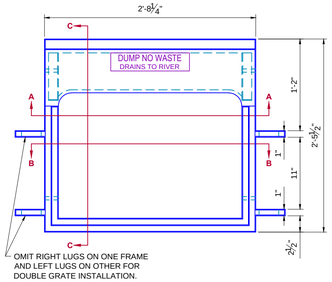
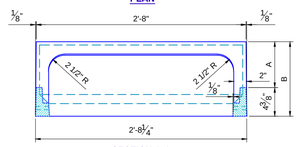
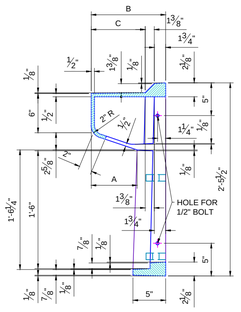


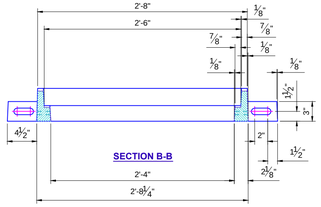
PLAN



SECTION A-A

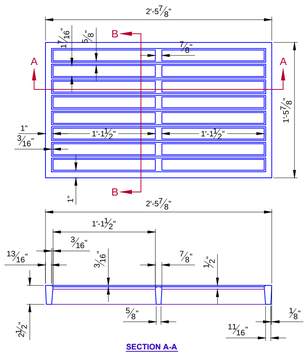


SECTION C-C

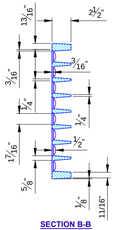


SECTION B-B

#1 CAST IRON STORM SEWER INLET FRAME WITH CURB INLET HOOD



SECTION A-A



SECTION B-B

STEEL CASTING SHALL CONFORM TO THE REQUIREMENTS FOR GRADE B - 2, FULL ANNEALED, OF THE A.S.T.M. SPECIFICATIONS, SERIAL DESIGNATION A27.

STORM SEWER INLET CAST IN STEEL GRATING TYPE - B

BRICK OPTION IN PLACE OF CONCRETE
HOLD INSIDE DIMENSION GIVEN FOR CONCRETE
6" P.C. CONCRETE FLOOR & 8" BRICK WALLS

MIN. QUANTITIES REQ'D.	2 - 0	2 - 1	2 - 2	2 - 3	2 - 4
BRICK (1/2" JOINTS)	445	725	995	1250	1495
1 : 2 MORTAR C.Y.	0.32	0.53	0.72	0.95	1.09
3500 CONCRETE C.Y.	0.4	0.60	0.80	1.00	1.20

CAST IRON INLET NUMBER

#	#1 INLET	TYPE B GRATE	#2 INLET
2 - 0	2	2	
2 - 1	2	2	2
2 - 2	2	2	4
2 - 3	2	2	6
2 - 4	2	2	8

GENERAL NOTES:

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

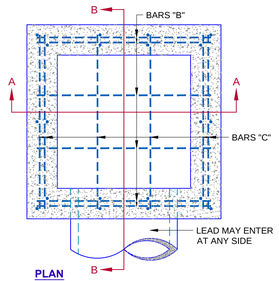
NO WORDING OR MARKING OF ANY KIND OTHER THAN THOSE SHOWN ON THE PLANS WILL BE PERMITTED ON THESE CASTINGS.

ALL BOLT REQUIREMENTS FOR THESE STRUCTURES WALL BE MACHINE BOLTS.

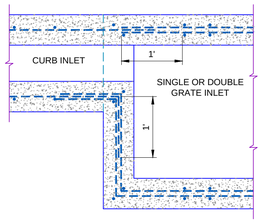
QUANTITIES FOR CURB INLETS

	CLASS A CONC.	STEEL
ONE CURB INLET	0.20	26
TWO CURB INLET	0.43	44
THREE CURB INLET	0.69	62
FOUR CURB INLET	0.95	80

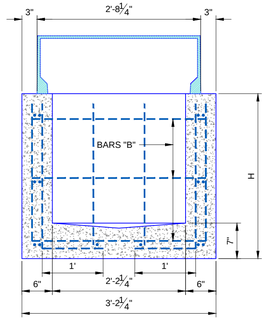
CURB INLETS SHALL BE PLACED ON UPSTREAM SIDE OF GRATE INLETS UNLESS OTHERWISE SPECIFIED. CONCRETE TROUGH FOR CURB INLETS AND CONCRETE STORM SEWER INLETS SHALL BE CONSTRUCTED AS ONE UNIT.



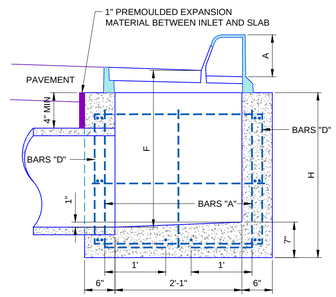
PLAN



DETAIL SHOWING COMBINATION OF CURB AND INLETS

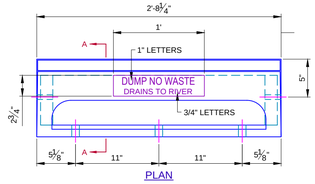


SECTION A-A

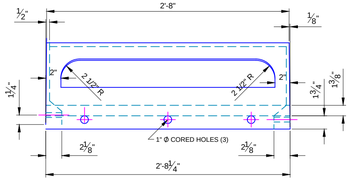


SECTION B-B

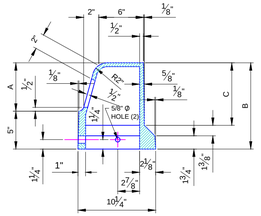
#2 CAST IRON STORM SEWER CURB INLET HOOD



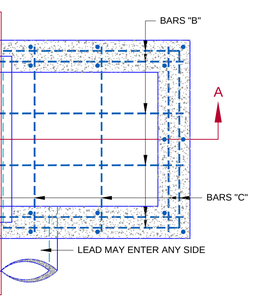
PLAN



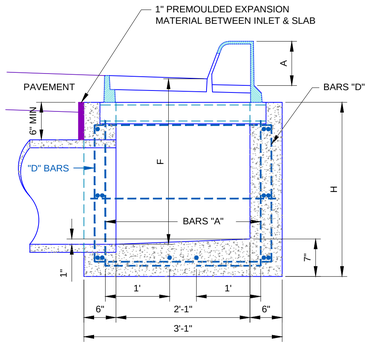
ELEVATION



SECTION A-A

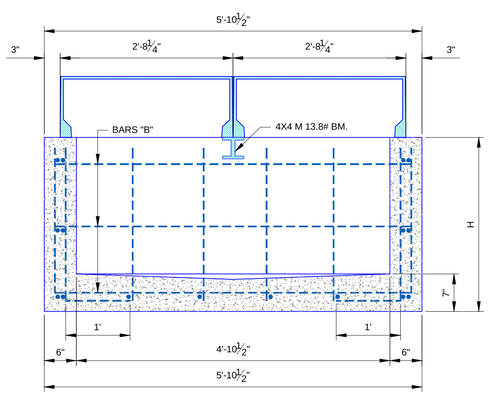


PLAN



SECTION B-B

#2 CAST IRON STORM SEWER INLET FRAME WITH CURB INLET



SECTION A-A

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"

BAR LIST & QUANTITIES FOR DOUBLE GRATE & CURB INLET

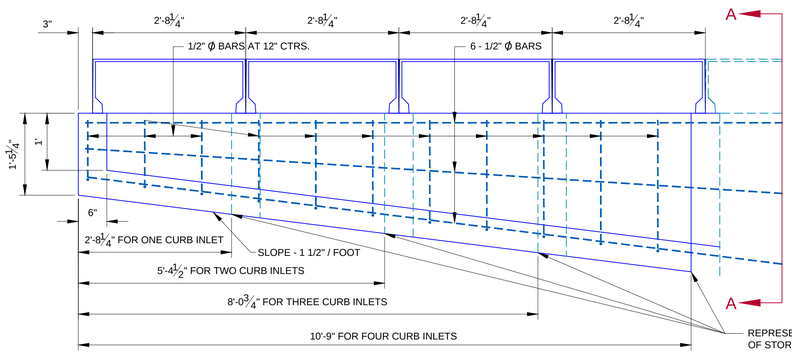
SIZE OF LEAD	H MINIMUM	F MINIMUM	CLASS A CONC. C.Y.	REINF. STL. LBS.
18"	2' - 8 1/2"	2.57 FT.	1.02	137
24"	3' - 3"	3.11 FT.	1.18	147
30"	3' - 9 1/2"	3.66 FT.	1.34	180

LEAD	PER ADDITIONAL FOOT OF DEPTH				BARS A (MIN.)	
	CONC. C.Y.		CONC. C.Y.		SIZE	#
18"	0.295		*19.0		1/2" ϕ x (H+8")	14
18"					1/2" ϕ x (H+8")	14
18"					1/2" ϕ x (H+8")	14
LEAD	BARS B		BARS C		BARS D (MIN.)	
	SIZE	#	SIZE	#	SIZE	#
18"	1/2" ϕ x 5' - 6"	14	1/2" ϕ x 2' - 9"	16	1/2" ϕ x (H+4")	14
18"	1/2" ϕ x 5' - 6"	14	1/2" ϕ x 2' - 9"	16	1/2" ϕ x (H+4")	14
18"	1/2" ϕ x 5' - 6"	18	1/2" ϕ x 2' - 9"	20	1/2" ϕ x (H+4")	14

* HORIZONTAL BARS ARE APPROXIMATELY 12" CENTERS. WHEN ADDITIONAL BARS ARE REQUIRED DUE TO INCREASE OF DEPTH OF INLET 22.5 LBS OF REINFORCING STEEL IS TO BE ADDED FOR EACH SET OF BARS.

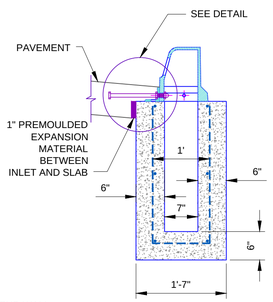
NOTE:
ALL COST OF 4 X 4 M 13.8 #BM SUPPORTS FOR GRATE FRAME TO BE INCLUDED IN THE PRICE OF BID FOR INLET FRAMES AND GRATES.

QUANTITIES OF ANGLE IRON FOR CURB INLETS		
INLET #	# PIECES	LENGTH OF 3" x 3" ∠
2 - 0		
2 - 1	1	5' - 1 5/8"
2 - 2	1	10' - 6 1/8"
2 - 3	1	15' - 10 5/8"
2 - 4	2	10' - 6 1/8"

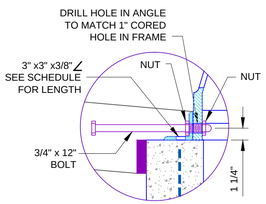


ELEVATION

#4 CAST IRON STORM SEWER INLET FRAME WITH CURB INLET



SECTION A-A



DETAIL OF CONNECTING ANGLE IRON & CAST IRON CURB

NOTE: ANGLE IRON TO BE BOLTED TO CURB WITH 3 (3/4" x 12") MACHINE BOLTS IN EACH CURB SECTION.

BAR LIST AND QUANTITIES FOR SINGLE GRATE AND CURB INLETS

SIZE OF LEAD	H (MIN.)	F (MIN.)	CLASS A CONC. C.Y.	REINF. STL. LBS.	PER ADDITIONAL FOOT OF DEPTH		BARS A (MIN.)		BARS B		BARS C		BARS D (MIN.)	
					CONC. C.Y.	VERT. STL.-- LBS.	SIZE	#	SIZE	#	SIZE	#	SIZE	#
15"	2' - 3 1/4"	2.14 FT.	0.54	86	0.20	*13.6	1/2" ϕ x (H+8")	10	1/2" ϕ x 2' - 10"	14	1/2" ϕ x 2' - 9"	14	1/2" ϕ x (H+4")	10
18"	2' - 6 1/2"	2.14 FT.	0.59	90			1/2" ϕ x (H+8")	10	1/2" ϕ x 2' - 10"	14	1/2" ϕ x 2' - 9"	14	1/2" ϕ x (H+4")	10
24"	3' - 1"	2.95 FT.	0.70	97			1/2" ϕ x (H+8")	10	1/2" ϕ x 2' - 10"	14	1/2" ϕ x 2' - 9"	14	1/2" ϕ x (H+4")	10

* HORIZONTAL BARS ARE APPROXAMENTALY 12" CENTERS WHEN ADDITIONAL BARS ARE REQUIRED DUE TO INCREASE OF DEPTH OF INLET. 15.2 LBS. OF REINFORCING STEEL IS TO BE ADDED FOR EACH ADDITIONAL SET OF BARS.

