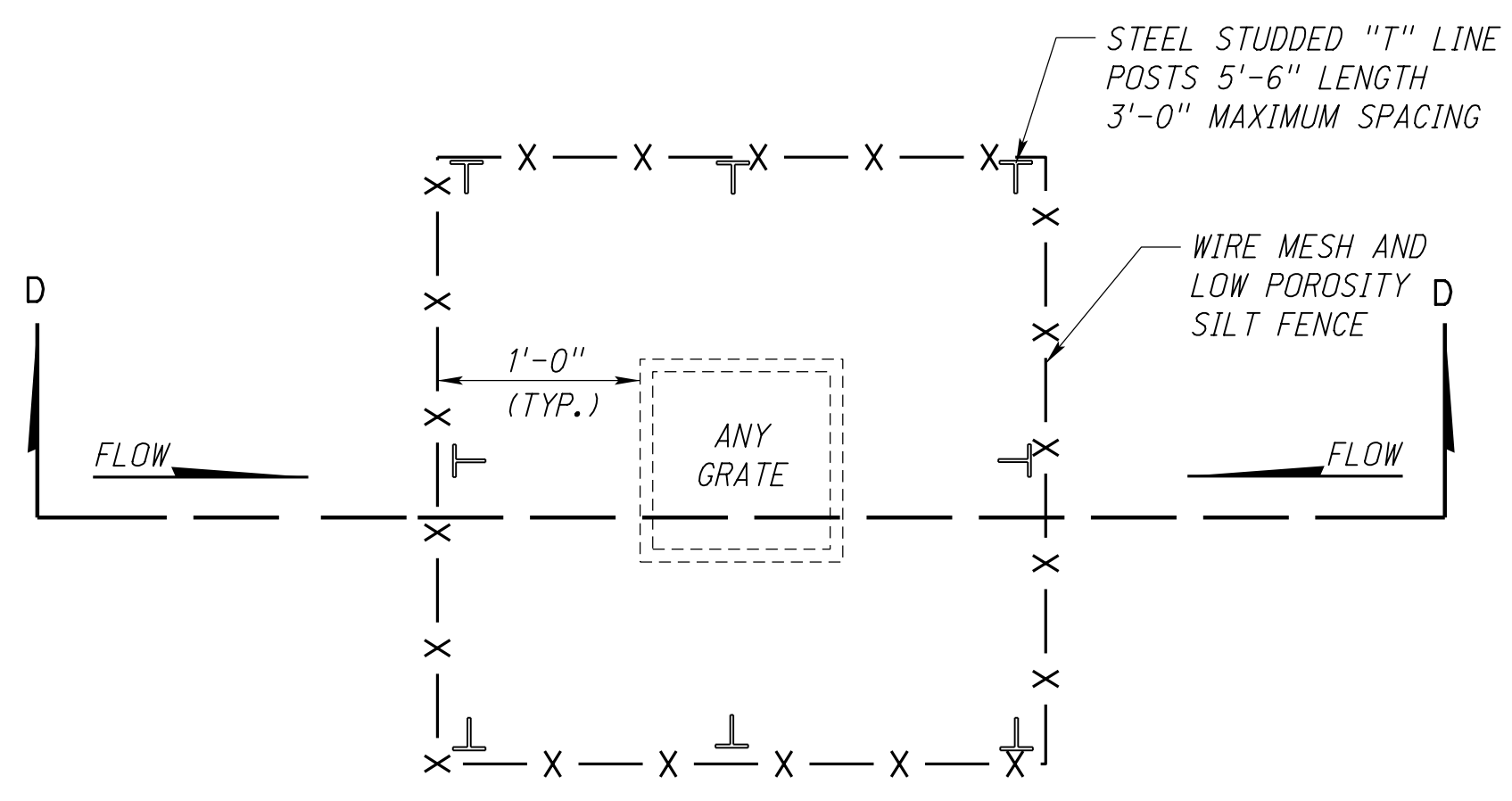
SILT FENCE AND WOOD FRAME FILTER AT INLET

NOTES:
STAKES SHALL BE WOOD AND BE 2" x 2" x 3'-0" NOMINAL.
EROSION BALES SHALL BE 18" x 18" x 36".
EROSION BALES SHALL BE ENTRENCHED 4 INCH MINIMUM INTO THE SOIL, TIGHTLY ABUTTED WITH NO GAPS, STAKED, AND BACKFILLED AROUND THE ENTIRE OUTSIDE PERIMETER.

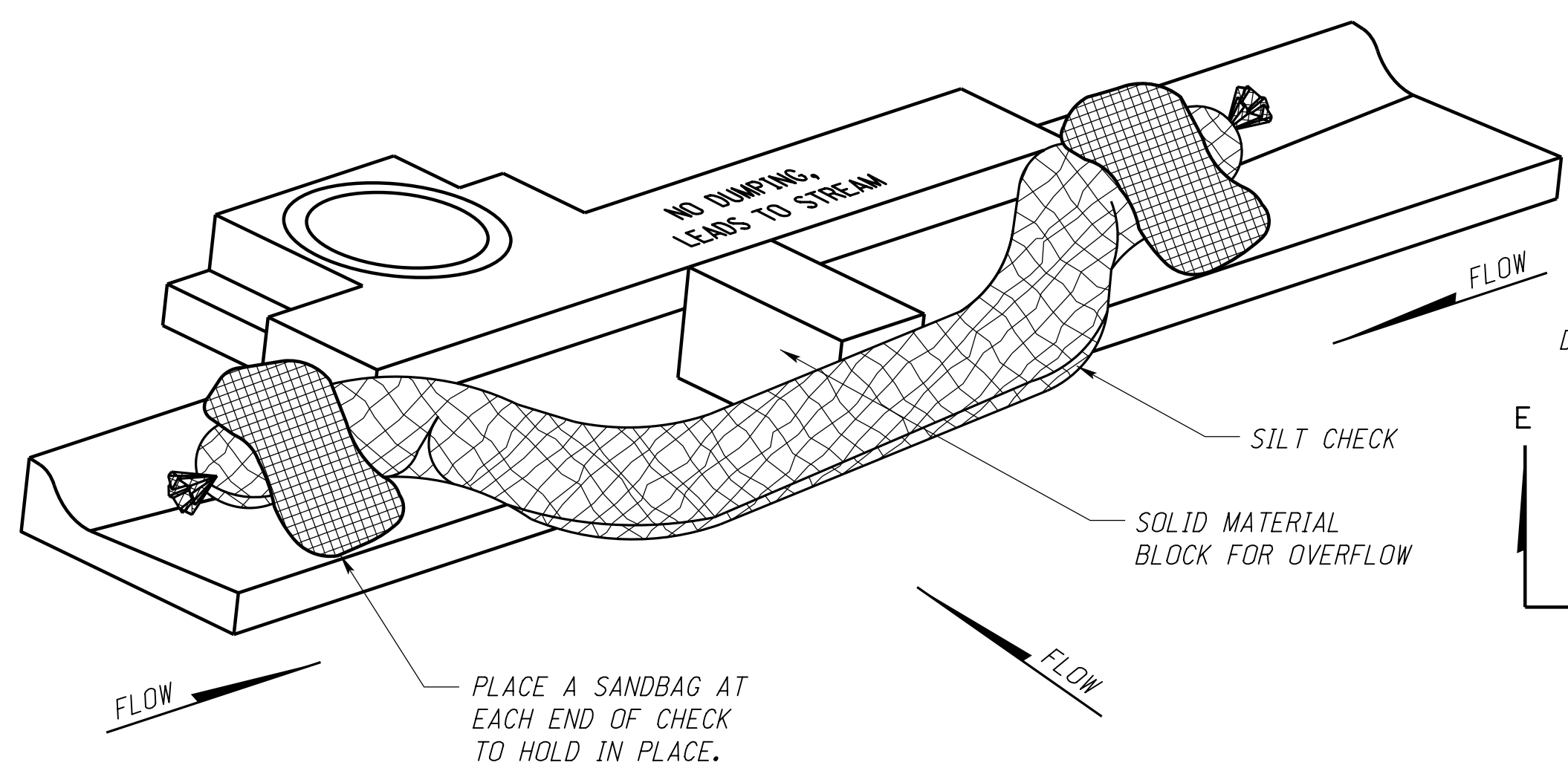
NOTES:
1. THE TOP OF THE STRUCTURE (PONDING HEIGHT) MUST BE WELL BELOW THE GROUND ELEVATION DOWNSLOPE TO PREVENT RUNOFF FROM BYPASSING THE INLET. A TEMPORARY DIKE MAY BE NECESSARY ON THE DOWNSLOPE SIDE OF THE STRUCTURE.



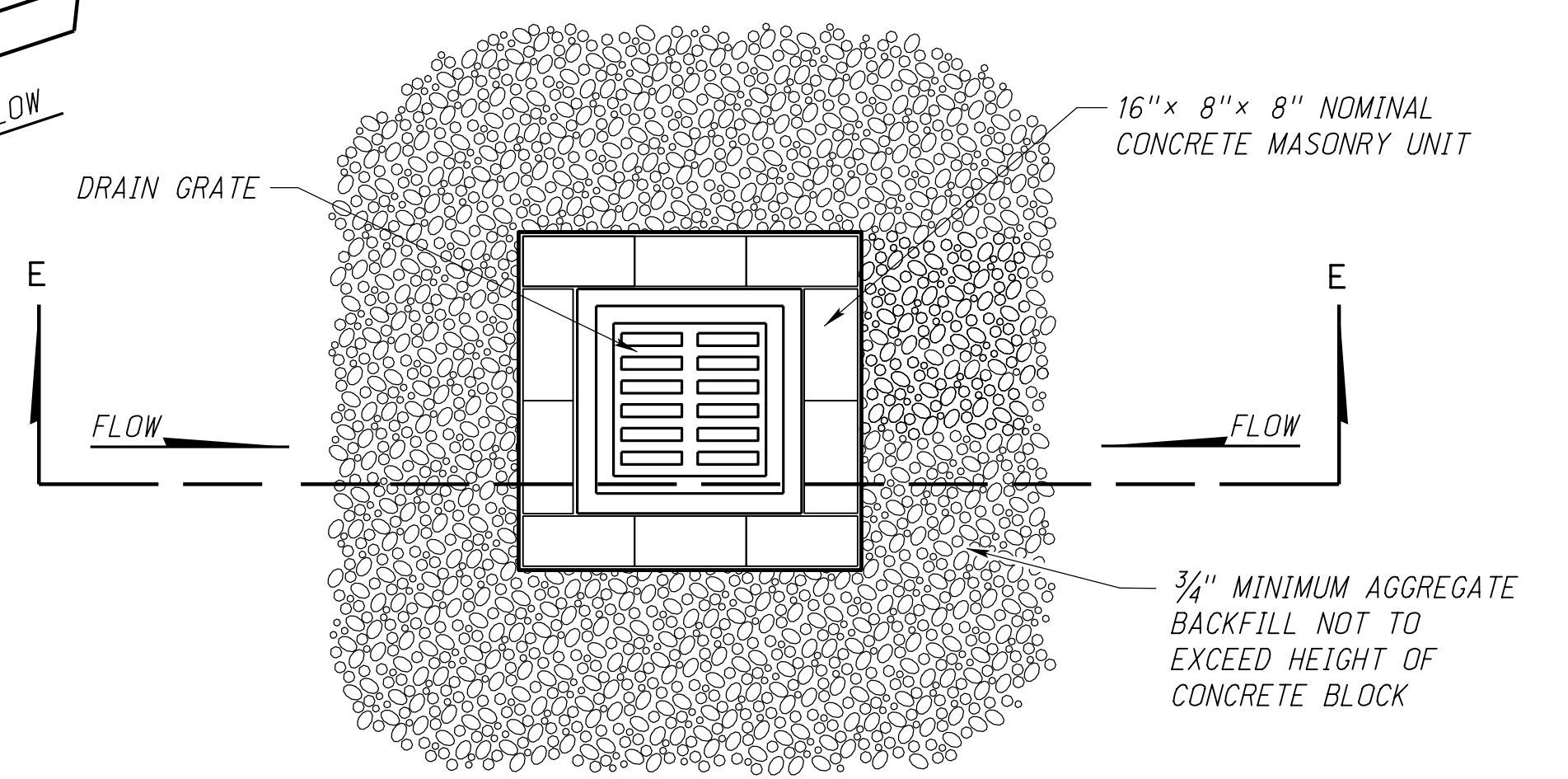
ROADWAY DESIGN DIVISION



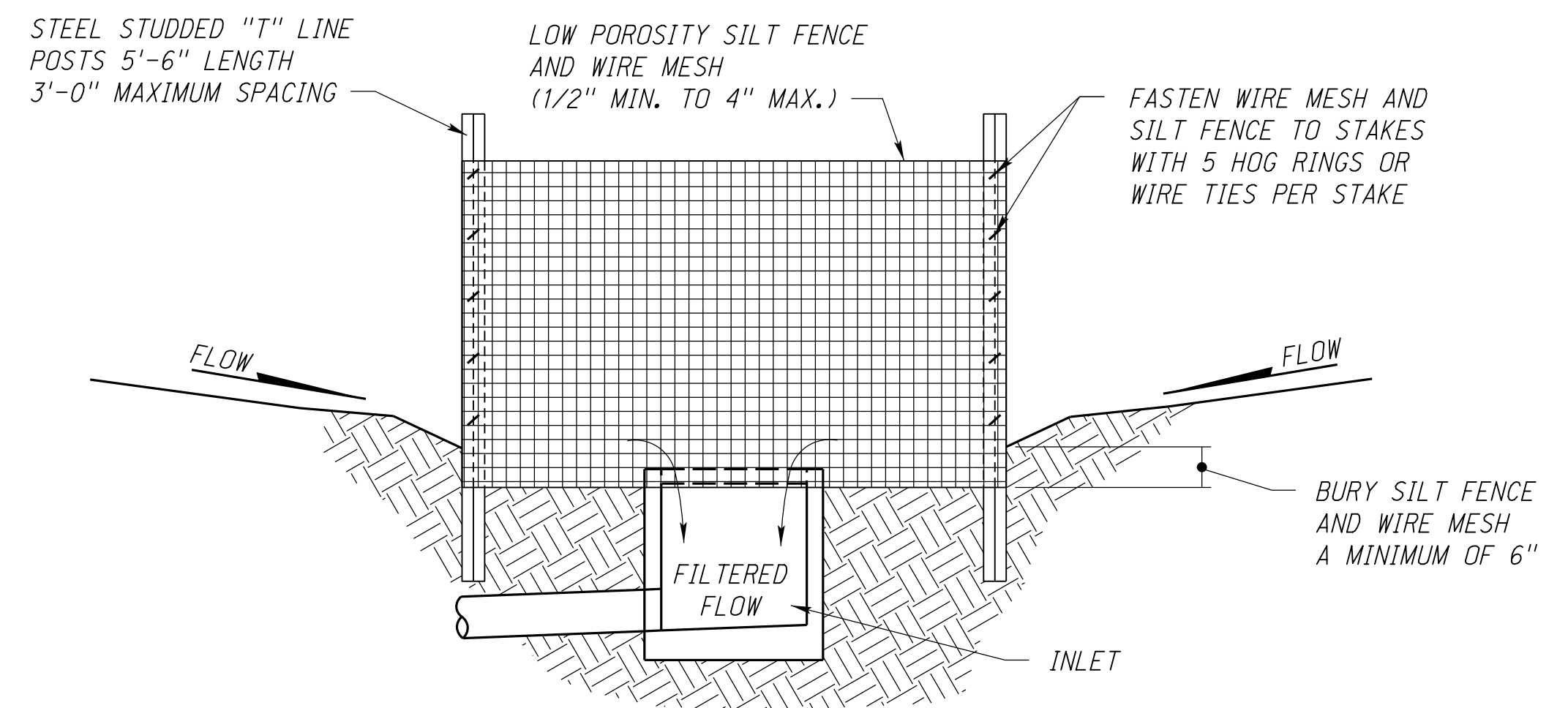
PLAN VIEW



CURB INLET PERSPECTIVE VIEW

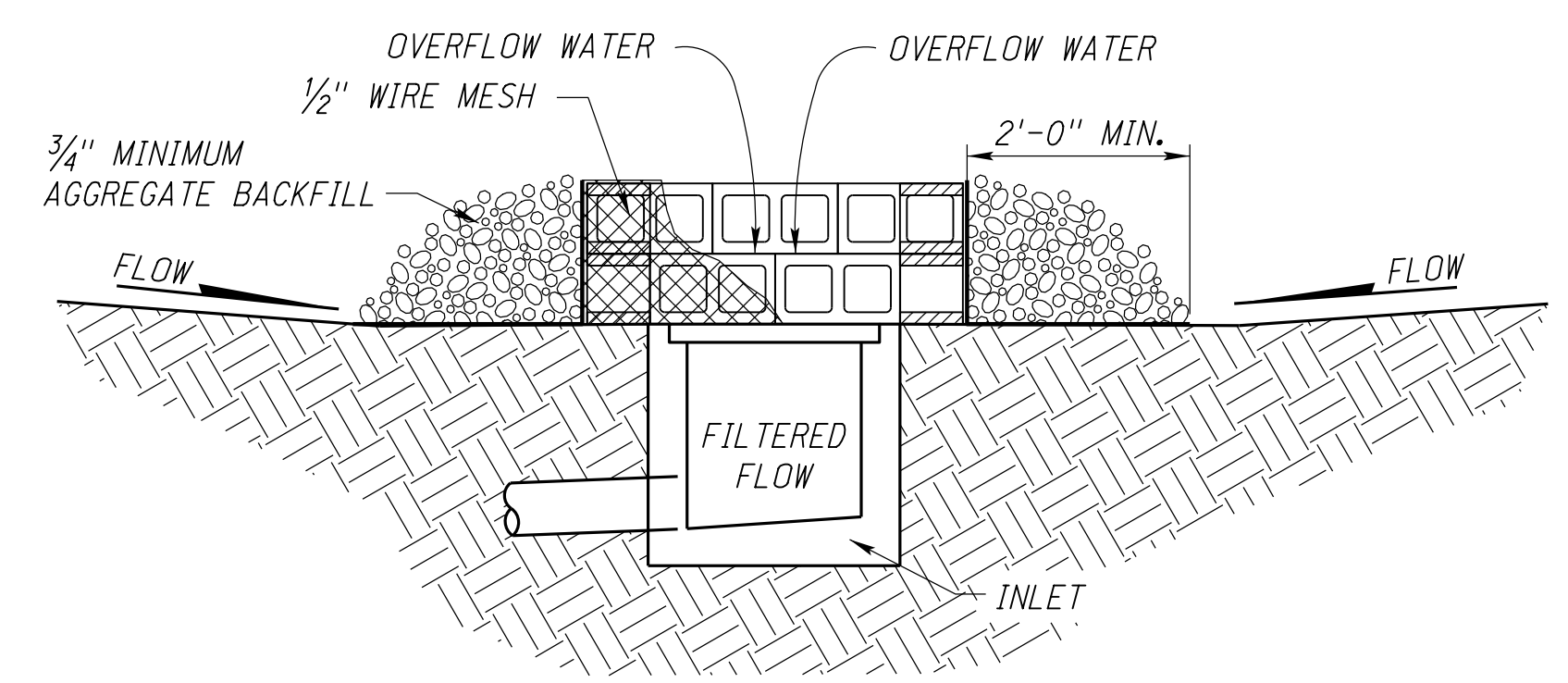


PLAN VIEW



ELEVATION SECTION D-D

WIRE MESH BACKED SILT FENCE FILTER AT INLET

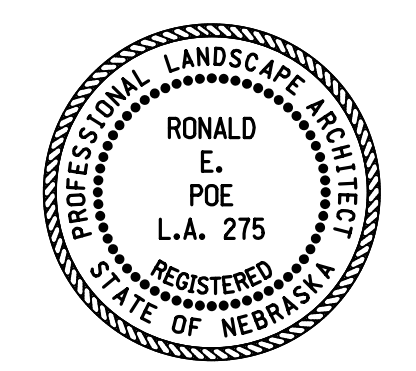


SECTION E-E

BLOCK AND GRAVEL FILTER AT INLET

NOTES:

1. APPLICABLE WHERE HEAVY FLOWS ARE EXPECTED AND WHERE AN OVERFLOW CAPACITY IS NECESSARY TO PREVENT EXCESSIVE PONDING AROUND THE STRUCTURE.
2. 1/2" WIRE MESH SHALL COVER ENTIRE VERTICAL FACE OF BLOCKS AND APRON BELOW THE AGGREGATE BACKFILL.
3. THE TOP OF THE STRUCTURE (PONDING HEIGHT) MUST BE WELL BELOW THE GROUND ELEVATION DOWNSLOPE TO PREVENT RUNOFF FROM BYPASSING THE INLET. A TEMPORARY DIKE MAY BE NECESSARY ON THE DOWNSLOPE SIDE OF THE STRUCTURE.
4. BLOCK COURSES SHOULD OFFSET TO IMPROVE STRUCTURAL STABILITY.

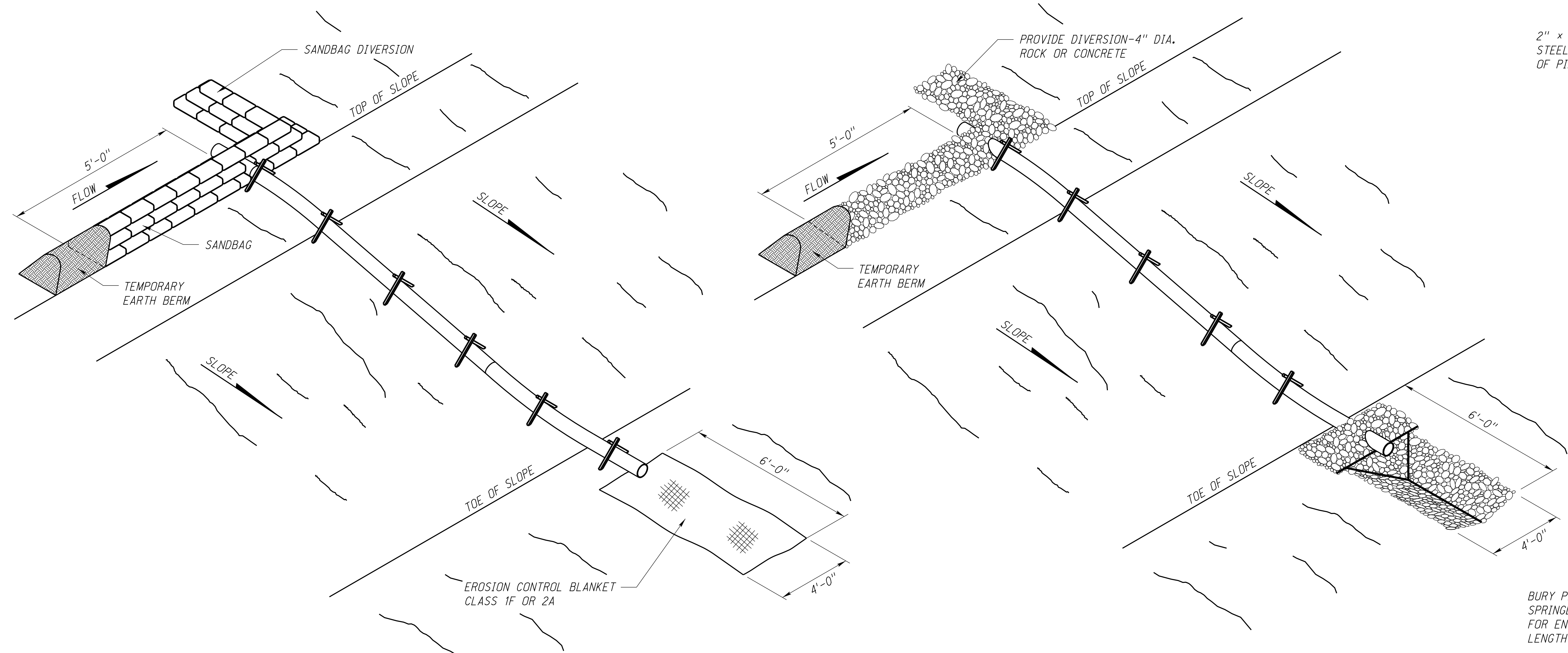


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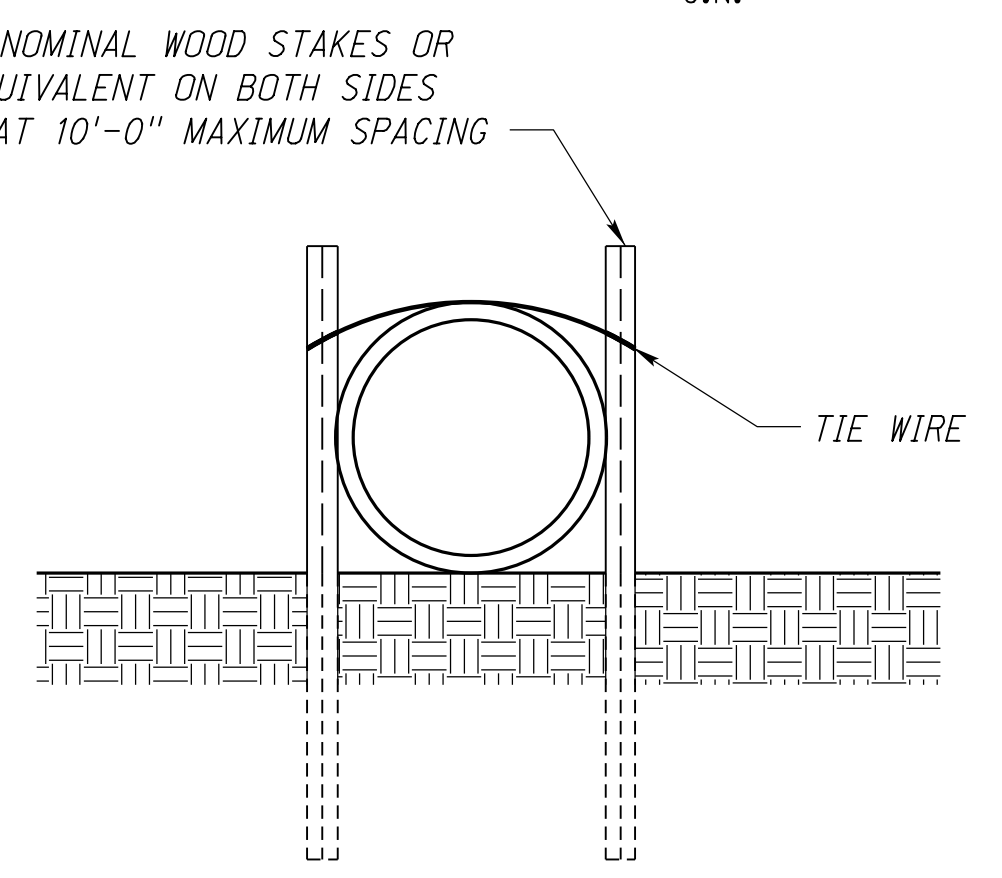
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ROADWAY DESIGN DIVISION

