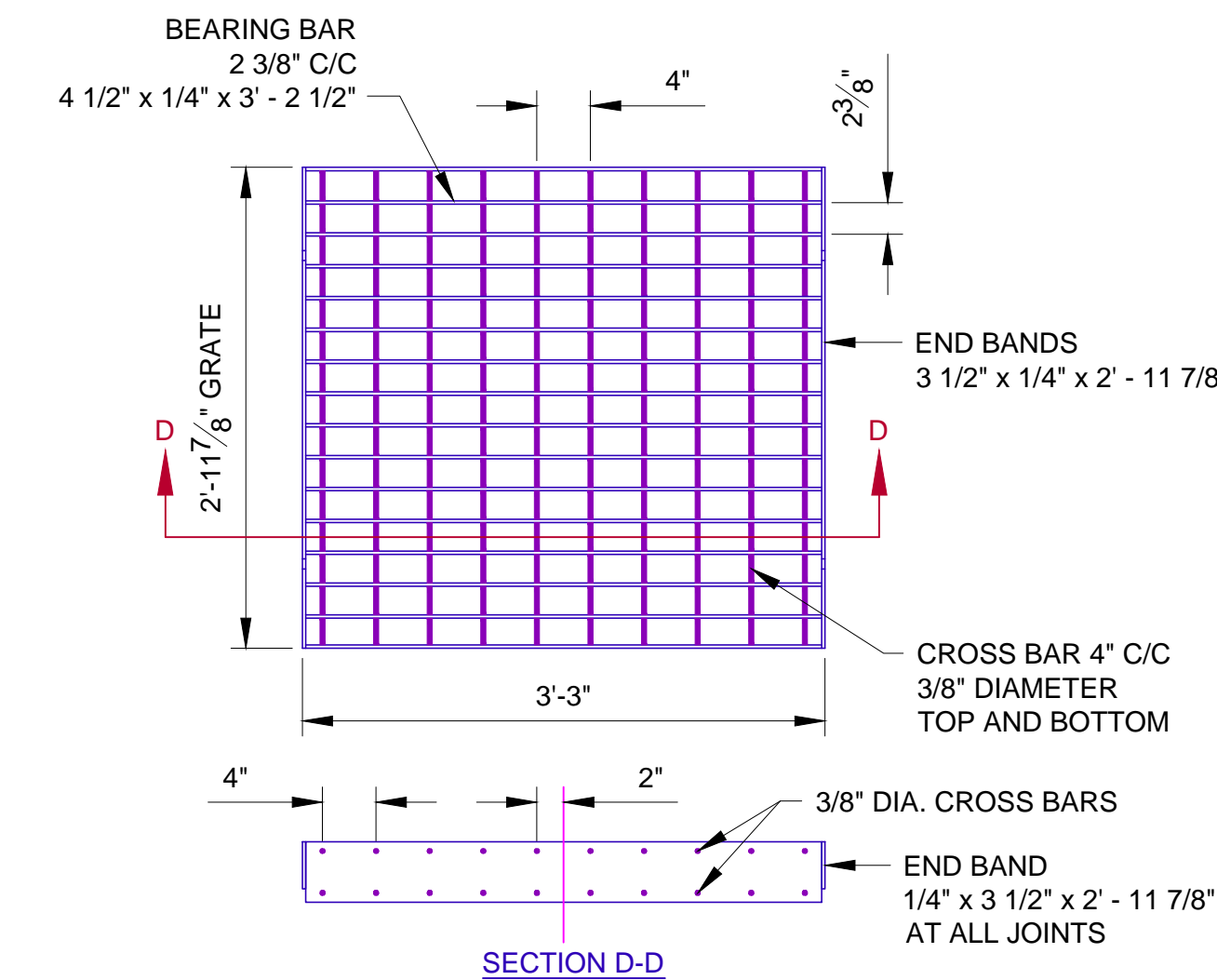
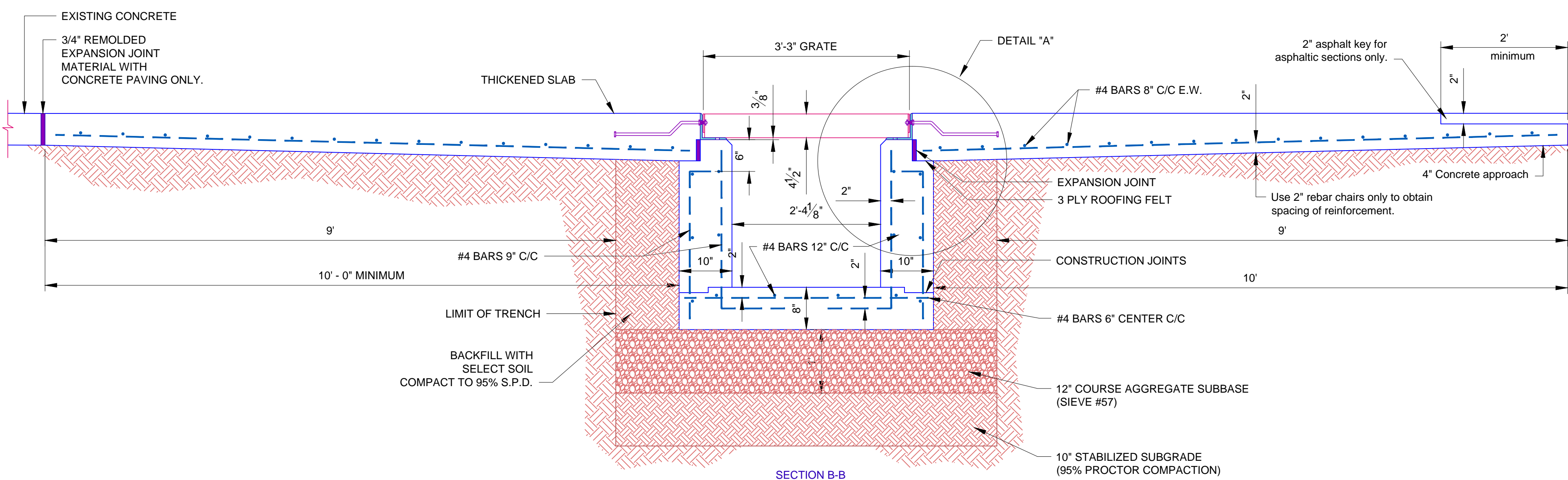
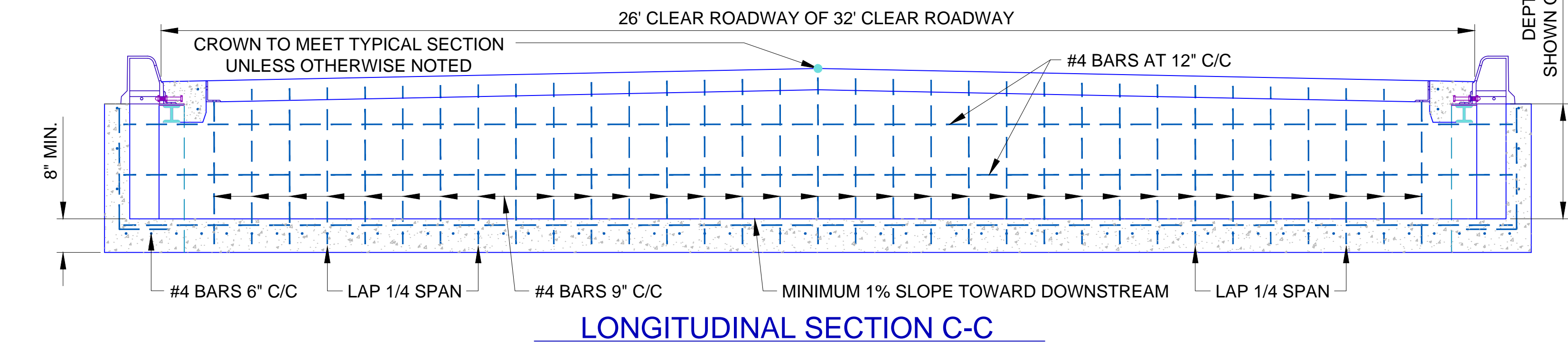
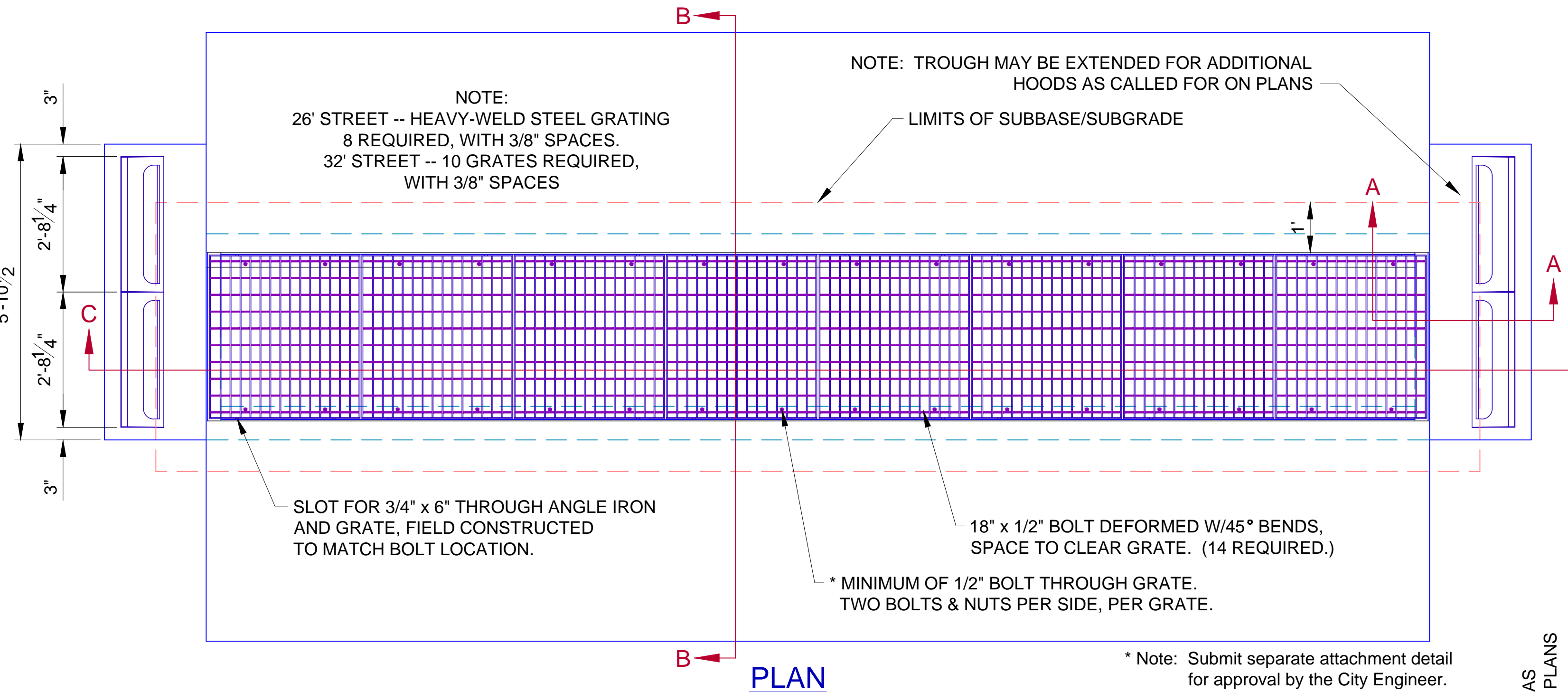
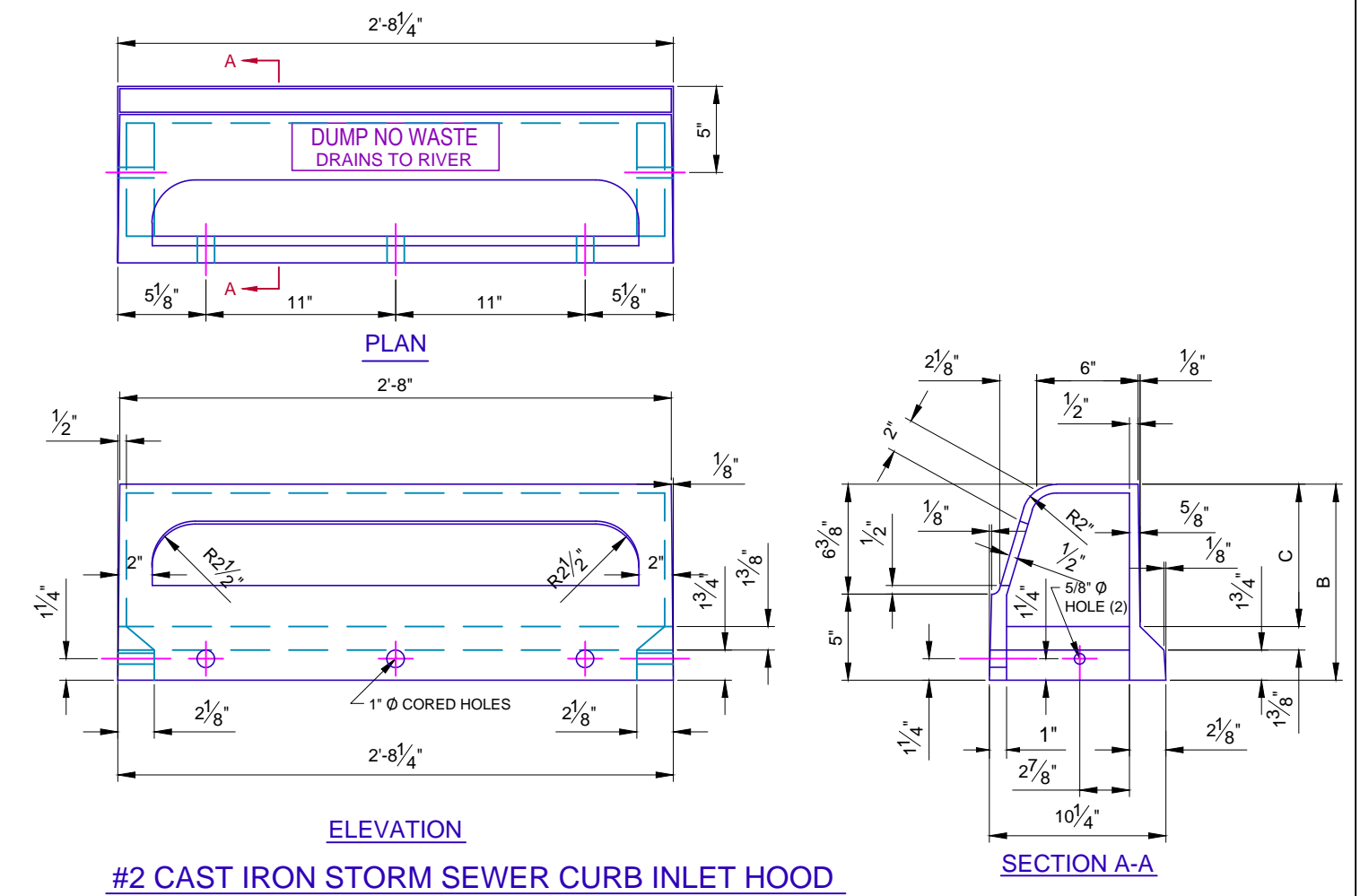
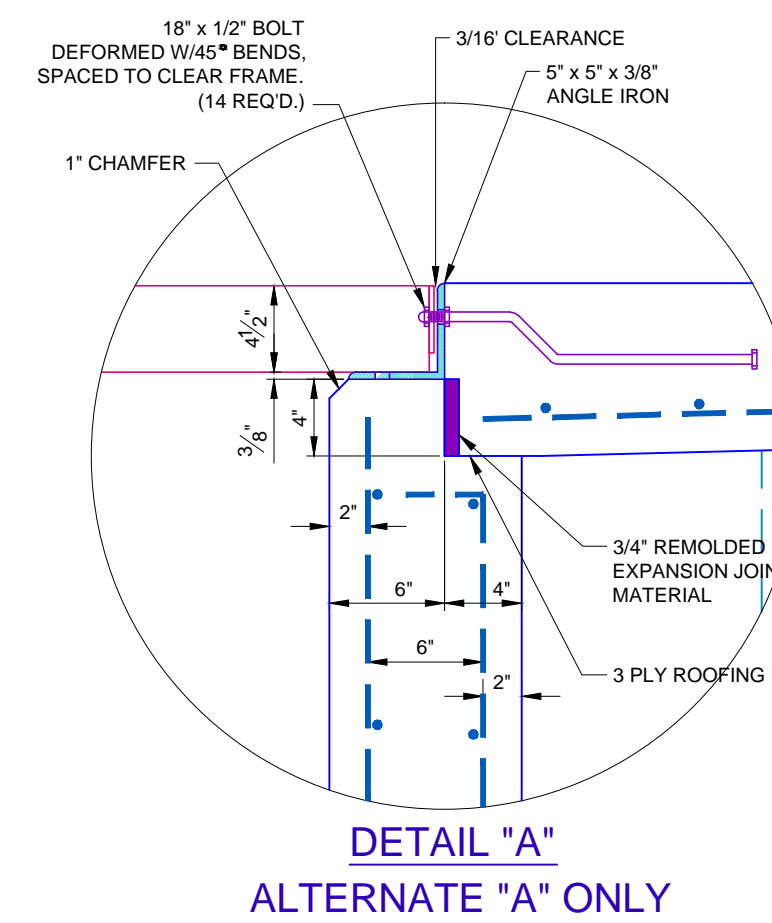


QUANTITIES OF ANGLE IRON FOR CURB INLETS		
# OF CAST HOODS	# OF PIECES	LENGTH OF 3" x 3" Δ
2 - 0	1	5' - 1 5/8"
2 - 1	1	10' - 6 1/8"
2 - 2	1	15' - 10 5/8"
2 - 3	2	10' - 6 1/8"

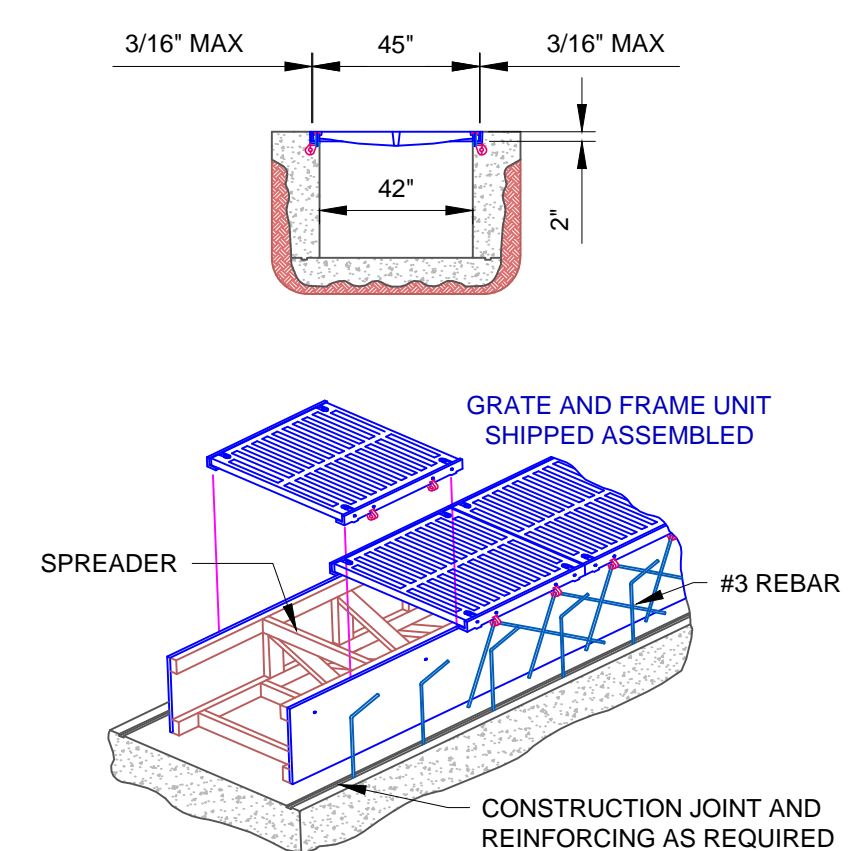
VARIABLE DIMENSION FOR ALL CURB CASTINGS			
	A	B	C
6" CURB FACE	7"	11 3/8"	8 1/4"
8" CURB FACE	9"	13 3/8"	10 1/4"

STREET WIDTH	IKG GRATE	
	SUMP	ON GRADE (NOT IN SUMP)
26'	112	67
32'	140	84



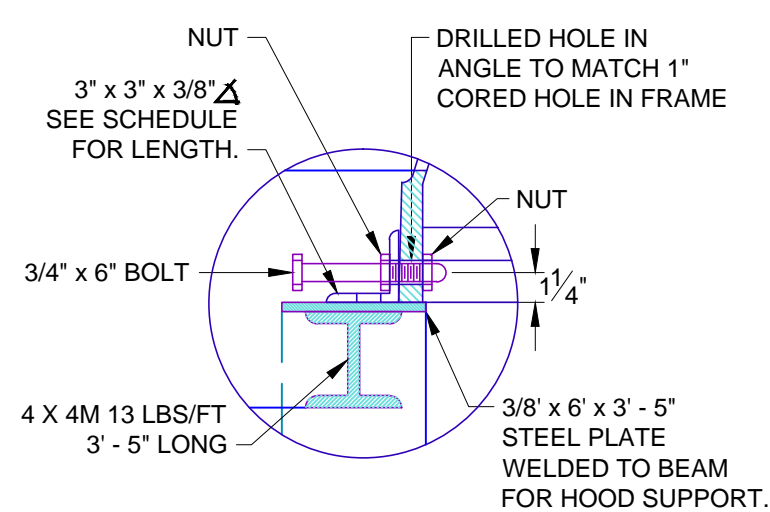
16 BEARING BARS 4 1/2" X 1/4" X 3' - 2 1/2" LONG SPACED AT 2 3/8" C/C. OVERALL DIMENSIONS 3' - 3" X 2' - 11 7/8" ARRANGED WITH 4 1/2" X 1/4" BEARING BARS 3' - 2 1/2" LONG WITH END BANDING 3 1/2" 1/4" END BANDS 2' - 11 7/8" LONG & 3/8" CROSS BARS TOP AND BOTTOM, 4" C/C SPACED AS SHOWN.

IKG INDUSTRIES IRVING HEAVY - WELD GALVANIZED STEEL GRATING TYPE HE ALTERNATE "A" ONLY

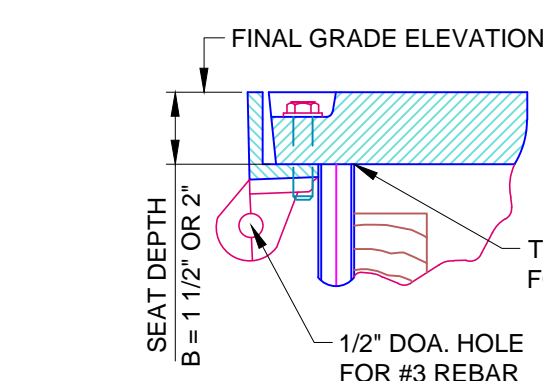


NEENAH FOUNDRY -- Type R-4999-NX w/ Type C Frame OR APPROVED EQUIVALENT

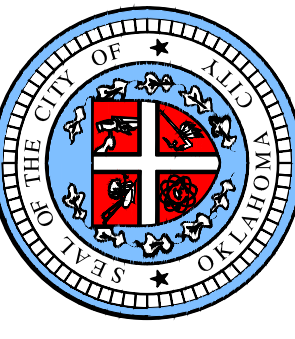
ALTERNATE "B" ONLY
To be installed as per manufacturer's specifications.

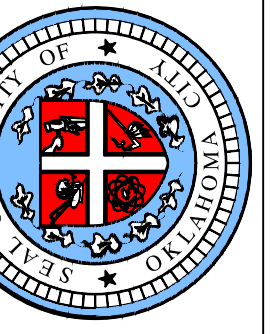


DETAIL "B" ALTERNATE "A" ONLY
NOTE: ANGLE IRON TO BE BOLTED TO CURB WITH 3(3/4" x 6") MACHINE BOLTS IN EACH CURB SECTION



DETAIL "B" ALTERNATE "B" ONLY
For dimensions chart see 102-a06

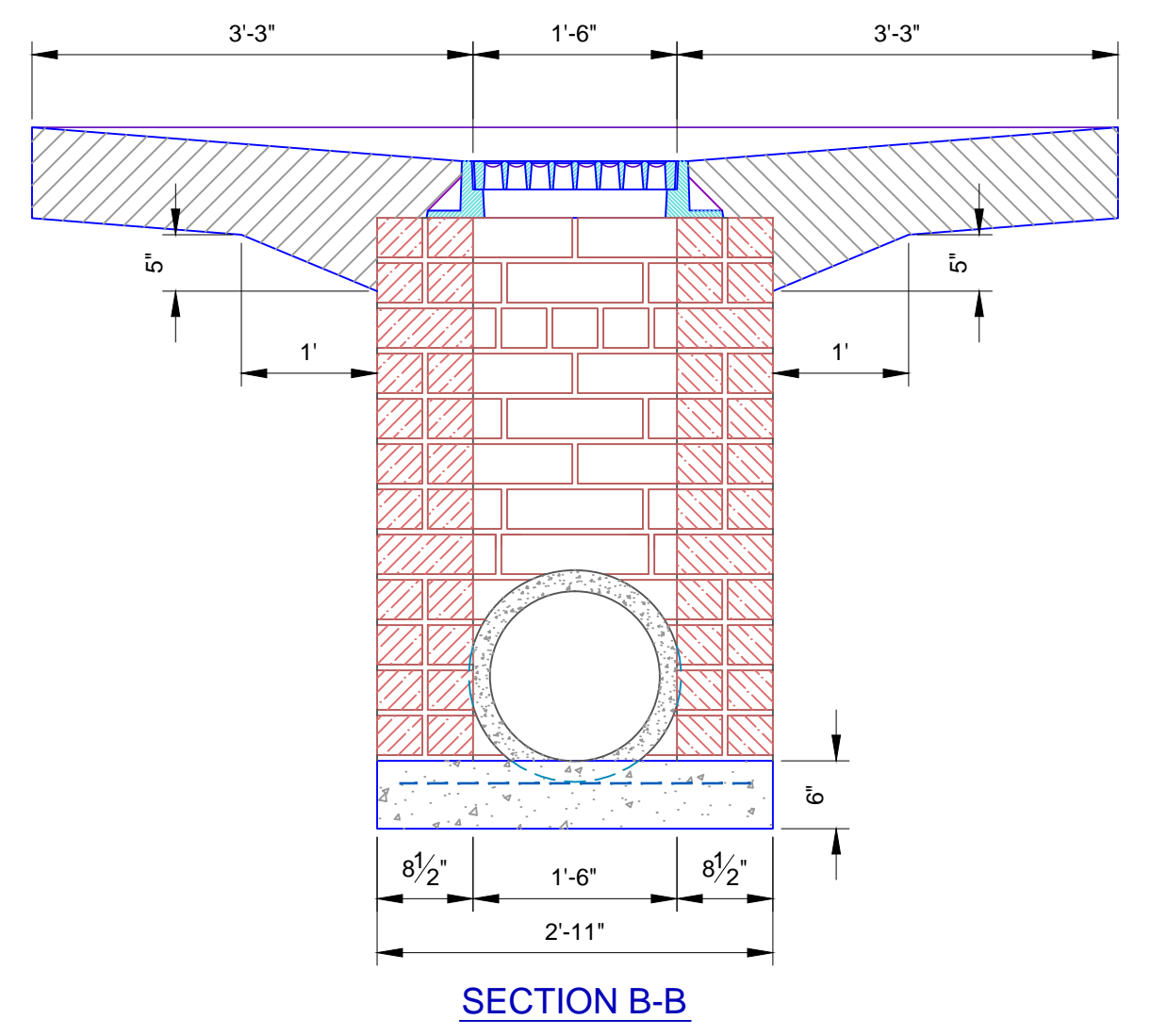
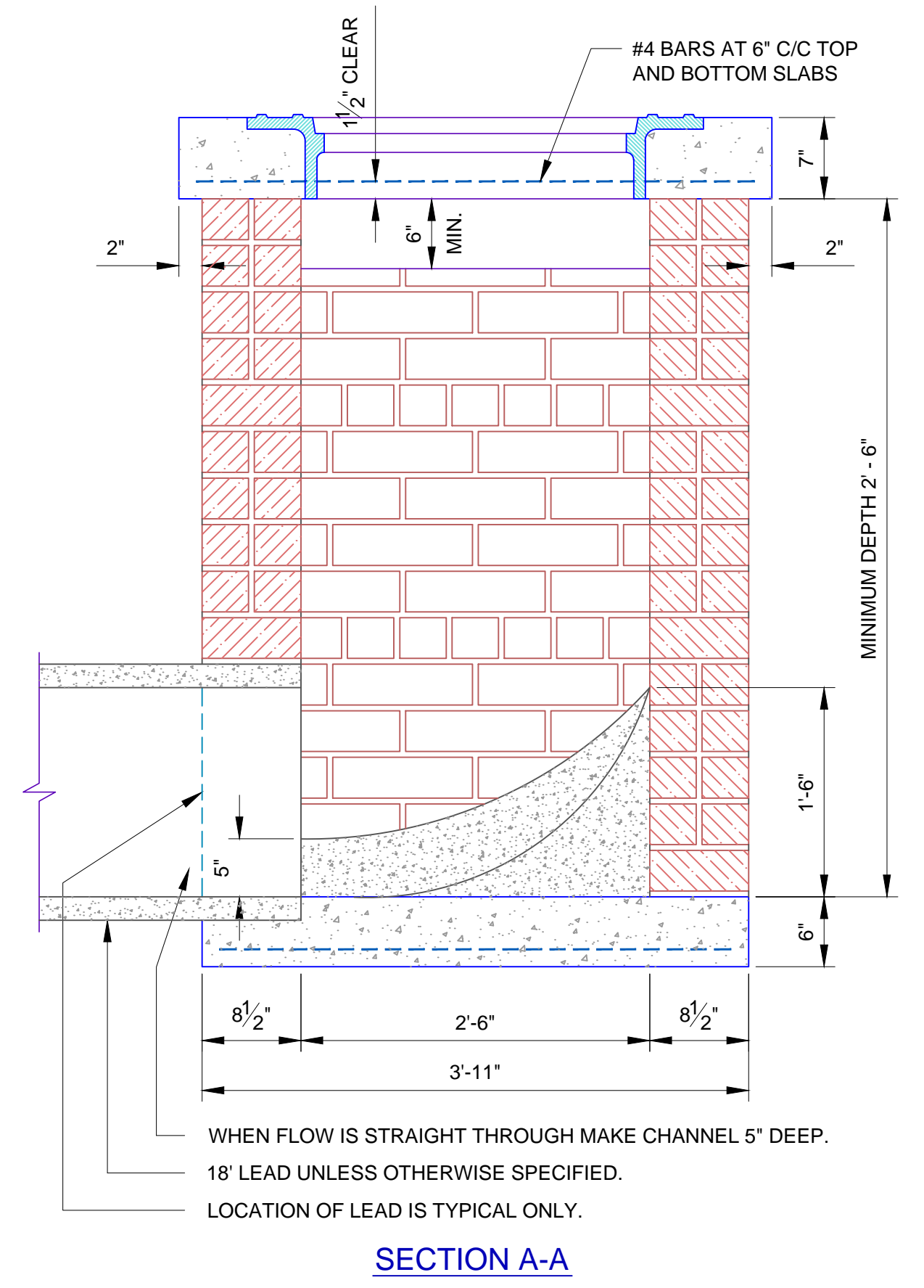
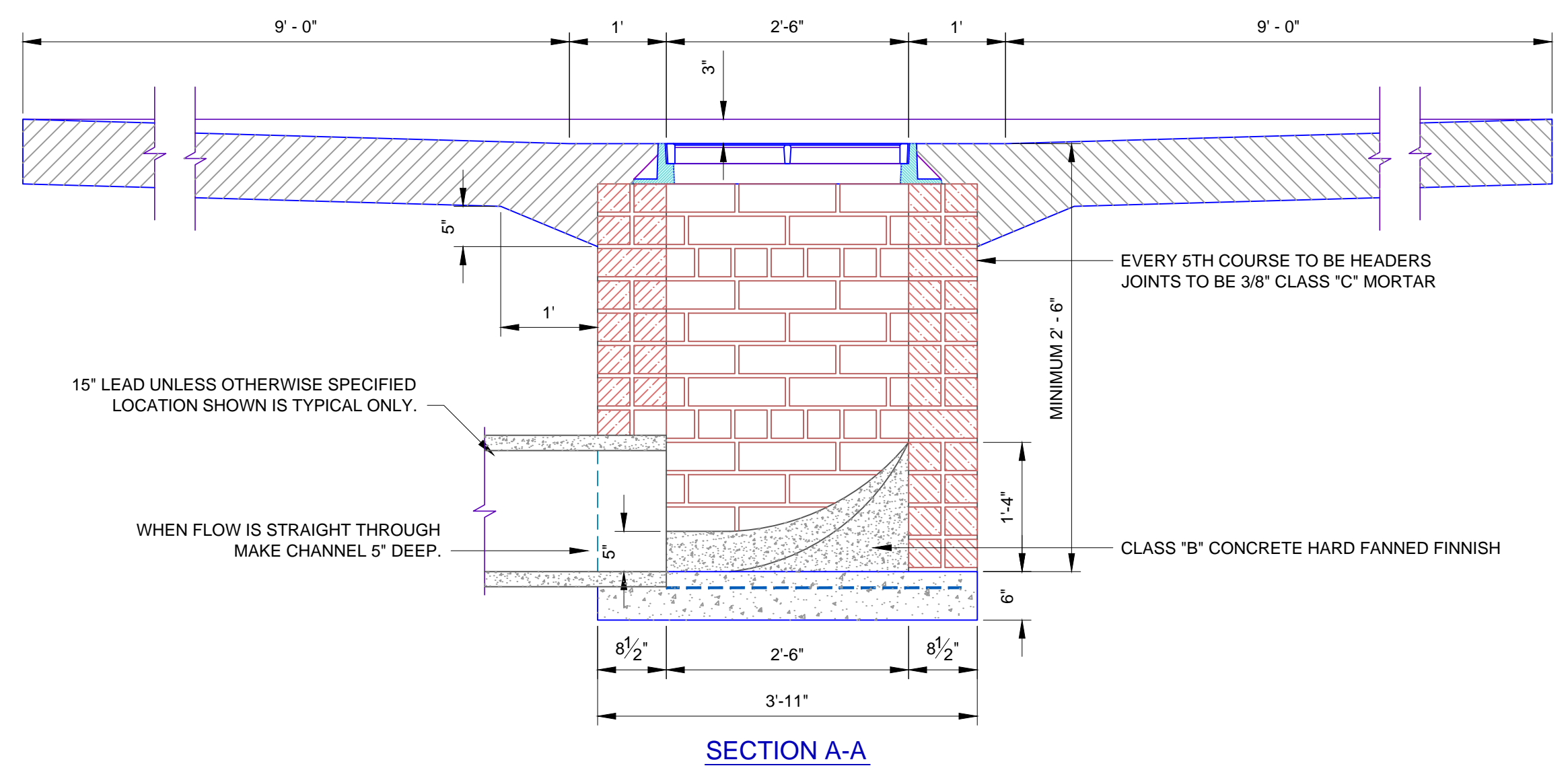
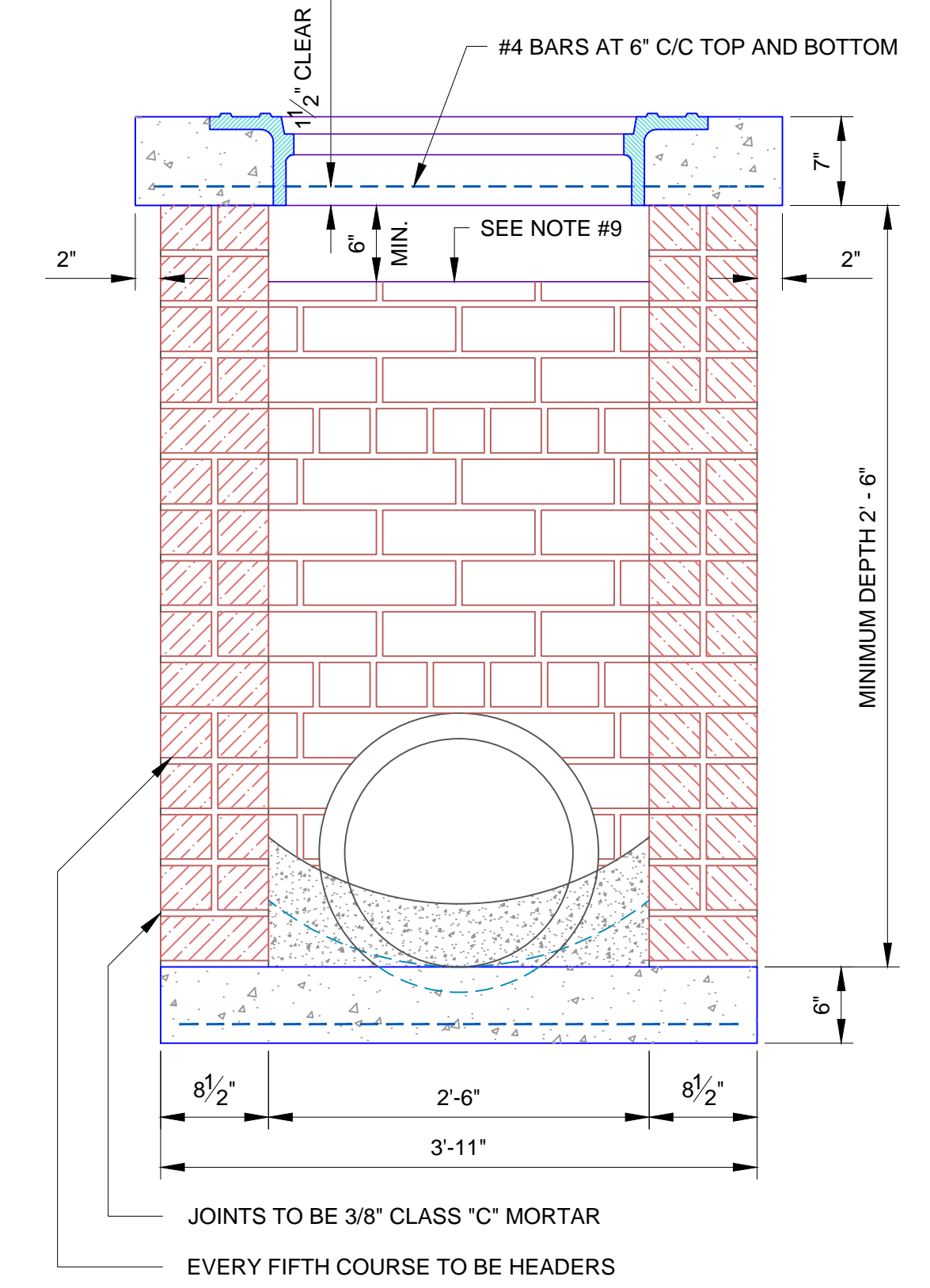
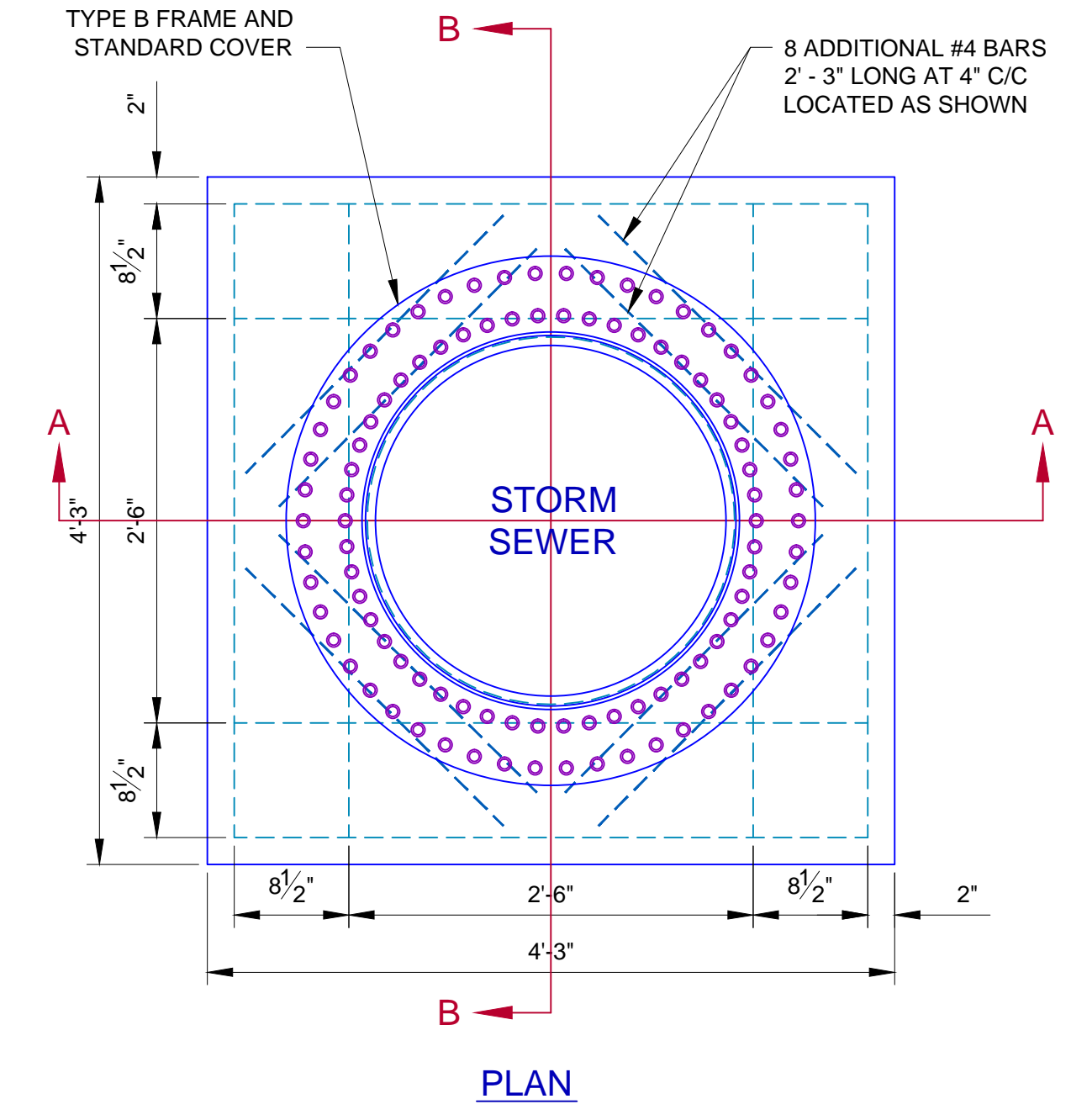
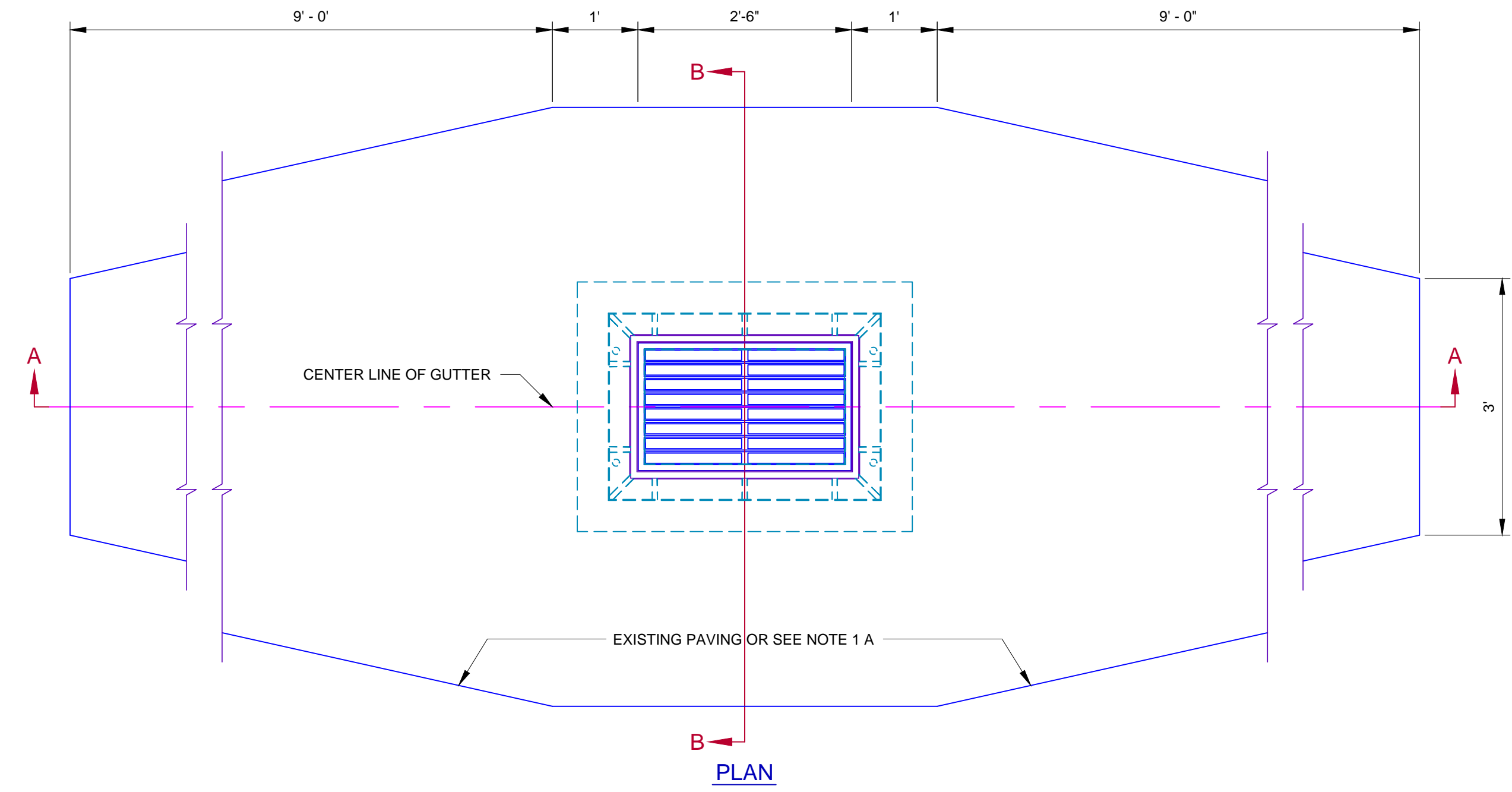




