

SIDE VIEW

END VIEW

NOMINAL PIPE SIZE ID, in	DIMENSIONS		MANDRELL O.D., in	RING O.D., in
	A, in	B, in		
6	4.0	4	5.61	4.90
8	5.3	6	7.36	6.65
10	6.7	6	9.21	8.50
12	8.0	8	11.06	10.35
15	10.0	9	13.82	13.11

MANDREL FOR USE IN ALL P.V.C. SEWER PIPE

NOTE:

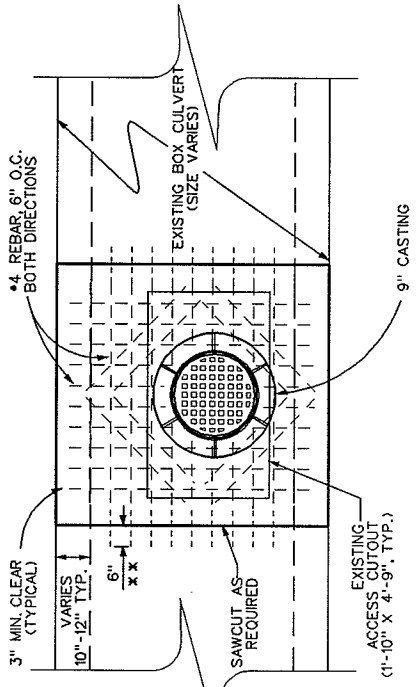
AFTER CONSTRUCTION IS COMPLETE, TRUE THE O.D. DIMENSION FOR THE FULL LENGTH OF "B" TO $+/-0.010$ " BY TOOL AND LATHE OR GRINDING.

2004

CITY OF MADISON ENGINEERING DIVISION
MANDREL DETAIL
STANDARD DETAIL DRAWING 5.1.1

ALL REINFORCEMENT SHALL BE EPOXY COATED.

** IF FALSEWORK IS USED, #6 DOWELS, 12" O.C. SHALL BE PLACED LONGITUDINALLY TO EXTEND 6" INTO EXISTING ROOF. ALL DOWELS SHALL BE GROUTED WITH EPOXY MORTAR.



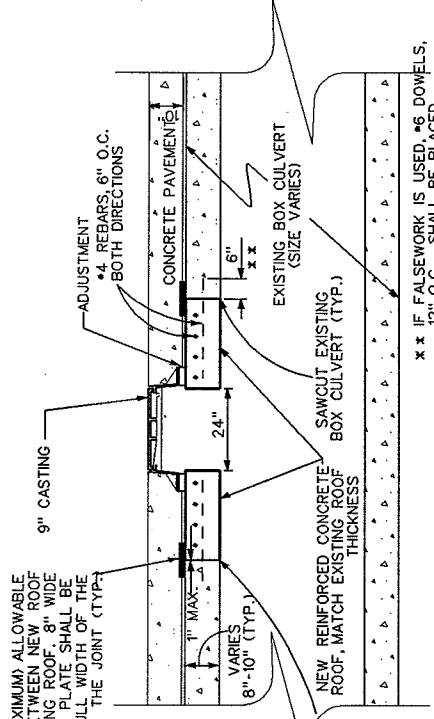
NOTE: NEW ROOFS FOR TYPE 1 AND TYPE 2 SHALL BE POURED SEPARATELY FROM THE EXISTING BOX CULVERT UNLESS FALSEWORK IS TO BE UTILIZED FOR TYPE 2 ROOF REPAIRS. NEW ROOFS SHALL BE POURED ON A LEVEL, FLAT SURFACE.

PATCH RCBC ROOF TYPE I & TYPE II
TOP VIEW

1" GAP (MAXIMUM) ALLOWABLE SPACING BETWEEN NEW ROOF AND EXISTING ROOF. 8" WIDE 1/4" STEEL PLATE SHALL BE PLACED THE FULL WIDTH OF THE BOX CENTERED ON THE JOINT (TYP.)

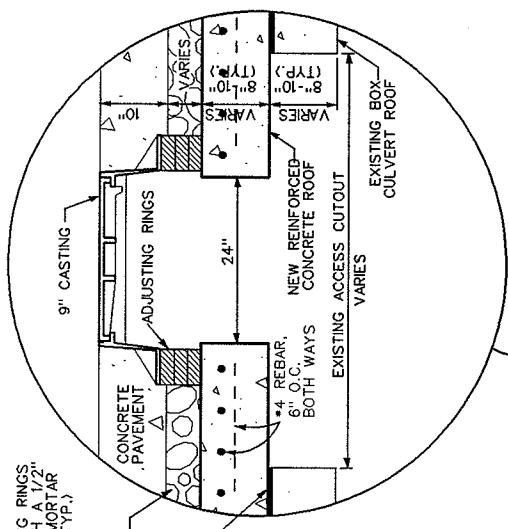
NOTE: THE OUTSIDE ADJUSTING RINGS SHALL BE SEALED WITH A 1/2" THICK, AIR ENTRAINED MORTAR TYPE M OR S SEAL (TYP.)

SEALTIGHT COLD PLASTIC SEWER JOINT COMPOUND TO BE PLACED BETWEEN NEW ROOF AND EXISTING ROOF (TYP.)



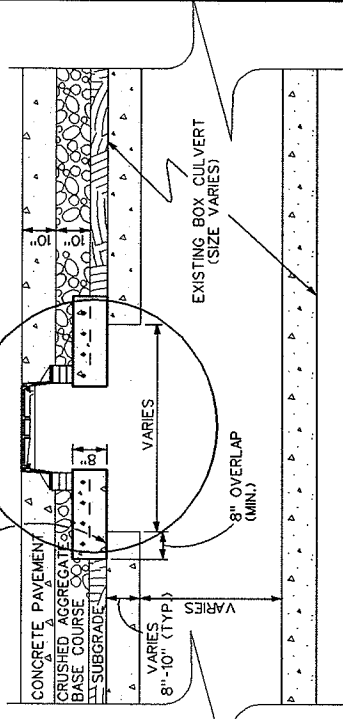
** IF FALSEWORK IS USED, #6 DOWELS, 12" O.C. SHALL BE PLACED LONGITUDINALLY INTO EXISTING ROOF. ALL DOWELS SHALL BE GROUTED WITH EPOXY MORTAR.

NOTE: THE OUTSIDE ADJUSTING RINGS SHALL BE SEALED WITH A 1/2" THICK, AIR ENTRAINED MORTAR TYPE M OR S SEAL (TYP.)



SEALTIGHT COLD PLASTIC SEWER JOINT COMPOUND OR AIR ENTRAINED TYPE M OR S MORTAR (PER THE CITY OF MADISON STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION) (TYP.)

SEALTIGHT COLD PLASTIC SEWER JOINT COMPOUND OR AIR ENTRAINED TYPE M OR S MORTAR (PER THE CITY OF MADISON STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION) (TYP.)



TYPE I REPAIR
SIDE VIEW

2004

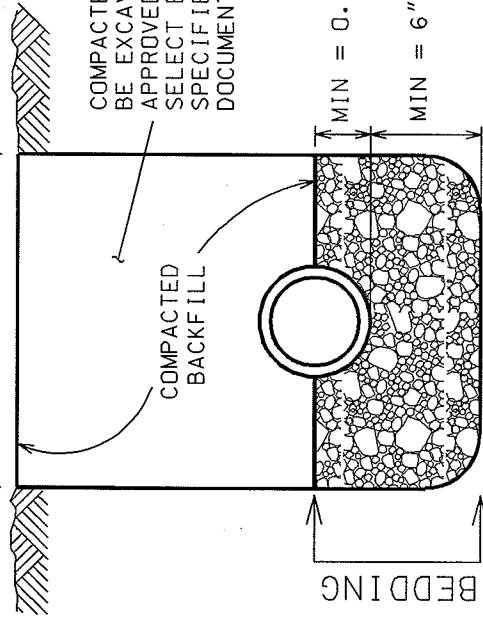
CITY OF MADISON
ENGINEERING DIVISION

**RCBC REPAIR
TYPE I & TYPE II**

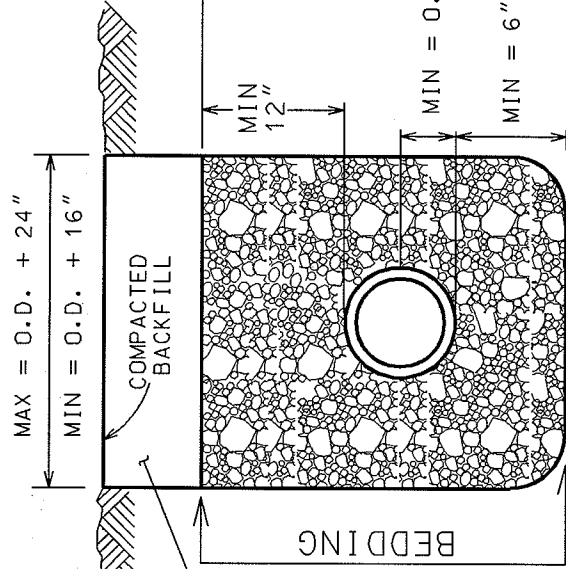
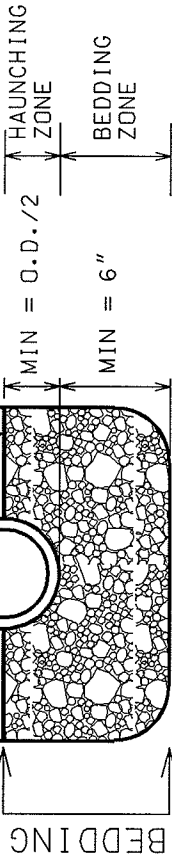
STANDARD DETAIL DRAWING 5.1.2

MAX = O.D. + 24"

MIN = O.D. + 16"



COMPACTED BACKFILL SHALL BE EXCAVATED MATERIAL AS APPROVED BY ENGINEER OR SELECT BACKFILL, PAID AS SPECIFIED IN THE CONTRACT DOCUMENTS.



INITIAL BACKFILL ZONE

HAUNCHING ZONE

BEDDING ZONE

MIN 12"

MIN = O.D./2

MIN = 6"

WASHED GRAVEL OR CRUSHED STONE AS SPECIFIED IN SECTION 502.1 (d), BEDDING OF SEWER PIPES



BEDDING FOR REINFORCED CONCRETE SEWER PIPES

WASHED GRAVEL, CRUSHED STONE, SAND OR LIMESTONE SCREENINGS FOR PIPE SIZES 10" IN DIAMETER OR LESS. WASHED GRAVEL OR CRUSHED STONE FOR PIPE SIZES OVER 10" IN DIAMETER, AS SPECIFIED IN SECTION 502.1 (d), BEDDING OF SEWER PIPES



BEDDING FOR PLASTIC SEWER PIPES

NOTES:

UNLESS OTHERWISE SPECIFIED, ALL SANITARY AND STORM SEWER PIPES, INCLUDING LATERALS AND LEADS, SHALL BE INSTALLED WITH THE TYPE OF BEDDING SHOWN FOR THE TYPE AND SIZE OF PIPE INSTALLED.

THE COSTS OF BEDDING SHALL BE INCLUDED IN THE UNIT PRICES BID FOR THE PIPE. FOR RCP, BEDDING INCLUDES THE HAUNCHING & BEDDING ZONES. FOR PLASTIC PIPES, THE BEDDING INCLUDES THE HAUNCHING, BEDDING & INITIAL BACKFILL ZONES. THE BEDDING SHALL BE INSTALLED & COMPACTED IN 6" MAXIMUM LIFTS.

ALL TRENCHES SHALL BE HAND BACKFILLED TO A POINT 12" ABOVE THE TOP OF THE PIPE. ALL BEDDING SHALL BE MECHANICALLY COMPACTED.

PAYMENT SHALL NOT BE MADE FOR BACKFILL WITH EXCAVATED MATERIAL, IF APPROVED. SELECT FILL, IF REQUIRED, SHALL BE PAID PER CONTRACT.

THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE O.D. + 24" AND MINIMUM OF O.D. + 16" AS SPECIFIED, AND SHALL APPLY FROM THE BOTTOM OF THE TRENCH TO A POINT 12" ABOVE THE TOP OF THE PIPE. WHERE THIS WIDTH IS EXCEEDED, THE CONTRACTOR SHALL FURNISH AND INSTALL A HIGHER TYPE OF BEDDING AT **NO EXTRA COST**. THE TYPE OF BEDDING SHALL BE DETERMINED BY THE ENGINEER.

O.D. EQUALS THE OUTSIDE DIAMETER OF THE PIPE.

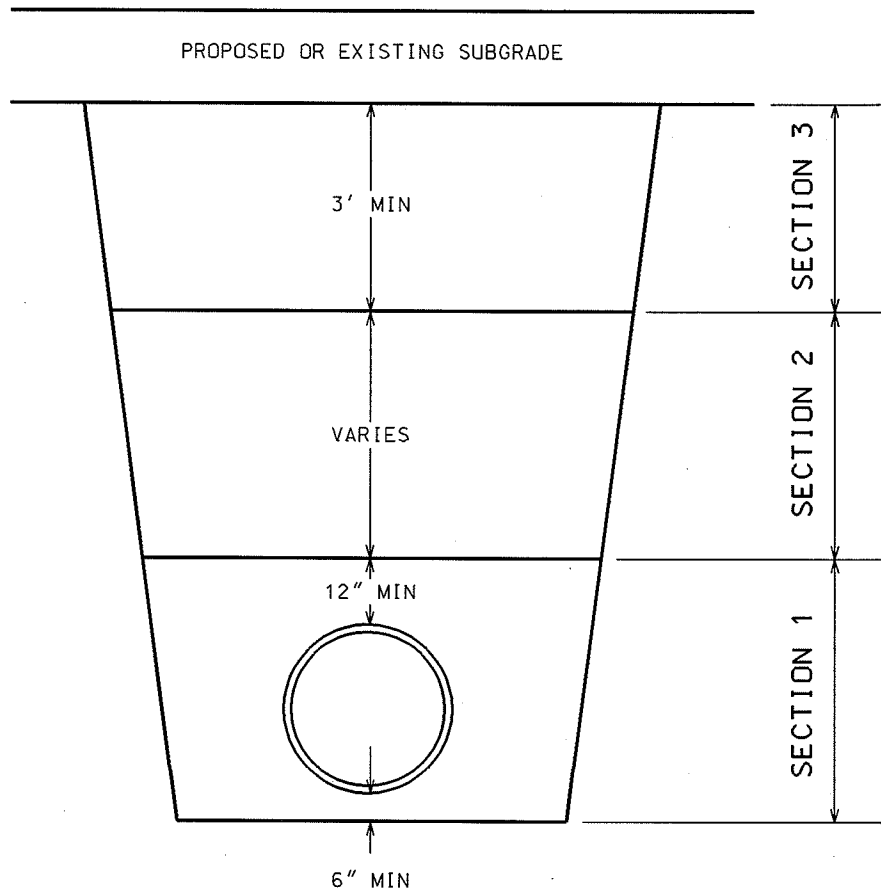
2004

CITY OF MADISON
ENGINEERING DIVISION

STORM AND SANITARY SEWER BEDDINGS

DRAWING NOT TO SCALE

STANDARD DETAIL DRAWING 5.2.1



STANDARD TRENCH COMPACTION

ALL BACKFILL MATERIAL SHALL BE PLACED IN LIFTS NOT TO EXCEED 12" BEFORE COMPACTION UNLESS AUTHORIZED BY THE ENGINEER DUE TO THE CHARACTER OF THE MATERIAL AND THE COMPACTING EQUIPMENT. EACH LIFT SHALL BE MECHANICALLY COMPACTED TO THE REQUIRED DENSITY PRIOR TO PLACING SUCCEEDING LIFTS OF BACKFILL MATERIAL.

IN COLD WEATHER, TRENCHES SHALL BE COMPACTED IN ACCORDANCE WITH THE REQUIREMENTS SPECIFIED IN SECTION 502.1 (e), BACKFILLING EXCAVATIONS AND COMPACTION OF BACKFILL, OF THESE SPECIFICATIONS.

SECTION 1:

MECHANICALLY COMPACTED BEDDING AS REQUIRED BY THE SPECIFICATIONS. COMPACTION ACHIEVED WITH SMALLER PLATE COMPACTOR.

SECTION 2:

MINIMUM COMPACTION 90% MAXIMUM DENSITY. COMPACTION OF BACKFILL WITH BOMAG OR HOE-PAC SHALL NOT BEGIN UNTIL THE DEPTH OF BACKFILL MATERIAL IS TWO FEET ABOVE THE TOP OF PIPE.

SECTION 3:

MAXIMUM COMPACTION 95% MINIMUM DENSITY.

2004

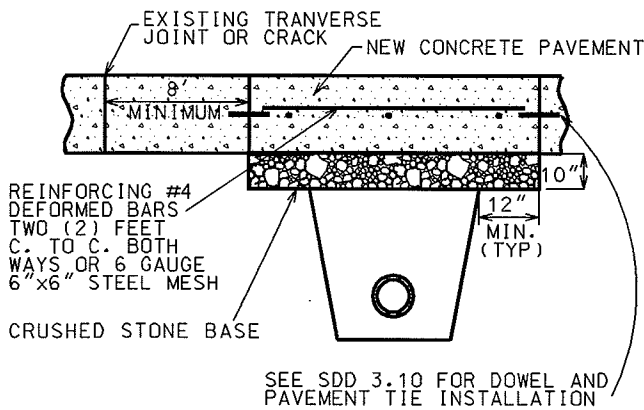
CITY OF MADISON
ENGINEERING DIVISION

TYPICAL
TRENCH
COMPACTION

STANDARD DETAIL DRAWING 5.2.2

TYPE I

CONCRETE PAVEMENT



TYPE I UTILITY TRENCH PATCH

THE PAVEMENT SHALL BE REMOVED IN TWO STAGES. THE INITIAL PAVEMENT REMOVAL SHALL BE LIMITED TO THE AREA OF THE PROPOSED TRENCH. FULL-DEPTH SAWCUTTING WILL NOT BE REQUIRED FOR THIS PHASE OF THE PAVEMENT REMOVAL. AFTER THE TRENCH HAS BEEN BACKFILLED AND COMPACTED, AND AFTER THE BASE HAS BEEN RESTORED IN THE AREA OF THE TRENCH, AND AFTER SAWCUTTING THE NEW JOINTS THE FULL DEPTH OF THE EXISTING PAVEMENT (INCIDENTAL), THE REMAINING PAVEMENT TO BE REMOVED SHALL BE REMOVED WITHOUT DISTURBING THE EXISTING BASE.

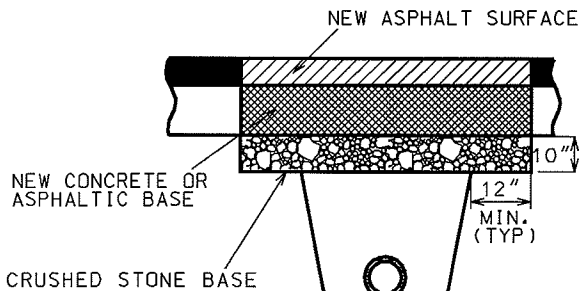
THE SIZE OF THE PATCH SHALL BE DETERMINED BY THE TOP WIDTH OF THE TRENCH, THE LOCATION AND SKEW OF THE EXISTING TRANSVERSE JOINTS, THE CONDITION OF THE EXISTING PAVEMENT, AND THE CONDITION OF THE BASE. NEW TRANSVERSE JOINTS SHALL BE PARALLEL TO THE EXISTING TRANSVERSE JOINTS, AND SHALL BE A MINIMUM OF ONE (1) FOOT FROM THE TRENCH. THE DISTANCE BETWEEN NEW AND EXISTING TRANSVERSE JOINTS SHALL BE A MINIMUM OF EIGHT (8) FEET, MEASURED PERPENDICULAR TO THE JOINTS. THE PATCH SHALL BE A MINIMUM OF EIGHT (8) FEET IN LENGTH, AND SHALL HAVE THE SAME WIDTH AS THE PAVEMENT LANE.

THE PATCH SHALL BE NINE (9) INCHES IN THICKNESS OF HIGH EARLY STRENGTH CONCRETE, DOWELED AND TIED WITH EPOXY COATED BARS, AND REINFORCED, ALL IN ACCORDANCE WITH THE TYPICAL SECTION.

THE TRANSVERSE EDGES OF THE FINISHED PATCH SHALL BE FLUSH WITH THE EDGES OF THE EXISTING CONCRETE PAVEMENT. THE LONGITUDINAL SURFACE SHALL FORM A STRAIGHT LINE FROM EDGE TO EDGE WITHIN A TOLERANCE OF $\frac{1}{8}$ INCH.

TYPE II

CONCRETE WITH ASPHALTIC OVERLAY



TYPE II UTILITY TRENCH PATCH

THE PATCH SHALL BE 7" HIGH EARLY STRENGTH CONCRETE BASE WITH THE SAME REINFORCEMENT AS THE EXISTING CONCRETE BASE, OVERLAID WITH ASPHALT UPPER LAYER. WHERE SPECIFIED, OR DIRECTED BY THE ENGINEER, THE BASE SHALL BE CONSTRUCTED OF ASPHALTIC BASE COURSE MATERIAL, SHALL BE THE SAME THICKNESS AS THE EXISTING BASE, AND SHALL BE LAID IN TWO OR MORE COMPACTED LIFTS OF NOT MORE THAN 3" IN THICKNESS EACH.

THE PAVEMENT ALONG THE PATCH SHALL BE SAWCUT, FULL DEPTH, AND INCIDENTAL TO THE TRENCH PATCH. THE EDGES OF THE PATCH SHALL BE VERTICAL, FREE OF LOOSE STONES OR CONCRETE PIECES, AND SHALL BE THOROUGHLY WETTED JUST PRIOR TO POURING THE NEW CONCRETE BASE.

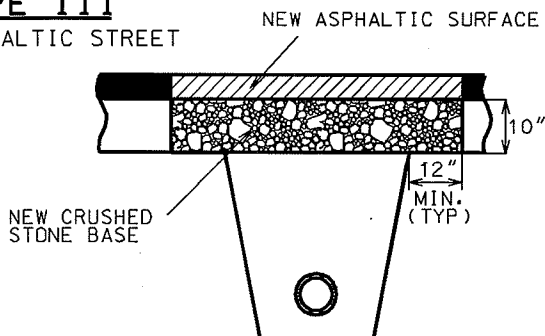
THE TOP OF THE NEW CONCRETE OR ASPHALT BASE SHALL BE FLUSH WITH THE TOP OF THE EXISTING CONCRETE BASE.

PRIOR TO PLACING THE ASPHALT UPPER LAYER, THE EDGES OF THE PATCH AND THE SURFACE OF THE NEW CONCRETE BASE SHALL BE THOROUGHLY TACKED WITH LIQUID ASPHALT.

THE ASPHALT UPPER LAYER SHALL BE OF THE SAME THICKNESS AS THE EXISTING ASPHALT OVERLAY WITH A MINIMUM THICKNESS OF 3" AND A MAXIMUM THICKNESS OF 5 $\frac{1}{4}$ " UNLESS OTHERWISE SPECIFIED AND SHALL BE LAID IN ONE OR MORE COURSES AS DIRECTED BY THE ENGINEER. THE ASPHALTIC UPPER LAYER SHALL BE MACHINE LAID WHERE DIRECTED BY THE ENGINEER. WHERE THE ASPHALTIC UPPER LAYER IS MACHINE LAID, AND IS NOT MORE THAN 3" IN THICKNESS, THE ASPHALTIC SURFACE MAY BE LAID IN ONE LIFT.

TYPE III

ASPHALTIC STREET



TYPE III UTILITY TRENCH PATCH

THE PATCH SHALL BE CRUSHED STONE BASE COURSE, GRADATION NO. 2 OVERLAID WITH ASPHALT UPPER LAYER EQUAL IN THICKNESS TO THE EXISTING ASPHALTIC PAVEMENT, WITH A MINIMUM THICKNESS OF 3" AND A MAXIMUM THICKNESS OF 5 $\frac{1}{4}$ " UNLESS OTHERWISE SPECIFIED AND LAID IN ONE OR MORE COURSES AS DIRECTED BY THE ENGINEER.

THE PAVEMENT ALONG THE PATCH SHALL BE SAWCUT, FULL DEPTH, AND INCIDENTAL TO THE TRENCH PATCH. THE EDGES OF THE EXISTING ASPHALTIC PAVEMENT SHALL BE FREE OF LOOSE STONES OR PAVEMENT MATERIAL.

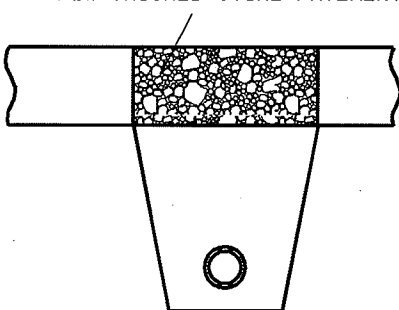
THE CRUSHED STONE BASE COURSE SHALL BE INSTALLED IN TWO LIFTS. THE LOWER LIFT SHALL BE THOROUGHLY MECHANICALLY COMPACTED PRIOR TO PLACING THE UPPER LIFT.

THE ASPHALT UPPER LAYER SHALL BE LAID IN TWO LIFTS. THE ASPHALT UPPER LAYER SHALL BE MACHINE LAID WHERE DIRECTED BY THE ENGINEER. WHERE THE ASPHALTIC UPPER LAYER IS MACHINE LAID AND IS NOT MORE THAN 3" IN THICKNESS, THE ASPHALT SURFACE COURSE MAY BE IN ONE LIFT.

PRIOR TO PLACING THE ASPHALT UPPER LAYER, THE EDGES OF THE PATCH AND THE SURFACE OF THE CRUSHED STONE BASE SHALL BE TACKED AND PRIMED WITH LIQUID ASPHALT.