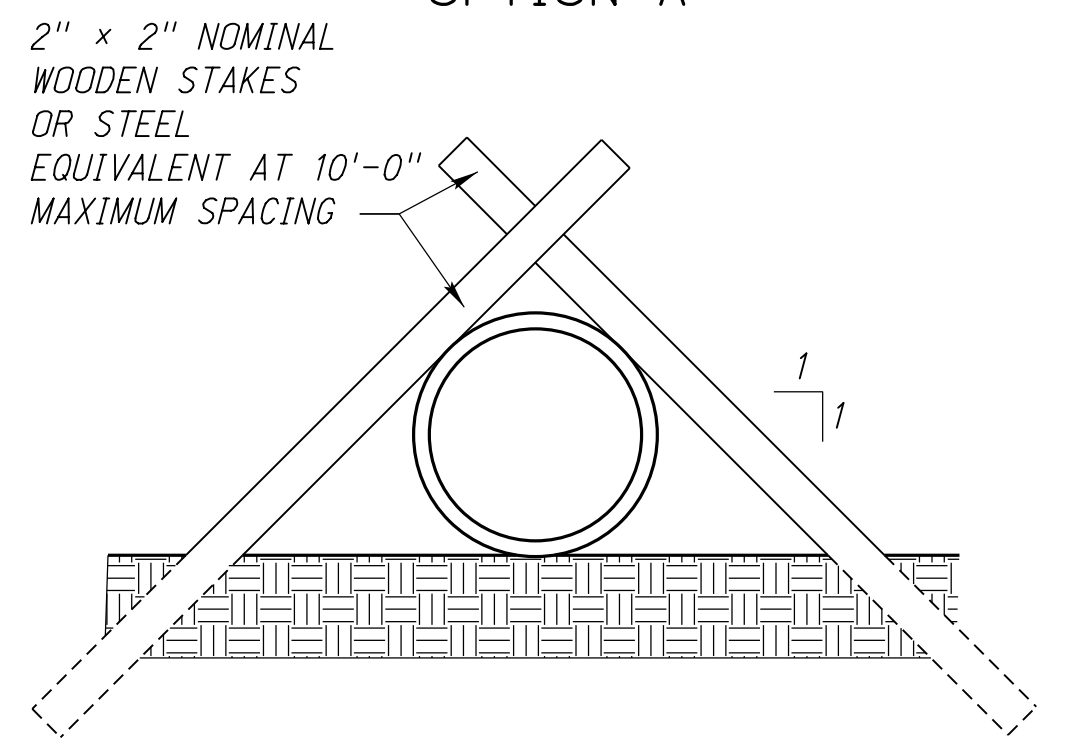


INLET OPTION A

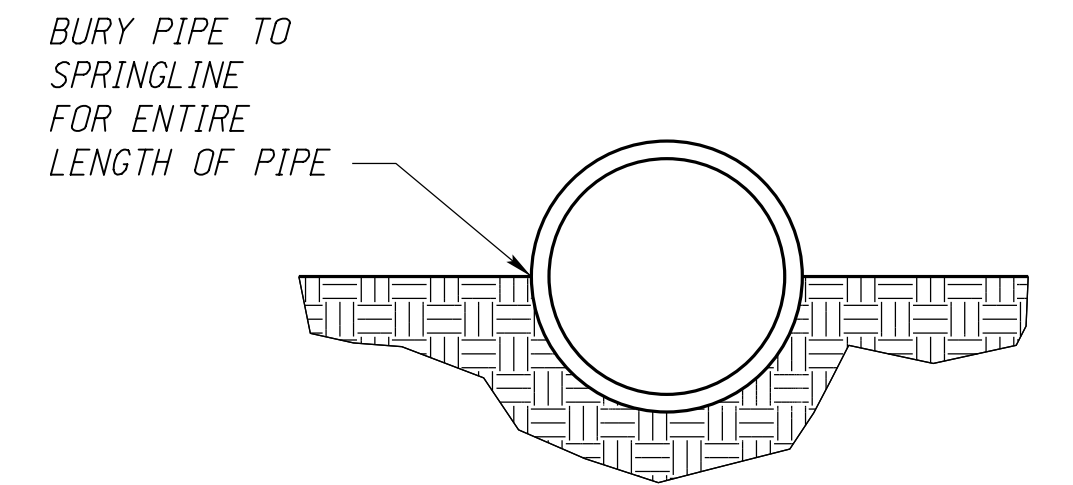
INLET OPTION B



OPTION A



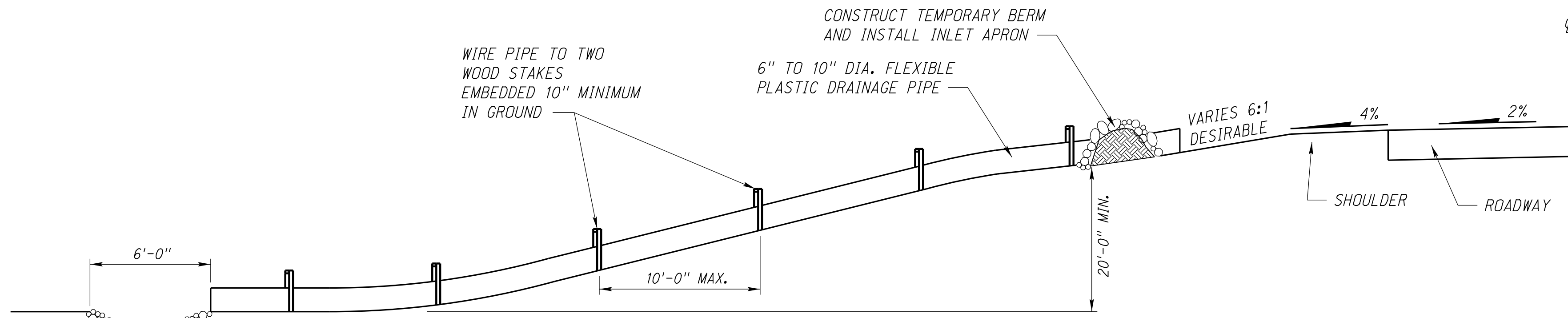
OPTION B



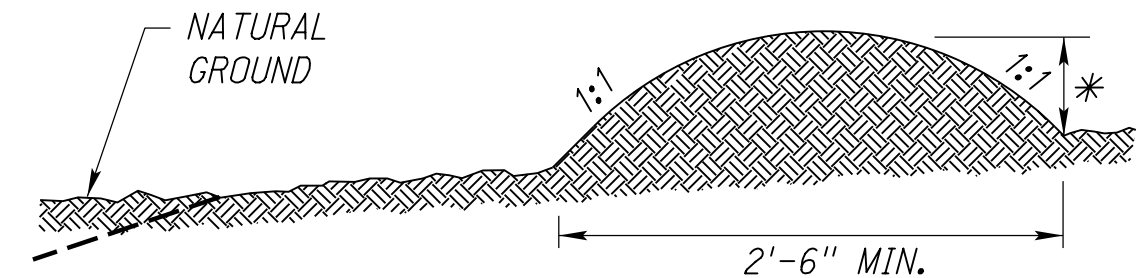
OPTION C

SLOPE DRAIN ANCHORING OPTIONS

NOTES:
 PLACE SLOPE DRAIN ON UNDISTURBED SOIL OR WELL COMPACTED FILL. CAREFULLY COMPACT COHESIVE SOILS AROUND INLET END OF THE DRAIN IN 6" LIFTS.
 DISCHARGE SLOPE DRAIN TO A STABLE OUTLET OR TO A SEDIMENT RETENTION DEVICE.
 PROVIDE PIPE AND APRONS OF DIAMETER SPECIFIED. PERFORATED PIPE IS NOT ALLOWED.
 MULTIPLE PIPES MAY BE USED IN CONJUNCTION TO GAIN ADDITIONAL DRAINAGE VOLUME.
 TEMPORARY BERM SHOULD BE USED TO DIRECT DRAINAGE INTO SLOPE DRAIN INLET.
 OPTIONS A, B & C ARE INTERCHANGEABLE UNLESS SPECIFIED



TEMPORARY DOWN DRAIN ON FORESLOPE

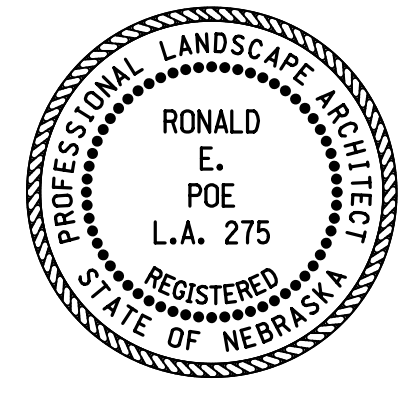


TYPICAL SECTION OF TEMPORARY EARTH BERM
 * 1 FT. MINIMUM OR VARIES

SLOPE DRAIN DESIGN GUIDELINES				
PIPE	BERM HEIGHT (H)	CAPACITY (HW-TOP OF PIPE)	LAND USE (MAX AREA FOR 2-YR STORM)	
			PAVEMENT	GRASS/PASTURE/CROP
6" HDPE	12"	0.4 CFS	0.1 ACRE	0.25 ACRE
8" HDPE	14"	0.8 CFS	0.2 ACRE	0.50 ACRE
10" HDPE	16"	1.4 CFS	0.4 ACRE	0.85 ACRE

HDPE - HIGH DENSITY POLYETHYLENE PIPE
 HEIGHT OF SANDBAG OR ROCK CHECK DIVERSION IS H+4"

- BERMS SHALL BE USED TO INTERCEPT AND DIVERT DRAINAGE TO A DESIGNATED OUTLET.
- BERMS SHALL NOT BE USED WHERE DRAINAGE AREA EXCEEDS 10 ACRES.
- BERM MATERIAL SHALL BE COMPACTED WITH THE WHEELS OF THE EQUIPMENT USED TO CONSTRUCT IT.



TEMPORARY PIPE SLOPE DRAIN
 SHEET 1 OF 1
SPECIAL PLAN C

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 Date: 18-MAY-2021 12:56
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 SHEET 1 OF 1

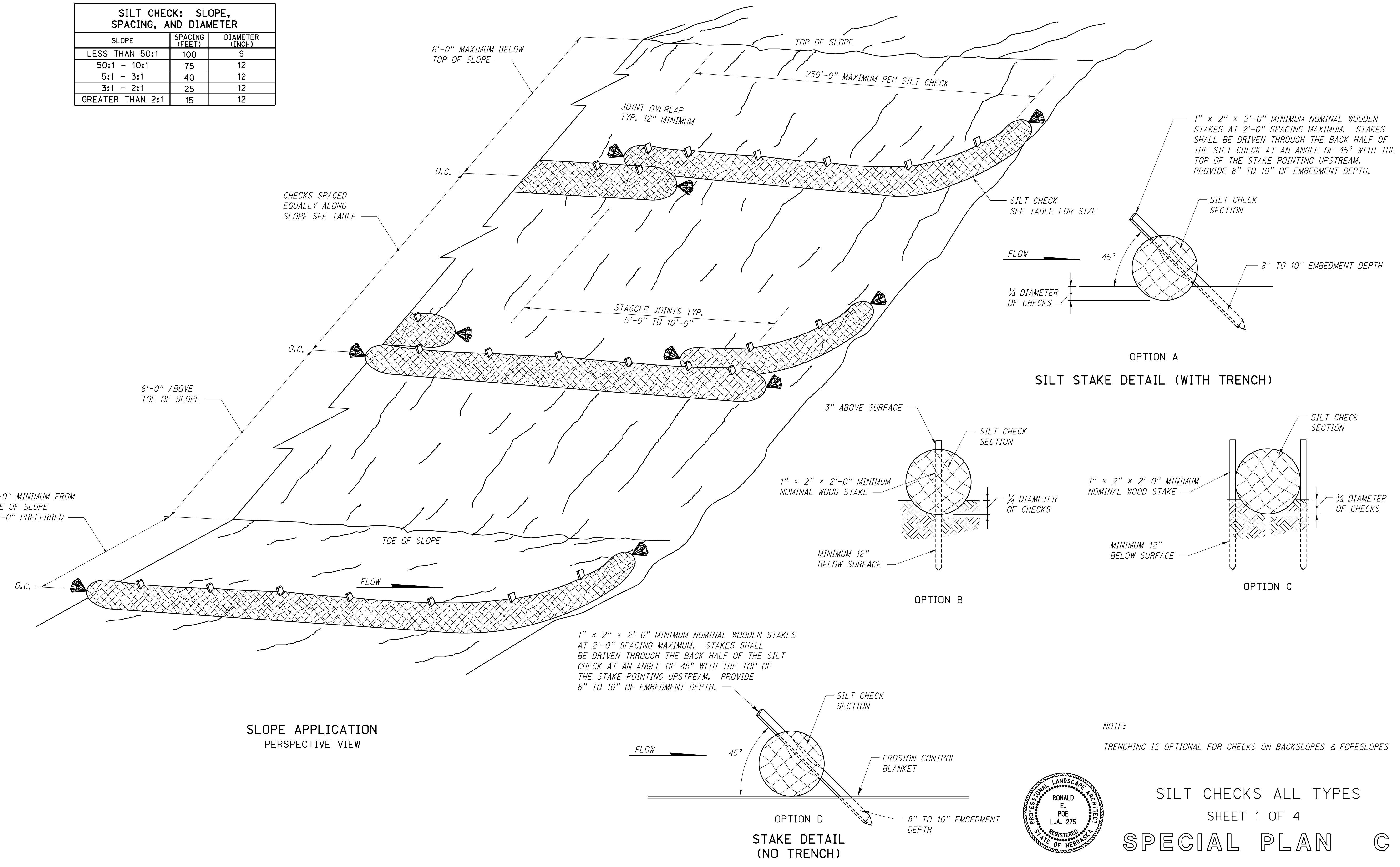
SILT CHECK: SLOPE, SPACING, AND DIAMETER		
SLOPE	SPACING (FEET)	DIAMETER (INCH)
LESS THAN 50:1	100	9
50:1 - 10:1	75	12
5:1 - 3:1	40	12
3:1 - 2:1	25	12
GREATER THAN 2:1	15	12

ROADWAY DESIGN DIVISION

Computer: NDDTDESIGN134

Date: 18-MAY-2021 12:56

File: 51041e00.dgn SHEET 1 OF 4



SLOPE APPLICATION PERSPECTIVE VIEW

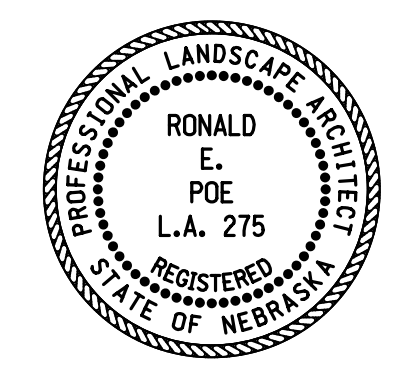
OPTION A SILT STAKE DETAIL (WITH TRENCH)

OPTION B

OPTION C

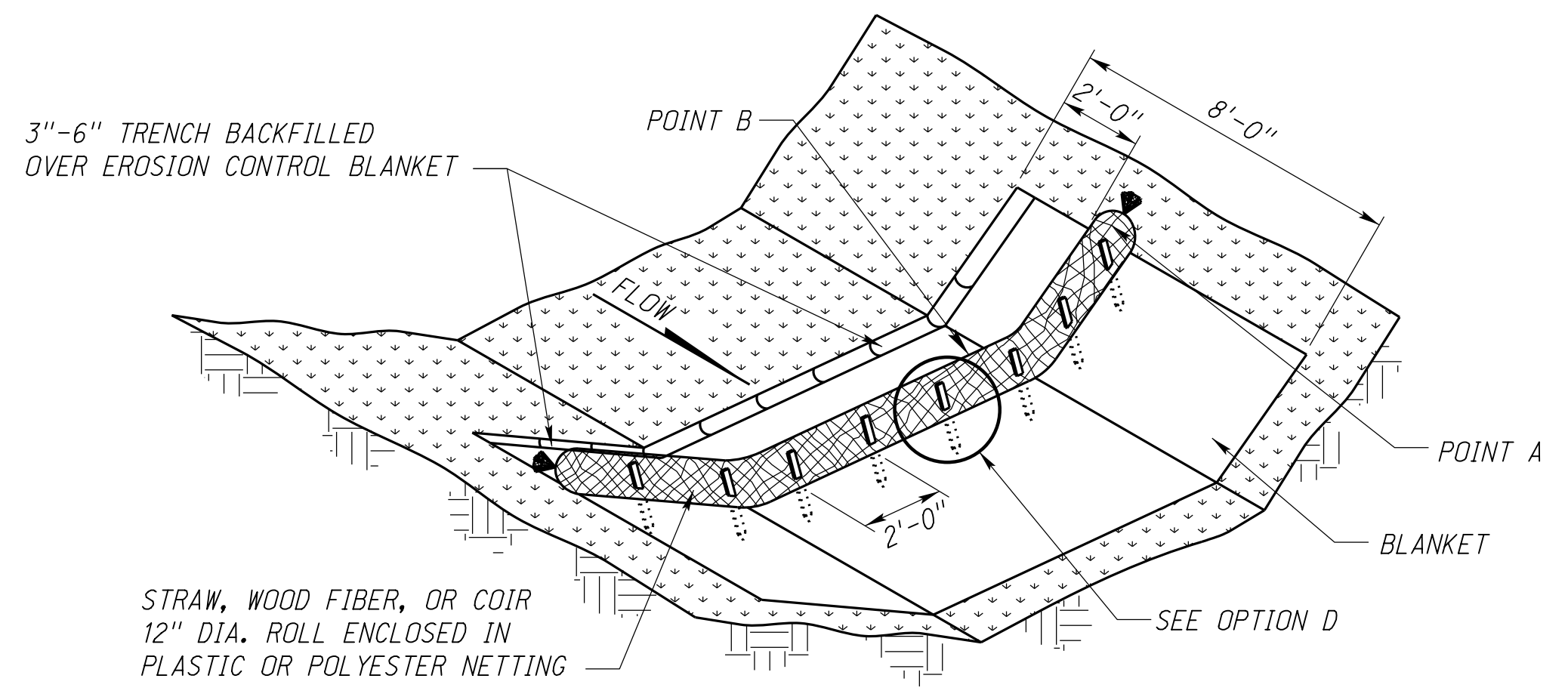
OPTION D STAKE DETAIL (NO TRENCH)

NOTE: TRENCHING IS OPTIONAL FOR CHECKS ON BACKSLOPES & FORESLOPES



SILT CHECKS ALL TYPES
SHEET 1 OF 4
SPECIAL PLAN C

ROADWAY DESIGN DIVISION

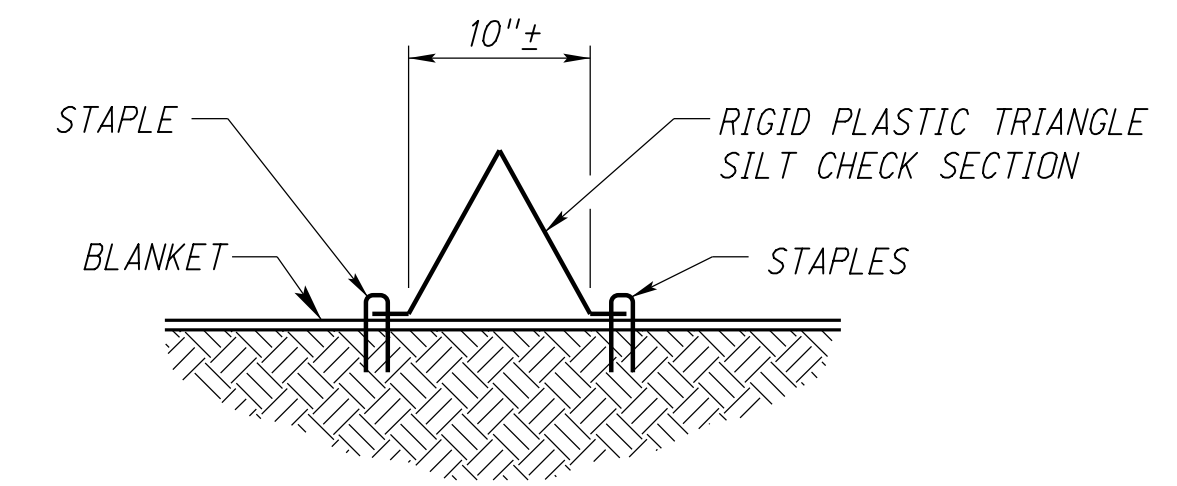


TYPE 2 & 3: HIGH & LOW WITH EROSION CONTROL

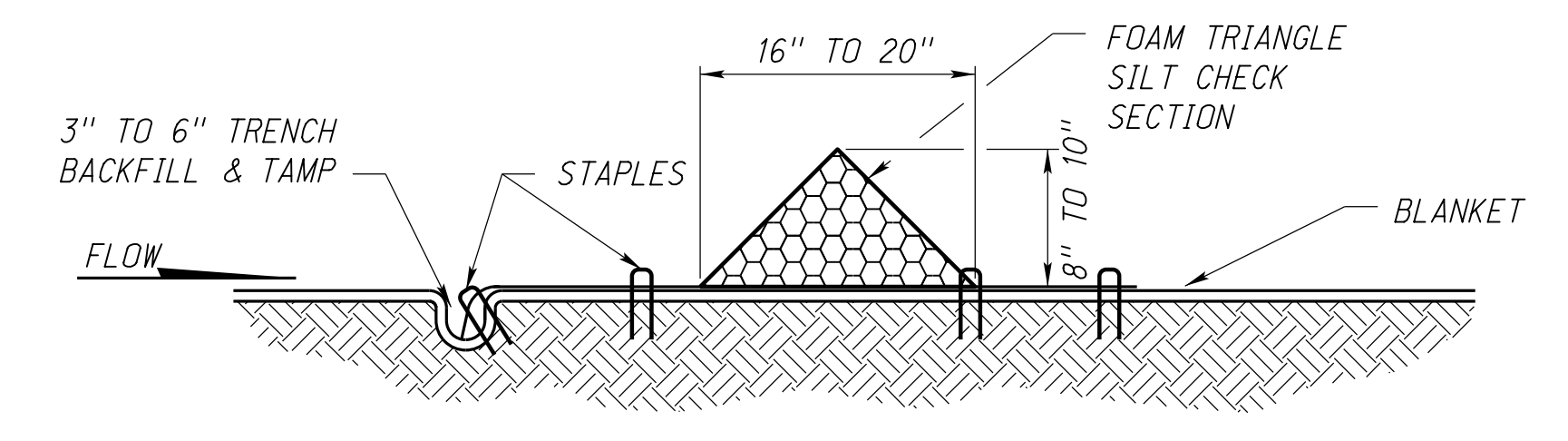
3"-6" TRENCH BACKFILLED OVER EROSION CONTROL BLANKET

STRAW, WOOD FIBER, OR COIR 12" DIA. ROLL ENCLOSED IN PLASTIC OR POLYESTER NETTING

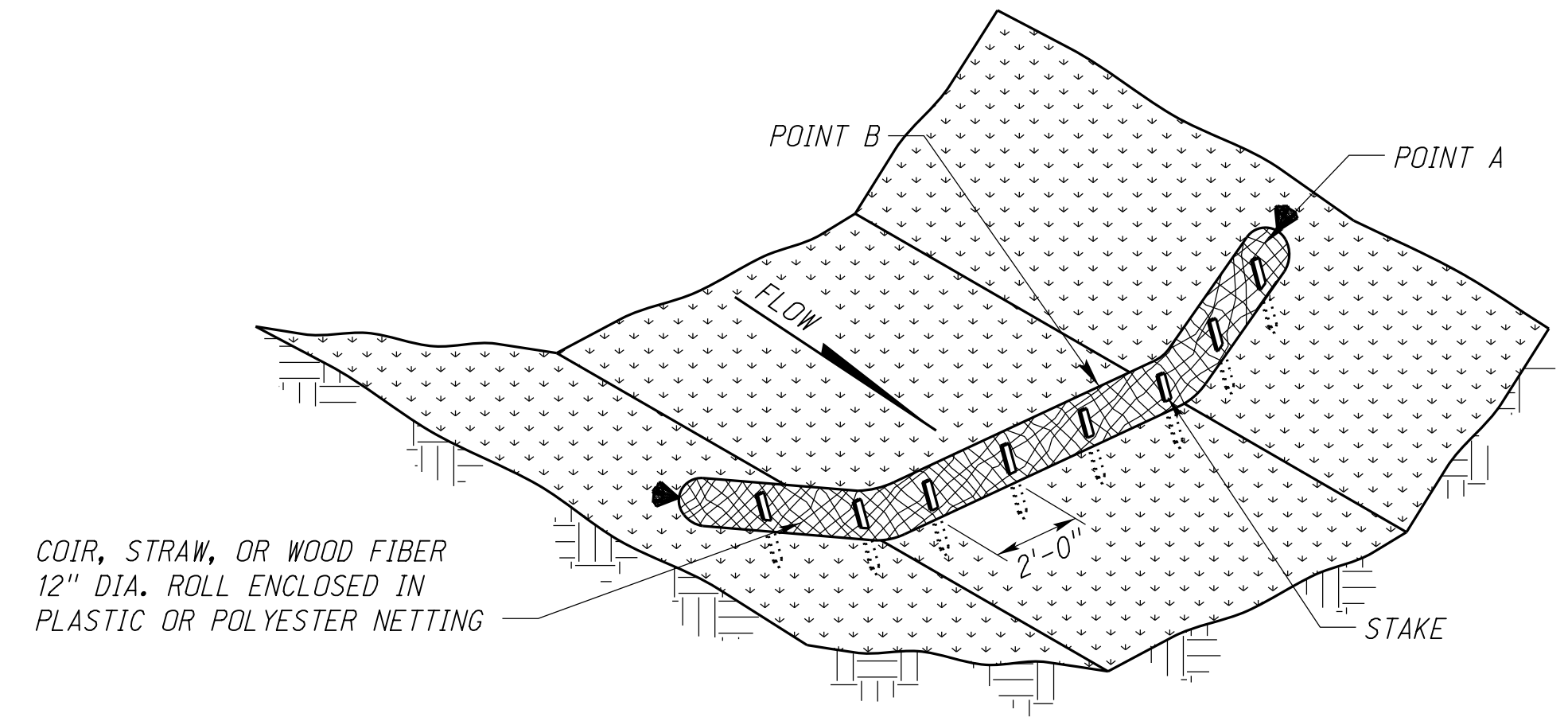
SEE OPTION D



TYPE 4 SECTION



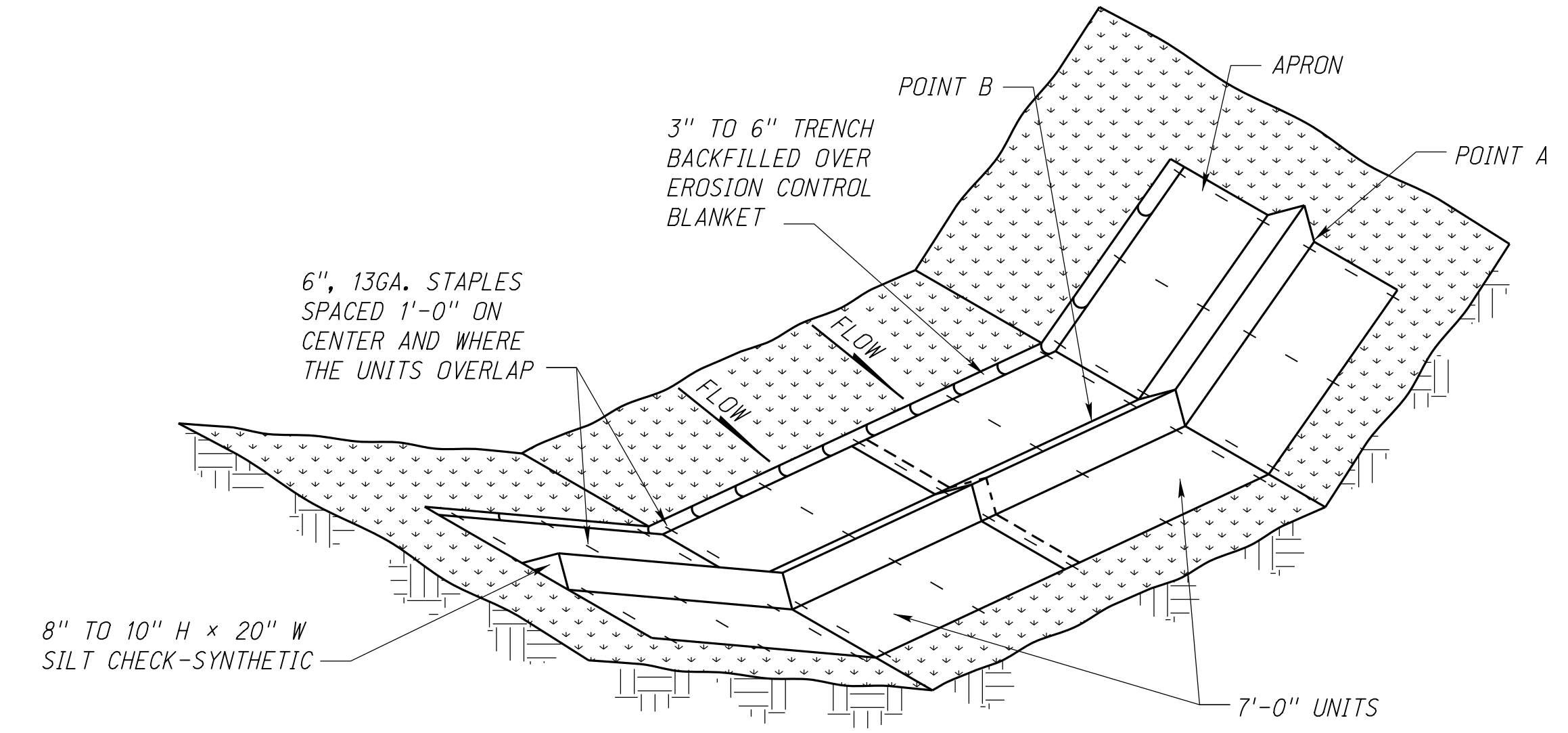
TYPE 4 SECTION



TYPE 1, 2 & 3: HIGH & LOW USE ON ROUGH GRADED & BARE SOIL AREAS

COIR, STRAW, OR WOOD FIBER 12" DIA. ROLL ENCLOSED IN PLASTIC OR POLYESTER NETTING

STAKE

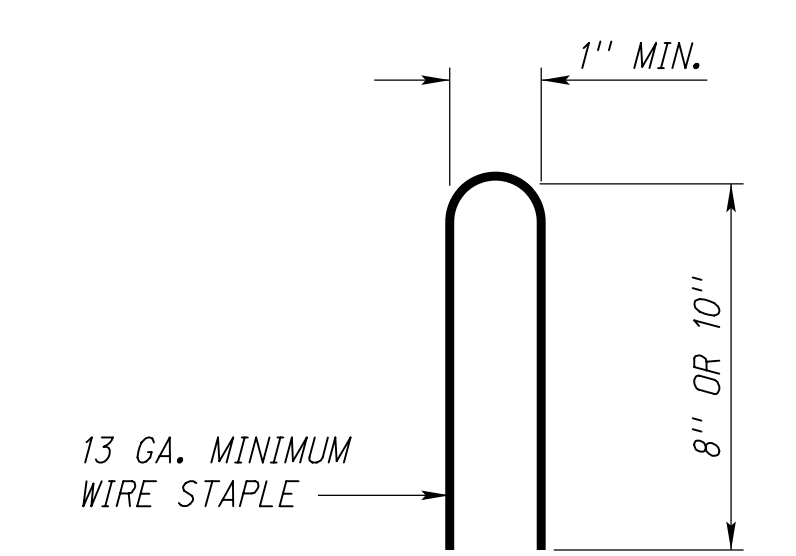
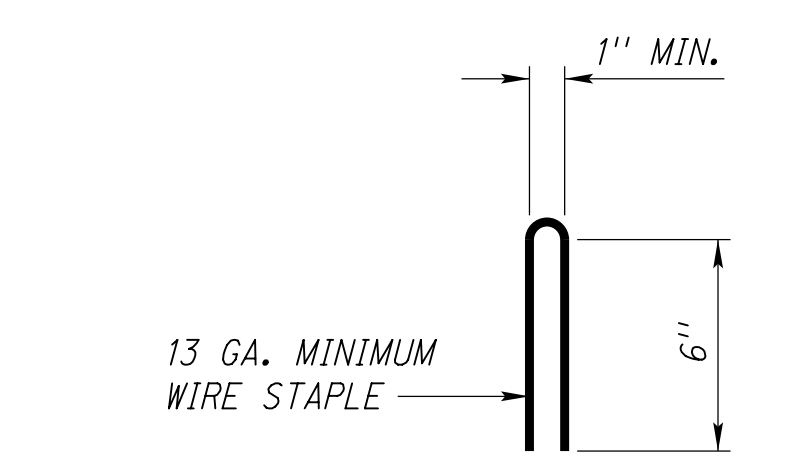
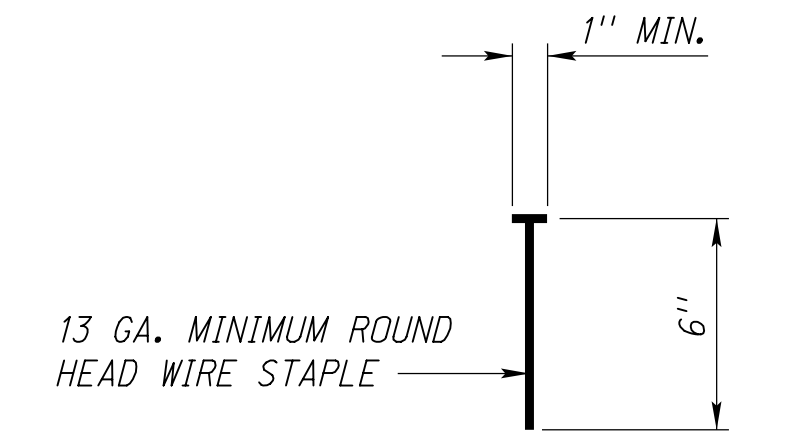


SILT CHECK: TYPE 4

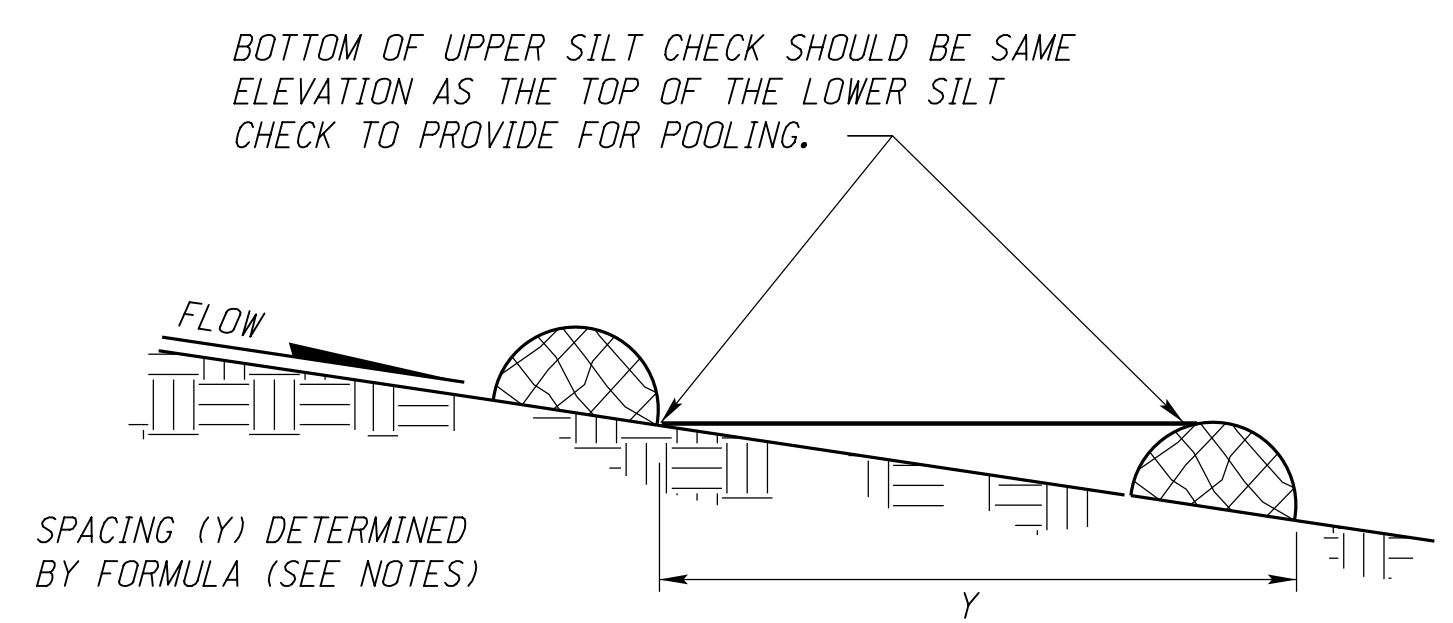
6", 13GA. STAPLES SPACED 1'-0" ON CENTER AND WHERE THE UNITS OVERLAP

8" TO 10" H x 20" W SILT CHECK-SYNTHETIC

7'-0" UNITS



WIRE STAPLE DETAIL



SILT CHECK SPACING-DITCH

NOTES:

APPROXIMATE SPACING BETWEEN EACH DITCH CHECK SHOULD BE DETERMINED FROM THE FOLLOWING SPACING FORMULA:

$$\text{APPROXIMATE SPACING OF DITCH CHECKS (FT.)} = Y = \frac{\text{SILT CHECK HEIGHT (FT.)}}{\% \text{ CHANNEL SLOPE}} \times 100$$

POINT A MUST BE A MINIMUM OF 6" HIGHER THAN POINT B TO ENSURE THAT WATER FLOWS OVER THE CHECK AND NOT AROUND THE ENDS.