APPROVED BY: DATE: 01-31-13
ERIC J. WENGER, P.E.
CITY ENGINEER
DRAWN: VSC
DATE: 01-31-13

**STANDARD INLET DETAILS
DESIGN # 5 (SINGLE GRATING)
AND BOX TYPE INLET**

Drawing Number
D-103

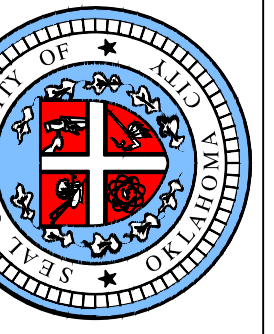


- GENERAL NOTES:**
1. WHEN INLET IS BUILT IN NEW PAVEMENT, THE PAVEMENT SHALL BE MONOLITHIC WITH NEW PAVEMENT AND CONFORM TO PLANS AND SPECIFICATIONS THEREOF.
 2. CAST IRON STEPS SHALL BE PLACED IN ALL INLETS 3' OR MORE IN DEPTH IN CONFORMITY WITH STANDARD SPECIFICATIONS.
 3. THE GRATING TO BE USED IN THIS STRUCTURE WILL BE SHOWN ON THE PLANS OR DESIGNATED IN SPECIAL PROVISIONS.
 4. THIS STRUCTURE WILL BE DESIGNED ON PLANS AS INLET NUMBER 5.
 5. BASIS OF PAYMENT FOR INLETS WILL BE FOR A LUMP SUM AS DETAILED OR UPON THE FOLLOWING ITEMS AS DESIGNATED IN THE PROPOSAL:
CUBIC FEET BRICK MASONRY
EACH TYPE "C" INLET FRAME & TYPE "A" GRATING
CUBIC YARDS TYPE "B" CONCRETE INLET BOTTOMS

**STORM SEWER INLET
DESIGN # 5 - SINGLE GRATING**

- GENERAL NOTES**
1. THIS TYPE INLET IS STANDARD FOR UNPAVED STREETS AND UNDEVELOPED AREAS.
 2. TOP SLAB MAY BE CAST IN PLACE MORTAR OR PRE-CAST AND SET IN MORTAR.
 3. CONCRETE SHALL BE 3,500 LBS. PER SQUARE INCH.
 4. BASIS OF PAYMENT SHALL BE LUMP SUM OR AS DESIGNED IN THE PROPOSAL.
 5. REINFORCING STEEL IN TOP TO BE #4 BARS 4' - 0" LONG, IN BOTTOM TO BE 3' - 8" LONG, AT 6" ON CENTERS EACH WAY.
 6. OPENINGS MAY BE OMITTED ON 1, 2, OR 3 SIDES.
 7. OKLAHOMA CITY STANDARD TYPE B FRAME STANDARD COVER SHALL BE INSTALLED IN TOP SLAB.
 8. ALL DIMENSIONS SHOWN ARE MINIMUM DIMENSIONS AND MAY VARY ACCORDING TO THE PLANS.
 9. INLET WEIR ELEVATION TO BE CONSTRUCTED TO THE ELEVATION SHOWN IN THE PLANS OR BE A MINIMUM OF 1.0' BELOW EXISTING GROUND LINE.

BOX TYPE INLET

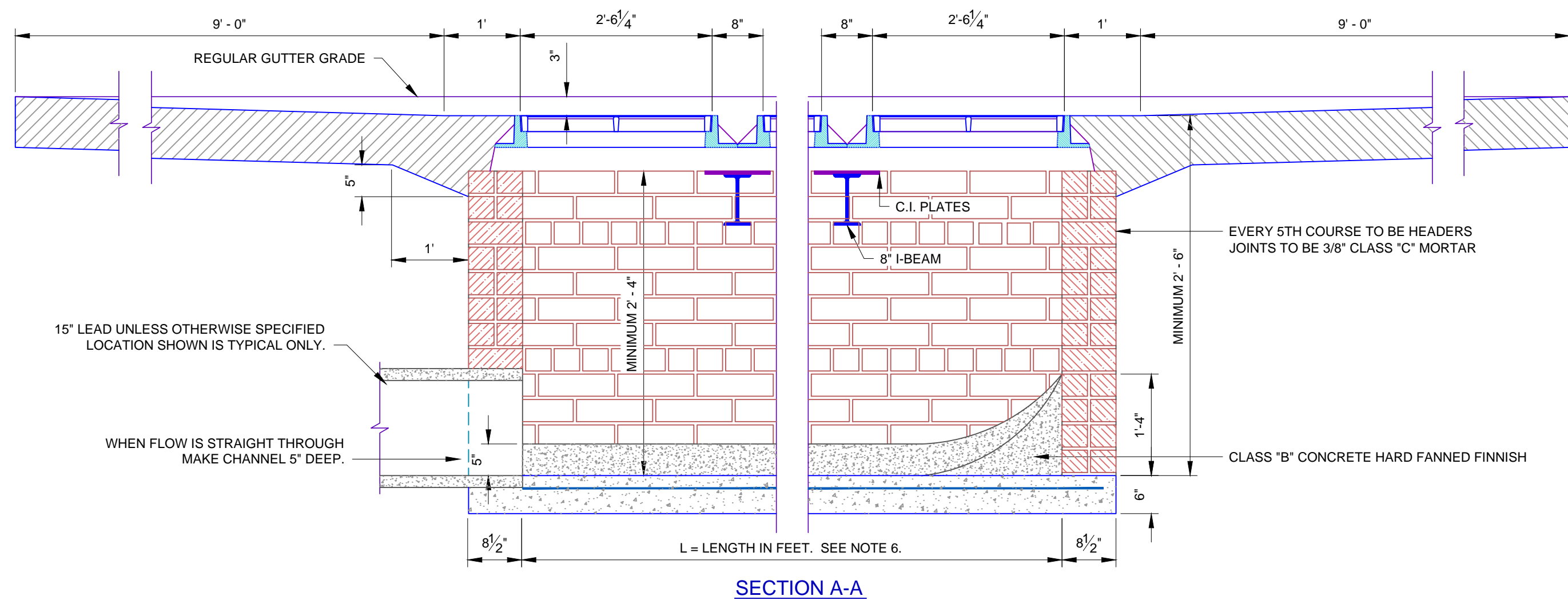
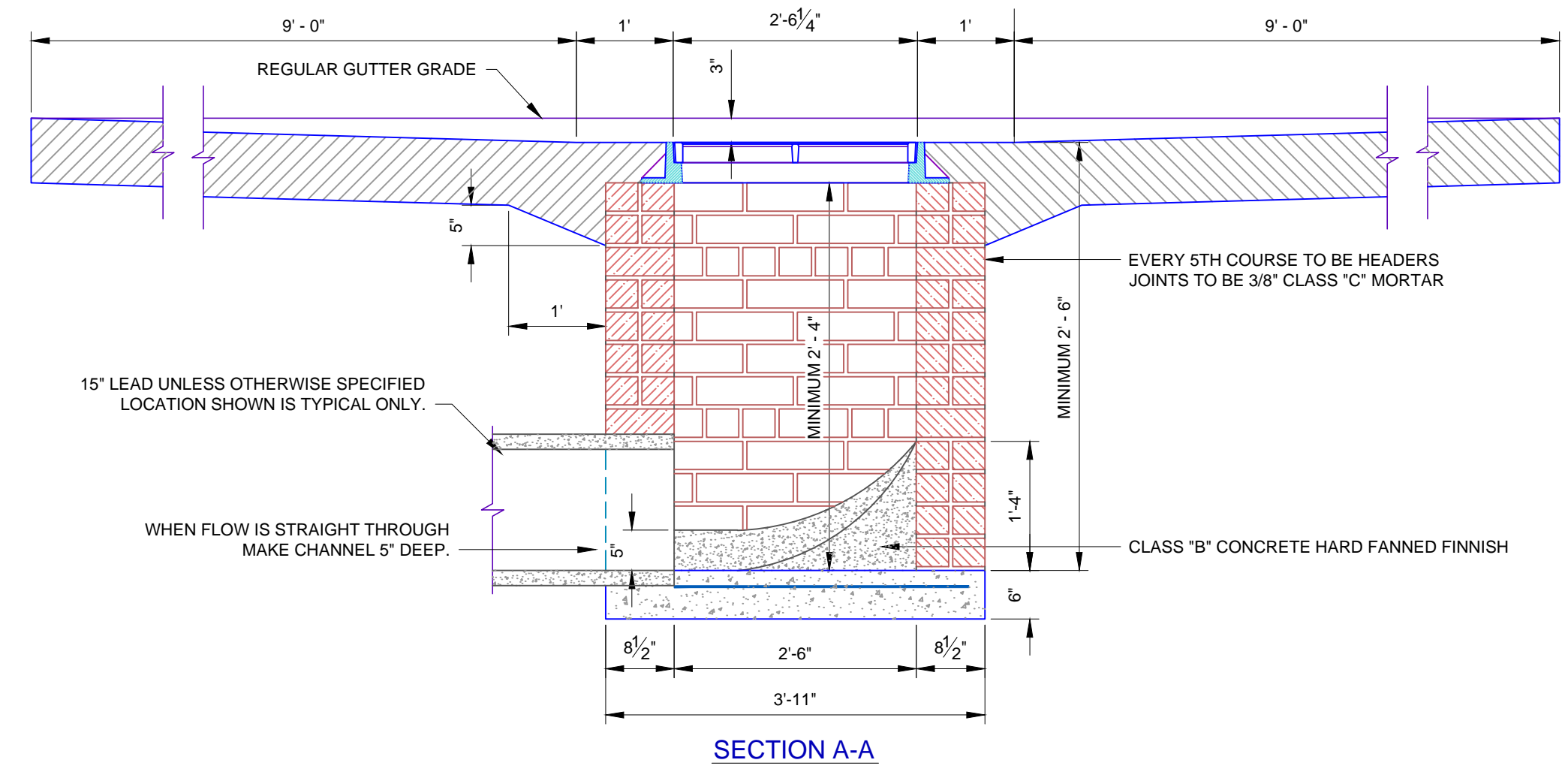
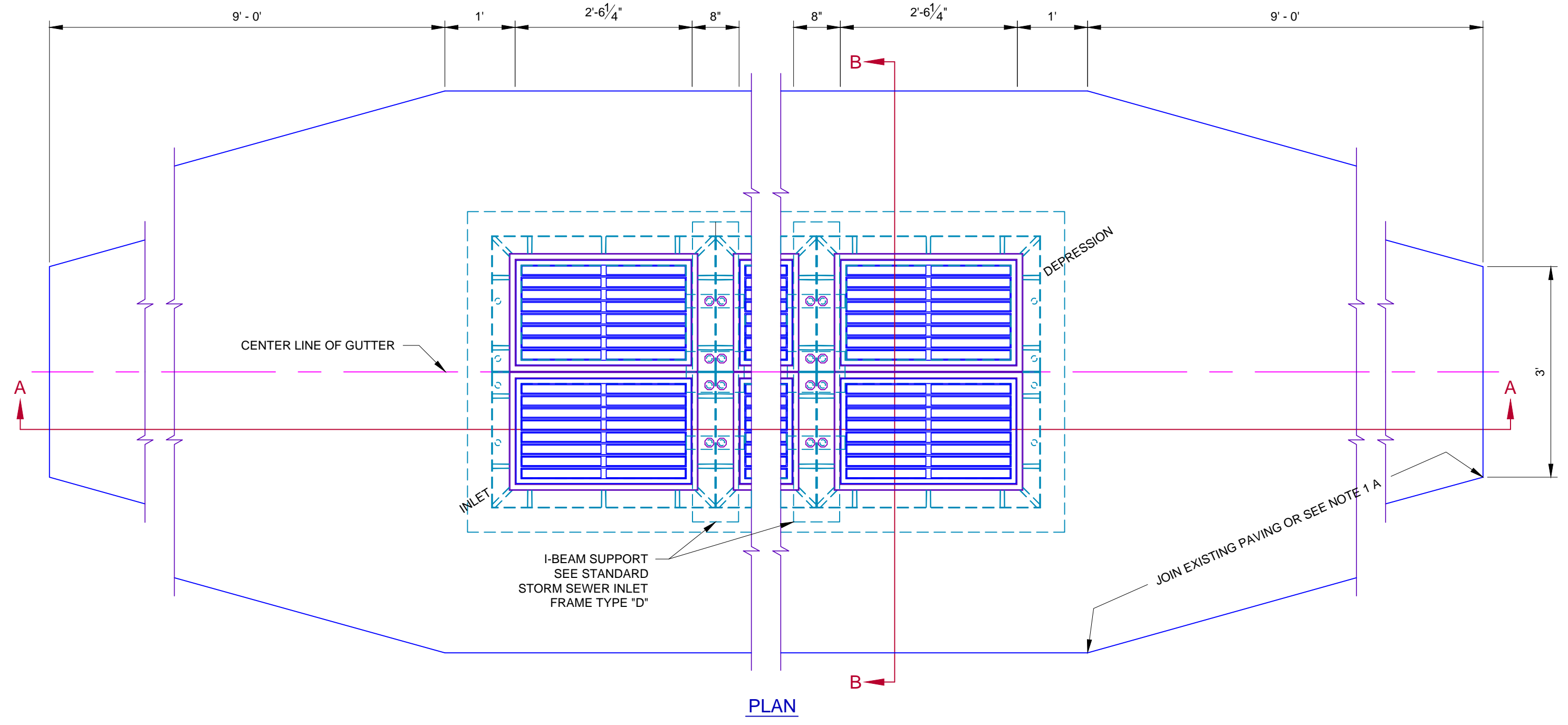
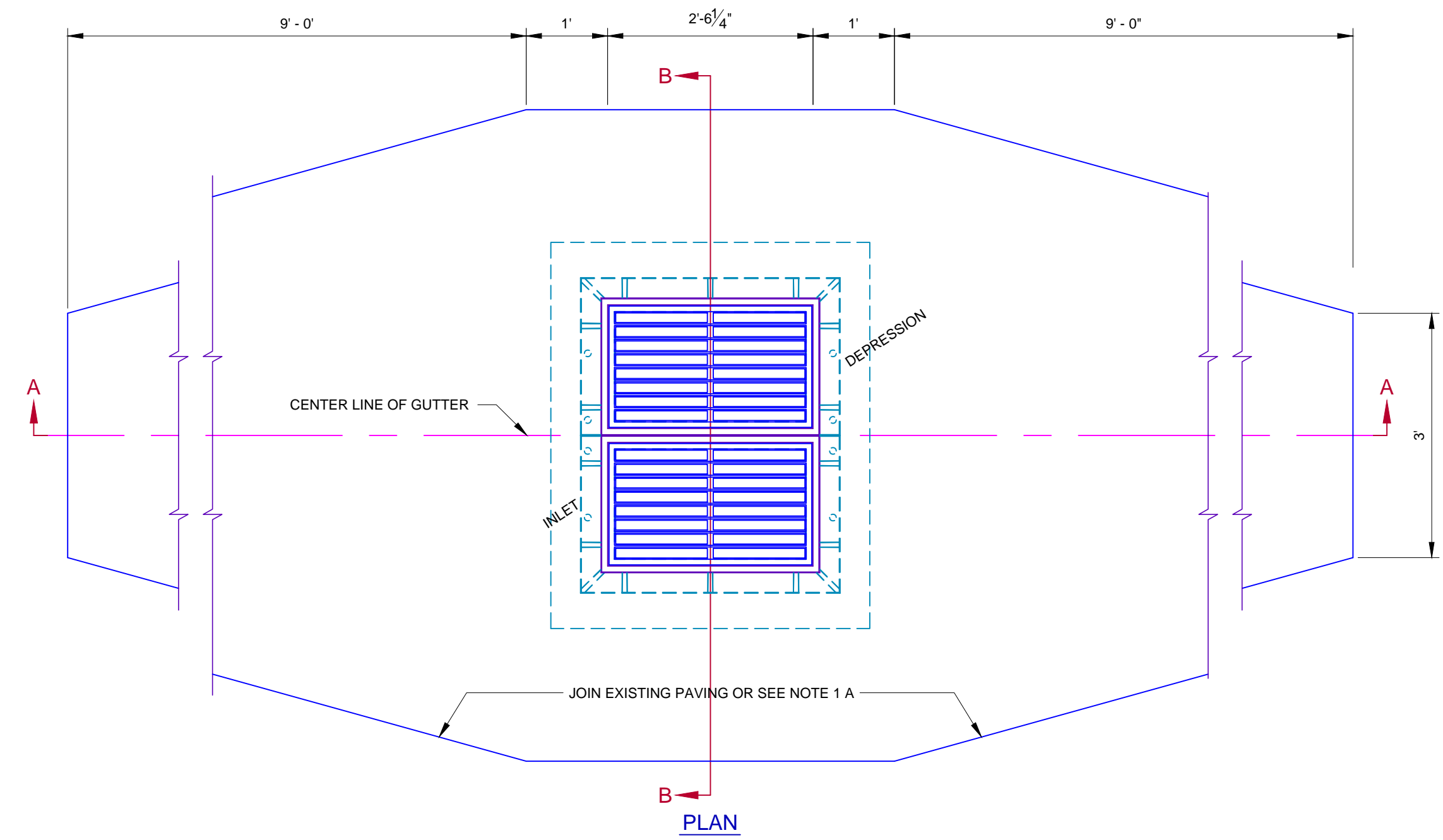


APPROVED BY: DATE: 01-31-13
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CITY ENGINEER

DRAWN: VSC
DATE: 01-31-13

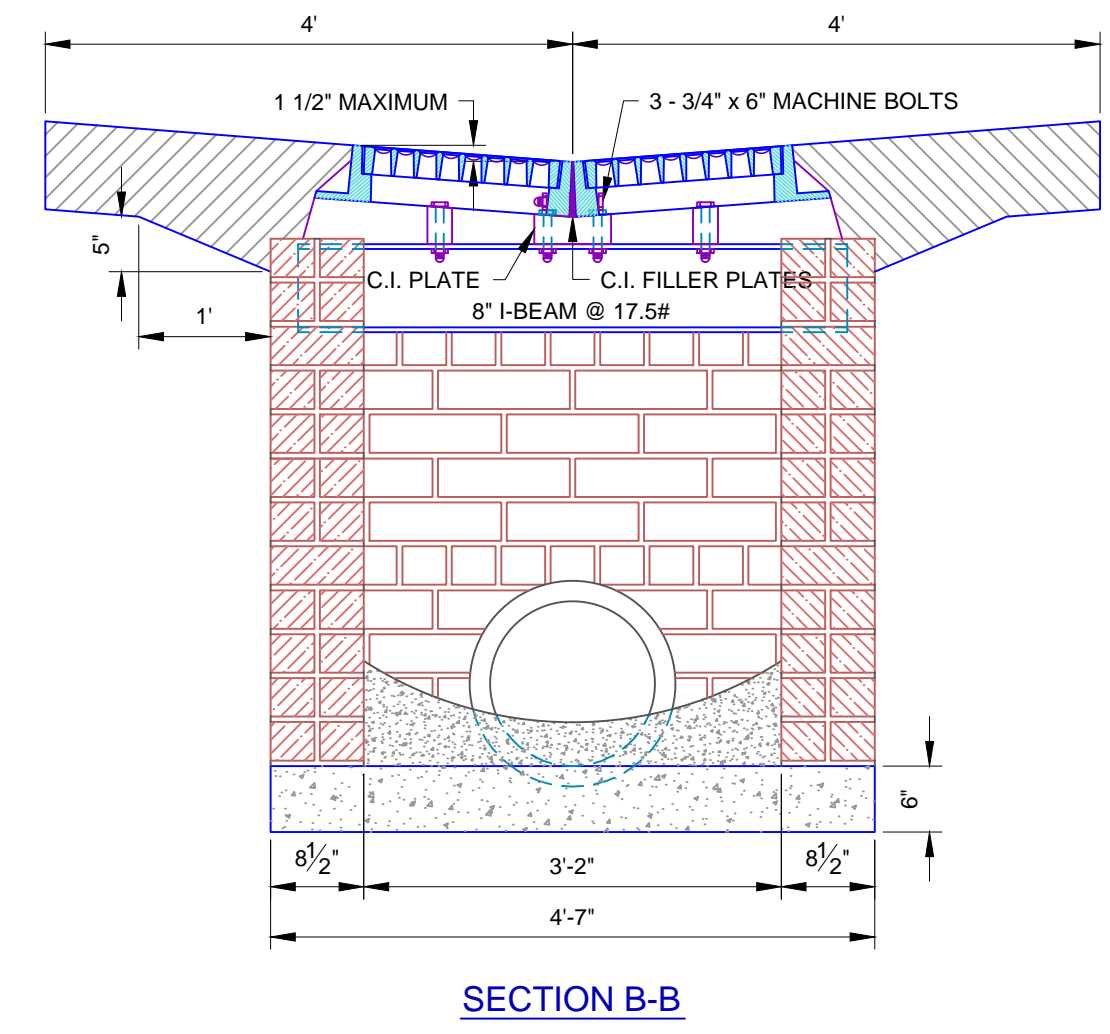
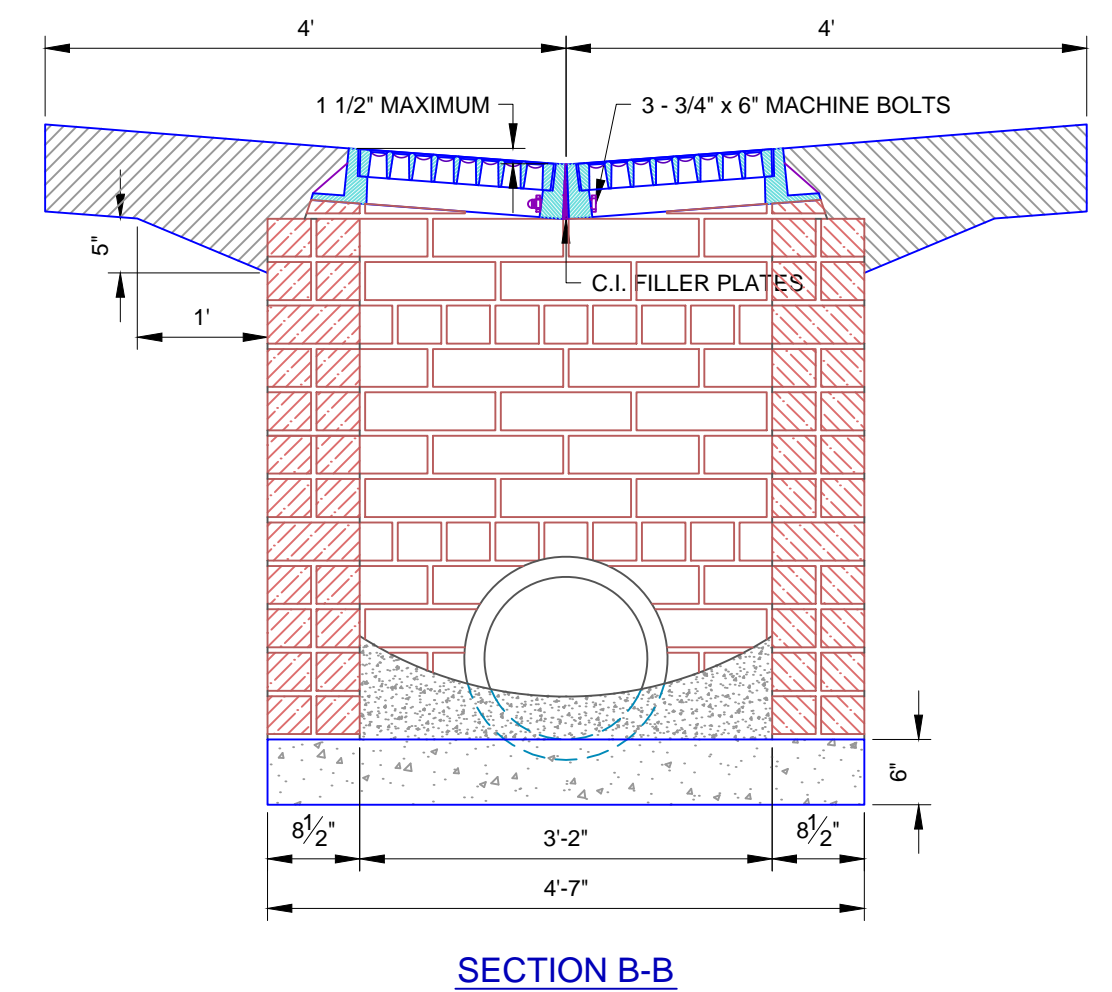
**STANDARD INLETS
DESIGN #6 & DESIGN #7**

Drawing Number
D-105



**STORM SEWER INLET
DESIGN #6 (DOUBLE GRATINGS)**

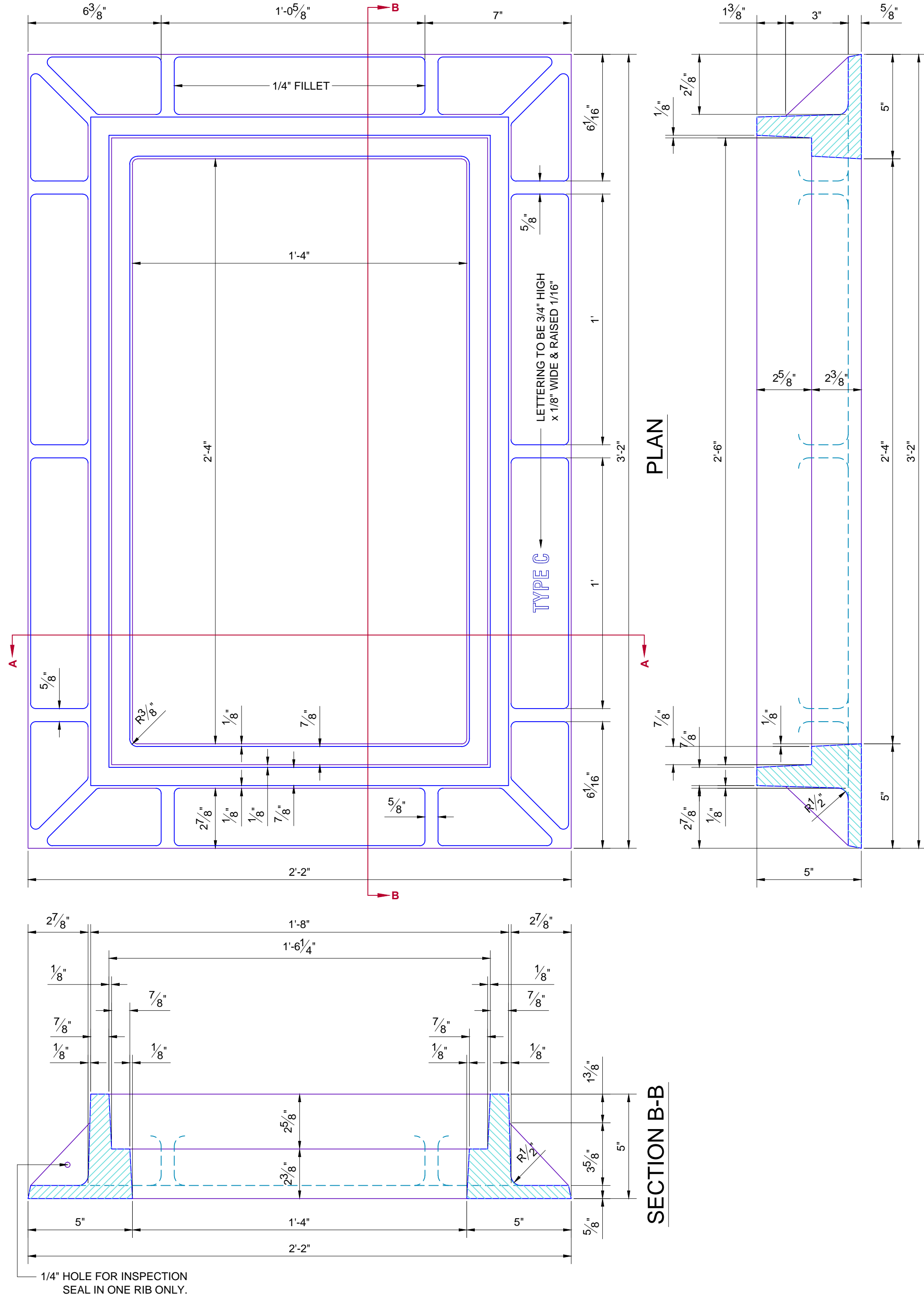
**STORM SEWER INLET
DESIGN #7 (MULTIPLE GRATINGS)**



- GENERAL NOTES:**
1. A. WHEN INLET IS BUILT IN NEW PAVEMENT, THE PAVEMENT SHALL BE MONOLITHIC WITH NEW PAVEMENT AND CONFORM TO PLANS AND SPECIFICATIONS THEREOF.
 1. B. WHEN INLET IS BUILT IN EXISTING PAVEMENT THE TYPES OF INLET PAVEMENT SHALL CONFORM TO THAT OF THE ADJACENT SLAB UNLESS OTHERWISE PROVIDED IN SPECIAL PROVISIONS.
 2. CAST IRON STEPS SHALL BE PLACED IN ALL INLETS 3' OR MORE IN DEPTH IN CONFORMITY WITH STANDARD SPECIFICATIONS.
 3. THE GRATING TO BE USED IN THIS STRUCTURE WILL BE SHOWN ON THE PLANS OR DESIGNATED IN SPECIAL PROVISIONS.
 4. THIS STRUCTURE WILL BE DESIGNATED ON PLANS AS INLET NUMBER 6.
 5. BASIS OF PAYMENT FOR INLETS WILL BE FOR A LUMP SUM INCLUDING REMOVAL AND REPLACEMENT OF EXISTING PAVEMENT.