TYPE IV

NEW CRUSHED STONE PAVEMENT



TYPE IV UTILITY TRENCH PATCH

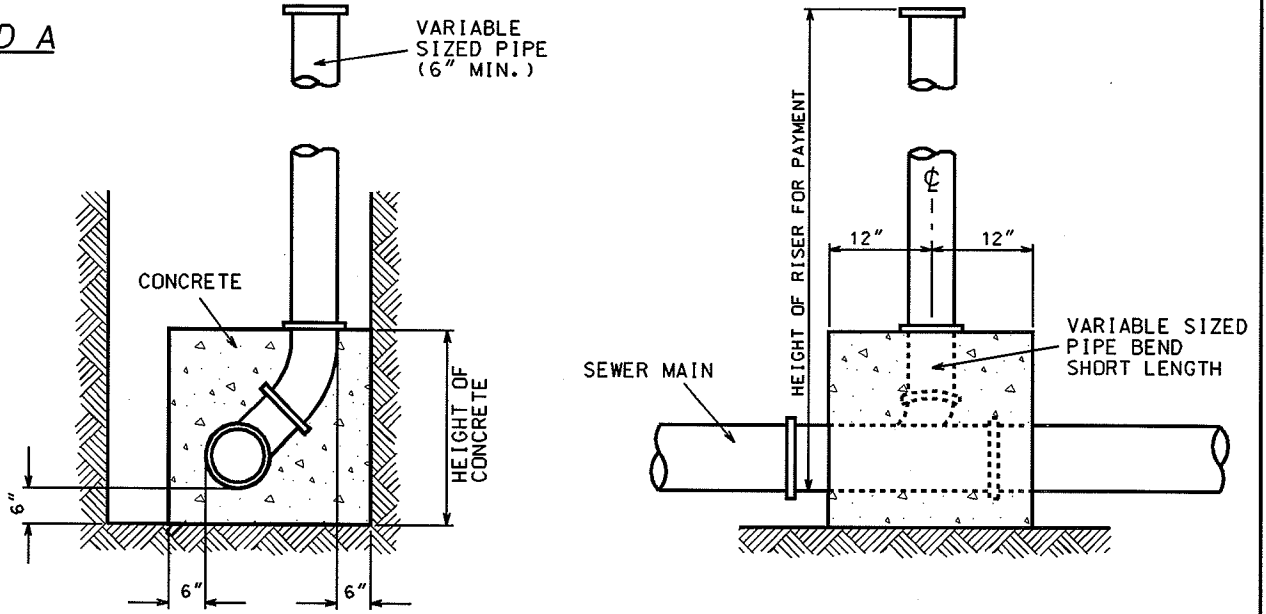
THE PATCH SHALL BE 9" CRUSHED STONE BASE COURSE, GRADATION NO. 2. FULL DEPTH SAWCUTTING OF ADJACENT PAVEMENT (IF ANY) SHALL BE CONSIDERED INCIDENTAL TO THE TRENCH PATCH.

THE CRUSHED STONE BASE COURSE SHALL BE INSTALLED IN THREE LIFTS. EACH LIFT SHALL BE THOROUGHLY MECHANICALLY COMPACTED PRIOR TO PLACING SUCCEEDING LIFTS.

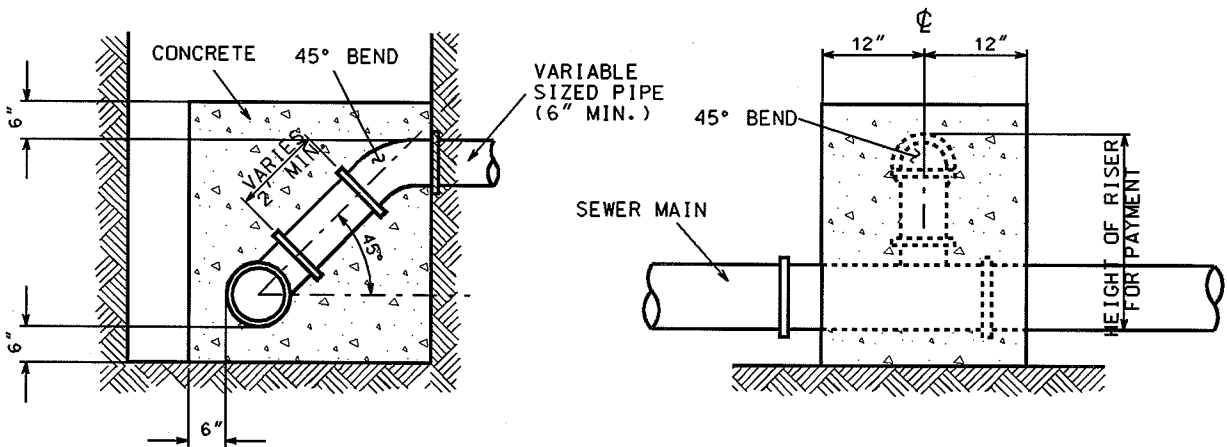
CITY OF MADISON
ENGINEERING DIVISION

TYPICAL PAVEMENT
PATCH SECTIONS

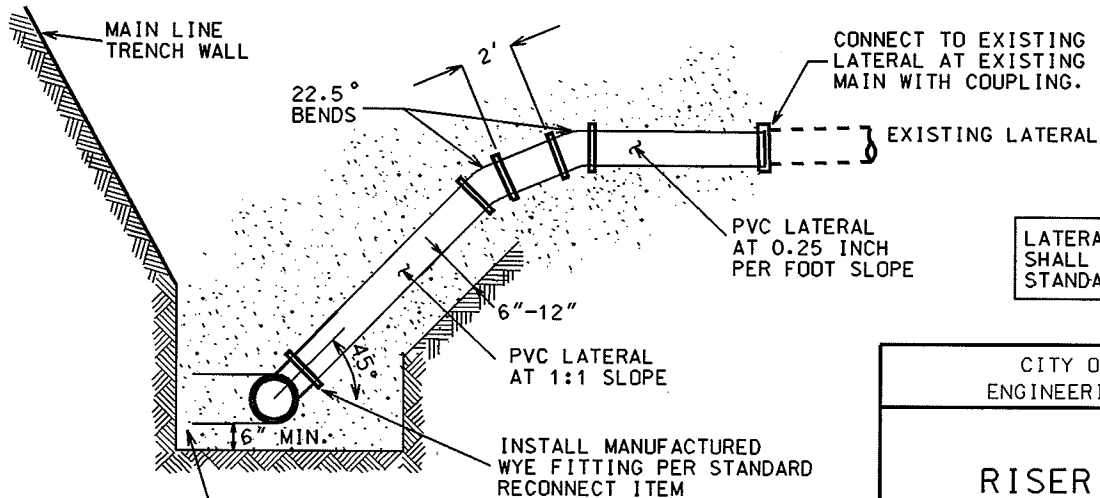
METHOD A



METHOD B



ALTERNATE TO RISER



LATERAL AND RECONNECT SHALL CONFORM TO STANDARD SPECIFICATIONS

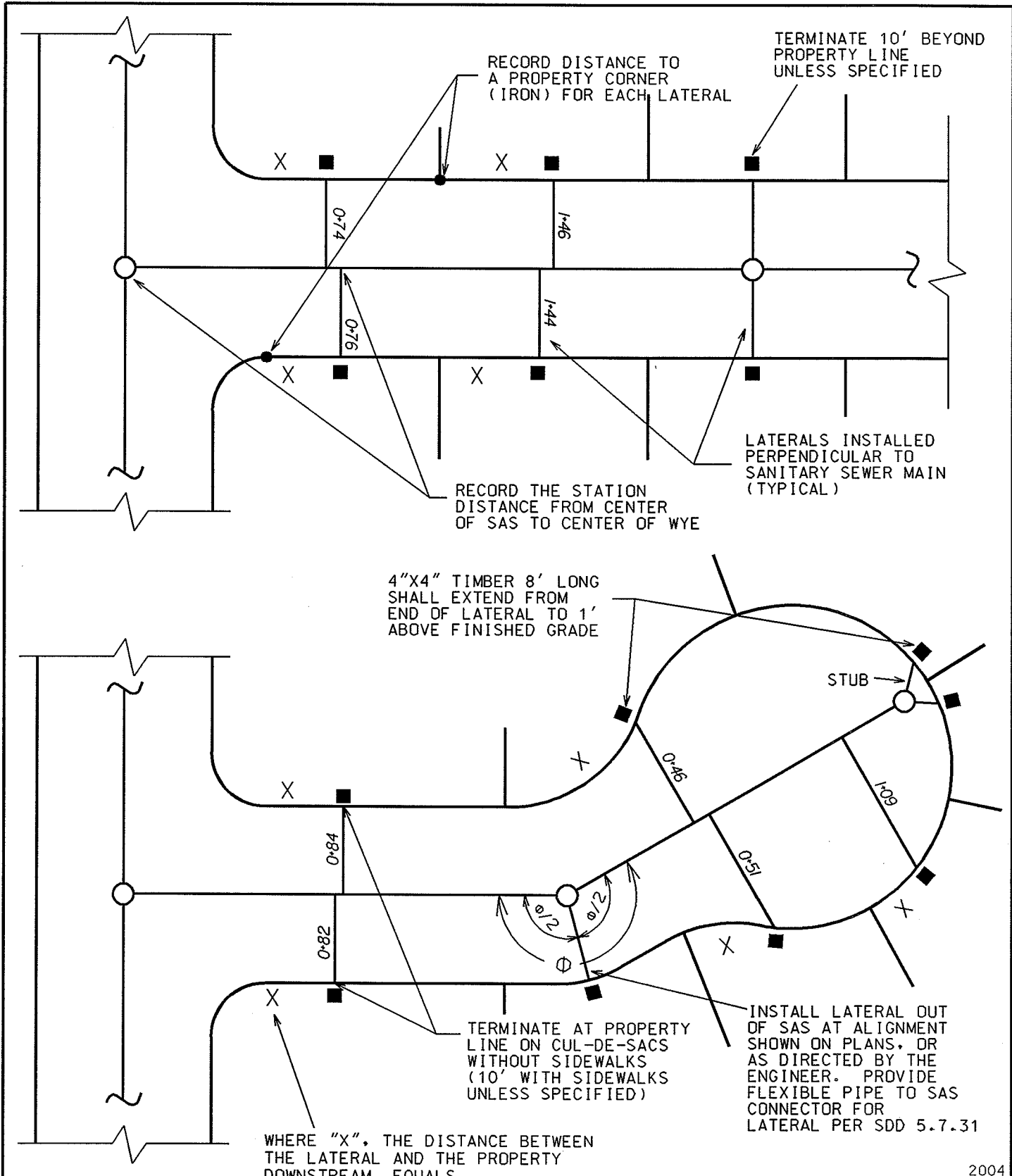
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CITY OF MADISON
ENGINEERING DIVISION

RISER DETAIL

STANDARD DETAIL DRAWING 5.3.1

BEDDING MATERIAL AND DIMENSIONS PER CITY OF MADISON STANDARD SPECIFICATIONS (STANDARD DETAIL DRAWING 5.2.1)



WHERE "X", THE DISTANCE BETWEEN THE LATERAL AND THE PROPERTY DOWNSTREAM, EQUALS

$$\frac{\text{LOT WIDTH} - 10'}{2}$$

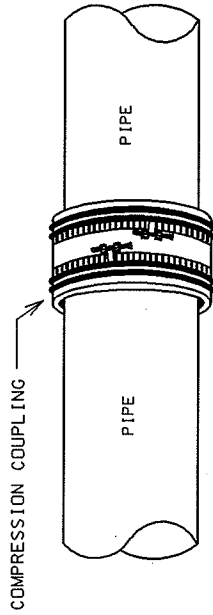
UNLESS OTHERWISE SPECIFIED ON THE PLAN OR DIRECTED BY THE ENGINEER

INSTALL LATERAL OUT OF SAS AT ALIGNMENT SHOWN ON PLANS, OR AS DIRECTED BY THE ENGINEER. PROVIDE FLEXIBLE PIPE TO SAS CONNECTOR FOR LATERAL PER SDD 5.7.31

2004

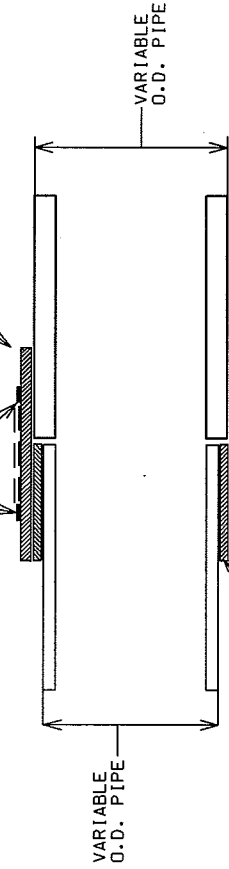
CITY OF MADISON ENGINEERING DIVISION
LOCATION OF SANITARY LATERALS
STANDARD DETAIL DRAWING 5.3.2

COMPRESSION COUPLING



STAINLESS STEEL BANDS, ASTM A-167

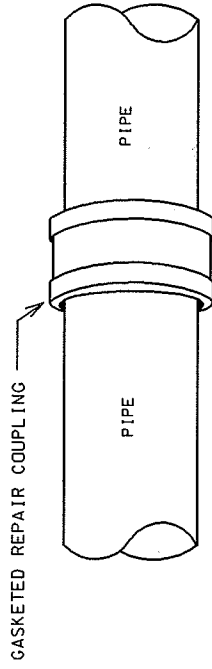
COMPRESSION COUPLING, CONFORMING TO ASTM C-594 TYPE B



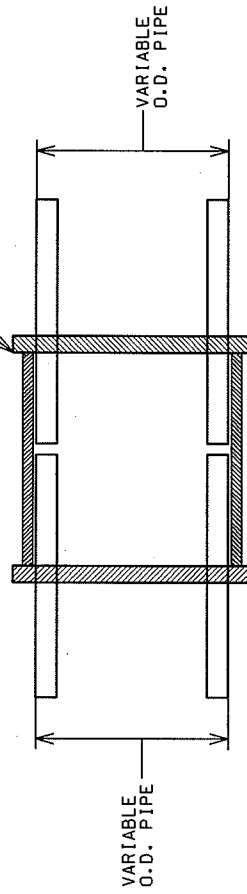
STAINLESS STEEL SHEAR RING, ASTM A-167, FOR USE ON 8" AND LARGER SIZE PIPE

TRANSITIONAL BUSHING TO CONFORM TO ASTM C-594 TYPE B, TO BE USED WHEN PIPES OF DIFFERENT MATERIAL AND DIFFERENT OUTSIDE DIAMETERS (O.D.) ARE TO BE CONNECTED

GASKETED REPAIR COUPLING



GASKETED REPAIR COUPLING CONFORMING TO ASTM D3034 SDR 35, ASTM F679, AND ASTM F2336



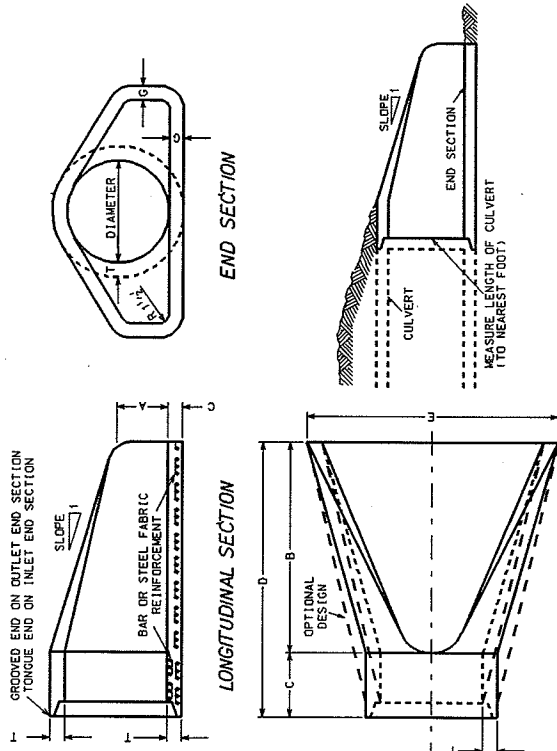
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CITY OF MADISON
ENGINEERING DIVISION

COUPLING
DETAILS

STANDARD DETAIL DRAWING 5.3.3

REINFORCED CONCRETE APRON ENDWALLS



DIA	APPROX. SECTION	T	A	B	C	D	E	G	APPROX. SLOPE
12"	530	2"	4"	24"	48 1/2"	72 1/2"	24"	2"	3 TO 1
15"	740	2 1/2"	6"	27"	46"	73"	30"	2 1/2"	3 TO 1
18"	990	2 1/2"	9"	27"	46"	73"	36"	2 1/2"	3 TO 1
21"	1280	2 1/2"	9"	36"	37 1/2"	73 1/2"	42"	2 1/2"	3 TO 1
24"	1520	3"	9 1/2"	43 1/2"	30"	73 1/2"	48"	3"	3 TO 1
27"	1930	3 1/2"	10 1/2"	49 1/2"	24"	73 1/2"	54"	3 1/2"	3 TO 1
30"	2190	3 1/2"	12"	54"	19 1/2"	73 1/2"	60"	3 1/2"	3 TO 1
36"	4100	4"	15"	63"	34 1/2"	97 1/2"	72"	4"	3 TO 1
42"	5380	4 1/2"	21"	63"	35"	98"	78"	4 1/2"	3 TO 1
48"	6550	5"	24"	72"	26"	98"	84"	5"	3 TO 1
54"	8040	5 1/2"	27"	65"	33 1/2"	95 1/2"	90"	5 1/2"	2 TO 1
60"	8730	6"	30"	75"	39"	99"	96"	6"	2 TO 1
66"	10630	6 1/2"	34"	78"	41"	99"	102"	6 1/2"	2 TO 1
72"	12520	7"	36"	84"	42"	99"	108"	7"	2 TO 1
78"	14430	7 1/2"	38"	90"	43"	99"	114"	7 1/2"	2 TO 1
84"	18160	8"	36"	90"	42"	111 1/2"	120"	8"	1 1/2 TO 1

NOTE: MINIMUM/MAXIMUM

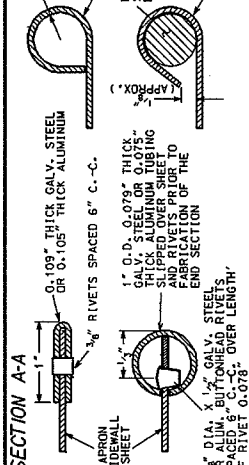
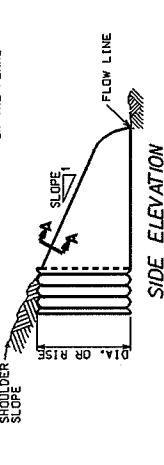
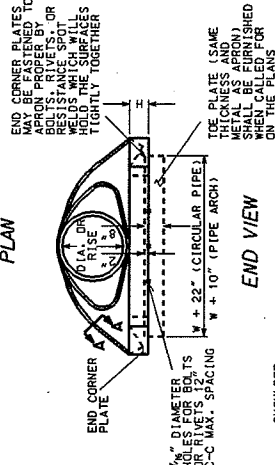
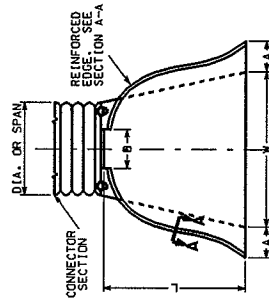
GENERAL NOTES:
 DETAILS OF CONSTRUCTION, MATERIALS, AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.
 VARIATIONS OF THE DIMENSIONS AND DESIGNS SHOWN BEFORE WILL BE PERMITTED PROVIDING ENGINEER IS OBTAINED.
 CONCRETE APRON ENDWALLS MAY NOT BE USED WITH GALVANIZED STEEL OR ALUMINUM CULVERT PIPE OR VICE VERSA.
 GALVANIZED STEEL OR ALUMINUM ENDWALLS SHALL NORMALLY BE INSTALLED ON CULVERT PIPE OF THE SAME MATERIAL. THE USE OF GALVANIZED STEEL OR ALUMINUM PIPES IS PERMITTED, PROVIDED THAT THE METAL THICKNESS SHALL BE AT LEAST 1/8" THICK. SUCH MATERIAL SHALL BE AN ASPHALT IMPREGNATED FABRIC, A SHEET PLASTIC, A RUBBER GASKET OR OTHER NONBIODEGRADABLE MATERIAL OF SUBSTANTIAL STRENGTH.
 WHEN TWO OR MORE PIPE ARCHES WITH APRON ENDWALLS ARE TO BE LAID ADJACENT TO EACH OTHER, THEY SHALL BE SEPARATED BY THE FOLLOWING AMOUNT:
 PIPES: TOTAL WIDTH OF APRON ENDWALL LESS THE DIAMETER OF PIPE PLUS 6 INCHES.
 PIPE ARCHES: TOTAL WIDTH OF APRON ENDWALL LESS THE SPAN DIMENSION OF THE PIPE ARCH PLUS 6 INCHES.

METAL APRON ENDWALLS FOR PIPE ARCHES

PIPE-ARCH SPAN RISE	DIMENSIONS				APPROX. SLOPE
	A	B	H	L	
17"	13"	0.064	7"	19"	2 1/2 TO 1
21"	15"	0.064	7"	23"	2 1/2 TO 1
24"	18"	0.064	8"	26"	2 1/2 TO 1
28"	20"	0.064	9"	28"	2 1/2 TO 1
35"	24"	0.079	10"	32"	2 1/2 TO 1
42"	29"	0.079	12"	39"	2 1/2 TO 1
49"	33"	0.109	13"	46"	2 1/2 TO 1
57"	38"	0.109	18"	53"	2 1/2 TO 1
64"	43"	0.109	18"	63"	2 1/2 TO 1
71"	47"	0.109	18"	70"	2 1/2 TO 1
77"	52"	0.109	18"	77"	2 TO 1
83"	57"	0.109	18"	84"	2 TO 1

NOTE: ALL SPLICES TO BE LAP RIVETED OR BOLTED

NOTE: ALL SPLICES TO BE LAP RIVETED OR BOLTED

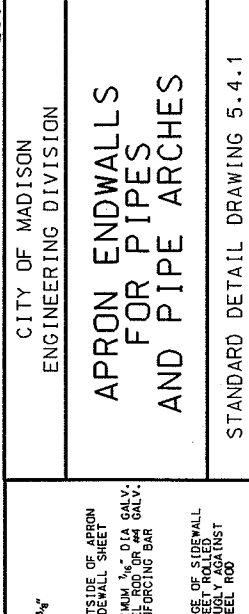
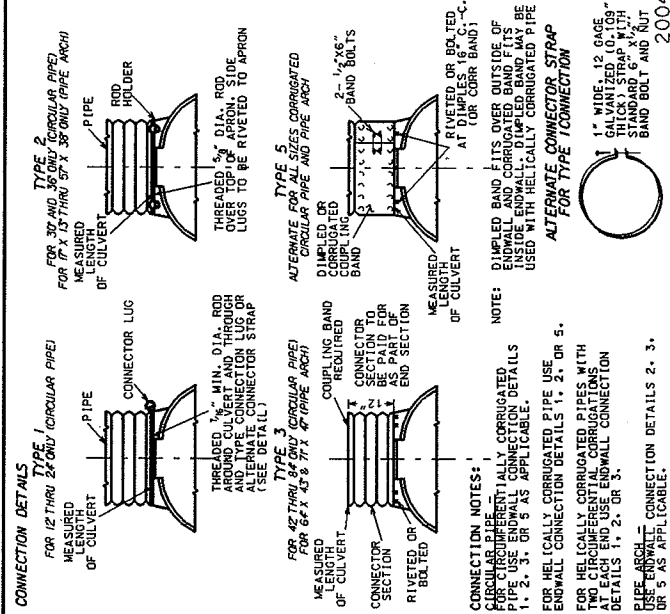


METAL OR ALUMINUM APRON ENDWALLS FOR CIRCULAR PIPES

DIA	DIMENSIONS				APPROX. SLOPE
	A	B	H	L	
12"	6"	0.064	6"	21"	2 1/2 TO 1
15"	8"	0.064	6"	26"	2 1/2 TO 1
18"	10"	0.064	6"	31"	2 1/2 TO 1
21"	12"	0.064	6"	36"	2 1/2 TO 1
24"	14"	0.079	6"	41"	2 1/2 TO 1
30"	16"	0.079	8"	51"	2 1/2 TO 1
36"	19"	0.109	9"	60"	2 1/2 TO 1
42"	22"	0.109	11"	69"	2 1/2 TO 1
48"	27"	0.109	12"	78"	2 1/2 TO 1
54"	30"	0.109	12"	84"	2 TO 1
60"	33"	0.109	12"	87"	1 1/2 TO 1
66"	36"	0.109	12"	87"	1 1/2 TO 1
72"	39"	0.109	12"	87"	1 1/2 TO 1
78"	42"	0.109	12"	87"	1 1/2 TO 1
84"	45"	0.109	12"	87"	1 1/2 TO 1