PERMANENT ROCK CHECKS PLACED WITHIN THE CLEAR ZONE WILL NEED TO BE 18" OR LESS IN HEIGHT. A 10:1 APPROACH AND DEPARTURE SLOPE SHALL BE PROVIDED.

THE TRENCH ON THE UPSTREAM SIDE OF THE SILT CHECK IS NOT REQUIRED IF THE EROSION CONTROL BLANKET CONTINUES IN THE ENTIRE LENGTH OF THE DITCH.

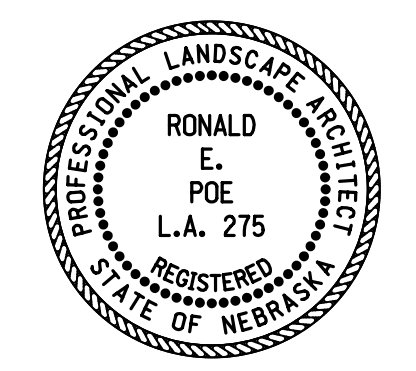
THE MANUFACTURERS RECOMMENDED INSTALLATION DETAILS SHALL GOVERN OVER THE PLANS.

SEE STAKING DETAIL SHEET 1 OF 4

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Date: 18-MAY-2021 12:56

File: 5104te00.dgn SHEET 2 OF 4

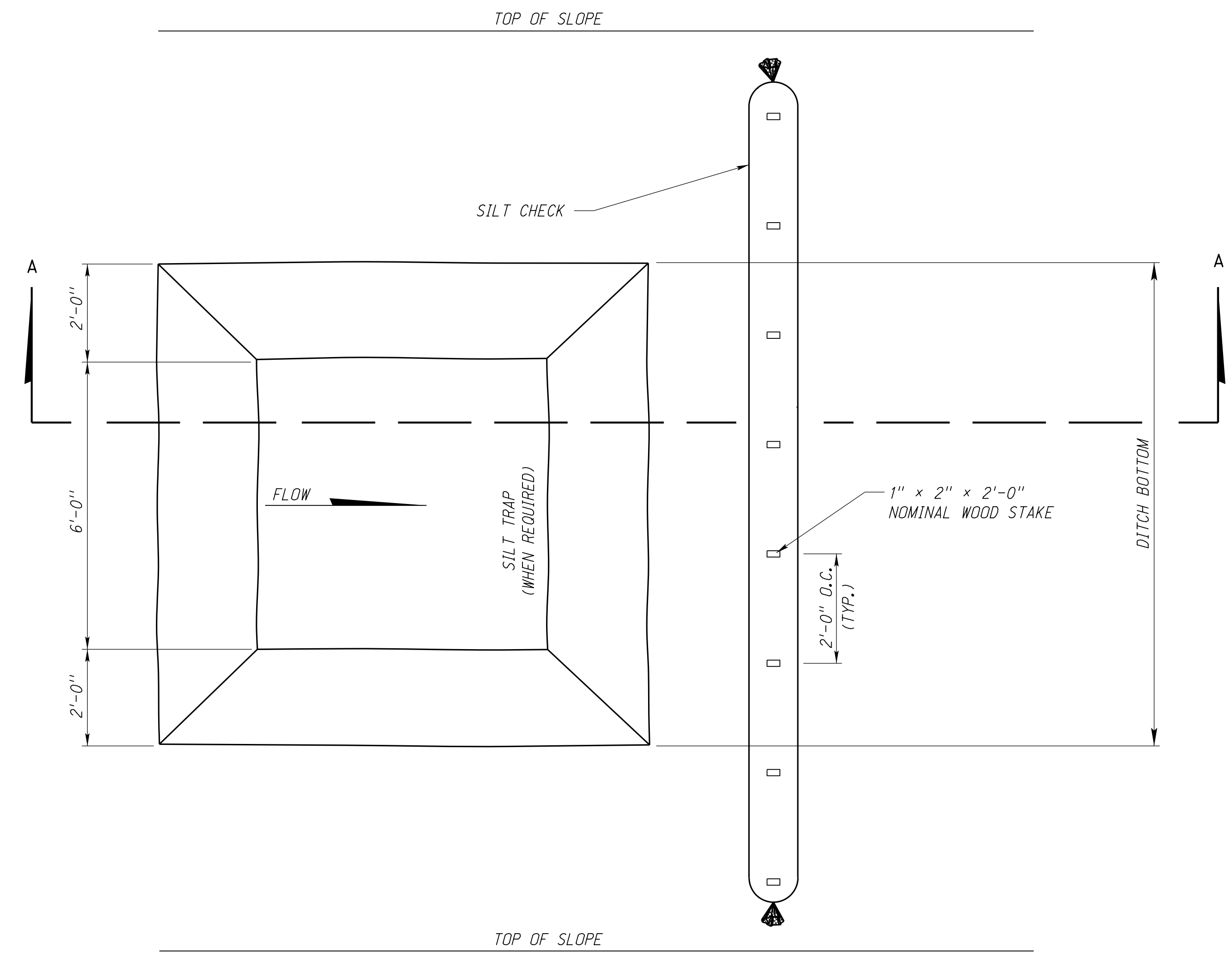


ROADWAY DESIGN DIVISION

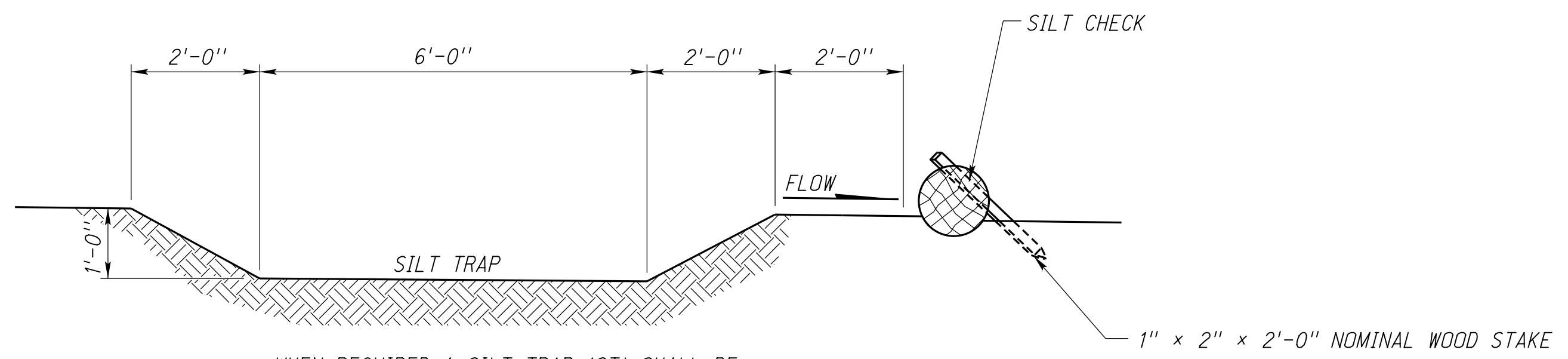
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SHEET 3 OF 4

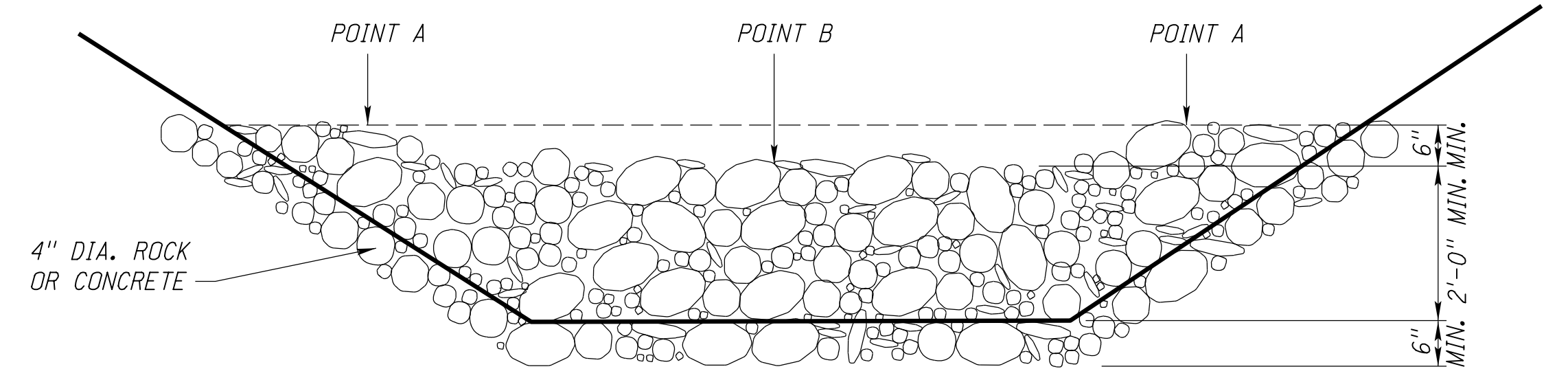


PLAN VIEW
FOR FLAT BOTTOM DITCH

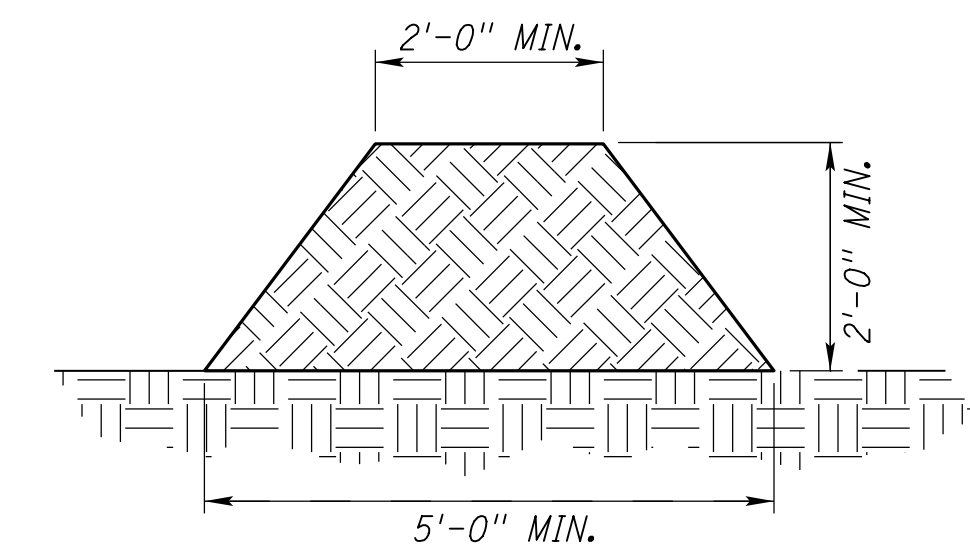


WHEN REQUIRED A SILT TRAP (ST) SHALL BE EXCAVATED TO THE WIDTH OF THE DITCH AND NO DIRECT PAYMENT WILL BE MADE.

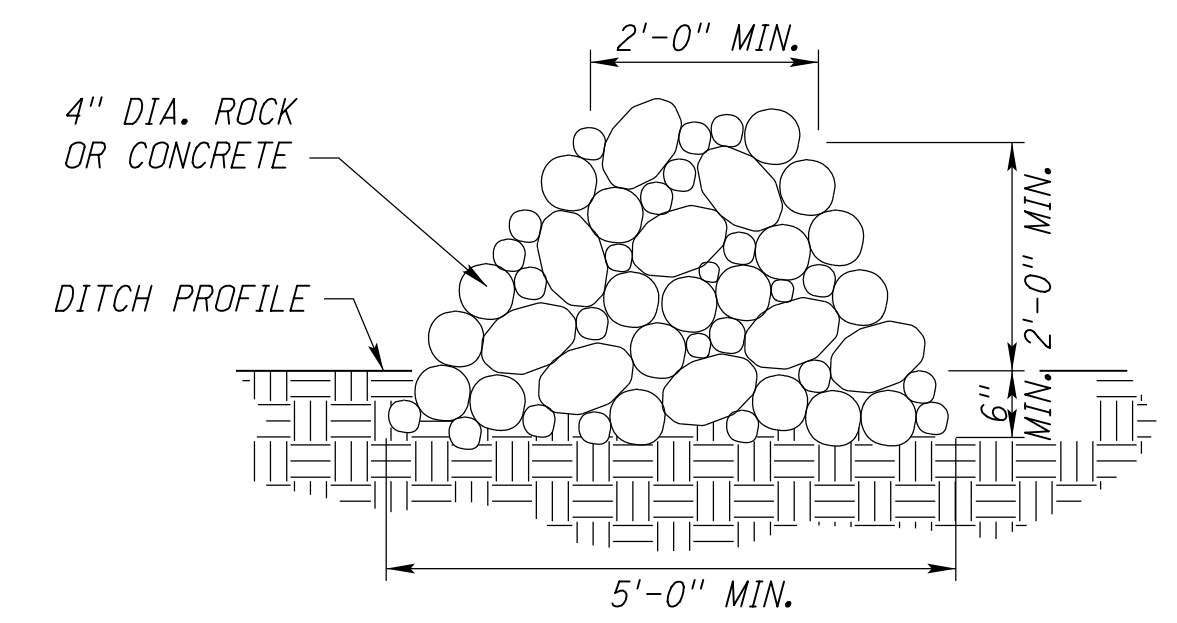
SECTION A-A



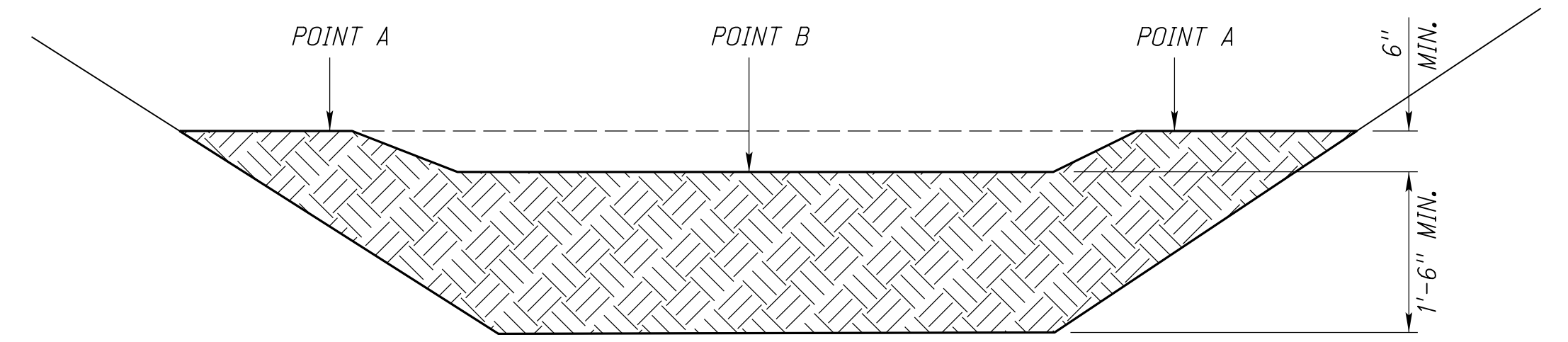
ROCK CHECK
ELEVATION VIEW



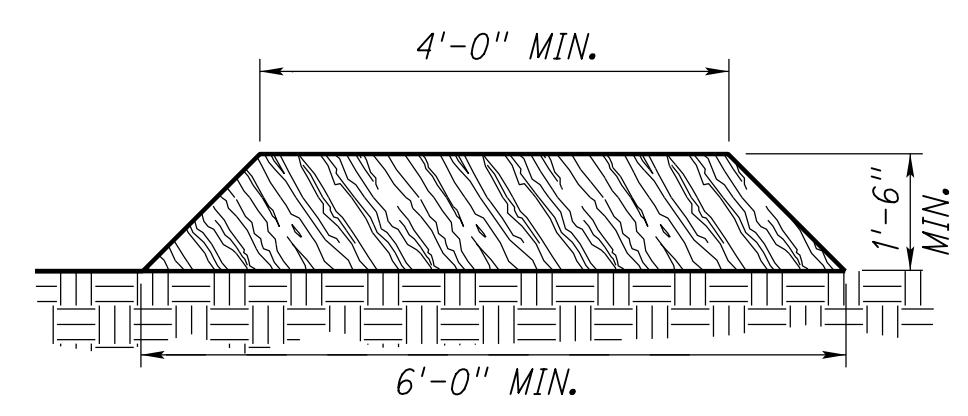
EARTH-SLASH MULCH PERIMETER BERM
CROSS SECTION



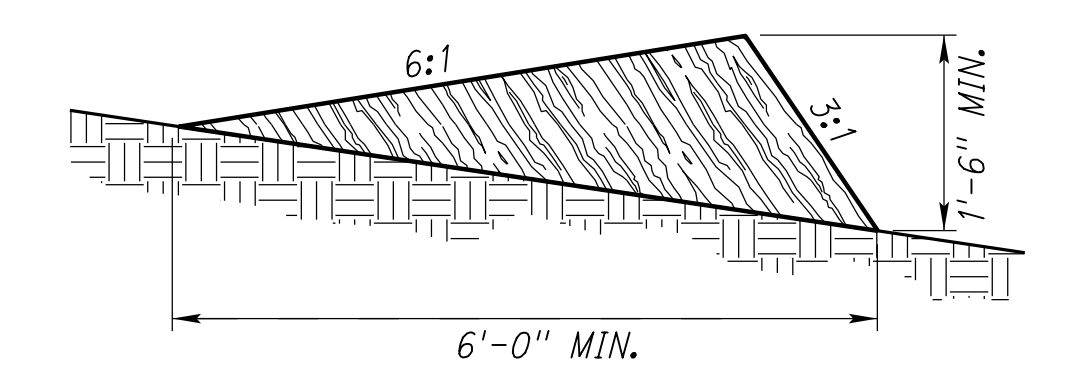
ROCK CHECK
CROSS SECTION



EARTH-SLASH MULCH CHECK
ELEVATION VIEW



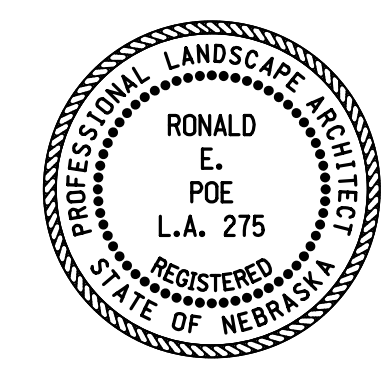
CROSS SECTION
SILT CHECK-SLASH MULCH
OPTION A