The City of Oklahoma City
Public Works Department
Engineering Division

APPROVED BY:
ERIC J. WENGER, P.E.
CITY ENGINEER
DATE: 01-30-13

DRAWN: VSC

DATE: 01-30-13

STANDARD STORM SEWER INLETS DESIGN 2 INLET WITH CAST STEEL HOODS

Drawing Number
D-101

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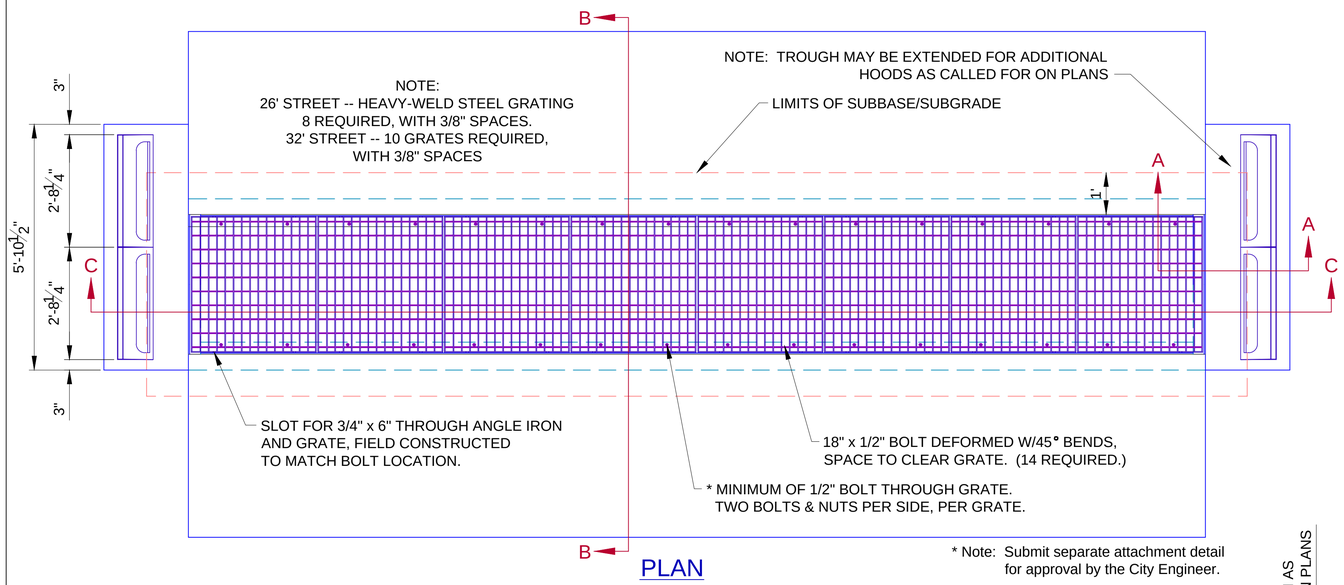
QUANTITIES OF ANGLE IRON FOR CURB INLETS		
# OF CAST HOODS	# OF PIECES	LENGTH OF 3" x 3" ∠
2 - 0	1	5' - 1 5/8"
2 - 1	1	10' - 6 1/8"
2 - 2	1	15' - 10 5/8"
2 - 3	2	10' - 6 1/8"

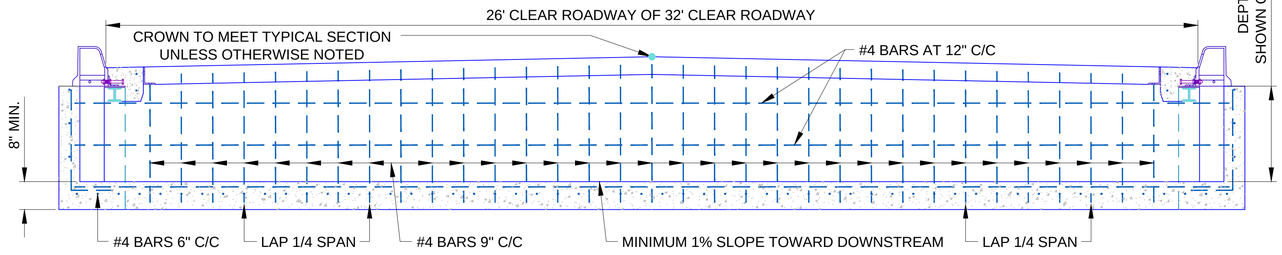
VARIABLE DIMENSION FOR ALL CURB CASTINGS			
	A	B	C
6" CURB FACE	7"	11 3/8"	8 1/4"
8" CURB FACE	9"	13 3/8"	10 1/4"

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

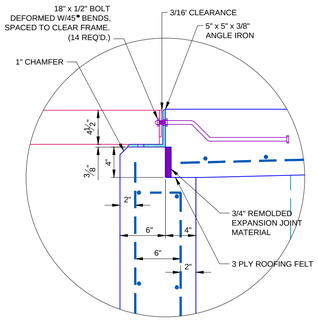


PLAN

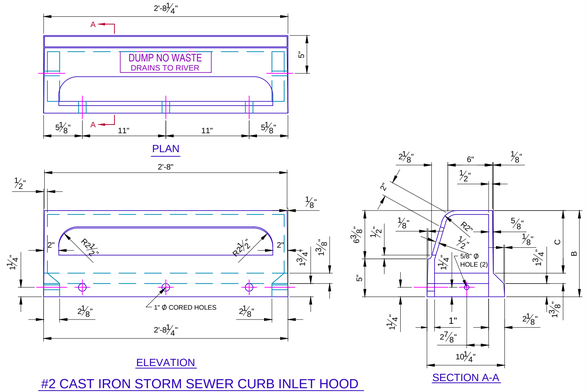
* Note: Submit separate attachment detail for approval by the City Engineer.



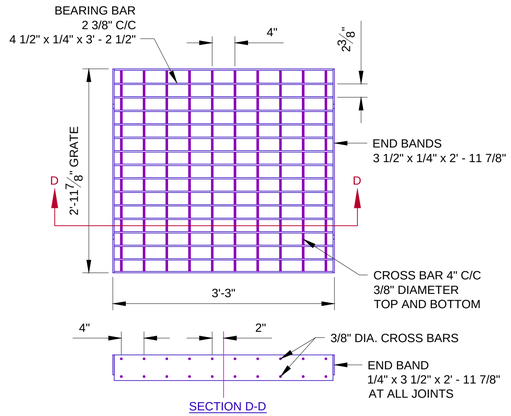
LONGITUDINAL SECTION C-C



DETAIL "A"
ALTERNATE "A" ONLY



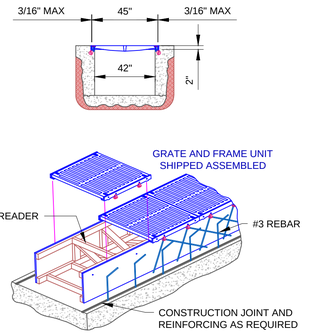
#2 CAST IRON STORM SEWER CURB INLET HOOD



SECTION D-D

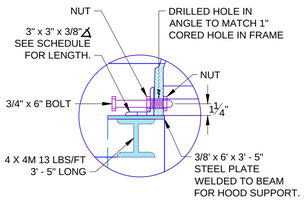
16 BEARING BARS 4 1/2" X 1/4" x 3' - 2 1/2" LONG SPACED AT 2 3/8" C/C.
OVERALL DIMENSIONS 3' - 3" X 2' - 11 7/8" ARRANGED WITH 4 1/2" X 1/4" BEARING BARS
3' - 2 1/2" LONG WITH END BANDING 3 1/2" 1/4" END BANDS 2' 11 7/8" LONG & 3/8"
CROSS BARS TOP AND BOTTOM, 4" C/C SPACED AS SHOWN.

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

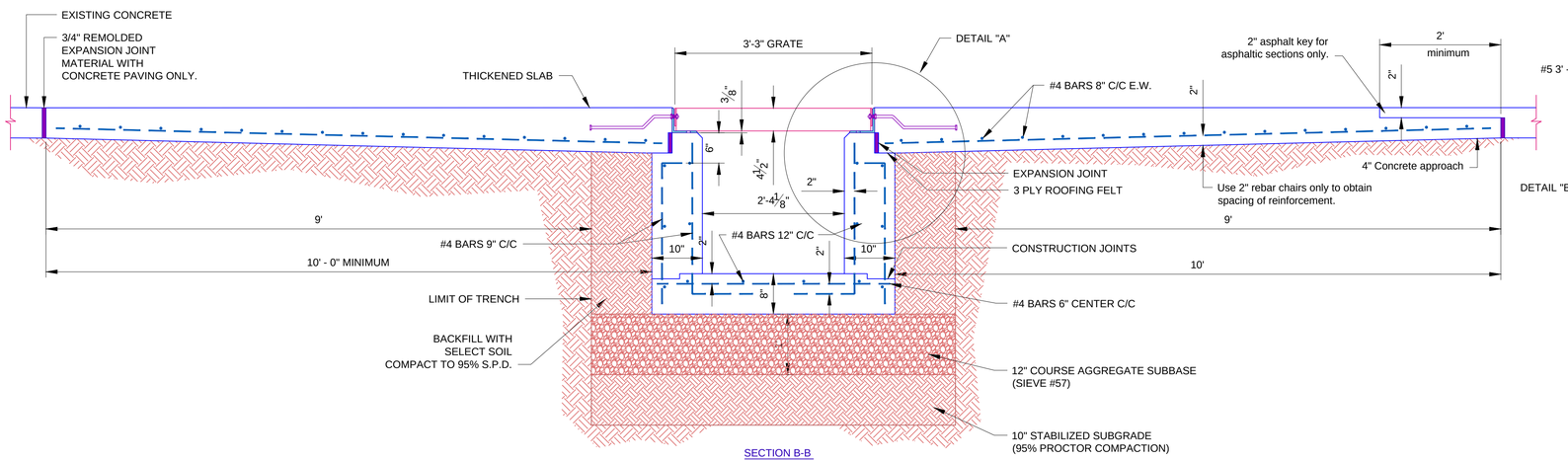
ALTERNATE "B" ONLY
To be installed as per manufacturer's specifications.



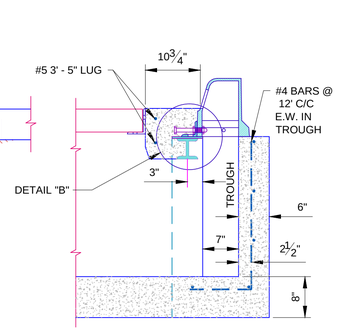
DETAIL "B"

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

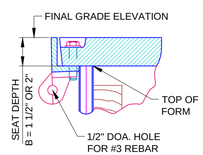
ALTERNATE "A" ONLY



SECTION B-B



SECTION A-A
DETAIL FOR IRVING GRATE



DETAIL "B"

For dimensions chart see 102-a06

ALTERNATE "B" ONLY

The City of Oklahoma City
Public Works Department
Engineering Division

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

DRAWN: VSC

DATE: 01-31-13

GRATED STREET INLET DETAIL

Drawing Number
D-102

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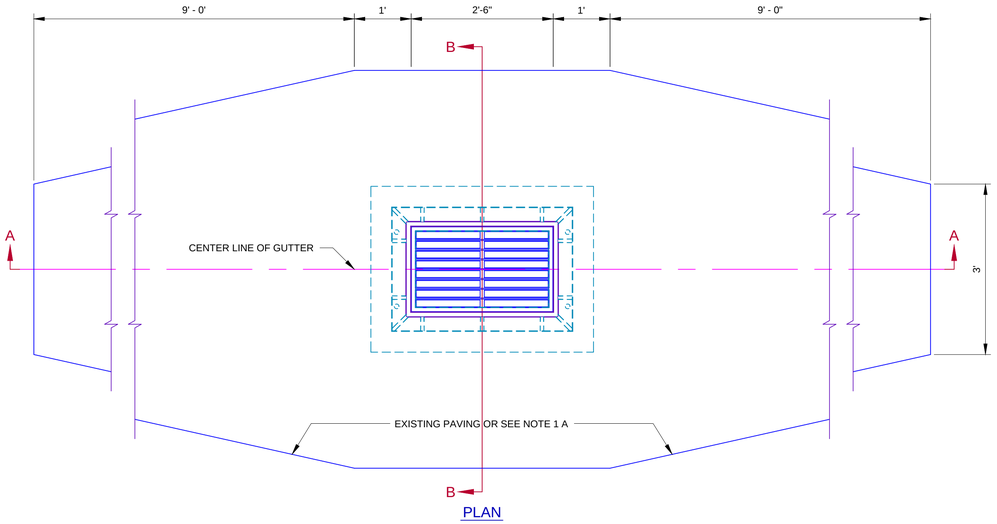
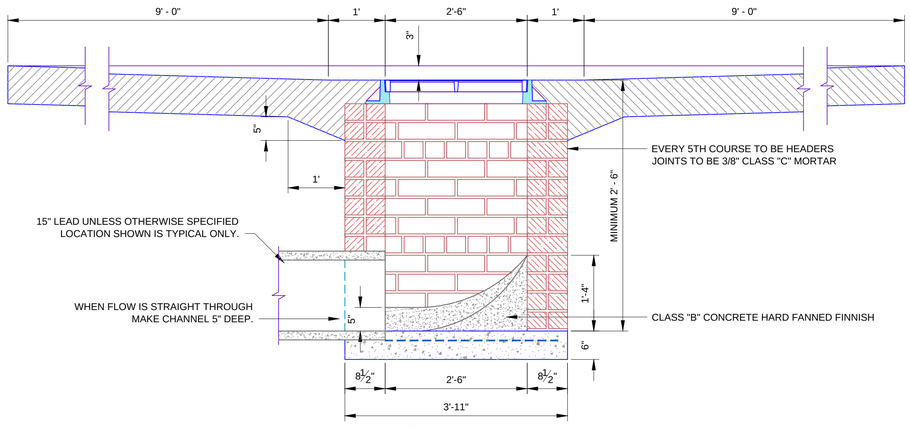
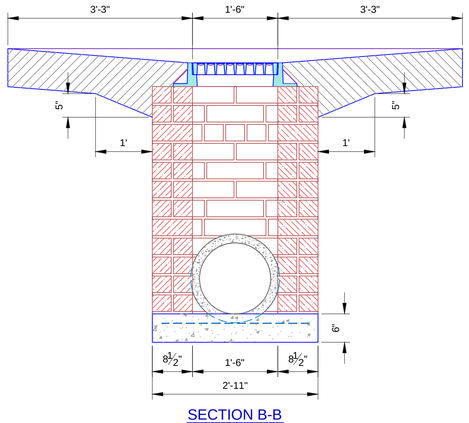