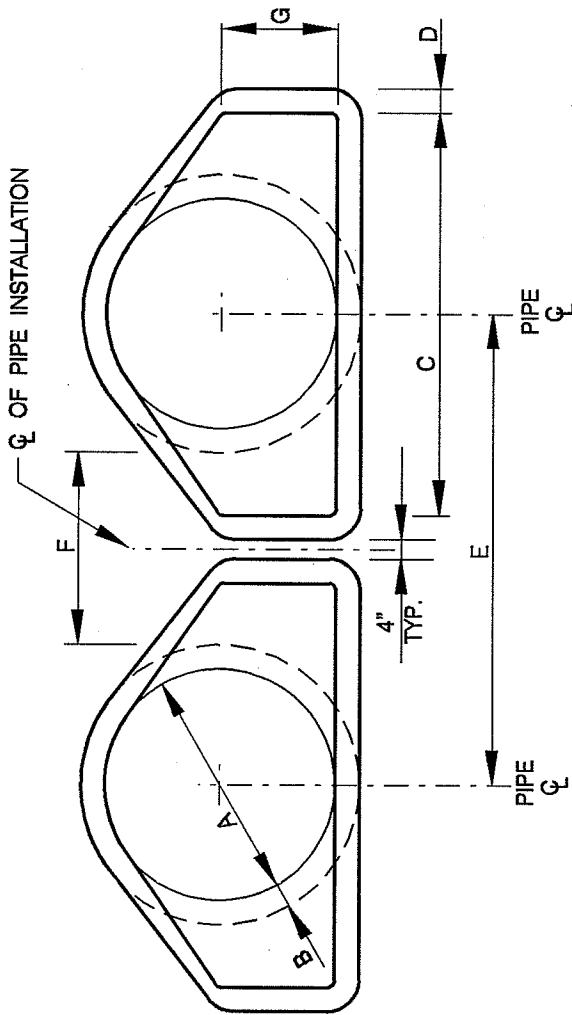
NOTE: ALL SPLICES TO BE LAP RIVETED OR BOLTED

NOTE: ALL SPLICES TO BE LAP RIVETED OR BOLTED

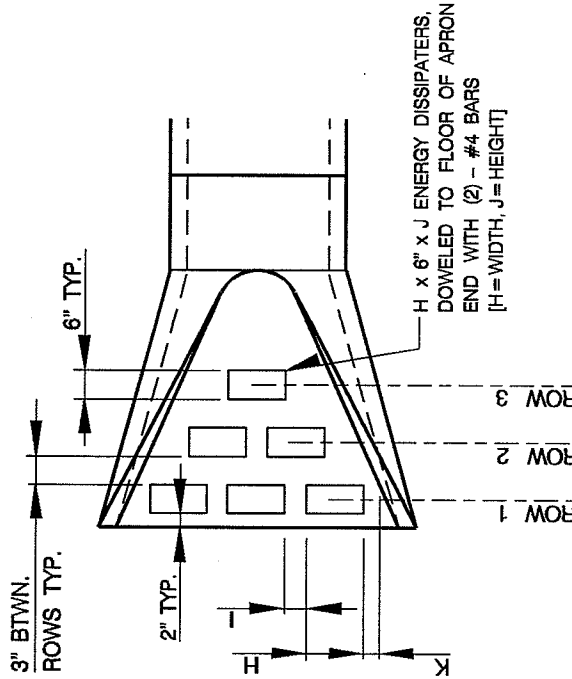


CITY OF MADISON
ENGINEERING DIVISION
APRON ENDWALLS FOR PIPES AND PIPE ARCHES
 STANDARD DETAIL DRAWING 5.4.1

ENERGY DISSIPATORS TO BE INSTALLED ONLY WHEN DIRECTED BY THE DESIGN ENGINEER



FRONT VIEW NOT TO SCALE



TOP VIEW NOT TO SCALE

H x 6" x J ENERGY DISSIPATERS, DOWELED TO FLOOR OF APRON END WITH (2) - #4 BARS [H=WIDTH, J=HEIGHT]

DIM.	PIPE DIAMETERS, RCP, CLASS III															
	12"	15"	18"	21"	24"	27"	30"	36"	42"	48"	54"	60"	66"	72"	78"	84"
A	2"	2-1/4"	3"	3-1/4"	4"	4-1/2"	5"	5-1/2"	6"	6-1/2"	7"	7-1/2"	8"	8-1/2"	9"	9-1/2"
B	2"	2-1/4"	3"	3-1/4"	4"	4-1/2"	5"	5-1/2"	6"	6-1/2"	7"	7-1/2"	8"	8-1/2"	9"	9-1/2"
C	24"	30"	36"	42"	48"	54"	60"	66"	72"	78"	84"	90"	96"	102"	108"	114"
D	2"	2-1/4"	3"	3-1/4"	4"	4-1/2"	5"	5-1/2"	6"	6-1/2"	7"	7-1/2"	8"	8-1/2"	9"	9-1/2"
E	32"	38-1/2"	45"	51-1/2"	58"	64-1/2"	71"	78"	84"	91"	98"	104"	110"	117"	124"	131"
F	18"	19"	22"	25"	28"	31"	34"	40"	40"	40"	39"	38"	38"	38"	38"	37"
G	4"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"
H	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"
I	6"	10"	5"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"
J	3"	3"	4"	4"	4"	4"	4"	4"	4"	4"	4"	4"	4"	4"	4"	4"
K	3"	4"	4"	4"	4"	4"	4"	4"	4"	4"	4"	4"	4"	4"	4"	4"
ROW 1	2	2	3	3	4	4	4	5	5	6	6	7	7	8	8	8
ROW 2	0	0	2	2	3	3	4	4	5	5	6	6	7	7	7	7
ROW 3	0	0	0	0	2	2	3	3	4	4	5	5	6	6	6	6

NOTE: DIMENSIONS 'K' & 'H' ARE FIXED. DIMENSION 'I' IS APPROXIMATE. ACTUAL 'I' DIMENSION SHALL BE THE RESULT OF EVENLY SPACED BLOCKS WITHIN THE REMAINDER OF OPEN SPACE FOR THE ROW.

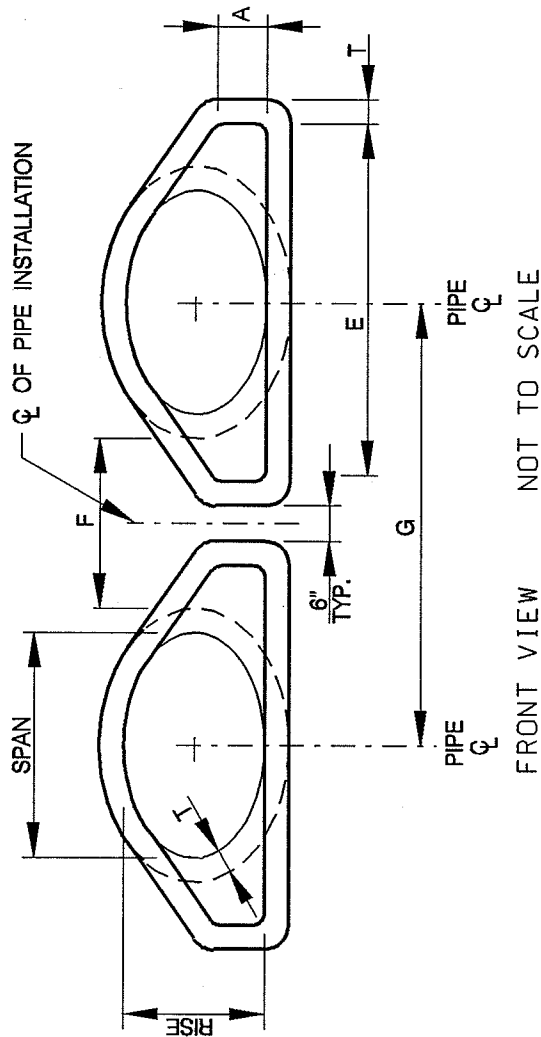
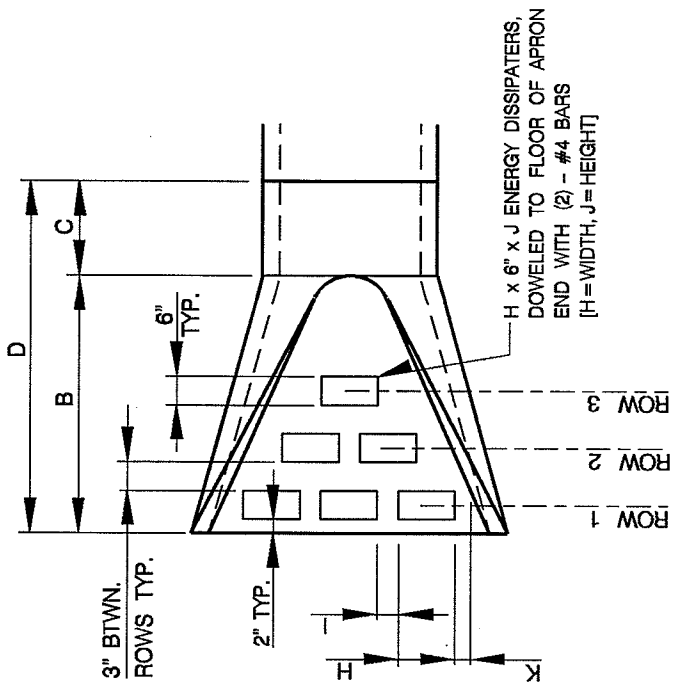
2004

CITY OF MADISON
ENGINEERING DIVISION

MULTIPLE RCP AE

STANDARD DETAIL DRAWING 5.4.2

ENERGY DISSIPATORS TO BE INSTALLED ONLY WHEN DIRECTED BY THE DESIGN ENGINEER



TOP VIEW NOT TO SCALE

FRONT VIEW NOT TO SCALE

NOTE: DIMENSIONS 'K' & 'H' ARE FIXED. DIMENSION 'I' IS APPROXIMATE. ACTUAL 'I' DIMENSION SHALL BE THE RESULT OF EVENLY SPACED BLOCKS WITHIN THE REMAINDER OF OPEN SPACE FOR THE ROW.

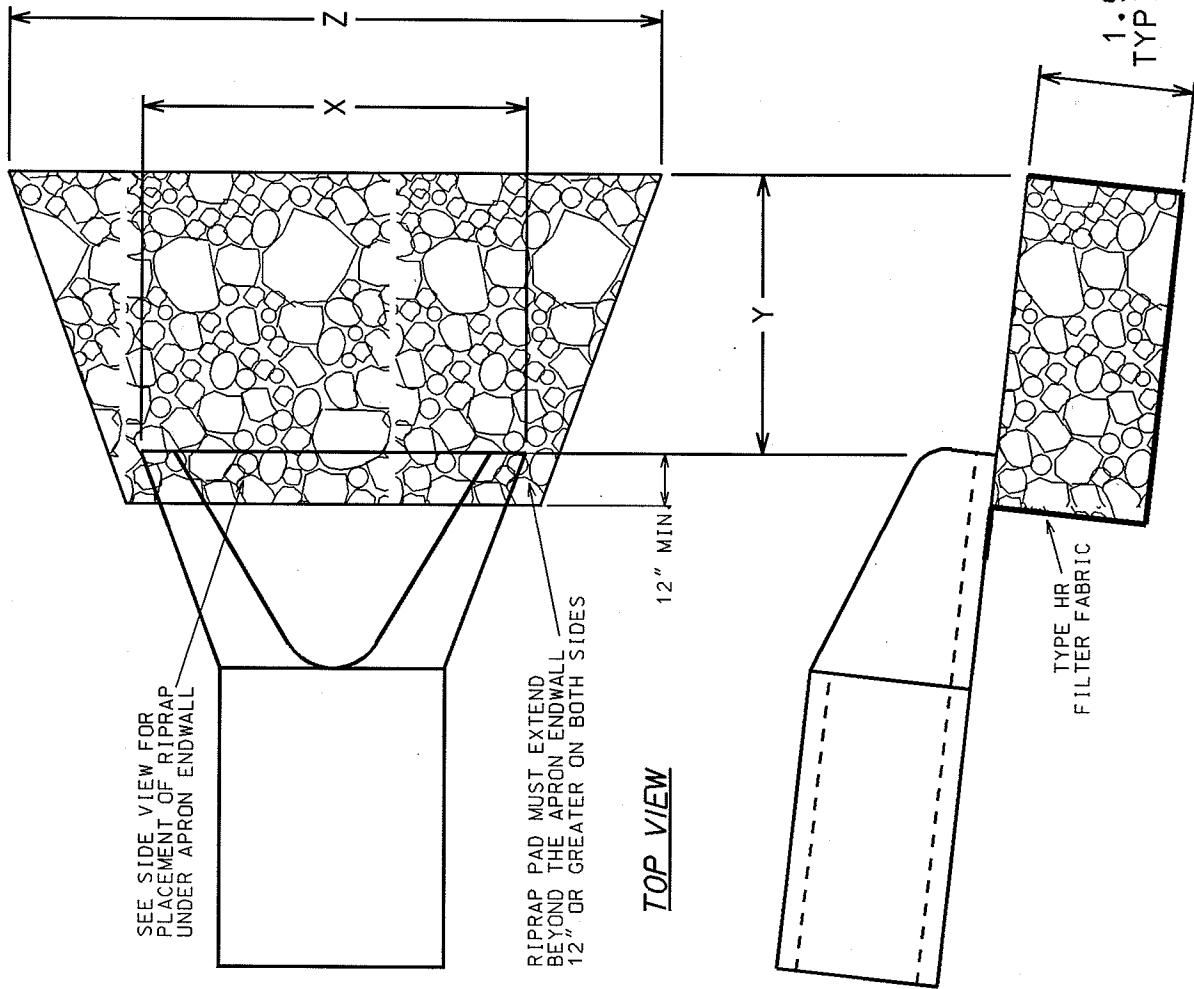
PIPE DIAMETERS, HERCP, CLASS III																
EQUIVALENT ROUND DIA.	RISE x SPAN DIMENSIONS	QTY. OF BLOCKS														
		A	B	C	D	E	F	G	H	I	J	K	T	ROW 1	ROW 2	ROW 3
18"	14 x 23	9.00"	3'-4"	2'-8"	6'-0"	3'-0"	1'-7"	3'-11 1/2"	6"	5"	4"	4"	2 3/4"	3	2	0
24"	19 x 30	8.50"	3'-0"	4'-0"	7'-0"	4'-0"	2'-0"	5'-0 1/2"	6"	5 1/3"	4"	4"	3 1/4"	4	3	2
30"	24 x 38	9.50"	4'-6"	2'-6"	7'-0"	5'-0"	2'-4"	6'-1 1/2"	6"	8"	4"	6"	3 3/4"	4	3	2
36"	29 x 45	11.25"	5'-0"	2'-0"	7'-0"	6'-0"	2'-9"	7'-3"	6"	8 1/2"	6"	4"	4 1/2"	5	4	3
42"	34 x 53	14.00"	5'-0"	2'-0"	7'-0"	6'-3"	2'-4"	7'-7"	6"	8 1/4"	6"	6"	5"	5	4	3
48"	38 x 60	18.00"	5'-0"	2'-0"	7'-0"	6'-10"	2'-4"	8'-3"	6"	7 1/2"	6"	4 1/4"	5 1/2"	6	5	4
54"	43 x 68	32.00"	5'-0"	3'-5"	8'-5"	7'-5"	2'-8"	9'-4"	6"	8"	6"	6 1/2"	6"	6	5	4
60"	48 x 76	36.00"	5'-0"	3'-5"	8'-5"	7'-11"	2'-1"	9'-6"	6"	9"	6"	7"	6 1/2"	6	5	4
72"	58 x 91	36.00"	5'-5"	2'-8"	8'-1"	8'-11"	1'-10"	10'-8"	6"	9 1/2"	6"	4"	7 1/2"	7	6	5

2003

CITY OF MADISON
ENGINEERING DIVISION

MULTIPLE HERCP AE

STANDARD DETAIL DRAWING 5.4.3



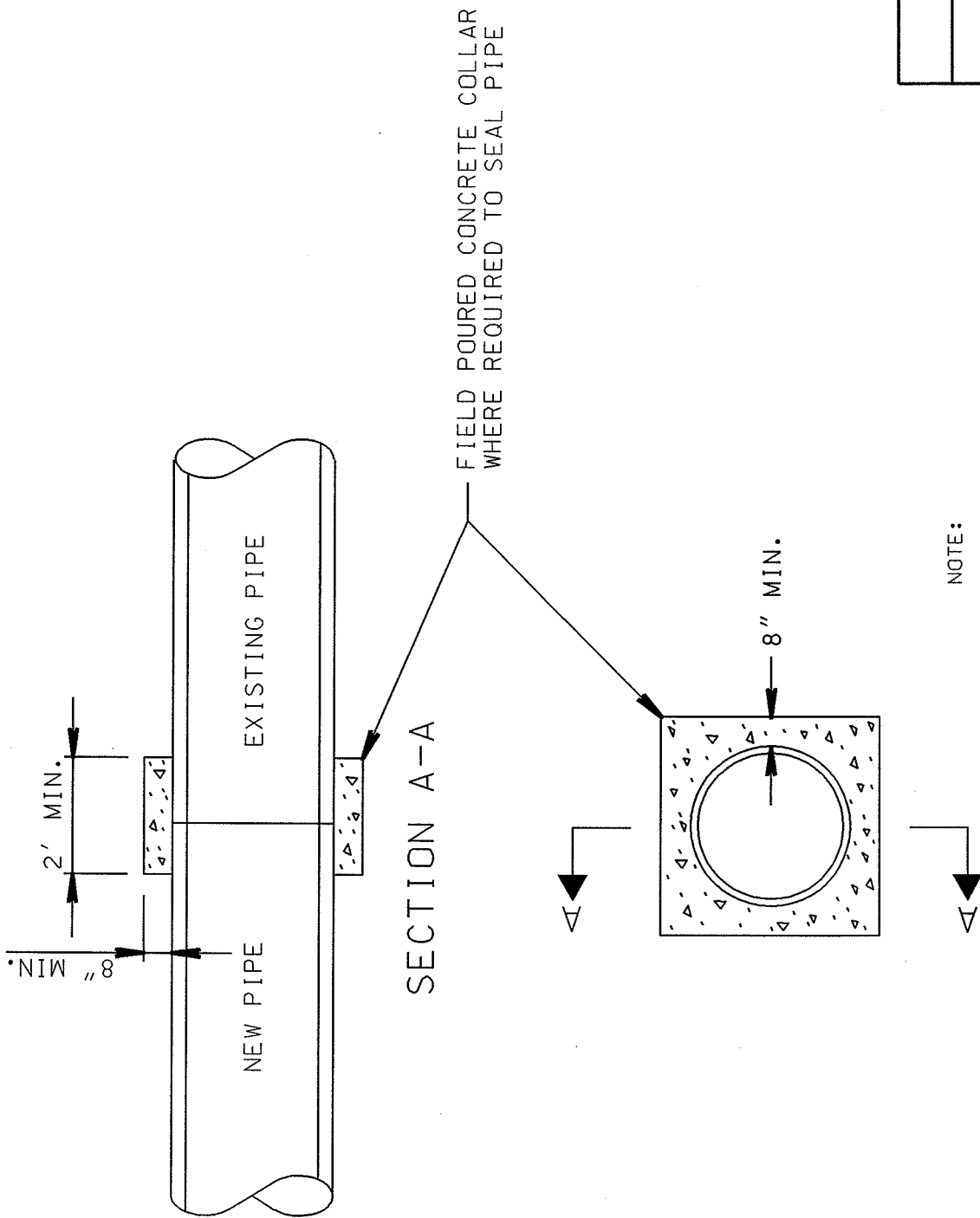
DIA (in)	X (in)	Y (in)	Z (in)	APPROX. WEIGHT (tons)
12	24	48	48	1.78
15	30	60	60	2.64
18	36	60	60	2.78
21	42	72	72	3.83
24	48	72	72	4.00
27	54	72	81	4.42
30	60	84	90	5.64
36	72	96	108	7.56
42	78	96	120	8.22
48	84	108	120	9.50
54	90	108	150	11.00
60	96	108	162	11.75
66	102	132	174	15.28
72	108	132	186	16.19

- NOTES:
- 1) CITY OF MADISON STANDARD SPECIFICATIONS SHALL APPLY TO ALL INSTALLATIONS.
 - 2) PIPES 36" AND GREATER SHALL HAVE JOINT TIES PER STANDARD DETAIL DRAWING 5.4.6 & SECTION 504.2 (i).
 - 3) PIPES 36" OR GREATER SHALL HAVE 50% OF THE RIPRAP PAD PLACED WITH A SLURRY GROUT MIX ON AN UNEVEN RIPRAP SURFACE. SLURRY GROUT SHALL BE TYPE B SLURRY PER SECTION 300 OF THE STANDARD SPECIFICATIONS.
 - 4) TWIN APRON INSTALLATIONS SHALL BE GOVERNED BY THE OUTSIDE DIMENSIONS OF A SINGLE PIPE.

2004

CITY OF MADISON ENGINEERING DIVISION
RIPRAP AT APRON END WALLS
STANDARD DETAIL DRAWING 5.4.4

NOT TO SCALE



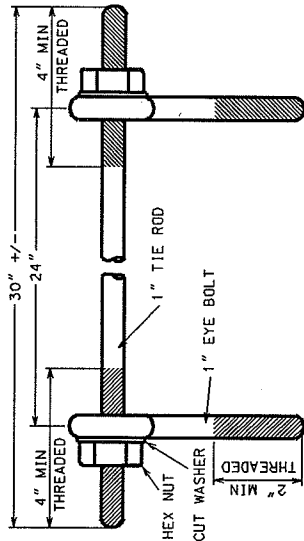
NOTE:
 IF REQUESTED BY THE CONSTRUCTION
 ENGINEER, FIBER REINFORCED
 CONCRETE SHALL BE PROVIDED

2004

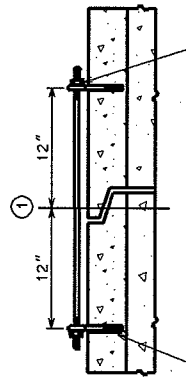
CITY OF MADISON ENGINEERING DIVISION
CONCRETE COLLAR
STANDARD DETAIL DRAWING 5.4.5

ALTERNATE 1

EYE BOLT AND TIE ROD ASSEMBLY
(JOINT TIES FOR 72" DIA AND OVER CONCRETE PIPE)



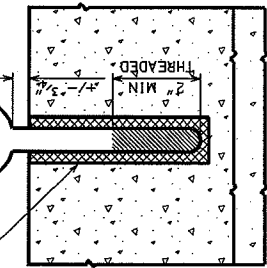
EYE BOLTS AND TIE ROD



② INSERT, CAST-IN-PLACE DURING FABRICATION FOR 1" DIA. EYE BOLT

WELDED EYE BOLT OR APPROVED EQUAL

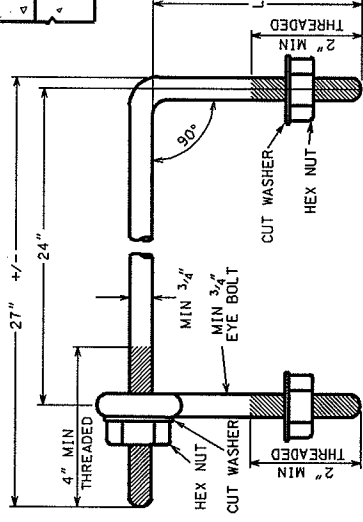
ROTATE 90° FOR NORMAL POSITION



(CAST-IN-PLACE THREADED INSERT) LONGITUDINAL SECTIONS

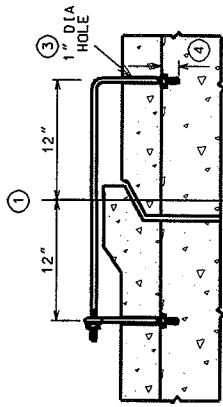
ALTERNATE 2

EYE BOLT AND TIE ROD ASSEMBLY
(JOINT TIES FOR 18" TO 66" DIA CONCRETE PIPE)

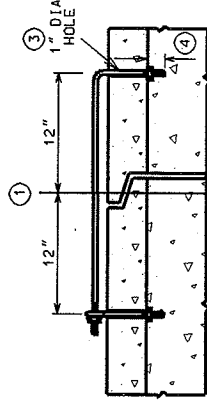


NOTE: TWO EYE BOLTS MAY BE USED WITH A 30" LONG THREADED ROD IN LIEU OF THE 90° BENT TIE ROD

EYE BOLT AND TIE ROD



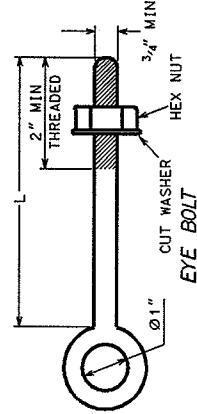
(MODIFIED BELL PIPE) LONGITUDINAL SECTION



(TONGUE AND GROOVE PIPE) LONGITUDINAL SECTION

PIPE SIZE	TONGUE & GROOVE PIPE	MODIFIED BELL PIPE
18" TO 24"	4 1/2"	6 1/4"
30"	5"	7"
36"	5 1/2"	7"
42"	6"	7"
48"	6 1/2"	7"
60"	7 1/2"	7"
66"	8"	7"

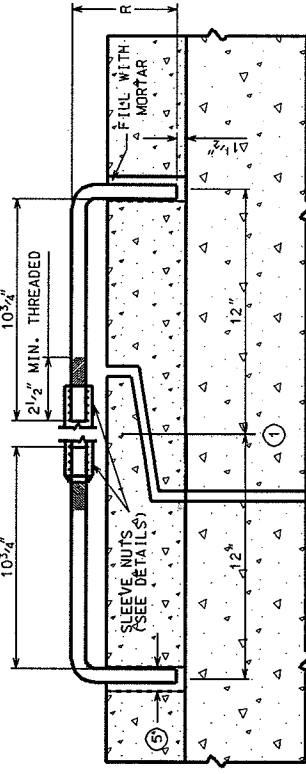
EYE BOLT DIMENSION TABLE



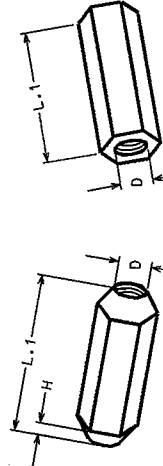
EYE BOLT

ALTERNATE 3

ADJUSTABLE TIE ROD
(JOINT TIES FOR 12" TO 108" DIA CONCRETE PIPE)



LONGITUDINAL SECTION



RIGHT AND LEFT THREADS SLEEVE NUTS

TAPERED

PLAIN

PIPE DIAMETER	TIE ROD DIAMETER	D	L-1	H	R
12" TO 30"	1 1/2"	1 1/2"	5"	1 1/2"	1 3/4"
36" TO 84"	3 1/4"	3 1/4"	5"	1 1/2"	5"
90" TO 104"	1"	1"	7"	1 1/8"	7 1/2"

ADJUSTABLE TIE ROD TABLE

2004

GENERAL NOTES:

- Ø OF TONGUE AND GROOVE OR BELL AND SPIGOT JOINTS
- THE INSIDE OF THE THREADED INSERTS SHALL BE CLEAN TO ALLOW THE INSERTION OF THREADED EYE BOLTS
- HOLES SHALL BE CAST-IN-PLACE OR DRILLED FROM TOP OF TONGUE AND GROOVE
- BOLT PROJECTION INSIDE OF PIPE SHALL NOT EXCEED 2"
- ROD DIAMETER = 1 INCH

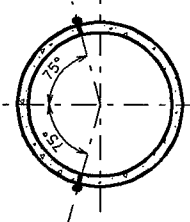
CONCRETE CULVERT PIPE SHALL BE TIED TOGETHER IN THE MANNER ILLUSTRATED BY THIS DETAIL AND PER STANDARD SPEC. 502.7 (D) AS LOCATION DESIGNATED ON THE PLANS. THE CONTRACTOR SHALL USE EITHER ALTERNATE 1 OR ALTERNATE 2 FOR CAST-IN-PLACE JOINTS UNLESS OTHERWISE STATED IN THE CONTRACT. THE MATERIALS, FABRICATION AND WORK NECESSARY TO THE CULVERT PIPE AS INDICATED ON THE PLANS AND BY THIS DETAIL WILL BE CONSIDERED INCIDENTAL TO CULVERT PIPE, REINFORCED CONCRETE CULVERT PIPE, OR REINFORCED CONCRETE PIPE CATTLE PASS.