CROSS SECTION
SILT CHECK-SLASH MULCH
OPTION B

SEE STAKING DETAIL SHEET 1 OF 4

SILT CHECKS ALL TYPES
SHEET 3 OF 4



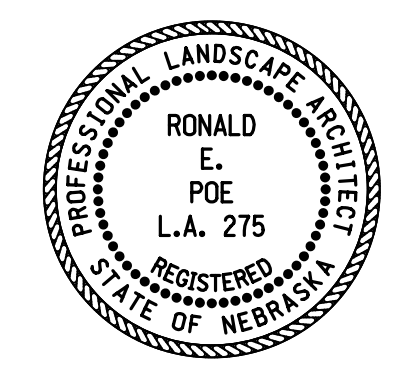
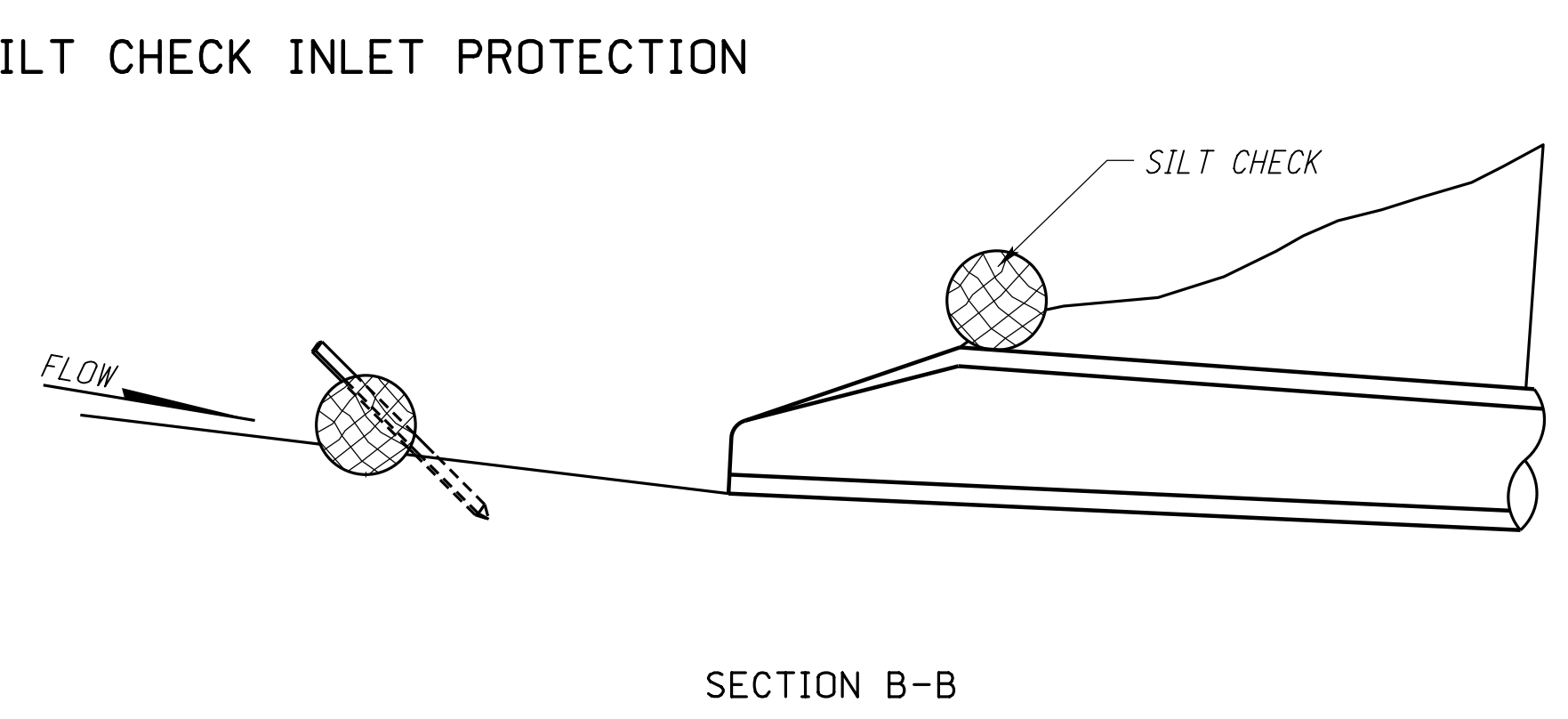
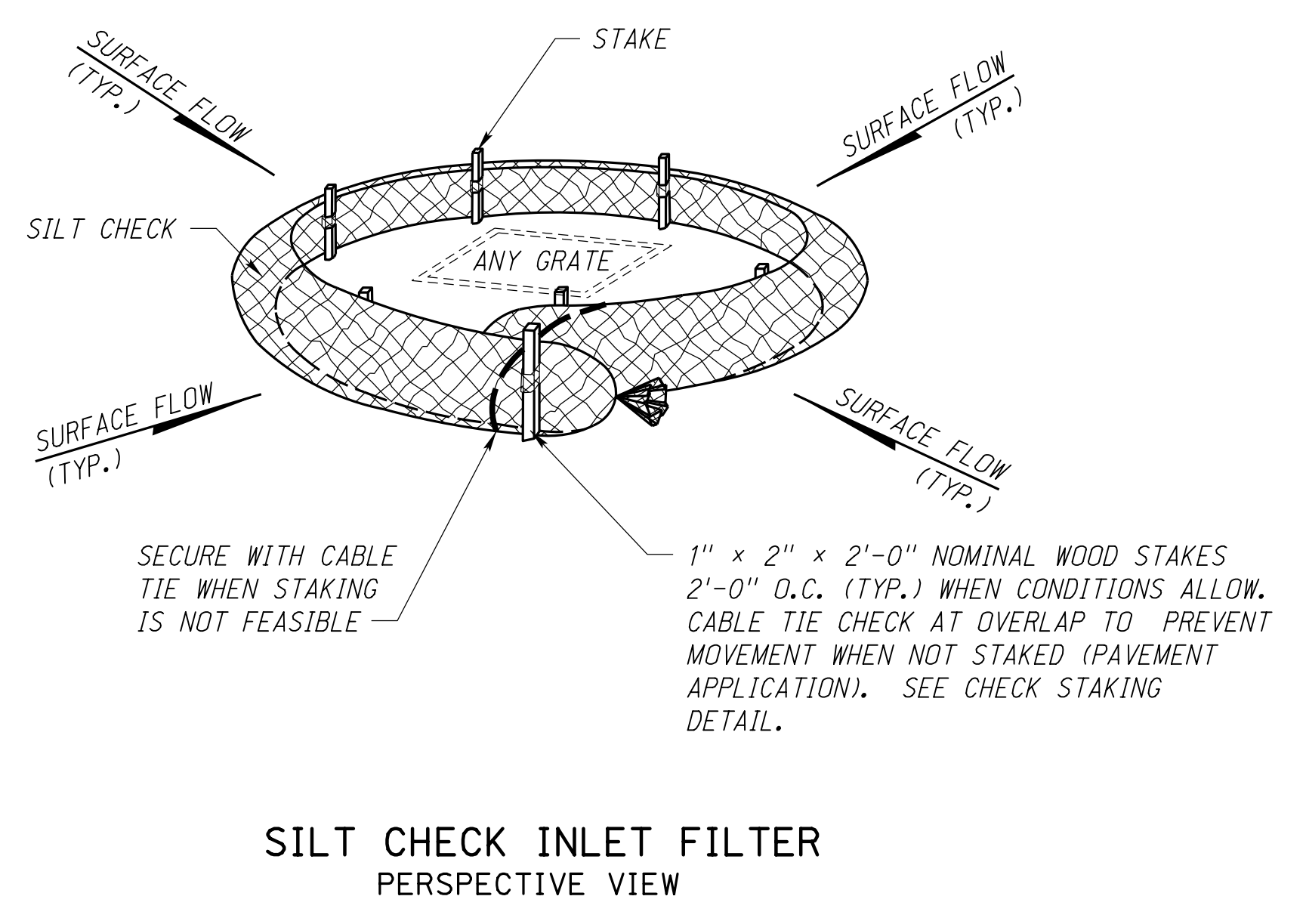
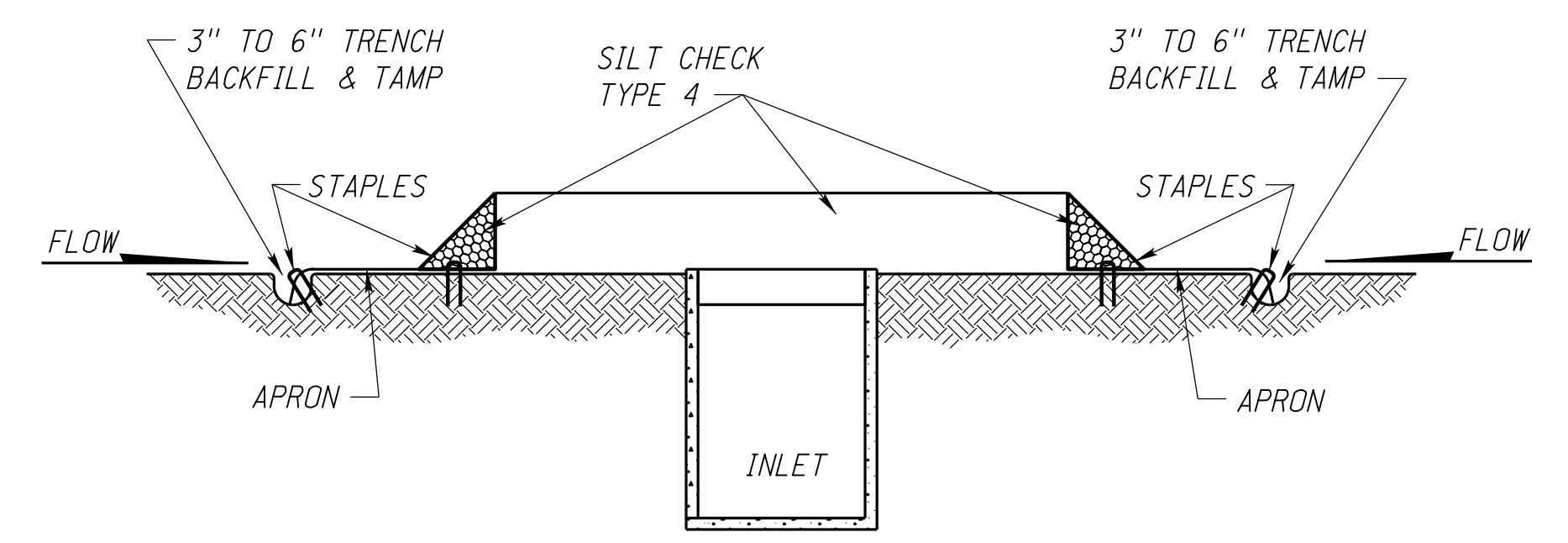
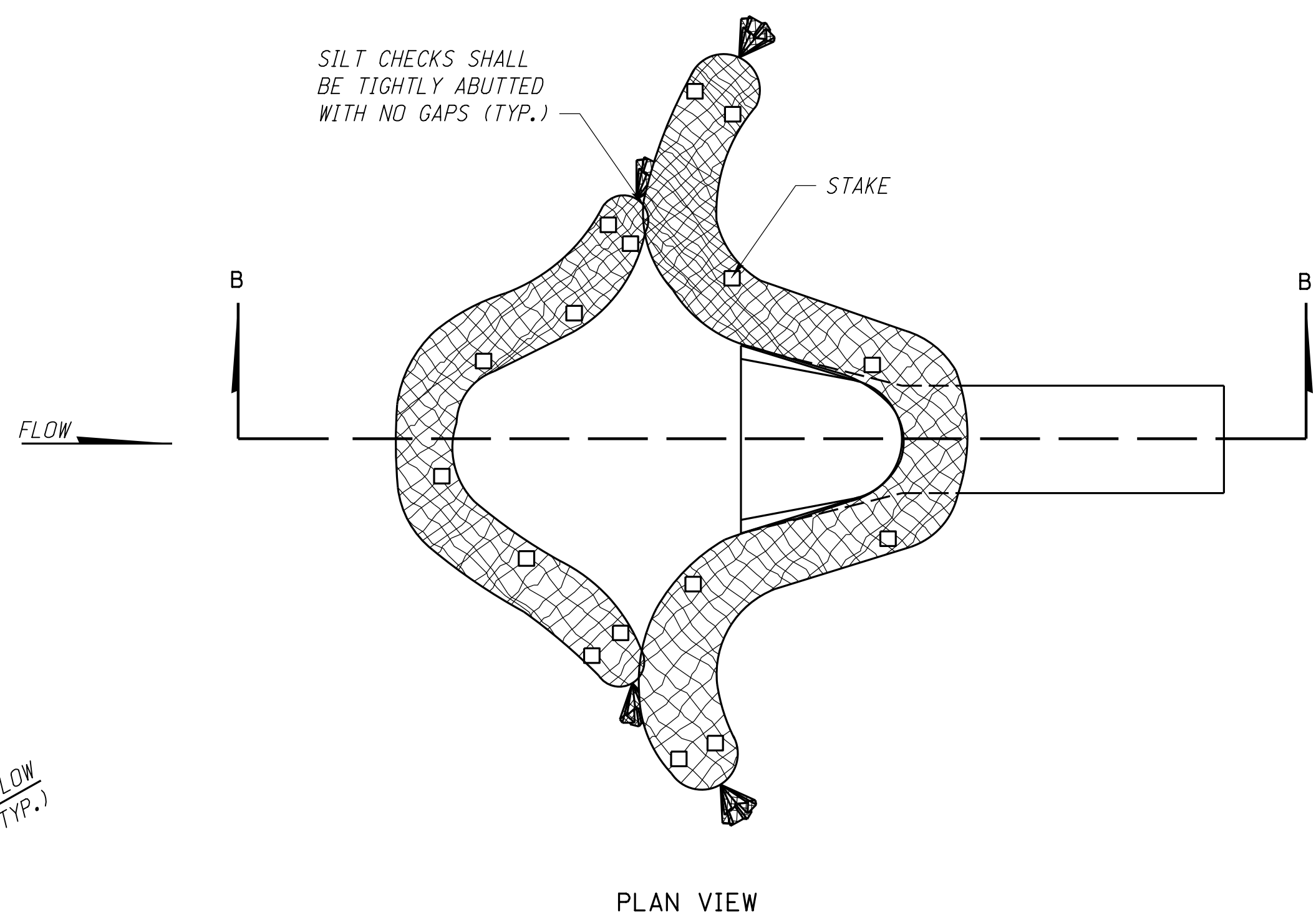
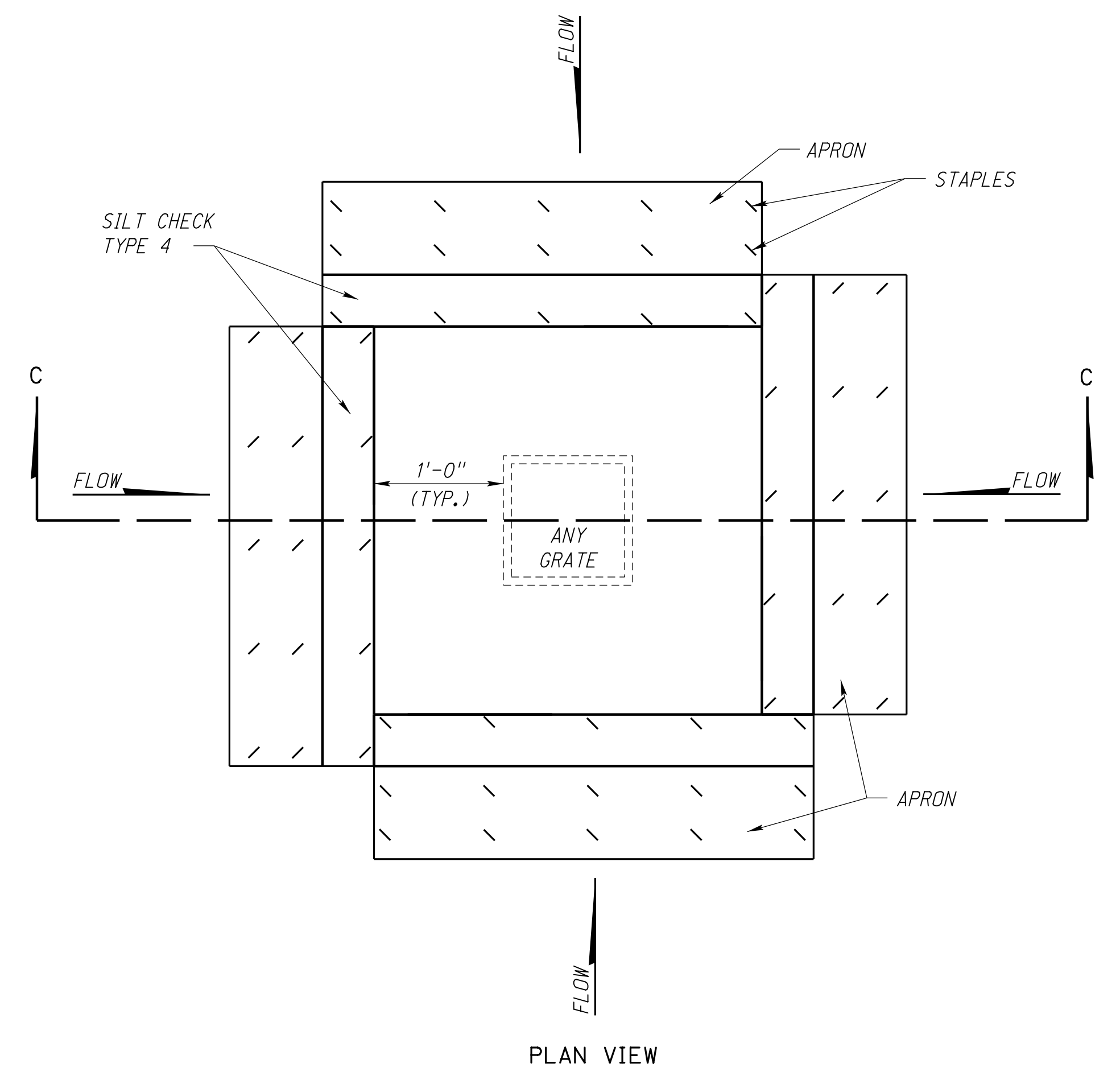
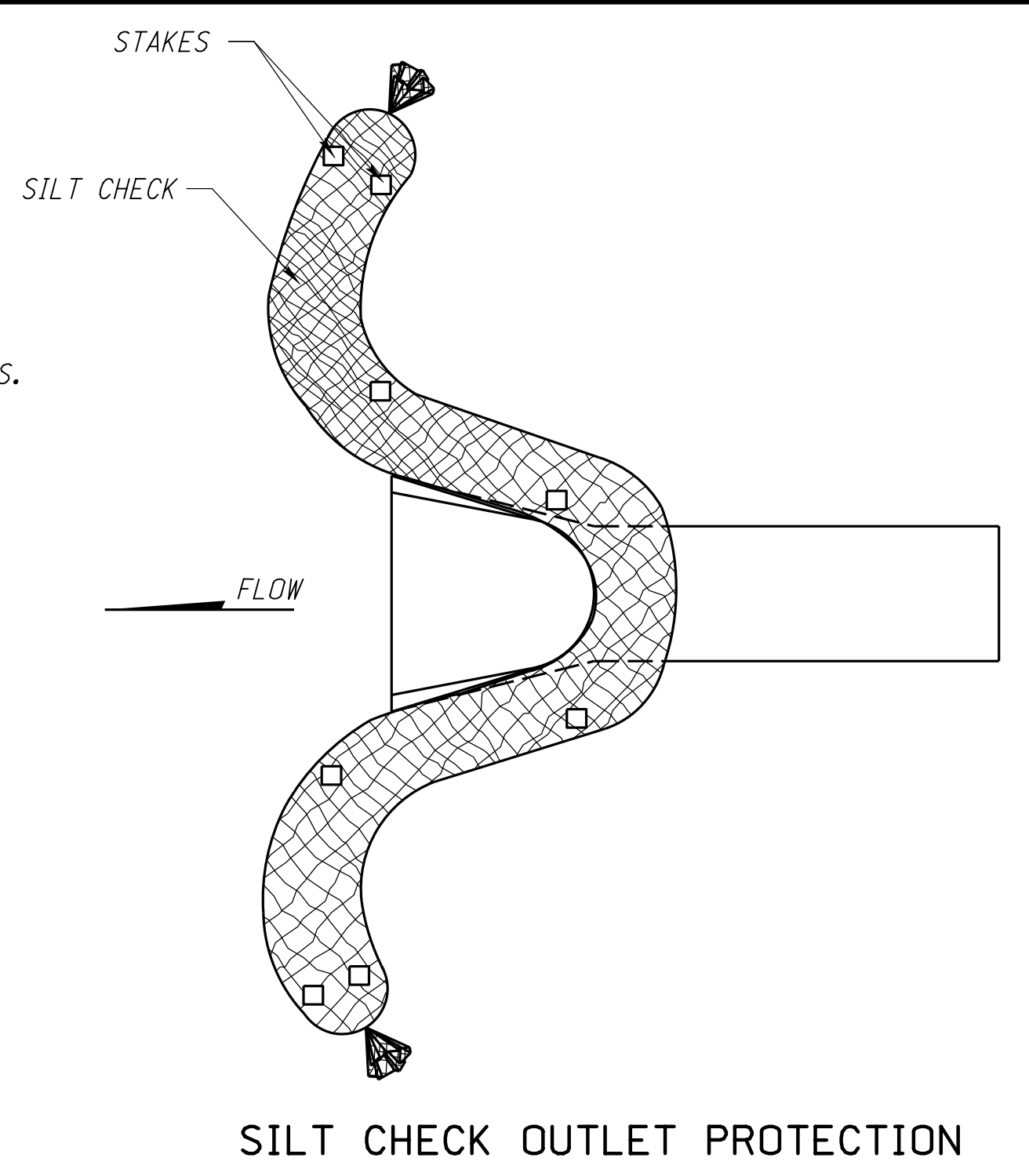
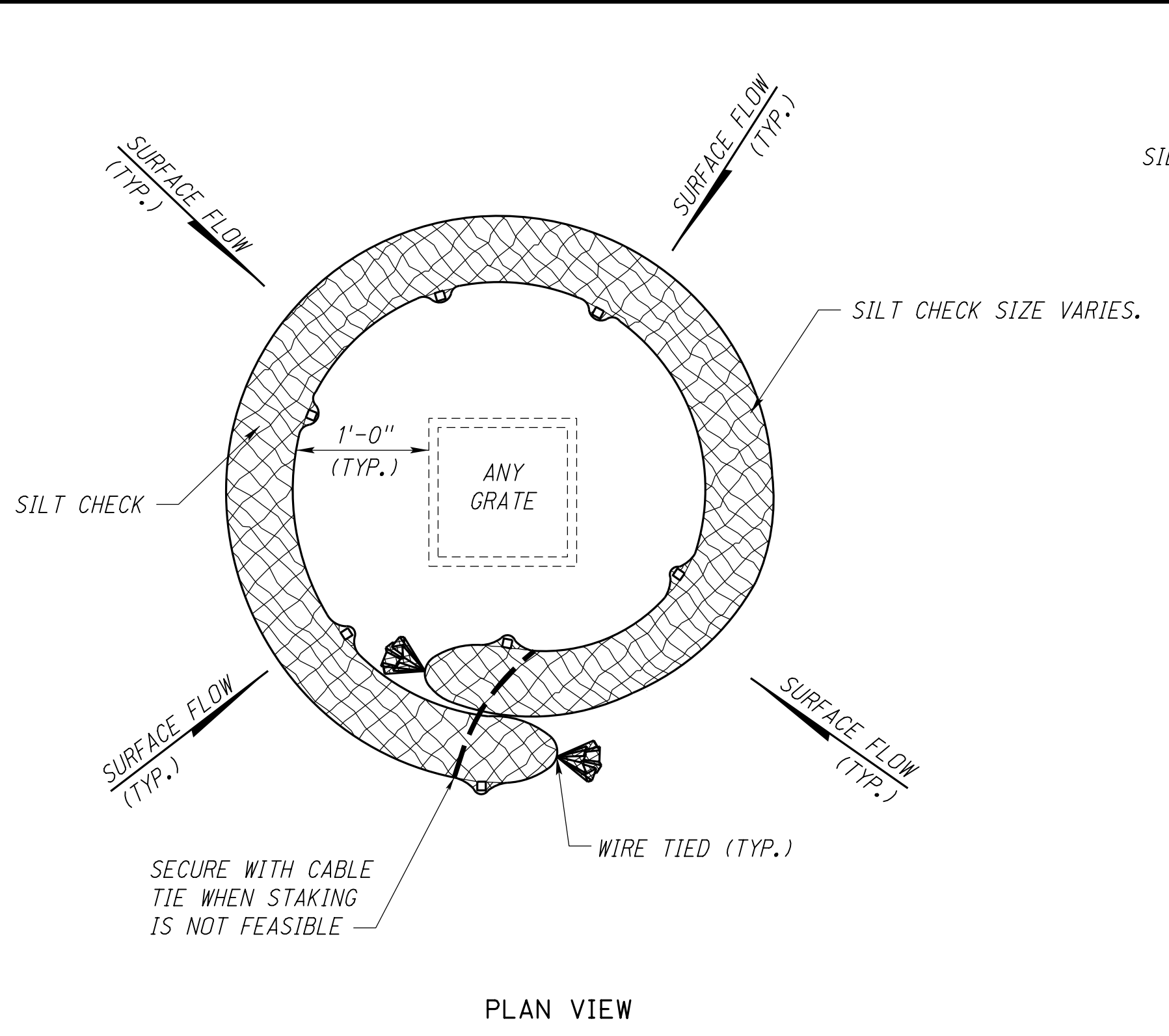
SPECIAL PLAN C

ROADWAY DESIGN DIVISION

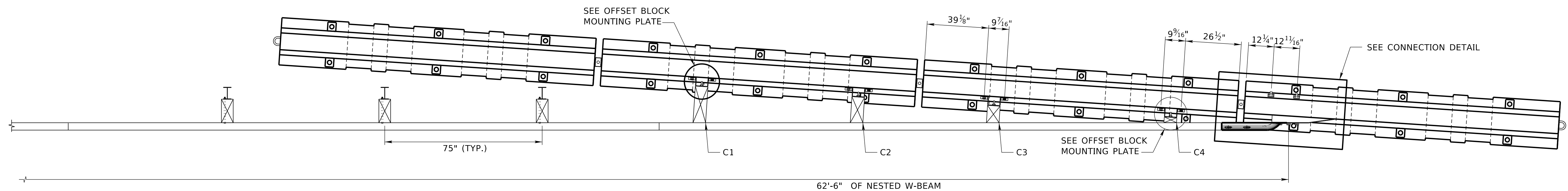
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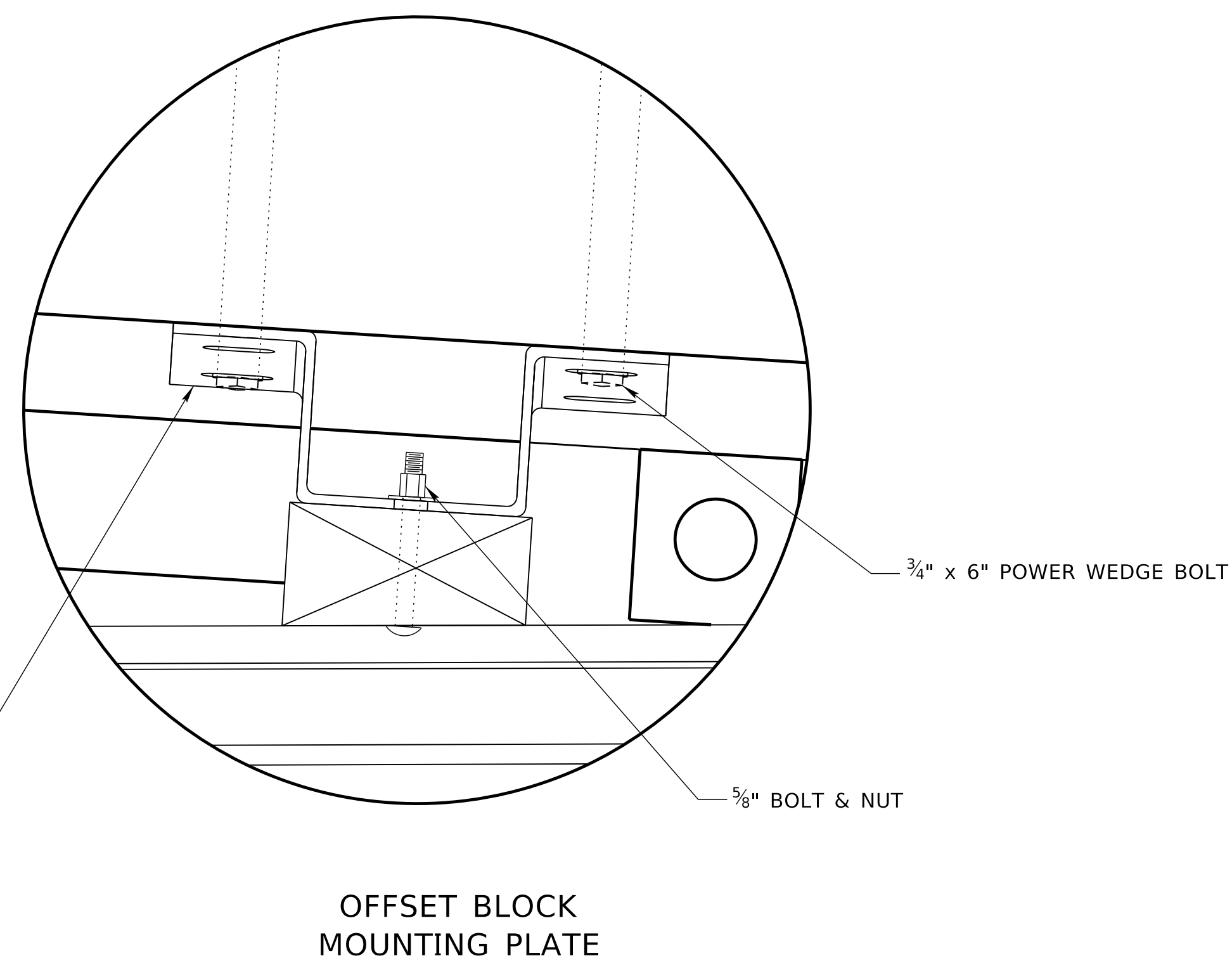
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SHEET 4 OF 4



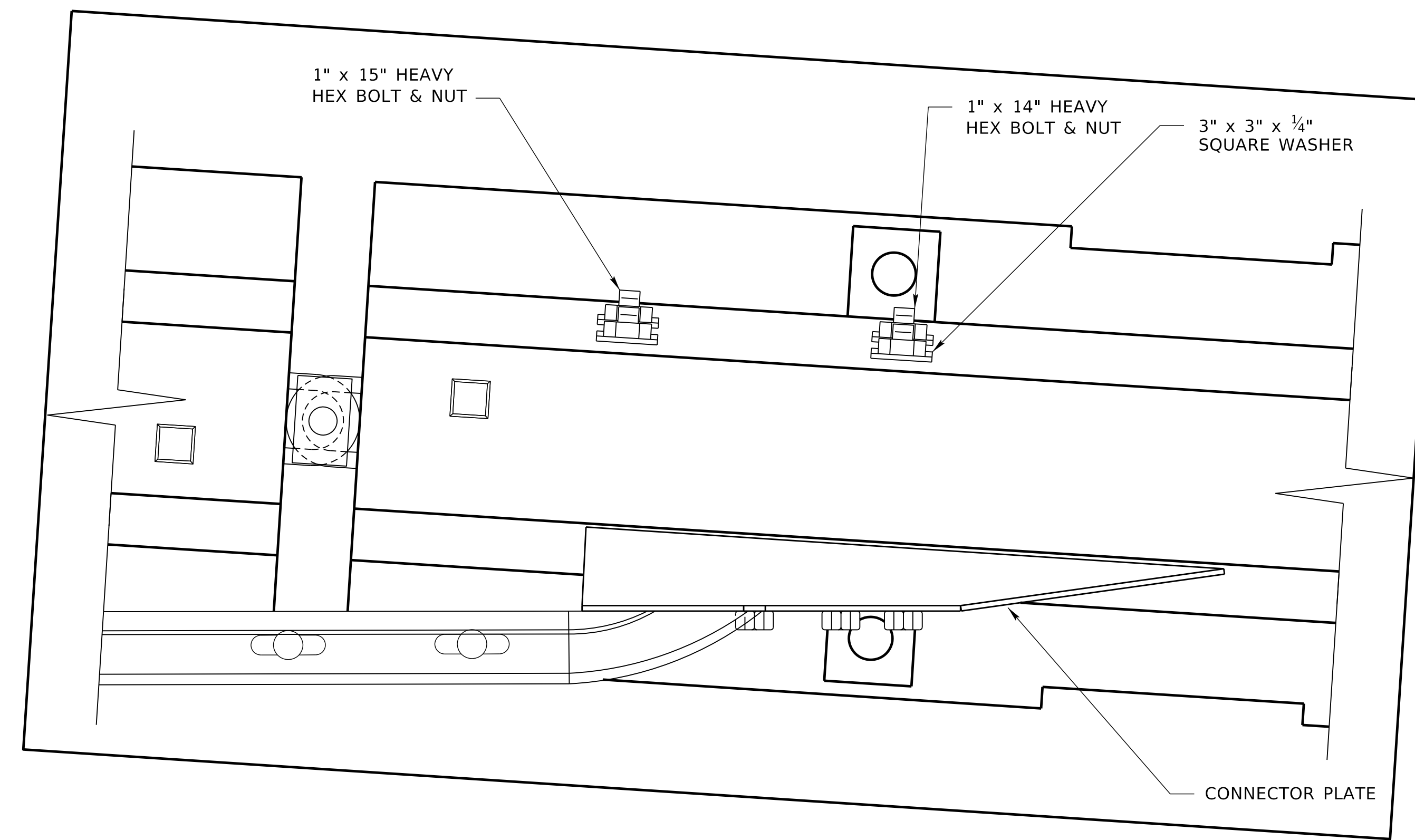
SEE STAKING DETAIL SHEET 1 OF 4
SILT CHECKS ALL TYPES
SHEET 4 OF 4
SPECIAL PLAN C



PLAN VIEW



OFFSET BLOCK MOUNTING PLATE



CONNECTION DETAIL

NOTES:

EACH OFFSET BLOCK MOUNTING PLATE USES TWO DIAGONAL POWER WEDGE BOLTS.

FOUR 1" HOLES ARE FIELD DRILLED THROUGH THE CONCRETE PROTECTION BARRIER FOR THE BOLTS USED TO MOUNT THE CONNECTOR PLATE.