PLAN



SECTION A-A

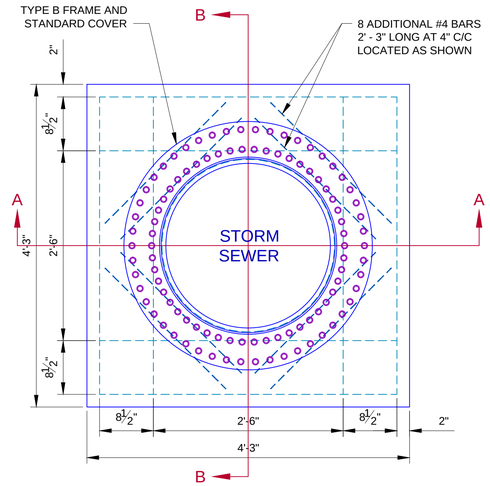


SECTION B-B

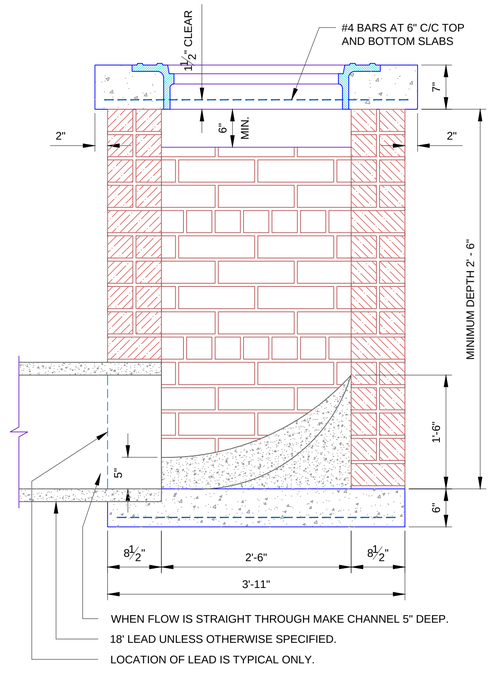
GENERAL NOTES:

1. A. WHEN INLET IS BUILT IN NEW PAVEMENT, THE PAVEMENT SHALL BE MONOLITHIC WITH NEW PAVEMENT AND CONFORM TO PLANS AND SPECIFICATIONS THEREOF.
   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 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

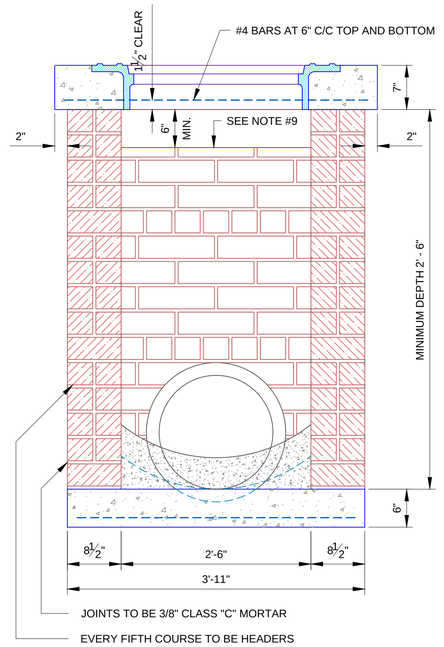
STORM SEWER INLET
DESIGN # 5 - SINGLE GRATING



PLAN



SECTION A-A



SECTION B-B

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 MORTAL.
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

The City of Oklahoma City
Public Works Department
Engineering Division

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

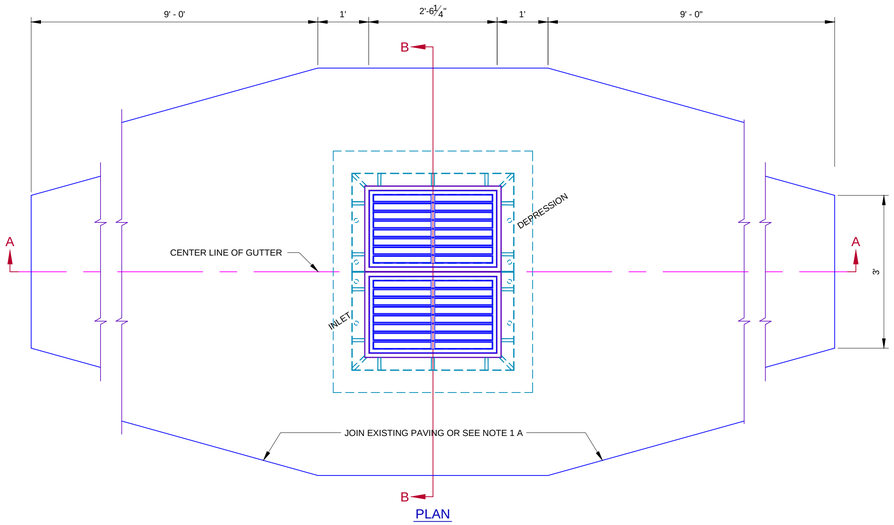
DRAWN: VSC

DATE: 01-31-13

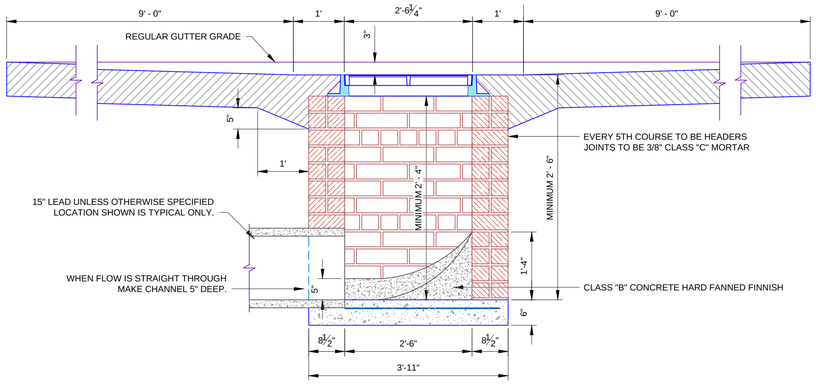
STANDARD INLET DETAILS
DESIGN # 5 (SINGLE GRATING) AND BOX TYPE INLET

Drawing Number
D-103

\\oi.okc.\okcPW-Section\CITYACAD-STDS\D-103 VSC 01-31-13



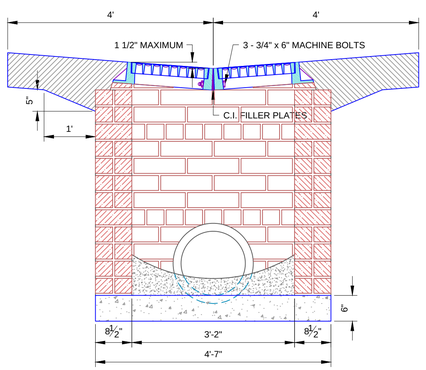
PLAN



SECTION A-A

STORM SEWER INLET

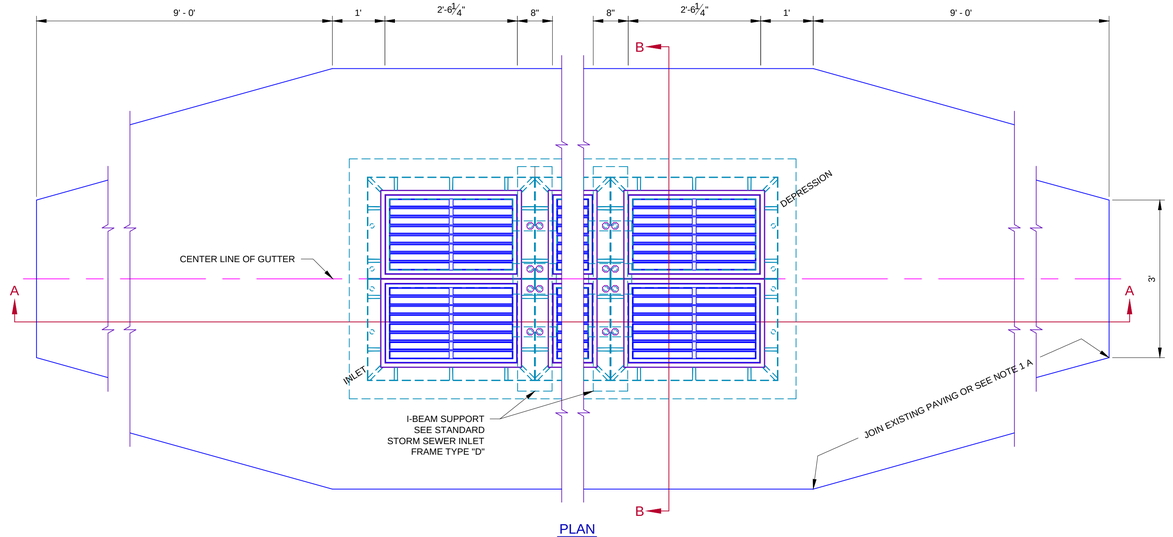
DESIGN #6 (DOUBLE GRATINGS)



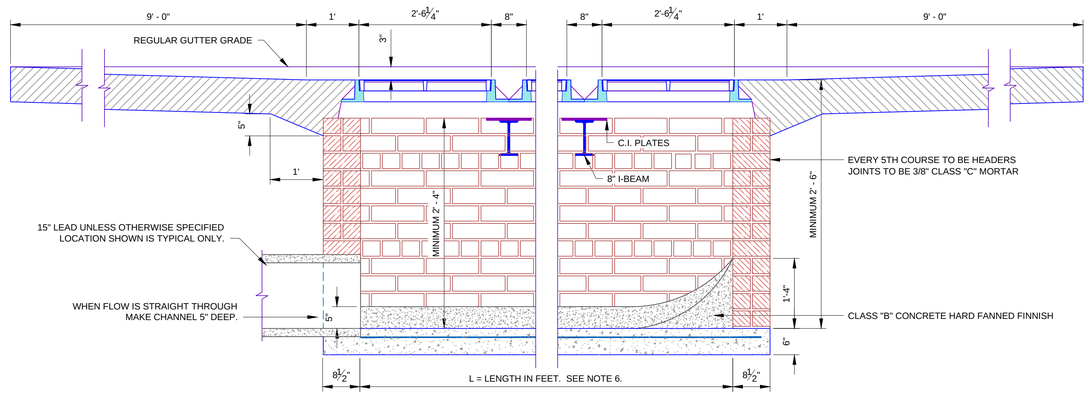
SECTION B-B

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.
   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.



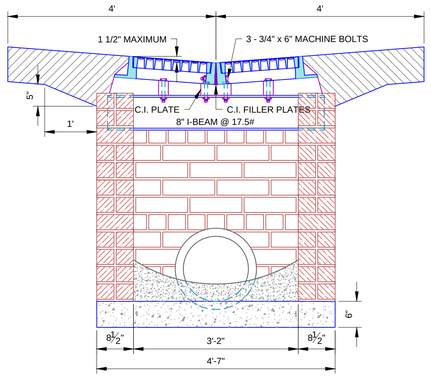
PLAN



SECTION A-A

STORM SEWER INLET

DESIGN #7 (MULTIPLE GRATINGS)



SECTION B-B

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.
   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.