DETAILED DRAWINGS FOR PROPOSED ALTERNATE DESIGNS FOR JOINT TIES SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.

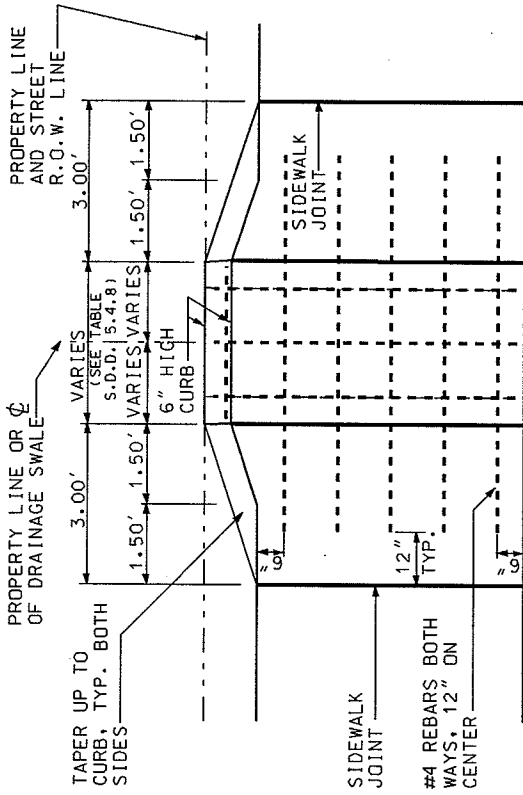
CITY OF MADISON
ENGINEERING DIVISION

CONCRETE PIPE JOINT TIES

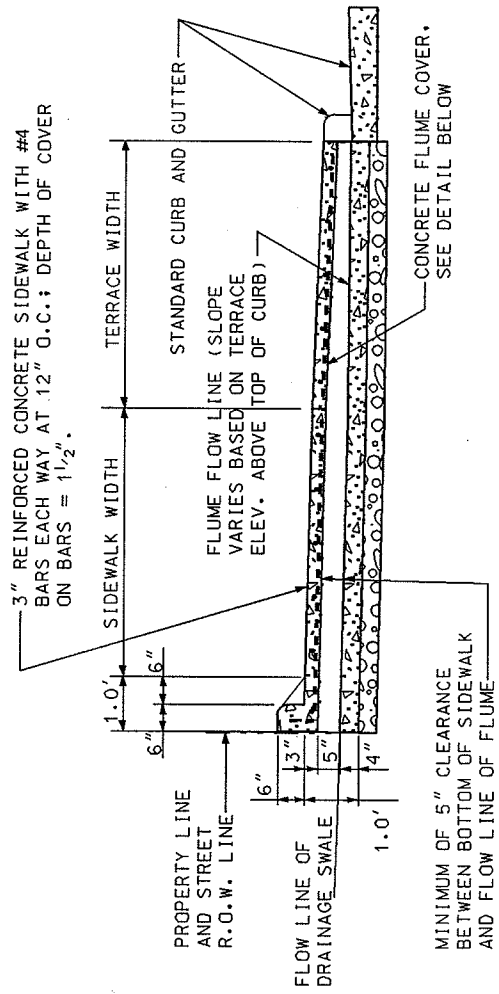
TRANSVERSE SECTION



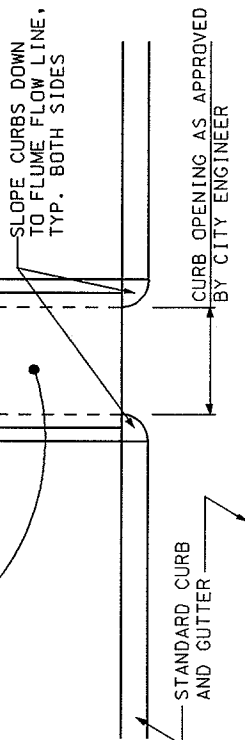
STANDARD DETAIL DRAWING 5.4.6



**DRAINAGE FLUME
LONGITUDINAL SECTION**



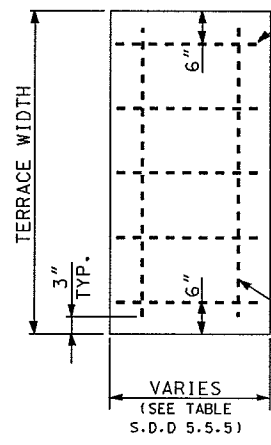
TERRACE CONCRETE FLUME COVER:
SEE PLAN DETAIL BELOW AND CROSS
SECTION VIEW IN S.D.D. 5.4.8



**DRAINAGE FLUME
PLAN VIEW**

NOTES:

1. A MINIMUM OF 2 SIDEWALK SECTIONS SHALL BE REMOVED AND REPLACED, UNLESS OTHERWISE DIRECTED BY THE CITY ENGINEER.
2. ALTERNATE ALIGNMENTS OF TERRACE PORTION OF FLUME SHALL BE ALLOWED WITH THE PRIOR APPROVAL OF THE CITY ENGINEER.
3. ALL REINFORCING BARS SHALL BE EPOXY COATED.
4. SIDEWALK AND SIDEWALK CURBING TO BE POURED MONOLITHIC.



CONCRETE FLUME COVER SHALL BE 3" THICK WITH #4 TRANSVERSE REBARS AT 8" O.C. MIN. TO 12" O.C. MAX. SPACING, AND 1" BOTTOM CLEARANCE. SEE DETAIL ON S.D.D. 5.4.8

#4 LONGITUDINAL BARS, SEE TABLE ON S.D.D. 5.4.8 FOR NUMBER OF BARS AND SPACING

**TERRACE CONCRETE FLUME COVER
PLAN VIEW**

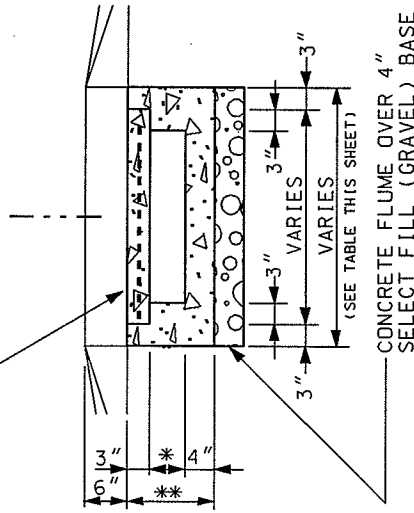
2004

CITY OF MADISON
ENGINEERING DIVISION

**DRAINAGE FLUME
DETAIL**

PLATE 1 OF 2
STANDARD DETAIL DRAWING 5.4.7

3" CONCRETE COVER WITH #4 REBARS AT 12" O.C. AND 1" BOTTOM CLEARANCE, SEE FLUME COVER DETAIL ON S.D.D 5.4.7

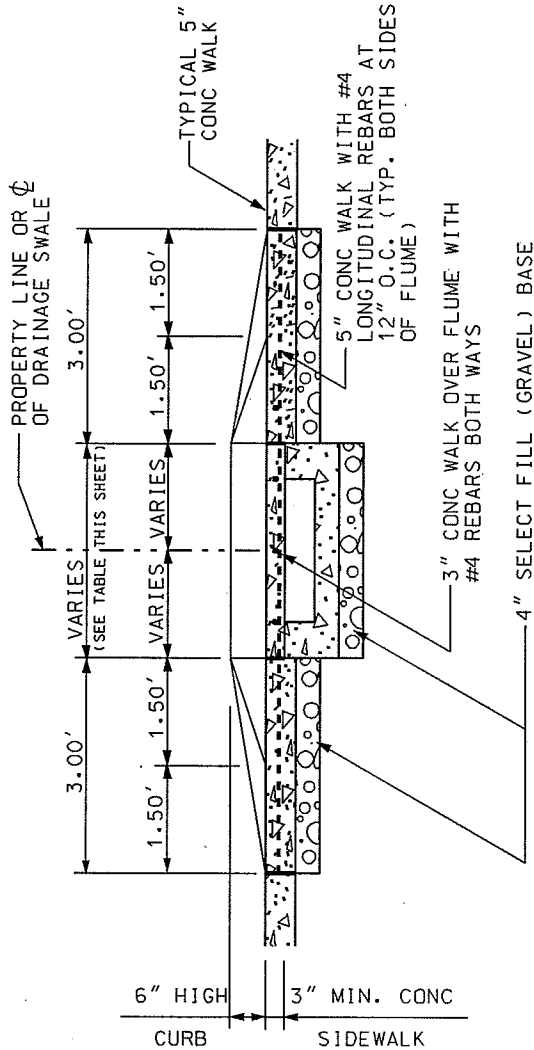


CONCRETE FLUME OVER 4" SELECT FILL (GRAVEL) BASE

* DIMENSION VARIES, 5" AT SIDEWALK TO 3" AT CURB.

** DIMENSION VARIES, 12" AT SIDEWALK TO 10" AT CURB.

DRAINAGE FLUME AT TERRACE CROSS SECTION



DRAINAGE FLUME AT SIDEWALK CROSS SECTION

ON GRADE IMPERVIOUS AREA IN SQUARE FEET

OUTLET FLUME SIZE	COVER WIDTH	NO. OF LONG. REBARS	CLEAR FROM EDGE	CENTER SPACING	EQUIV. PIPE DIAM.	GRADE PER FOOT OF PIPE & FLUME			
						1/16"	1/8"	1/4"	1/2"
12"x3"	18"	2	3"	12"	4"	1.625	7,470	3,740	4,720
18"x3"	24"	2	6"	12"	6"	5,200	7,470	10,400	14,600
24"x3"	30"	3	3"	12"	8"	11,650	16,250	22,750	32,600
30"x3"	36"	3	6"	12"	10"	22,100	30,850	44,250	63,000
36"x3"	42"	4	3"	12"	12"	34,150	52,300	71,500	102,200

NOTE: INCREASE ROOF AREAS BY 25% PRIOR TO USING CHART

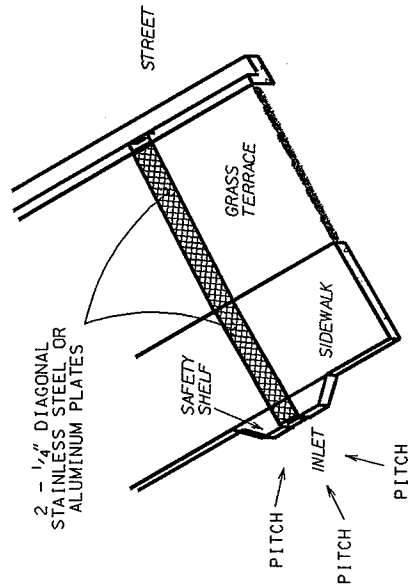
2004

CITY OF MADISON
ENGINEERING DIVISION

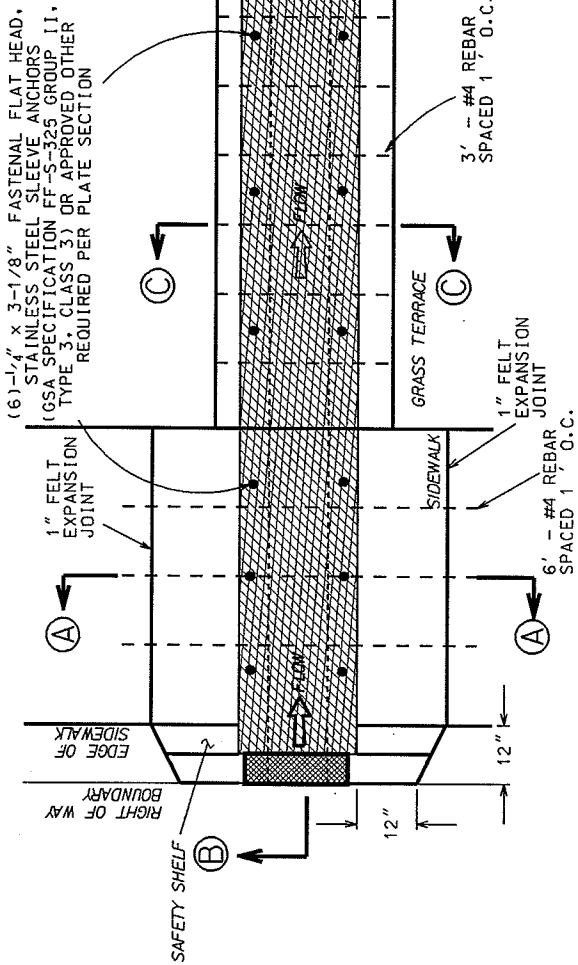
DRAINAGE FLUME DETAIL

PLATE 2 OF 2

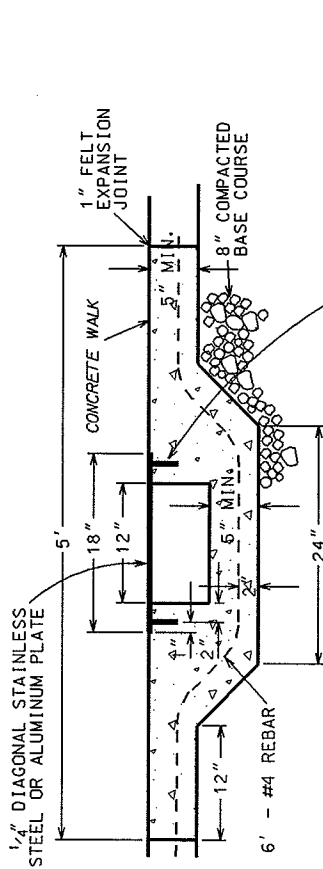
STANDARD DETAIL DRAWING 5.4.8



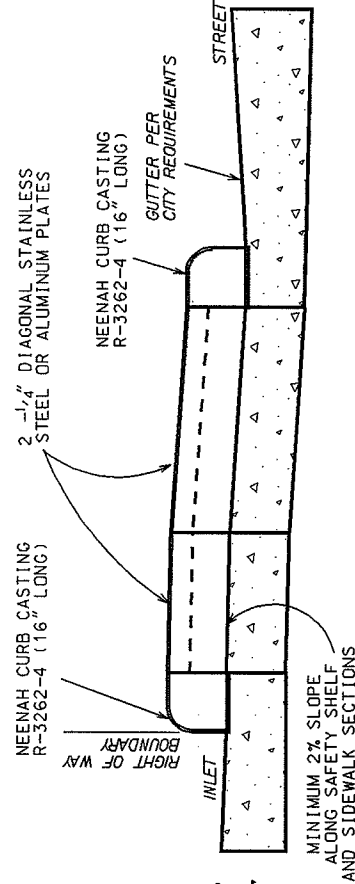
ISOMETRIC VIEW



PLAN VIEW



SECTION A-A



SECTION B-B

(6) - 1/4" x 3-1/8" FASTENAL FLAT HEAD, STAINLESS STEEL SLEEVE ANCHORS (GSA SPECIFICATION FF-S-325 GROUP II, TYPE 3, CLASS 3) OR APPROVED OTHER REQUIRED PER PLATE SECTION

1/4" DIAGONAL STAINLESS STEEL OR ALUMINUM PLATE

NOTES:

- 1) WHEN THE SIDEWALK IS ABUTTING A GRASSED PROPERTY, THE CONCRETE FLAG AND NEENAH CASTING ON THE PROPERTY SIDE SHALL BE OMITTED. ONLY ONE NEENAH CURB CASTING IS REQUIRED FOR THE STREET OUTLET.
- 2) WHEN THE SIDEWALK IS ABUTTING A PAVED PROPERTY, THE CONCRETE FLAG SHALL EXTEND 1' BEYOND THE RIGHT OF WAY BOUNDARY.

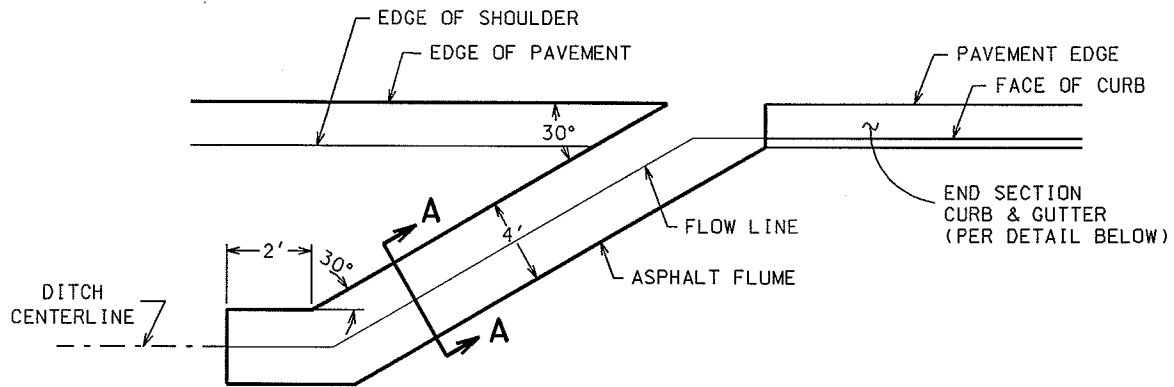
SECTION C-C

2004

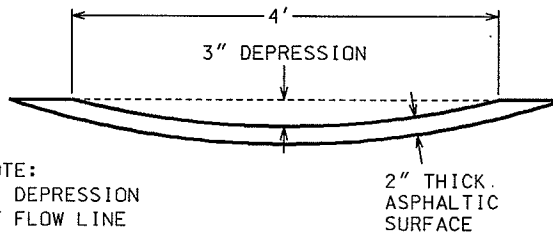
CITY OF MADISON
ENGINEERING DIVISION

SIDEWALK FLUME

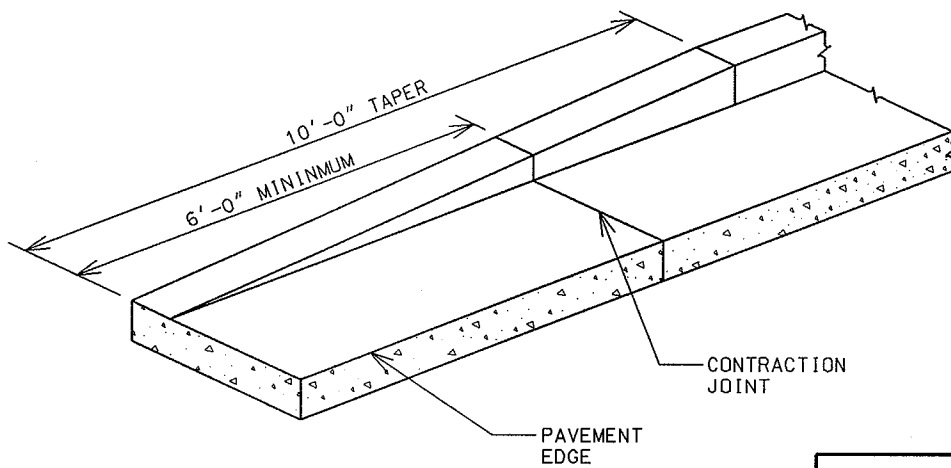
STANDARD DETAIL DRAWING 5.4.9



ASPHALT FLUME DETAIL
TOP VIEW



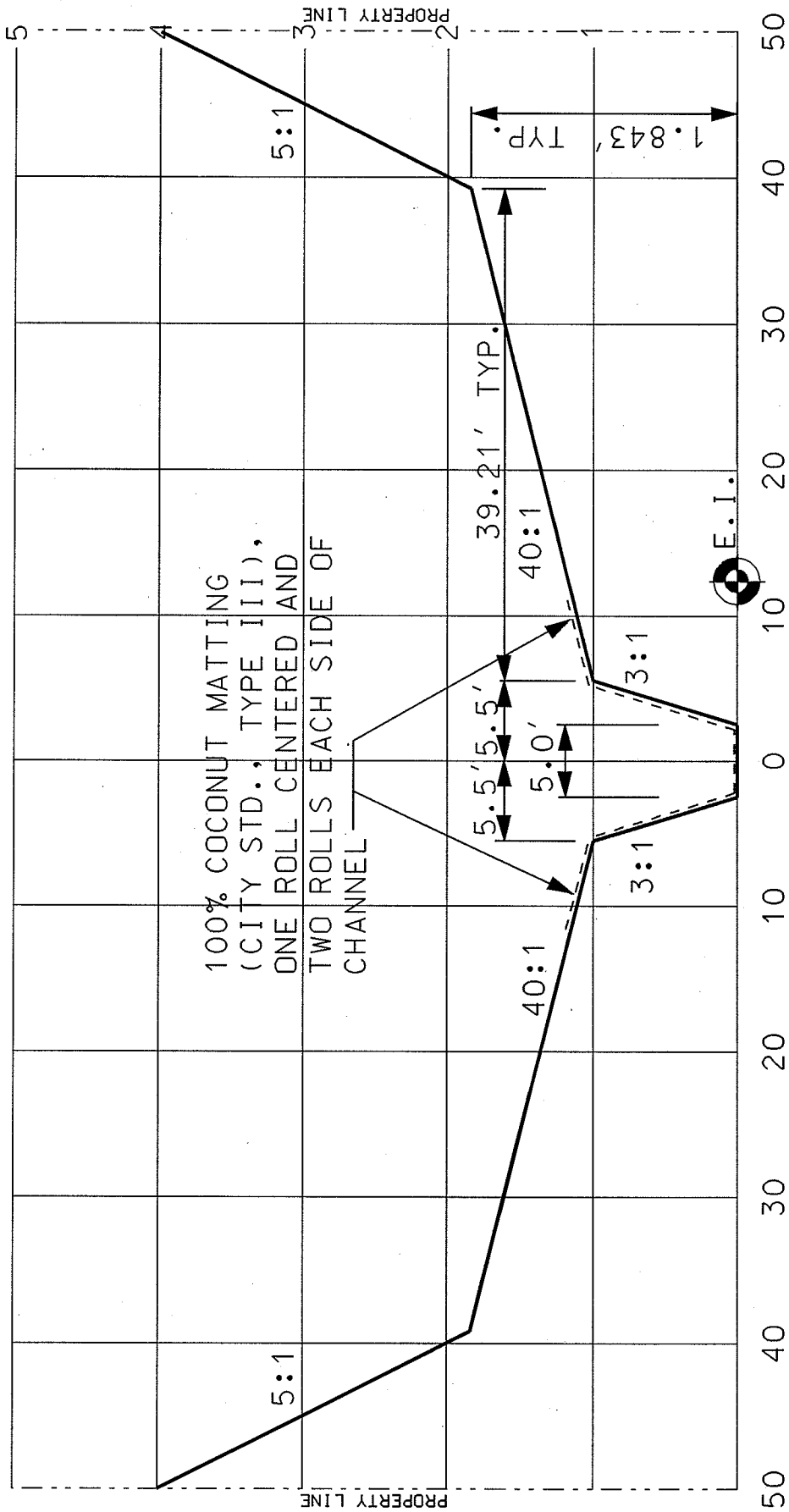
ASPHALT FLUME
SECTION A-A



END SECTION CURB AND GUTTER

2004

CITY OF MADISON ENGINEERING DIVISION
CURB TO DITCH TRANSITION ASPHALT FLUME
STANDARD DETAIL DRAWING 5.4.10



100% COCONUT MATTING
(CITY STD., TYPE III),
ONE ROLL CENTERED AND
TWO ROLLS EACH SIDE OF
CHANNEL

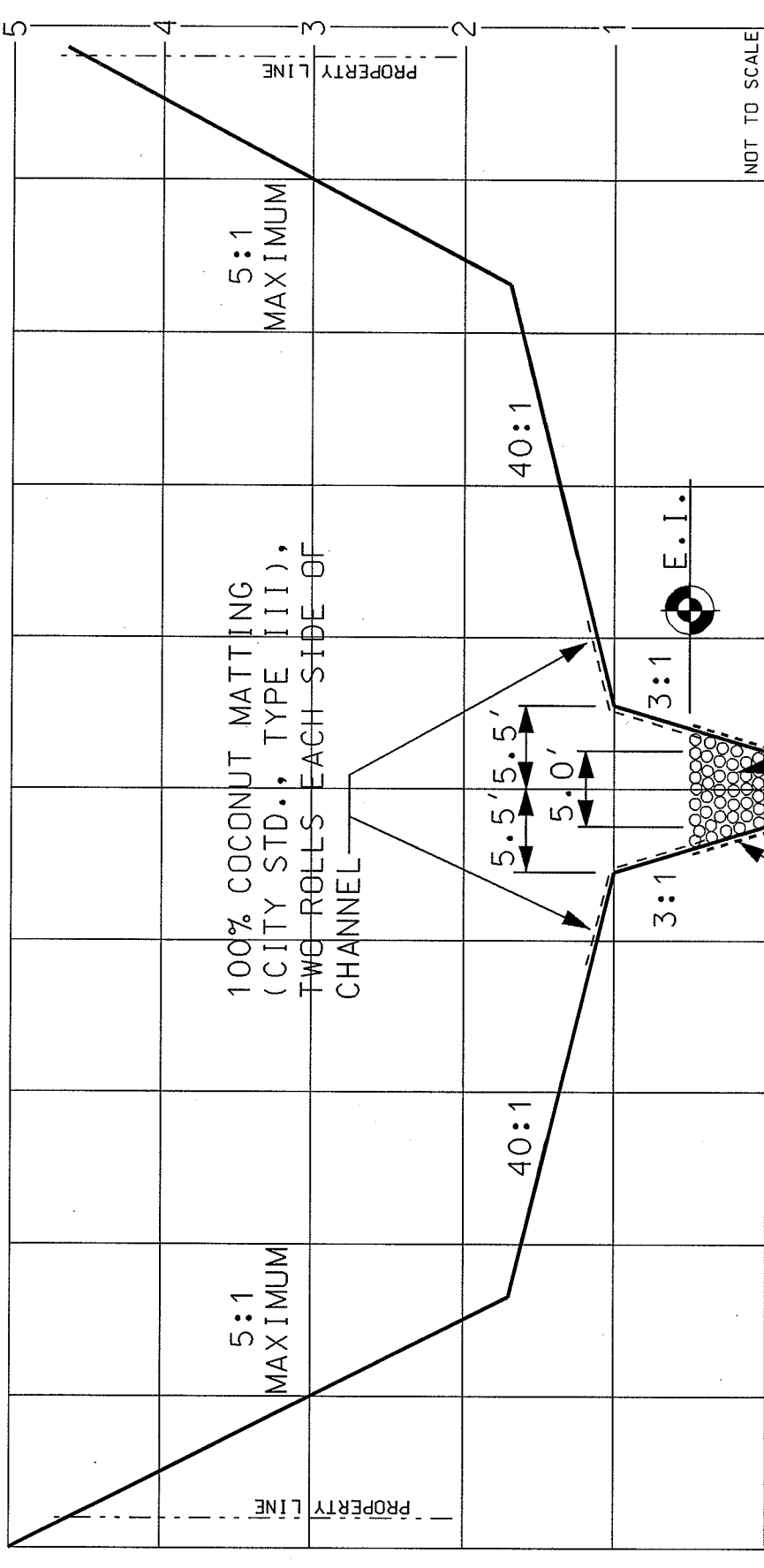
NOTE: LONGITUDINAL SLOPE
ALONG CHANNEL VARIES
AS PER PLANS

2004

CITY OF MADISON
ENGINEERING DIVISION

TYPICAL
GREENWAY SECTION
(GRASSED FLOWLINE)

STANDARD DETAIL DRAWING 5.4.11



100% COCONUT MATTING
(CITY STD., TYPE III),
TWO ROLLS EACH SIDE OF
CHANNEL

'R' FABRIC TO MEET
D.O.T. SPECIFICATIONS

CLEAR STONE, 3"-5" SMALLEST DIMENSION
LARGEST DIMENSION SHALL NOT EXCEED
3x IT'S SMALLEST DIMENSION

NOTE: LONGITUDINAL SLOPE ALONG
CHANNEL VARIES AS PER PLANS.