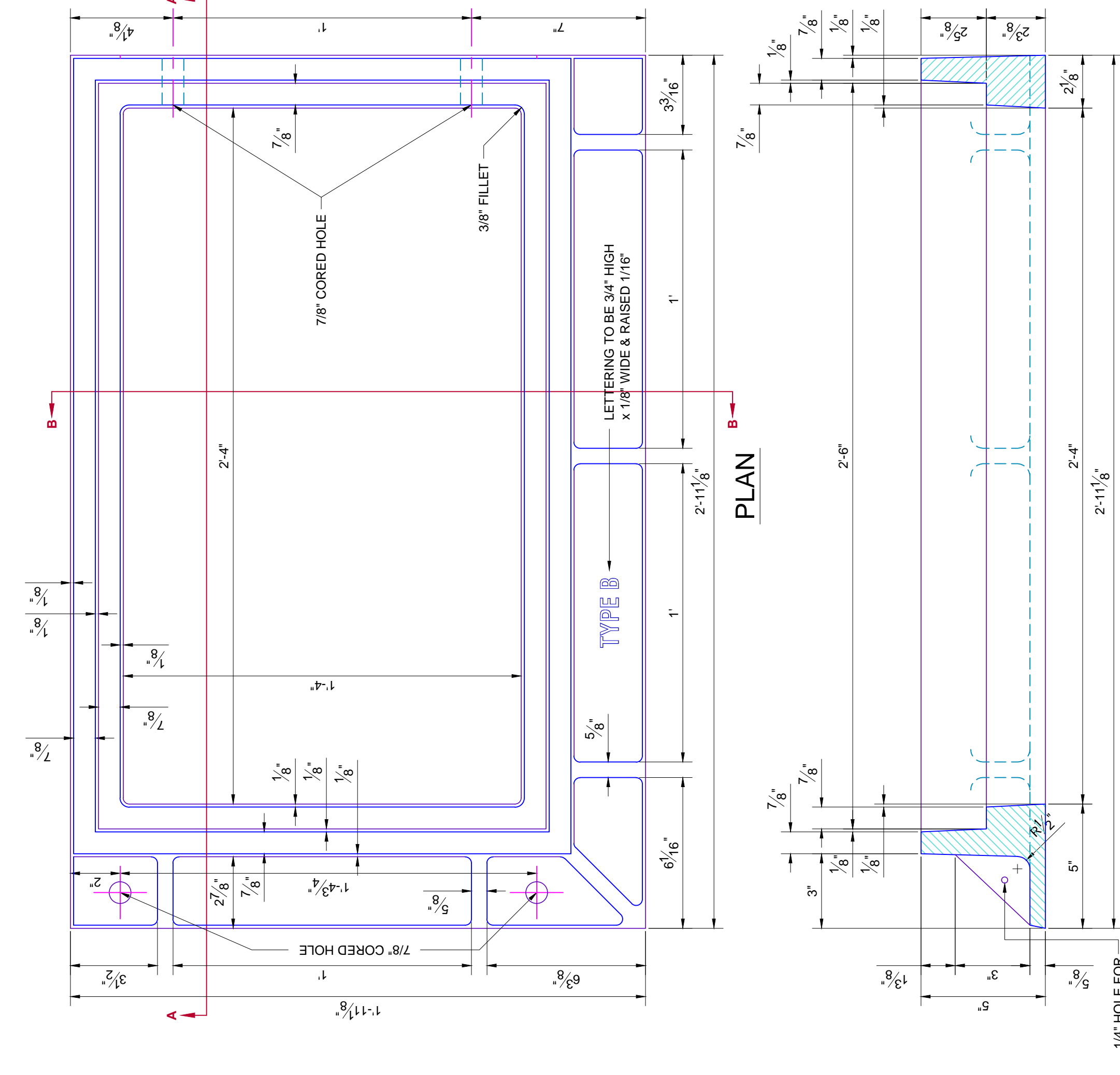
- GENERAL NOTES:**
1. A. WHEN INLET IS BUILT IN NEW PAVEMENT, THE PAVEMENT SHALL BE MONOLITHIC WITH NEW PAVEMENT AND CONFORM TO PLANS AND SPECIFICATIONS THEREOF.
 1. B. WHEN INLET IS BUILT IN EXISTING PAVEMENT THE TYPES OF INLET PAVEMENT SHALL CONFORM TO THAT OF THE ADJACENT SLAB UNLESS OTHERWISE PROVIDED IN SPECIAL PROVISIONS.
 2. CAST IRON STEPS SHALL BE PLACED IN ALL INLETS 3' OR MORE IN DEPTH IN CONFORMITY WITH STANDARD SPECIFICATIONS.
 3. THE GRATING TO BE USED IN THIS STRUCTURE WILL BE SHOWN ON THE PLANS OR DESIGNATED IN SPECIAL PROVISIONS.
 4. THIS STRUCTURE WILL BE DESIGNATED ON PLANS AS INLET NUMBER 7-X (IN WHICH X = NUMBER OF DOUBLE GRATING).
 5. BASIS OF PAYMENT FOR INLETS WILL BE FOR A LUMP SUM INCLUDING REMOVAL AND REPLACEMENT OF EXISTING PAVEMENT.
 6. L = (3.18 N) - 0.66 IN WHICH N = THE NUMBER OF DOUBLE GRATINGS.

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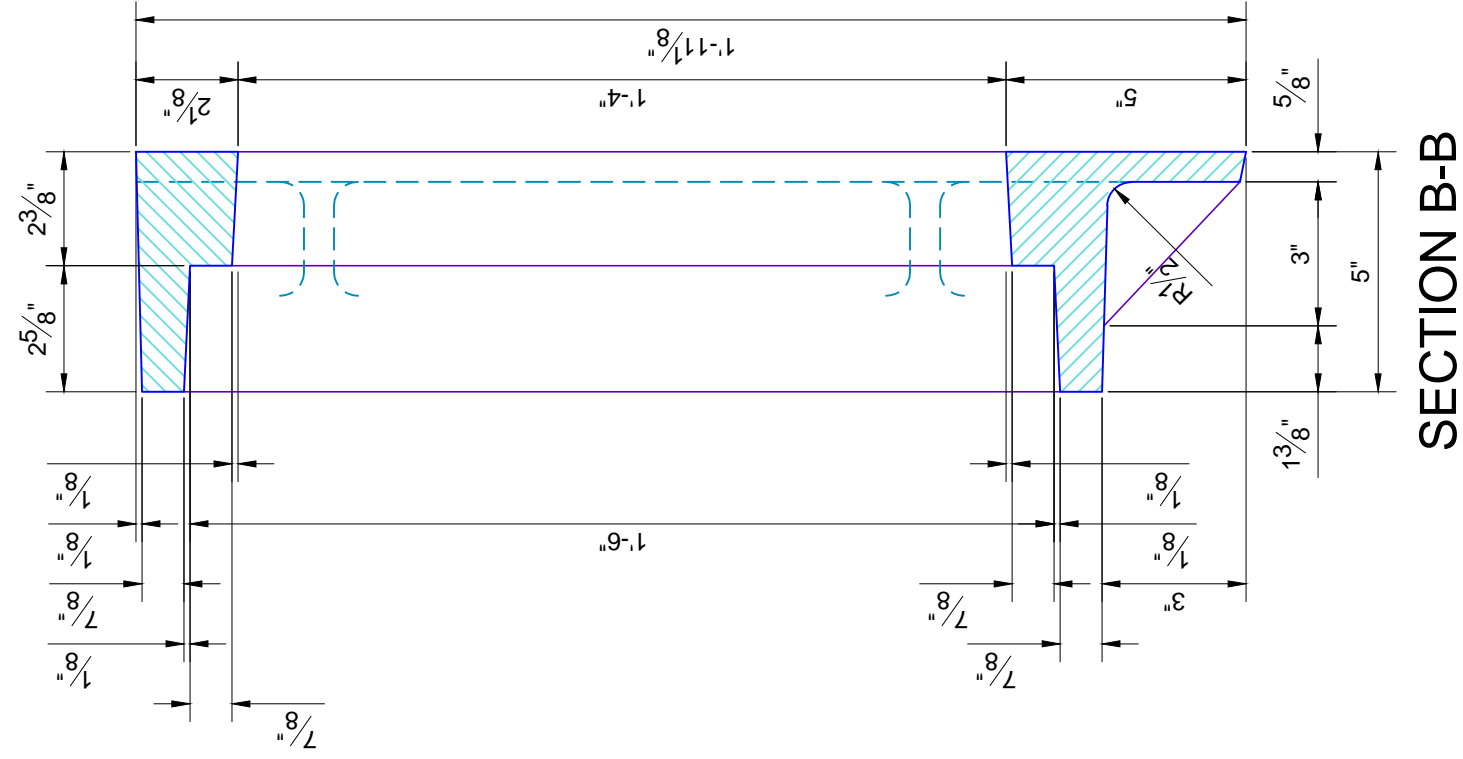
STORM SEWER INLET FRAME
INLET DESIGN #5

SECTION A-A

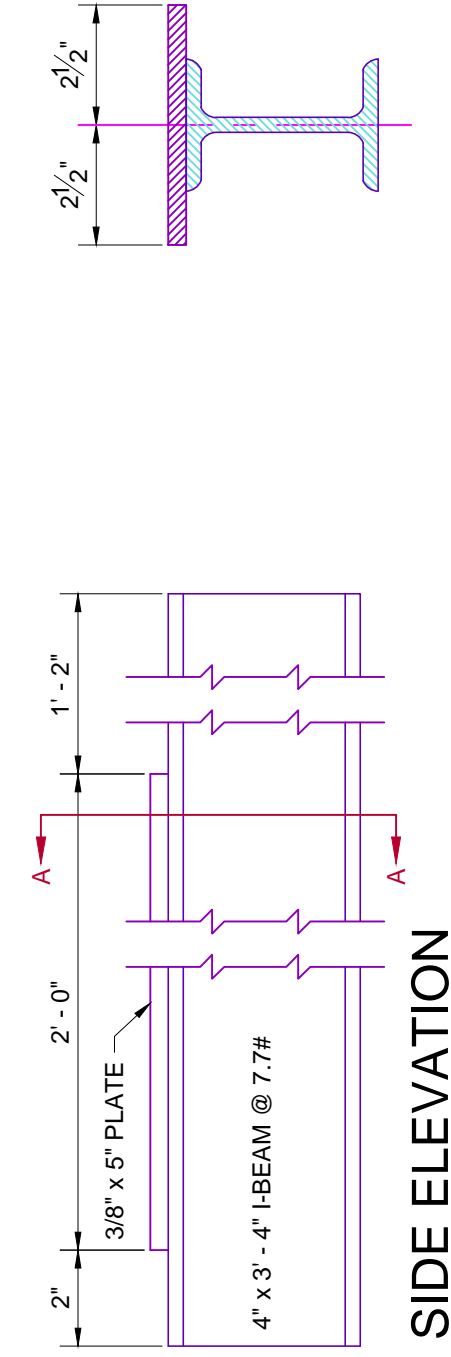


STORM SEWER INLET FRAME
TYPE "B" FOR INLET DESIGN #2

SECTION A-A



SECTION B-B



I-BEAM SUPPORT
FOR USE ON CURVED CURBS

GENERAL NOTES:
1. CASTINGS SHALL CONFORM TO THE A.S.T.M. SPECIFICATIONS FOR GRAY IRON CASTINGS SERIAL DESIGN A-48-28.
2. NO WORDING OR MARKINGS OF ANY KIND OTHER THAN THOSE SHOWN ON THE PLANS WILL BE PERMITTED ON THESE CASTINGS.

CASTING WEIGHTS

THE AVERAGE WEIGHT OF CASTINGS FURNISHED WILL NOT BE LESS THAN 98% OF WEIGHTS SHOWN BELOW. WEIGHTS OF INDIVIDUAL CASTINGS SHALL NOT BE LESS THAN 95% OF WEIGHTS SHOWN BELOW.

TYPE "A" FRAME ONLY 205 LBS.
TYPE "B" FRAME ONLY 195 LBS.
TYPE "C" FRAME ONLY 210 LBS.
TYPE "A" GRATE ONLY 145 LBS.

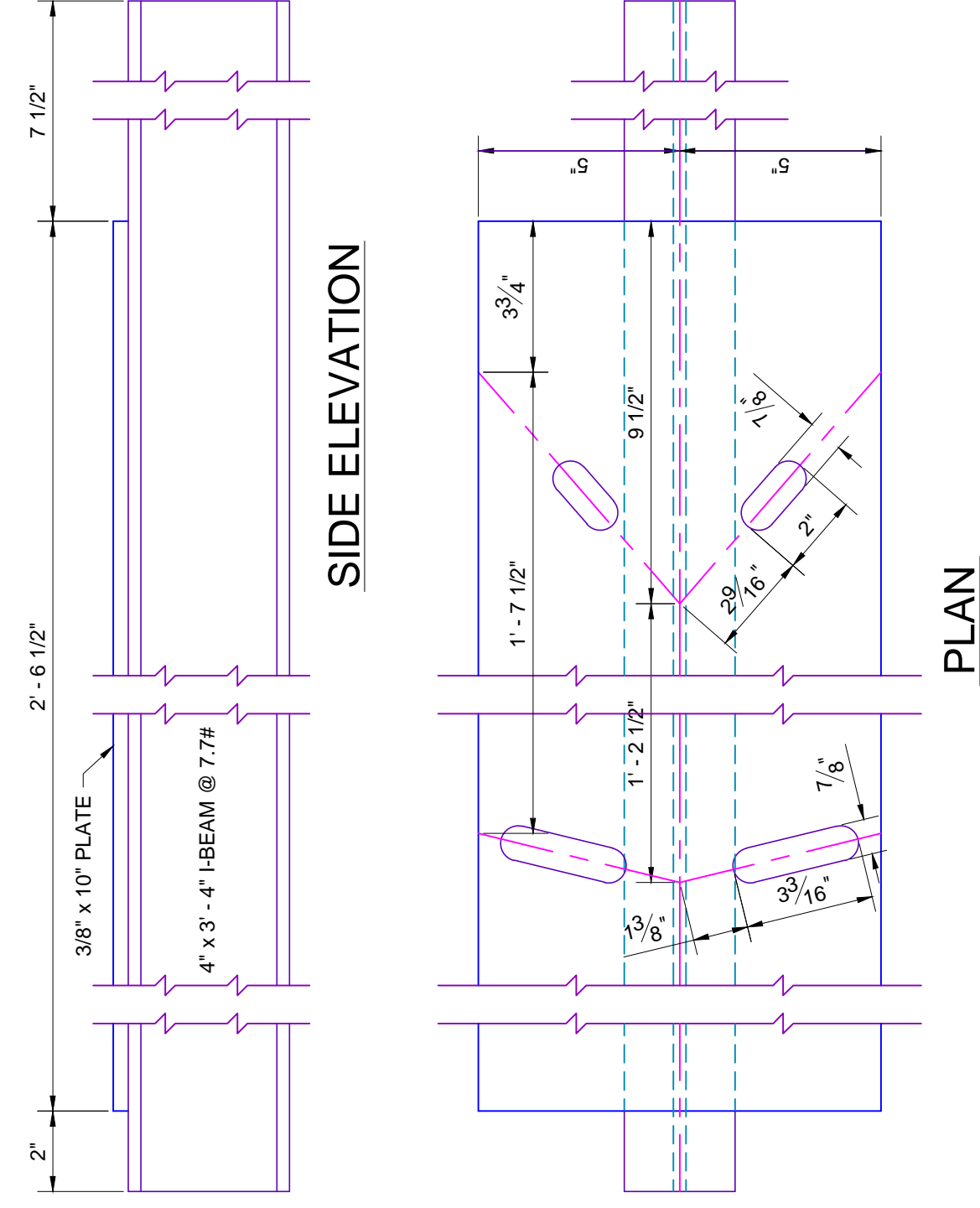
GENERAL NOTES:

- CASTINGS SHALL CONFORM TO THE A.S.T.M. SPECIFICATIONS FOR GRAY IRON CASTINGS SERIAL DESIGN A-48-28.
- NO WORDING OR MARKINGS OF ANY KIND OTHER THAN THOSE SHOWN ON THE PLANS WILL BE PERMITTED ON THESE CASTINGS.
- MAKE ONE FRAME AS SHOWN AND ONE REVERSED FOR EACH PAIR OF DOUBLE FRAMES.
- PLATES ON I-BEAM SUPPORTS SHALL BE SPOT WELDED TO THE I-BEAM AT FOUR PLACES ON EACH SIDE OF FLANGE.
- WHEN BUILT ON A CURVE, INLET DESIGN #2 REQUIRES 1 - 3/4" x 5" MACHINE BOLT WITH NUT, 1 - 3/4" x 6 1/2" MACHINE BOLT WITH NUT, AND 1 - 3/8" x 5" PLATE.
- WHEN BUILT ON A CURVE, INLET #3 REQUIRES THE DOUBLE FRAME AND IN ADDITION REQUIRES THE I-BEAM SUPPORT WITH 10" PLATE. THE NUMBER OF THESE SUPPORTS IS ONE LESS THAN THE NUMBER OF DOUBLE FRAMES SPECIFIED. FOUR 3/4" x 1 3/4" MACHINE BOLTS WITH NUTS ARE REQUIRED FOR EACH OF THESE SUPPORTS.

CASTING WEIGHTS

THE AVERAGE WEIGHT OF CASTINGS FURNISHED WILL NOT BE LESS THAN 98% OF WEIGHTS SHOWN BELOW. WEIGHTS OF INDIVIDUAL CASTINGS SHALL NOT BE LESS THAN 95% OF WEIGHTS SHOWN BELOW.

TYPE "A" FRAME ONLY 205 LBS.
TYPE "B" FRAME ONLY 195 LBS.
TYPE "C" FRAME ONLY 210 LBS.
TYPE "A" GRATE ONLY 145 LBS.



I-BEAM SUPPORT
FOR INLET DESIGN #3 ONLY

STANDARD INLET FRAME
DETAIL FOR DESIGN #2 & #5

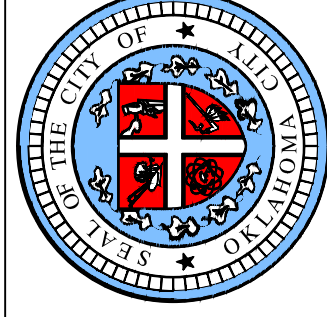
Drawing Number
D-106

APPROVED BY:
ERIC J. WENGER, P.E.
CITY ENGINEER

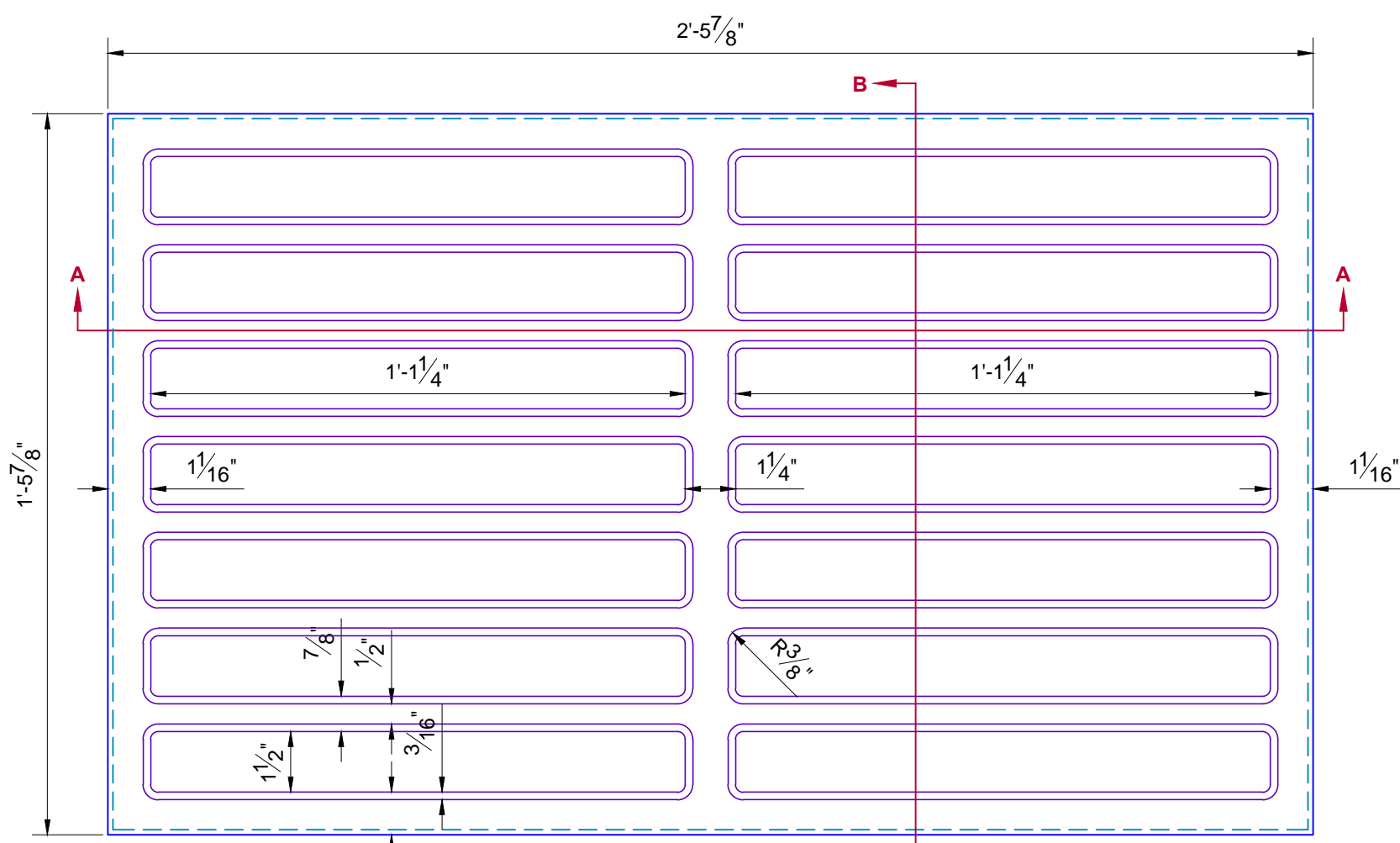
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DRAWN: VSC

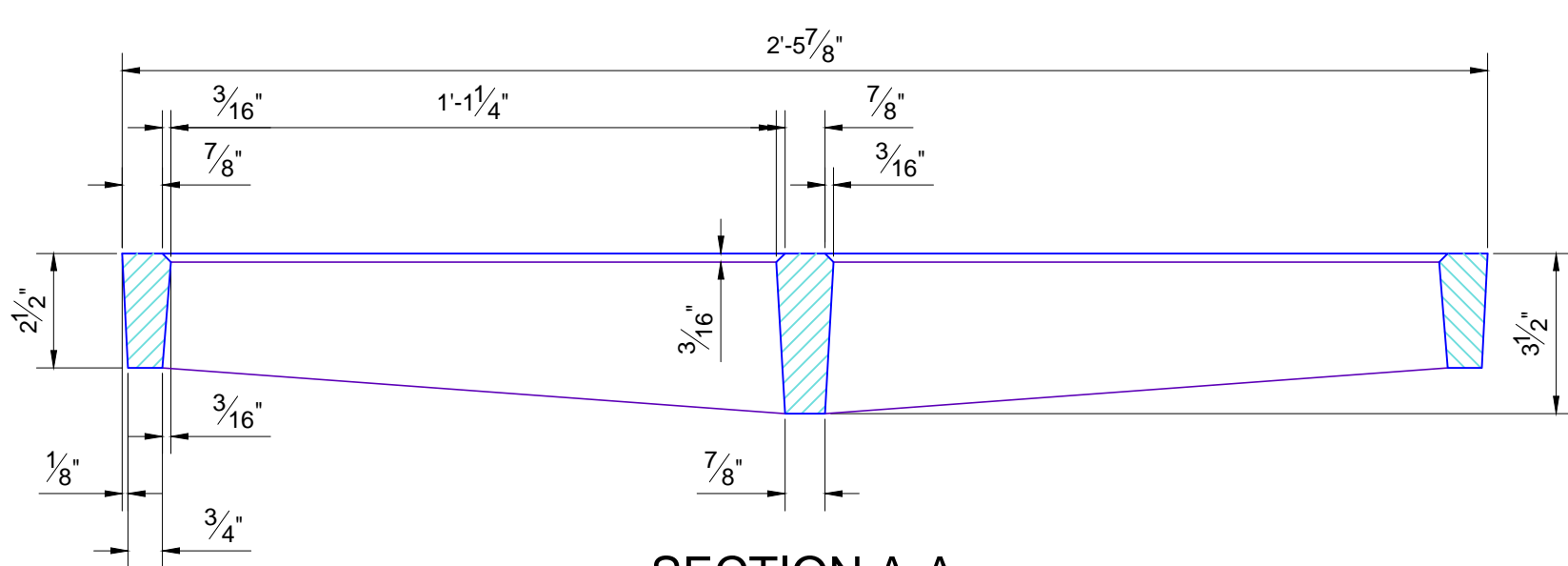
DATE: 01-31-13



The City of
Oklahoma City
Public Works Department
Engineering Division



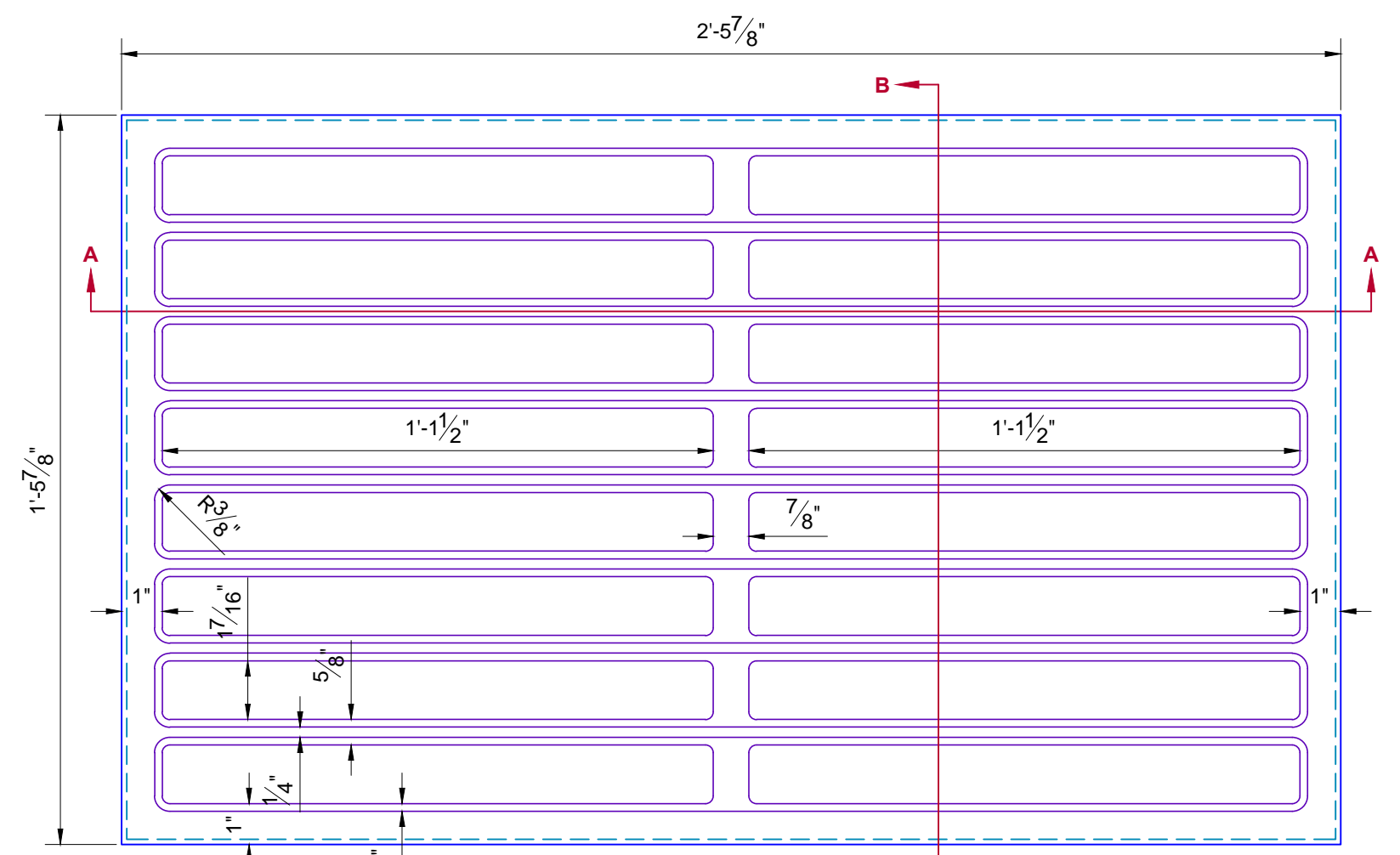
PLAN



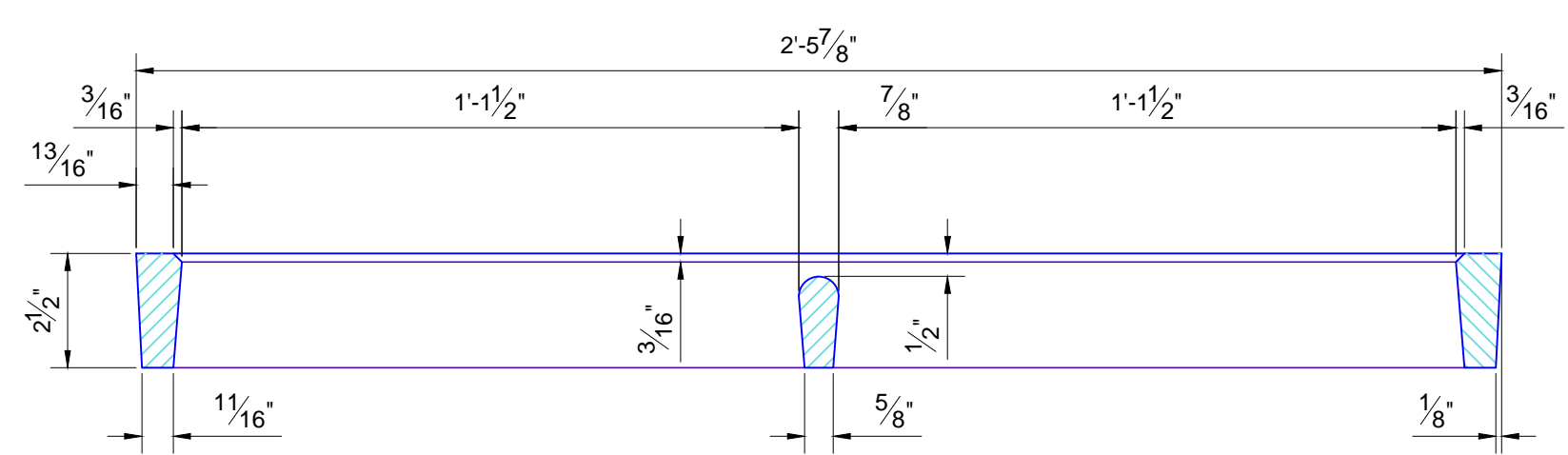
SECTION A-A

STORM SEWER INLET GRATING

DETAIL OF TYPE "A" GRATING



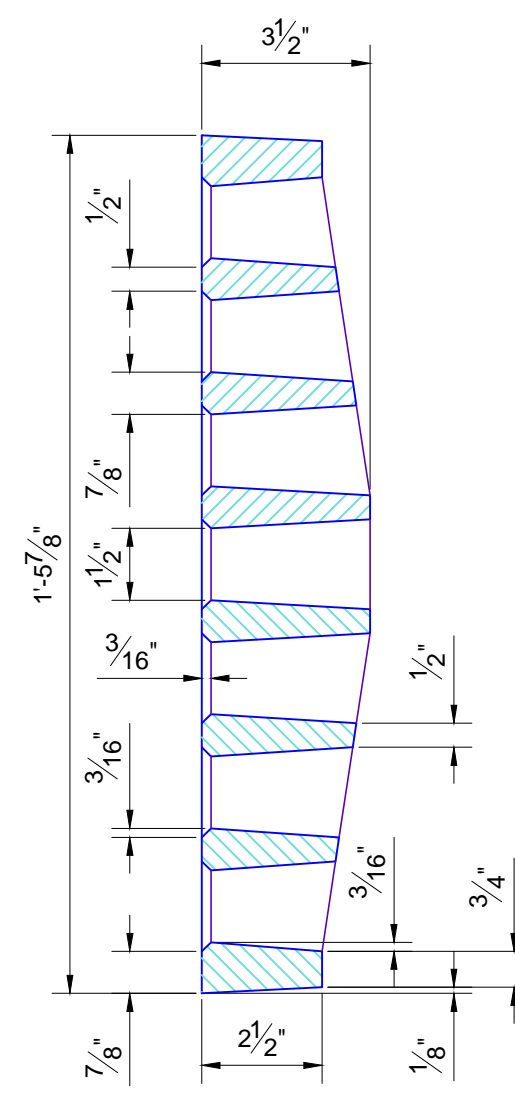
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SECTION A-A

STORM SEWER INLET GRATING

DETAIL OF TYPE "B" GRATING



SECTION B-B

CASTING WEIGHTS

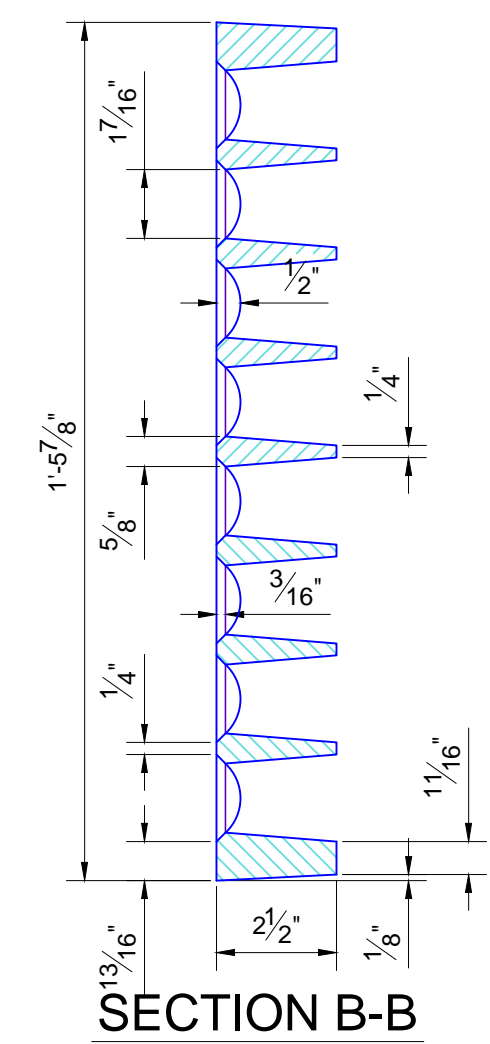
THE AVERAGE WEIGHT OF CASTINGS FURNISHED WILL NOT BE LESS THAN 98% OF WEIGHTS SHOWN BELOW.

WEIGHTS OF INDIVIDUAL CASTINGS SHALL NOT BE LESS THAN 95% OF WEIGHTS SHOWN BELOW.

- TYPE A FRAMES ONLY 250 LBS.
- TYPE B FRAMES ONLY 195 LBS.
- TYPE C FRAMES ONLY 210 LBS.
- TYPE A GRATES ONLY 145 LBS.

NOTE

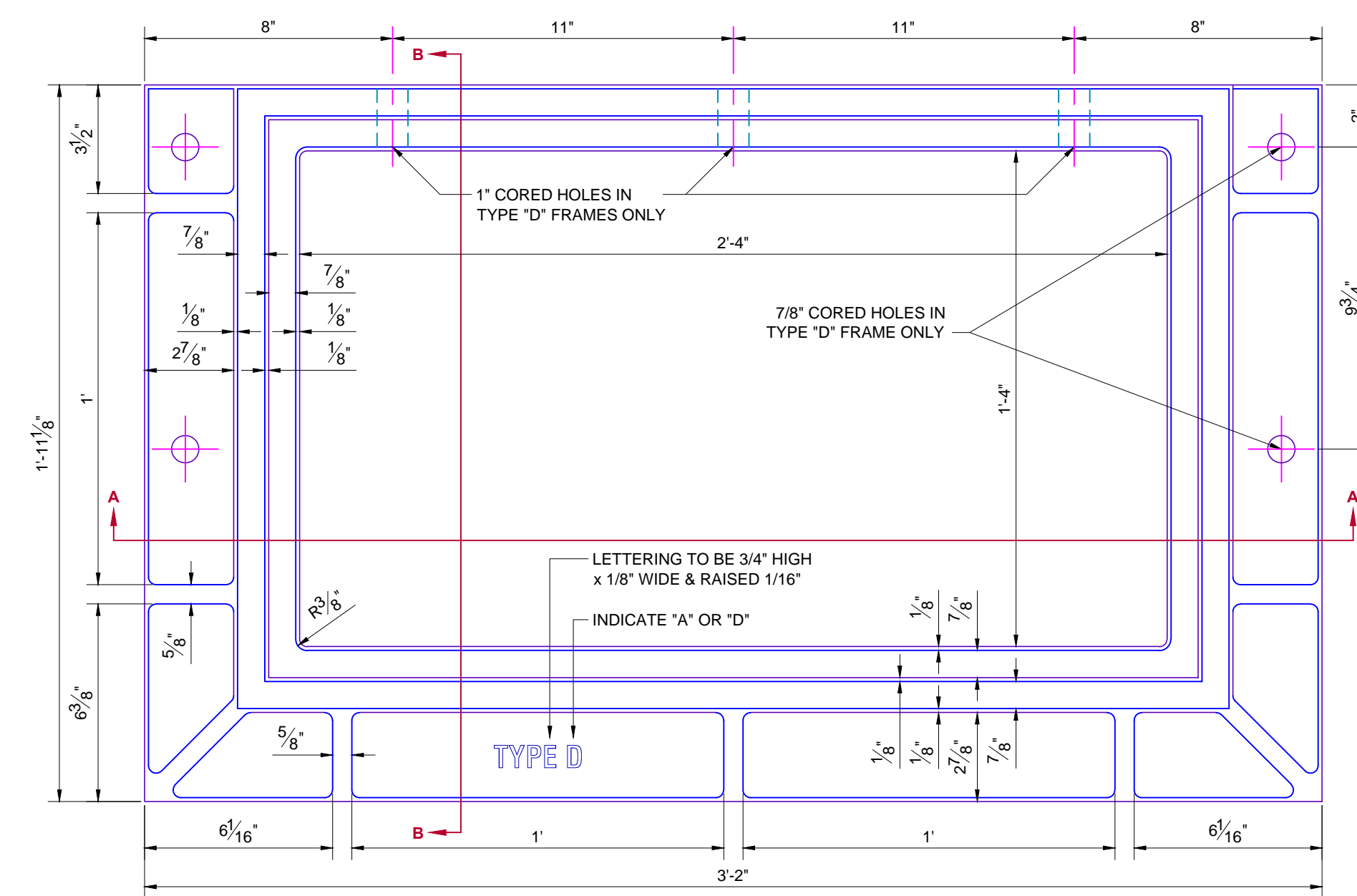
GRATING SHALL CONFORM TO THE A.S.T.M. SPECIFICATIONS FOR GRAY IRON CASTINGS SERIAL DESIGNATION A-48-29.