The City of Oklahoma City
Public Works Department
Engineering Division

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

DATE: 01-31-13

DRAWN: VSC

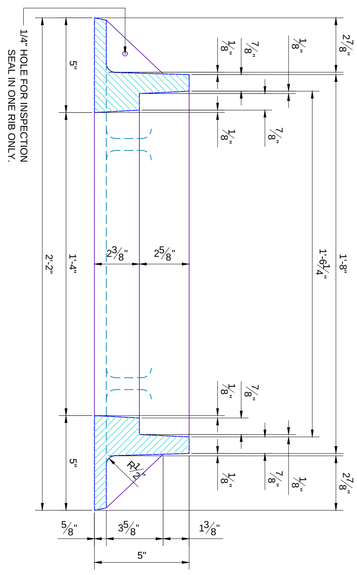
DATE: 01-31-13

STANDARD INLETS
DESIGN #6 & DESIGN #7

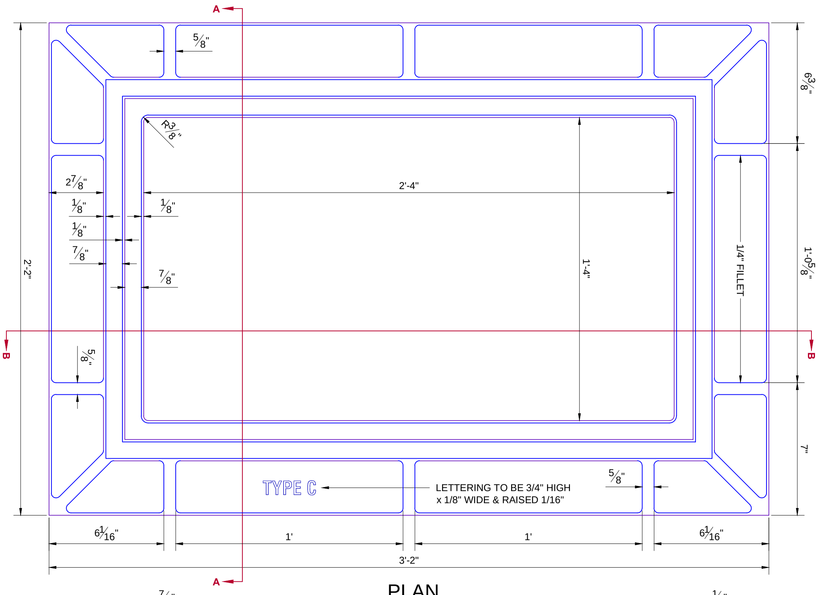
Drawing Number

D-105

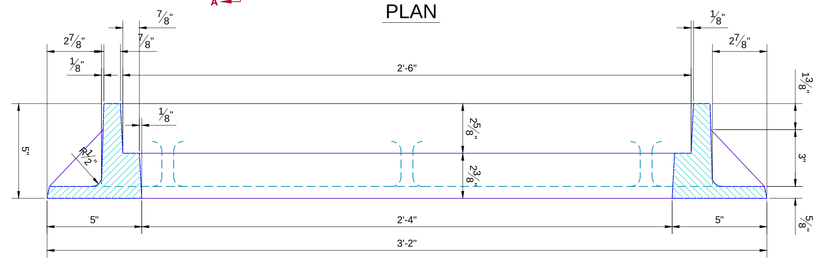
\\ci.okc.\okcPW-Section\CITYACAD-STDS\D-105 VSC 01-31-13



SECTION B-B



PLAN



SECTION A-A

GENERAL NOTES:

1. CASTINGS SHALL CONFORM TO THE A.S.T.M. SPECIFICATIONS FOR GRAY IRON CASTINGS SERIAL DESIGN A-48-29.
2. NO WORDING OR MARKINGS OF ANY KIND OTHER THAN THOSE SHOWN ON THE PLANS WILL BE PERMITTED ON THESE CASTINGS.

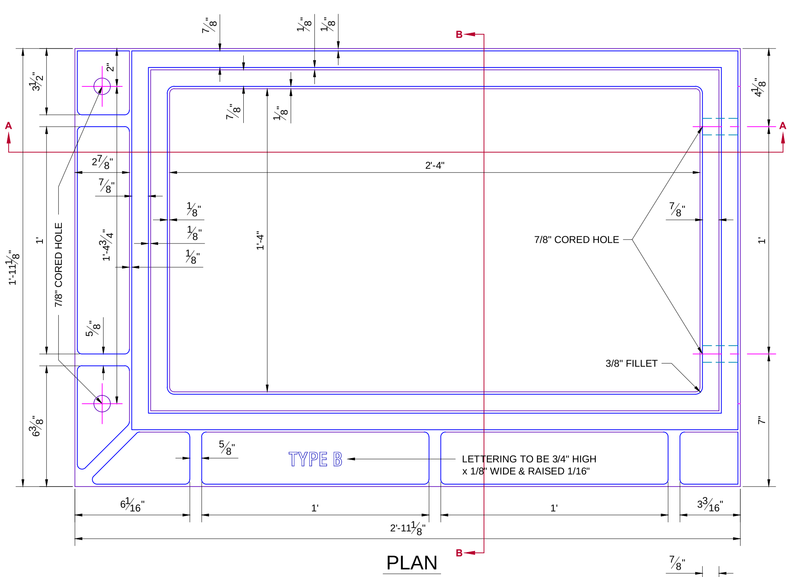
CASTING WEIGHTS

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

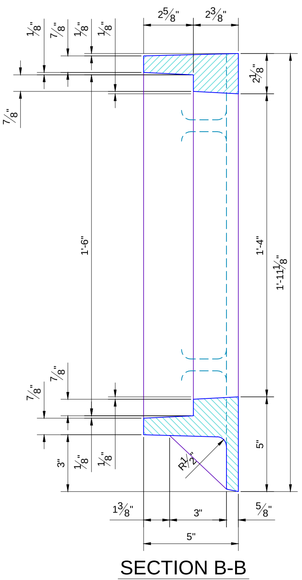
TYPE "A" FRAME ONLY	205 LBS.
TYPE "B" FRAME ONLY	195 LBS.
TYPE "C" FRAME ONLY	210 LBS.
TYPE "A" GRATE ONLY	145 LBS.

STORM SEWER INLET FRAME

INLET DESIGN #5



PLAN



SECTION B-B

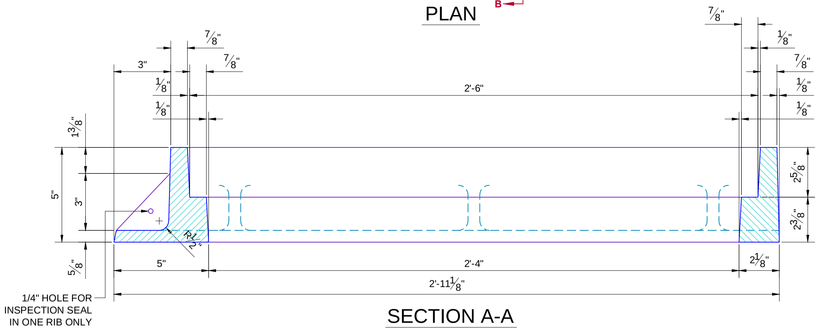
GENERAL NOTES:

1. CASTINGS SHALL CONFORM TO THE A.S.T.M. SPECIFICATIONS FOR GRAY IRON CASTINGS SERIAL DESIGN A-48-29.
2. NO WORDING OR MARKINGS OF ANY KIND OTHER THAN THOSE SHOWN ON THE PLANS WILL BE PERMITTED ON THESE CASTINGS.
3. MAKE ONE FRAME AS SHOWN AND ONE REVERSED FOR EACH PAIR OF DOUBLE FRAMES.
4. PLATES ON I-BEAM SUPPORTS SHALL BE SPOT WELDED TO THE I-BEAM AT FOUR PLACES ON EACH SIDE OF FLANGE.
5. 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.
6. WHEN BUILT ON A CURVE, INLET #3 REQUIRES THE SAME APPURTENANCES AS INLET #2 FOR EACH 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 OG CASTINGS FURNISHED WILL NOT BE LSEE THAN 98% OF WEIGHTS SHOWN BELOW. wEIGHTS OF INDIVIDUAL CASTINGS SHALL NOT BE LESS THAN 95% OF WEIGHTS SHOWN BELOW.

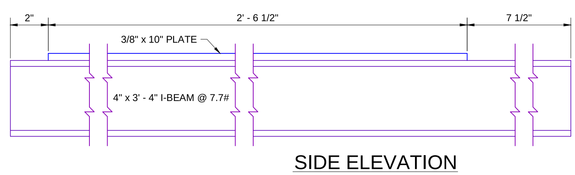
TYPE "A" FRAME ONLY	205 LBS.
TYPE "B" FRAME ONLY	195 LBS.
TYPE "C" FRAME ONLY	210 LBS.
TYPE "A" GRATE ONLY	145 LBS.



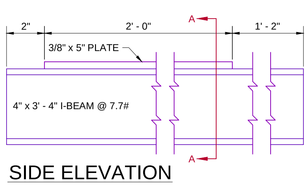
SECTION A-A

STORM SEWER INLET FRAME

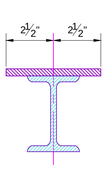
TYPE "B" FOR INLET DESIGN #2



SIDE ELEVATION



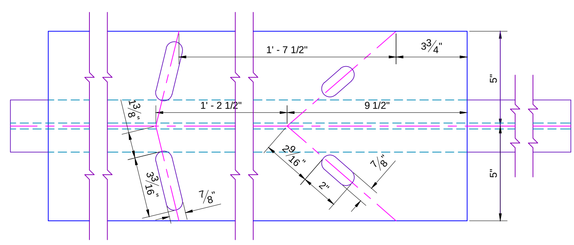
SIDE ELEVATION



SEC. A-A

I-BEAM SUPPORT

FOR USE ON CURVED CURBS



PLAN

I-BEAM SUPPORT

FOR INLET DESIGN #3 ONLY

Drawing Number D-106

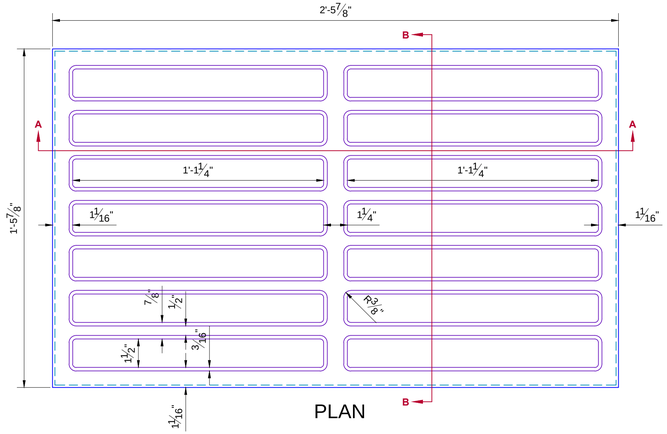
STANDARD INLET FRAME DETAIL FOR DESIGN #2 & #5

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

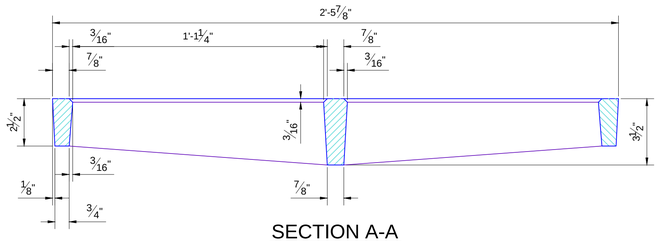
DRAWN: VSC

DATE: 01-31-13

The City of Oklahoma City
Public Works Department
Engineering Division



PLAN

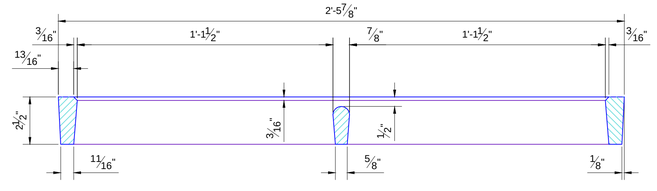


SECTION A-A

STORM SEWER INLET GRATING

DETAIL OF TYPE "A" GRATING

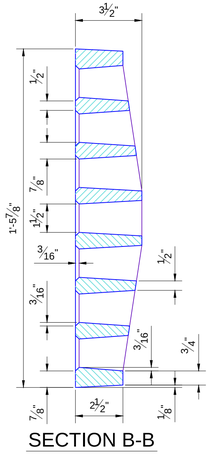
PLAN



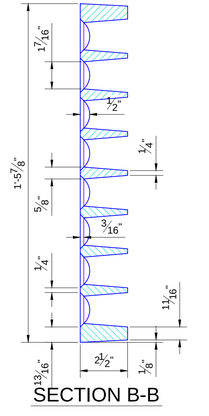
SECTION A-A

STORM SEWER INLET GRATING

DETAIL OF TYPE "B" GRATING



SECTION B-B



SECTION B-B

CASTING WEIGHTS

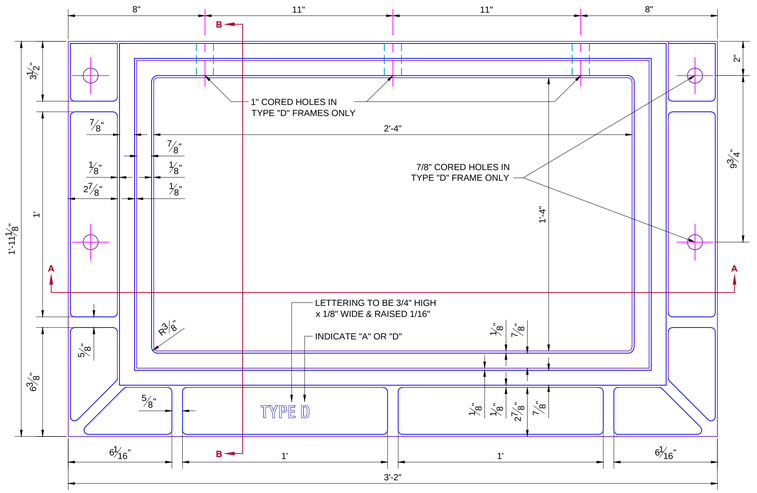
THE AVERAGE WEIGHT OF CASTINGS FURNISHED WILL NOT BE LESS THAN 98% OF WEIGHTS SHOWN BELOW.

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

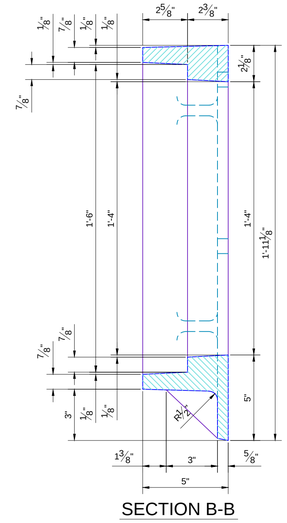
TYPE A FRAMES ONLY 250 LBS.
TYPE B FRAMES ONLY 195 LBS.
TYPE C FRAMES ONLY 210 LBS.
TYPE A GRATES ONLY 145 LBS.