SPECIAL PLAN _C
 1 OF 5
 W-BEAM CONNECT TO CONCRETE PROTECTION BARRIER

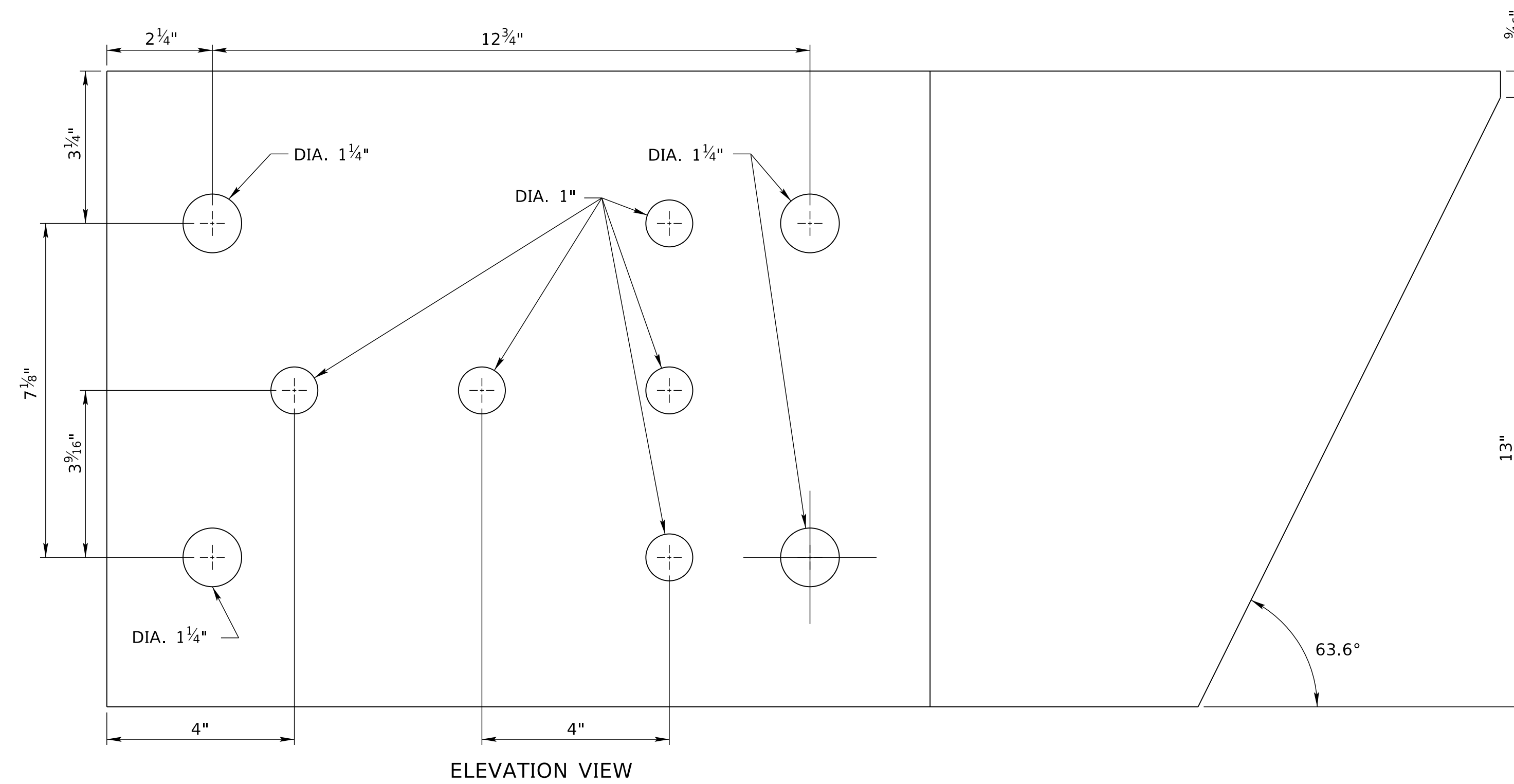
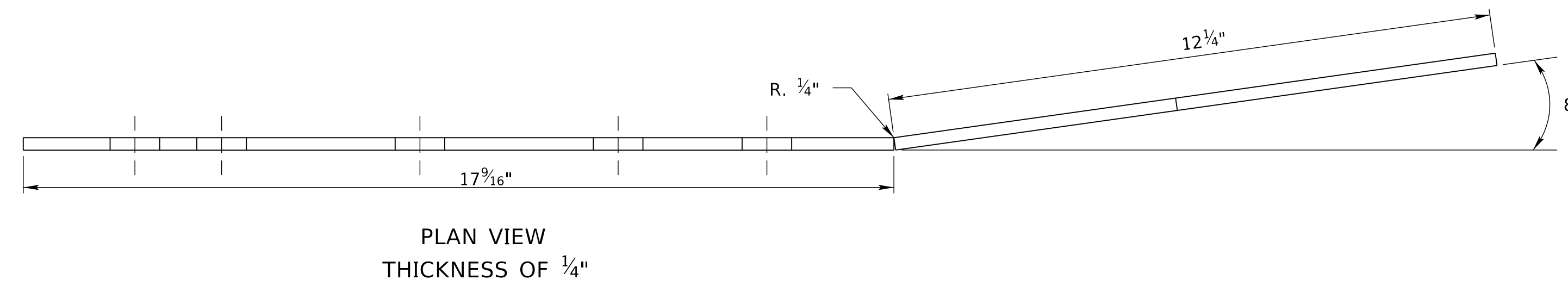
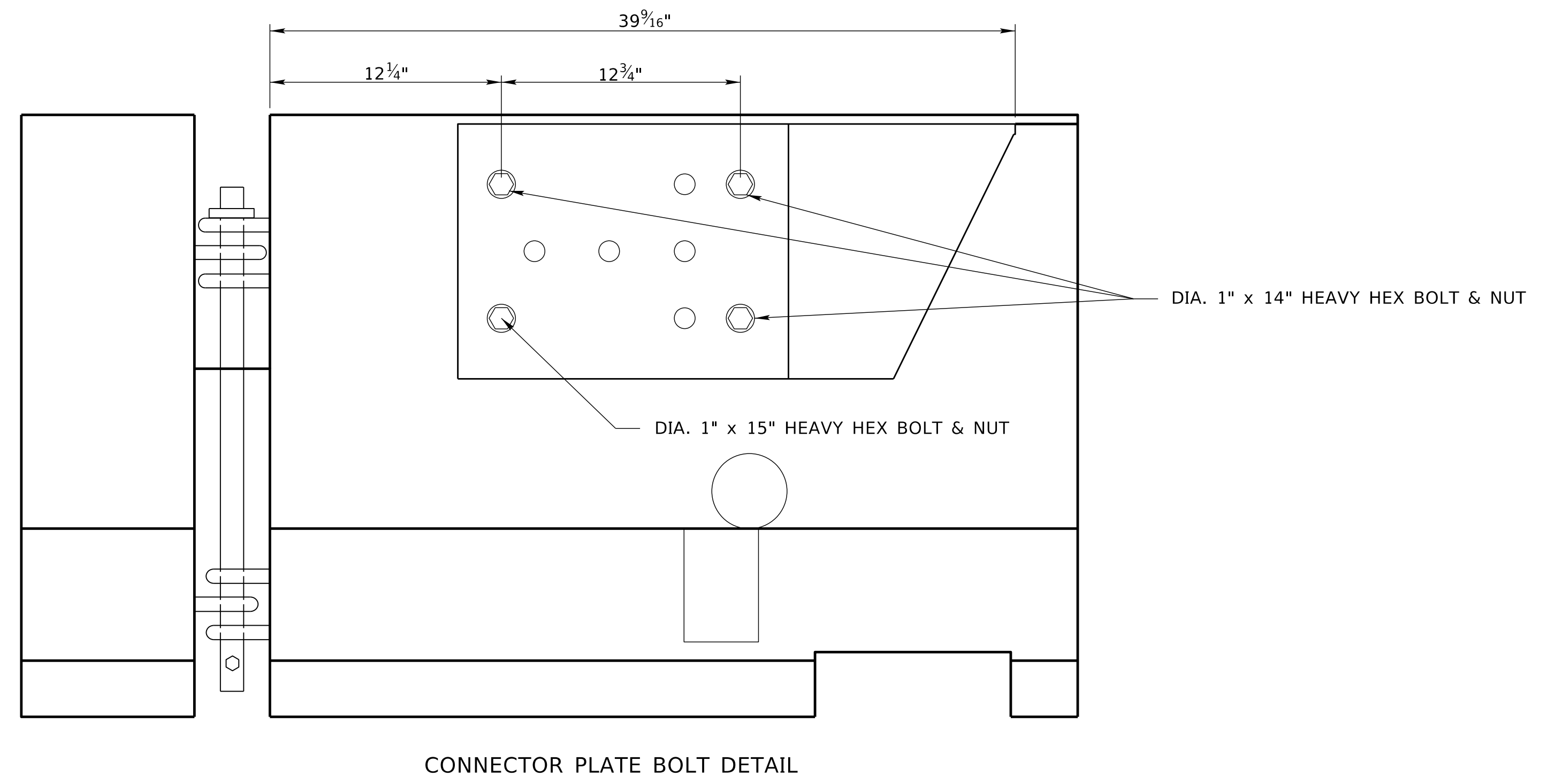
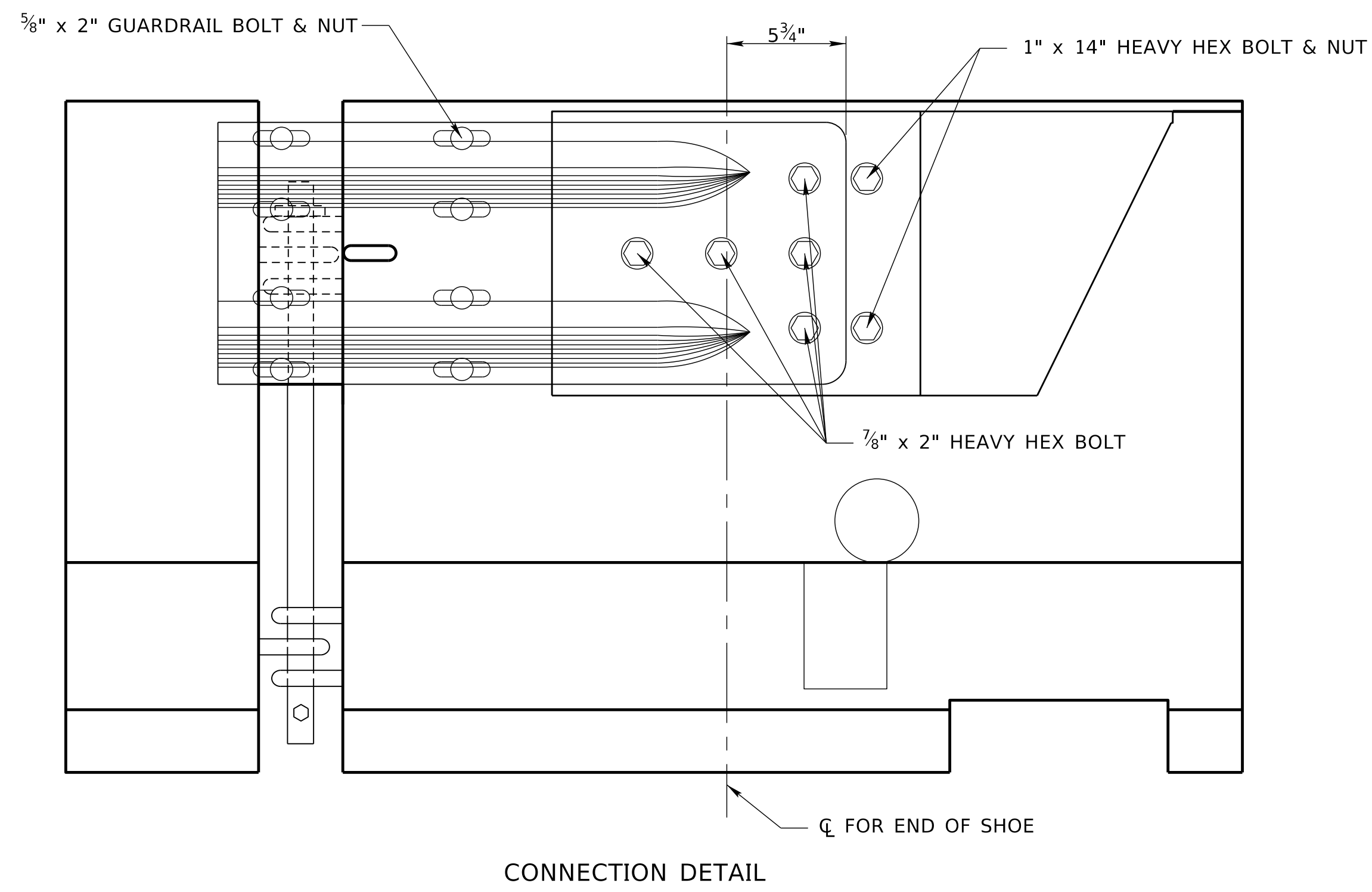


Roadway Design Division

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CONNECTOR FACE PLATE
PART E1

SPECIAL PLAN _C
2 OF 5
W-BEAM CONNECT TO CONCRETE PROTECTION BARRIER

SPECIAL PLAN _C
2 OF 5

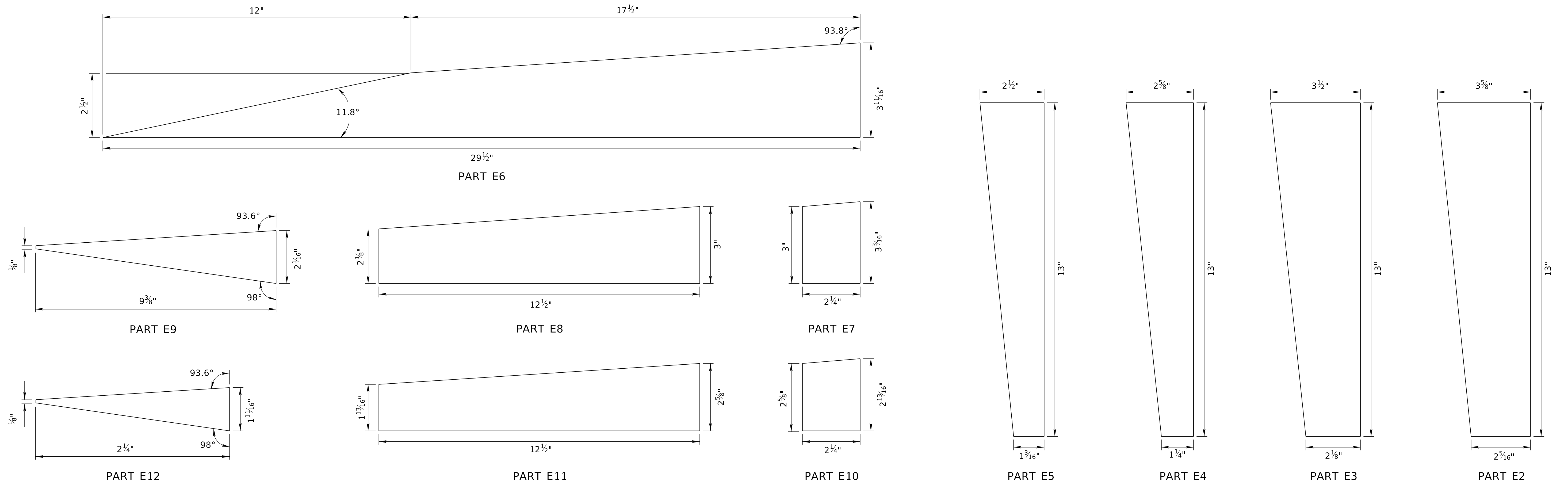


Roadway
Design
Division

COMPUTER: BG0419M534

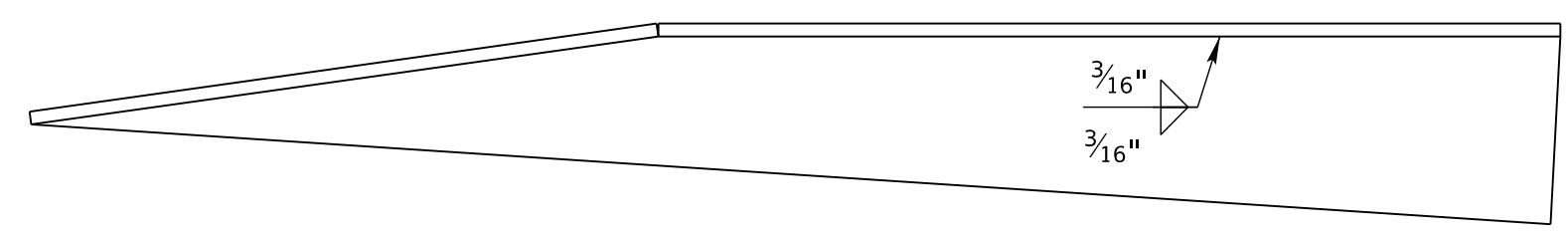
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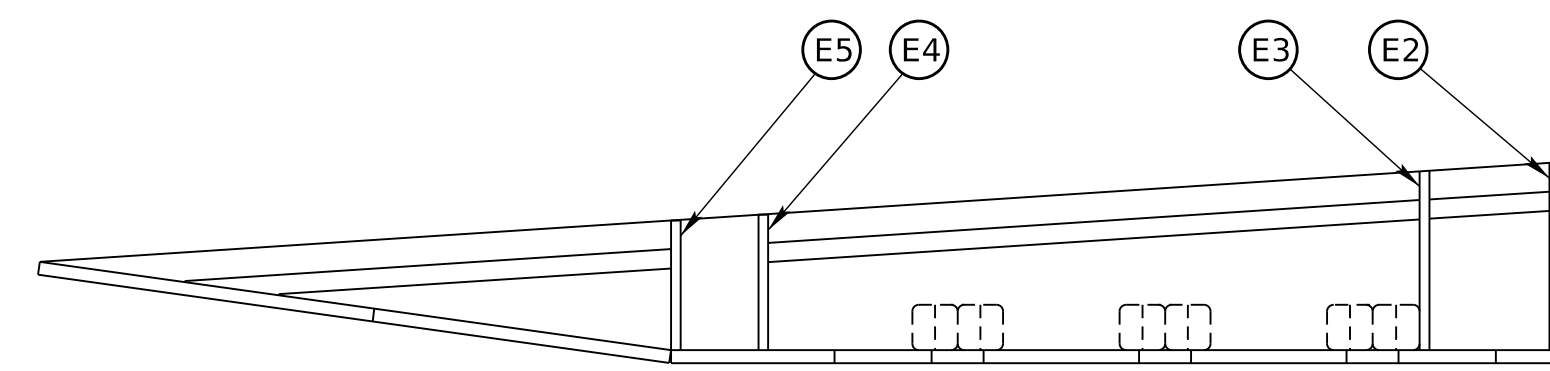


CONNECTOR PLATE HORIZONTAL GUSSETS

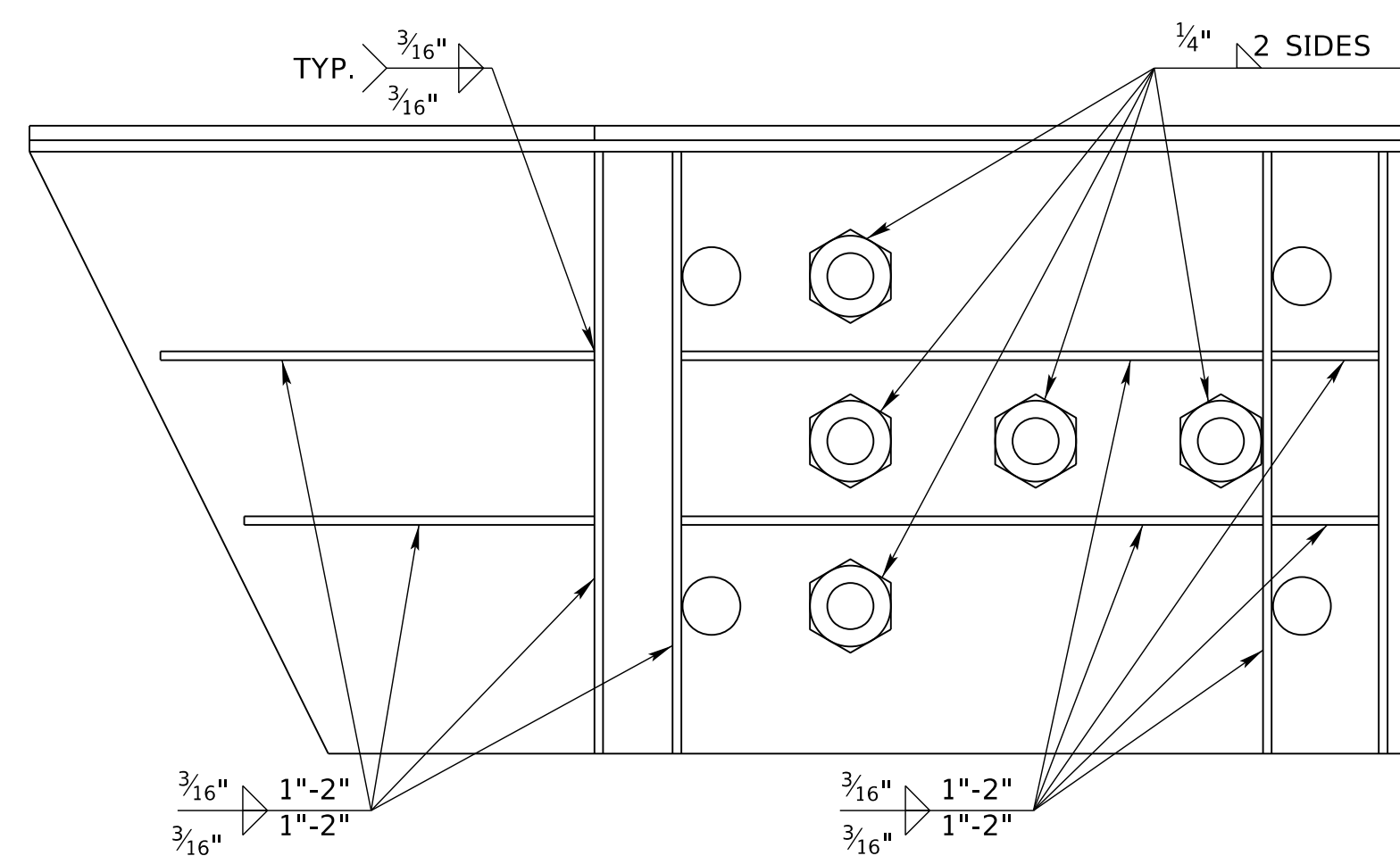
CONNECTOR PLATE VERTICAL GUSSETS
 ALL VERTICAL GUSSETS HAVE A THICKNESS OF 1/4"