2004
CITY OF MADISON
ENGINEERING DIVISION

TYPICAL
GREENWAY SECTION
(STABILIZED FLOWLINE)

STANDARD DETAIL DRAWING 5.4.12

NOTE: ALL BARS TO BE EPOXY COATED.

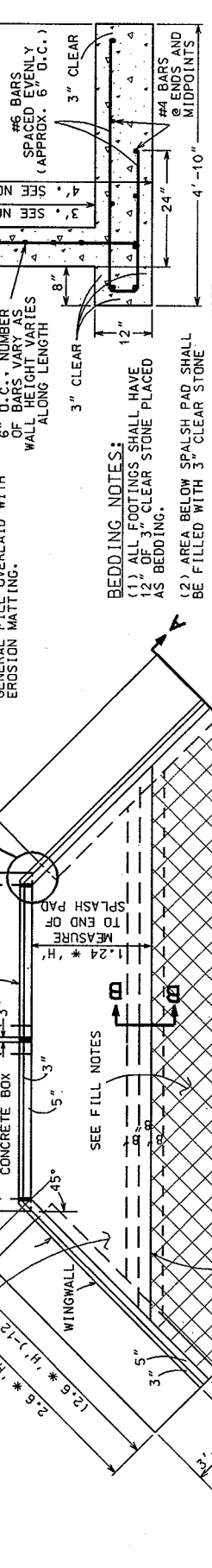
SPLASH PAD
BENT WITH 1/4" AND
7/8" DIMENSIONS OF
3" x 4" x 8" x 8"
SPACED EVENLY
APPROX. 24" O.C.
8" LEG ALTERNATES
INTO FOOTING LEG
AND 6" LEG EMBEDDED
INTO SPLASH PAD

FOR UPSTREAM BOX CULVERTS,
THE ENTRANCE SHALL HAVE 45°
CHAMFERED ROOF AND SIDE EDGES.
MITER ALL EXPOSED
POURED WALLS 45°
WINGWALLS SHALL BE ONE
CONTINUOUS POUR FROM
CONSTRUCTION JOINT ABOVE
FOOTING TO TOP OF WALL -
NO CONSTRUCTION JOINT
AT SPLASH PAD

SEE REINFORCEMENT DETAIL
FOR DIMENSIONS AND INSET
FOR ORIENTATION; 1/2" FELTS
TO BE PLACED EACH JOINT AND
AT CONNECTION TO WINGWALLS

HEADER
FOR DIMENSIONS AND INSET
FOR ORIENTATION; 1/2" FELTS
TO BE PLACED EACH JOINT AND
AT CONNECTION TO WINGWALLS

FILL NOTES:
(1) WINGWALLS WITH SPLASH
PAD DOWNSTREAM; 1/2" FELTS
SEE S.D.D. 5.5.2 FOR
INSTALLATION OF RIPRAP
AT BOX CULVERT WINGWALLS.
(2) WINGWALLS WITH SPLASH
PAD UPSTREAM;
FILL AREA WITH NON-GRANULAR
GENERAL FILL OVERLAID WITH
EROSION MATTING.

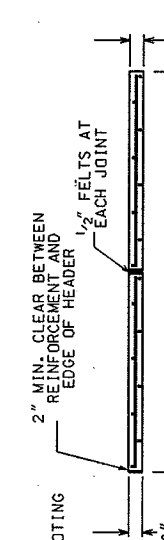


NOTE:
(1) VERTICAL DIMENSION SHOWN IS
AT END OF WALL DIMENSION INCREASES
ALONG WALL LENGTH. SEE SIDE VIEW.
(2) THE WINGWALL SHALL BE ONE
CONTINUOUS POUR FROM CONSTRUCTION
JOINT ABOVE FOOTING TO TOP OF WALL.

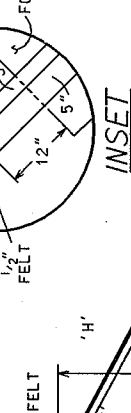
BEDDING NOTES:
(1) ALL FOOTINGS SHALL HAVE
12" OF 3" CLEAR STONE PLACED
AS BEDDING.
(2) AREA BELOW SPLASH PAD SHALL
BE FILLED WITH 3" CLEAR STONE



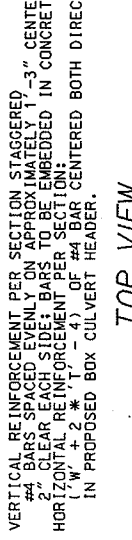
SECTION A-A
WINGWALL DETAIL AT END OF WALL



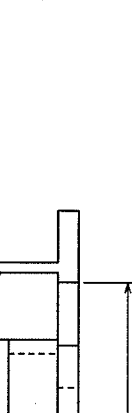
SECTION B-B
CUT-OFF WALL DETAIL



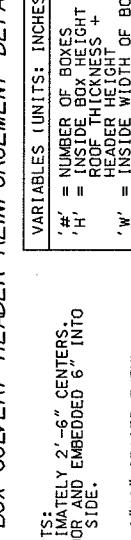
TOP VIEW
BOX CULVERT HEADER REINFORCEMENT DETAIL



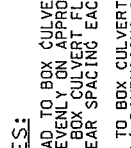
FRONT VIEW
WINGWALLS WITH SPLASHPAD



SIDE VIEW
WINGWALLS WITH SPLASHPAD



INSET



STEEL CONNECTION NOTES:

- (1) CONNECTION OF SPLASH PAD TO BOX CULVERTS:
12" LONG #6 REBARS SPACED EVENLY ON APPROXIMATELY 2'-6" CENTERS,
TIGHT DRIVEN 6" INTO END OF BOX CULVERT FLOOR AND EMBEDDED 6" INTO
SPLASH PAD FLOOR WITH 2" CLEAR SPACING EACH SIDE.
- (2) CONNECTION OF WINGWALL TO BOX CULVERT:
#4 REBARS FIELD BENT WITH L₁ DIMENSIONS OF 6"x6" SPACED EVENLY
ON APPROXIMATELY 8" CENTERS. ONE 6" LEG DRIVEN INTO SIDE OF
BOX AND THE OTHER EMBEDDED 6" INTO THE WINGWALL. BARS SHALL
HAVE 2" CLEAR SPACING TOP AND BOTTOM. (SAME EACH WINGWALL)
- (3) CONNECTION OF SPLASH PAD TO WINGWALLS:
#4 REBARS FIELD BENT WITH L₁ DIMENSIONS OF 12"x8"
SPACED EVENLY ON APPROXIMATELY 12" CENTERS. THE
12" LEG EMBEDDED INTO THE SPLASH PAD AND THE 8" LEG
EMBEDDED DOWNWARD INTO THE WINGWALL. BARS SHALL BE
CENTERED IN THE SPLASH PAD AND THE WINGWALL. WINGWALLS
SHALL BE ONE CONTINUOUS POUR FROM CONSTRUCTION JOINT
ABOVE FOOTING TO TOP OF THE WALL. THERE SHOULD BE NO
CONSTRUCTION JOINT AT PAD ELEVATION.
- (4) CONNECTION OF SPLASH PAD TO THE CUT-OFF WALL:
(SEE CUT-OFF WALL DETAIL) THE #6 BAR REINFORCING OF
THE CUT-OFF WALL SHALL BE FIELD BENT INTO A C AND Z
SHAPE APPROXIMATELY 24" CENTERS. THE 8" LEG EMBEDDED
INTO FOOTING LEG AND 6" EMBEDDED INTO SPLASH PAD.
BARS SHALL BE CENTERED IN THE CUT-OFF WALL.

FOR UPSTREAM BOX CULVERTS,
THE ENTRANCE SHALL HAVE 45°
CHAMFERED ROOF AND SIDE EDGES.
MITER ALL EXPOSED
POURED WALLS 45°
WINGWALLS SHALL BE ONE
CONTINUOUS POUR FROM
CONSTRUCTION JOINT ABOVE
FOOTING TO TOP OF WALL -
NO CONSTRUCTION JOINT
AT SPLASH PAD

SEE REINFORCEMENT DETAIL
FOR DIMENSIONS AND INSET
FOR ORIENTATION; 1/2" FELTS
TO BE PLACED EACH JOINT AND
AT CONNECTION TO WINGWALLS

FILL NOTES:
(1) WINGWALLS WITH SPLASH
PAD DOWNSTREAM; 1/2" FELTS
SEE S.D.D. 5.5.2 FOR
INSTALLATION OF RIPRAP
AT BOX CULVERT WINGWALLS.
(2) WINGWALLS WITH SPLASH
PAD UPSTREAM;
FILL AREA WITH NON-GRANULAR
GENERAL FILL OVERLAID WITH
EROSION MATTING.

VARIABLES (UNITS: INCHES)	
'#'	= NUMBER OF BOXES
'H'	= INSIDE BOX HEIGHT + ROOF THICKNESS + HEADER HEIGHT
'W'	= INSIDE WIDTH OF BOX
'T'	= INSIDE HEIGHT OF BOX + SIDE WALL THICKNESS

VERTICAL REINFORCEMENT PER SECTION STAGGERED
#4 BARS SPACED EVENLY ON APPROXIMATELY 1'-3" CENTERS,
2" CLEAR EACH SIDE; BARS TO BE EMBEDDED IN CONCRETE 4"
HORIZONTAL REINFORCEMENT PER SECTION:
{ 'W' + 2 * 'T' - 4 } OF #4 BAR CENTERED BOTH DIRECTION
IN PROPOSED BOX CULVERT HEADER.

STEEL CONNECTION NOTES:
(1) CONNECTION OF SPLASH PAD TO BOX CULVERTS:
12" LONG #6 REBARS SPACED EVENLY ON APPROXIMATELY 2'-6" CENTERS,
TIGHT DRIVEN 6" INTO END OF BOX CULVERT FLOOR AND EMBEDDED 6" INTO
SPLASH PAD FLOOR WITH 2" CLEAR SPACING EACH SIDE.

(2) CONNECTION OF WINGWALL TO BOX CULVERT:
#4 REBARS FIELD BENT WITH L₁ DIMENSIONS OF 6"x6" SPACED EVENLY
ON APPROXIMATELY 8" CENTERS. ONE 6" LEG DRIVEN INTO SIDE OF
BOX AND THE OTHER EMBEDDED 6" INTO THE WINGWALL. BARS SHALL
HAVE 2" CLEAR SPACING TOP AND BOTTOM. (SAME EACH WINGWALL)

(3) CONNECTION OF SPLASH PAD TO WINGWALLS:
#4 REBARS FIELD BENT WITH L₁ DIMENSIONS OF 12"x8"
SPACED EVENLY ON APPROXIMATELY 12" CENTERS. THE
12" LEG EMBEDDED INTO THE SPLASH PAD AND THE 8" LEG
EMBEDDED DOWNWARD INTO THE WINGWALL. BARS SHALL BE
CENTERED IN THE SPLASH PAD AND THE WINGWALL. WINGWALLS
SHALL BE ONE CONTINUOUS POUR FROM CONSTRUCTION JOINT
ABOVE FOOTING TO TOP OF THE WALL. THERE SHOULD BE NO
CONSTRUCTION JOINT AT PAD ELEVATION.

(4) CONNECTION OF SPLASH PAD TO THE CUT-OFF WALL:
(SEE CUT-OFF WALL DETAIL) THE #6 BAR REINFORCING OF
THE CUT-OFF WALL SHALL BE FIELD BENT INTO A C AND Z
SHAPE APPROXIMATELY 24" CENTERS. THE 8" LEG EMBEDDED
INTO FOOTING LEG AND 6" EMBEDDED INTO SPLASH PAD.
BARS SHALL BE CENTERED IN THE CUT-OFF WALL.

DRAWING NOT TO SCALE

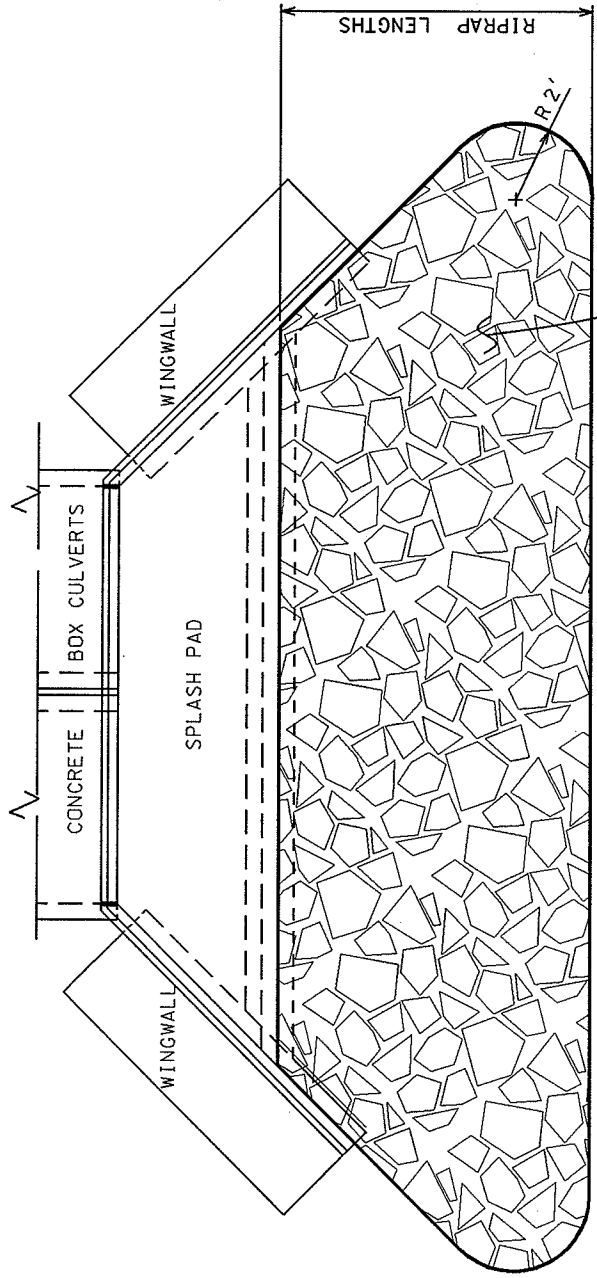
CITY OF MADISON
ENGINEERING DIVISION

BOX CULVERT
WINGWALL

STANDARD DETAIL DRAWING 5.5.1

2004

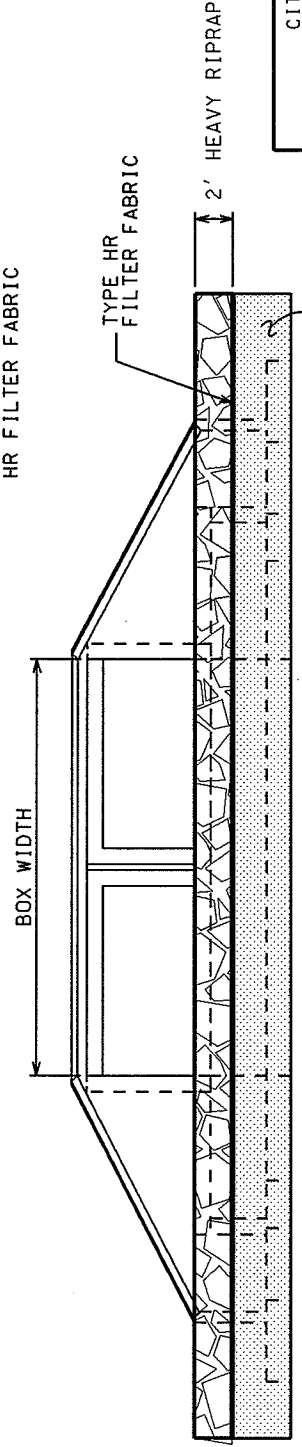
CONSTRUCT WINGWALLS AND SPLASH PAD PER S.D.D. 5.5.1



TOP VIEW
WINGWALLS WITH SPLASHPAD

RIPRAP LENGTHS	
BOX WIDTH FT	RIPRAP LENGTH FT
4	10
6	12
8	15
10	20
10+	20

FILL AREA WITH COMPACTED NON-GRANULAR FILL, INSTALL 2' HEAVY RIPRAP OVER TYPE HR FILTER FABRIC



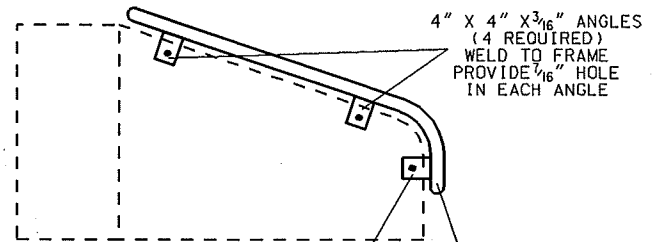
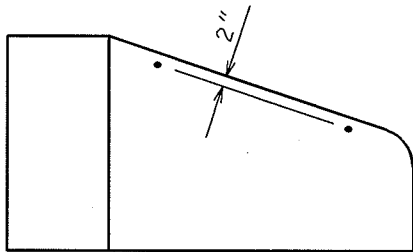
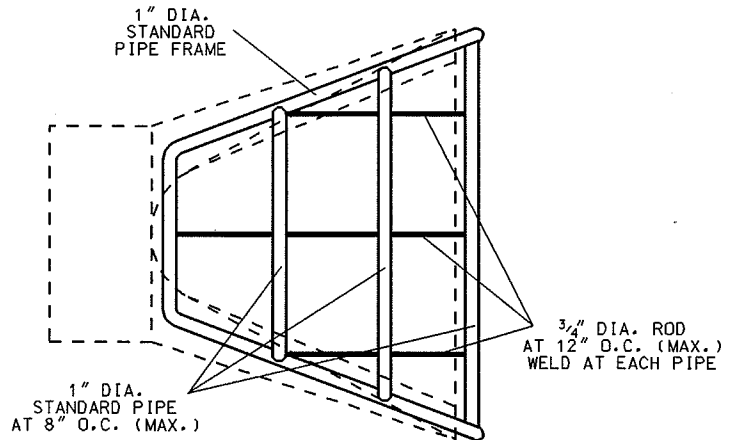
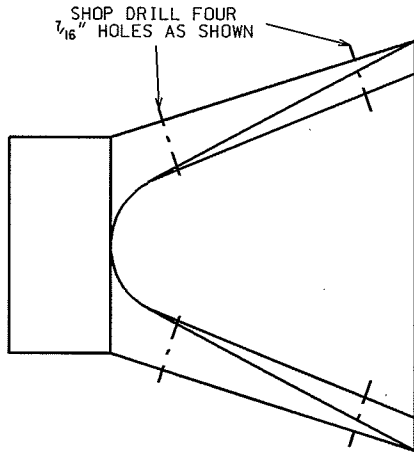
FRONT VIEW
WINGWALLS WITH SPLASHPAD

2004

CITY OF MADISON
ENGINEERING DIVISION

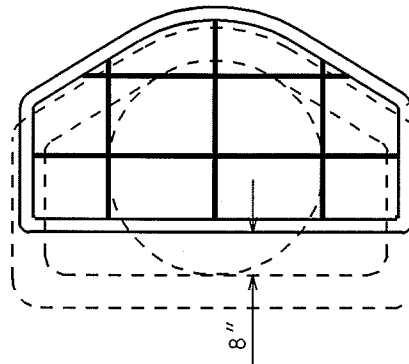
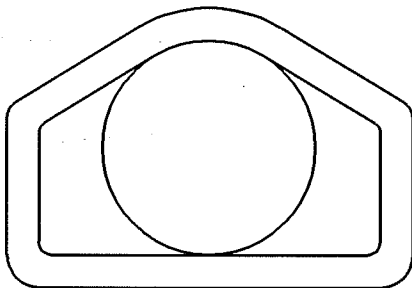
RIPRAP AT BOX
CULVERT WINGWALLS

STANDARD DETAIL DRAWING 5.5.2



PROVIDE 2 ADDITIONAL
CONNECTIONS WHEN
PIPE IS 36" OR LARGER

1" DIA.
STANDARD
STEEL PIPE



THE CONTRACTOR SHALL BOLT THE PIPE GATE
TO THE CONCRETE ENDWALL WITH FOUR $\frac{3}{8}$ " X 6"
MACHINE BOLTS WITH NUTS ON INSIDE WALL.

PAINING SPECIFICATIONS

FOR PAINTING REQUIREMENTS, SEE SECTION 506.2 (b)
STRUCTURAL STEEL PAINT-EPOXY
SYSTEM FOR STORM SEWER GRATES/GATES

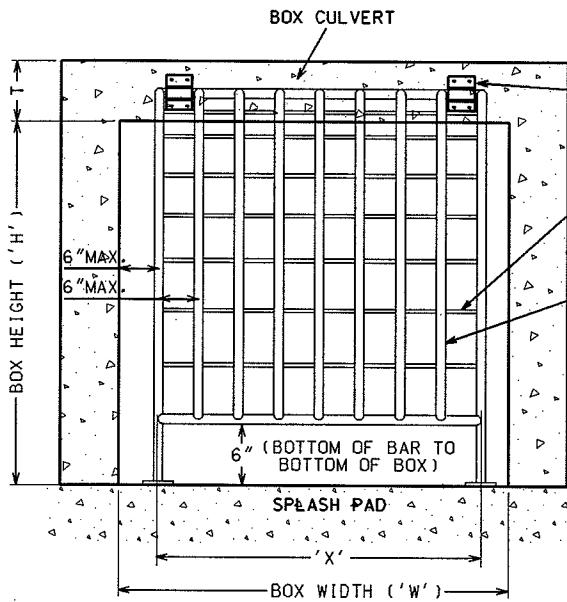
2004

CITY OF MADISON
ENGINEERING DIVISION

RCP AE
GATE

STANDARD DETAIL DRAWING 5.6.1

FRONT ELEVATION



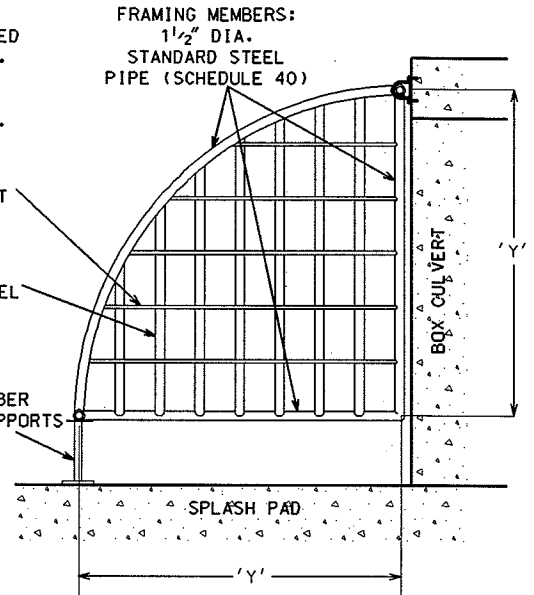
HINGE SHALL BE MOUNTED CENTERED IN BOX ROOF. SEE HINGE DETAIL FOR CONSTRUCTION AND TABLE FOR QUANTITIES.