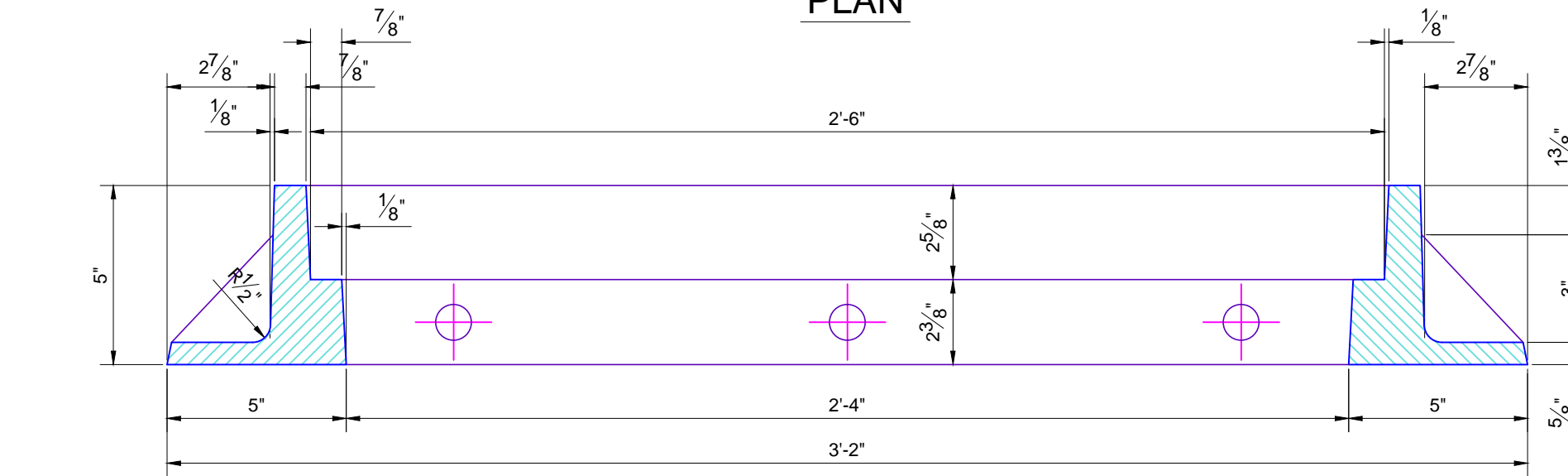
SECTION B-B

NOTE

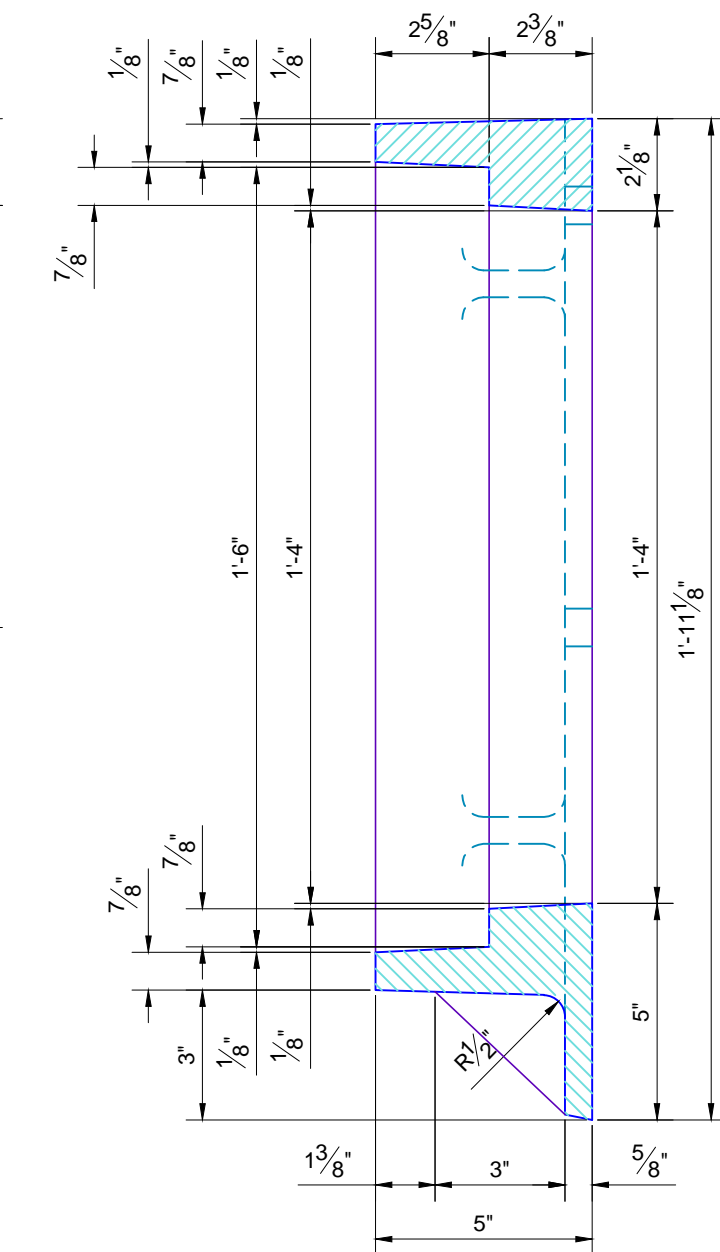
GRATING SHALL CONFORM TO THE A.S.T.M. SPECIFICATIONS FOR STEEL CASTINGS SERIAL DESIGNATION A-27-24. CASTINGS SHALL BE CL "B" HARD STEEL.



PLAN



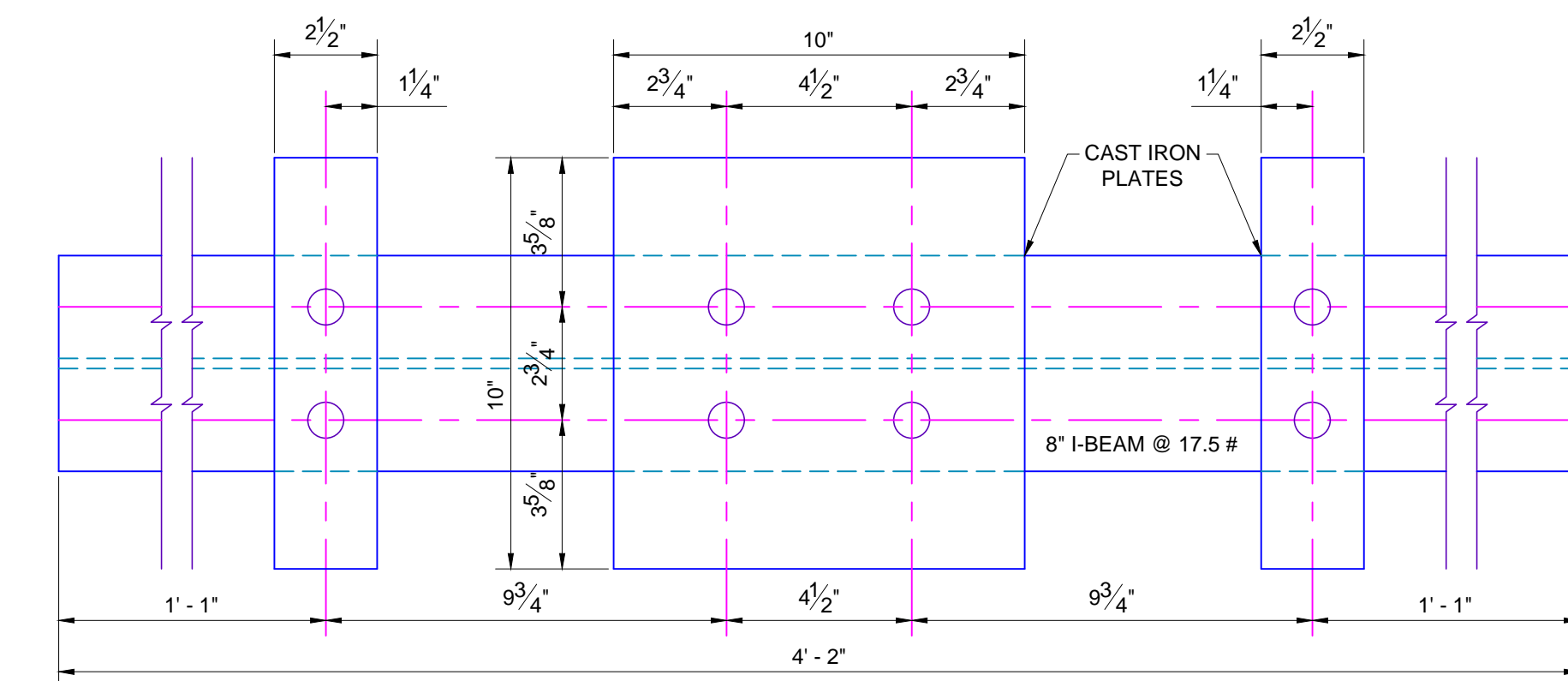
SECTION A-A



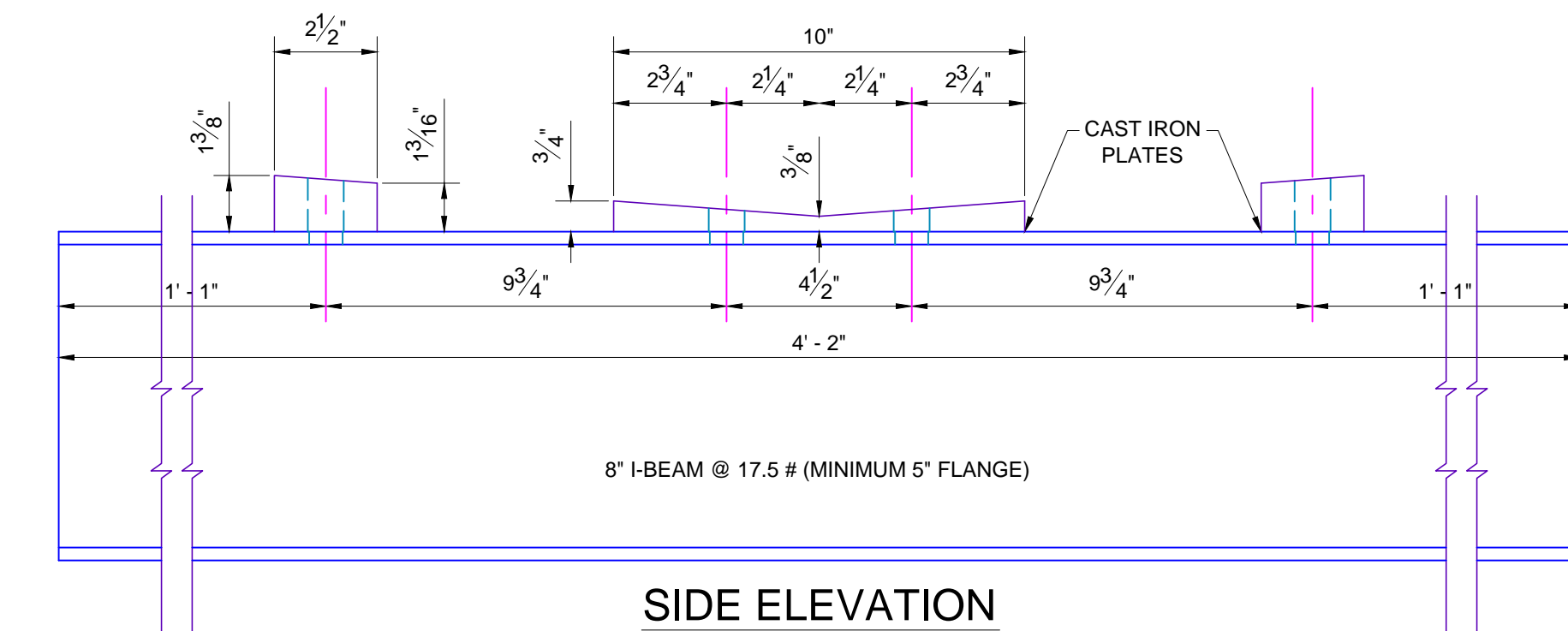
SECTION B-B

STORM SEWER INLET FRAME

TYPE "D" & TYPE "A"



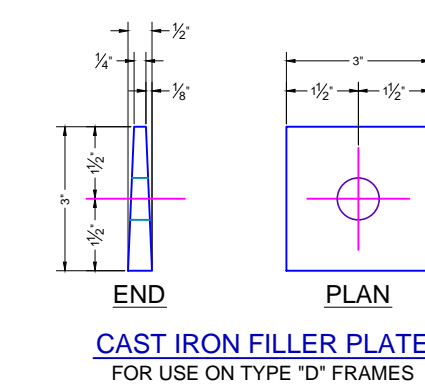
PLAN



SIDE ELEVATION

DETAILS OF I-BEAM SUPPORT

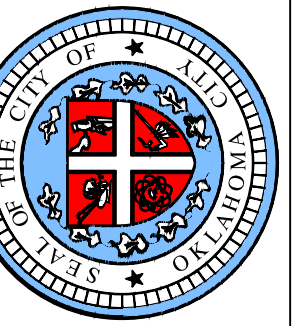
FOR INLET #7 ONLY

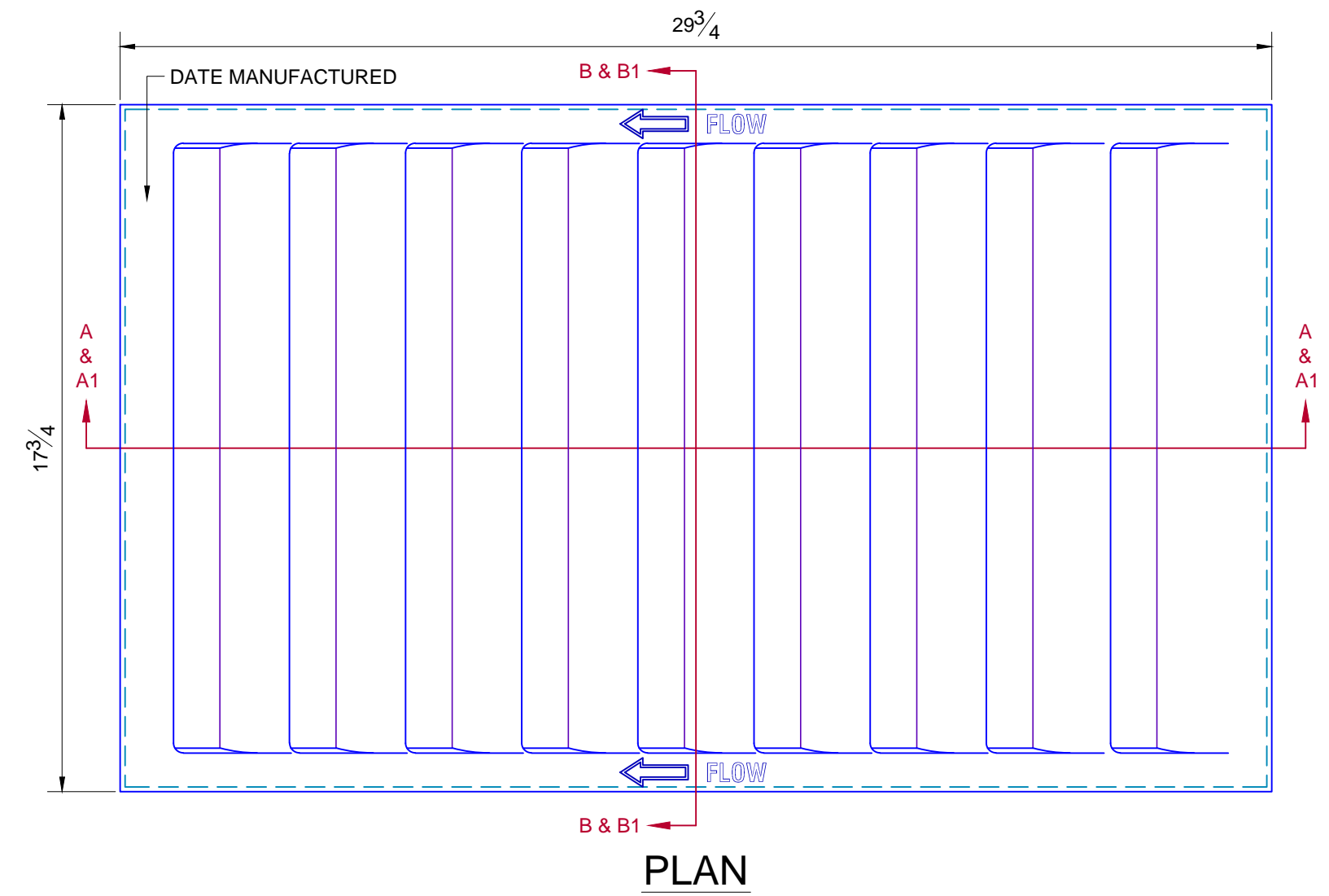


CAST IRON FILLER PLATE
FOR USE ON TYPE "D" FRAMES

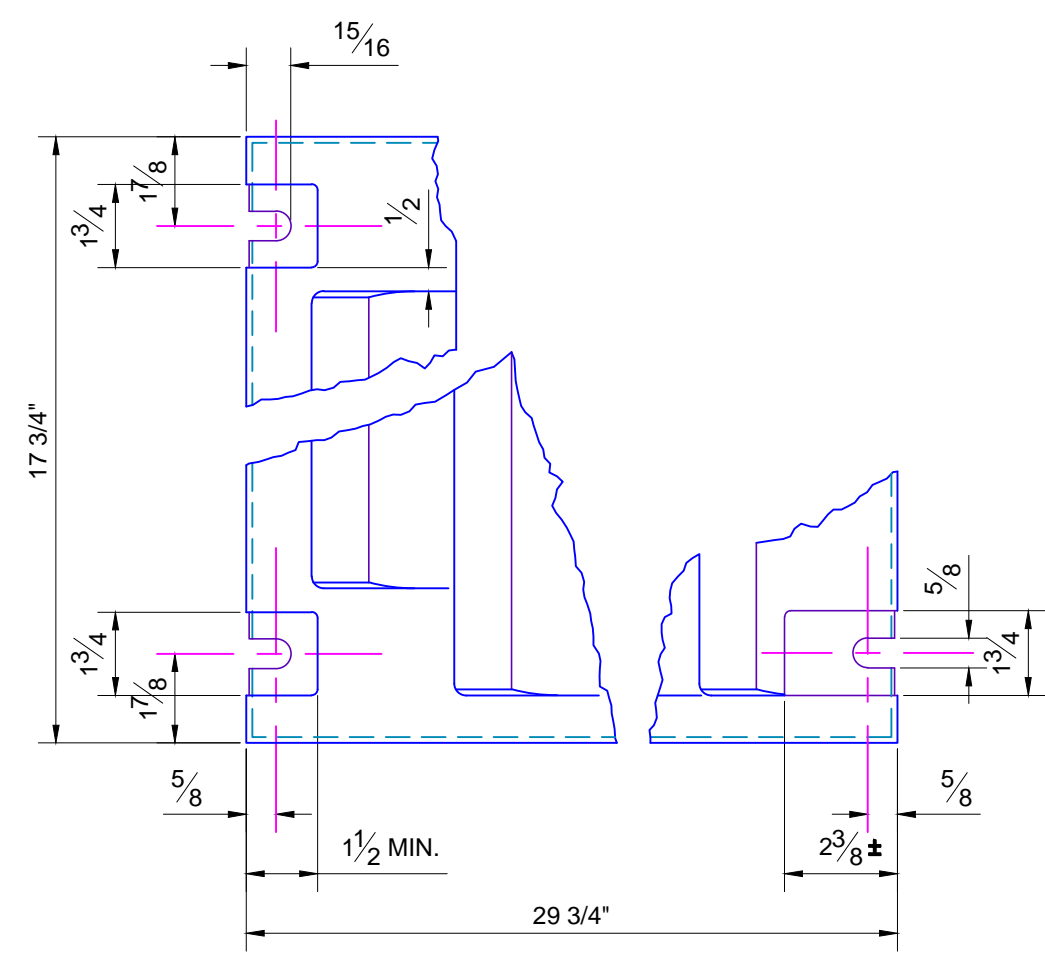
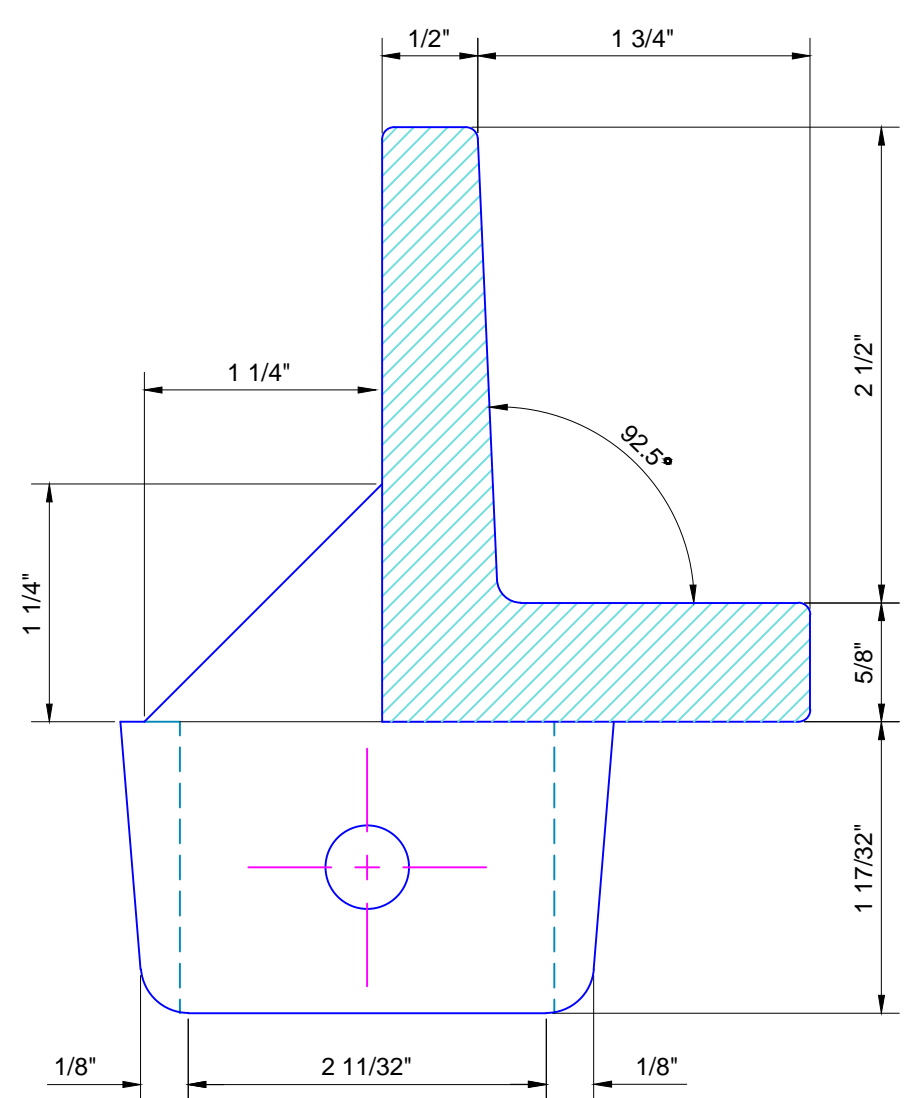
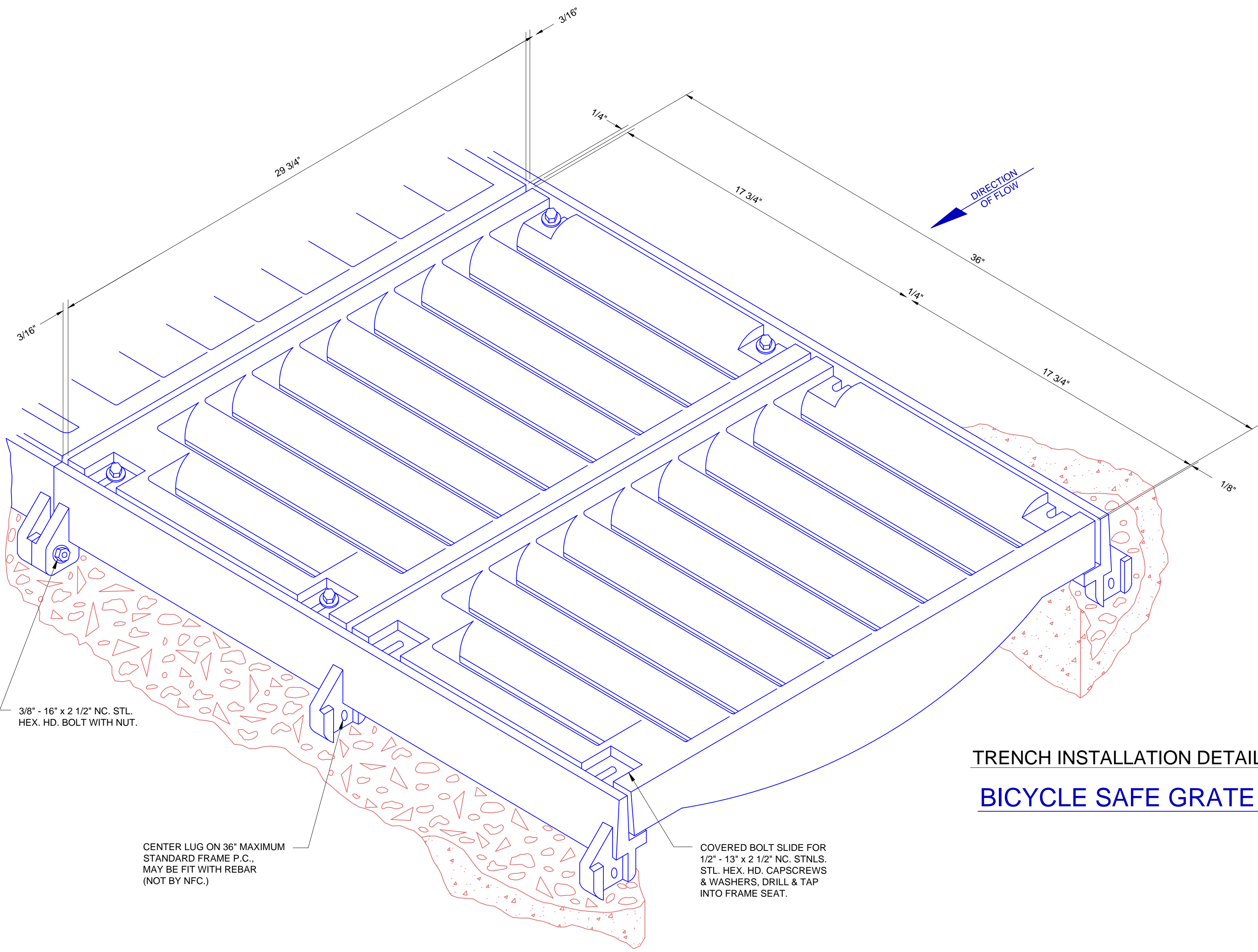
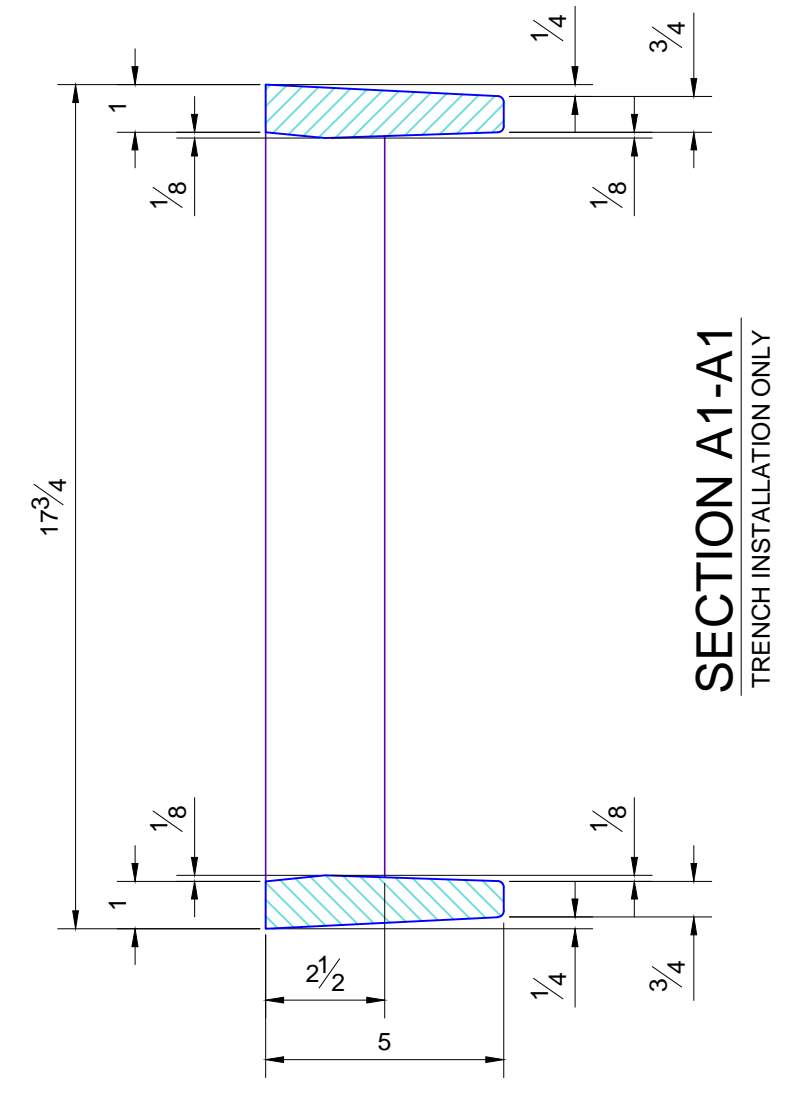
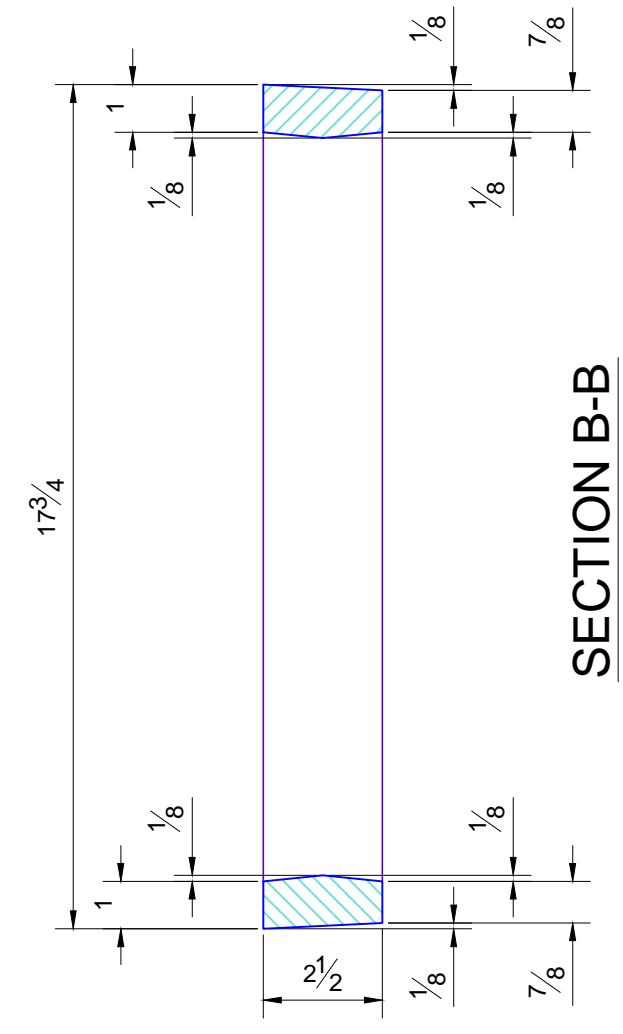
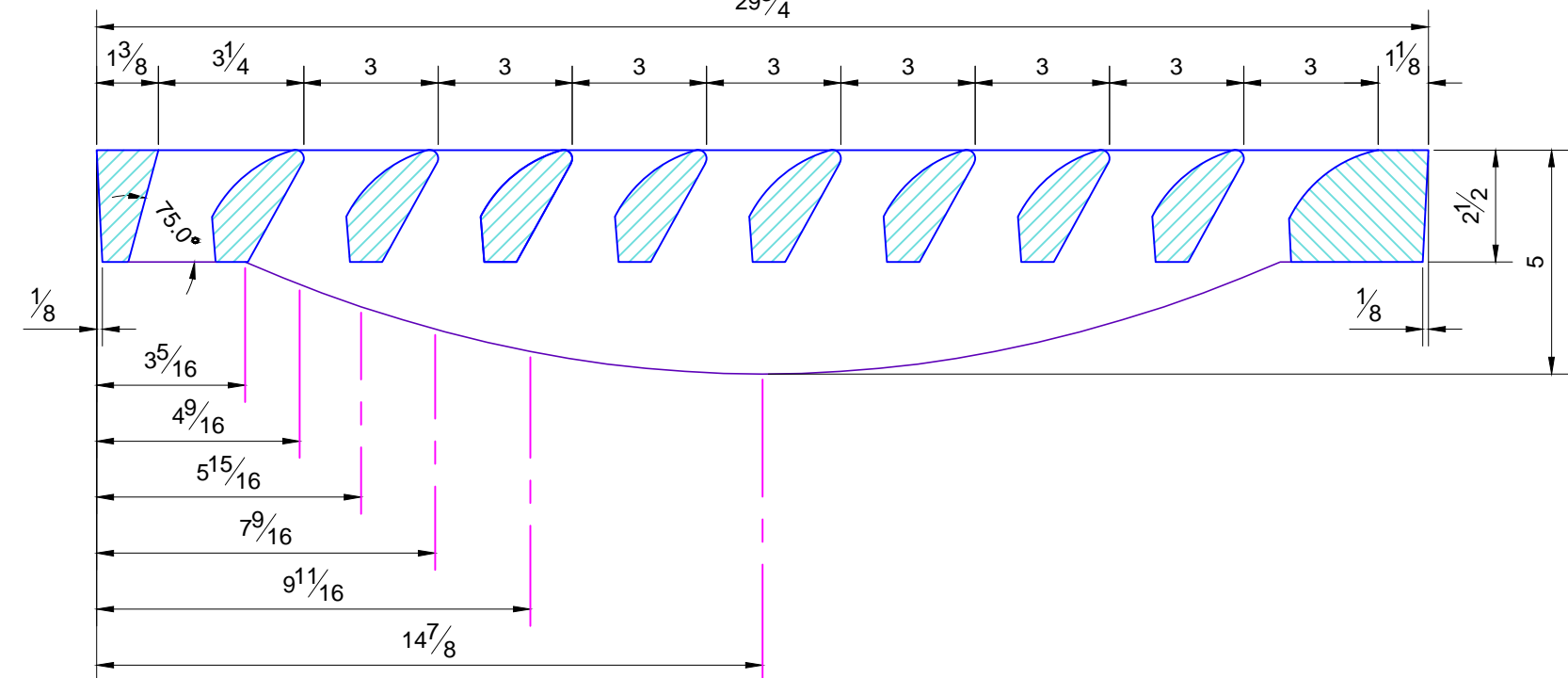
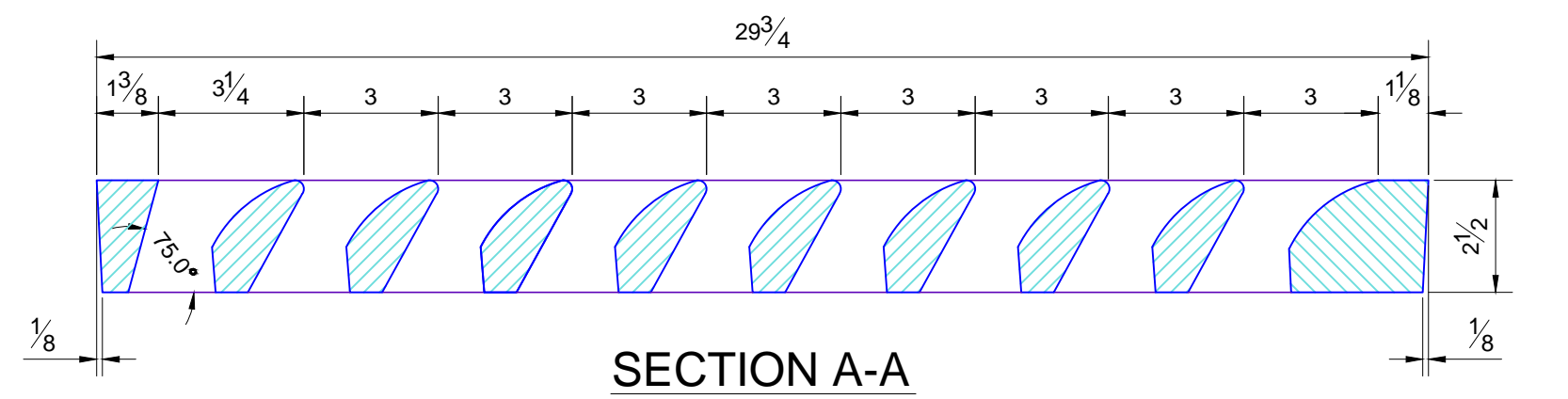
GENERAL NOTES

1. CASTINGS SHALL CONFORM TO THE A.S.T.M. SPECIFICATIONS FOR GRAY IRON CASTINGS SERIAL DESIGNATION A-48-29.
2. NO WELDING OR MARKINGS OF ANY KIND OTHER THAN THOSE SHOWN ON THE PLANS WILL BE PERMITTED ON THESE CASTINGS.
3. TYPE "A" FRAMES DO NOT REQUIRE APPURTENANCES OF ANY KIND.
4. TYPE "D" FRAMES REQUIRE THREE 3/4" x 6" MACHINE BOLTS WITH NUTS AND THREE CAST IRON FILLER PLATES WITH EACH DOUBLE FRAME.
5. THE NUMBER OF I-BEAM SUPPORTS REQUIRED FOR INLET DESIGN #7 IS ONE LESS THAN THE NUMBER OF DOUBLE FRAMES SPECIFIED. FOUR 3/4" x 2 1/2" AND FOUR 3/4" x 3 1/2" MACHINE BOLTS WITH NUTS ARE REQUIRED FOR EACH I-BEAM SUPPORT.
6. TYPE "A" GRATE IS FOR INLET DESIGN #1.
TYPE "D" GRATE IS FOR INLET DESIGN #6 & 7.