NOTE

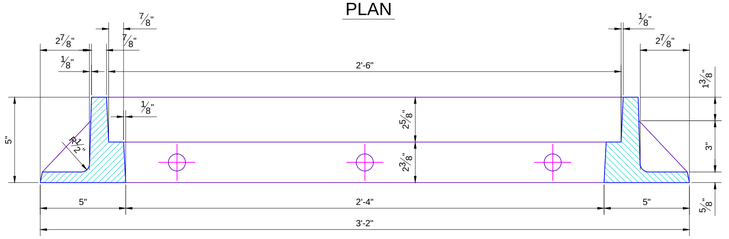
GRATING SHALL CONFORM TO THE A.S.T.M. SPECIFICATIONS FOR GRAY IRON CASTINGS SERIAL DESIGNATION A-48-29.



PLAN



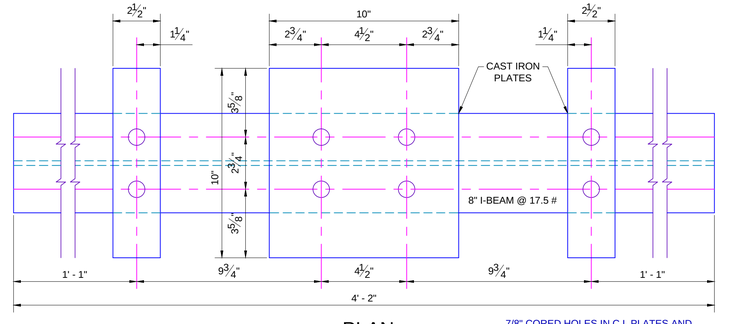
SECTION B-B



SECTION A-A

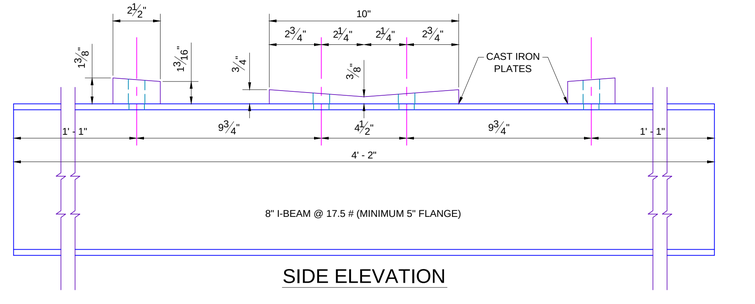
STORM SEWER INLET FRAME

TYPE "D" & TYPE "A"



PLAN

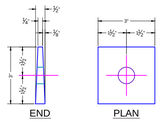
7/8" CORED HOLES IN C.I. PLATES AND 13/13" PUNCHED OR DRILLED HOLES IN FLANGE OF I-BEAM.



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 WORDING 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.

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.

The City of Oklahoma City
Public Works Department
Engineering Division

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

DRAWN: VSC

DATE: 01-31-13

STORM SEWER INLET GRATE DESIGN #1 - #6 & #7

Drawing Number
D-107

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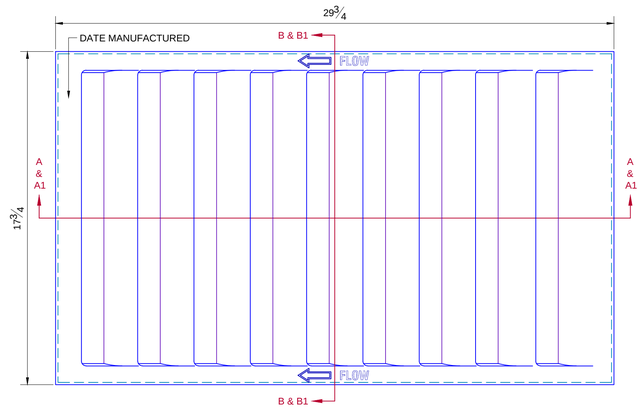
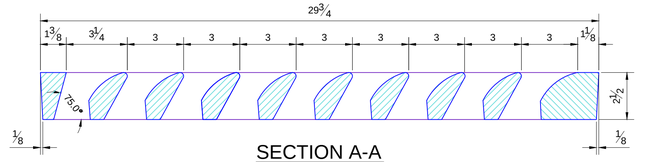
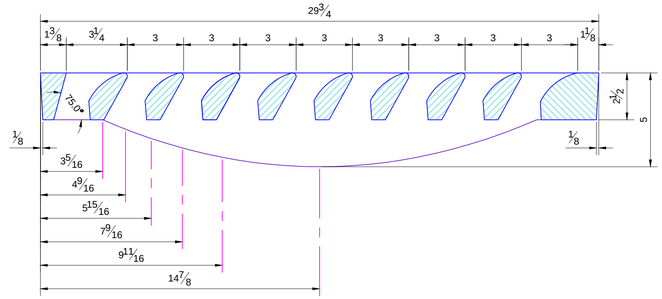


PLAN

BICYCLE SAFE GRATE

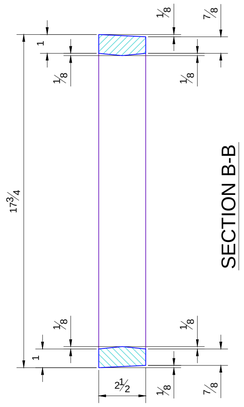


SECTION A-A

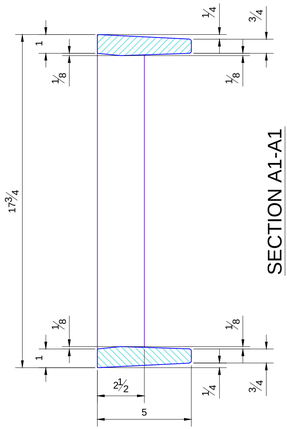


SECTION A1-A1

TRENCH INSTALLATION ONLY

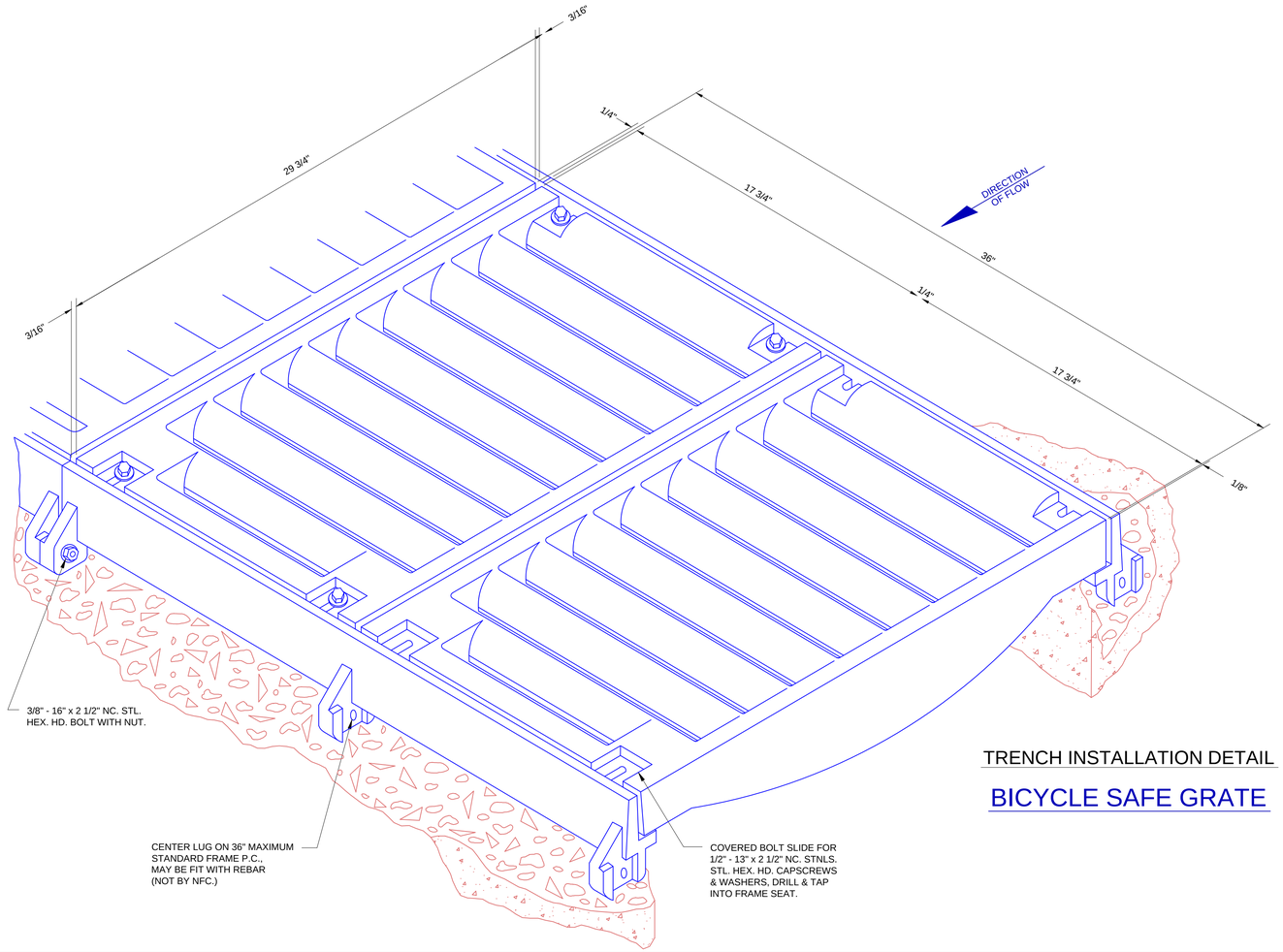


SECTION B-B



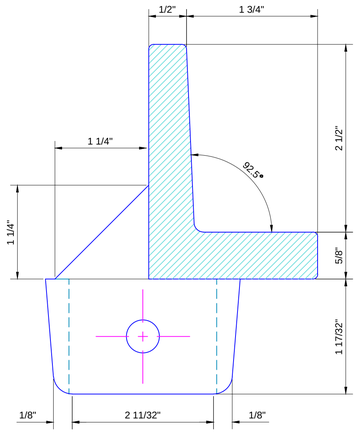
SECTION A1-A1

TRENCH INSTALLATION ONLY



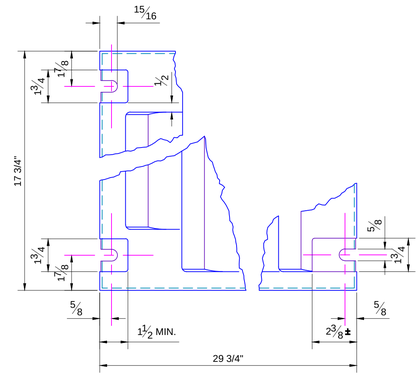
TRENCH INSTALLATION DETAIL

BICYCLE SAFE GRATE



SECTION THRU TYPE "X" FRAME

TRENCH INSTALLATION ONLY
4 X SCALE



BOLT SLOT DETAIL

TRENCH INSTALLATION ONLY

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.

The City of Oklahoma City
Public Works Department
Engineering Division

DATE: 02-01-13

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

VSC

DRAWN:

02-01-13

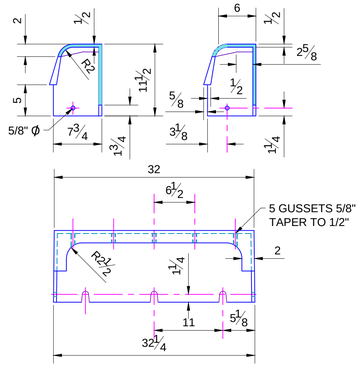
DATE:

BICYCLE SAFE GRATE

Drawing Number

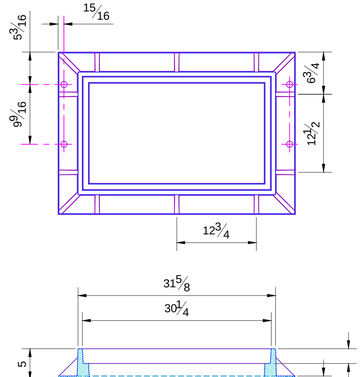
D-108

E:/CITYACAD2000-STD/D-108.DWG VSC 02-01-13



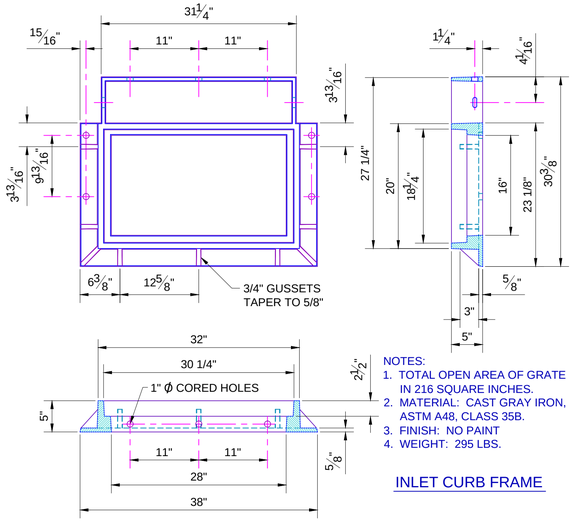
NOTES:
1. MATERIAL: CAST GRAY IRON, ASTM A-48, CLASS 35B
2. FINISH: NO PAINT
3. WEIGHT: 105 LBS.