HORIZONTAL MEMBERS:
3/4" DIA. ROD PER CHART

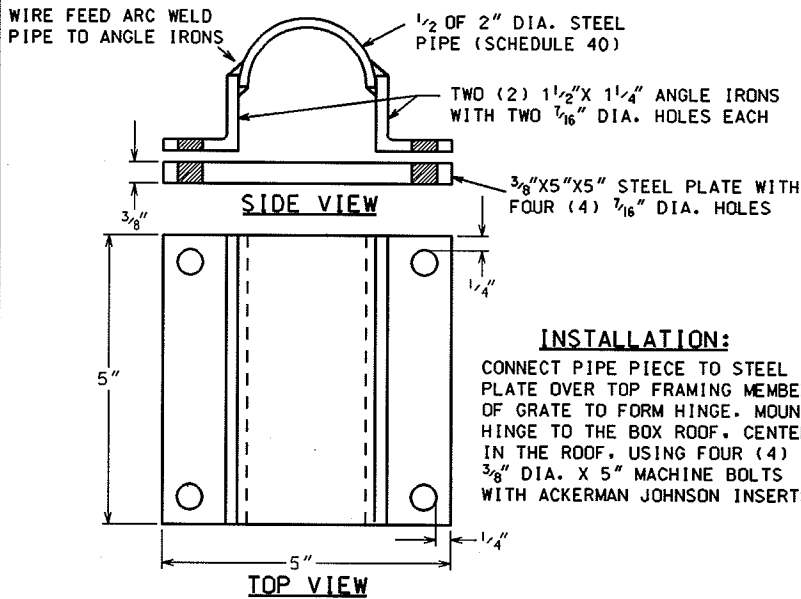
VERTICAL MEMBERS:
1 1/2" DIA. STANDARD STEEL PIPE (SCHEDULE 40)

EXTEND FRAMING MEMBER TO CREATE FRONT SUPPORTS AS SHOWN BELOW

SIDE VIEW



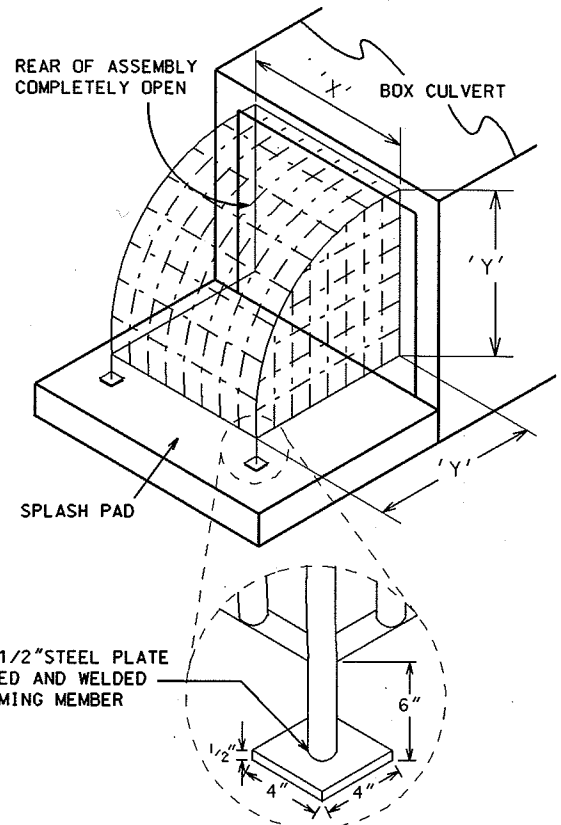
TWO PIECE SPLIT HINGE DETAIL



INSTALLATION:

CONNECT PIPE PIECE TO STEEL PLATE OVER TOP FRAMING MEMBER OF GRATE TO FORM HINGE. MOUNT HINGE TO THE BOX ROOF. CENTERED IN THE ROOF. USING FOUR (4) 3/8" DIA. X 5" MACHINE BOLTS WITH ACKERMAN JOHNSON INSERTS

ISOMETRIC VIEW



NOTES:

PAINTING SPECIFICATIONS FOR PAINTING REQUIREMENTS. SEE SECTION 506.2 (b) STRUCTURAL STEEL PAINT-EPOXY SYSTEM FOR STORM SEWER GATES

ALL DIMENSIONS ARE BAR CENTER TO BAR CENTER UNLESS OTHERWISE NOTED

BOX SIZE 'W' X 'H' (FEET)	T (IN)	NUMBER OF GATES	DIMENSIONS X Y (INCHES)		NUMBER OF BARS PER GATE (EXCLUDING FRAMING BARS) (EVENLY SPACED)		NUMBER OF HINGES PER GATE
			X	Y	VERTICAL	HORIZONTAL	
4X3	7 1/2	1	36	32.80	4	4	2
6X3	8	1	60	33.05	7	4	3
6X4	8	1	60	45.05	7	6	3
6X5	8	1	60	57.05	7	8	3
6X6	8	1	60	69.05	7	10	3
* 8X4	8	2	39	45.05	4	6	2
* 8X5	8	2	39	57.05	4	8	2
* 8X6	8	2	39	69.05	4	10	2
*10X6	10	2	51	70.05	6	10	3

* WITH TWIN GATES THERE SHALL BE A 6" BETWEEN THE GATES (MEASURED TO THE CENTER OF THE FRAMING BARS)

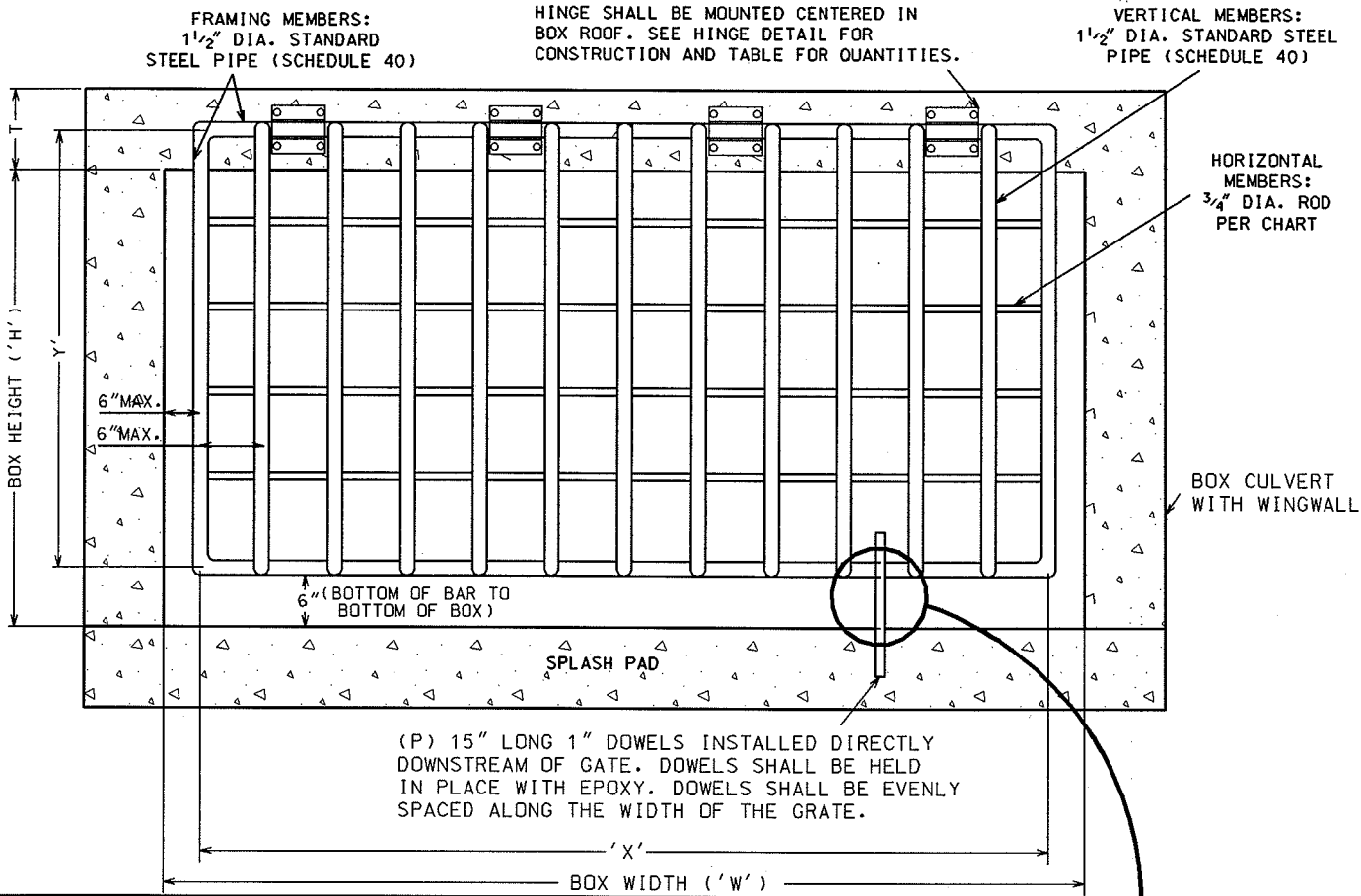
CONSTRUCT WINGWALLS AND SPLASH PADS PER S.D.D. 5.5.1

2004

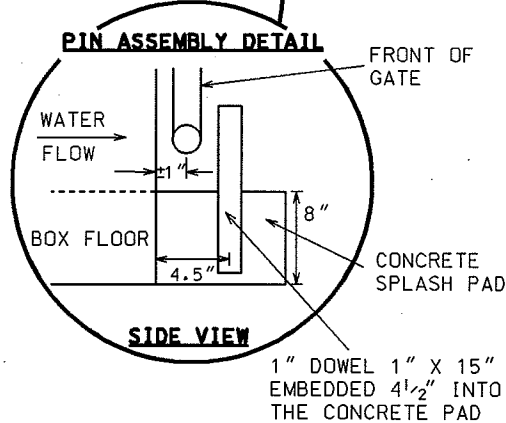
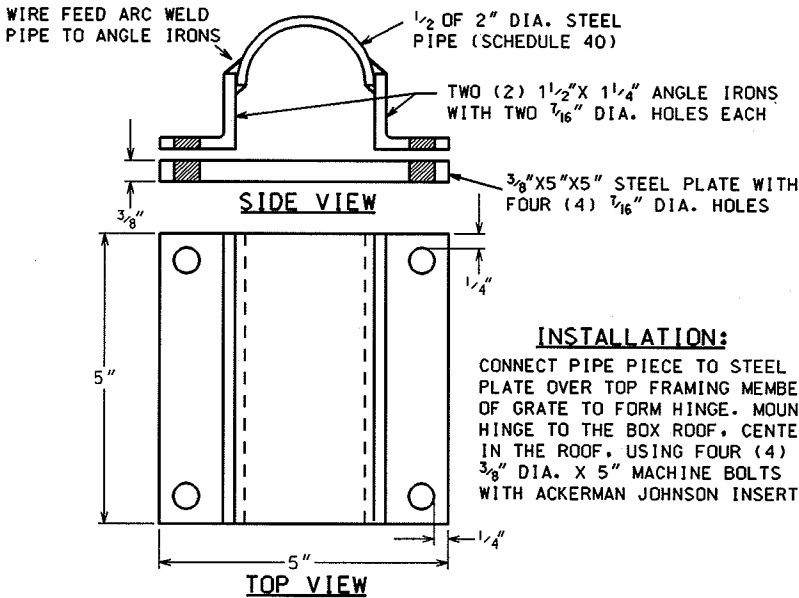
CITY OF MADISON
ENGINEERING DIVISION

**BOX CULVERT
INLET GATE
(UPSTREAM)**

STANDARD DETAIL DRAWING 5.6.2



TWO PIECE SPLIT HINGE DETAIL



NOTES:
PAINTING SPECIFICATIONS
FOR PAINTING REQUIREMENTS, SEE SECTION
506.2 (b) STRUCTURAL STEEL PAINT-EPOXY
SYSTEM FOR STORM SEWER GATES

CONSTRUCT WINGWALLS AND
SPLASH PADS PER S.D.D. 5.5.1

ALL DIMENSIONS ARE BAR CENTER TO BAR CENTER UNLESS OTHERWISE NOTED

BOX SIZE 'W' X 'H' (FEET)	T (IN)	NUMBER OF GATES	DIMENSIONS X Y (INCHES)		NUMBER OF BARS PER GATE (EXCLUDING FRAMING BARS) (EVENLY SPACED)		NO. OF HINGES PER GATE	NO. OF PINS PER GATE
			X	Y	VERTICAL	HORIZONTAL		
4X3	7 1/2	1	36	32.80	4	4	2	1
6X3	8	1	60	33.05	7	4	3	2
6X4	8	1	60	45.05	7	6	3	2
6X5	8	1	60	57.05	7	8	3	2
6X6	8	1	60	69.05	7	10	3	2
* 8X4	8	1	84	45.05	10	6	4	2
* 8X5	8	1	84	57.05	10	8	4	2
* 8X6	8	1	84	69.05	10	10	4	2
* 10X6	10	1	108	70.05	13	10	5	3

2004

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ENGINEERING DIVISION

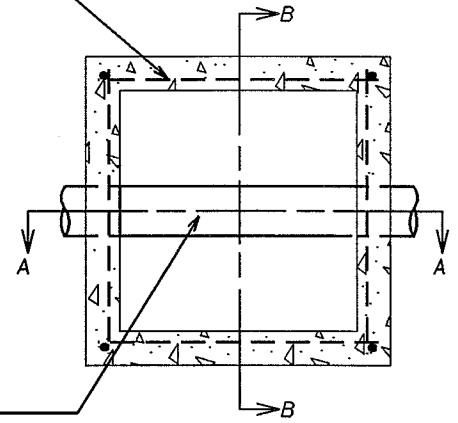
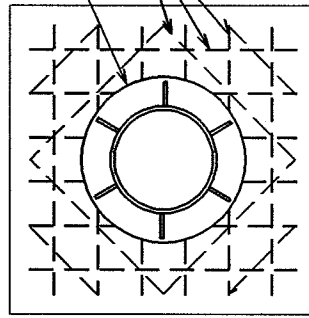
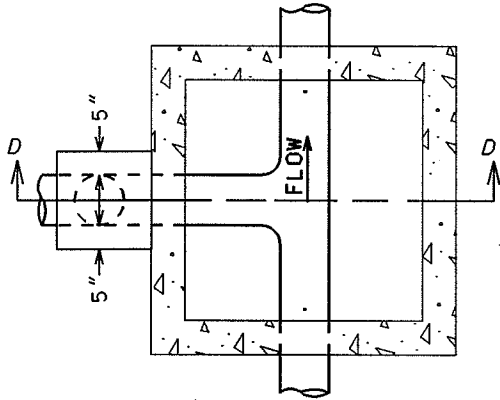
BOX CULVERT
OUTLET GATE
(DOWNSTREAM)

STANDARD DETAIL DRAWING 5.6.3

MADISON STANDARD
S.A.S. FRAME & COVER

#4 ϕ RODS
6" BOTH WAYS

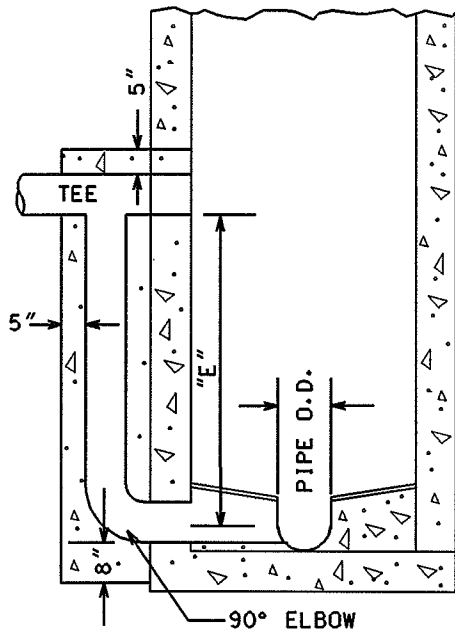
#6 ϕ RODS - SPACED 2 1/2"
FROM INSIDE WALL
OF STRUCTURE.



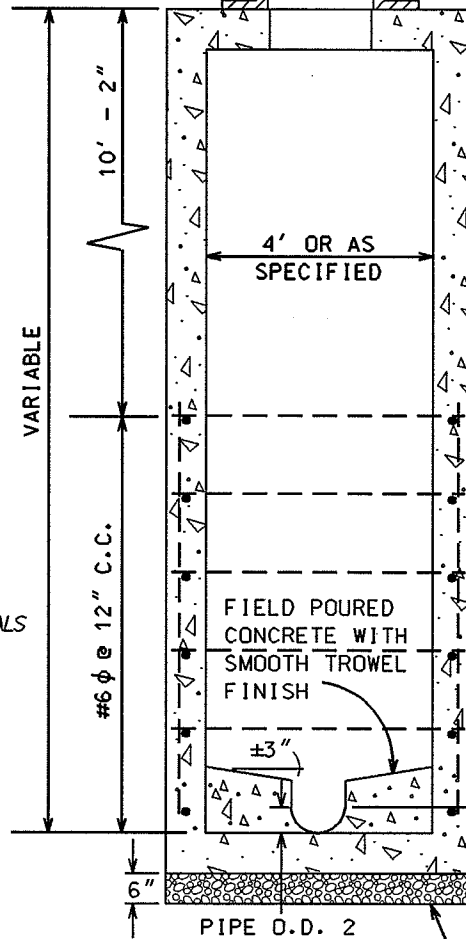
CONCRETE FLOWLINE
WITH SMOOTH TROWEL
FINISH

SEE DETAIL 5.7.15
FOR CASTING AND
ADJUSTMENT
REQUIREMENTS

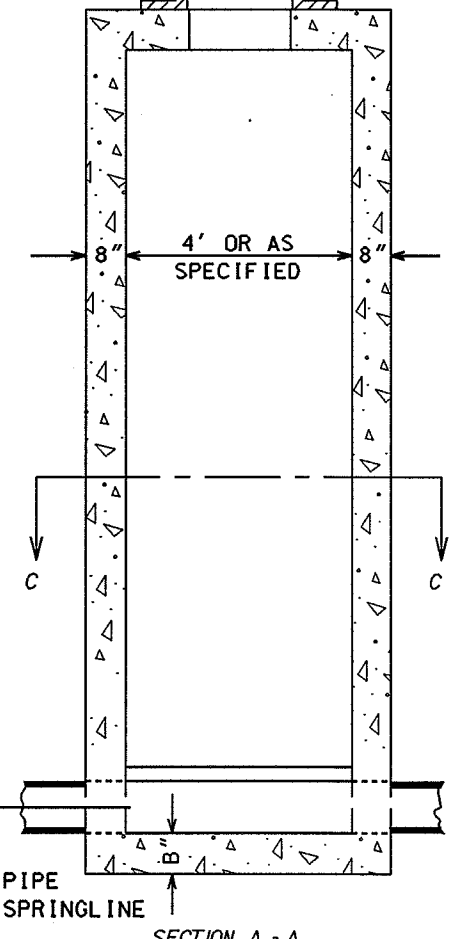
SECTION C - C



SECTION D - D
DROP INLET CONSTRUCTION FOR
SANITARY SEWER MAINS AND LATERALS



SECTION B - B



SECTION A - A

NOTES:

DROP INLET TO BE BUILT AT ALL S.A.S. WHEN DISTANCE "E" IS GREATER THAN 24". "E" SHOULD BE MEASURED FROM INVERT OF INCOMING PIPE TO THE SPRINGLINE OF THE OUTGOING SEWER.

ON 4'X4' & 5'X5' S.A.S., CENTER CASTING ON S.A.S.; ON 6'X6' S.A.S., CENTER OF CASTING TO BE 2' FROM OUTSIDE WALL OF S.A.S..

THICKNESS OF FLOOR (DIMENSION "B") TO BE 8" UP TO 10' DEPTHS & 12" FOR GREATER DEPTHS.

REFER TO STANDARD PLATE 5.7.16 "MADISON STANDARD FRAMES WITH NON-ROCKING COVER" FOR CASTING DESIGNATION.

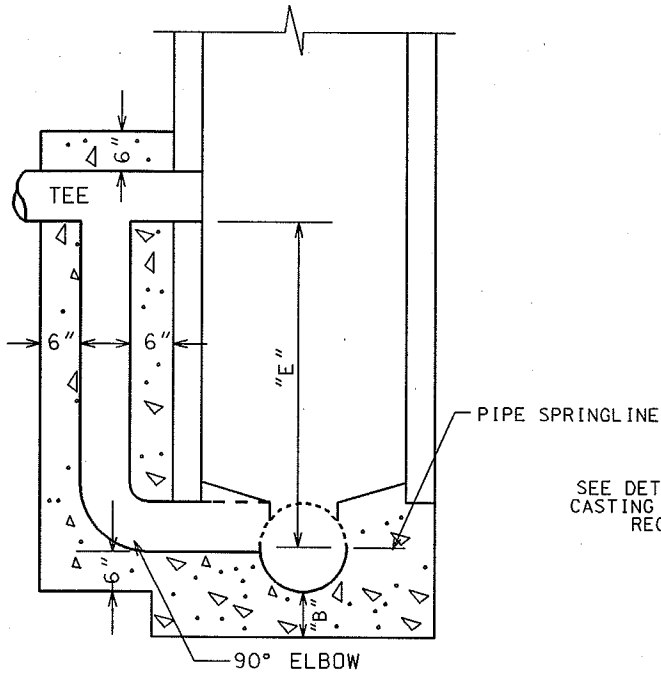
MECHANICALLY
COMPACTED
CRUSHED
STONE

2004

CITY OF MADISON
ENGINEERING DIVISION

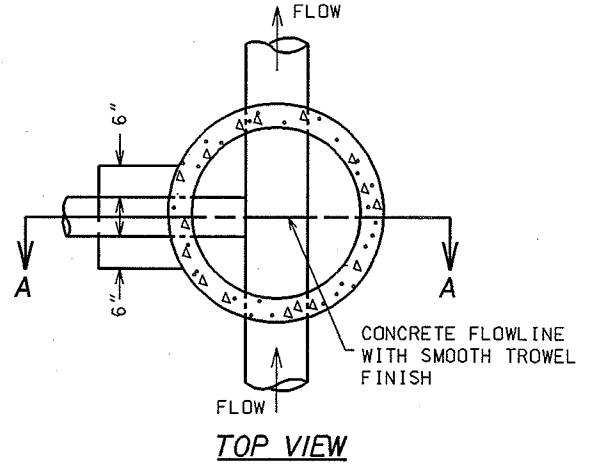
SANITARY SEWER
CAST-IN-PLACE SAS

STANDARD DETAIL DRAWING 5.7.1



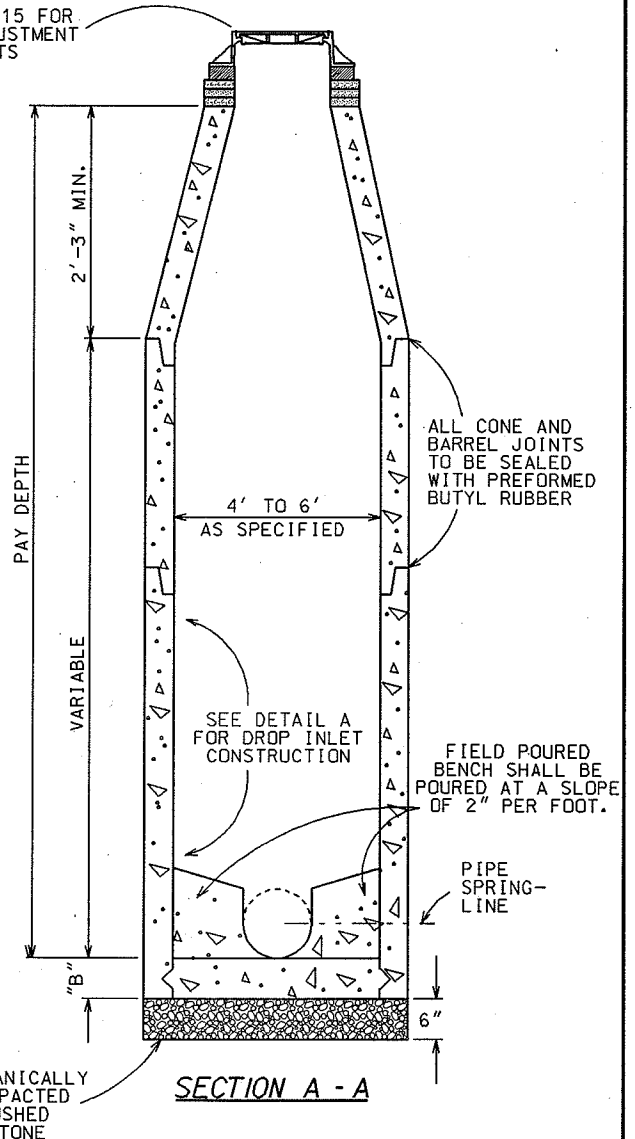
DETAIL A

SHOWING DROP INLET CONSTRUCTION FOR SANITARY SEWER MAINS & LATERALS



TOP VIEW

SEE DETAIL 5.7.15 FOR CASTING AND ADJUSTMENT REQUIREMENTS



SECTION A - A

NOTES:

- 1) PRECAST S.A.S. SECTIONS SHALL BE CONSTRUCTED IN ACCORDANCE WITH ASTM C-478.
- 2) THICKNESS OF BASE, "B":
6" MIN. FOR 4' DIAMETER SAS
8" MIN. FOR 5' AND 6' DIAMETER SAS
- 3) FOR CASTING DESIGNATION REFER TO STANDARD DETAIL DRAWING 5.7.16
- 4) CENTERED (CONCENTRIC) CONE SHALL BE INSTALLED UNLESS OTHERWISE DIRECTED.
- 5) DROP INLET SHALL BE BUILT FOR ALL SEWER MAINS AND LATERALS WHEN "E" IS GREATER THAN 24". "E" SHOULD BE MEASURED FROM INVERT OF INCOMING PIPE TO THE SPRINGLINE OF THE OUTGOING SEWER. INSIDE DROP PER STANDARD DETAIL DRAWING 5.7.30 MAY BE INSTALLED FOR 4" AND 6" SERVICE CONNECTIONS WHERE OUTSIDE DROP INLET CONSTRUCTION IS INFEASIBLE. ENGINEER SHALL APPROVE INSIDE DROP INLET PRIOR TO INSTALLATION.
- 6) FLEXIBLE PIPE TO SAS CONNECTOR REQUIRED PER STANDARD DETAIL DRAWING 5.7.31
- 7) ALL BENCHES TO BE FIELD POURED CONCRETE WITH SMOOTH TROWEL FINISH. PRECAST BENCHES ONLY PERMITTED WITH PRIOR APPROVAL OF ENGINEER IN WRITING.
- 8) ALL JOINTS BETWEEN RINGS SHALL BE SEALED WITH $\frac{3}{8}$ " OF AIR-ENTRAINED TYPE M OR S MORTAR. THE OUTSIDE SURFACE OF THE ADJUSTING RINGS SHALL BE SEALED WITH A $\frac{1}{2}$ " THICK AIR-ENTRAINED MORTAR TYPE M OR S SEAL. THE METHOD USED FOR SEALING THE OUTSIDE SURFACE SHALL BE COMPATIBLE WITH THAT USED TO SEAL JOINTS BETWEEN THE RINGS.