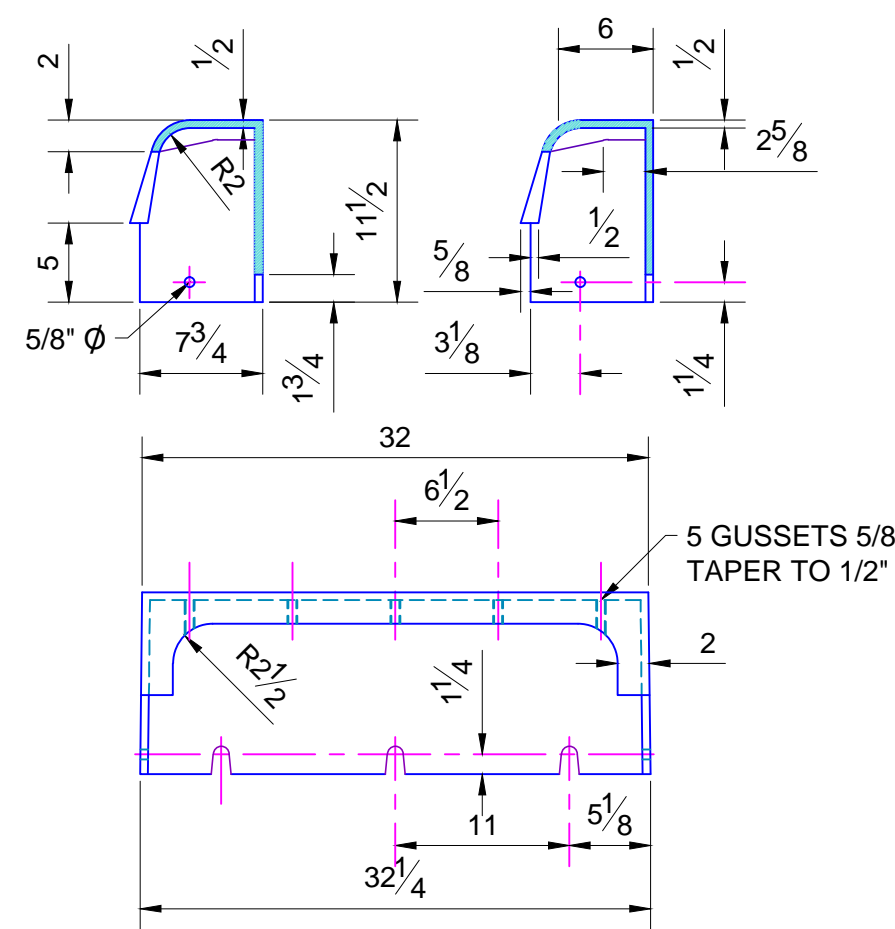




BICYCLE SAFE GRATE

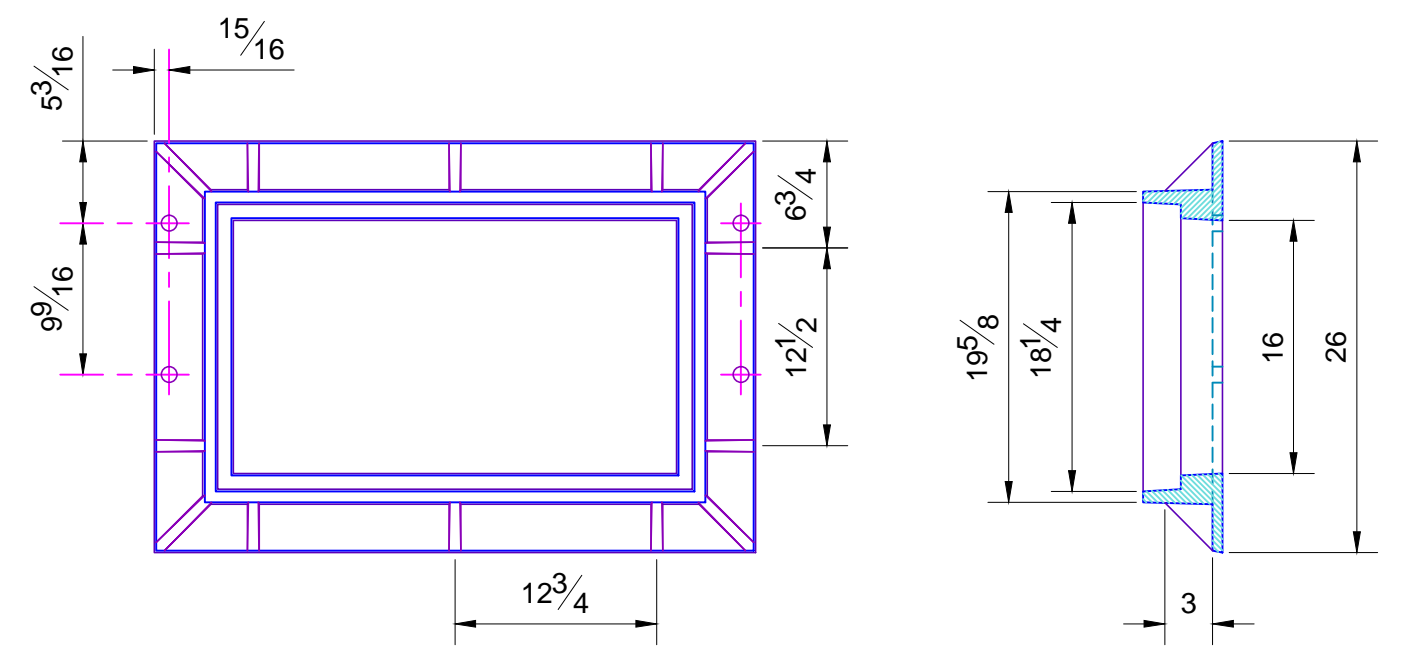


- NOTES:
1. ALL CONSTRUCTION METHODS & MATERIAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE CURRENT SPECIFICATIONS.
 2. SHARP EDGES RESULTING EDGES RESULTING FROM FABRICATION SHALL BE DULLED BY ANY ACCEPTABLE METHOD FOR SAFETY IN HANDLING.
 3. GRATES SHALL BE INSTALLED IN FRAME WITH FLOW ARROW POINTING DOWNSTREAM OR TOWARD THE LOW POINT IN A SUMP.
 4. CAST GRATES SHALL BE OF DUCTILE IRON CONTAINING THE REQUIREMENTS OF ASTM A-536, GRADE 65-45-12, OR OF GRAY IRON CONFORMING TO THE REQUIREMENTS OF AASHTO M-105 (OR ASTM - A-480, CASE 35B.)
 5. FERROUS CASTINGS SHALL BE OF UNIFORM QUALITY, FREE OF BLOWHOLES, POROSITY, HARDSPOTS, SHRINKAGE DISTORTION OR OTHER DEFECTS.
 6. CASTINGS SHALL BE SMOOTH & WELL CLEANED BY SHOT BLASTING OR OTHER APPROVED CLEANING.
 7. ALL CASTINGS SHALL BE MANUFACTURED TRUE TO PATTERN; COMPONENT PARTS SHALL FIT TOGETHER IN A SATISFACTORY MANNER.
 8. ALL LETTERING SHALL BE RECESSED 1/16". REFERENCE NF-29927M NF-21808, & ORIGINAL REFERENCE 2669.



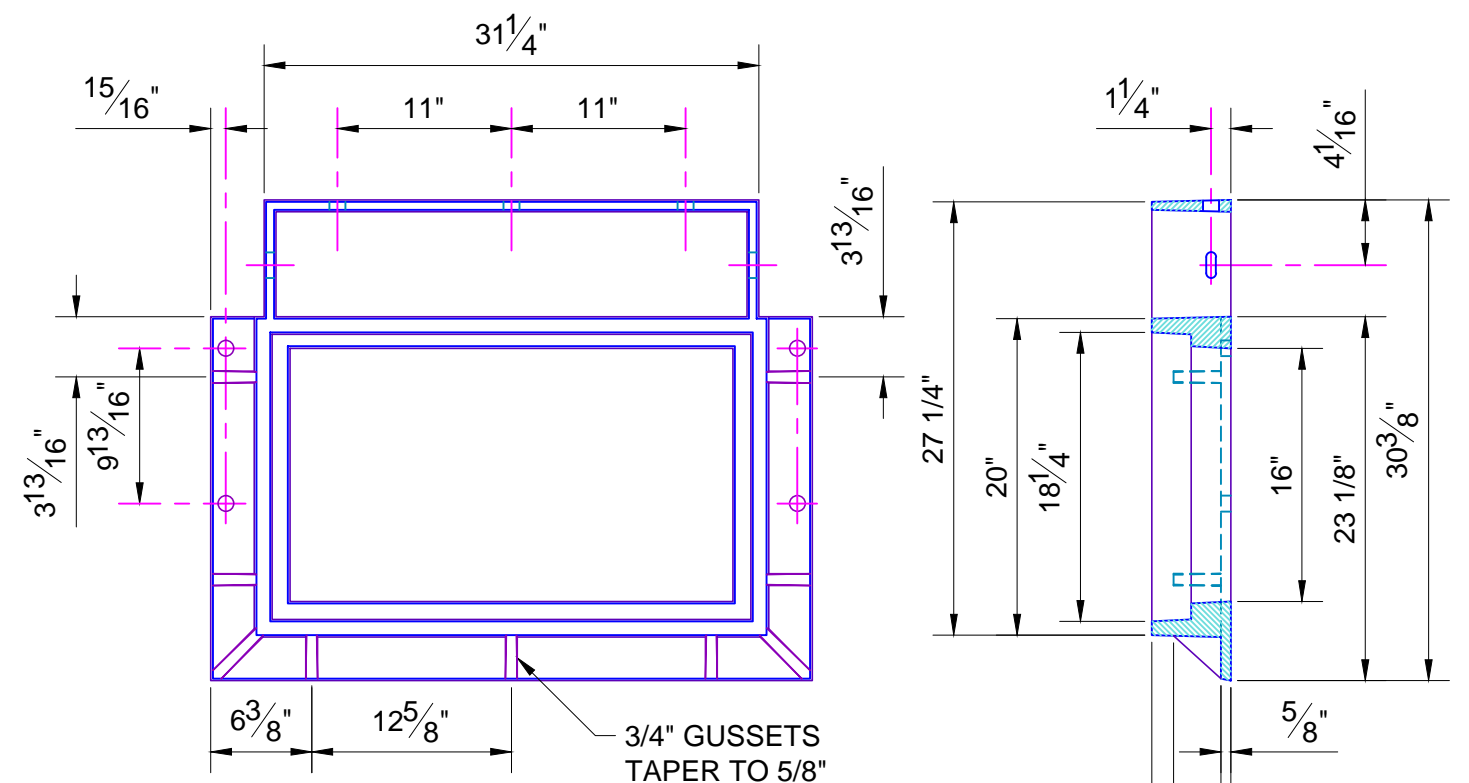
NOTES:
 1. MATERIAL: CAST GRAY IRON, ASTM A-48, CLASS 35B
 2. FINISH: NO PAINT
 3. WEIGHT: 105 LBS.

BARRIER CURB 11 1/2"



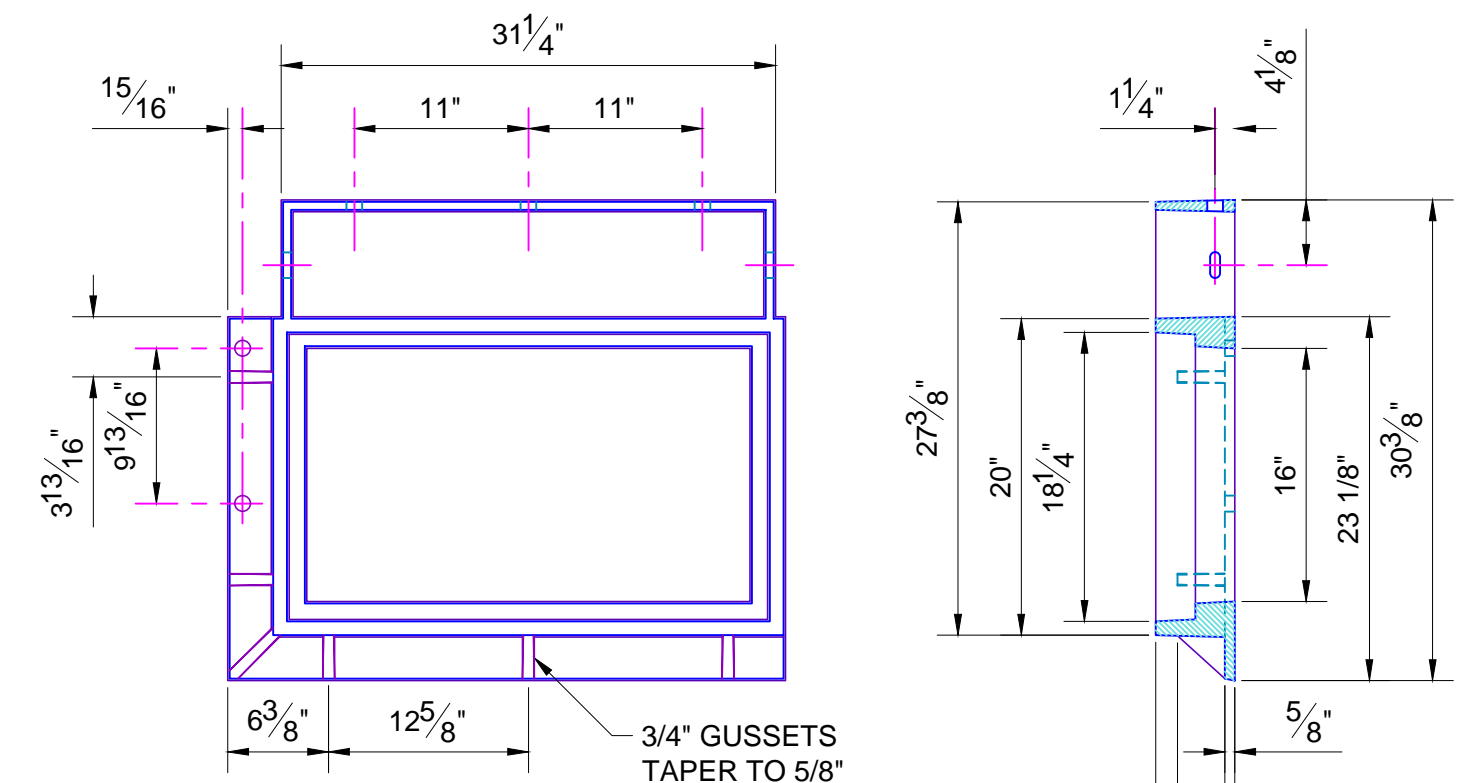
NOTES:
 1. TOTAL OPEN AREA OF GRATE IN 216 SQUARE INCHES.
 2. MATERIAL: CAST GRAY IRON, ASTM A48-94A, CLASS 35B.
 3. FINISH: NO PAINT
 4. WEIGHT: 242 LBS.

CATCH BASIN INLET FRAME



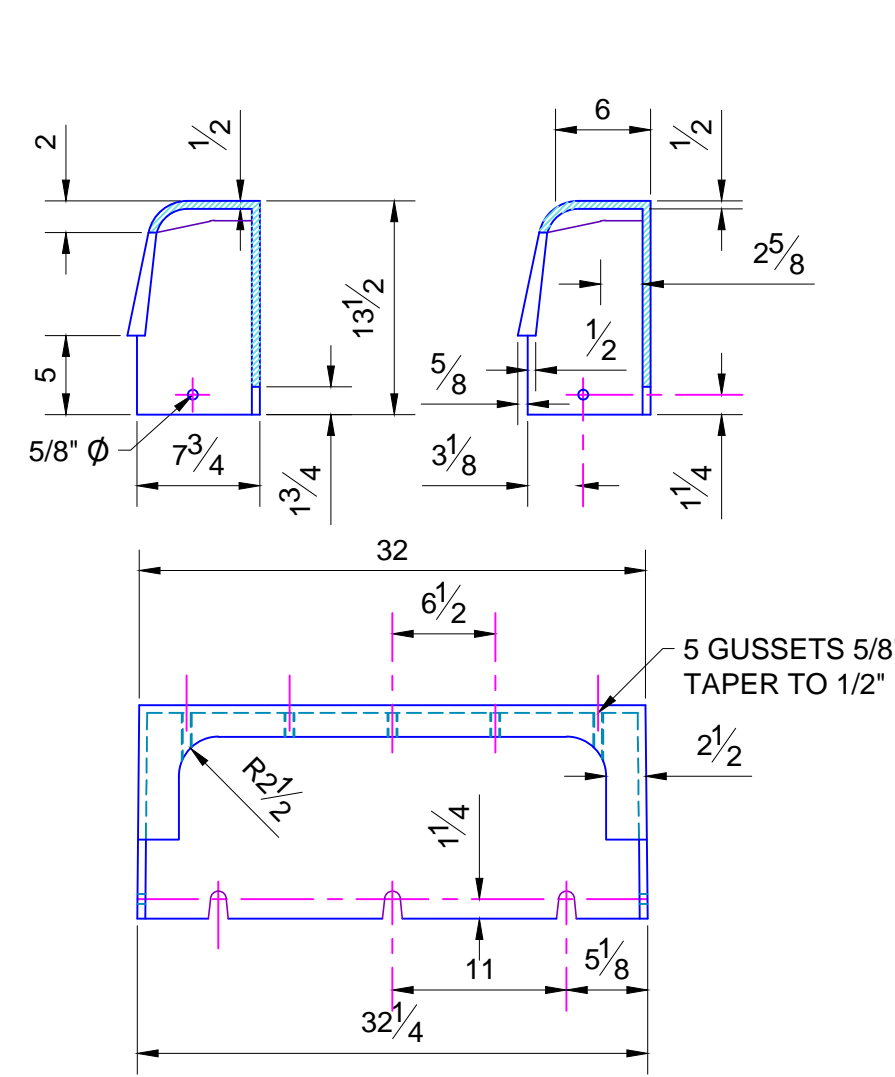
NOTES:
 1. TOTAL OPEN AREA OF GRATE IN 216 SQUARE INCHES.
 2. MATERIAL: CAST GRAY IRON, ASTM A48, CLASS 35B.
 3. FINISH: NO PAINT
 4. WEIGHT: 295 LBS.

INLET CURB FRAME



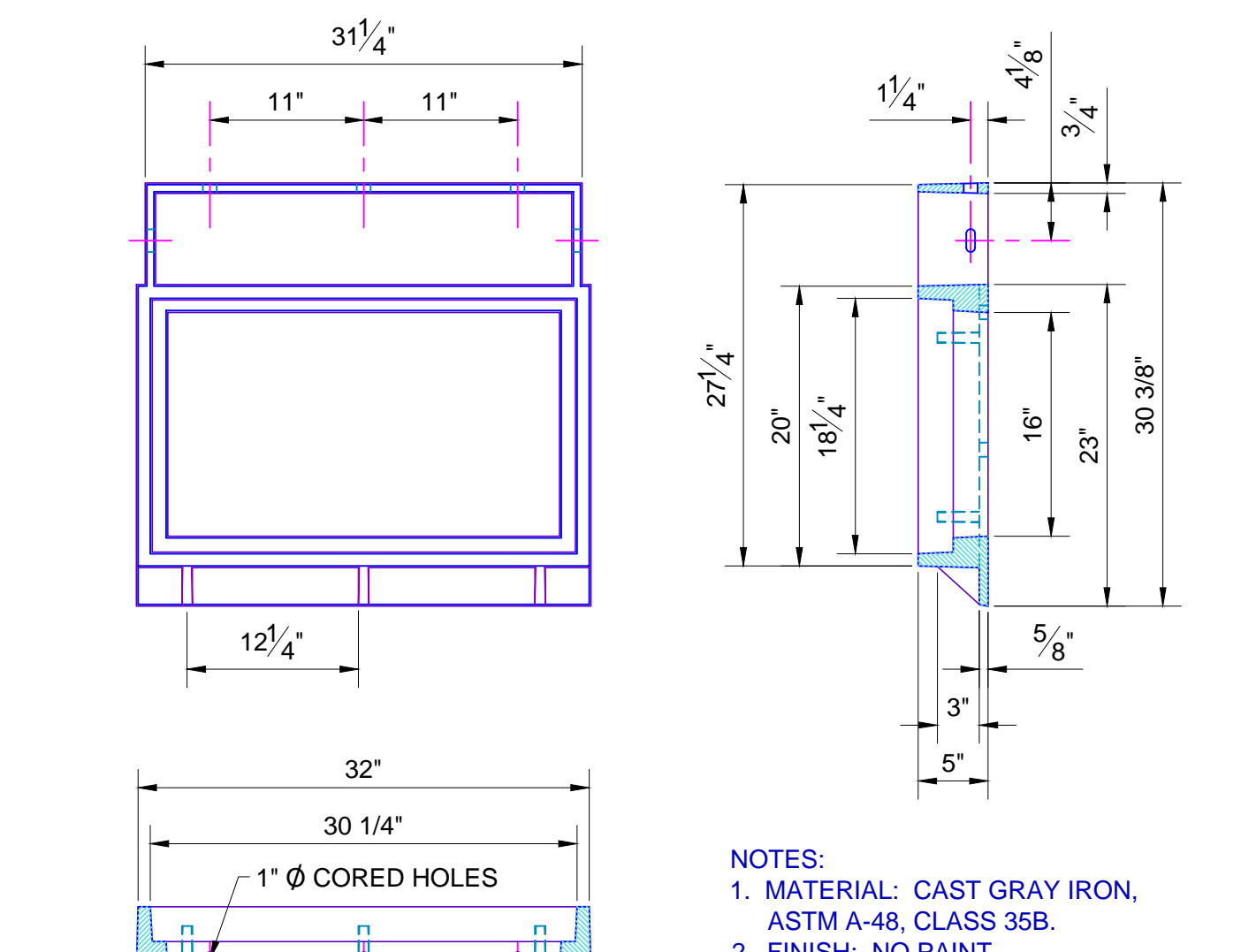
NOTES:
 1. TOTAL OPEN AREA OF GRATE IN 216 SQUARE INCHES.
 2. MATERIAL: CAST GRAY IRON, ASTM A48, CLASS 35B.
 3. FINISH: NO PAINT
 4. WEIGHT: 278 LBS.

INLET CURB FRAME FOR MULTIPLE INLET



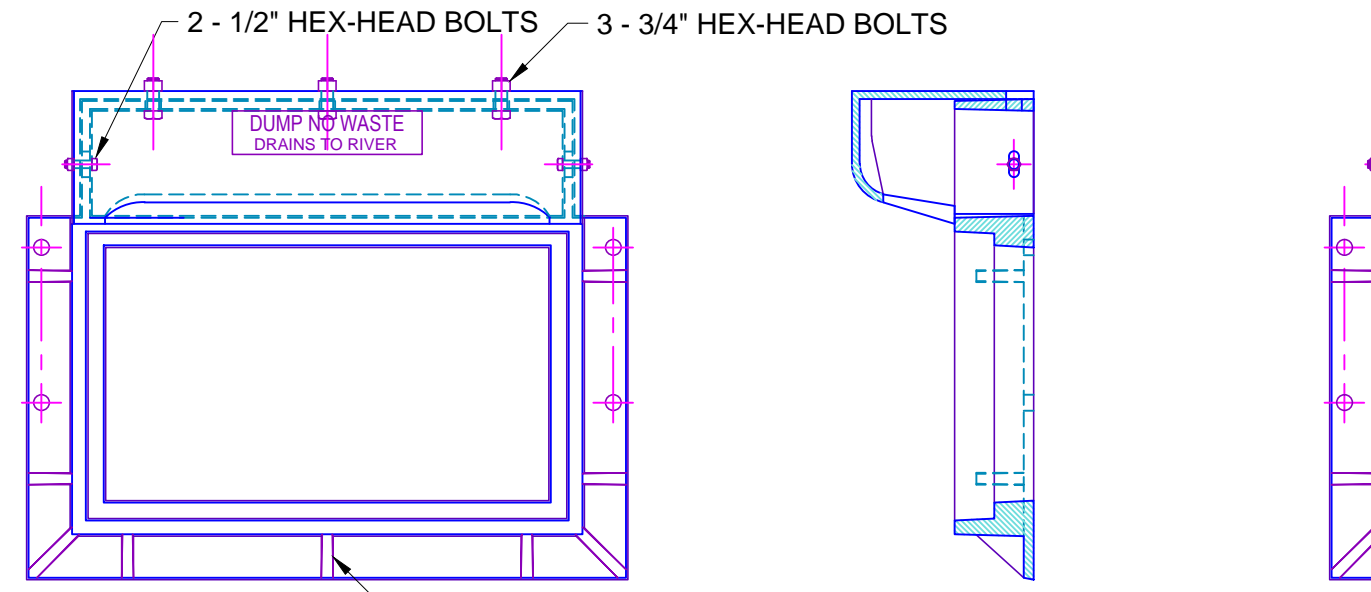
NOTES:
 1. MATERIAL: CAST GRAY IRON, ASTM A-48, CLASS 35B
 2. FINISH: NO PAINT
 3. WEIGHT: 112 LBS.

BARRIER CURB 13 1/2"



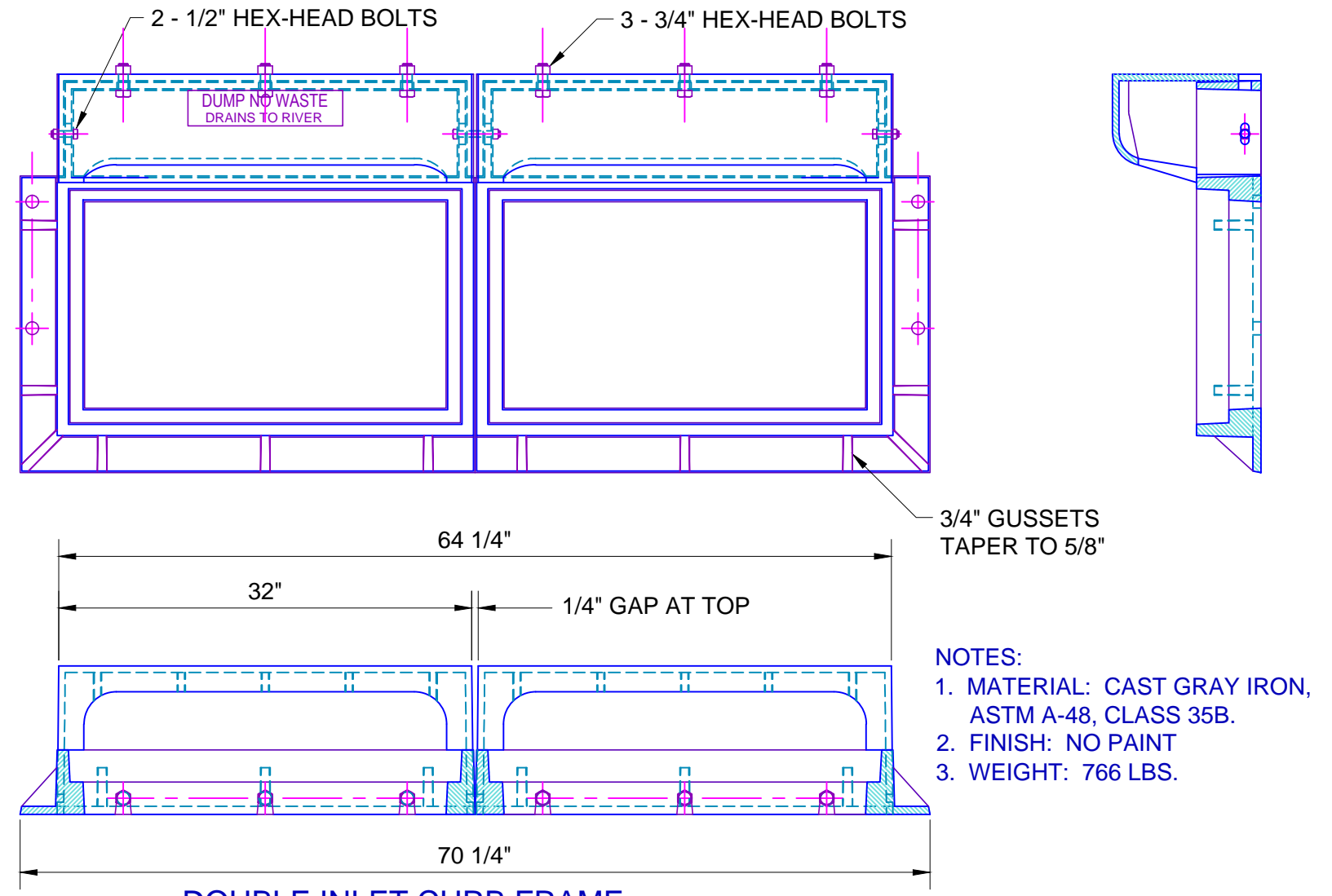
NOTES:
 1. MATERIAL: CAST GRAY IRON, ASTM A-48, CLASS 35B.
 2. FINISH: NO PAINT
 3. WEIGHT: 261 LBS.

INLET CURB FRAME FOR MULTIPAL INLET



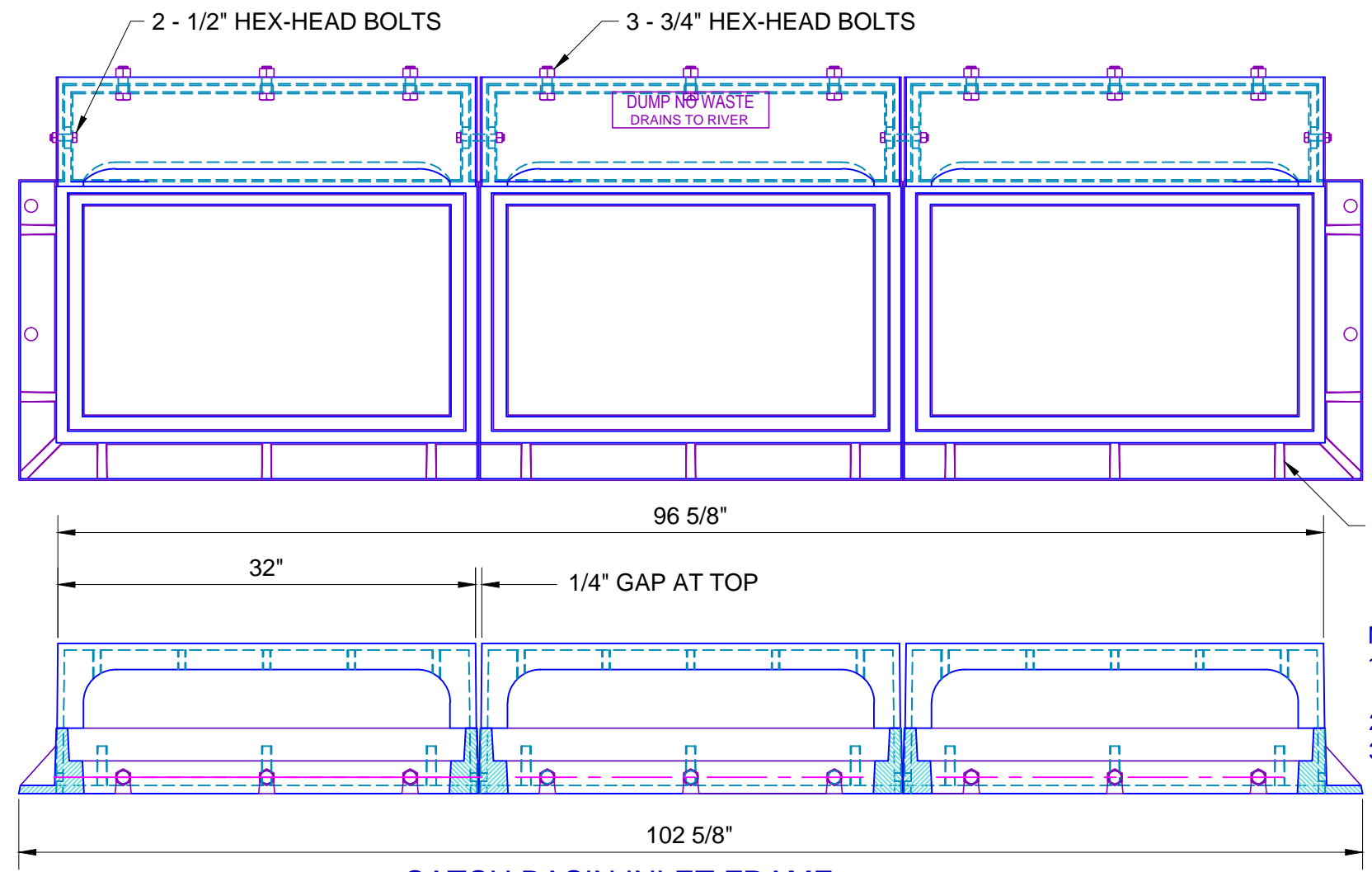
NOTES:
 1. MATERIAL: CAST GRAY IRON, ASTM A-48, CLASS 35B.
 2. FINISH: NO PAINT
 3. WEIGHT: 400 LBS.

CURB FRAME WITH CURB



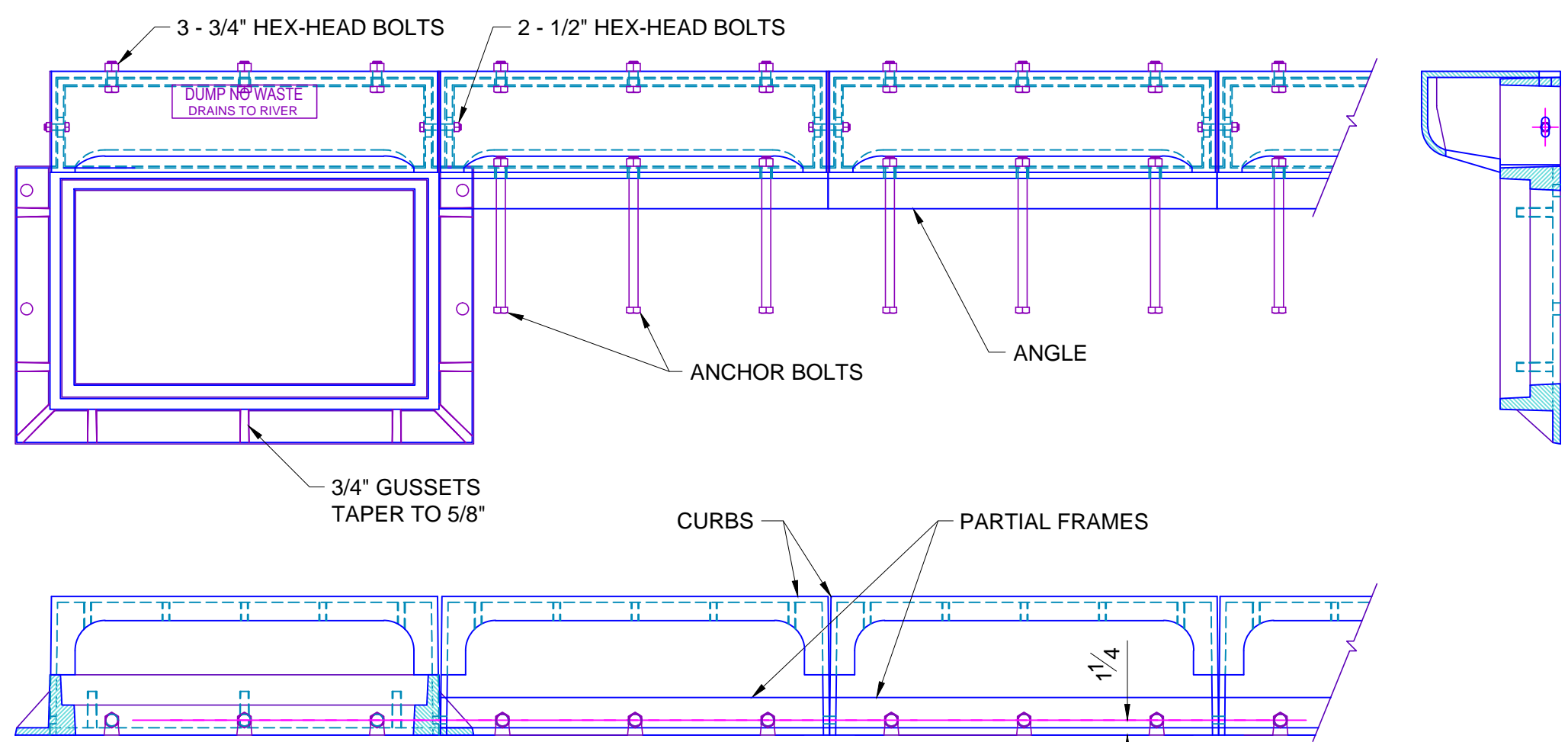
NOTES:
 1. MATERIAL: CAST GRAY IRON, ASTM A-48, CLASS 35B.
 2. FINISH: NO PAINT
 3. WEIGHT: 766 LBS.

DOUBLE INLET CURB FRAME

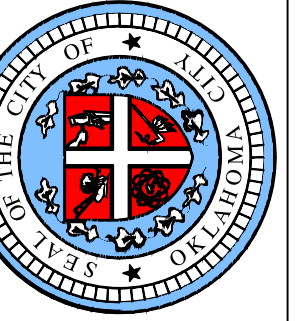


NOTES:
 1. MATERIAL: CAST GRAY IRON, ASTM A-48, CLASS 35B.
 2. FINISH: NO PAINT
 3. WEIGHT: 1124 LBS.