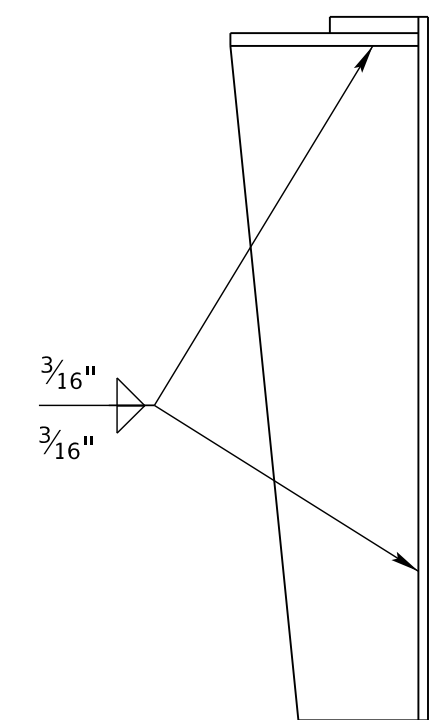
PLAN VIEW



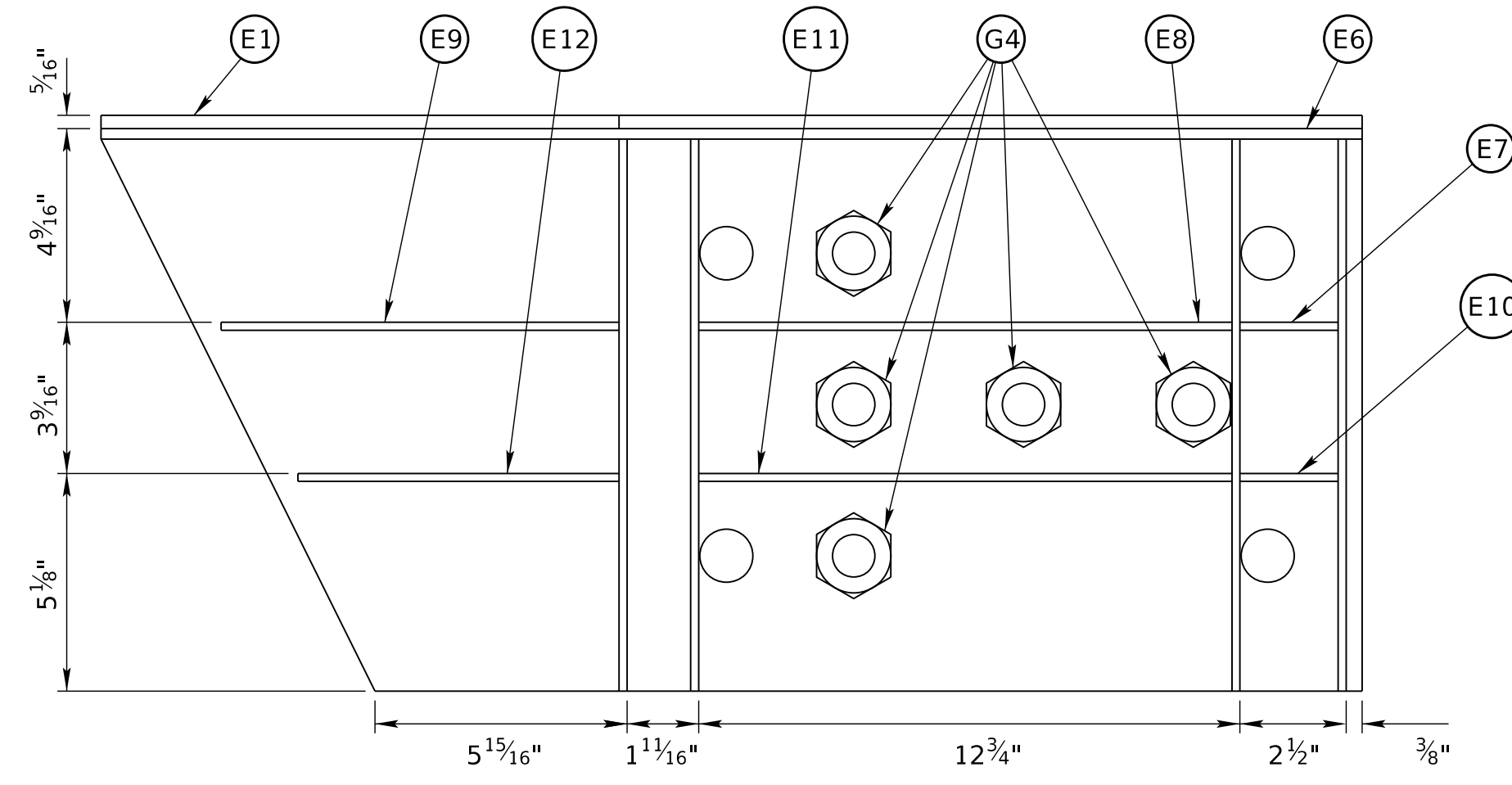
BOTTOM PLAN VIEW



BACK ELEVATION VIEW



PROFILE VIEW



BACK ELEVATION VIEW

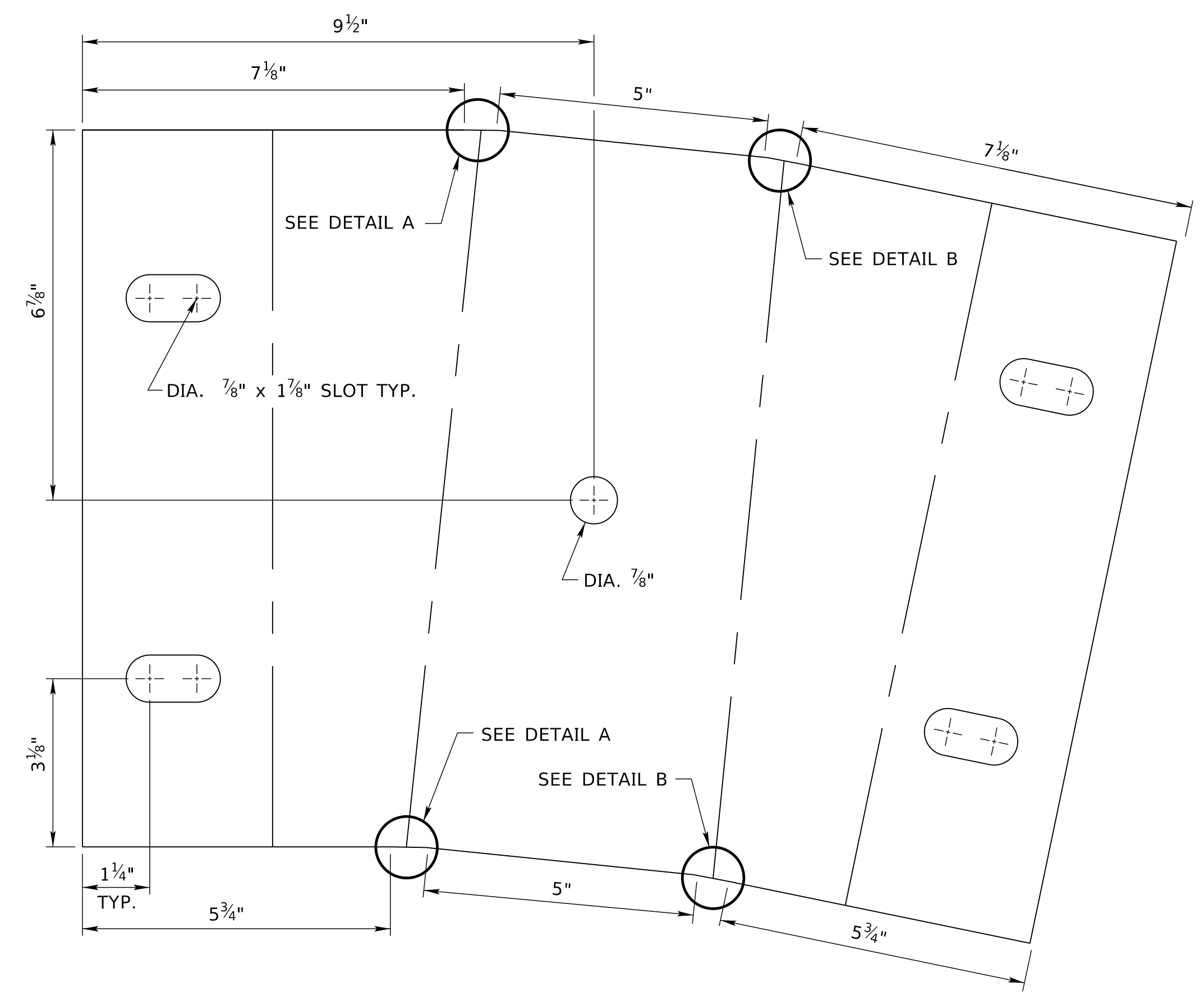
CONNECTOR PLATE DETAIL

CONNECTOR PLATE WELD DETAIL

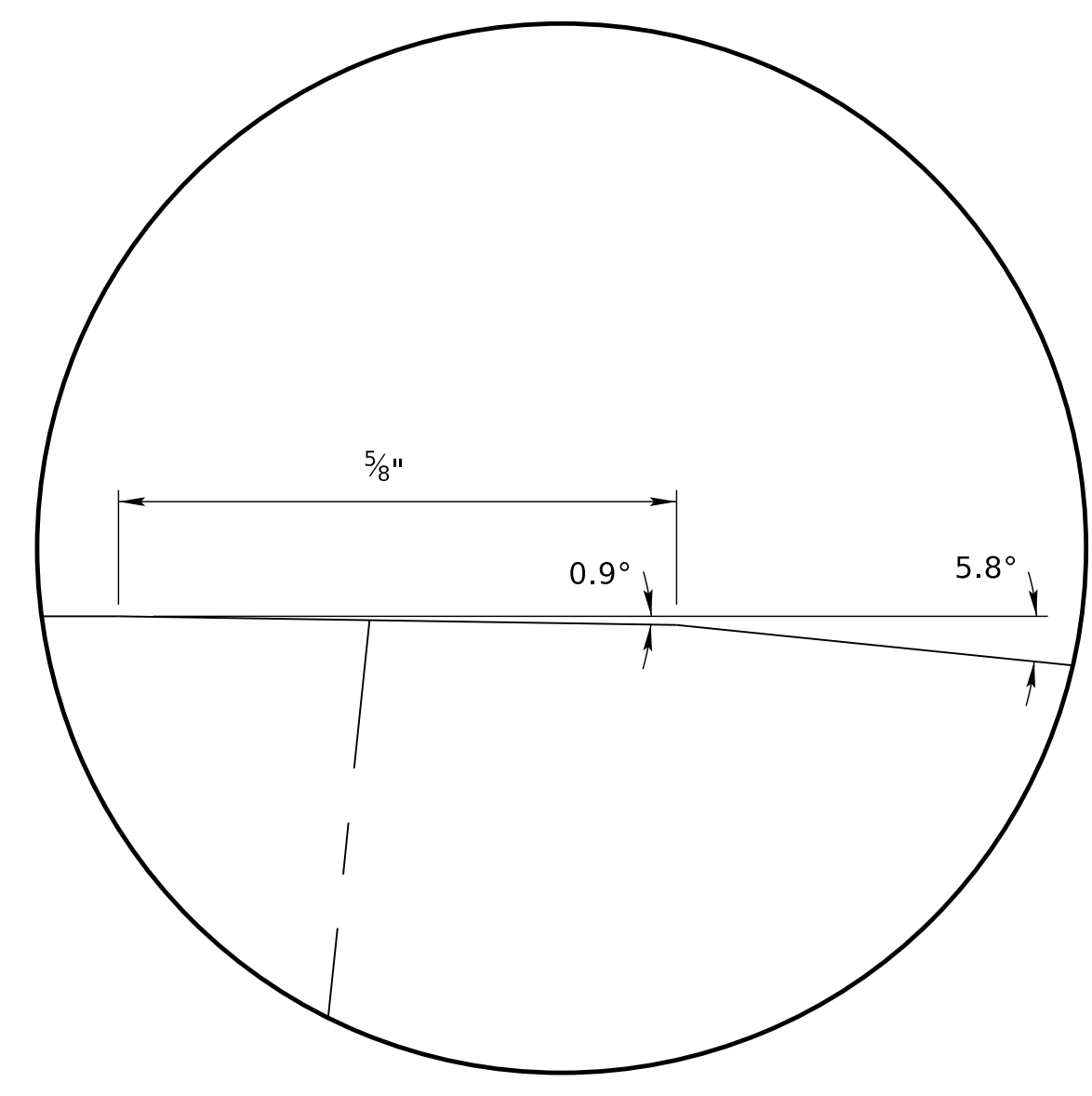
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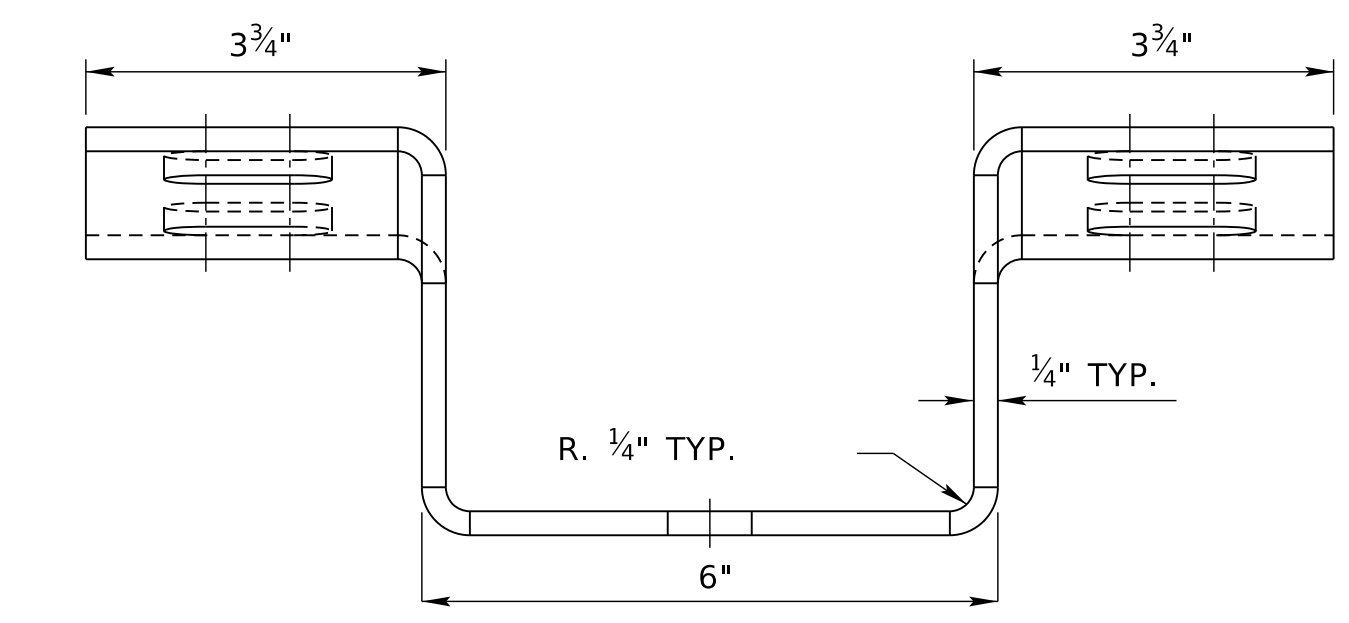
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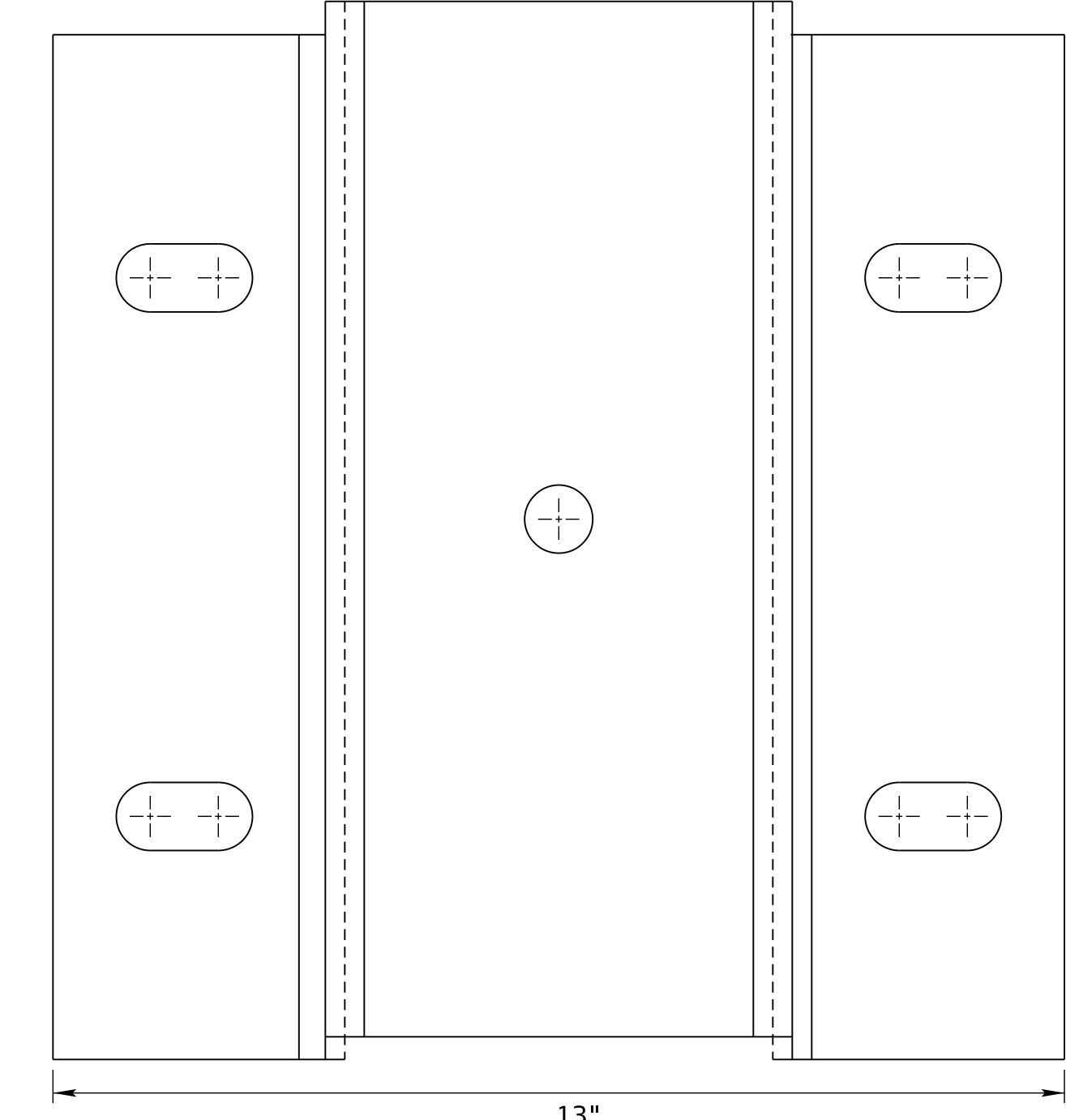
SIZE & ANGLE PATTERN



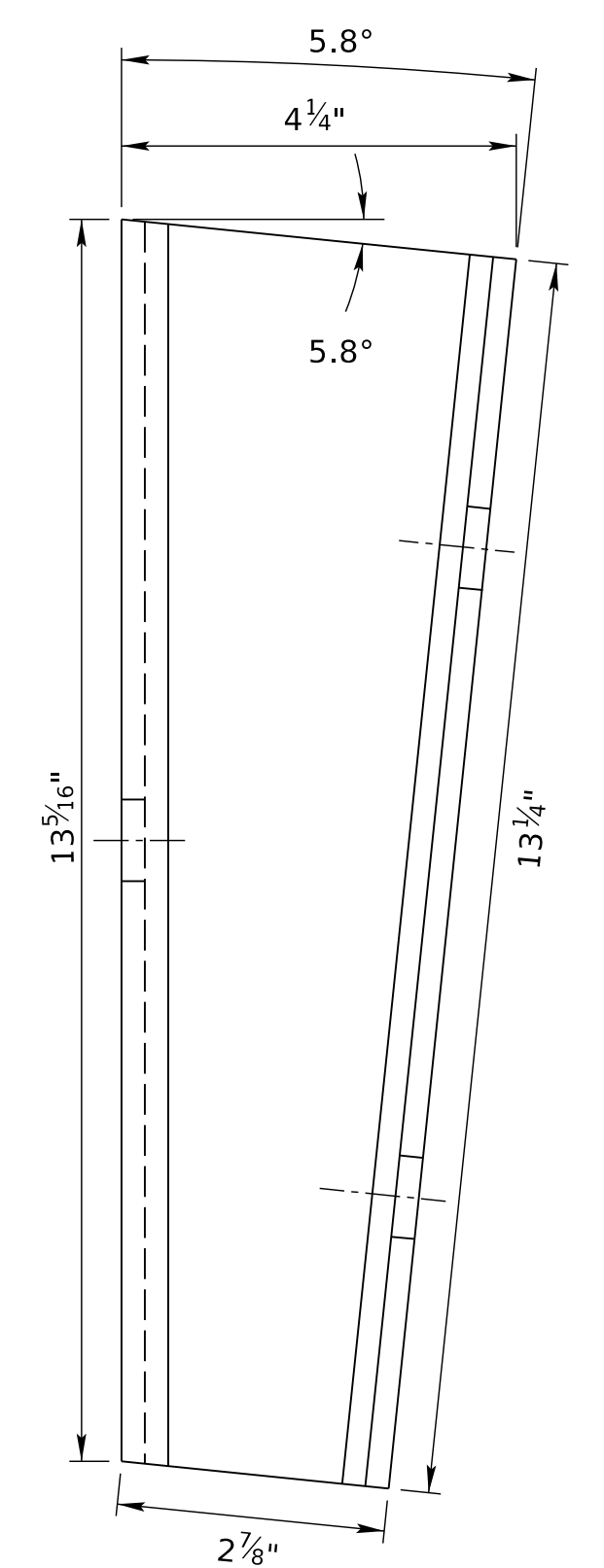
DETAIL A



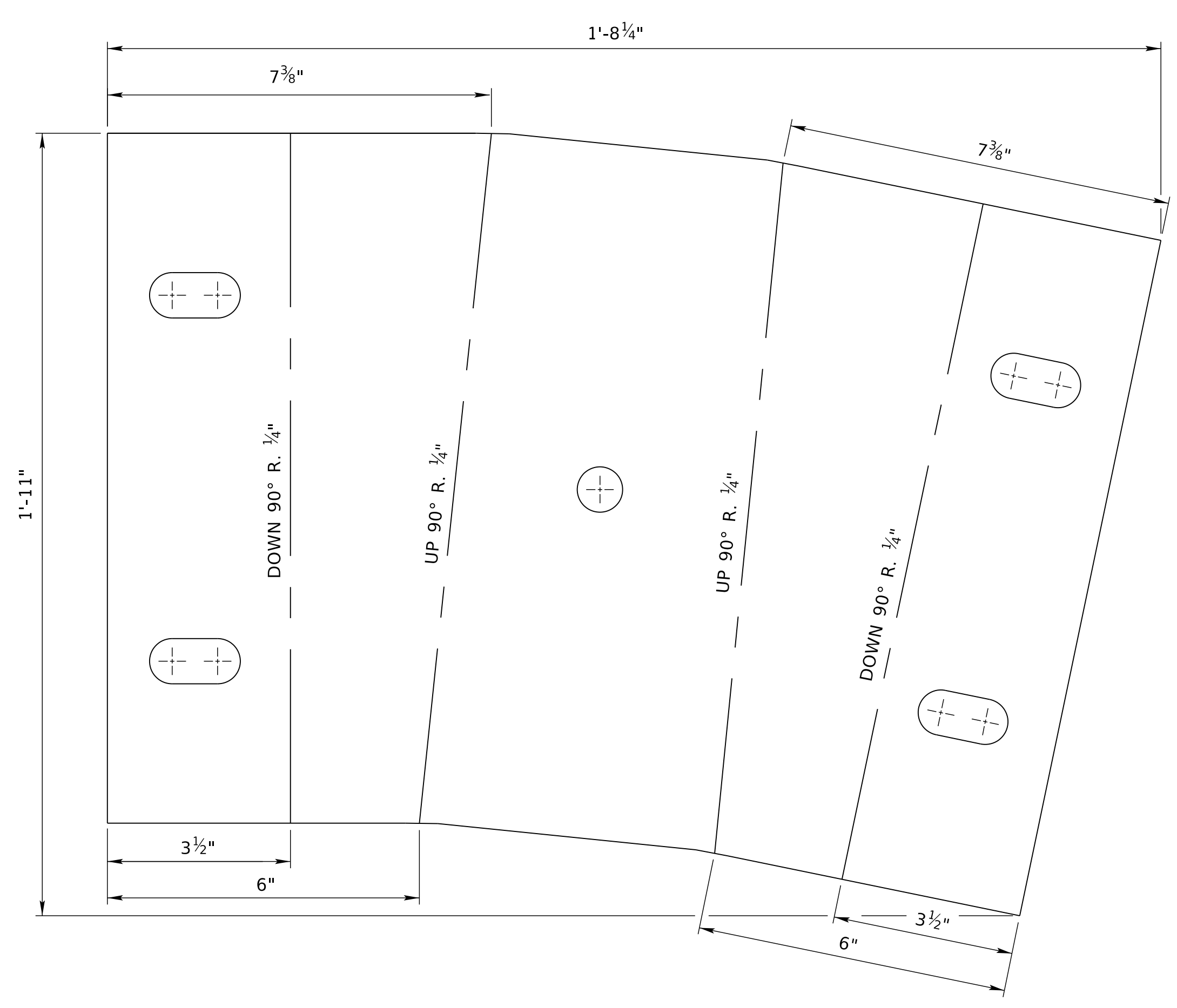
PLAN VIEW



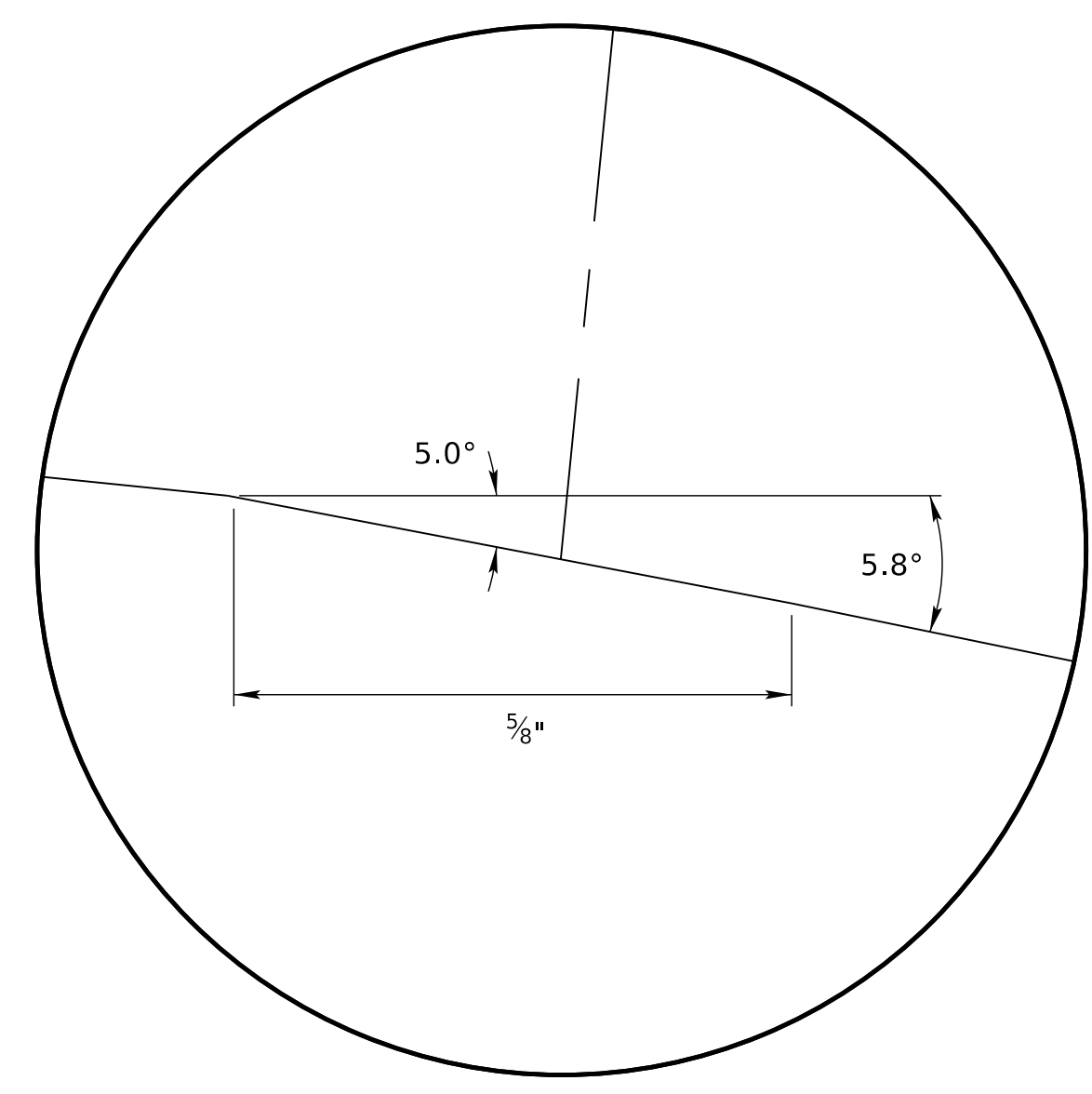
ELEVATION VIEW



PROFILE VIEW



FOLD PATTERN



DETAIL B

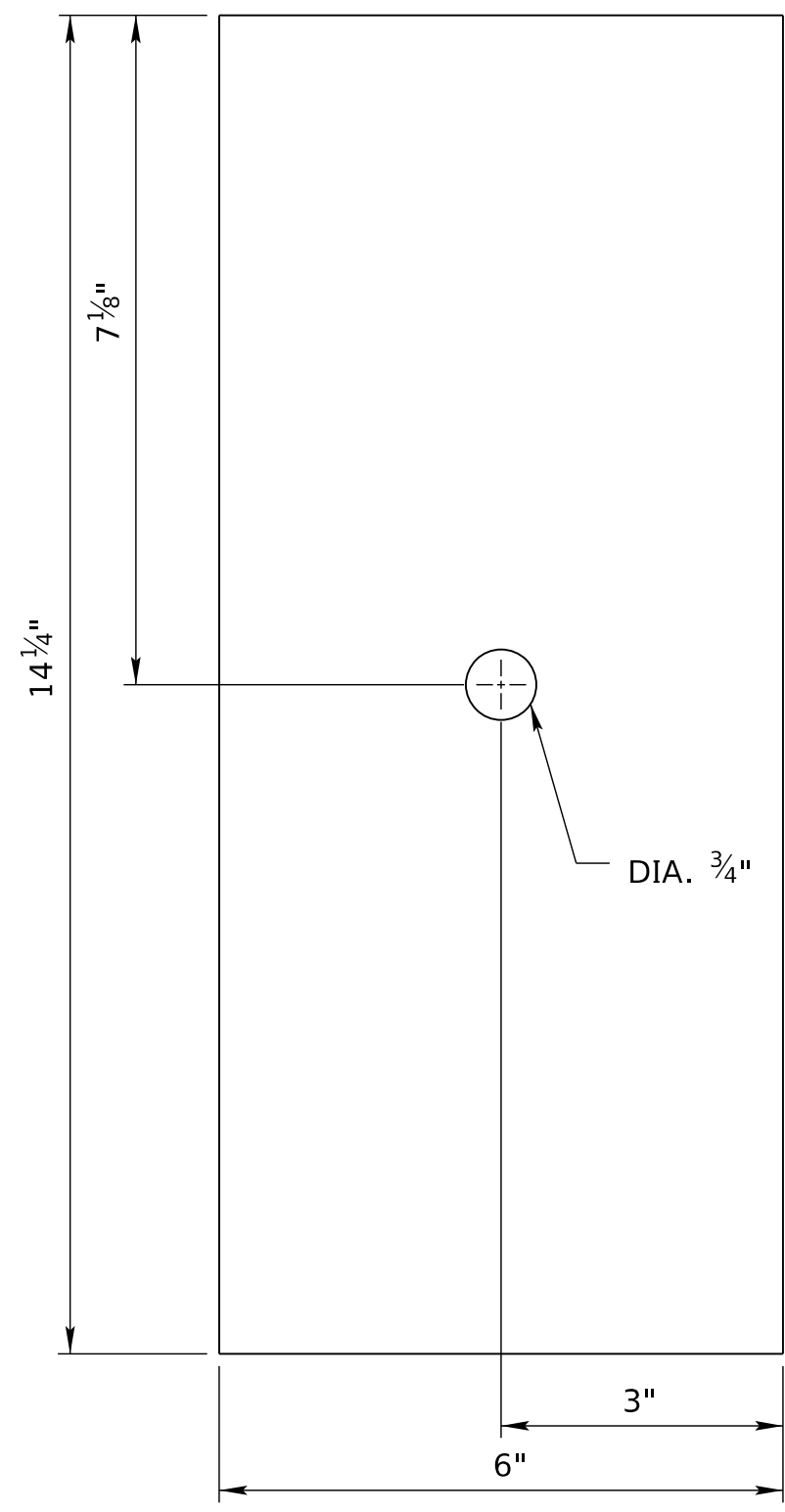
OFFSET BLOCK MOUNTING BRACKET
THICKNESS FOR PLATE IS 1/4"

SPECIAL PLAN_C
4 OF 5
W-BEAM CONNECT TO CONCRETE PROTECTION BARRIER

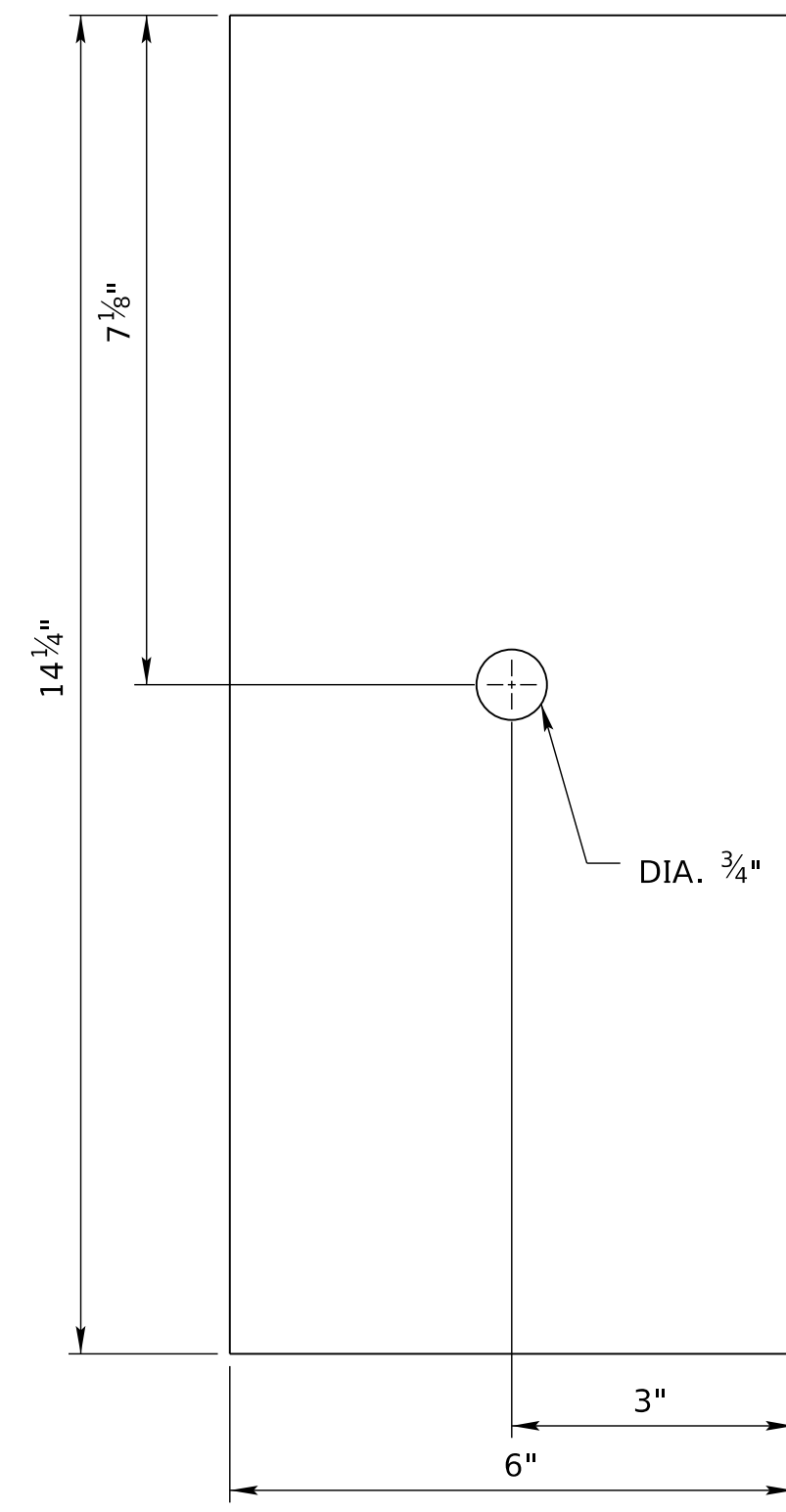


Roadway Design Division

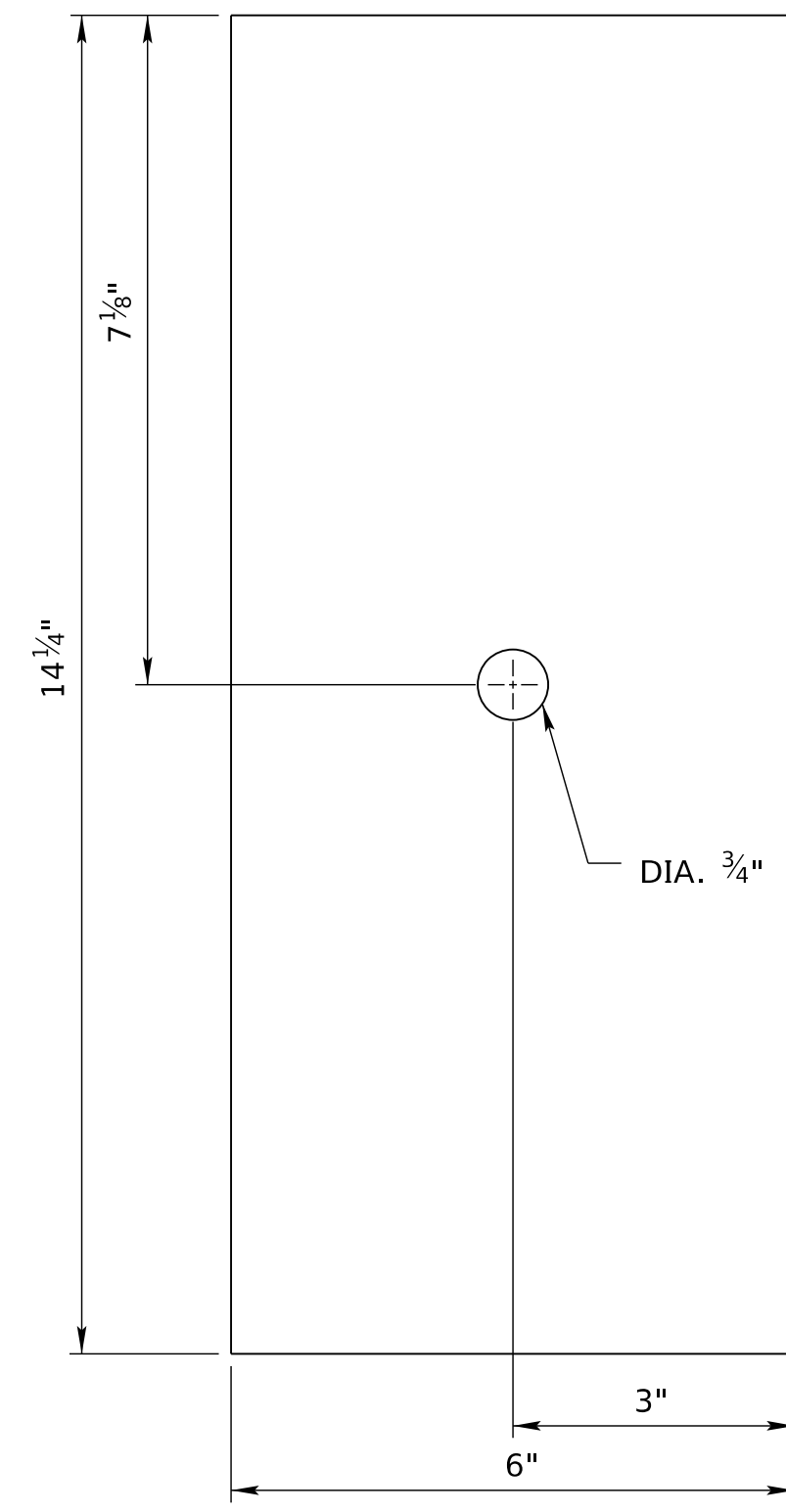
FILE: 7300 1 R0.dgn DATE: 17-APR-2023 14:34 COMPUTER: BG0419M534