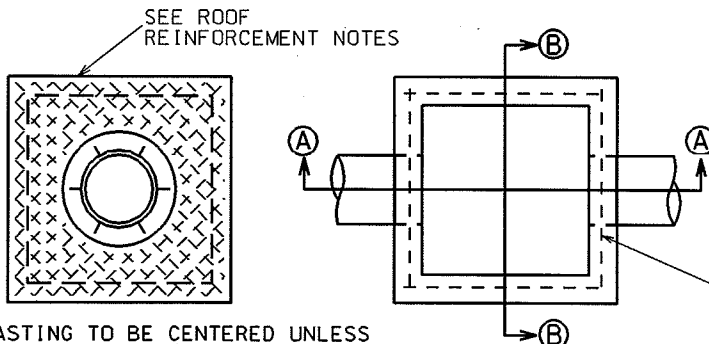
2004

CITY OF MADISON ENGINEERING DIVISION
SANITARY SEWER PRECAST SAS
STANDARD DETAIL DRAWING 5.7.2

SEWER ACCESS STRUCTURES

ROOF REINFORCEMENT NOTES:

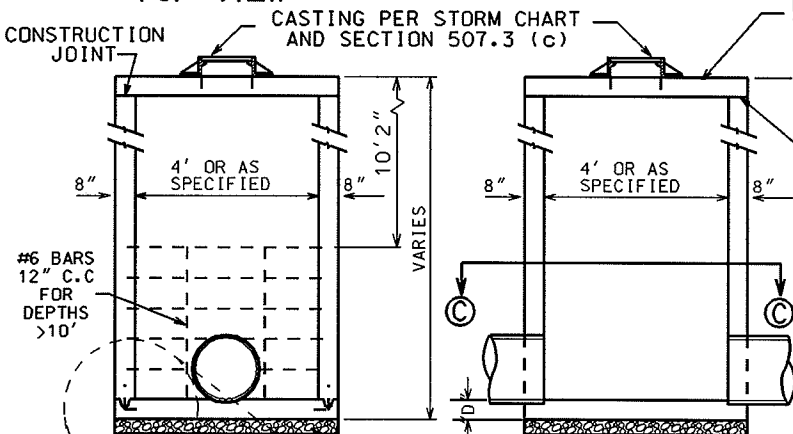
- 1) EPOXY COATED REBARS SHALL BE USED IN ALL CASES
- 2) #4 BARS PLACED ON 6" CENTERS FOR 3'X3', 3'X4', 4'X4', 4'X5', 5'X5' STRUCTURES
- 3) #6 BARS PLACED ON CENTERS FOR 6'X5', 6'X6' AND LARGER STRUCTURES
- 4) 3" CLEAR SHALL BE MAINTAINED IN ALL CASES



NOTE: CASTING TO BE CENTERED UNLESS NOTED IN STORM STRUCTURE TABLE

TOP VIEW

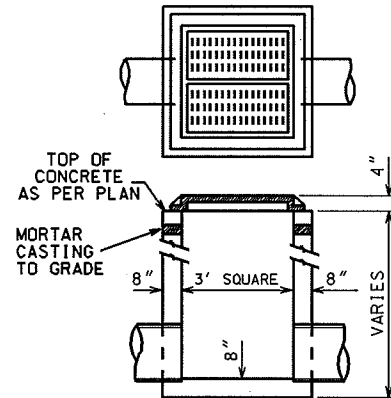
SECTION C-C



SECTION B-B

NOTE: THICKNESS OF FLOOR (DIMENSION "D") TO BE 8" UP TO 10' DEPTHS AND 10" FOR GREATER DEPTHS

3'X3' CATCH BASIN



PRECAST REINFORCED CONCRETE STRUCTURES MAY BE USED IF APPROVED ACCORDING TO ARTICLES 106.3 AND 507.3 (b) OF THE STANDARD SPECIFICATIONS

NEENAH FOUNDRY CASTINGS AS LISTED OR EQUAL. ALL CASTING WITH FLANGE AT BASE.

- LIGHT DUTY
- R-1879-A10G FOR OPEN GRATE
 - R-1879-A10L FOR SOLID LID
- HEAVY DUTY
- R-1878-A10G FOR OPEN GRATE
 - R-1878-A10L FOR SOLID LID

6" MECHANICALLY COMPACTED CRUSHED STONE

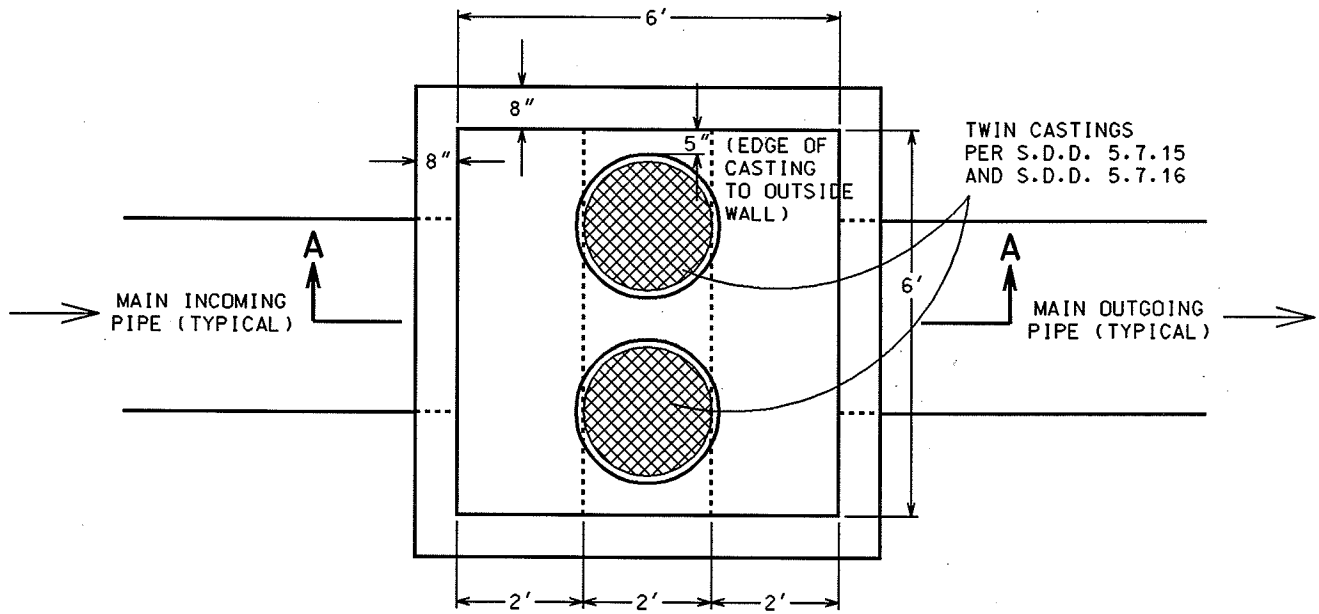
#4 'L' BAR, EPOXY COATED, CENTERED IN FLOOR AND WALL.

2004

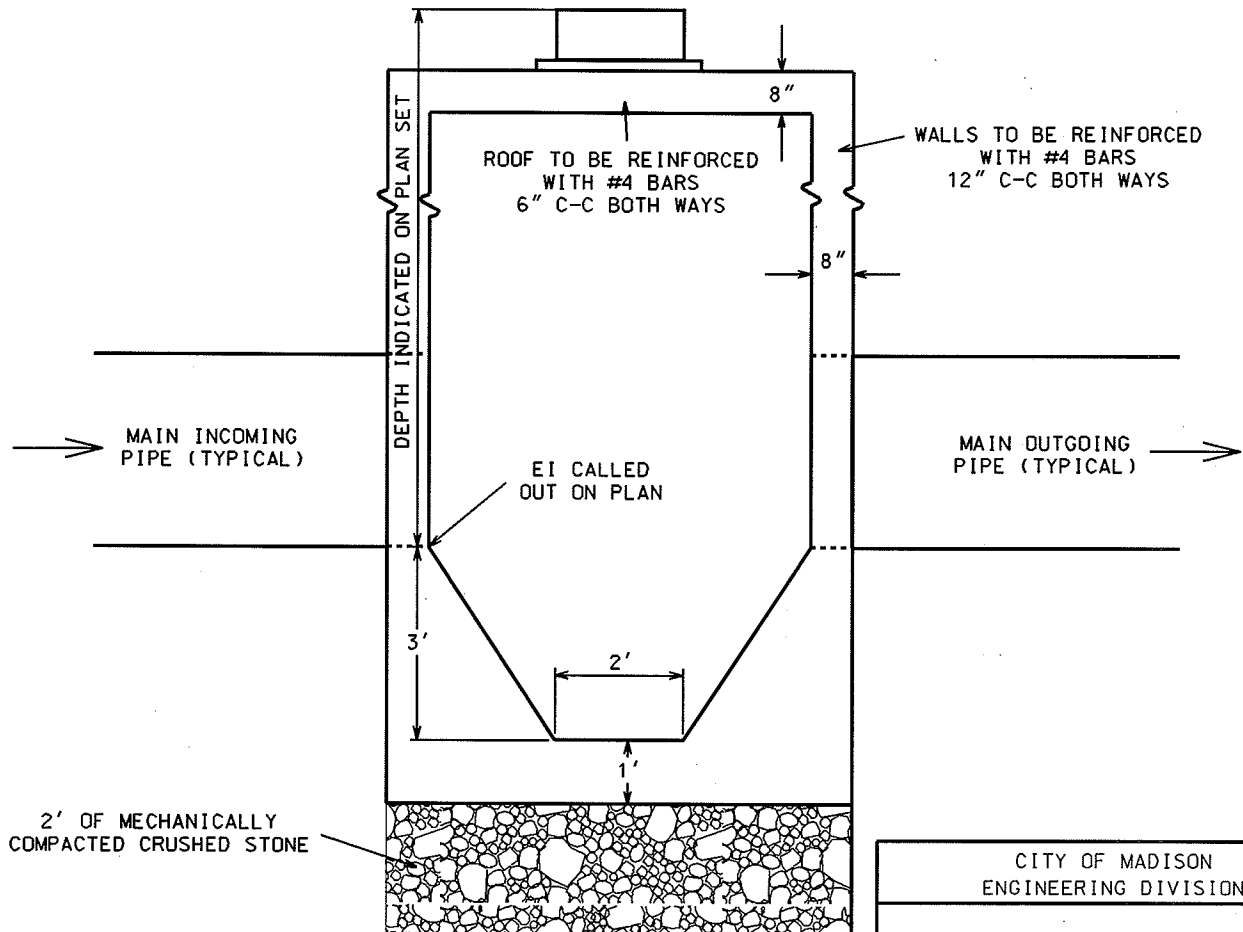
CITY OF MADISON
ENGINEERING DIVISION

STORM SEWER SAS
AND CATCH BASINS

STANDARD DETAIL DRAWING 5.7.3



PLAN VIEW



SECTION A-A

2004

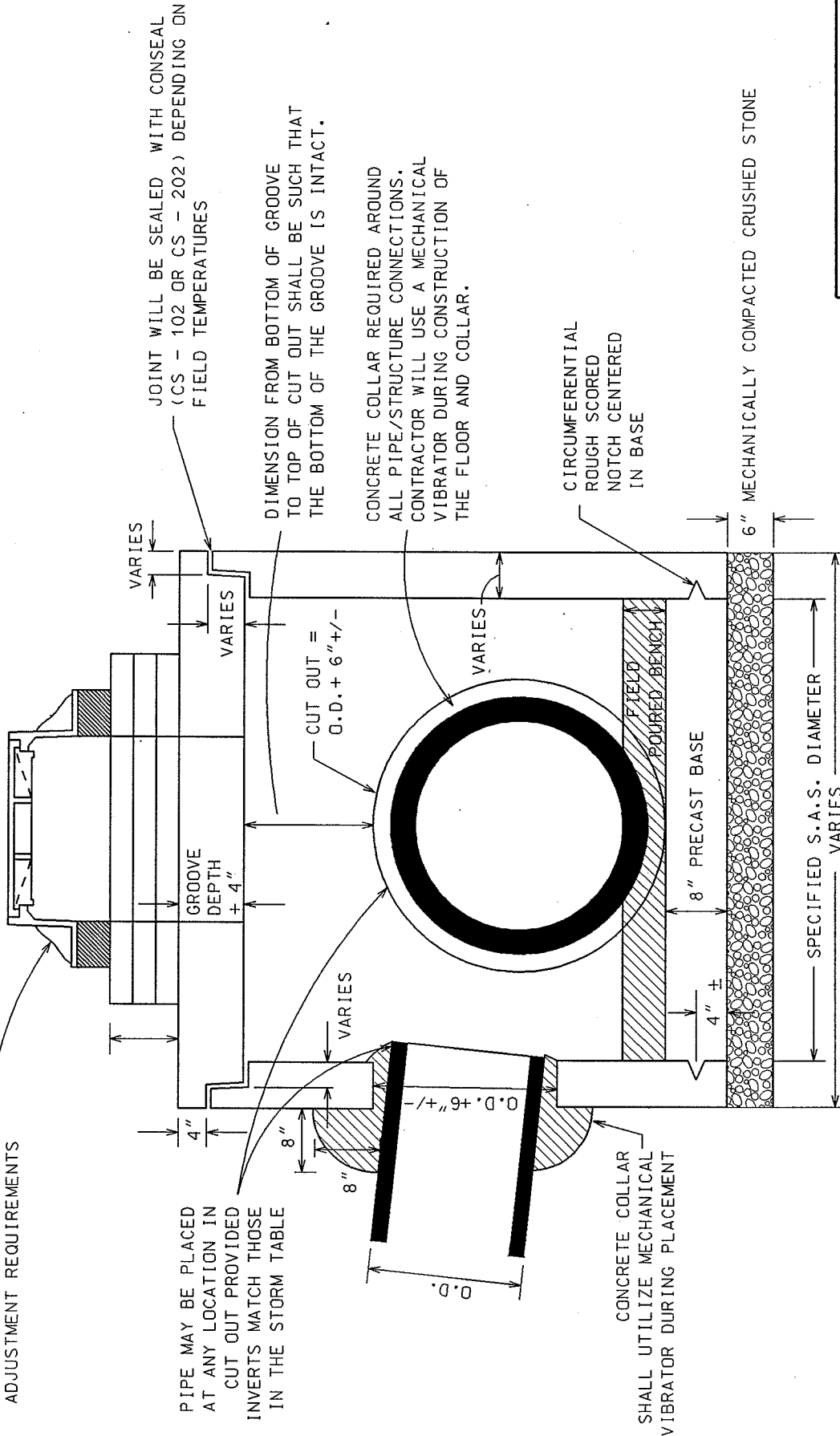
CITY OF MADISON
ENGINEERING DIVISION

**STORM SEWER
6' X 6' CATCH BASIN**

STANDARD DETAIL DRAWING 5.7.4

SEE DETAIL 5.7.15
FOR CASTING AND
ADJUSTMENT REQUIREMENTS

PIPE MAY BE PLACED
AT ANY LOCATION IN
CUT OUT PROVIDED
INVERTS MATCH THOSE
IN THE STORM TABLE



CONCRETE COLLAR
SHALL UTILIZE MECHANICAL
VIBRATOR DURING PLACEMENT

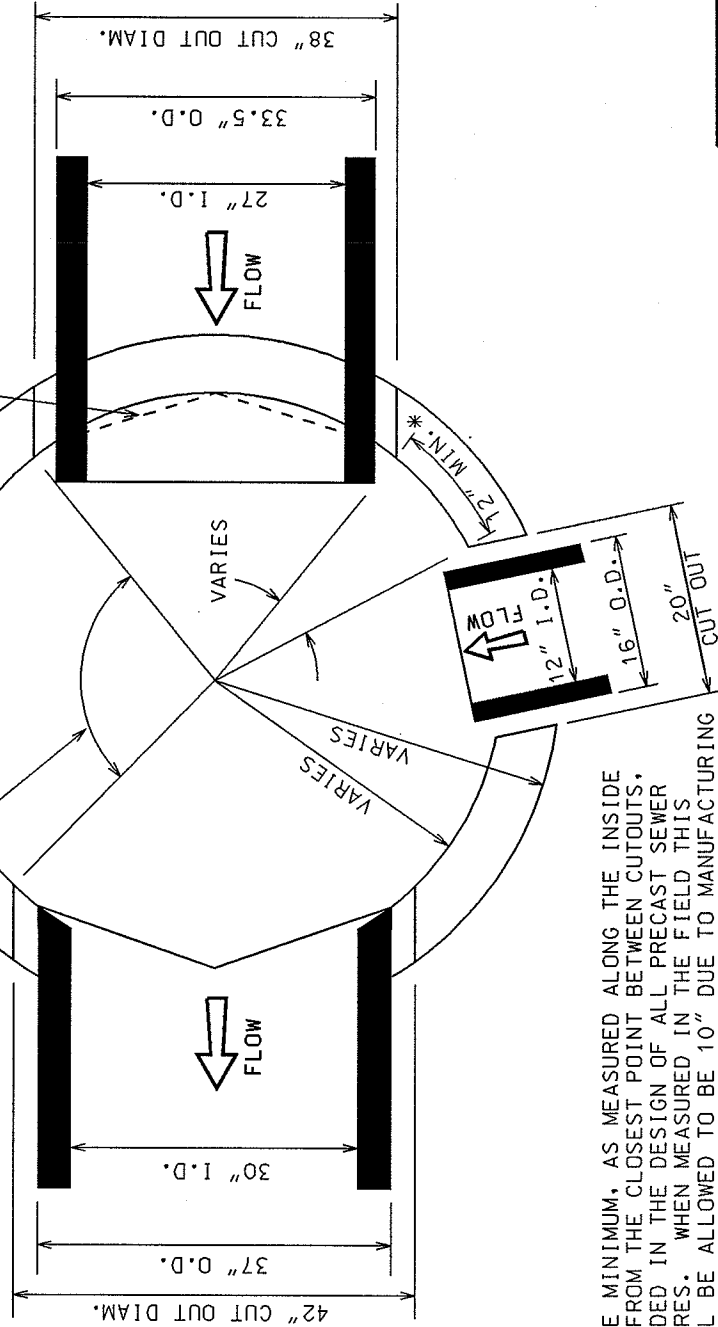
2004

CITY OF MADISON ENGINEERING DIVISION
STORM SEWER PRECAST SAS (THROUGH SECTION VIEW)
STANDARD DETAIL DRAWING 5.7.5

NOTE: ALL STORM SEWER ACCESS STRUCTURES (S.A.S.) SHALL BE CONSTRUCTED IN COMPLIANCE WITH ASTM C478

NOTE: FOR STRAIGHT THROUGH PIPE ALIGNMENTS IN STORM SEWER ACCESS STRUCTURES THE MINIMUM DEGREE ALLOWED BETWEEN CUTOUTS SHALL BE 60°

PIPE SHALL BE CUT TO APPROXIMATELY MATCH THE INSIDE OF THE S.A.S. PIPES SHALL BE CUT FROM THE INTERSECTION OF THE PIPE O.D. WITH THE STRUCTURE WALL TO THE CENTER OF THE PIPE AS SHOWN.



* 12" OF CONCRETE MINIMUM, AS MEASURED ALONG THE INSIDE WALL RADIALLY FROM THE CLOSEST POINT BETWEEN CUTOUTS, SHALL BE PROVIDED IN THE DESIGN OF ALL PRECAST SEWER ACCESS STRUCTURES. WHEN MEASURED IN THE FIELD THIS DIMENSION SHALL BE ALLOWED TO BE 10" DUE TO MANUFACTURING TOLERANCES. STRUCTURES WITH LESS THAN 10" SHALL ONLY BE ALLOWED WITH THE CONSTRUCTION ENGINEER'S APPROVAL.

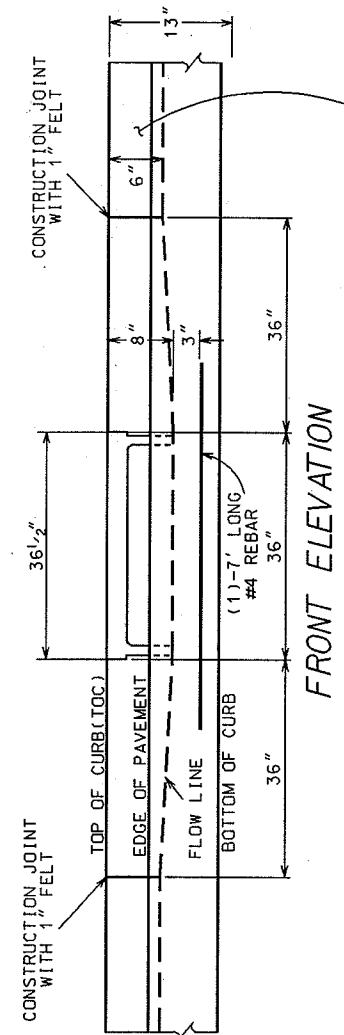
** NOTE: PIPES SHOWN IN VARIOUS CONSTRUCTION STAGES FOR ILLUSTRATIVE PURPOSES.