CATCH BASIN INLET FRAME



ONE CURB FRAME WITH MULTIPLE CURB INLETS



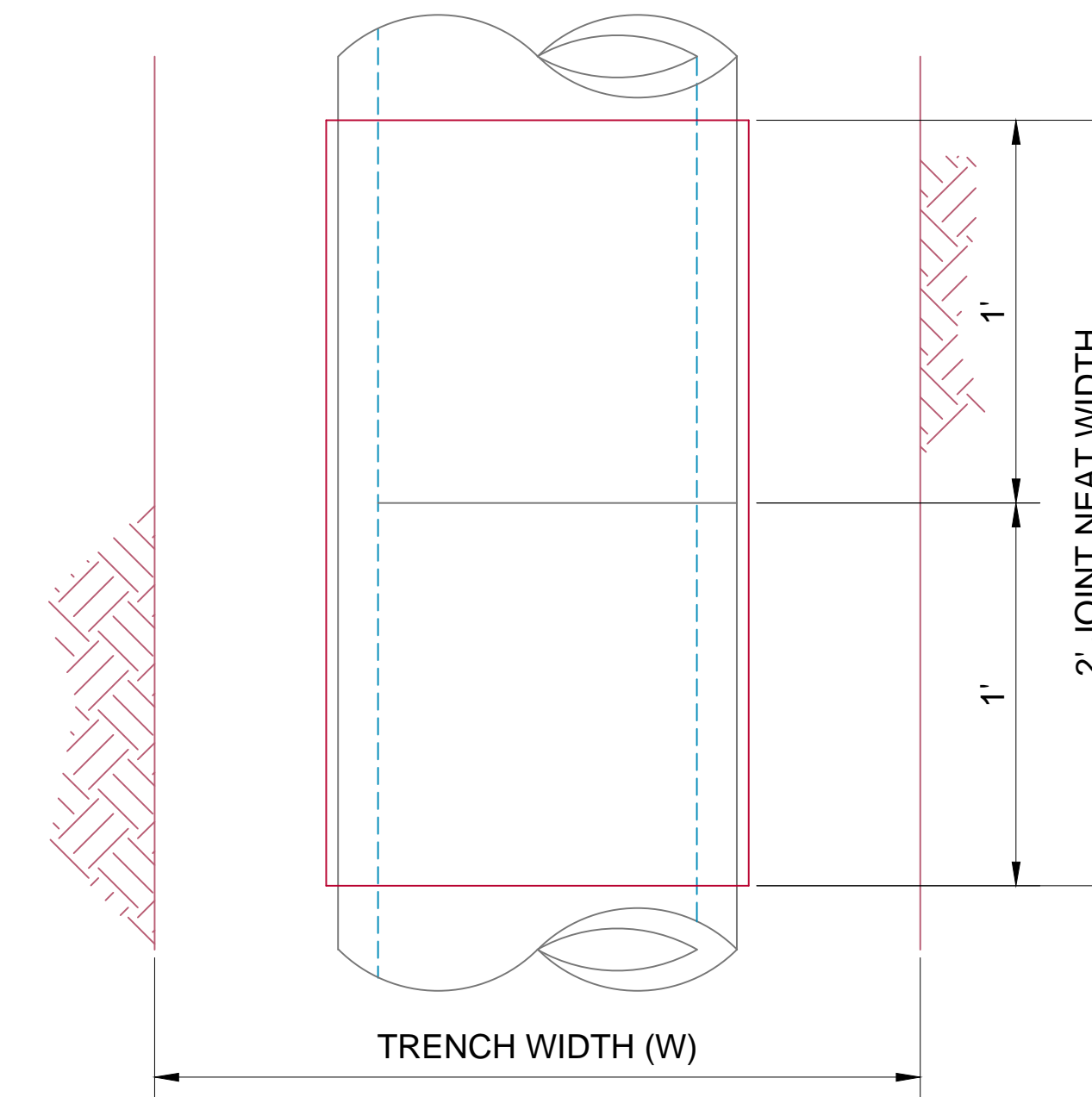
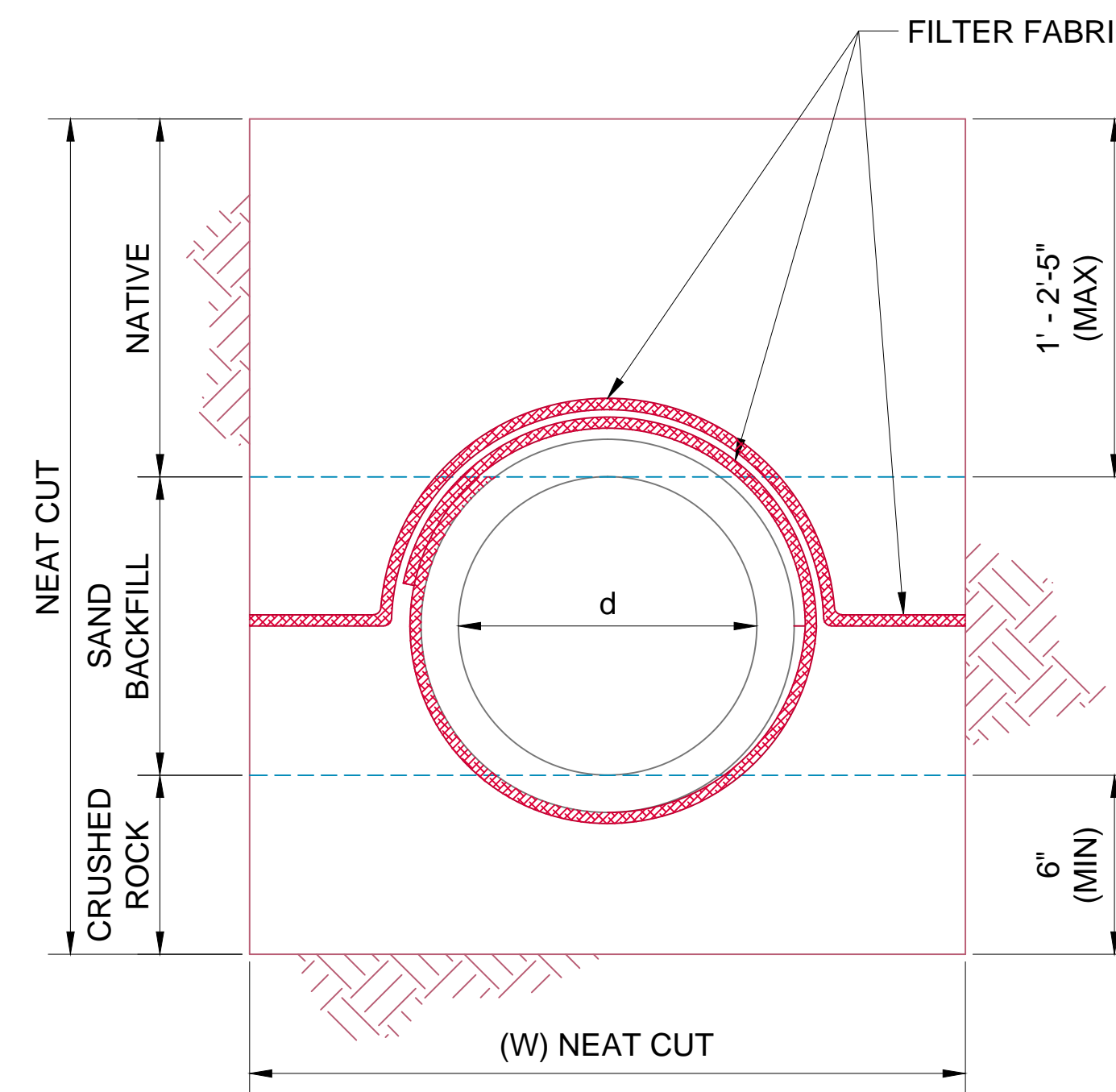
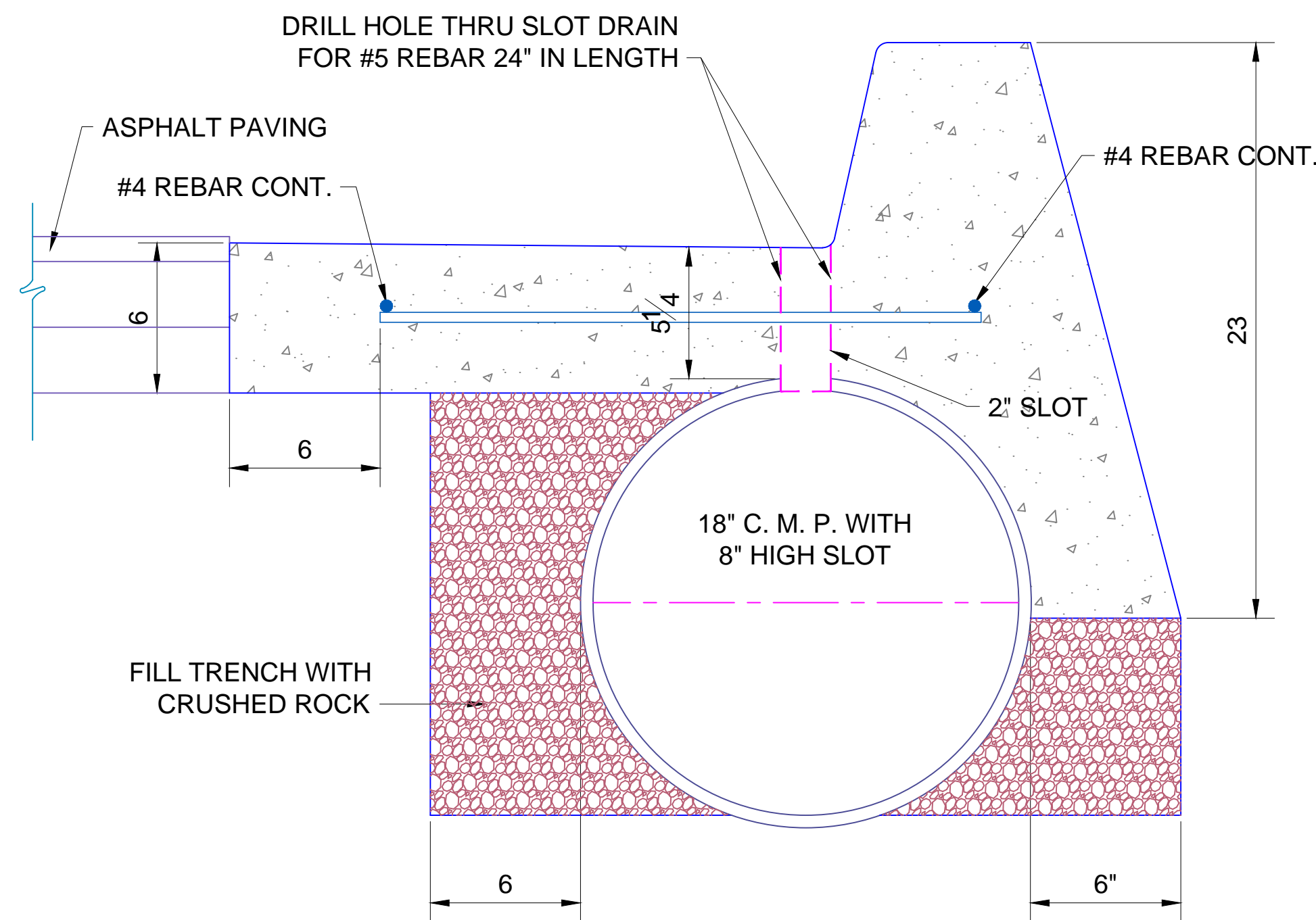
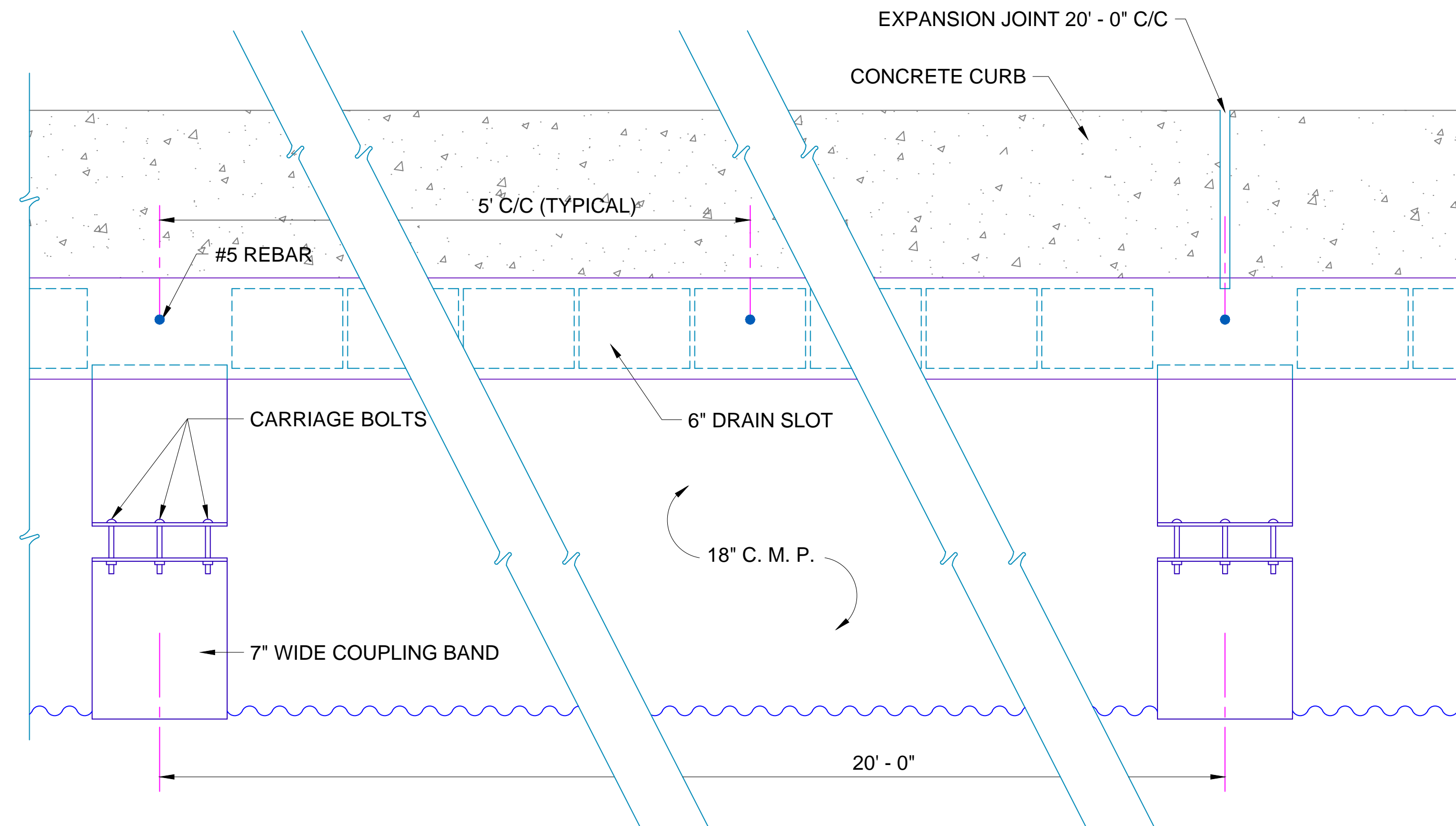
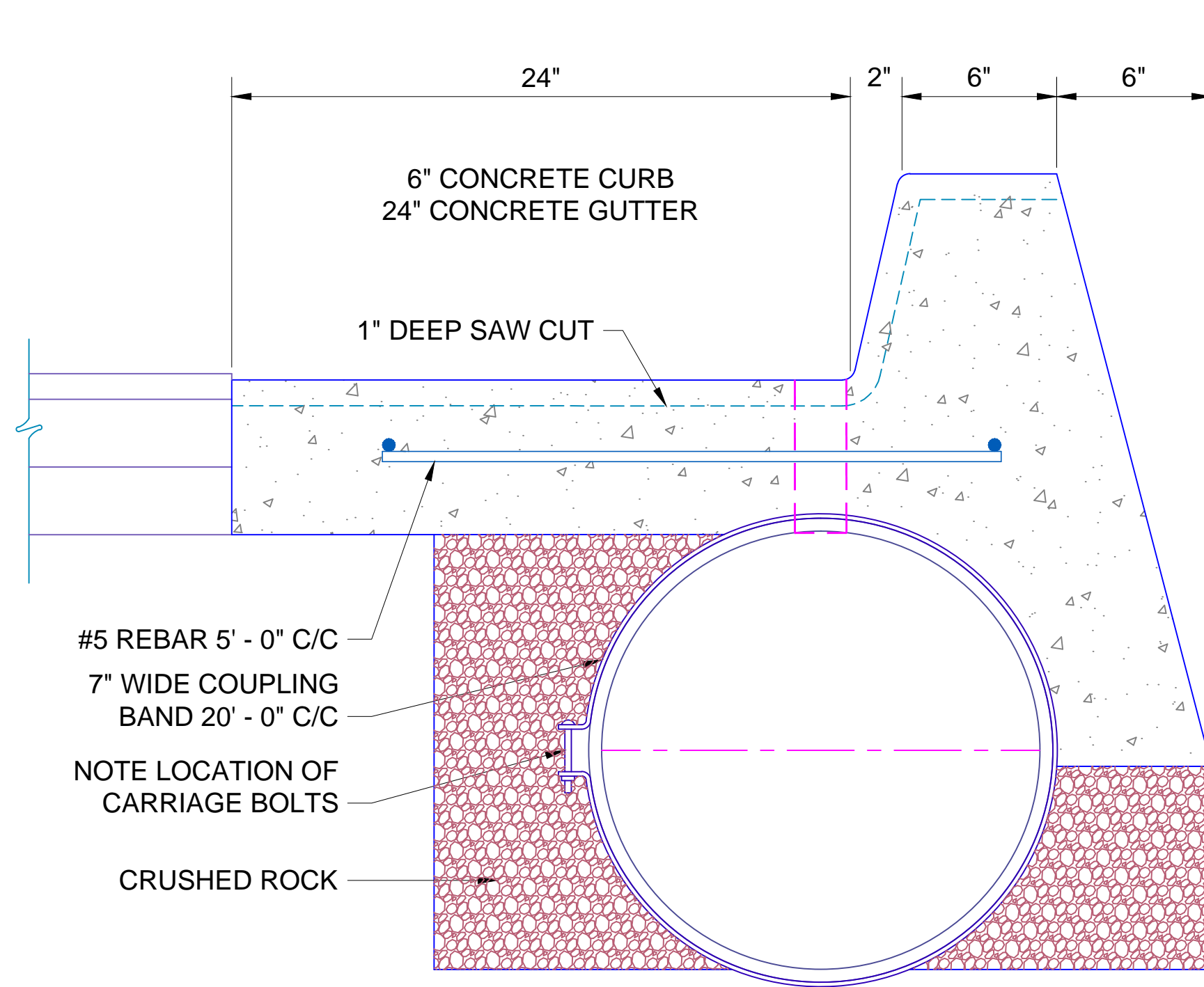
APPROVED BY: DATE: 02-01-13
ERIC J. WENGER, P.E.
CITY ENGINEER

DRAWN: VSC
DATE: 02-01-13

**SLOTTED DRAIN INLET &
TRENCH WIDTH PIPE WARPING
FOR STORM SEWER**

Drawing Number

D-110



SECTION

PLAN VIEW

General Notes

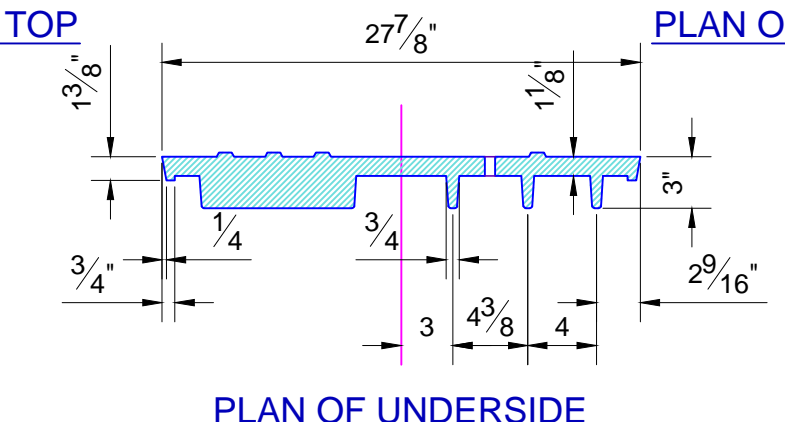
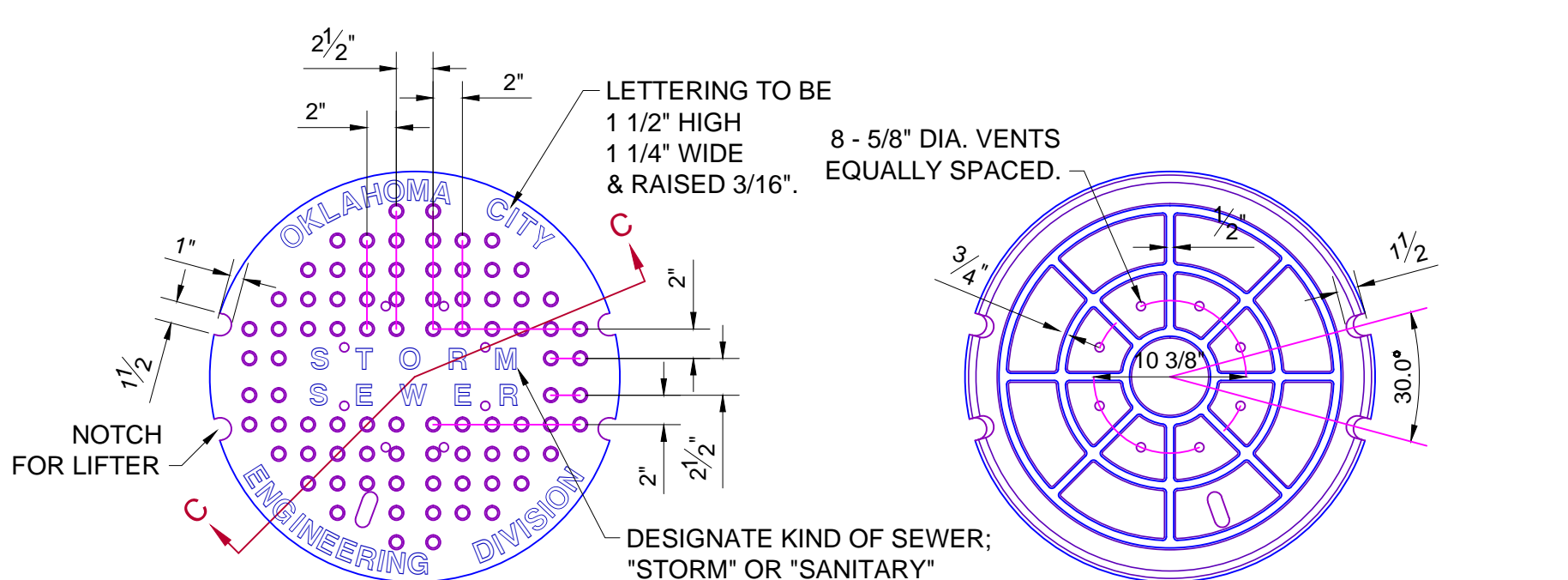
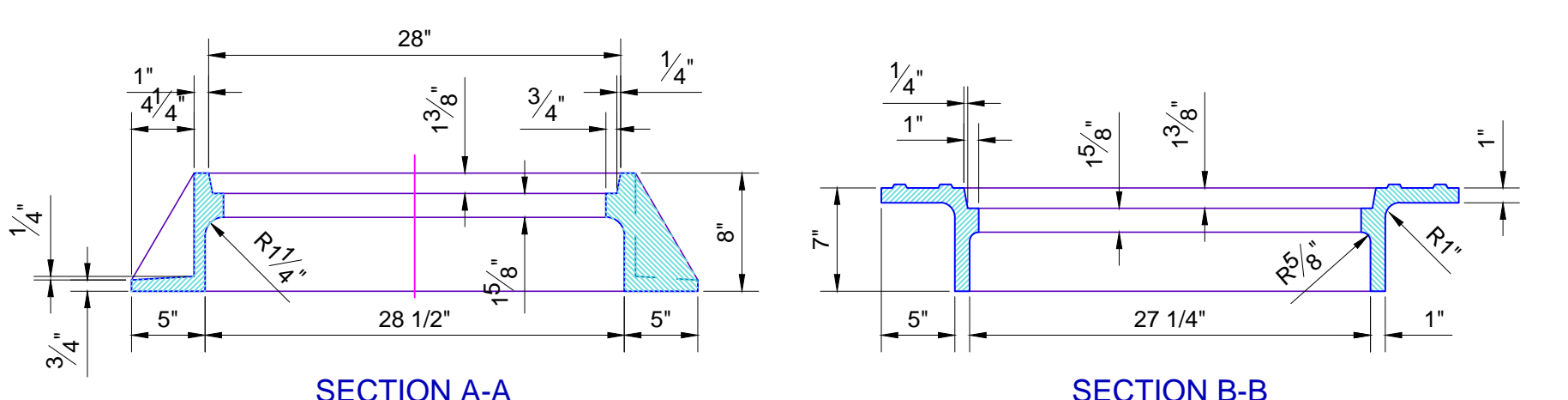
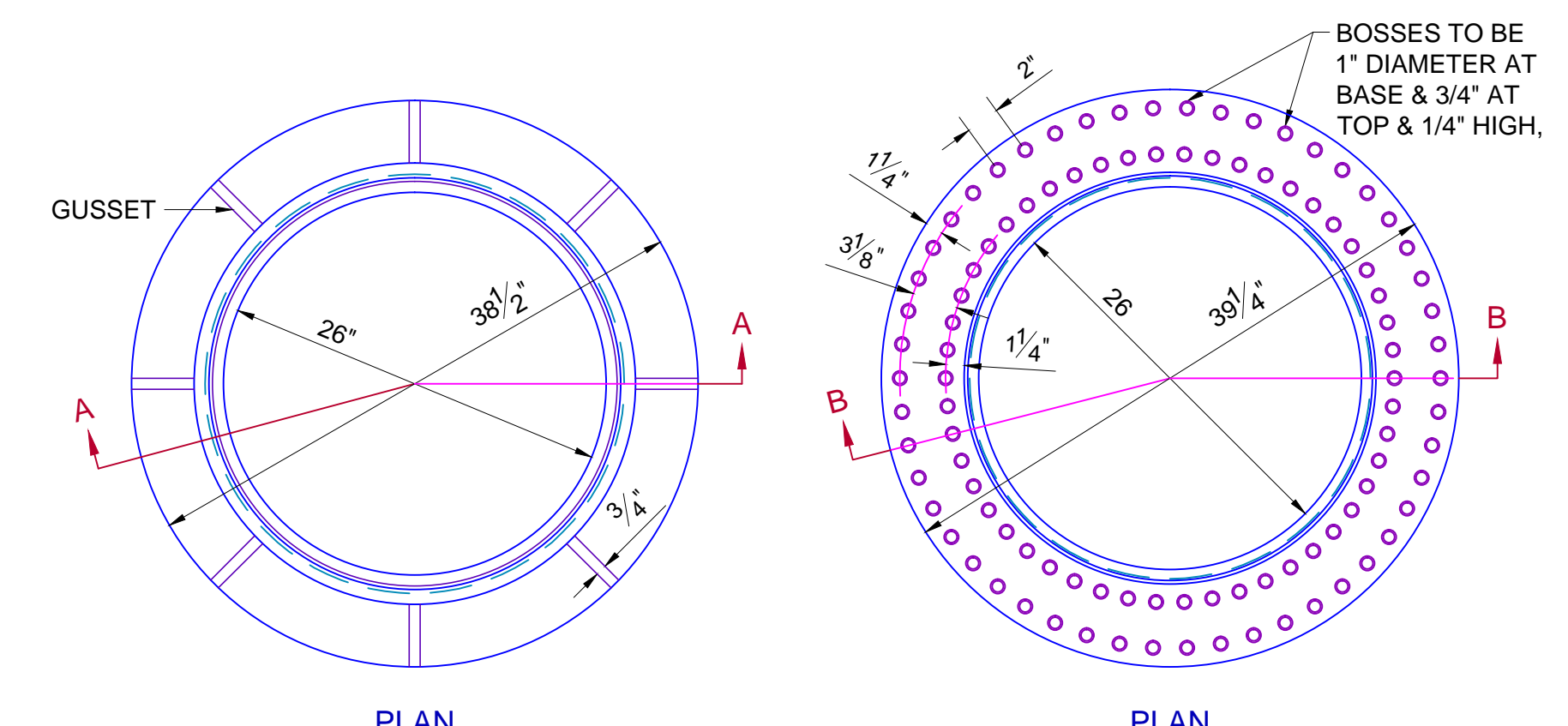
- Quantities for sand Backfill and crushed rock will be paid for as "Neat Cut" Dimensions.
- Excess sand backfill and crushed rock quantities above scheduled quantities shall be considered waste and the cost shall be borne by the contractor.
- Native Backfill over the sand backfill shall be compacted to applicable specifications whether under paving sections, developed areas or unimproved areas.

Construction Notes

- Width of trench shall conform to minimum widths noted for diameter of pipe.
- Filter Fabric shall be placed between crushed rock and sand backfill to prevent migration of sand into bedding.
- Wrapped joints shall be a minimum of one foot (1') either side of the joint.
- Wrapped joints shall be double wrapped sufficient to prevent slippage of wrap material as crushed rock is placed in trench.
- Wrapped joints shall be double wrapped from top of pipe to the spring line or two foot minimum.
- Wrapped joints shall be wrapped the entire circumference of the pipe and double wrapped as noted.

Pipe Diameter and Minimum Trench Width

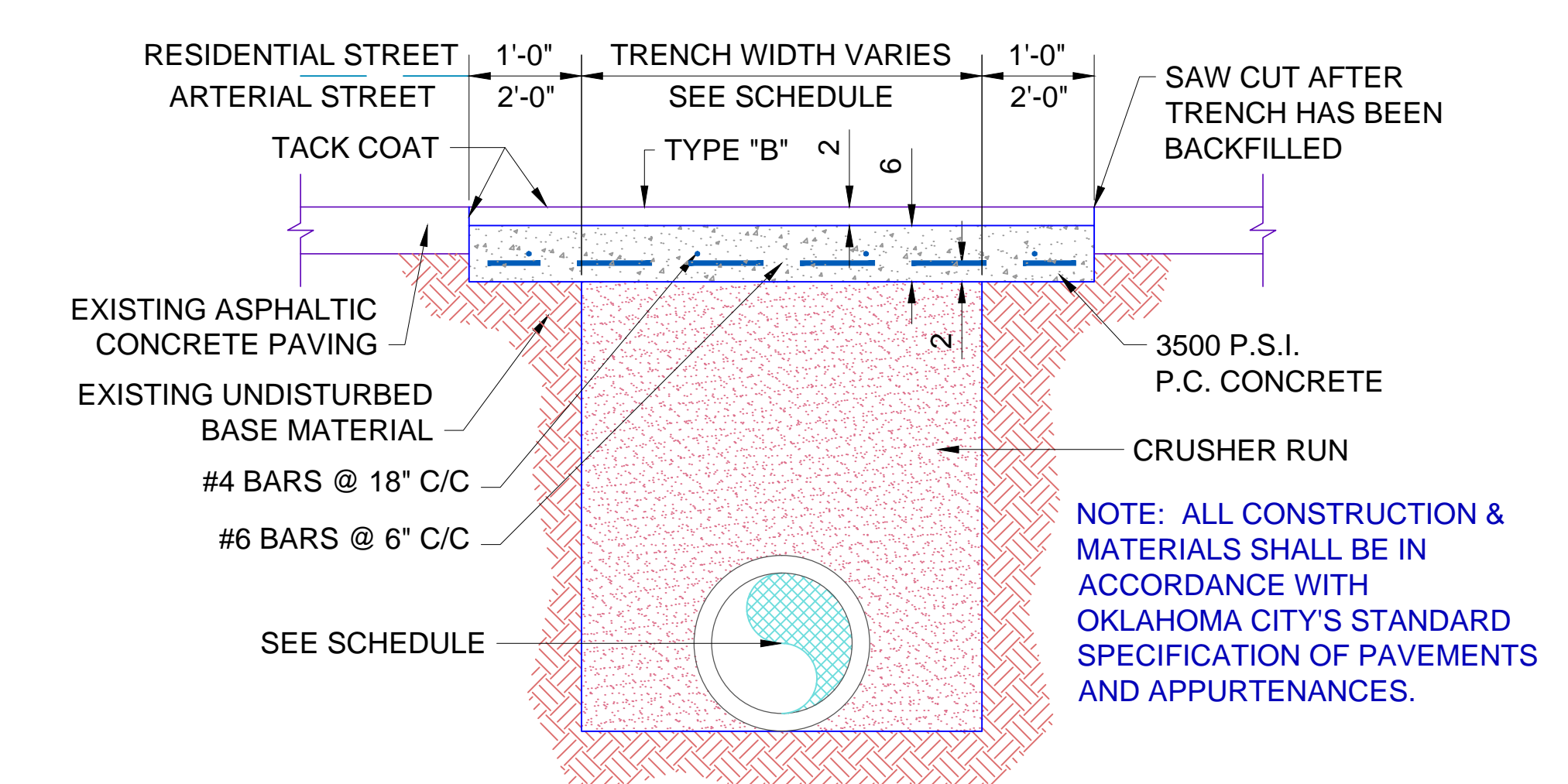
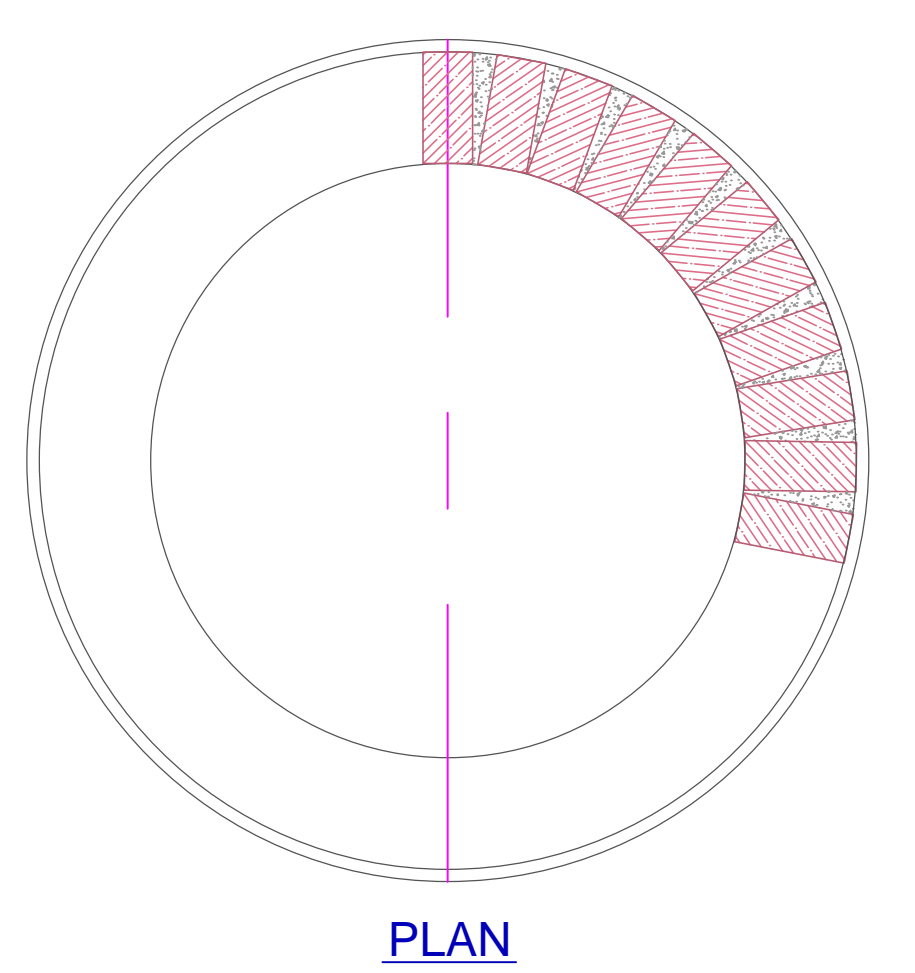
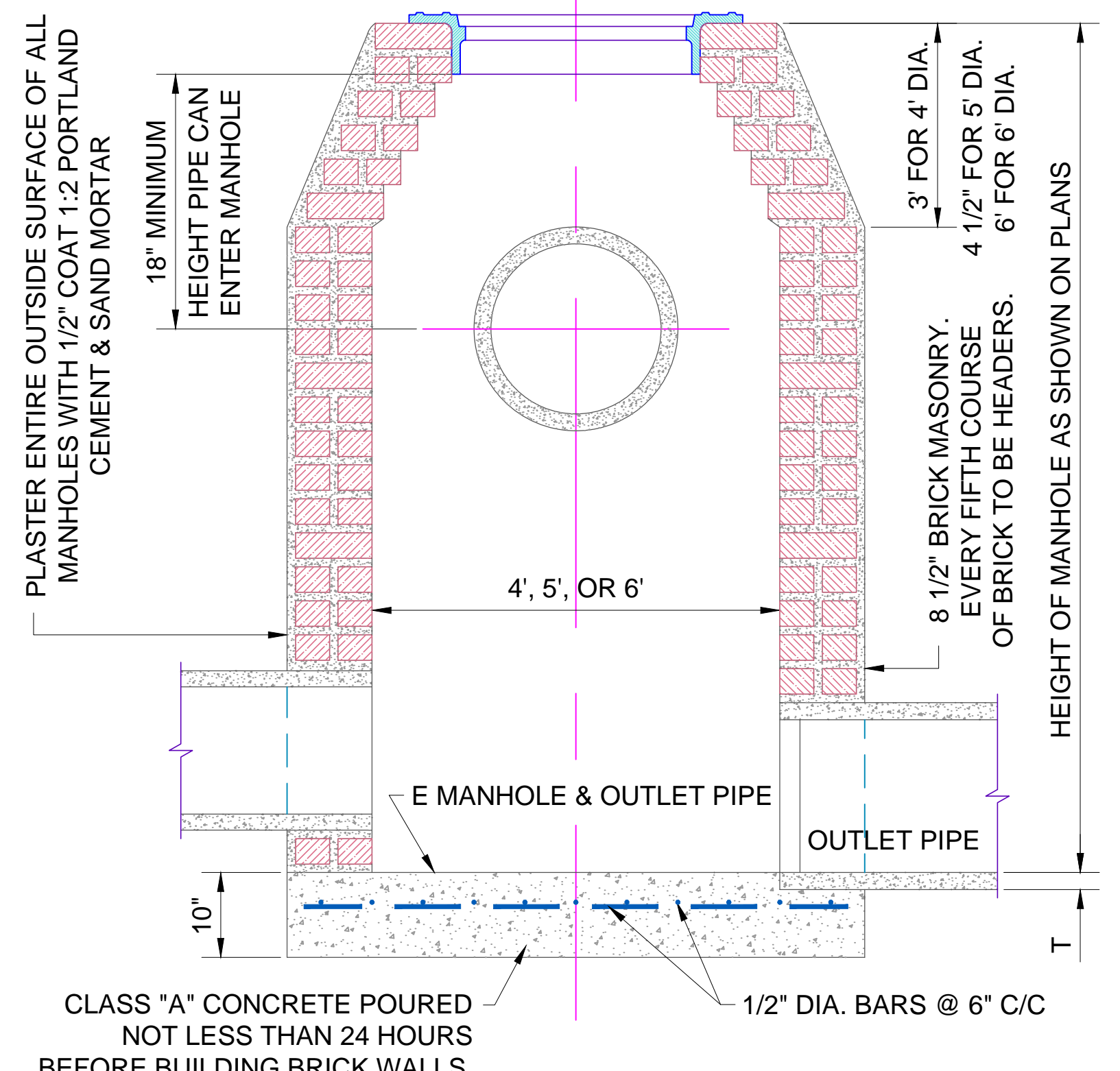
Diameter (in.)	6	8	10	12	15	18	21	24	27	30	33	36	42	48	54	60	66	72	78	84
Trench Width (ft.)	2.00	2.00	2.00	2.00	2.63	2.92	3.21	3.50	4.29	4.58	4.63	4.92	5.50	6.08	6.67	7.25	7.83	8.42	9.00	9.58



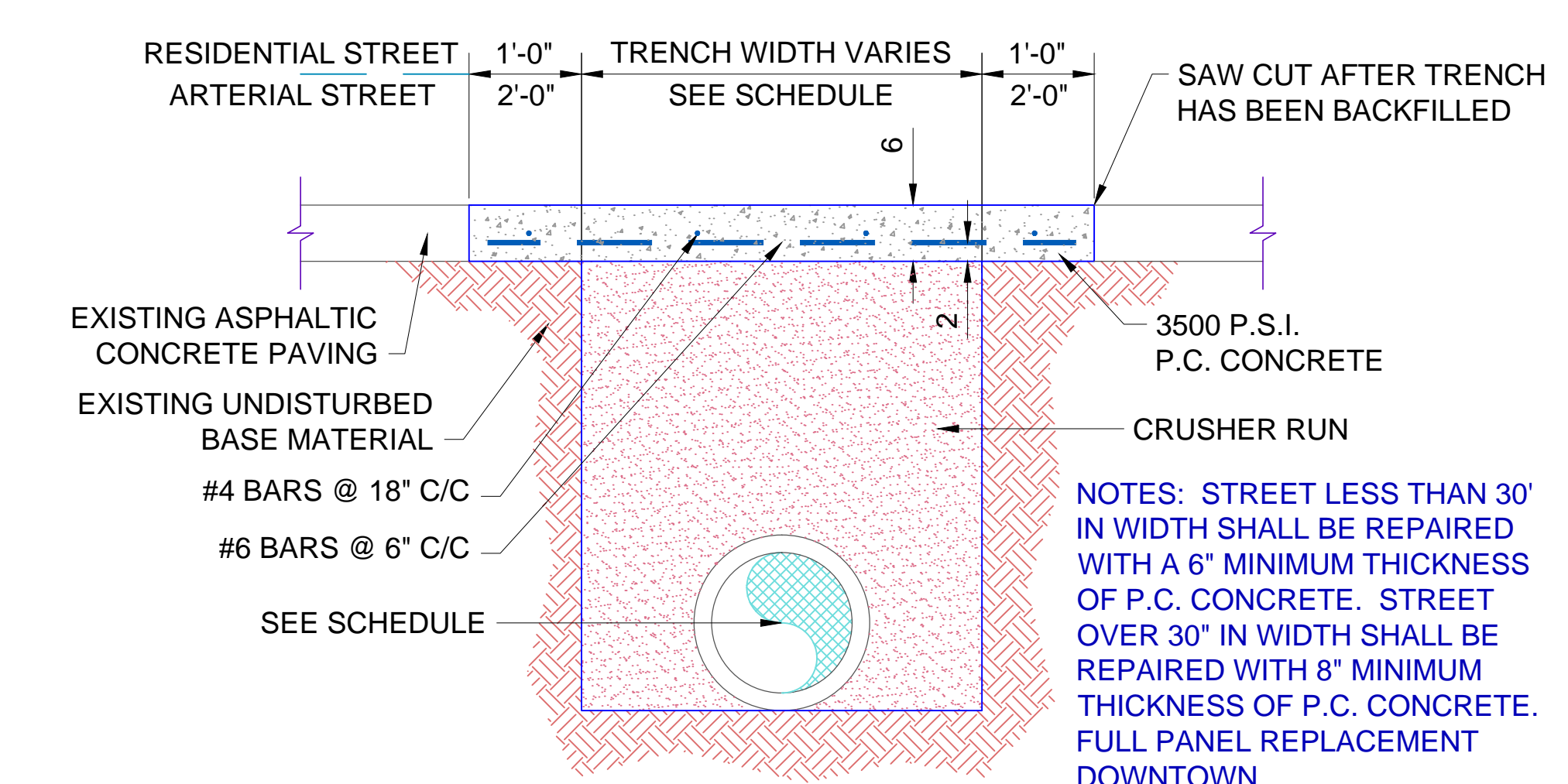
- GENERAL NOTES:**
1. CASTINGS TO CONFORM TO THE A.S.T.M. SPECIFICATIONS FOR GRAY IRON CASTINGS, SERIAL DESIGNATION A 48-28.
 2. WHEN EACH COVER IS PLACED IN ANY POSITION IN ITS ASSOCIATED FRAME, THE SIDE PLAY IN ANY DIRECTION SHALL NOT EXCEED 1/8".
 3. TYPE A FRAMES SHALL BE USED ON PAVED STREETS AND ALLEYS.
 4. TYPE A FRAMES SHALL BE USED ON UNPAVED STREETS AND ALLEYS.
 5. NO WORDING OF MARKINGS OF ANY KIND OTHER THAN THOSE SHOWN ON THIS STANDARD WILL BE PERMITTED ON THESE CASTINGS.
 6. THE AVERAGE WEIGHT OF CASTINGS WILL NOT BE LESS THAN 98% OF WEIGHTS SHOWN.
 7. REVERSIBLE FRAME AND COVER D-204, MAY BE USED IN LIEU OF FRAME AND COVER SHOWN ON D-201.