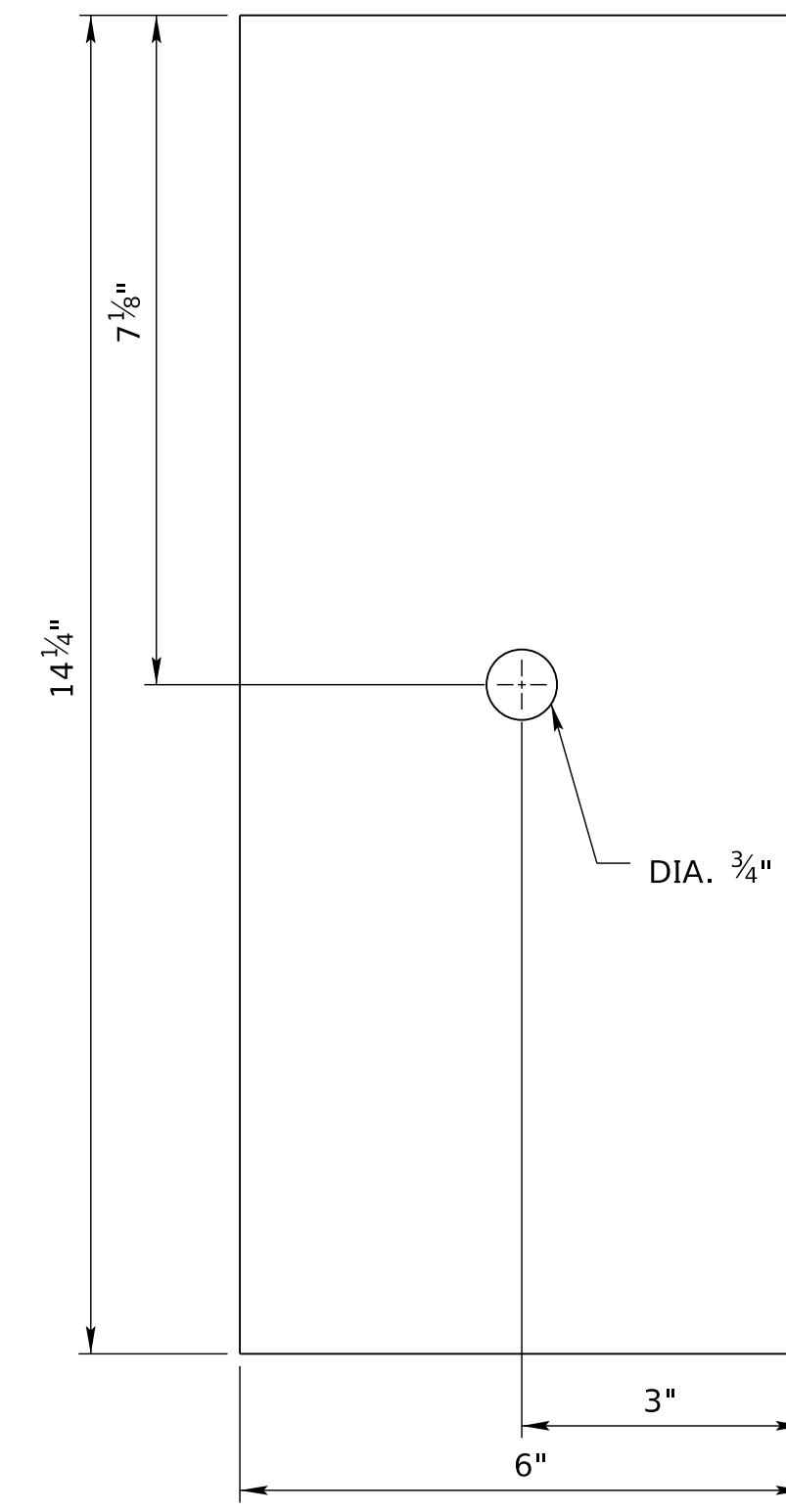
ELEVATION VIEW



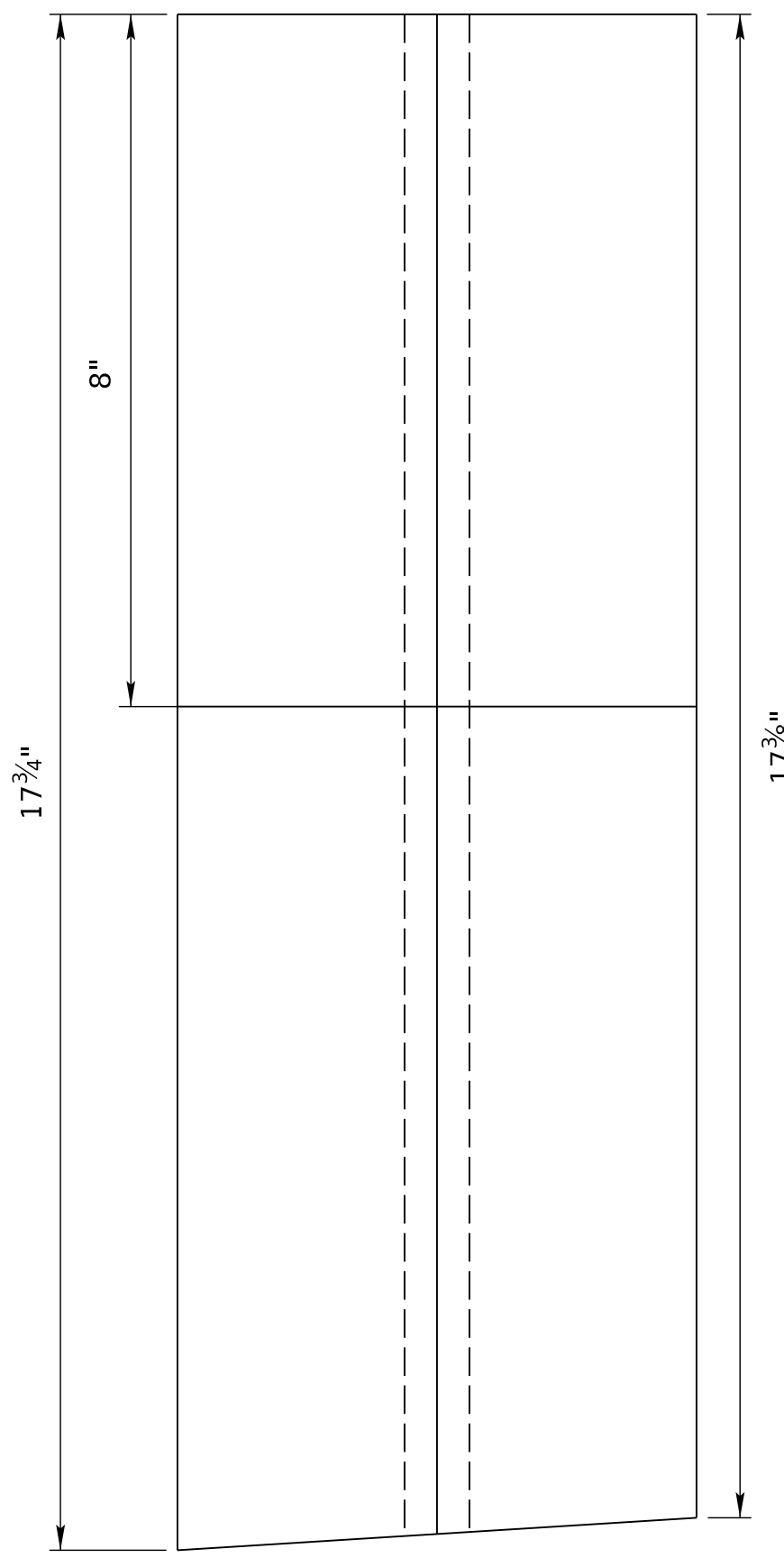
ELEVATION VIEW



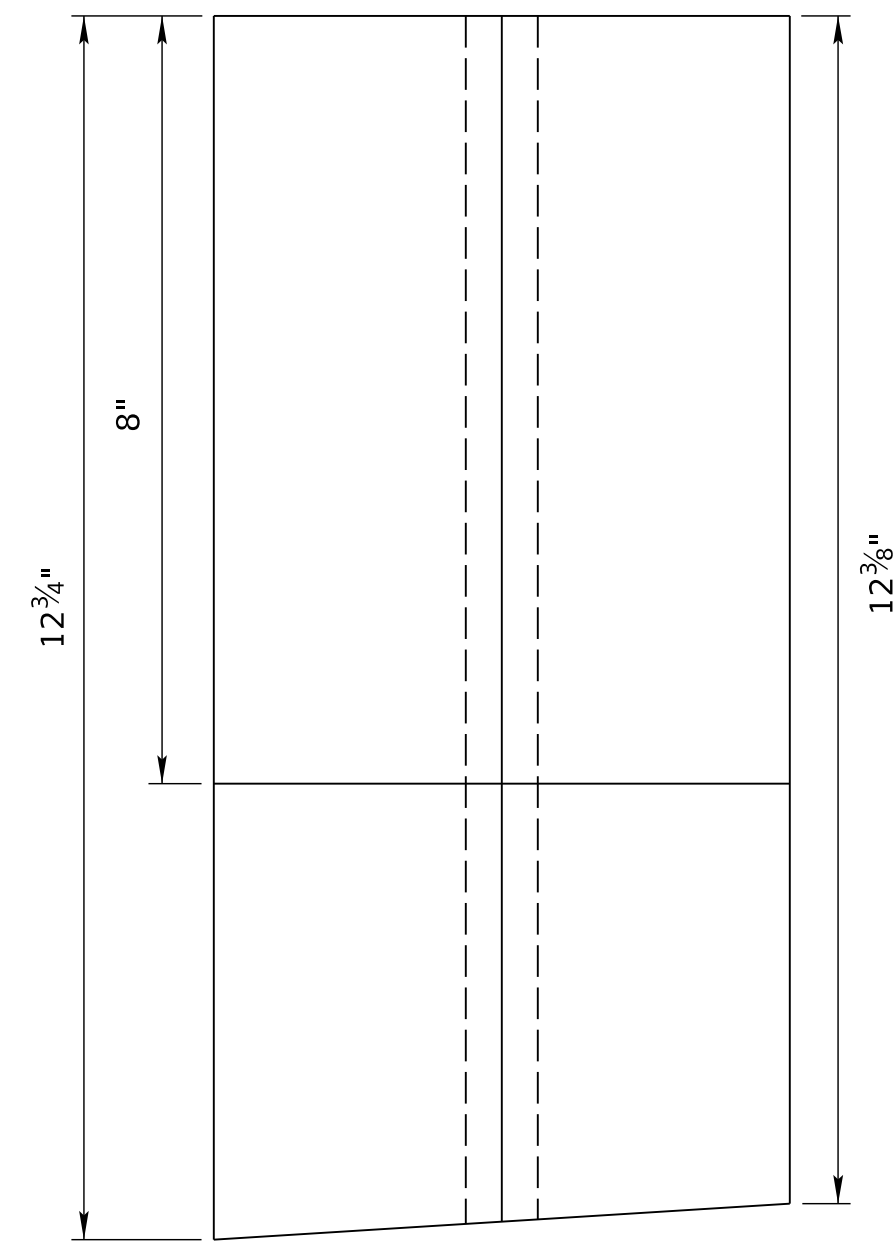
ELEVATION VIEW



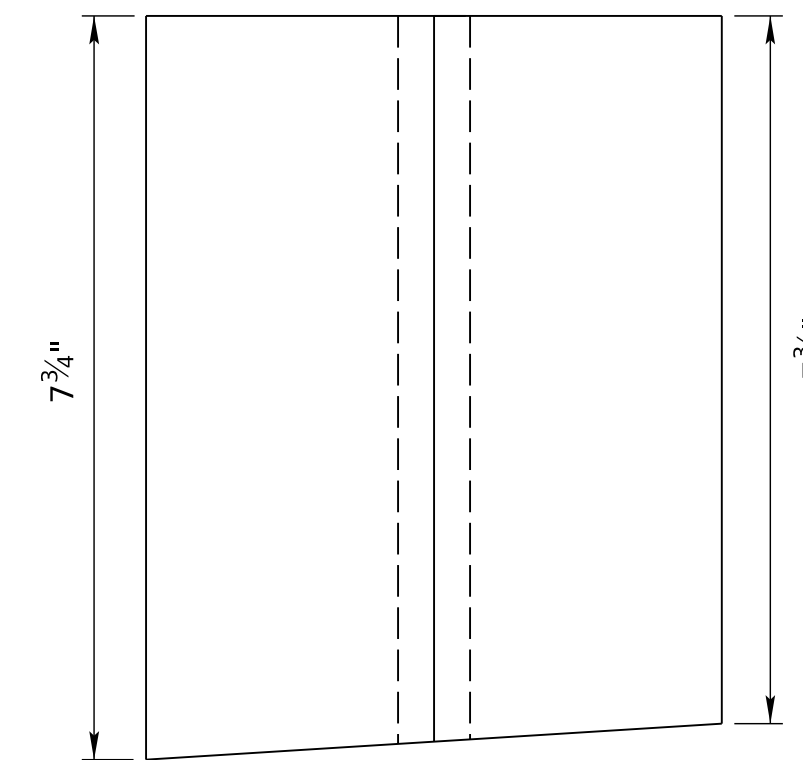
ELEVATION VIEW



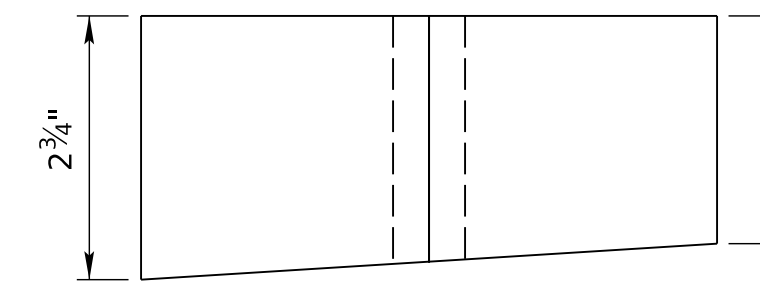
PLAN VIEW
C1
6" x 17 3/4" x 14 1/4"
OFFSET BLOCK



PLAN VIEW
C2
6" x 12 3/4" x 14 1/4"
OFFSET BLOCK



PLAN VIEW
C3
6" x 7 3/4" x 14 1/4"
OFFSET BLOCK



PLAN VIEW
C4
6" x 2 3/4" x 14 1/4"
OFFSET BLOCK

TRANSITION BLOCKOUTS

NOTES:
PARTS C2 AND C3 CAN BE MADE FROM ANY TWO
COMBINED BLOCK SIZES AND CAN BE ADJUSTED AS NECESSARY.

SPECIAL PLAN _C
5 OF 5
W-BEAM CONNECT TO CONCRETE PROTECTION BARRIER



Roadway
Design
Division

FILE: 7300_1 RO.dgn DATE: 17-APR-2023 14:34 COMPUTER: BG0419M534

CONNECTION NOTES:

FOR DIVIDED ROADWAY

INSTALL THRIE-BEAM END SHOE, BETWEEN NESTED GUARDRAIL ELEMENTS. (SUBSIDIARY TO BRIDGE APPROACH SECTION)

FOR 2-LANE ROADWAY

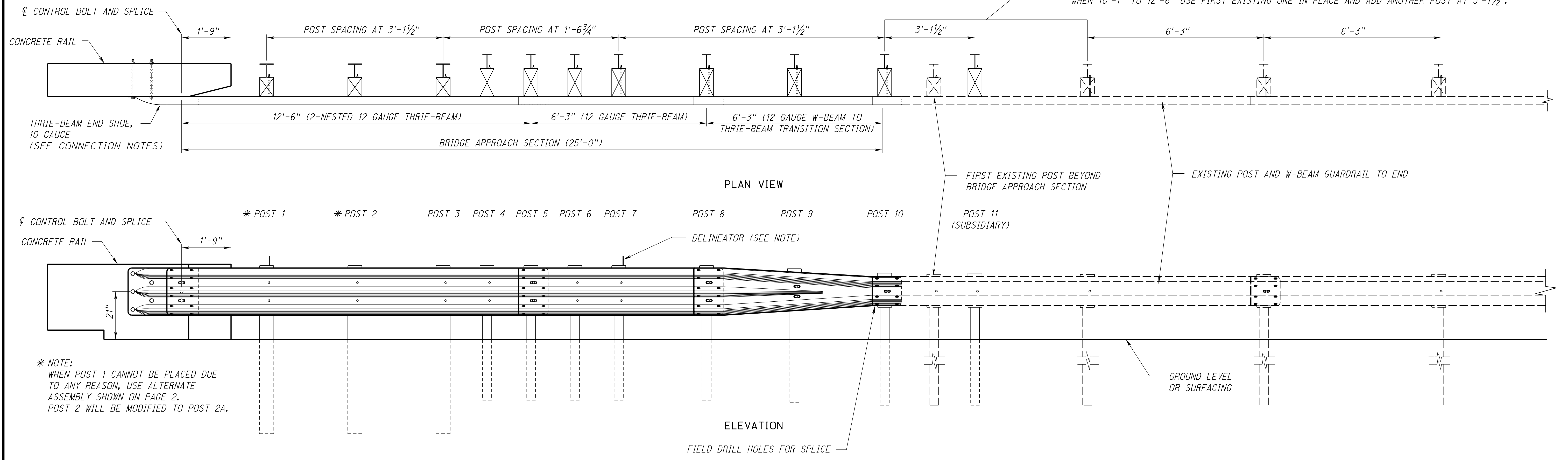
FOR APPROACHING TRAFFIC INSTALL THRIE-BEAM END SHOE, BETWEEN NESTED GUARDRAIL ELEMENTS. (SUBSIDIARY TO BRIDGE APPROACH SECTION)

FOR OFF END CONNECTIONS INSTALL THRIE-BEAM END SHOE, OUTSIDE OF THE NESTED GUARDRAIL ELEMENTS. (SUBSIDIARY TO BRIDGE APPROACH SECTION)

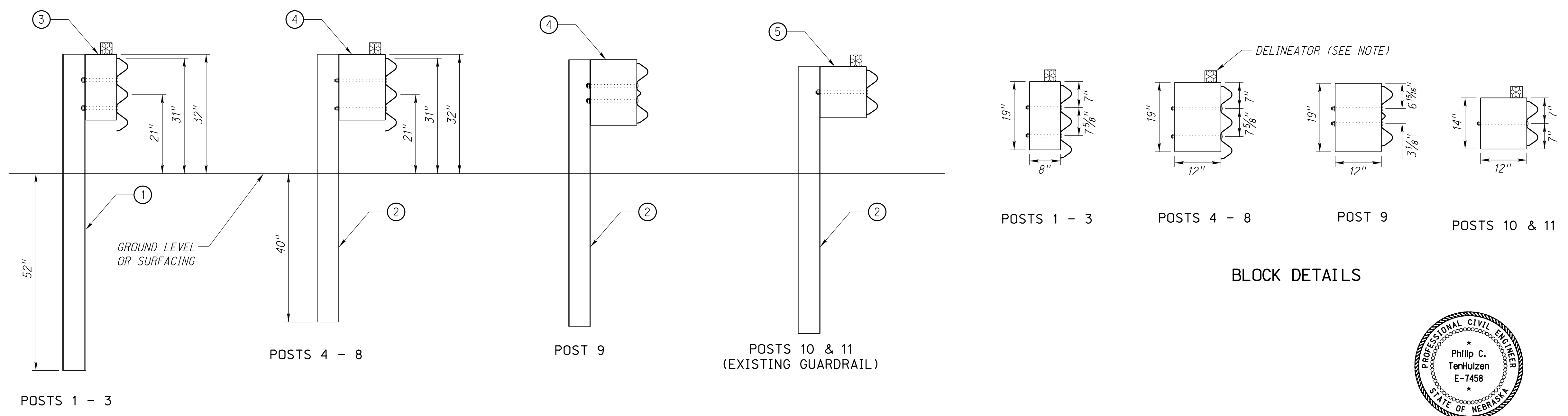
LEGEND

- ① W6 x 15 x 7' POST
- ② W6 x 8.5 x 6' OR W6' x 9 x 6' POST
- ③ 6" x 8" x 19" OFFSET BLOCK
- ④ 6" x 12" x 19" OFFSET BLOCK
- ⑤ 6" x 12" x 14" OFFSET BLOCK

DISTANCE TO SECOND EXISTING POST:
WHEN 6'-3" TO 8'-0" REMOVE FIRST POST, PLACE NEW POST AT 3'-1 1/2".
WHEN 8'-1" TO 10'-0" USE FIRST EXISTING POST
WHEN 10'-1" TO 12'-6" USE FIRST EXISTING ONE IN PLACE AND ADD ANOTHER POST AT 3'-1 1/2".

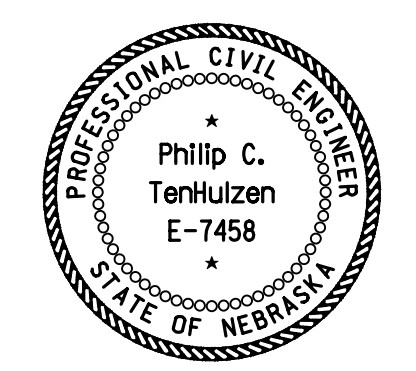


* NOTE:
WHEN POST 1 CANNOT BE PLACED DUE TO ANY REASON, USE ALTERNATE ASSEMBLY SHOWN ON PAGE 2. POST 2 WILL BE MODIFIED TO POST 2A.



BLOCK DETAILS

NOTES:
DELINEATORS SUBSIDIARY TO BRIDGE APPROACH SECTION.
BUTTON HEAD BOLT 5/8" DIA. x LENGTH AS REQUIRED, SECURED WITH HEX NUT.
ALL STEEL MEMBERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.



BRIDGE APPROACH SECTION
31" TO EXISTING
SHEET 1 OF 2
SPECIAL PLAN C

ROADWAY DESIGN DIVISION

Computer: NDOTDESIGN134

Date: 18-MAY-2021 13:17

File: 73901e00.dgn SHEET 1 OF 2 1350 1 e 00

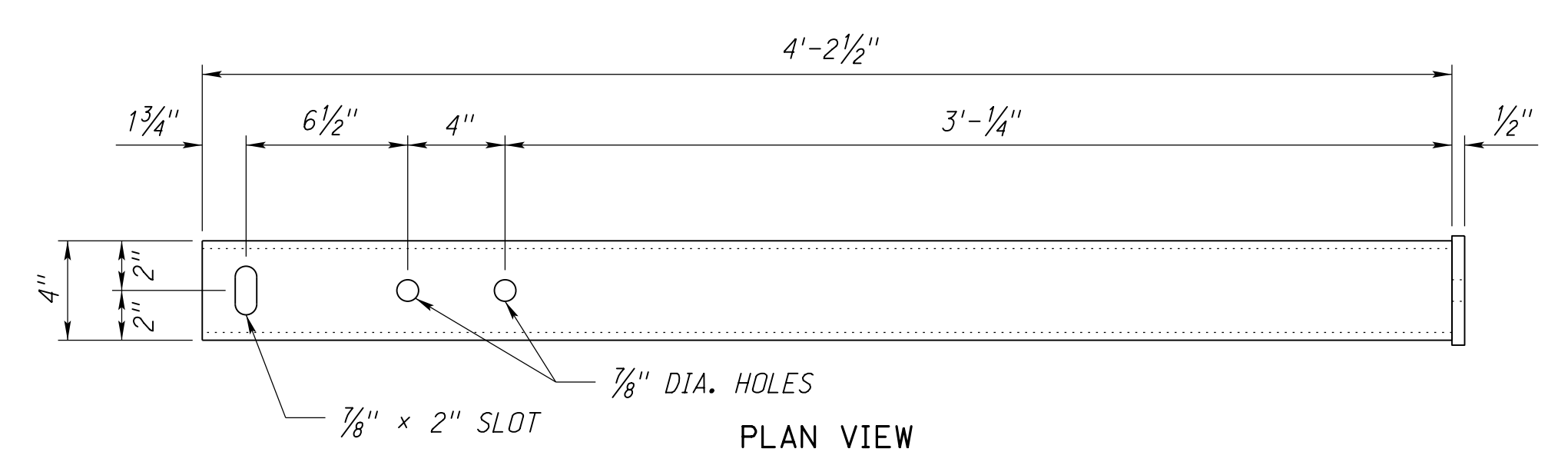
Plan 743 is also Required When Using This Plan.

ROADWAY DESIGN DIVISION

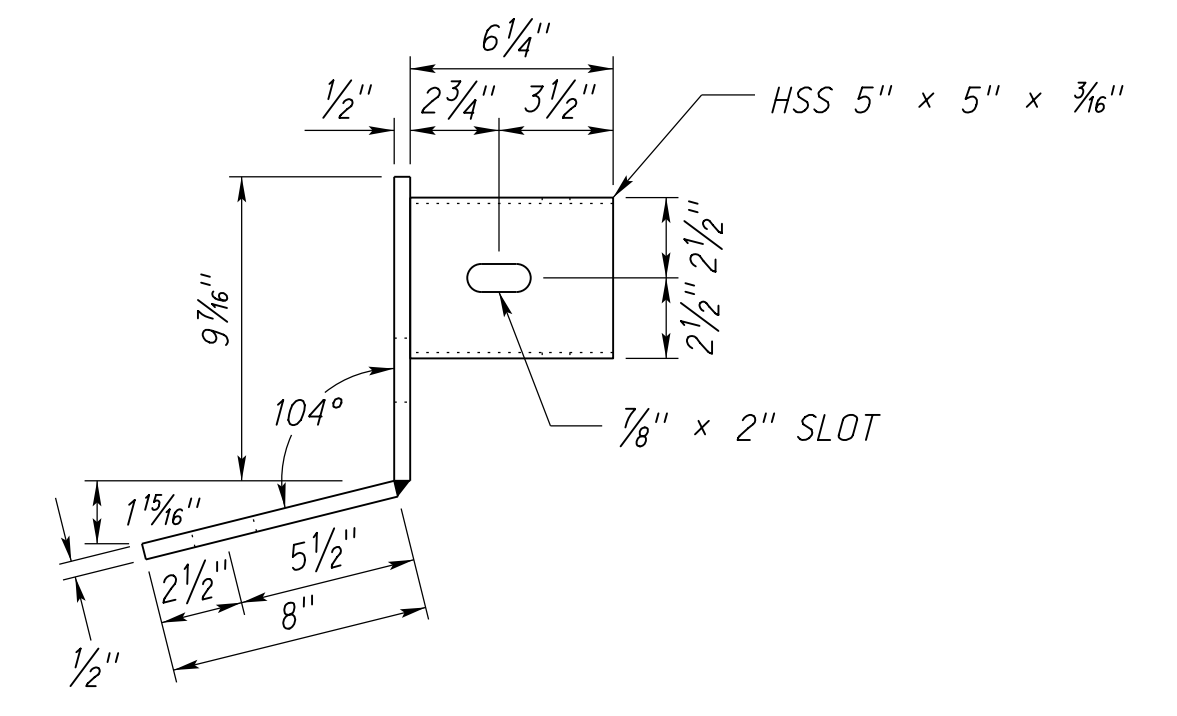
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Date: 18-MAY-2021 13:17

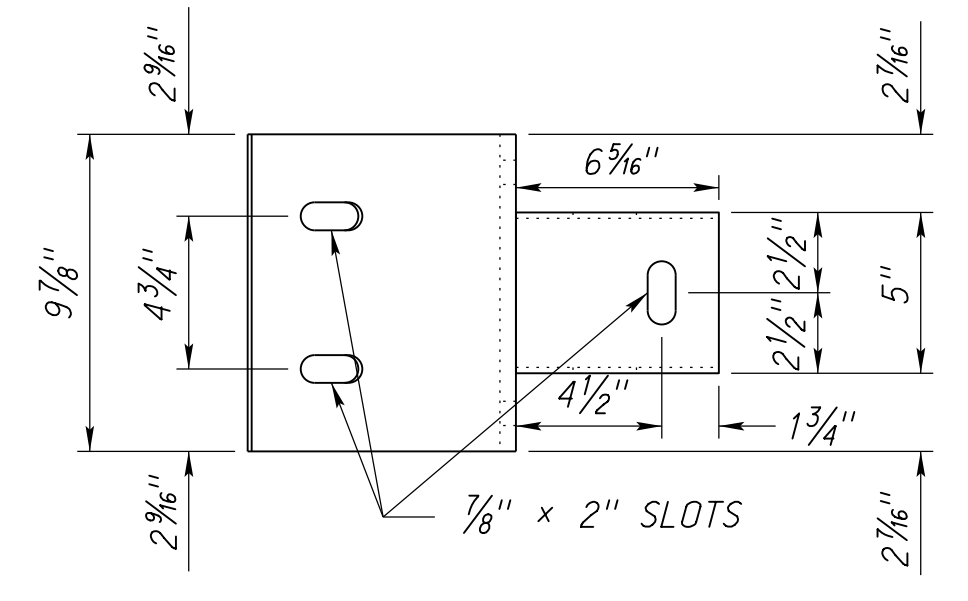
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SHEET 2 OF 2