BARRIER CURB 11 1/2"



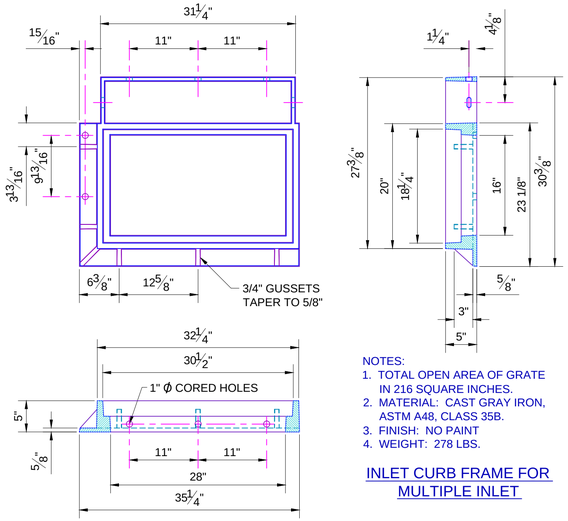
NOTES:
1. TOTAL OPEN AREA OF GRATE IN 216 SQUARE INCHES.
2. MATERIAL: CAST GRAY IRON, ASTM A48-94A, CLASS 35B.
3. FINISH: NO PAINT
4. WEIGHT: 242 LBS.

CATCH BASIN INLET FRAME



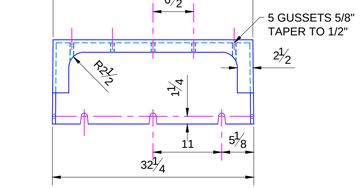
NOTES:
1. TOTAL OPEN AREA OF GRATE IN 216 SQUARE INCHES.
2. MATERIAL: CAST GRAY IRON, ASTM A48, CLASS 35B.
3. FINISH: NO PAINT
4. WEIGHT: 295 LBS.

INLET CURB FRAME



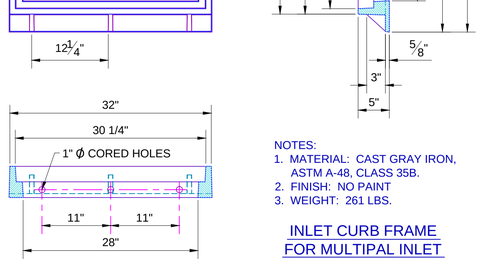
NOTES:
1. TOTAL OPEN AREA OF GRATE IN 216 SQUARE INCHES.
2. MATERIAL: CAST GRAY IRON, ASTM A48, CLASS 35B.
3. FINISH: NO PAINT
4. WEIGHT: 278 LBS.

INLET CURB FRAME FOR MULTIPLE INLET



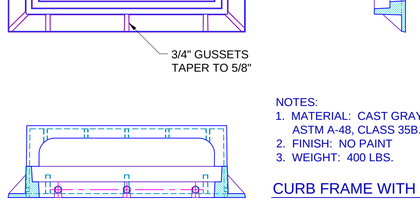
NOTES:
1. MATERIAL: CAST GRAY IRON, ASTM A-48, CLASS 35B
2. FINISH: NO PAINT
3. WEIGHT: 112 LBS.

BARRIER CURB 13 1/2"



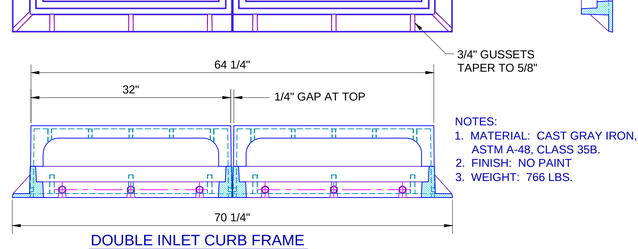
NOTES:
1. MATERIAL: CAST GRAY IRON, ASTM A-48, CLASS 35B.
2. FINISH: NO PAINT
3. WEIGHT: 261 LBS.

INLET CURB FRAME FOR MULTIPAL INLET



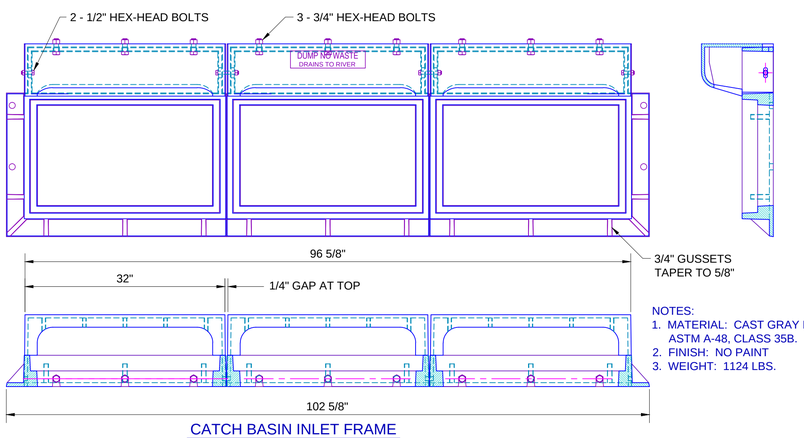
NOTES:
1. MATERIAL: CAST GRAY IRON, ASTM A-48, CLASS 35B.
2. FINISH: NO PAINT
3. WEIGHT: 400 LBS.

CURB FRAME WITH CURB



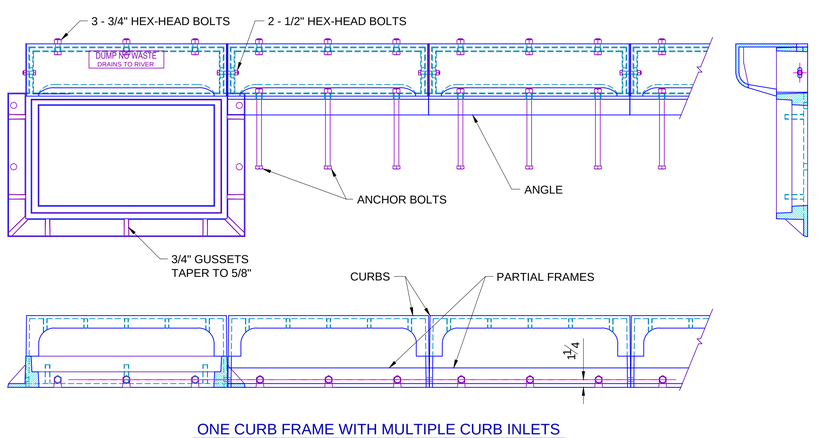
NOTES:
1. MATERIAL: CAST GRAY IRON, ASTM A-48, CLASS 35B.
2. FINISH: NO PAINT
3. WEIGHT: 766 LBS.

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

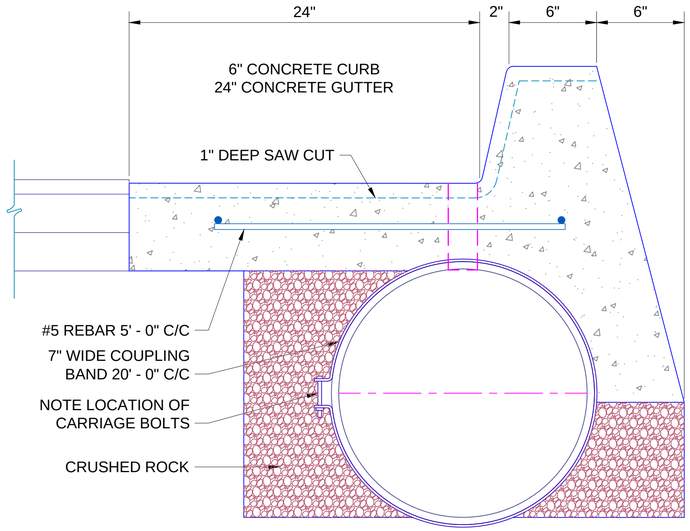
The City of Oklahoma City
Public Works Department
Engineering Division

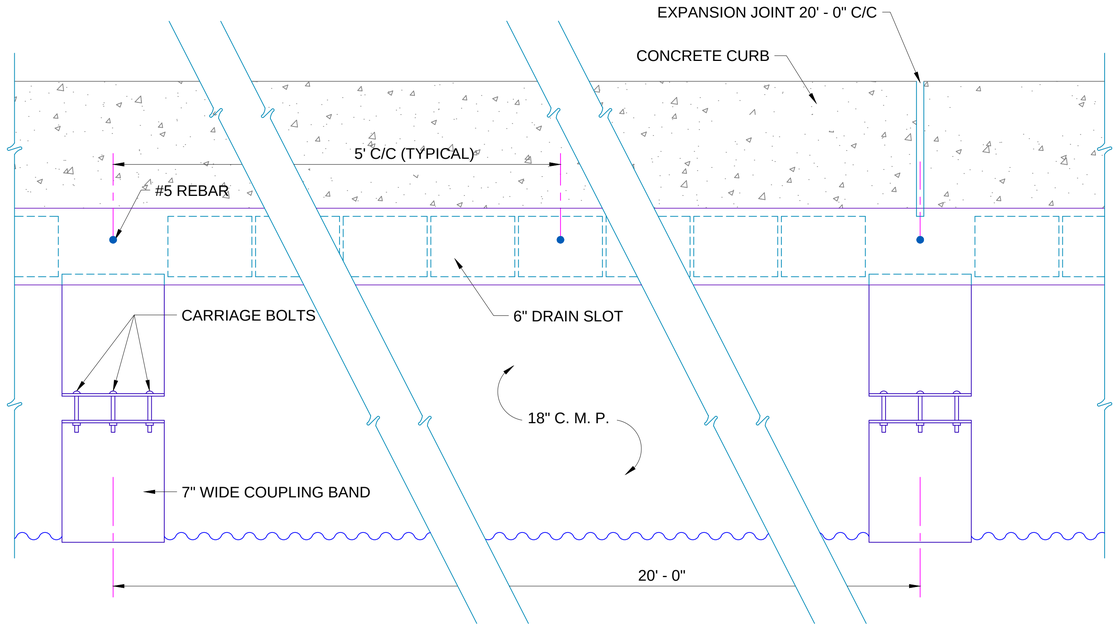
APPROVED BY: ERIC J. WENGER, P.E. CITY ENGINEER — DATE: 02-01-13
DRAWN: VSC — DATE: 02-01-13

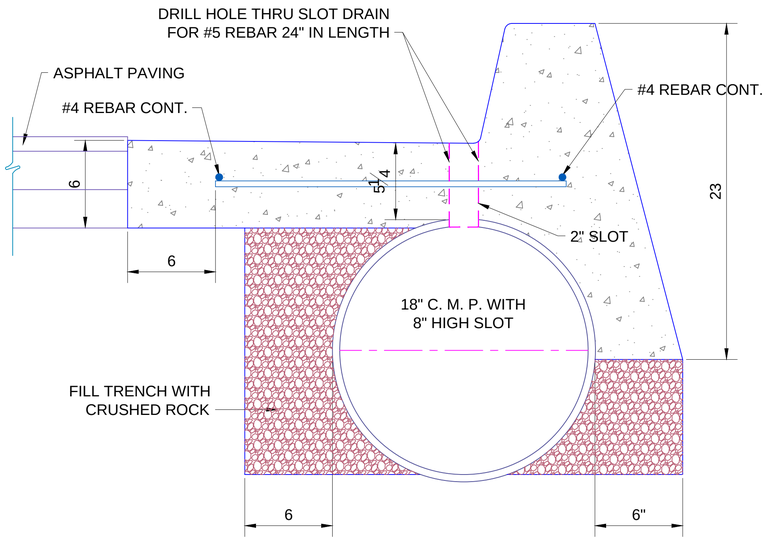
CURB / CATCH BASIN INLET FRAME DETAILS

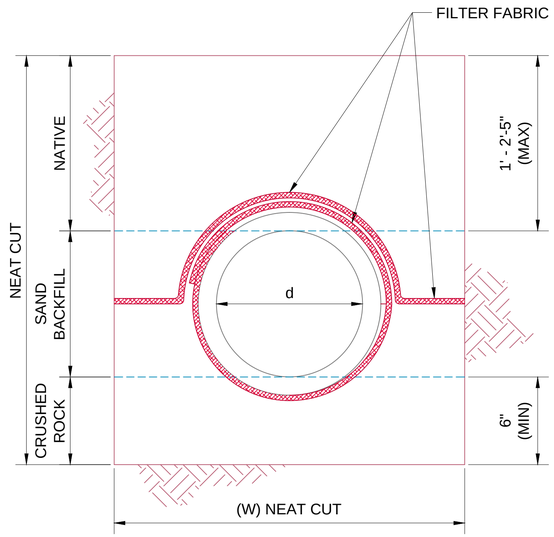
Drawing Number
D-109

E:/CITY/ACAD2000-STD/D-109.DWG VSC 02-01-13

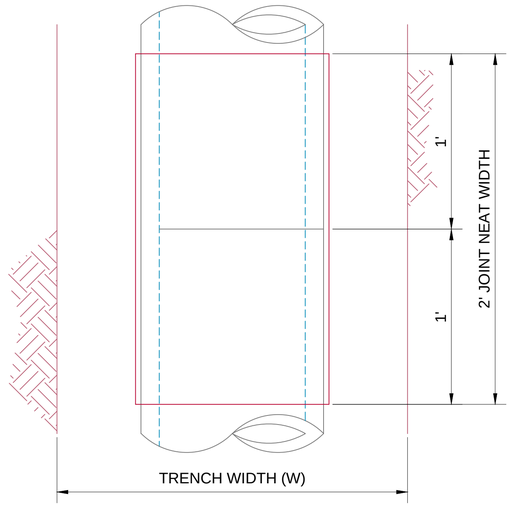








SECTION



PLAN VIEW

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

Construction Notes

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

The City of Oklahoma City
Public Works Department
Engineering Division

DATE: 02-01-13

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

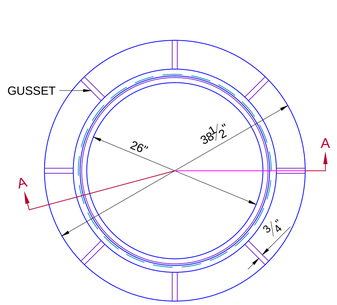
DRAWN: VSC

DATE: 02-01-13

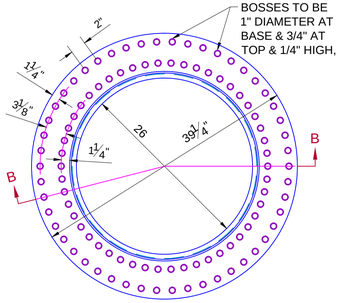
SLOTTED DRAIN INLET & TRENCH WIDTH PIPE WARPING FOR STORM SEWER

Drawing Number
D-110

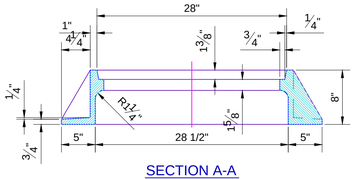
E:/CITY/ACAD2000-ST/D/D-110.DWG VSC 02-01-13