CASTING WEIGHTS

"A" RING ONLY	347 LBS.
"B" RING ONLY	392 LBS.
COVER ONLY	251 LBS.
TOTAL TYPE "A"	598 LBS.
TOTAL TYPE "B"	643 LBS.



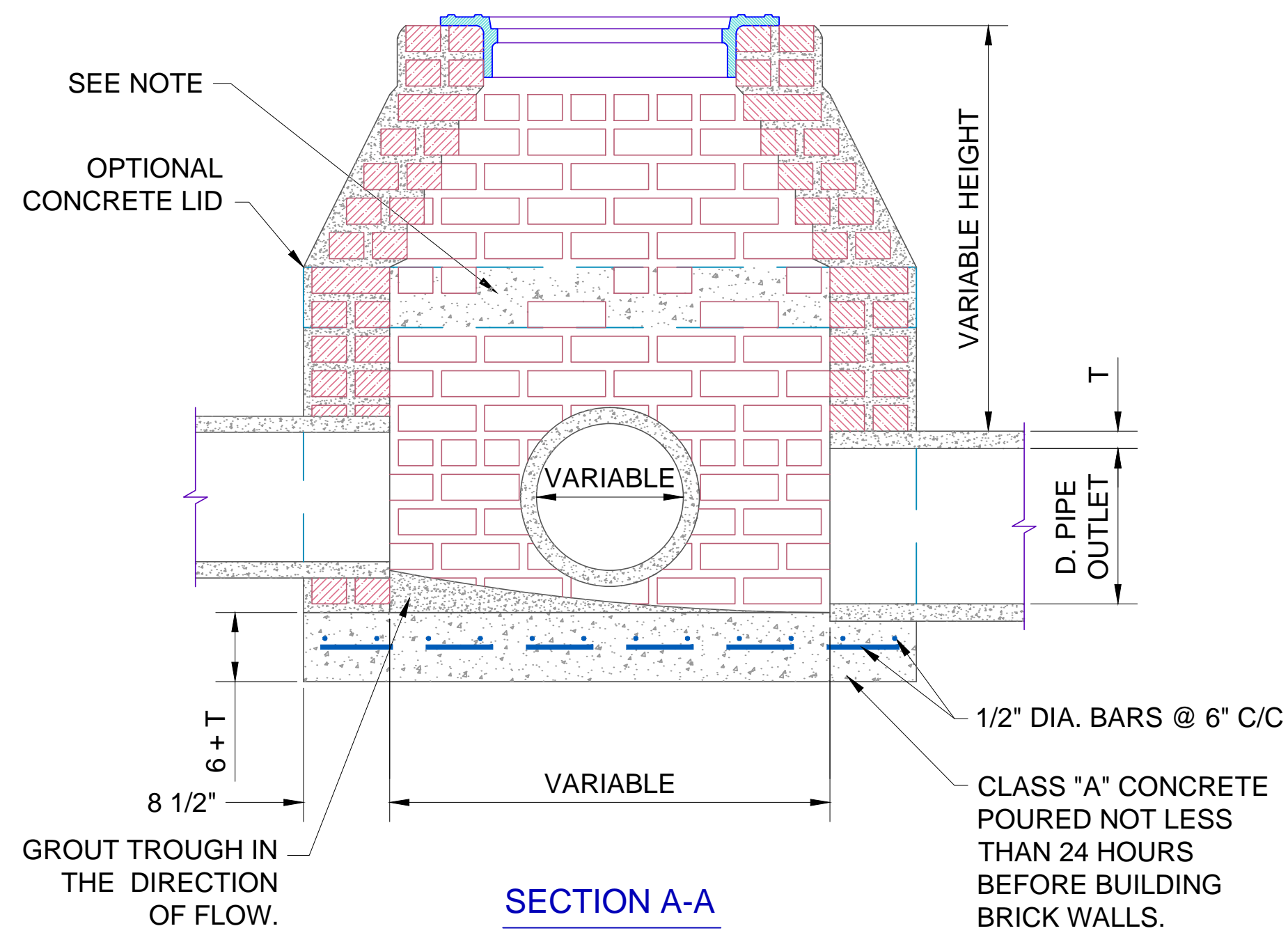
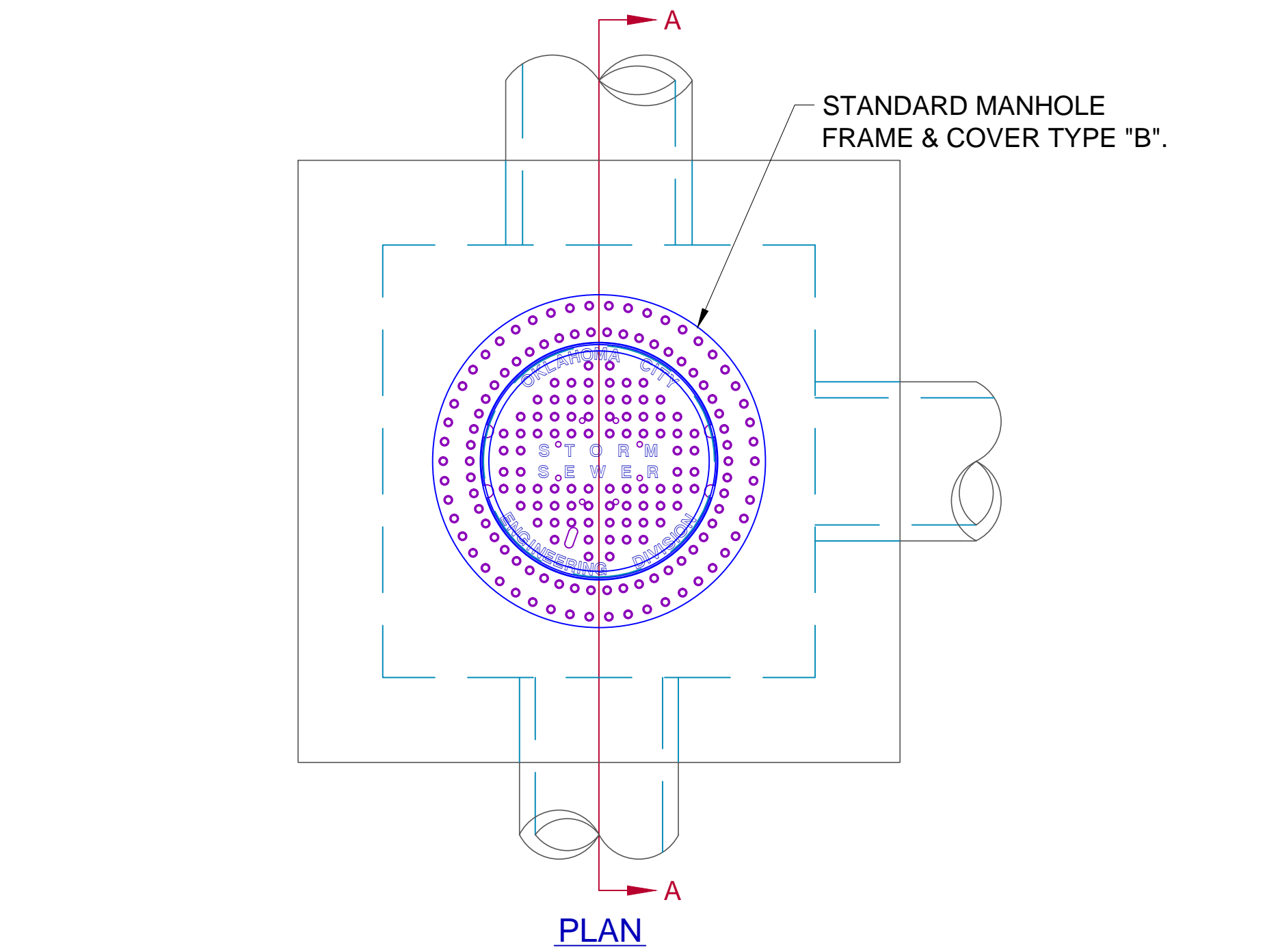
TYPICAL PERMANENT REPAIR SECTION FOR ASPHALT CONCRETE PAVING



TYPICAL PERMANENT REPAIR SECTION FOR P.C. CONCRETE PAVING

TRENCH WIDTH SCHEDULE

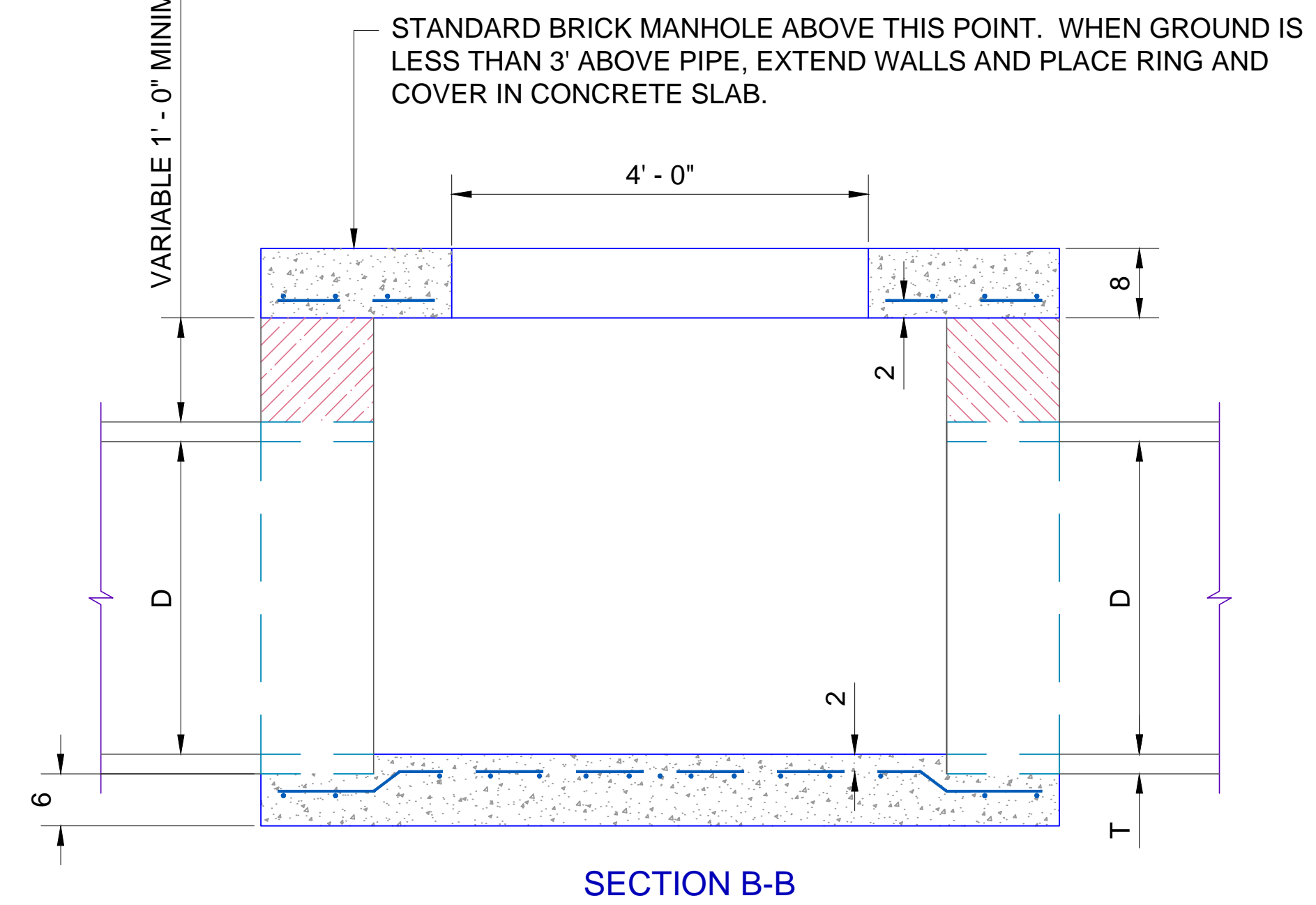
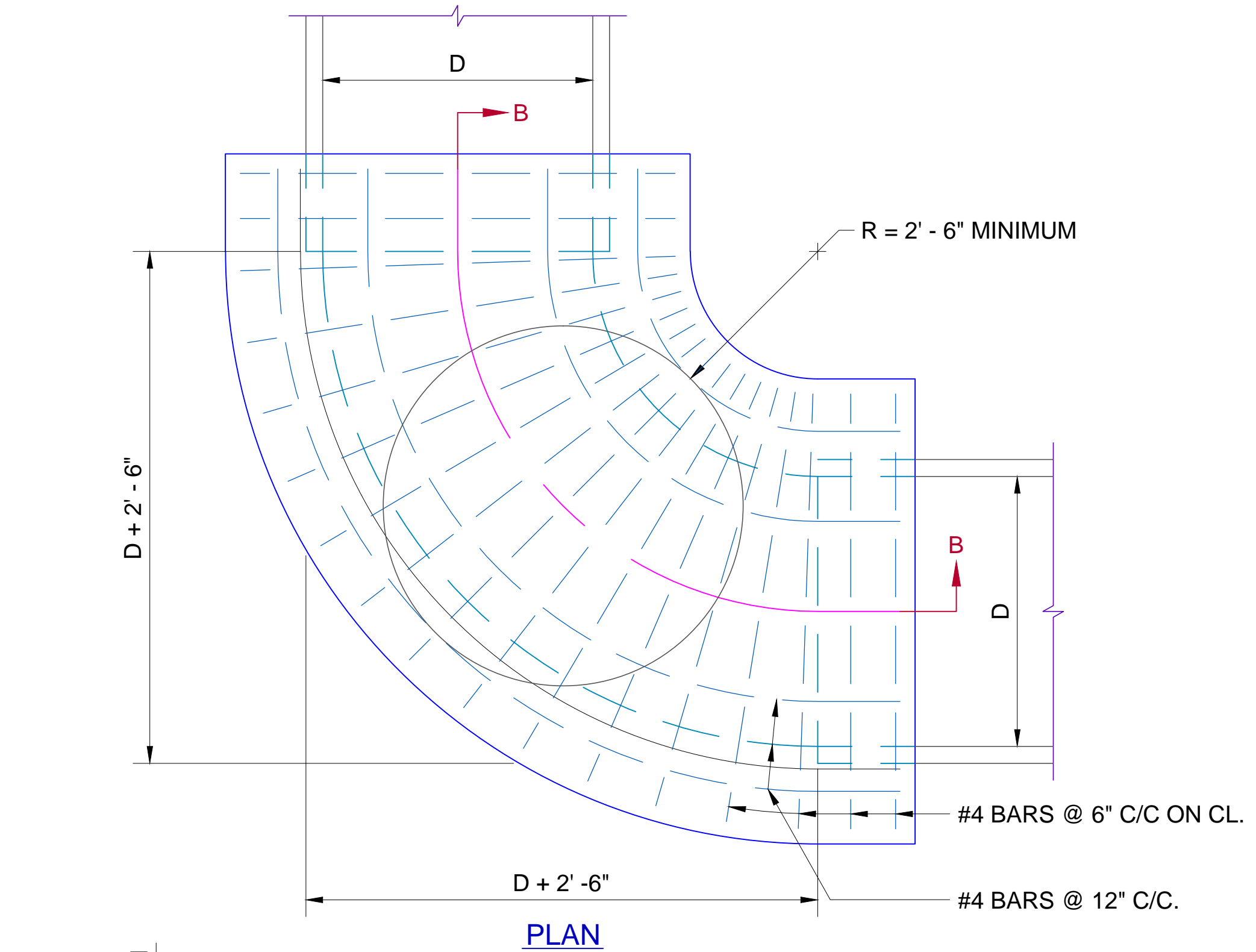
PIPE SIZE I.D.	12" OR LESS	15" TO 21"	24" TO 30"	33" TO 54"	60" & OVER
TRENCH WIDTH (W/O SHORING)	24"	O.D. + 12"	O.D. + 18"	O.D. + 15"	O.D. + 15"
TRENCH WIDTH (W/ SHORING)	36"	O.D. + 24"	O.D. + 30"	O.D. + 30"	O.D. + 36"



DETAIL OF MASONRY JUNCTION BOX

NOTE:

1. ALL CONSTRUCTION AND MATERIAL SHALL BE IN ACCORDANCE WITH THE OKLAHOMA CITY STANDARDS SPECIFICATIONS.
2. ALL CONCRETE SHALL BE CLASS "A" CONCRETE 3500 P.S.I. AND POURED NOT LESS THAN 24 HOURS BEFORE BUILDING BRICK WALLS.
3. OPTIONAL CONCRETE LID WITH STANDARD MANHOLE FRAME AND COVER MAY BE USED IN LIEU OF BRICK CONE FOR SHALLOW BOXES OF PAVED AREAS IF CALLED FOR IN THE PLANS OR APPROVED BY THE ENGINEER. CONCRETE LID SHALL BE 7" THICK WITH #4 BARS AT 6" C/C EACH WAY. EIGHT ADDITIONAL #4 BARS SHALL BE PLACED AT 45° UNDER MANHOLE FRAME.
4. RADIUS JUNCTION BOX WILL BE USED FOR PIPE DIAMETER 36" AND ABOVE.

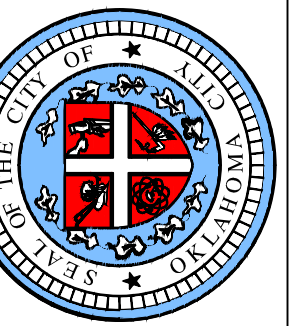


DETAIL OF MASONRY RADIUS JUNCTION BOX

NOTE:

1. ALL CONSTRUCTION AND MATERIAL SHALL BE IN ACCORDANCE WITH THE OKLAHOMA CITY STANDARDS SPECIFICATIONS.
2. ALL CONCRETE SHALL BE CLASS "A" CONCRETE 3500 P.S.I. AND POURED NOT LESS THAN 24 HOURS BEFORE BUILDING BRICK WALLS.
3. RADIUS JUNCTION BOX WILL BE USED FOR PIPE DIAMETER 36" AND ABOVE.

I:\d\c\l\w\p\w\Section\CITY\CAD-STDS\ID-202 VSC 05-02-13



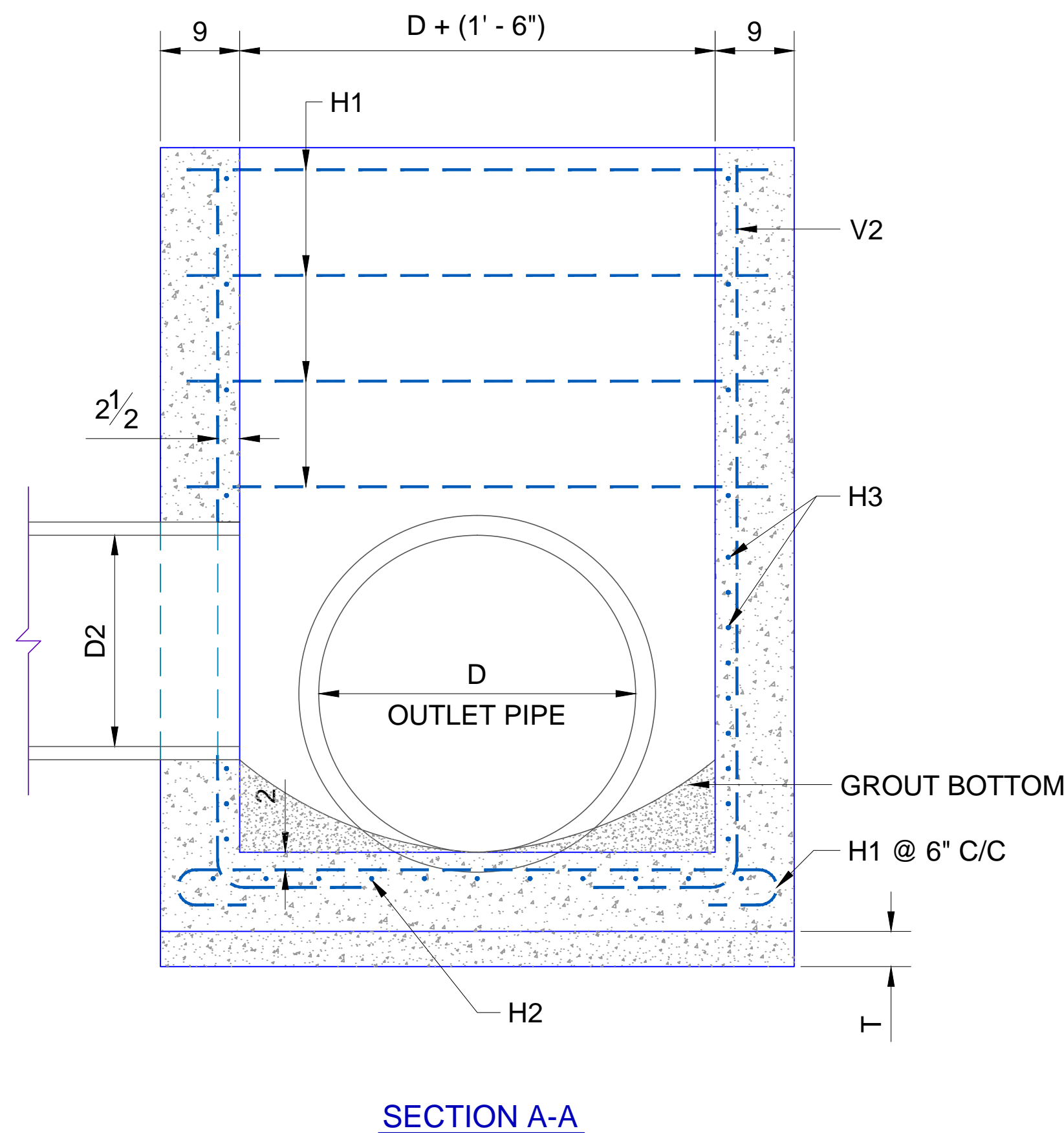
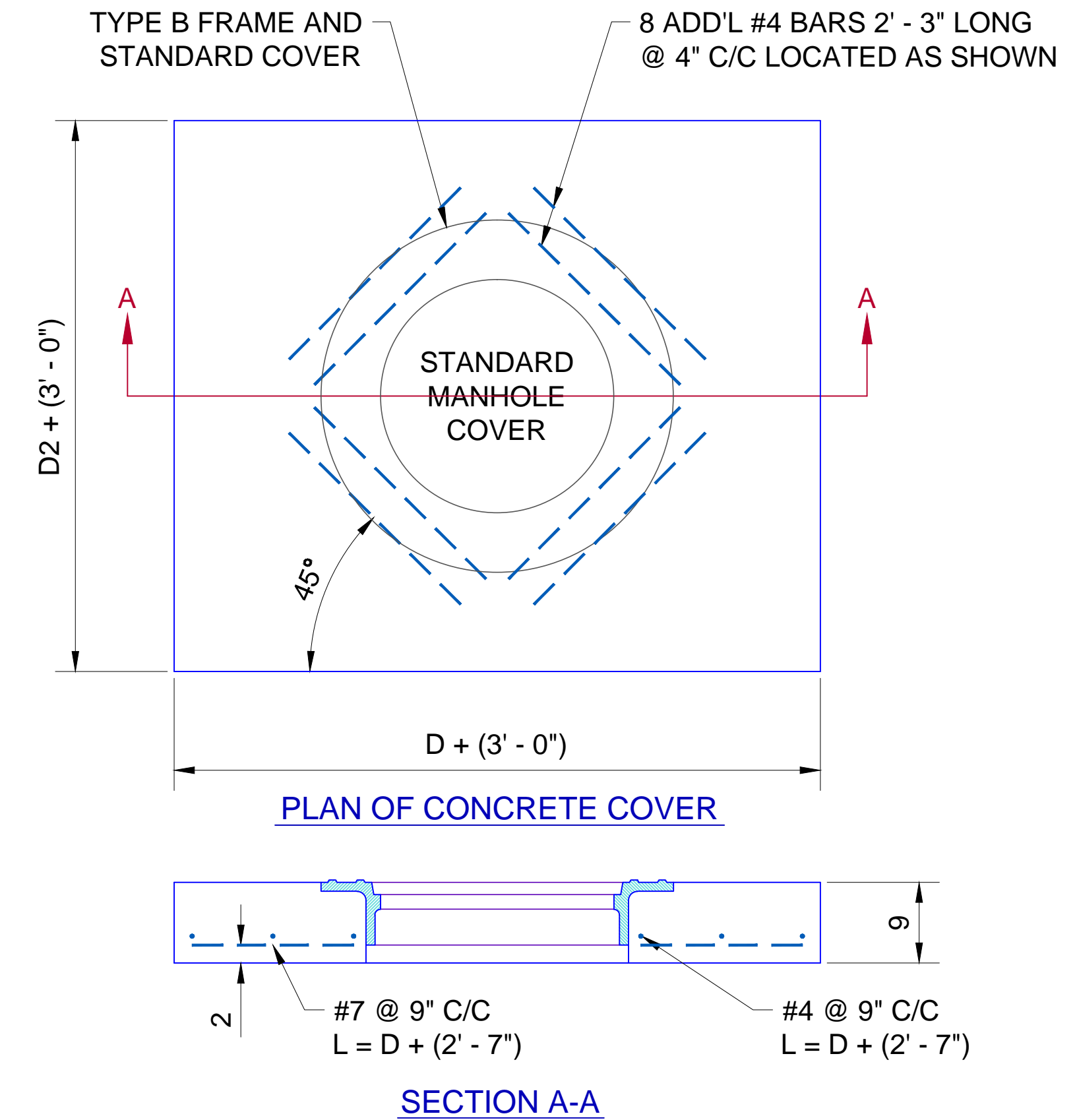
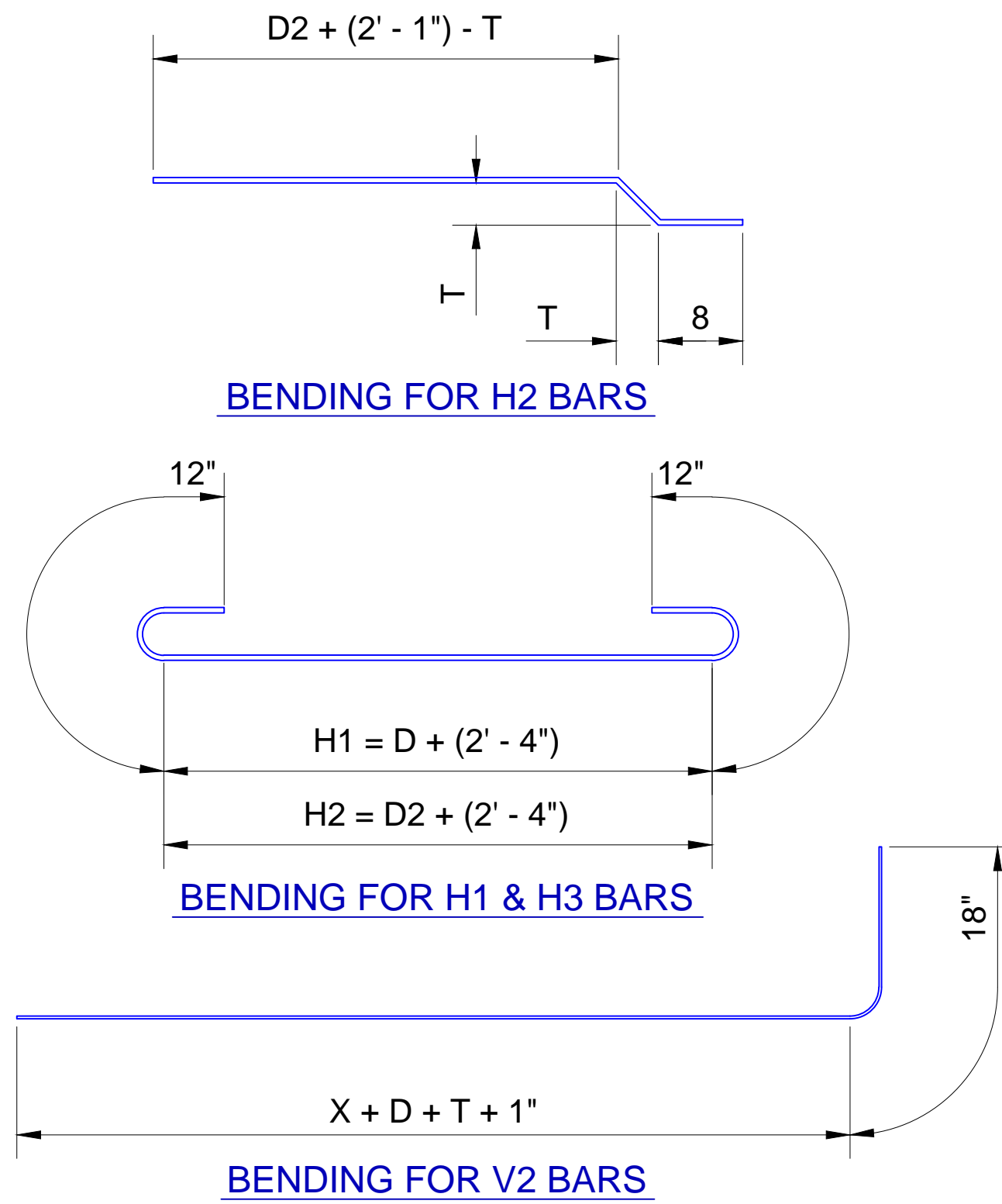
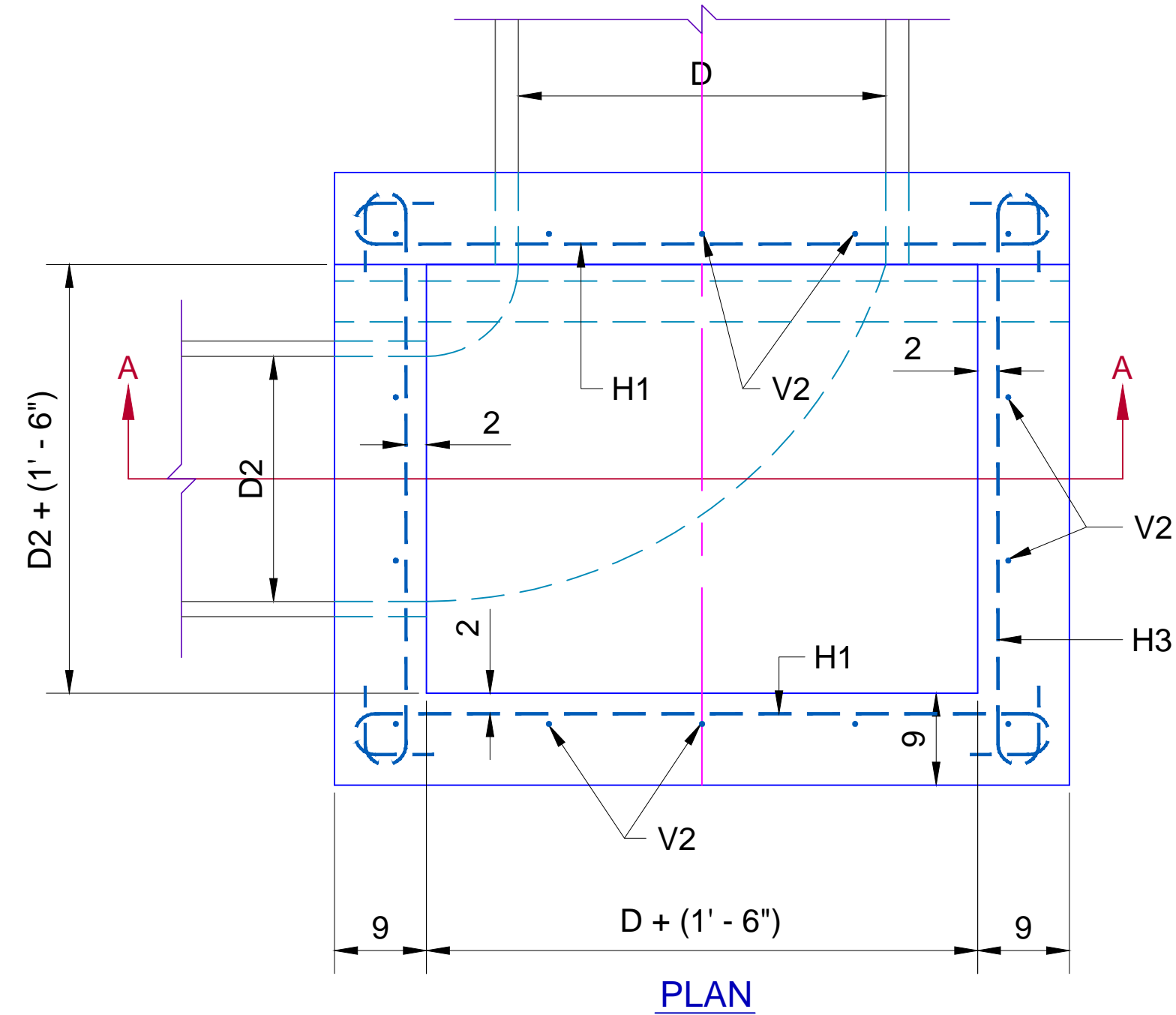
APPROVED BY:  DATE: 05-02-13
ERIC J. WENGER, P.E.
CITY ENGINEER

DRAWN: VSC
DATE: 05-02-13

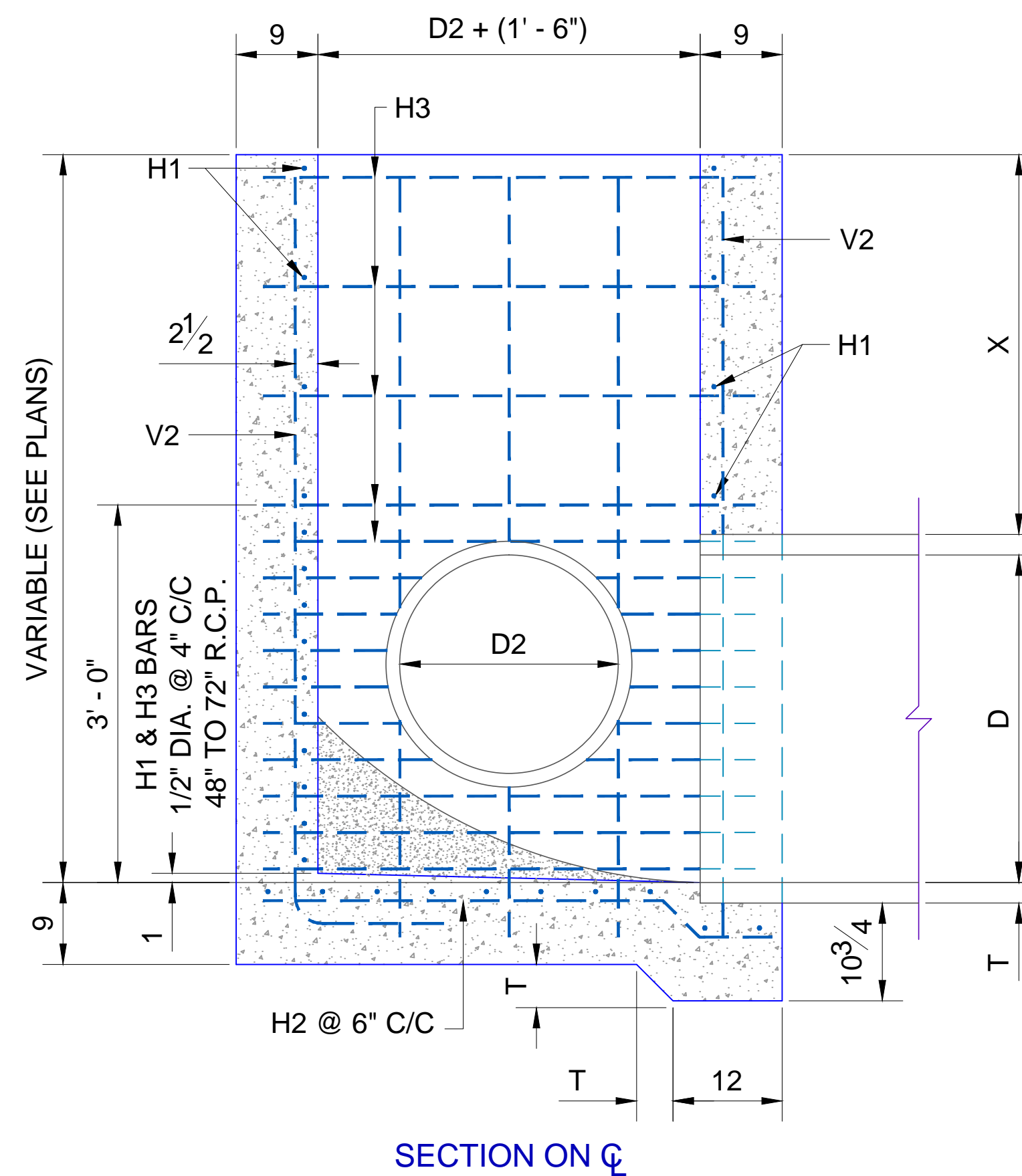
**STANDARD MASONRY
JUNCTION BOX
& RADIUS JUNCTION BOX**

Drawing Number

D-202



**JUNCTION BOX 36" TO 72"
REINFORCED CONCRETE PIPE**

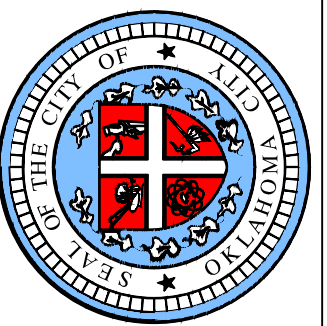


SECTION ON C

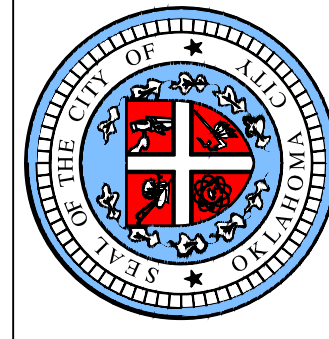
GENERAL NOTES:

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH OKLAHOMA CITY STANDARD SPECIFICATIONS.
2. ALL EXPOSED CONCRETE SURFACES SHALL HAVE A CARBORUNDUM FINISH.
3. ALL EXPOSED CONCRETE SURFACES SHALL HAVE A 3/4" CHAMFER
4. ALL REINFORCED STEEL SHALL BE 1/2" DIAMETER, EXCEPT AS NOTED. ALL HORIZONTAL BARS SHALL BE SPACED AS SHOWN. (18" MAXIMUM)
5. MAXIMUM DEPTHS OF BOXES FOR 48" TO 72" R.C.P. SHALL BE AS FOLLOWS: 48" - 18"; 54" - 16"; 60" - 12'; 72" - 10'.
6. REINFORCED CONCRETE PIPE SHALL CONFORM TO THE REQUIREMENTS OF A.A.S.H.T.O. M-170 (ASTM C-78) CLASS III UNLESS OTHERWISE DESIGNATED.
7. WALL THICKNESS (DIMENSION "T") OF PIPES SHOWN, ARE FROM "WALL B" COLUMN OF A.A.S.H.T.O. TABLES.
8. DIMENTION D2 IS THE DIAMETER OF THE LARGEST PIPE ENTERING THE JUNCTION BOX THROUGH THE SIDE.
9. DIMENTION "X" DEPENDS ON THE DEPTHS AS CALLED FOR IN THE PLANS.