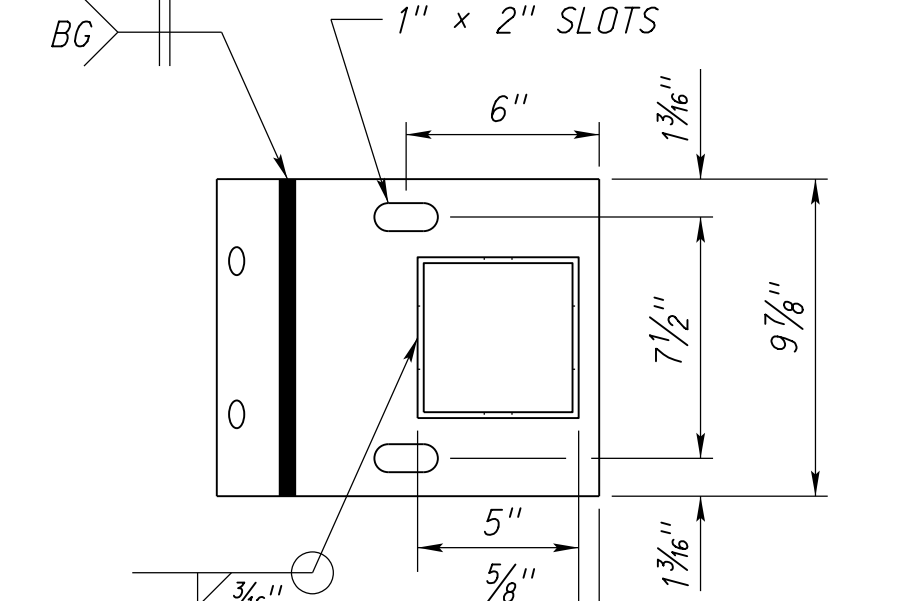
PLAN VIEW



TOP VIEW

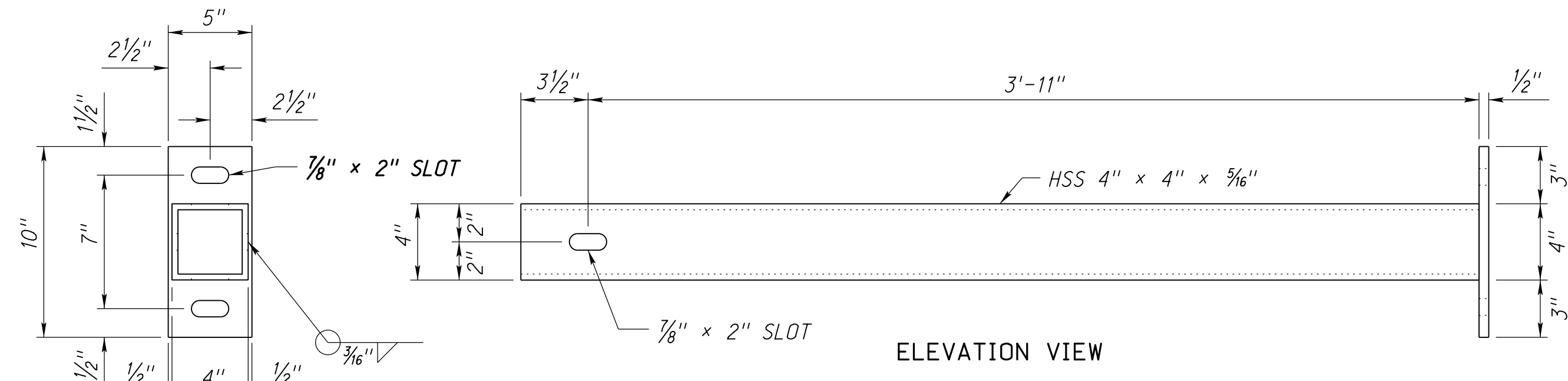


ELEVATION VIEW



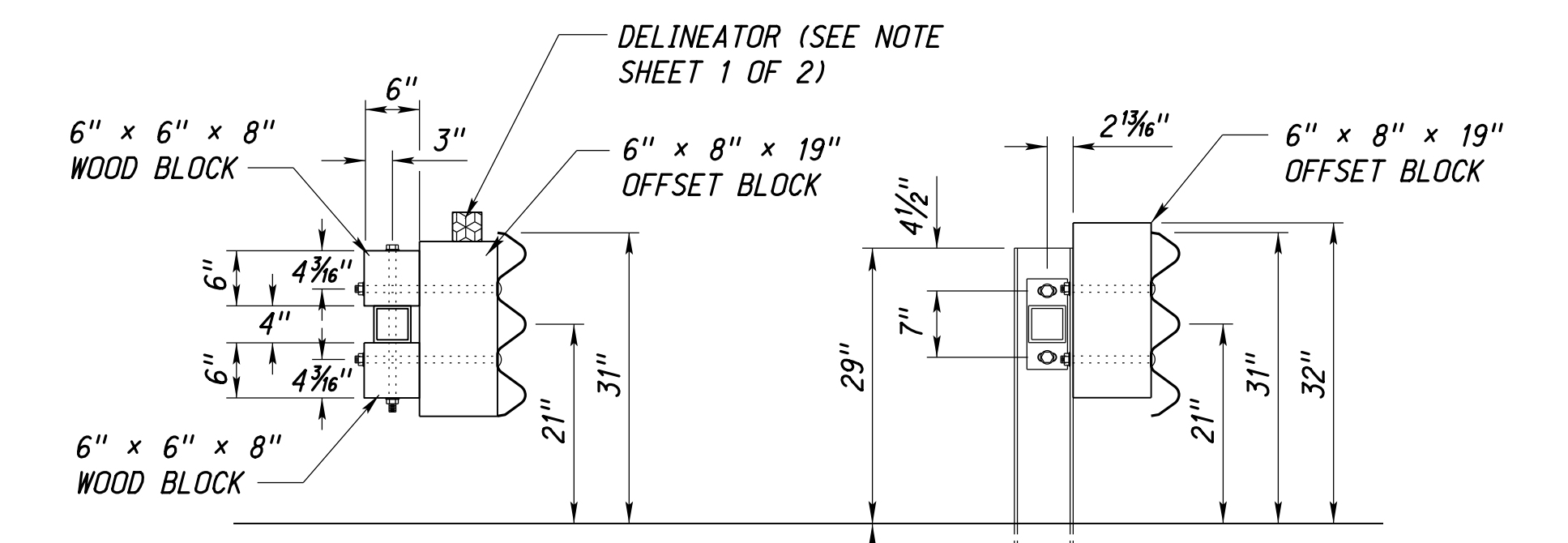
SIDE VIEW

END BRACKET DETAIL



RAIL DETAIL

SIDE VIEW

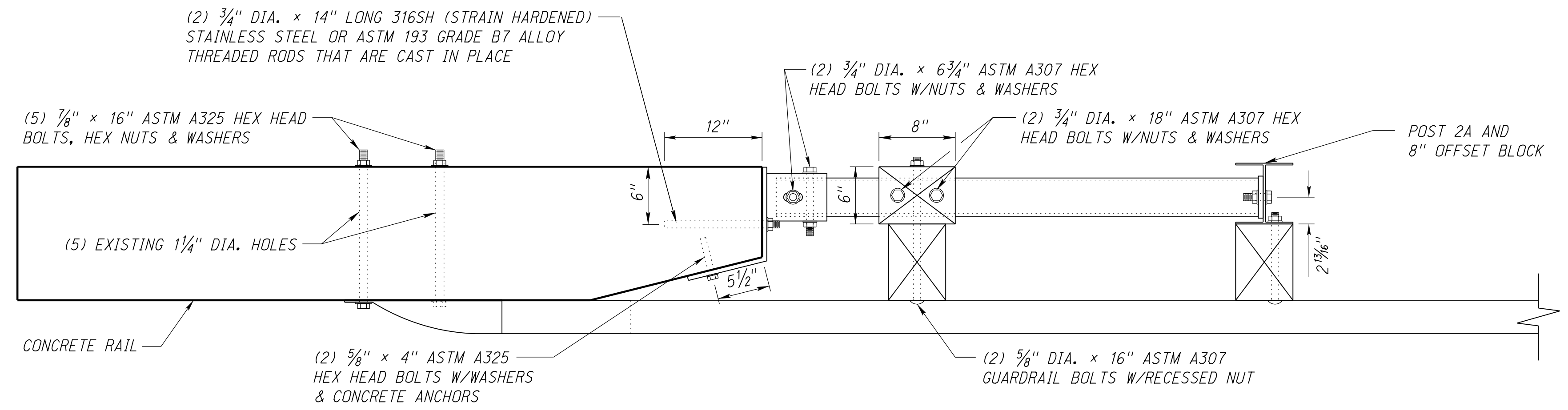


MIDSPAN RAIL SUPPORT

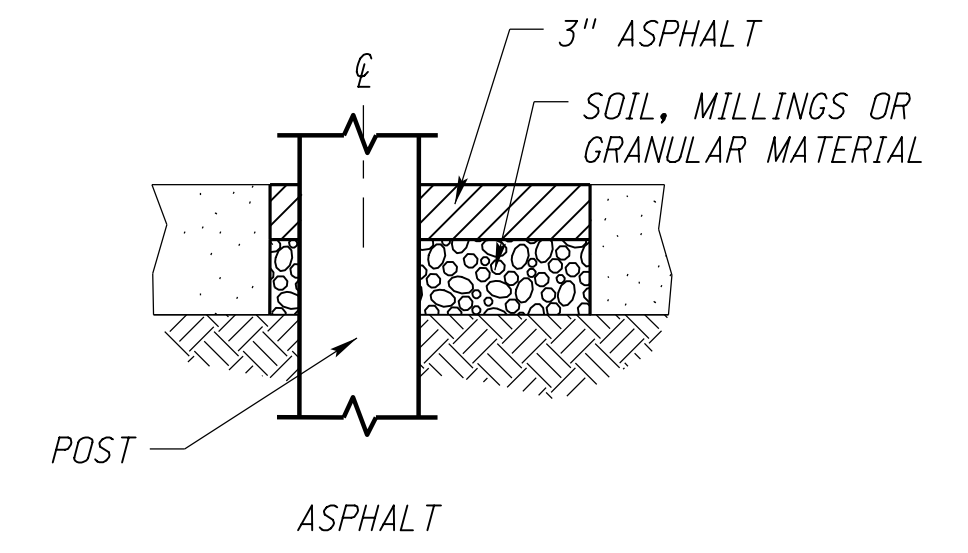
POST 2A

NOTE:
OFFSET BLOCK LISTED ON THE APPROVED PRODUCTS LIST MAY ALSO BE USED.

ALTERNATE ASSEMBLY



PLAN VIEW



DETAIL OF BACKFILLING AROUND POST

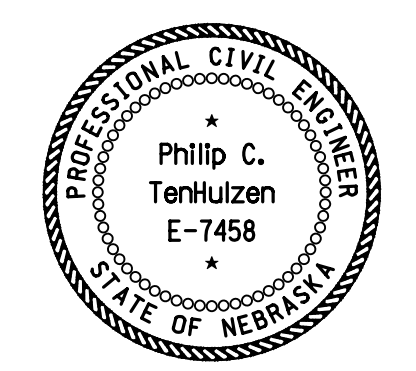
GUARDRAIL POSTS IN SURFACING

NOTE:
ALL STEEL MEMBERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

IN LIEU OF THE CAST IN PLACE 3/4" DIA. x 14" ANCHOR BOLTS, THE CONTRACTOR MAY GROUT 3/4" DIA. x 12" BOLTS INTO 7/8" DIA. x 12" DRILLED HOLES. ALL GROUT USED SHALL BE AN APPROVED NON-SHRINK GROUT. FOR 5/8" DIA. BOLTS USE 3/4" DIA. HOLES. NO ADDITIONAL COMPENSATION WILL BE ALLOWED FOR THIS OPTION.

BRIDGE APPROACH SECTION
31" TO EXISTING
SHEET 2 OF 2

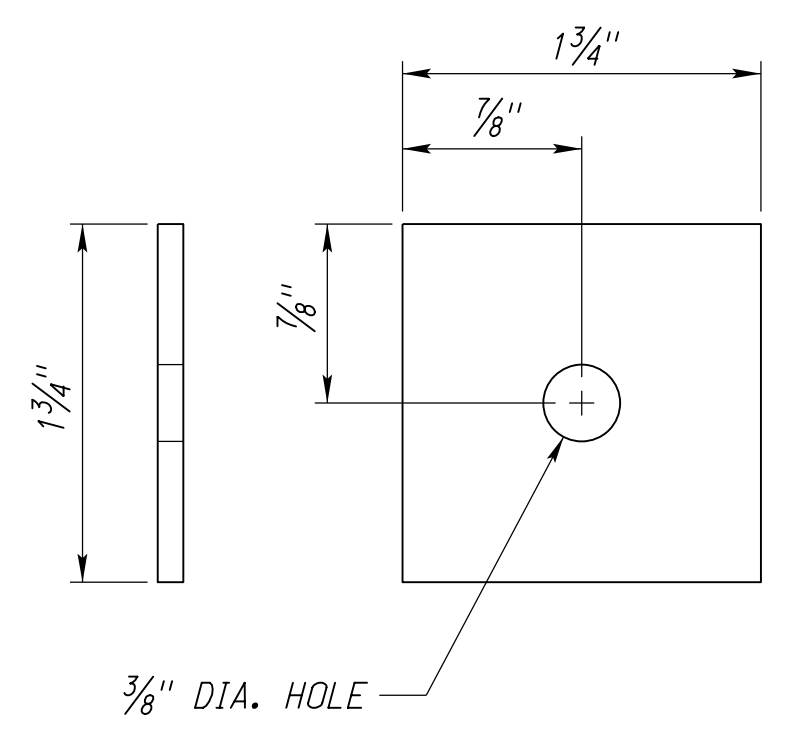
SPECIAL PLAN C



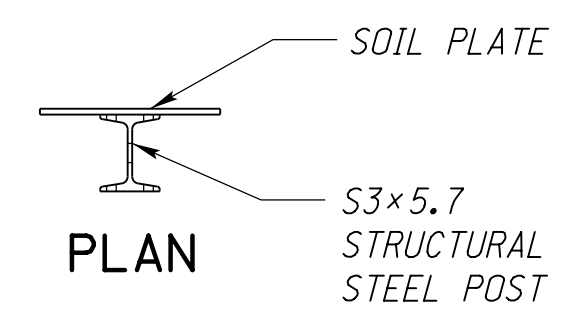
ELEVATION VIEW
MIDSPAN RAIL SUPPORT DETAIL
MUST USE POST 2A (W6 x 25 x 8'-6")

Plan 734 is also Required When Using This Plan.

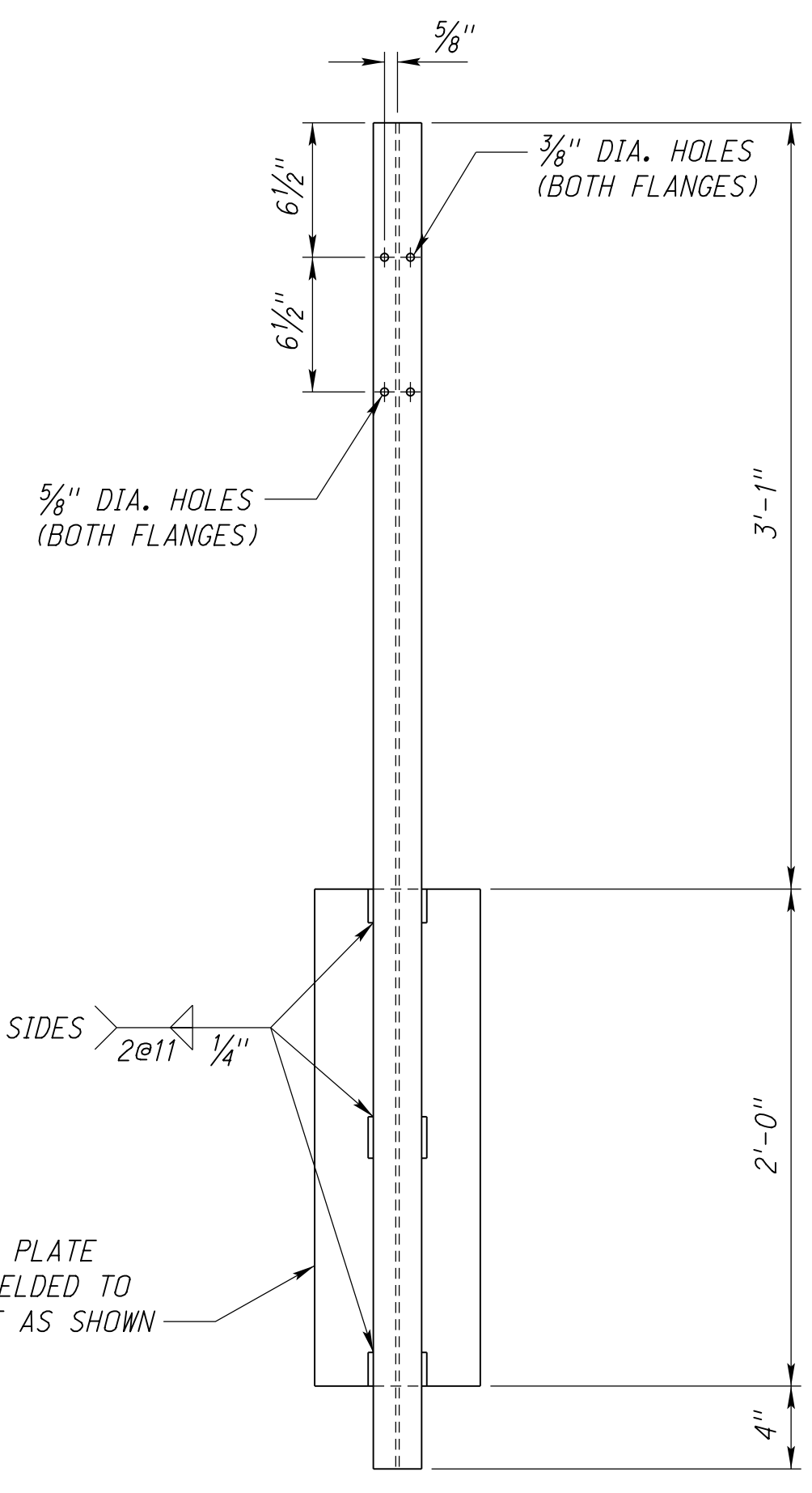
ROADWAY DESIGN DIVISION



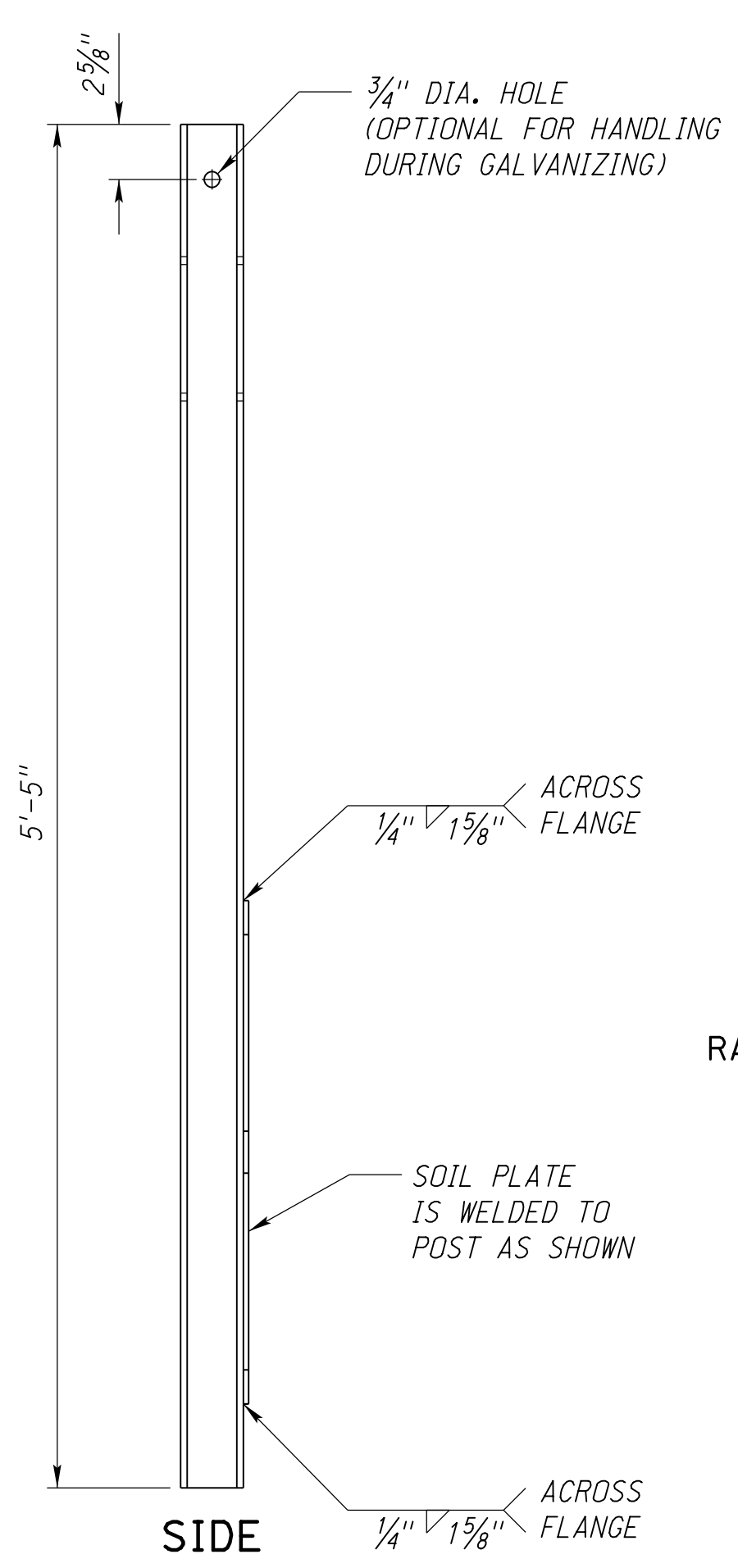
SQUARE GUARDRAIL WASHER



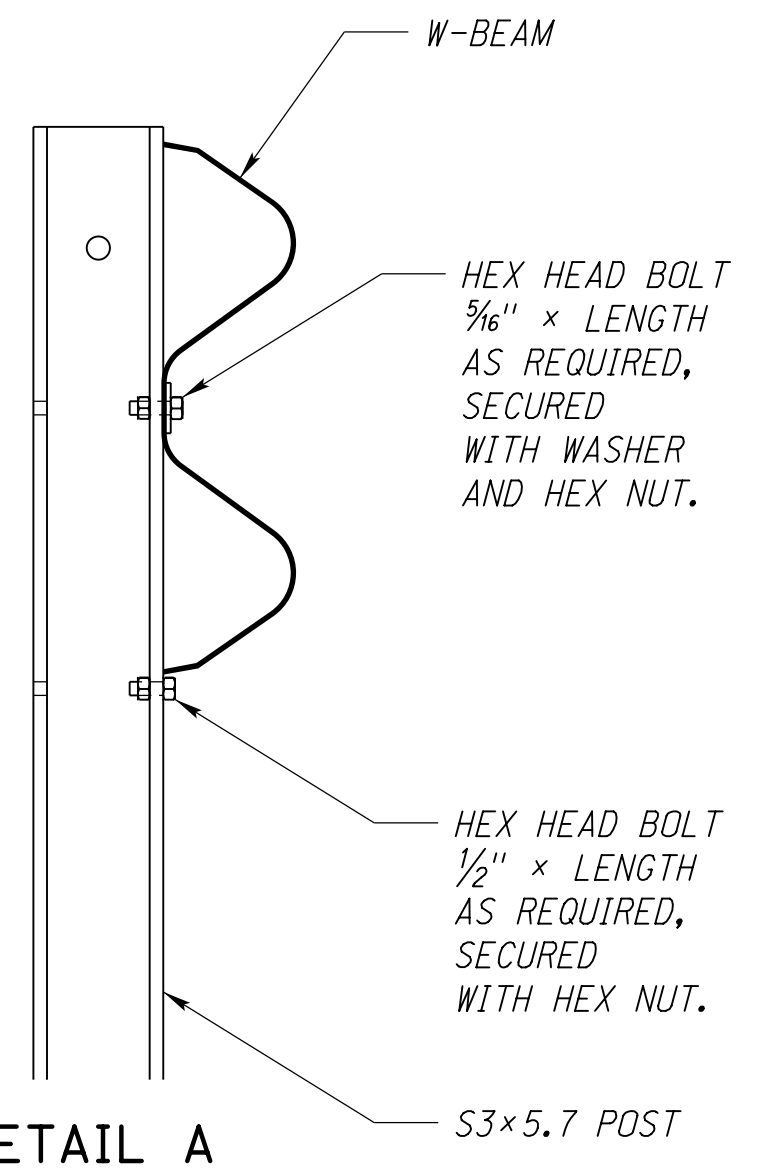
PLAN
SOIL PLATE
S3x5.7 STRUCTURAL STEEL POST



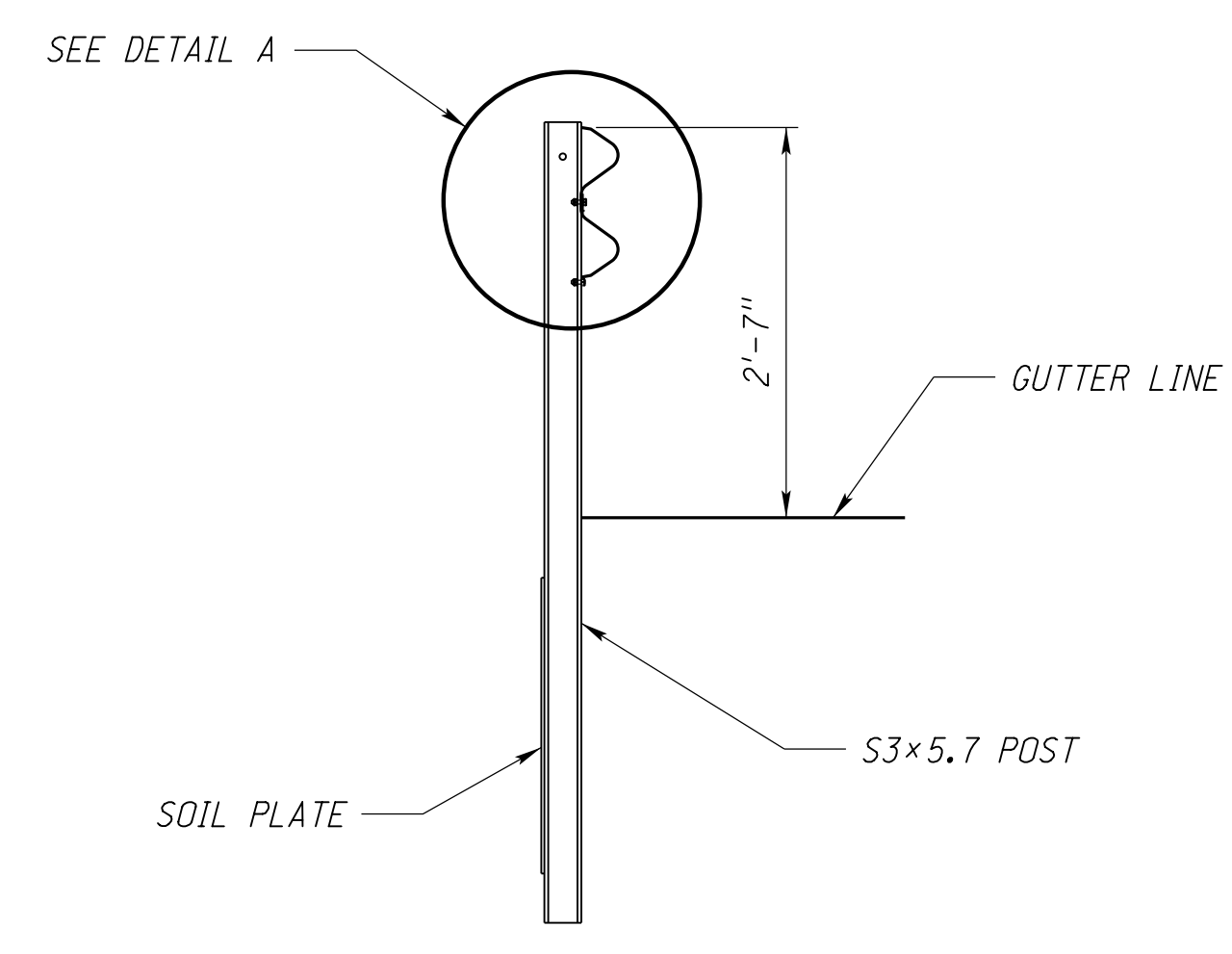
WEAK POST GUARDRAIL POST & SOIL PLATE



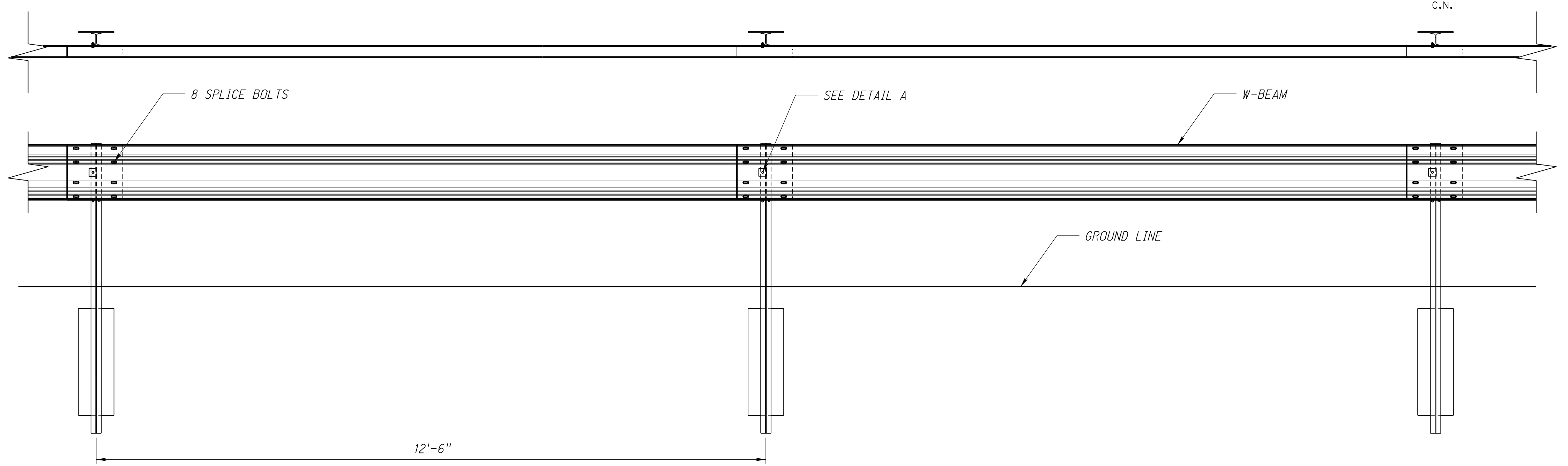
SIDE



DETAIL A
RAIL-POST ATTACHMENT



SECTION
RAIL-POST ATTACHMENT



ELEVATION

NOTES:

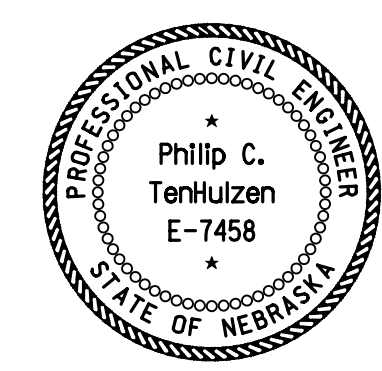
ALL POSTS SHALL BE MANUFACTURED USING STEEL CONFORMING TO ASTM A 36. THIS SECTION SHALL BE MANUFACTURED SUCH THAT IT CONFORMS TO THE GEOMETRY AND TOLERANCES OF ASTM A6 FOR A S3 x 5.7 S-SECTION. AFTER ALL PUNCHING, DRILLING, STAMPING AND WELDING IS COMPLETE, THE SECTION SHALL BE GALVANIZED ACCORDING TO ASTM A 123. ALL HOLES SHALL BE PUNCHED THROUGH BOTH FLANGES (IN-LINE).

THE SQUARE GUARDRAIL WASHER SHALL BE MANUFACTURED FROM ASTM A 36 STEEL PLATE. AFTER STAMPING OR PUNCHING, GALVANIZED PLATES SHALL BE FINISHED ACCORDING TO ASTM A 123.

MATERIAL FOR HOT DIPPED ZINC-COATED BOLTS, NUTS AND WASHERS SHALL CONFORM TO ASTM A307 GRADE A.

ALL STEEL MEMBERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

Computer: NDDTDESIGN134
Date: 18-MAY-2021 13:17
File: 74901e09.dgn
SHEET 1 OF 1 7450 1 E 00



WEAK POST GUARDRAIL
SHEET 1 OF 1
SPECIAL PLAN C