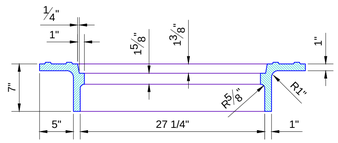
PLAN



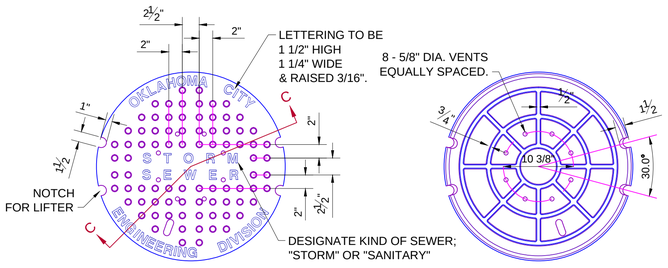
PLAN



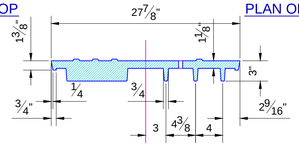
SECTION A-A



SECTION B-B



PLAN OF TOP PLAN OF UNDERSIDE



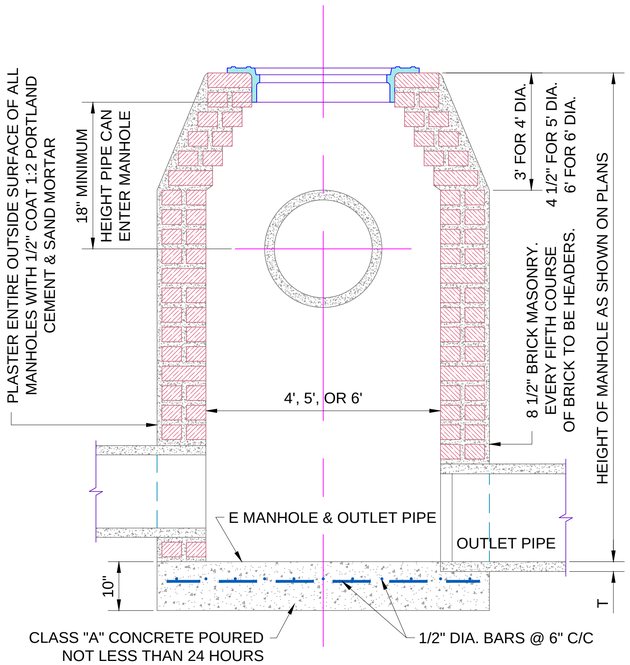
PLAN OF UNDERSIDE

GENERAL NOTES:

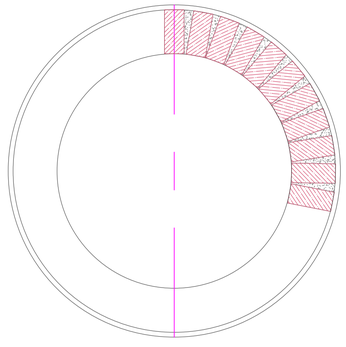
1. CASTINGS TO CONFORM TO THE A.S.T.M. SPECIFICATIONS FOR GRAY IRON CASTINGS, SERIAL DESIGNATION A 48-28.
2. WHEN EACH COVER IS PLACED IN ANY POSITION IN ITS ASSOCIATED FRAME, THE SIDE PLAY IN ANY DIRECTION SHALL NOT EXCEED 1/8".
3. TYPE A FRAMES SHALL BE USED ON PAVED STREETS AND ALLEYS.
4. TYPE A FRAMES 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.

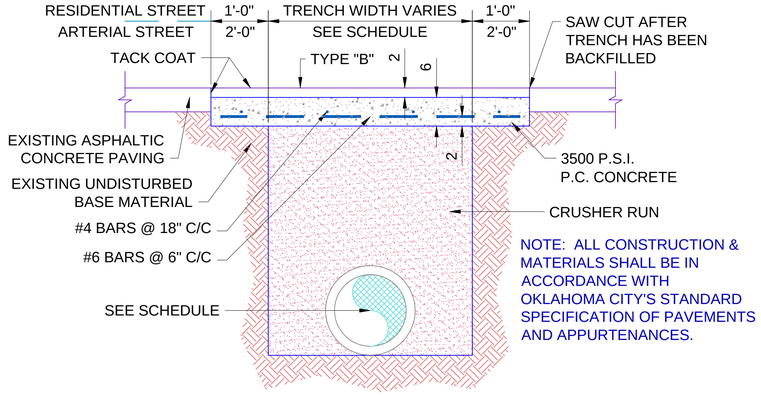


ELEVATION

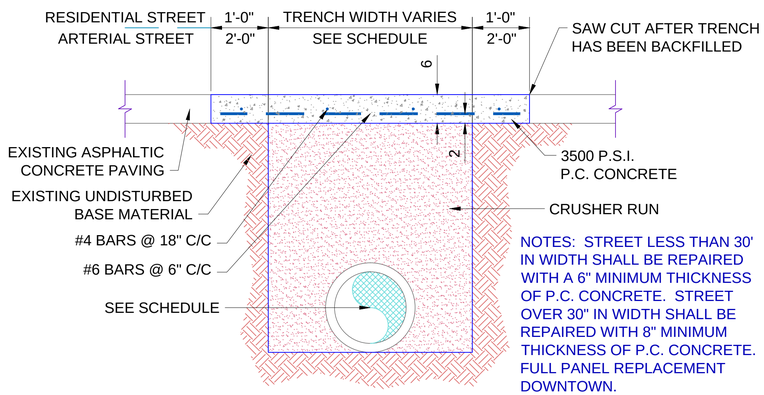


PLAN

DETAIL OF STANDARD
MASONRY MANHOLE



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"

The City of
Oklahoma City
Public Works Department
Engineering Division

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

DATE: 05-02-13

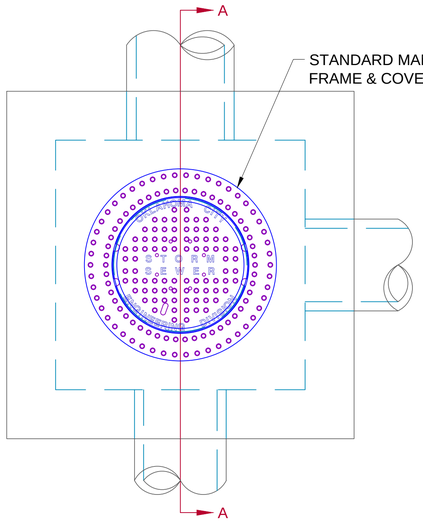
DRAWN: VSC

DATE: 05-02-13

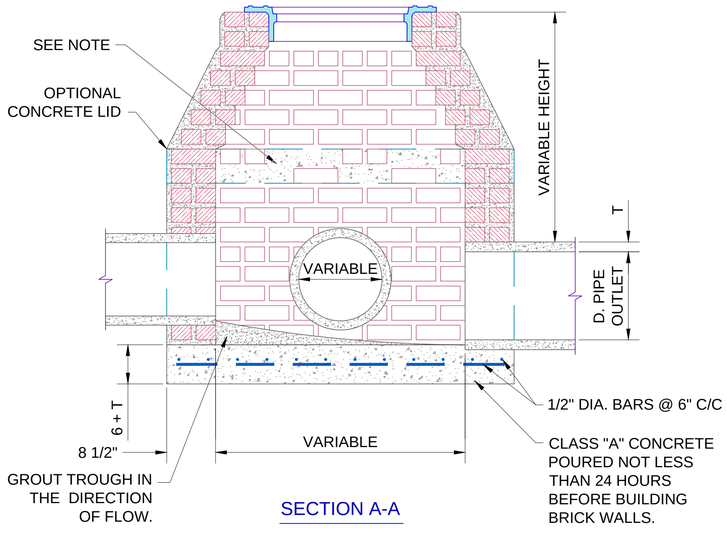
STANDARD MASONRY MANHOLE

Drawing Number
D-201

\\Ci.okc.lokct\PW-Section\CITYA\CAD-STDS\D-201 VSC 05-02-13



PLAN

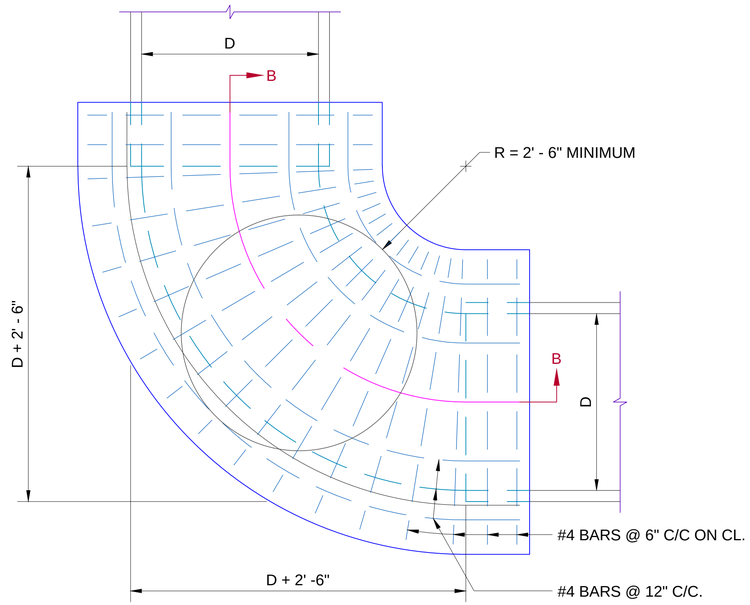


SECTION A-A

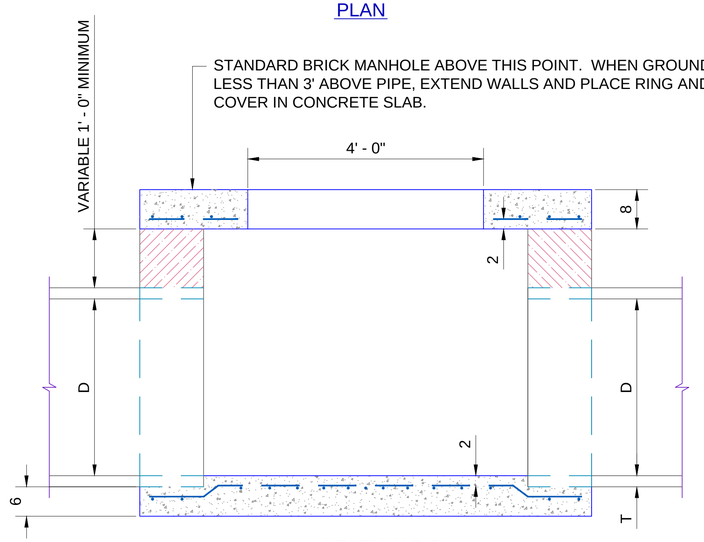
DETAIL OF MASONRY JUNCTION BOX

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.



PLAN



SECTION B-B

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.