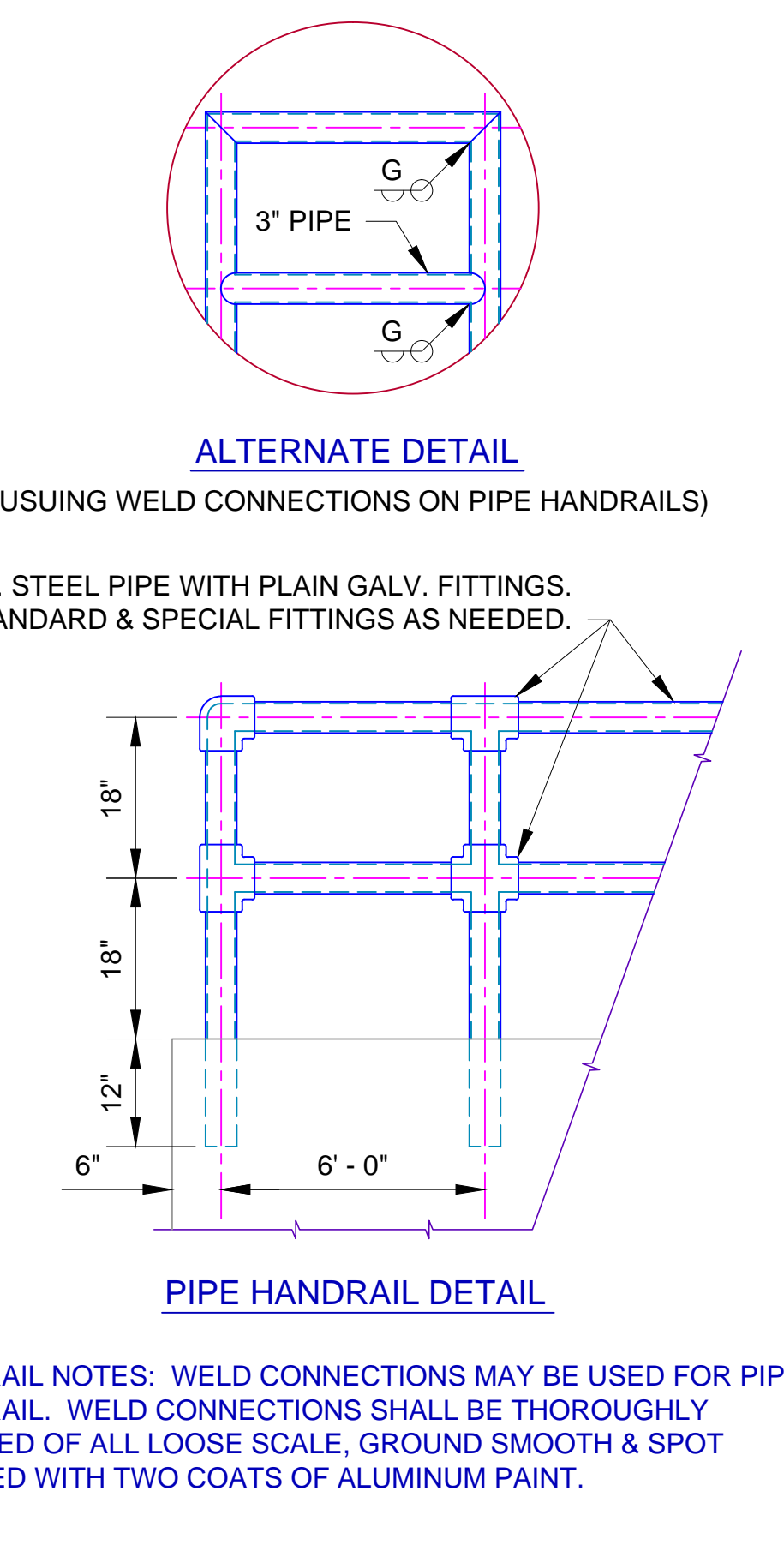
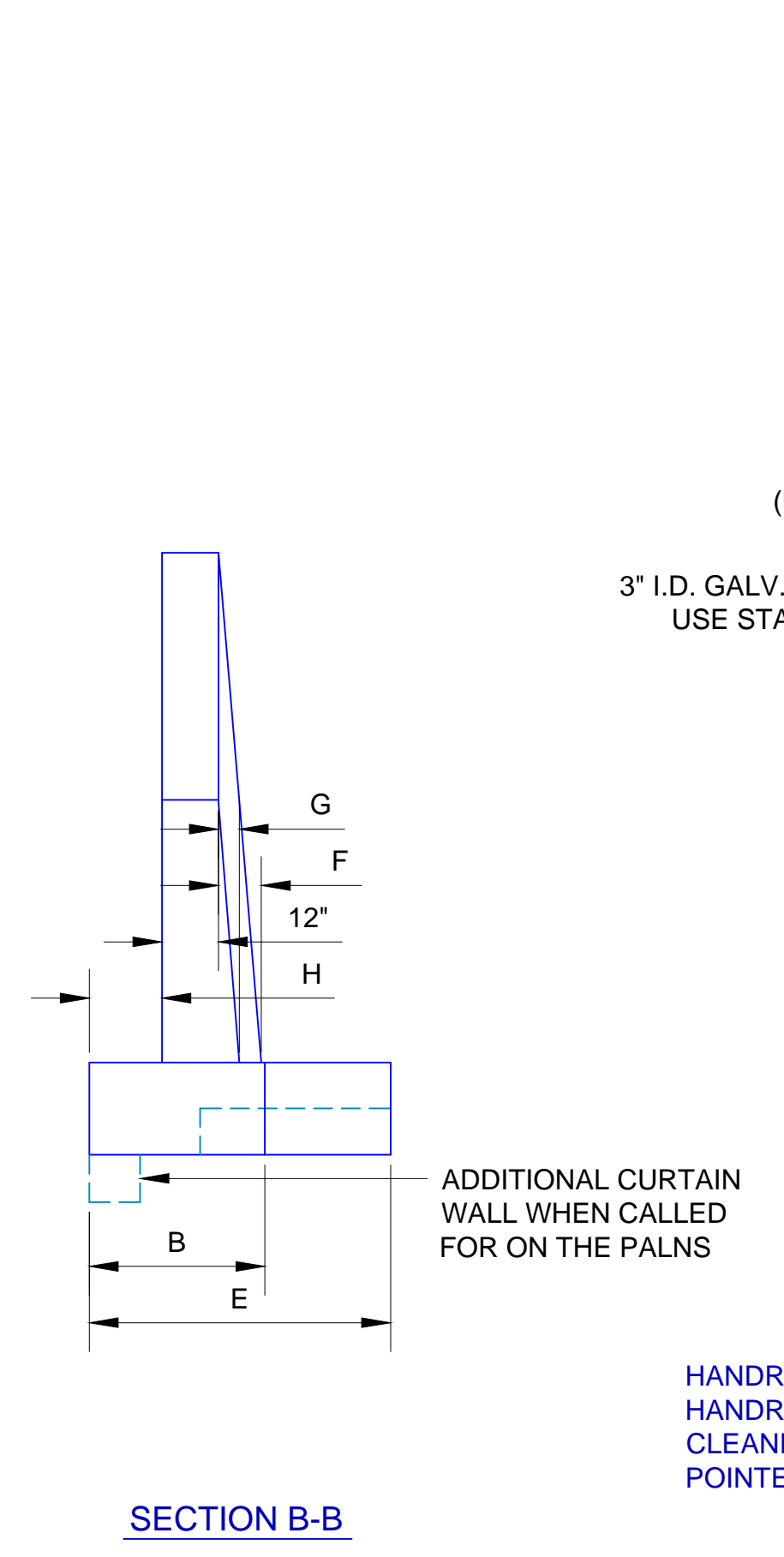
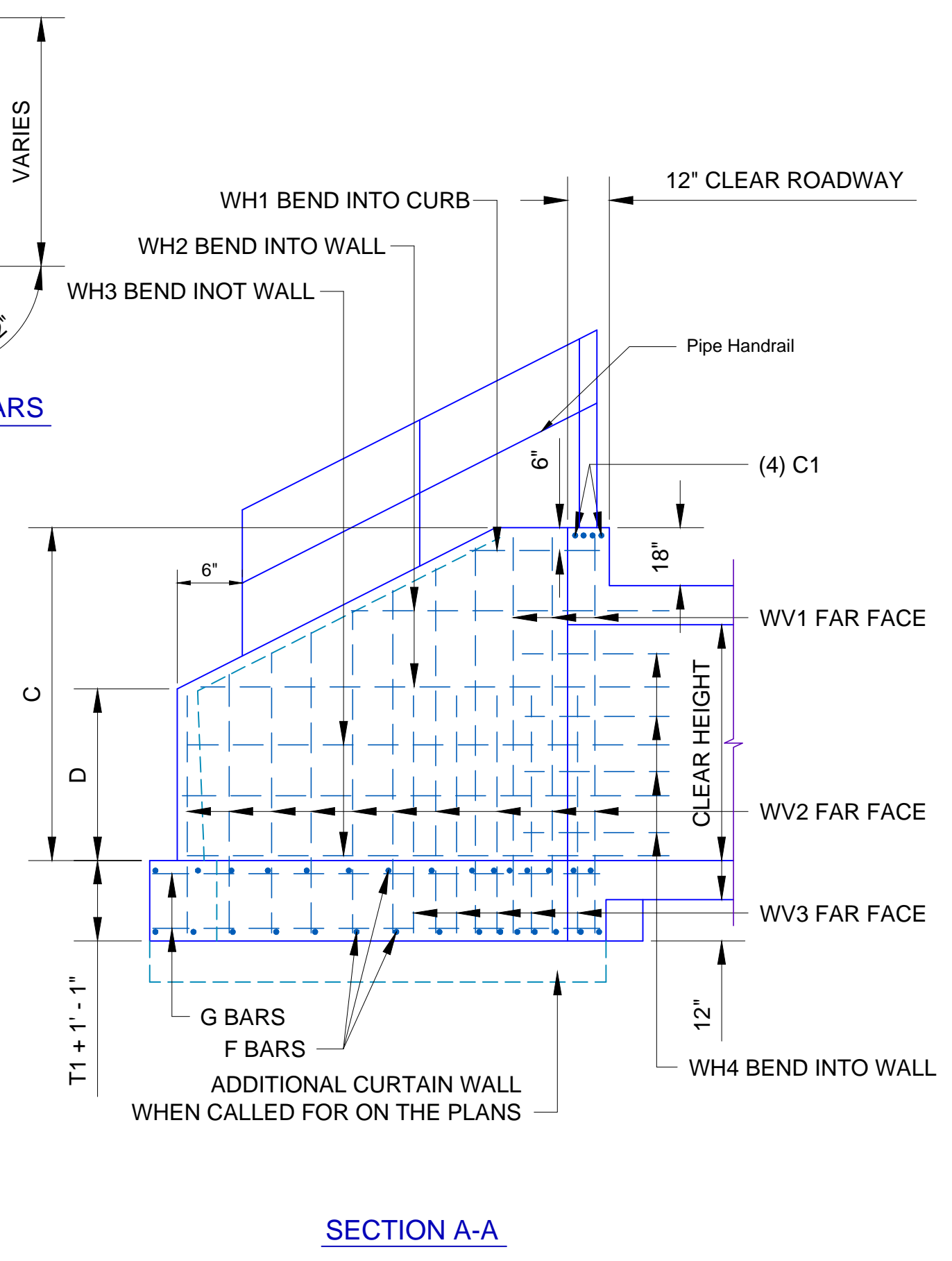
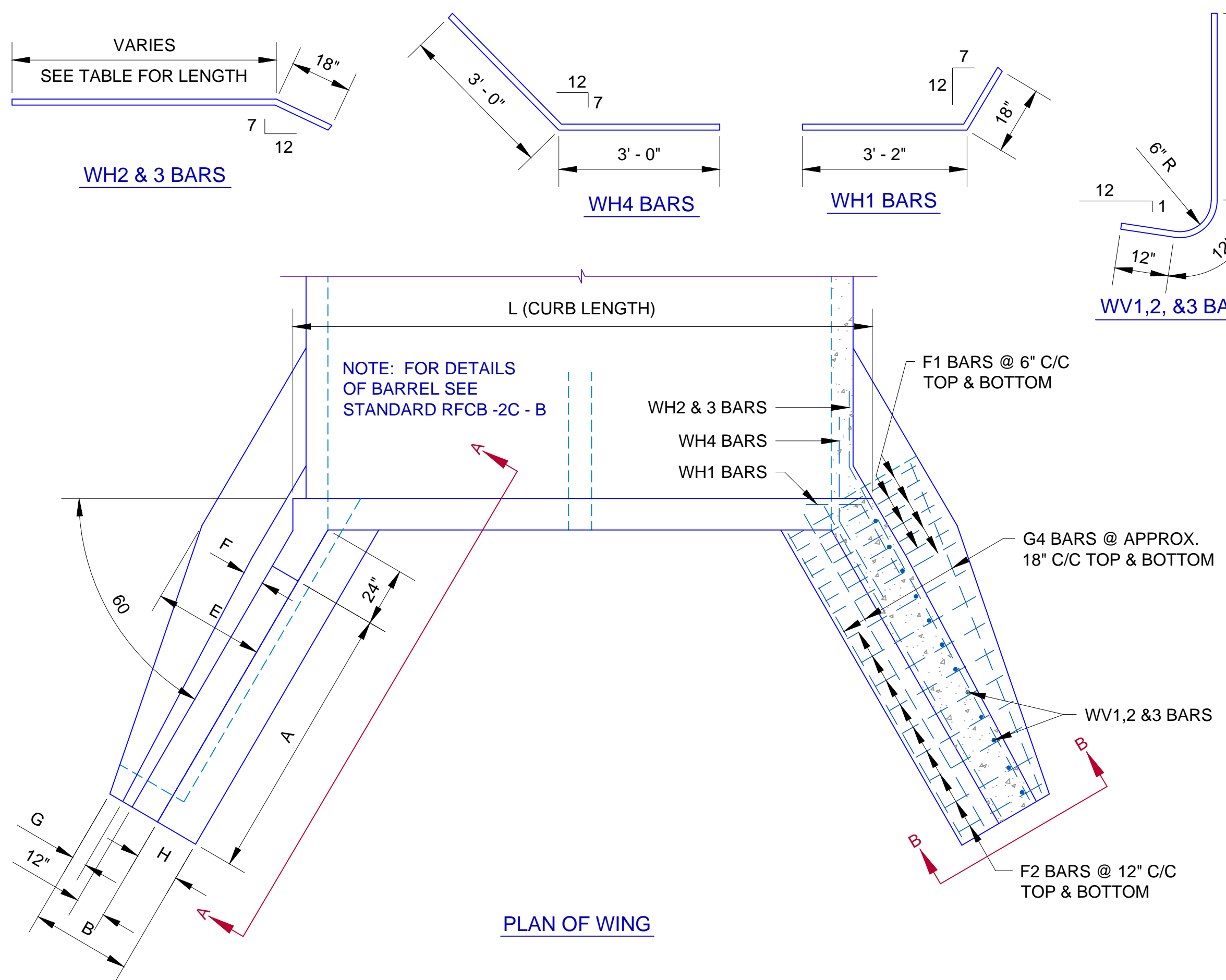
D	36"	42"	48"	54"	60"	66"	72"
T	4"	4 1/2"	5"	5 1/2"	6"	6 1/2"	7"



**STANDARD REINFORCED CONCRETE
JUNCTION BOX FOR 36" TO 72"
REINFORCED CONCRETE PIPE**



APPROVED BY: DATE: 05-03-13
ERIC J. WENGER, P.E.
CITY ENGINEER
DRAWN: VSC
DATE: 05-03-13



3" I.D. GALV. STEEL PIPE WITH PLAIN GALV. FITTINGS. USE STANDARD & SPECIAL FITTINGS AS NEEDED.

ALTERNATE DETAIL
(USING WELD CONNECTIONS ON PIPE HANDRAILS)

PIPE HANDRAIL DETAIL

HANDRAIL NOTES: WELD CONNECTIONS MAY BE USED FOR PIPE HANDRAIL. WELD CONNECTIONS SHALL BE THOROUGHLY CLEANED OF ALL LOOSE SCALE, GROUND SMOOTH & SPOT POINTED WITH TWO COATS OF ALUMINUM PAINT.

4 WINGS - 2 CURBS - 2 CUTOFF WALLS

* NOTE: QUANTITIES SHOWN INCLUDE CURB, WINGS AND CUTOFF WALLS FOR ONE UPSTREAM & ONE DOWNSTREAM END BARREL.

CLEAR SPAN	CLEAR HEIGHT	DIMENSIONS										REINFORCING															TOTAL QUANTITIES *											
		A	B	C	D	E	F	G	H	L	T1	C1 BARS #6 AS SHOWN		F1 BARS #4 AS SHOWN		F2 BARS #4 @ 12" C/C		G BARS #4 @ 18" C/C AS SHOWN		WH1 BARS #4 AS SHOWN		WH2 BARS #4 @ 18" C/C		WH3 BARS #4 @ 12" C/C		WH4 BARS #4 @ 12" C/C		WV1 BARS @ 12" C/C		WV2 BARS @ 12" C/C		WV3 BARS @ 12" C/C		STEEL LBS.	CONC. CU. YDS.			
		#	(STR.) LENGTH	#	(STR.) LENGTH	4 SETS OF	(STR.) LIMITS OF VAR.	#	(STR.) LENGTH	#	(STR.) LENGTH	4 SETS OF	(STR.) LIMITS OF VAR.	#	(STR.) LENGTH	#	(STR.) LENGTH	4 SETS OF	(STR.) LIMITS OF VAR.	#	(STR.) LENGTH	#	SIZE	(STR.) LENGTH	#	SIZE	(STR.) LENGTH	#	SIZE	(STR.) LENGTH								
8	4	5' - 11"	2' - 9 1/2"	6' - 2 1/2"	3' - 7"	4' - 1"	6"	3 1/2"	1' - 0"	19' - 0 3/4"	8 1/2"	8	18' - 9"	48	3' - 9"	14	2' - 6" to 3' - 7"	32	8' - 3"	4	4' - 8"	1	9' - 0"	2	10' - 10" to 11' - 0"	24	6' - 0"	12	#4	8' - 10"	6	#4	6' - 3" to 8' - 6"	1,100	20.0			
	5	7' - 4"	2' - 10"	7' - 2 1/2"	4' - 0"	4' - 7"	7"	3 3/4"	1' - 0"	19' - 0 3/4"	8 1/2"	8	18' - 9"	48	4' - 3"	16	2' - 6" to 4' - 1"	32	9' - 7"	4	4' - 8"	2	9' - 0"	2	12' - 13" to 12' - 8"	28	6' - 0"	12	#4	9' - 10"	7	#4	7' - 1" to 9' - 6"	1,200	25.3			
	6	8' - 10"	3' - 5"	8' - 2 1/2"	4' - 4"	5' - 1"	8 1/2"	4 1/4"	1' - 6"	19' - 0 3/4"	8 1/2"	8	18' - 9"	48	4' - 9"	18	3' - 1" to 4' - 7"	32	11' - 2"	4	4' - 8"	2	9' - 0" to 12' - 7"	3	13' - 11" to 14' - 5"	32	6' - 0"	12	#4	10' - 10"	9	#4	7' - 0" to 10' - 6"	1,400	32.8			
10	4	5' - 11"	2' - 10"	6' - 3 3/4"	3' - 8"	4' - 2"	6"	3 1/2"	1' - 0"	23' - 0 3/4"	9 3/4"	8	22' - 9"	48	3' - 10"	14	2' - 6" to 3' - 8"	32	8' - 5"	4	4' - 8"	1	9' - 0"	2	10' - 10" to 11' - 0"	24	6' - 0"	12	#4	9' - 0"	6	#4	6' - 5" to 8' - 9"	1,100	21.6			
	6	8' - 10"	3' - 5"	8' - 3 3/4"	4' - 5"	5' - 2"	8 1/4"	4 1/2"	1' - 6"	23' - 0 3/4"	9 3/4"	8	22' - 9"	48	4' - 10"	18	3' - 1" to 4' - 8"	32	11' - 4"	4	4' - 8"	2	9' - 0" to 12' - 7"	3	13' - 11" to 14' - 5"	32	6' - 0"	12	#4	11' - 0"	9	#4	7' - 3" to 10' - 9"	1,500	34.7			
	8	11' - 9"	3' - 7"	10' - 3 3/4"	5' - 2"	6' - 2"	10 1/4"	5 1/4"	1' - 6"	23' - 0 3/4"	9 3/4"	8	22' - 9"	48	5' - 10"	19	3' - 3" to 5' - 8"	40	14' - 3"	4	4' - 8"	3	9' - 0" to 16' - 2"	3	17' - 1" to 17' - 7"	40	6' - 0"	12	#4	13' - 0"	12	#4	8' - 0" to 12' - 9"	16	#4	3' - 7"	2,000	50.7
	10	14' - 8"	4' - 0"	12' - 3 3/4"	5' - 10"	7' - 2"	1' - 0 1/4"	6"	2' - 0"	23' - 1 3/4"	9 3/4"	8	22' - 10"	56	6' - 10"	30	3' - 8" to 6' - 8"	48	17' - 6"	4	4' - 8"	4	9' - 2" to 20' - 0"	3	20' - 4" to 21' - 0"	48	6' - 0"	12	#4	15' - 0"	15	#4	8' - 7" to 14' - 9"	36	#4	5' - 7"	2,800	71.3
12	4	5' - 11"	2' - 10"	6' - 3 3/4"	3' - 8"	4' - 2"	6"	3 1/2"	1' - 0"	23' - 0 3/4"	9 3/4"	8	22' - 11"	56	7' - 10"	36	4' - 2" to 7' - 8"	48	20' - 5"	4	4' - 8"	4	9' - 4" to 20' - 2"	4	23' - 6" to 24' - 3"	56	6' - 0"	12	#5	17' - 0"	18	#4	9' - 6" to 16' - 9"	36	#5	5' - 8"	3,900	95.7
	6	8' - 10"	3' - 5"	8' - 5 1/2"	4' - 7"	5' - 2"	8 1/2"	4 1/2"	1' - 6"	27' - 0 3/4"	11 1/2"	8	26' - 9"	48	4' - 10"	18	3' - 1" to 4' - 8"	32	11' - 4"	4	4' - 8"	2	9' - 0" to 12' - 7"	3	13' - 11" to 14' - 5"	32	6' - 0"	12	#4	11' - 1"	9	#4	7' - 4" to 10' - 10"	1,600	37.1			
	8	11' - 9"	3' - 7"	10' - 5 1/2"	5' - 4"	6' - 2"	10 1/2"	5 1/4"	1' - 6"	27' - 0 3/4"	11 1/2"	8	26' - 9"	48	5' - 10"	19	3' - 3" to 5' - 8"	40	14' - 4"	4	4' - 8"	3	9' - 0" to 16' - 2"	3	17' - 1" to 17' - 7"	40	6' - 0"	12	#4	13' - 1"	12	#4	8' - 1" to 12' - 10"	16	#4	3' - 7"	2,100	53.8
	10	14' - 8"	4' - 0"	12' - 5 1/2"	6' - 10"	7' - 2"	1' - 0 1/2"	6"	2' - 0"	27' - 1 3/4"	11 1/2"	8	26' - 10"	56	6' - 10"	30	3' - 8" to 6' - 8"	48	17' - 6"	4	4' - 8"	4	9' - 2" to 20' - 0"	3	20' - 4" to 21' - 0"	48	6' - 0"	12	#4	15' - 1"	12	#4	8' - 8" to 14' - 10"	36	#4	5' - 7"	2,800	75.2
12	17' - 7"	4' - 6"	14' - 5 1/2"	6' - 8"	8' - 2"	1' - 2 1/2"	6 3/4"	2' - 0"	27' - 2 3/4"	11 1/2"	8	26' - 11"	56	7' - 10"	36	4' - 2" to 7' - 8"	48	20' - 5"	4	4' - 8"	4	9' - 4" to 20' - 2"	4	23' - 6" to 24' - 3"	56	6' - 0"	12	#5	17' - 1"	18	#4	9' - 7" to 16' - 10"	36	#5	5' - 8"	4,000	100.6	

NOTES:

ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE CURRENT OKLAHOMA CITY STANDARD SPECIFICATIONS.

REINFORCING STEEL IN BOTTOM SLAB (FOOTING) SHALL BE SUPPORTED ON BAR CHAIRS. CHAIRS SHALL BE SUPPORTED ON TIMBER PLANKS OR CLASS "C" CONCRETE STRIPS PLACED AT 4' C/C.

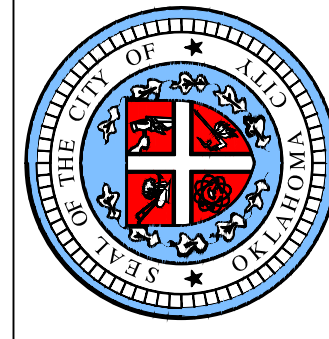
REINFORCING STEEL IN TOP SLAB SHALL BE SUPPORTED ON SLAB SPACERS.

REINFORCING STEEL IN THE WALLS SHALL BE HELD IN PLACE BY METAL CHAIRS. MAXIMUM SPACING OF THE CHAIRS SHALL BE 6'.

COST OF METAL CHAIRS, WOOD PLANK OR CONCRETE STRIPS SHALL BE INCLUDED OTHER ITEMS OF WORK.

STANDARD REINFORCED
CONCRETE BOX - TWO CELL -
FLARED WING

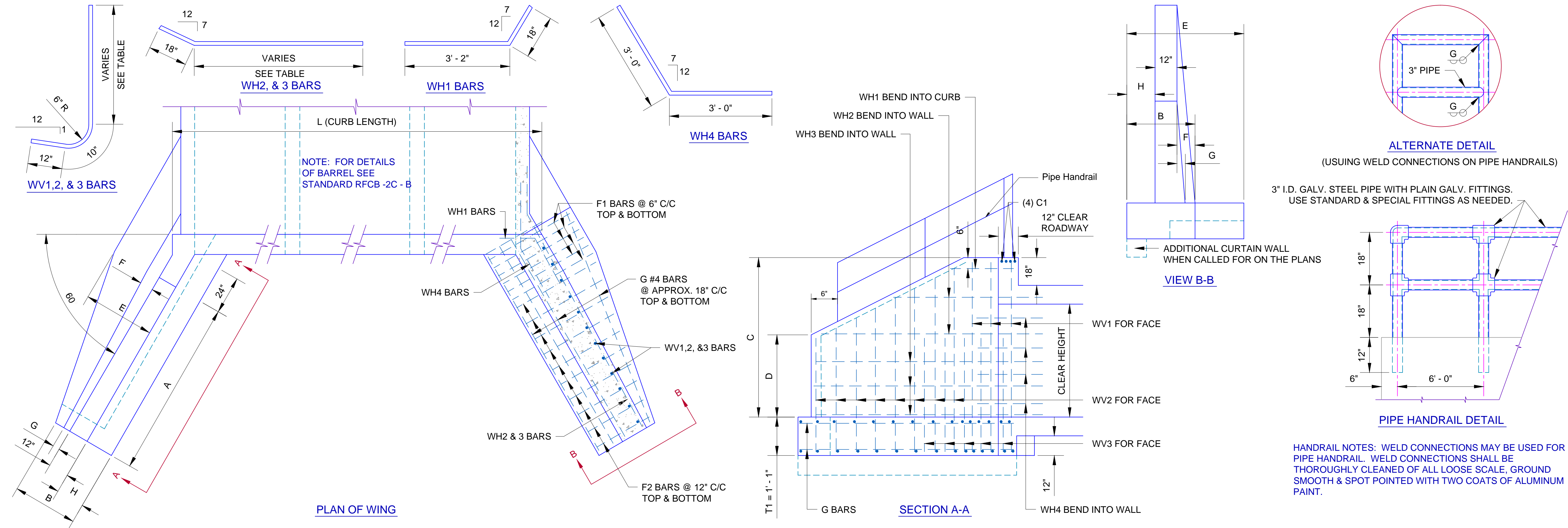
Drawing Number
D-402



APPROVED BY: DATE: 05-03-13
ERIC J. WENGER, P.E.
CITY ENGINEER
DRAWN: VSC
DATE: 05-03-13

**STANDARD REINFORCED CONCRETE
BOX - THREE CELL - FLARED WING**

Drawing Number
D-403



HANDRAIL NOTES: WELD CONNECTIONS MAY BE USED FOR PIPE HANDRAIL. WELD CONNECTIONS SHALL BE THOROUGHLY CLEANED OF ALL LOOSE SCALE, GROUND SMOOTH & SPOT POINTED WITH TWO COATS OF ALUMINUM PAINT.

4 WINGS - 2 CURBS - 2 CUTOFF WALLS

* NOTE: QUANTITIES SHOWN INCLUDE CURB, WINGS AND CUTOFF WALLS FOR ONE UPSTREAM & ONE DOWNSTREAM END BARREL.

CLEAR SPAN	CLEAR HEIGHT	DIMENSIONS										REINFORCING															TOTAL QUANTITIES *											
		A	B	C	D	E	F	G	H	L	T1	C1 BARS #6 AS SHOWN		F1 BARS #4 AS SHOWN		F2 BARS #4 @ 12" C/C		G BARS #4 @ 18" C/C AS SHOWN		WH1 BARS #4 AS SHOWN		WH2 BARS #4 @ 18" C/C		WH3 BARS #4 @ 12" C/C		WH4 BARS #4 @ 12" C/C		WV1 BARS @ 12" C/C		WV2 BARS @ 12" C/C		WV3 BARS @ 12" C/C		STEEL LBS.	CONC. CU. YDS			
		#	(STR.) LENGTH	#	(STR.) LENGTH	4 SETS OF	(STR.) LIMITS OF VAR.	#	(STR.) LENGTH	#	(STR.) LENGTH	4 SETS OF	(STR.) LIMITS OF VAR.	#	(STR.) LENGTH	#	(STR.) LENGTH	4 SETS OF	(STR.) LIMITS OF VAR.	#	(STR.) LENGTH	#	SIZE	(STR.) LENGTH	#	SIZE	(STR.) LENGTH	#	SIZE	(STR.) LENGTH	#	SIZE	(STR.) LENGTH					
4	5'-11"	2'-9 1/2"	6'-2 1/2"	3'-7"	4'-1"	6"	3 1/2"	1'-0"	27'-9 3/4"	8 1/2"	8	27'-6"	48	3'-9"	14	2'-6" to 3'-7"	32	8'-3"	4	4'-8"	1	9'-0"	2	10'-10" to 11'-0"	24	6'-0"	12	#4	8'-10"	6	#4	6'-3" to 8'-6"			1,100	21.6		
	8	7'-4"	2'-10"	7'-2 1/2"	4'-0"	4'-7"	7"	3 3/4"	1'-0"	27'-9 3/4"	8 1/2"	8	27'-6"	48	4'-3"	16	2'-6" to 4'-1"	32	9'-7"	4	4'-8"	2	9'-0"	2	12'-13" to 12'-8"	28	6'-0"	12	#4	9'-10"	7	#4	7'-1" to 9'-6"			1,300	26.9	
	6	8'-10"	3'-5"	8'-2 1/2"	4'-4"	5'-1"	8 1/2"	4 1/4"	1'-6"	27'-9 3/4"	8 1/2"	8	27'-6"	48	4'-9"	18	3'-1" to 4'-7"	32	11'-2"	4	4'-8"	2	9'-0" to 12'-7"	3	13'-11" to 14'-5"	32	6'-0"	12	#4	10'-10"	9	#4	7'-0" to 10'-6"			1,500	34.4	
10	4	5'-11"	2'-10"	6'-3 3/4"	3'-8"	4'-2"	6"	3 1/2"	1'-0"	33'-9 3/4"	9 3/4"	8	33'-6"	48	3'-10"	14	2'-6" to 3'-8"	32	8'-5"	4	4'-8"	1	9'-0"	2	10'-10" to 11'-0"	24	6'-0"	12	#4	9'-0"	6	#4	6'-5" to 8'-9"			1,200	23.6	
	6	8'-10"	3'-5"	8'-3 3/4"	4'-5"	5'-2"	8 1/4"	4 1/2"	1'-6"	33'-9 3/4"	9 3/4"	8	33'-6"	48	4'-10"	18	3'-1" to 4'-8"	32	11'-4"	4	4'-8"	2	9'-0" to 12'-7"	3	13'-11" to 14'-5"	32	6'-0"	12	#4	11'-0"	9	#4	7'-3" to 10'-9"			1,600	36.7	
	8	11'-9"	3'-7"	10'-3 3/4"	5'-2"	6'-2"	10 1/4"	5 1/4"	1'-6"	33'-9 3/4"	9 3/4"	8	33'-6"	48	5'-10"	24	3'-3" to 5'-8"	40	14'-3"	4	4'-8"	3	9'-0" to 16'-2"	3	17'-1" to 17'-7"	40	6'-0"	12	#4	13'-0"	12	#4	8'-0" to 12'-9"	16	#4	3'-7"	2,200	52.7
	10	14'-8"	4'-0"	12'-3 3/4"	5'-10"	7'-2"	1'-0 1/4"	6"	2'-0"	33'-11 3/4"	9 3/4"	8	33'-8"	56	6'-10"	30	3'-8" to 6'-8"	48	17'-6"	4	4'-8"	4	9'-2" to 20'-0"	3	20'-4" to 21'-0"	48	6'-0"	12	#4	15'-0"	15	#4	8'-7" to 14'-9"	36	#4	5'-7"	2,900	73.1
12	17'-7"	4'-6"	14'-3 3/4"	6'-7"	8'-2"	1'-2 1/4"	6 3/4"	2'-0"	33'-1 3/4"	9 3/4"	8	33'-10"	56	7'-10"	36	4'-2" to 7'-8"	48	20'-5"	4	4'-8"	4	9'-4" to 20'-2"	4	23'-6" to 24'-3"	56	6'-0"	12	#5	17'-0"	18	#5	9'-6" to 16'-9"	36	#5	5'-8"	4,000	97.8	
12	4	5'-11"	2'-9 1/2"	6'-5 1/2"	3'-10"	4'-2"	6 1/2"	3 1/2"	1'-0"	39'-9 3/4"	11 1/2"	8	39'-6"	48	3'-10"	14	2'-6" to 3'-8"	32	8'-5"	4	4'-8"	1	9'-0"	2	10'-10" to 11'-0"	24	6'-0"	12	#4	9'-1"	6	#4	6'-8" to 8'-10"			1,300	25.7	
	6	8'-10"	3'-5"	8'-5 1/2"	4'-7"	5'-2"	8 1/2"	4 1/2"	1'-6"	39'-9 3/4"	11 1/2"	8	39'-6"	48	4'-10"	18	3'-1" to 4'-8"	32	11'-4"	4	4'-8"	2	9'-0" to 12'-7"	3	13'-11" to 14'-5"	32	6'-0"	12	#4	11'-1"	9	#4	7'-4" to 10'-10"			1,700	39.5	
	8	11'-9"	3'-7"	10'-5 1/2"	5'-4"	6'-2"	10 1/2"	5 1/4"	1'-6"	39'-9 3/4"	11 1/2"	8	39'-6"	48	5'-10"	24	3'-3" to 5'-8"	40	14'-3"	4	4'-8"	3	9'-0" to 16'-2"	3	17'-1" to 17'-7"	40	6'-0"	12	#4	13'-1"	12	#4	8'-1" to 12'-10"	16	#4	3'-7"	2,200	56.1
	10	14'-8"	4'-0"	12'-5 1/2"	6'-0"	7'-2"	1'-0 1/2"	6"	2'-0"	39'-11 3/4"	11 1/2"	8	39'-8"	56	6'-10"	30	3'-8" to 6'-8"	48	17'-6"	4	4'-8"	3	9'-2" to 20'-0"	3	20'-4" to 21'-0"	48	6'-0"	12	#4	15'-1"	15	#4	8'-8" to 14'-10"	36	#4	5'-7"	3,000	78.0
	12	17'-7"	4'-6"	14'-5 1/2"	6'-8"	8'-2"	1'-2 1/2"	6 3/4"	2'-0"	40'-1 3/4"	11 1/2"	8	39'-10"	56	7'-10"	36	4'-2" to 7'-8"	48	20'-5"	4	4'-8"	4	9'-4" to 20'-2"	4	23'-6" to 24'-3"	56	6'-0"	12	#5	17'-1"	18	#5	9'-7" to 16'-10"	36	#5	5'-8"	4,100	103.0
14	20'-6"	4'-11"	16'-5 1/2"	7'-5"	9'-2"	1'-4 1/2"	8"	2'-6"	40'-3 3/4"	11 1/2"	8	40'-0"	56	8'-10"	42	4'-7" to 8'-10"	56	23'-7"	4	4'-8"	5	9'-6" to 24'-0"	4	26'-10" to 27'-7"	64	6'-0"	12	#6	19'-1"	21	#6	10'-0" to 18'-11"	40	#6	6'-3"	5,800	134.0	