The City of Oklahoma City
Public Works Department
Engineering Division

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

DRAWN: VSC

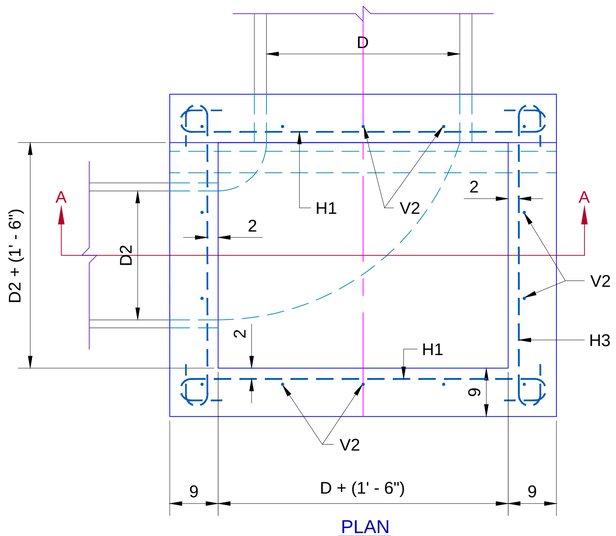
DATE: 05-02-13

STANDARD MASONRY JUNCTION BOX & RADIUS JUNCTION BOX

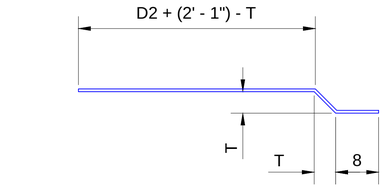
Drawing Number

D-202

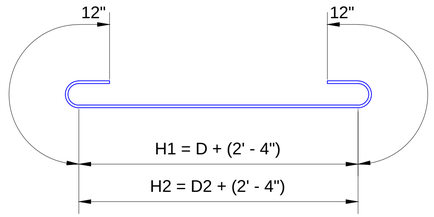
\\ci.okc.\okc\PW-Section\CITY\ACAD-STDS\D-202 VSC 05-02-13



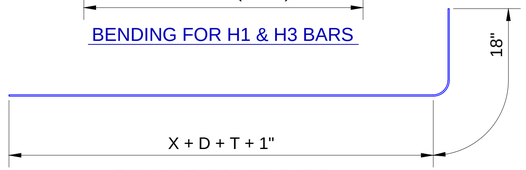
PLAN



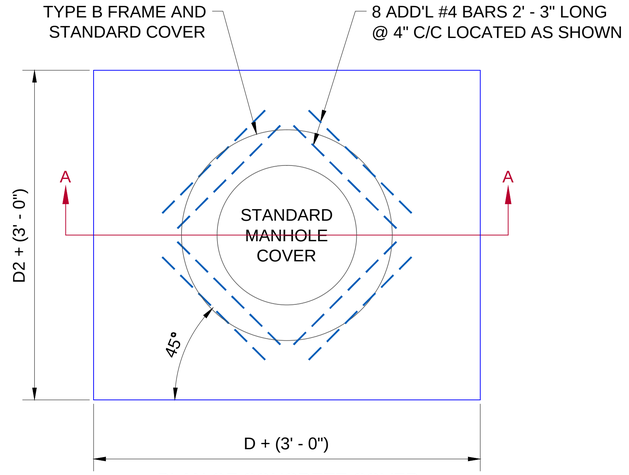
BENDING FOR H2 BARS



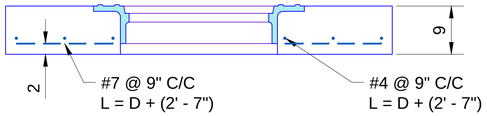
BENDING FOR H1 & H3 BARS



BENDING FOR V2 BARS



PLAN OF CONCRETE COVER



SECTION A-A

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'.

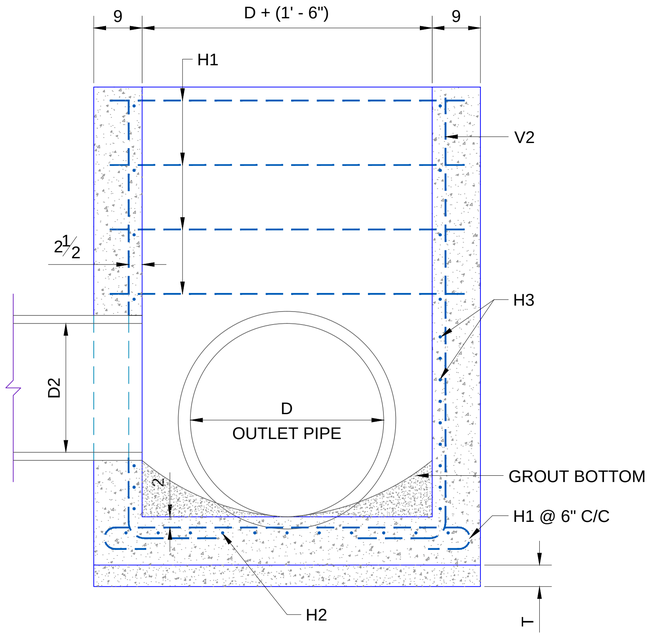
6. REINFORCED CONCRETE PIPE SHALL CONFORM TO THE REQUIREMENTS OF A.A.S.H.T.O. M-170 (ASTM C-78) CLASS III UNLESS OTHERWISE DESIGNATED.

7. WALL THICKNESS (DIMENSION "T") OF PIPES SHOWN, ARE FROM "WALL B" COLUMN OF A.A.S.H.T.O. TABLES.

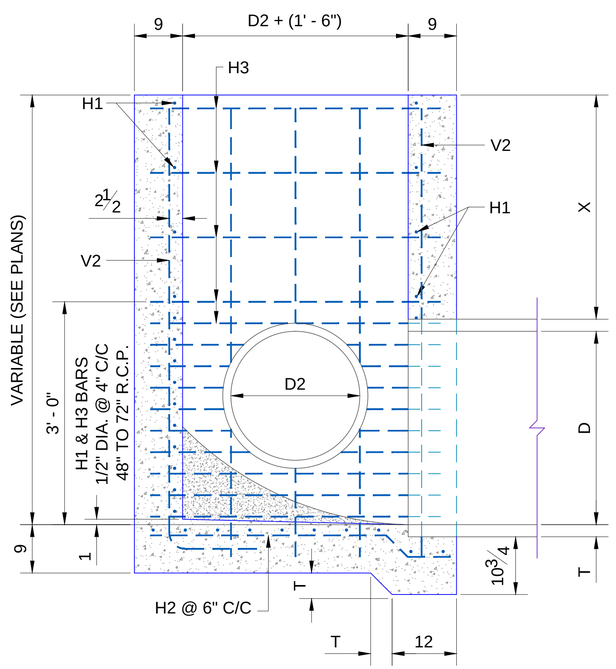
D	36"	42"	48"	54"	60"	66"	72"
T	4"	4 1/2"	5"	5 1/2"	6"	6 1/2"	7"

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.



SECTION A-A



SECTION ON ℄

JUNCTION BOX 36" TO 72"
REINFORCED CONCRETE PIPE

The City of Oklahoma City
Public Works Department
Engineering Division

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

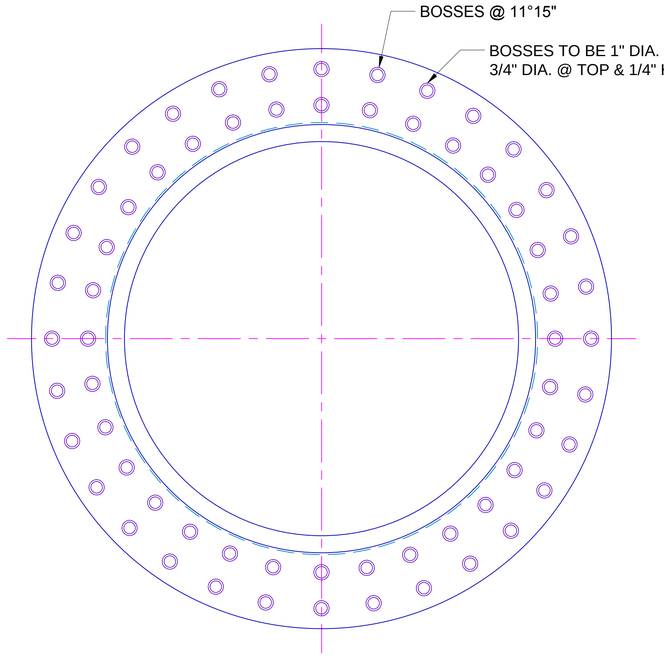
DRAWN: VSC

DATE: 05-02-13

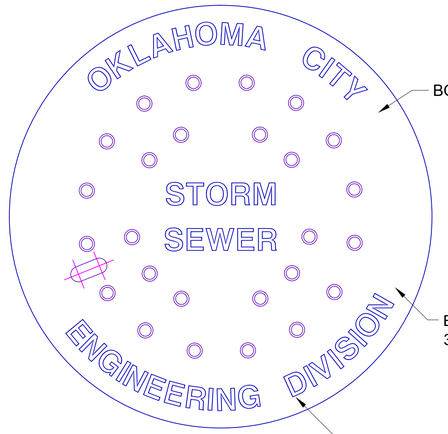
STANDARD REINFORCED CONCRETE JUNCTION BOX FOR 36" TO 72" REINFORCED CONCRETE PIPE

Drawing Number
D-203

\\ci.okc.\okcPW-Section\CITYACAD-STDS\D-203 VSC 05-02-13



PLAN



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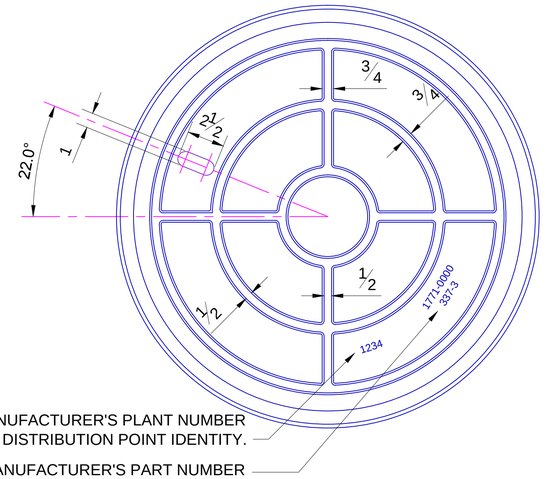
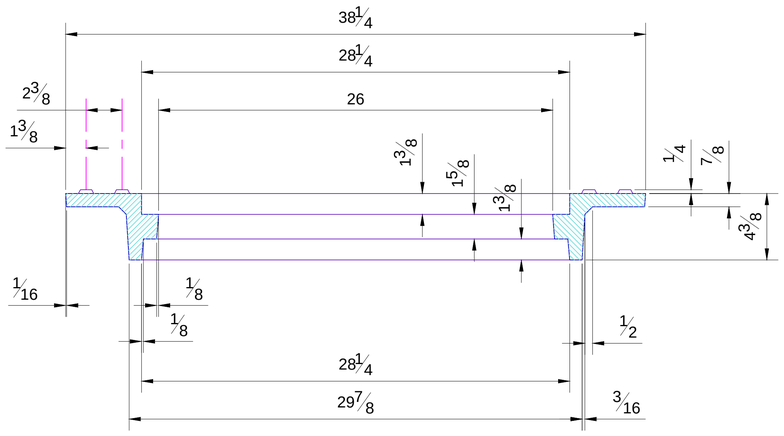
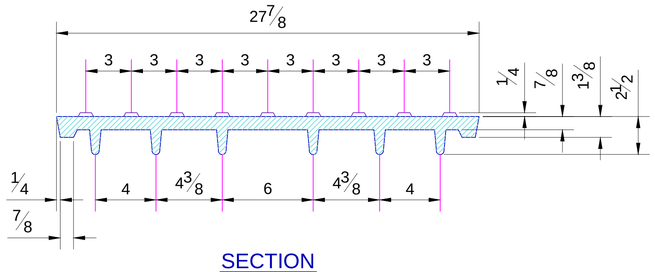


PLAN OF UNDERSIDE



SECTION

REVERSIBLE MANHOLE FRAME



SECTION

STANDARD MANHOLE COVER

GENERAL NOTES:

1. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE CURRENT SPECIFICATIONS.
2. SHARP EDGES RESULTING FROM FABRICATION SHALL BE DULLED BY ANY ACCEPTABLE METHOD FOR SAFETY IN HANDLING.
3. COVERS SHALL BE GRAY IRON CONFORMING TO THE REQUIREMENTS OF ASHTO M-105 CLASS 35B OR ASTM A-48-76 CLASS 35B OR ASTM A-48-76 CLASS 30B.
4. FERROUS CASTINGS SHALL BE OF UNIFORM QUALITY, FREE OF BLOWHOLES, POROSITY HARDSPOTS, SHRINKAGE DISTORTION OR OTHER DEFECTS. THEY SHALL BE SMOOTH AND WELL CLEANED BY SHOT BLASTING OR OTHER APPROVED CLEANING METHOD.
5. ALL CASTINGS SHALL BE MANUFACTURED TRUE TO PATTERN; COMPONENT PARTS SHALL FIT TOGETHER IN A SATISFACTORY MANNER.
6. WHERE INDICATED, MACHINED SURFACES SHALL BE FURNISHED.
7. WEIGHTS ARE APPROXIMATE AND AVERAGE. DEVIATION FROM THE FOLLOWING WEIGHTS SHALL NOT EXCEED 5% PLUS OR MINUS: FRAME 235 L.B. COVERS 195 L.B.
8. CASTING SHALL BE UNPAINTED.

The City of Oklahoma City
Public Works Department
Engineering Division

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

DRAWN: VSC

DATE: 05-02-13

STANDARD MANHOLE
REVERSIBLE FRAME & COVER

Drawing Number
D-204

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