2004

CITY OF MADISON
ENGINEERING DIVISION

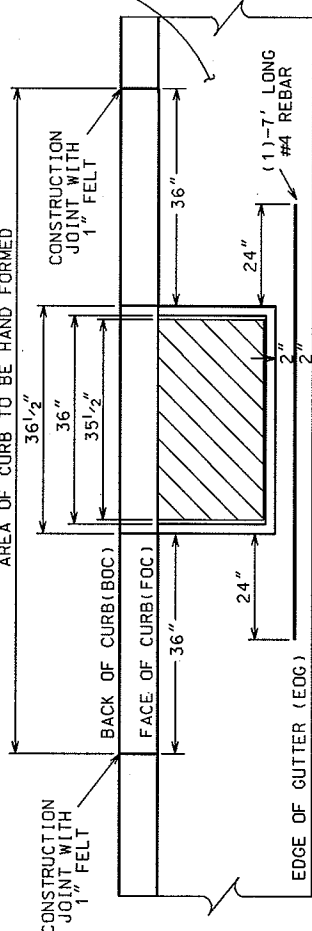
STORM SEWER
PRECAST SAS
{ TOP VIEW }

STANDARD DETAIL DRAWING 5.7.6

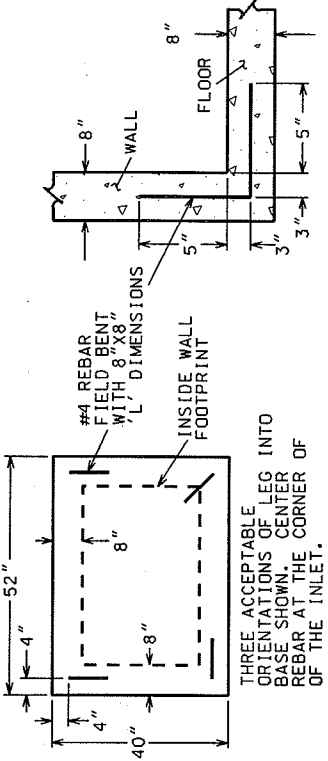


FRONT ELEVATION

NOTE: "A" CURB TYPE AND GUTTER SHOWN



PLAN VIEW

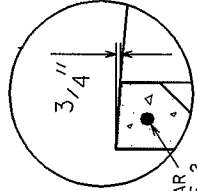


TOP VIEW OF FLOOR WITH INSIDE WALL FOOTPRINTS

FIELD POURED FLOOR REINFORCEMENT

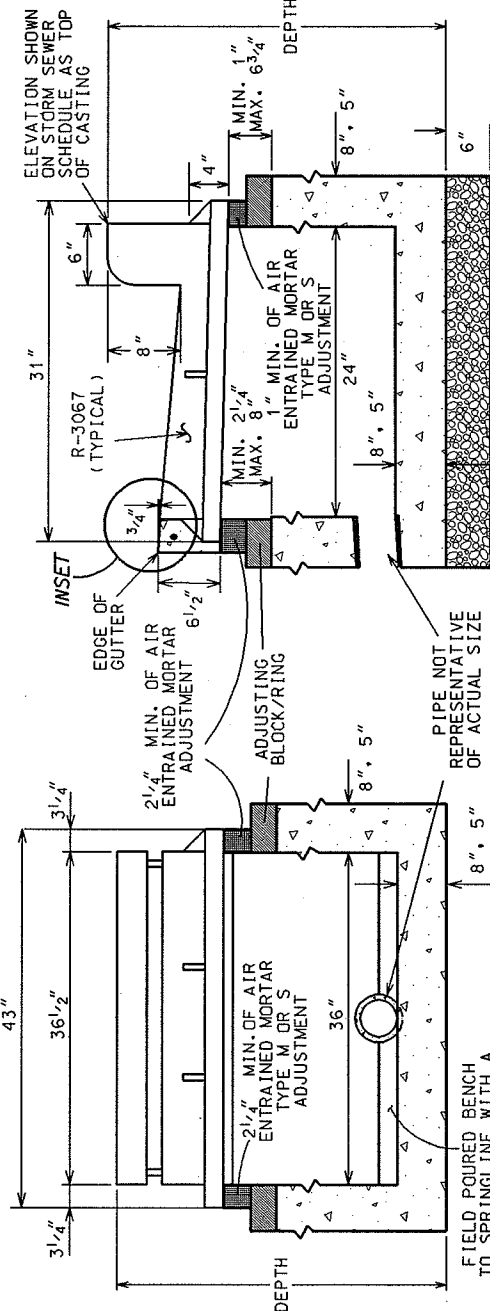
NOTES:

1. PRECAST REINFORCED CONCRETE STRUCTURES MAY BE USED IF APPROVED ACCORDING TO SECTION 106.3, 507.3 (b) OF THE STANDARD SPECIFICATIONS.
2. INSTALLATION COST OF INLETS SHALL INCLUDE THE COST OF REINFORCING BARS AS FOLLOWS:
 - (1) - #4 BARS 7'-0" LONG IN CONCRETE GUTTER ALONG THE FRONT OF INLET.
 - (4) - #4 REBARS FIELD BENT WITH 8"x8" 'L' DIMENSIONS.
3. WHEN AN "S" INLET IS SPECIFIED, THE INSIDE DIMENSIONS OF THE STANDARD "H" INLET SHALL BE ALTERED TO 2'-4" x 1'-6".
4. PRECAST INLETS REQUIRE 2" OF CONCRETE FROM THE EDGE OF CUTOFF/KNOCKOUT TO THE INSIDE WALLS AND TO THE TOP OF STRUCTURE.
5. FIELD POURED STRUCTURES SHALL HAVE A BENCH POURED INSIDE TO THE SPRINGLINE OF THE PIPES CREATING A POSITIVE LOW FLOW CHANNEL AS SHOWN IN THE TYPICAL FRONT SECTION VIEW.
6. ASSUMING 90 DEGREE PIPE CONNECTIONS, THE MAXIMUM PIPE OUT A 3' SIDE IS 21" AND THE MAXIMUM PIPE OUT A 2' SIDE IS 12".
7. WALL THICKNESS DIMENSIONS OF 8" AND 5" CORRESPOND TO CAST-IN-PLACE AND PRECAST STRUCTURES, RESPECTIVELY.
8. THERE SHALL BE AN 8" FLOWLINE DEPRESSION FROM TOC ALONG THE INLET TAPERED FROM THE TYPICAL 6" FLOWLINE AS SHOWN IN THE FRONT ELEVATION.
9. SEE STANDARD DETAIL DRAWING 5.7-29 FOR INLET CASTING OFFSET CRITERIA FOR H INLETS.
10. FLOOR REINFORCEMENT REQUIRED IN ALL FIELD POURED INLETS



NOTE: 3/4" TILT CREATES SPECIFIED FLOW LINE DEPRESSION

INSET



TYPICAL SECTION

INLET DEPTH AS PER PLANS

TYPICAL FRONT SECTION

INLET DEPTH AS PER PLANS

FIELD POURED BENCH TO SPRINGLINE WITH A POSITIVE LOW FLOW CHANNEL

DRAWING NOT TO SCALE

2004

CITY OF MADISON
ENGINEERING DIVISION

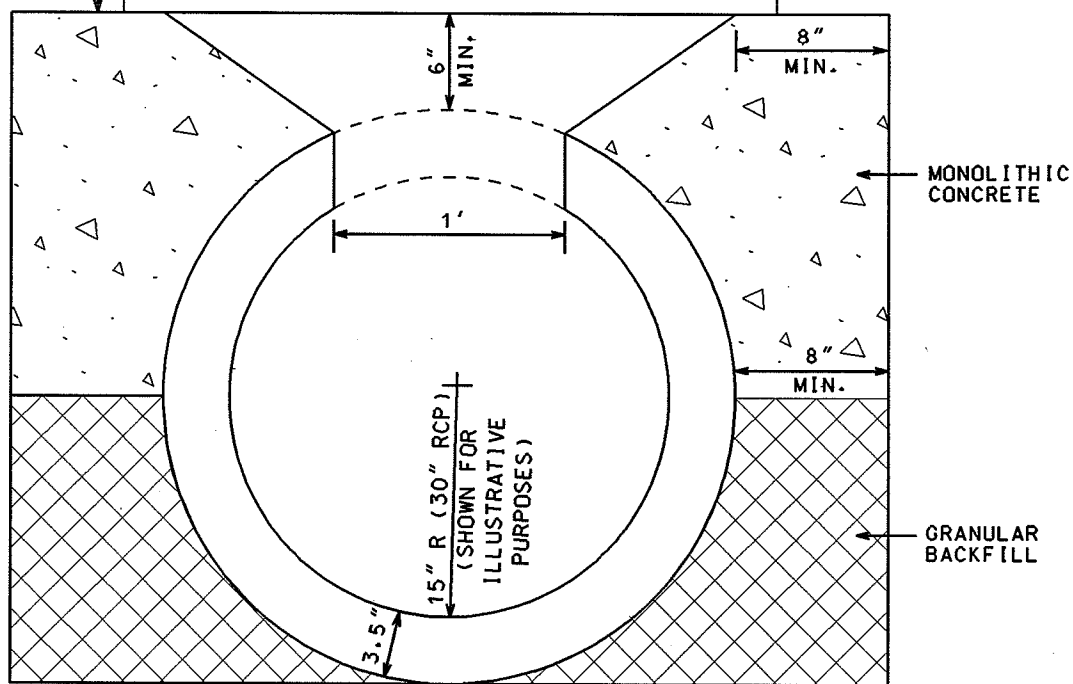
TYPE "H" INLET

STANDARD DETAIL DRAWING 5.7.7

3" MIN. - 8" MAX. OF ADJUSTING RINGS SHALL BE ALLOWED UNLESS NOTED IN PLAN SET

R-3067 (TYPICAL)

SEALING OF RINGS SHALL BE PER STANDARD DETAIL DRAWING 5.7.7



TO BE USED ON PIPES OR BOXES WHERE THE O.D. OF THE THROUGH PIPE IS LESS THAN OR EQUAL TO 4'-4".

2004

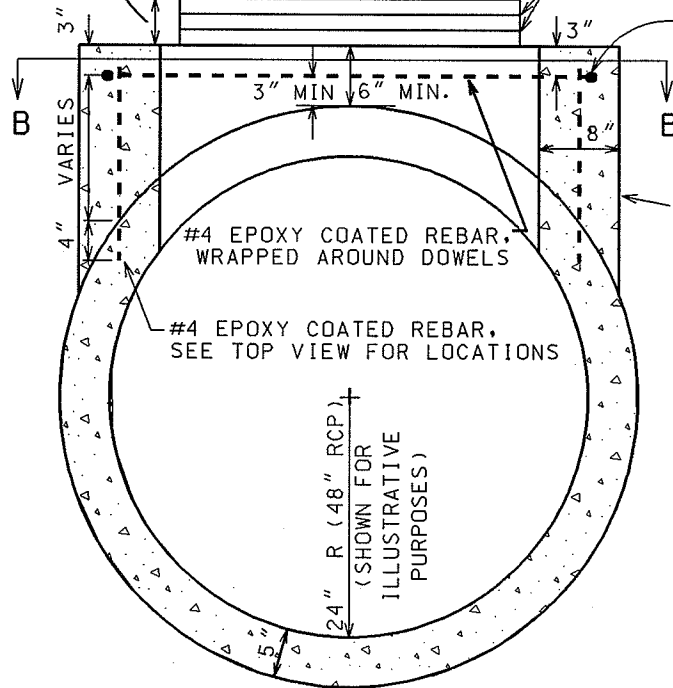
CITY OF MADISON ENGINEERING DIVISION
MADISON STANDARD SADDLED INLET TYPE I
STANDARD DETAIL DRAWING 5.7.8

3" MIN. - 8" MAX. OF ADJUSTING RINGS SHALL BE ALLOWED UNLESS NOTED IN PLAN SET

R-3067 (TYPICAL)

SEALING OF RINGS SHALL BE PER STANDARD DETAIL DRAWING 5.7.7

ADDITIONAL LONGITUDINAL REBAR ON 8" CENTER AS INLET DEPTH INCREASES

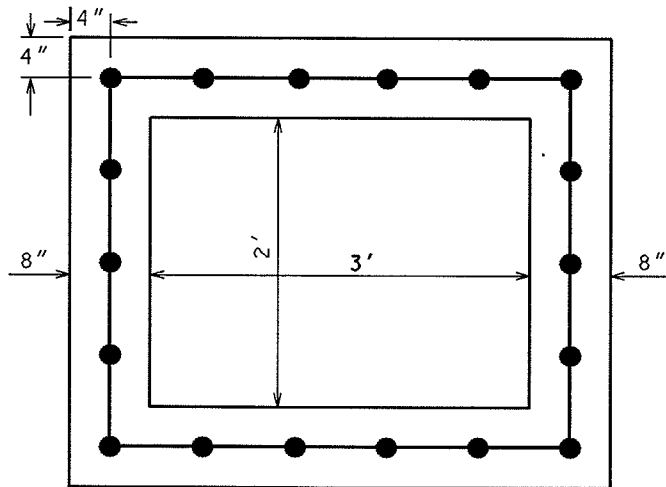


8" THICK MONOLITHIC CONCRETE WITH DOWELS AND REINFORCEMENT AS NOTED.

#4 EPOXY COATED REBAR, WRAPPED AROUND DOWELS

#4 EPOXY COATED REBAR, SEE TOP VIEW FOR LOCATIONS

24" R (48" RCP)
(SHOWN FOR ILLUSTRATIVE PURPOSES)



SECTION B - B

2004

CITY OF MADISON
ENGINEERING DIVISION

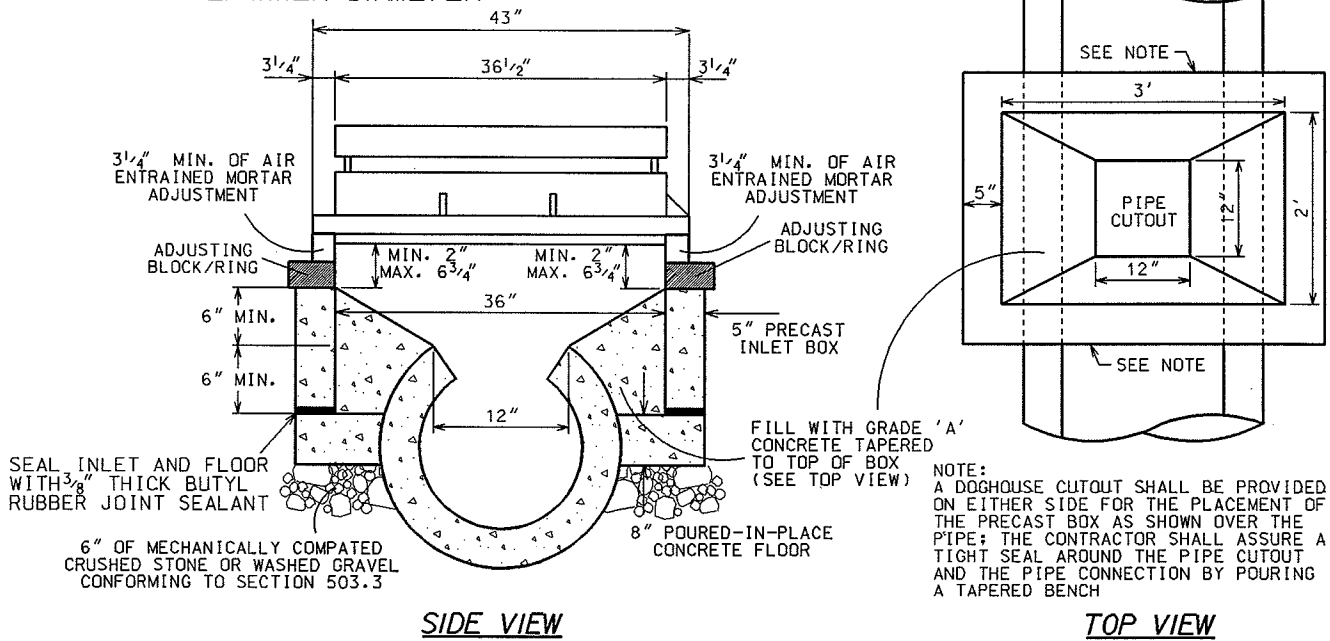
MADISON STANDARD
SADDLED INLET
TYPE II

STANDARD DETAIL DRAWING 5.7.9

TO BE USED ON PIPES OR BOXES WHERE THE O.D. OF THE PIPE OR BOX IS GREATER THAN 4'-4".

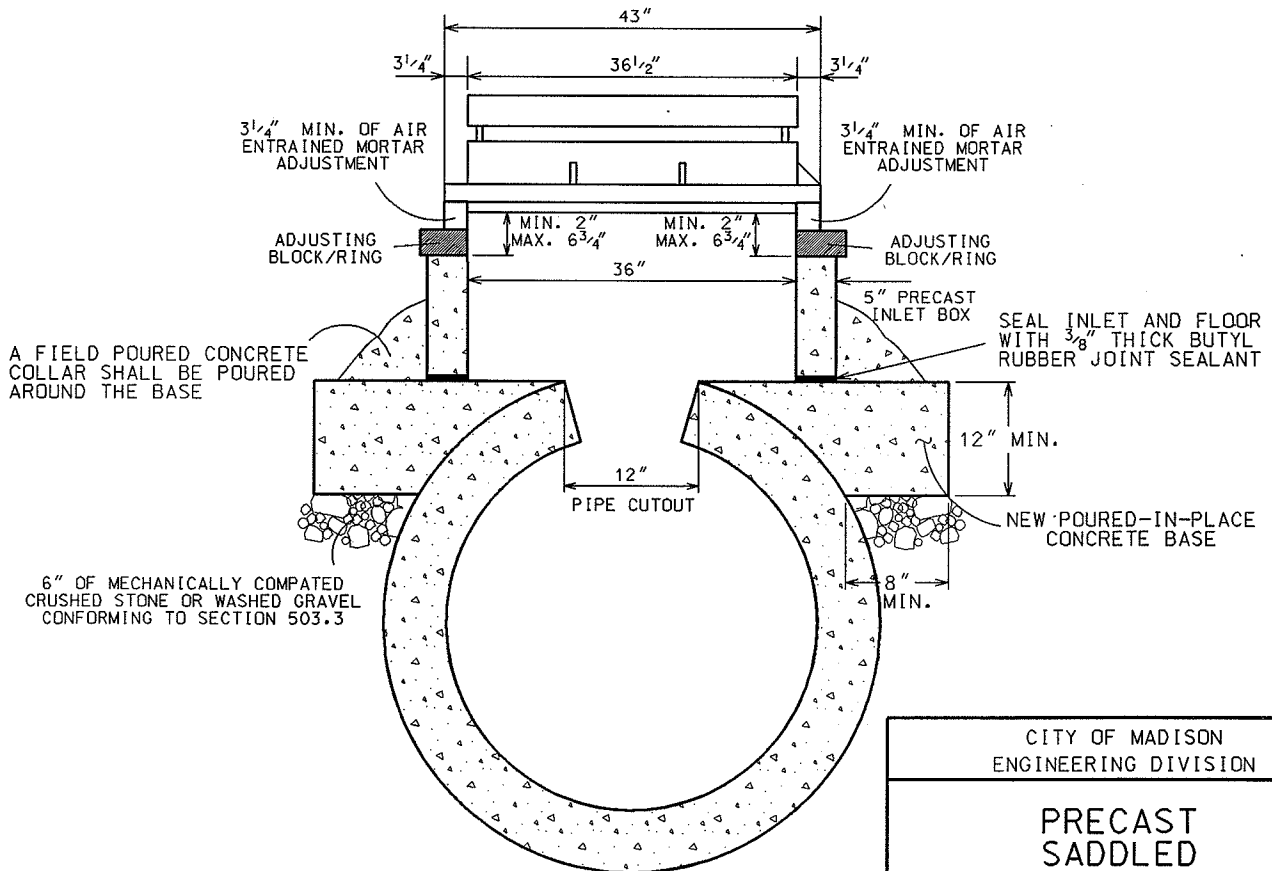
TYPE A

FOR PIPES WITH DIAMETER LESS THAN OR EQUAL TO 27" INNER DIAMETER



TYPE B

FOR PIPES WITH DIAMETER GREATER THAN 27" INNER DIAMETER



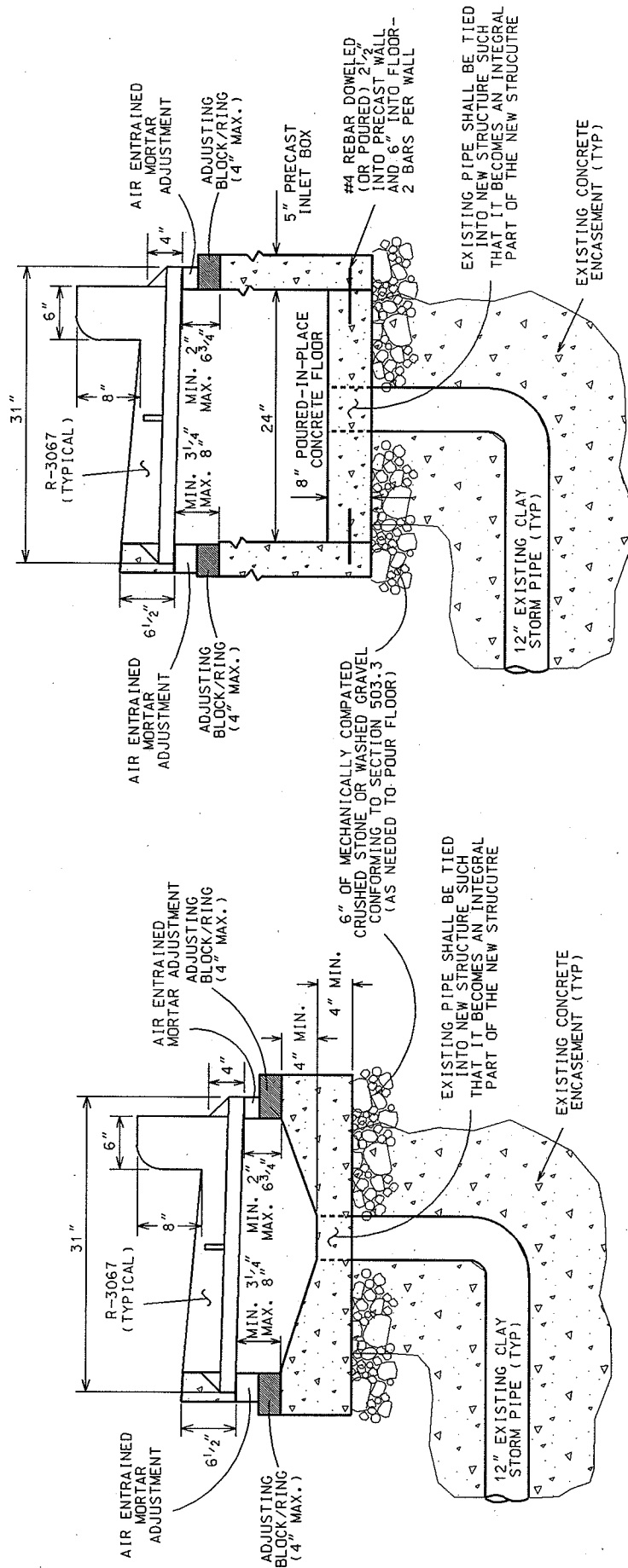
2004

CITY OF MADISON
ENGINEERING DIVISION

**PRECAST
SADDLED
INLET**

DRAWING NOT TO SCALE

STANDARD DETAIL DRAWING 5.7.10



FIELD POUR OPTION

PRECAST OPTION

DESIGN OPTIONS:

- (1) FIELD POUR - PER THE DESIGN IN THE DETAIL DRAWING, THE MINIMUM DEPTH FOR THE FIELD POUR OPTION SHALL BE 19" (4" WALL + 2" MORTAR ADJUSTMENT + 13" CASTING) WITH AN ADDITIONAL MINIMUM 4" OF EXCAVATION REQUIRED FOR THE FLOOR.
- (2) PRECAST - PER THE DESIGN IN THE DETAIL DRAWING, THE MINIMUM DEPTH FOR THE PRECAST OPTION SHALL BE 19" (12" INLET WALL - 8" FLOOR + 2" MORTAR ADJUSTMENT + 13" CASTING) WITH AN ADDITIONAL MINIMUM OF 8" OF EXCAVATION REQUIRED FOR THE FLOOR.
- (3) FIELD STACKED - THE DESIGN CONSISTS OF AN 8" FIELD Poured Concrete Floor, Stacked Adjustment Rings, Air Entrained Mortar Adjustment, and H Casting. THE MINIMUM DEPTH FOR THE STACKED OPTION SHALL BE 17" (2" ADJUSTMENT RING, 2" MORTAR ADJUSTMENT, 13" CASTING). THE MAXIMUM DEPTH SHALL BE 19" (4" ADJUSTMENT RINGS, 2" MORTAR ADJUSTMENT, 13" CASTING)

GENERAL NOTES:

- (1) REMOVE EXISTING INLET AND CLAY PIPE TO A STABLE LOCATION
- (2) REMOVE MATERIAL SURROUNDING PIPE TO A DEPTH OF FOURTEEN (14) INCHES BEYOND THE STABLE LOCATION REFERRED TO ABOVE
- (3) INSTALL NEW INLET CASTING ADJUSTMENTS.
- (4) IF TO FIND A STABLE PIPE LOCATION, THE EXISTING PIPE IS REMOVED BEYOND THE ELBOW, THE RECONSTRUCT TUB INLET SPECIFICATION IS NO LONGER APPLICABLE. THE RELEVANT ITEMS BECOME REMOVE INLET AND REPLACE WITH TYPE 'H' INLET.

DRAWINGS NOT TO SCALE

CITY OF MADISON
ENGINEERING DIVISION

**RECONSTRUCT
TUB INLET**

STANDARD DETAIL DRAWING 5.7.11

ROAD

EDGE OF GUTTER

FACE OF CURB

SECTION 2

2' OUTSIDE RADIUS - TAPER CURB FROM 6" TO 4.5" @ STRUCTURE

SECTION 1

SECTION 1

4.25"

4'-6.75"

SECTION 2

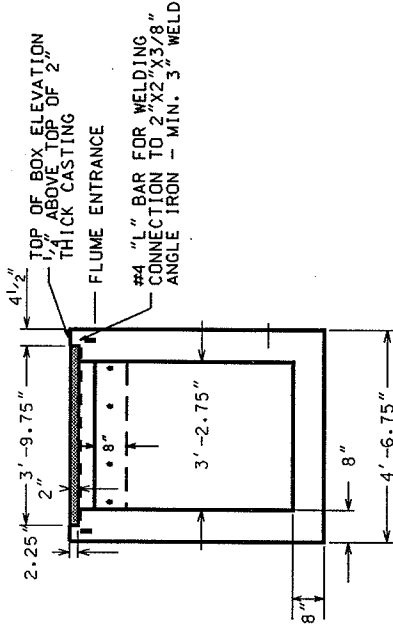
SECTION 2

2 EACH (GRATE ONLY) MEEENAH COMPONENT NUMBER 38080005

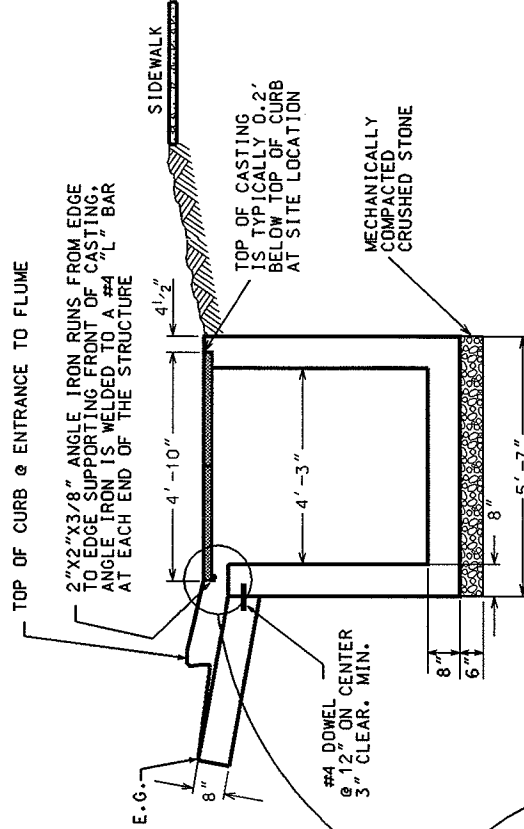
5'-7"

STRUCTURE

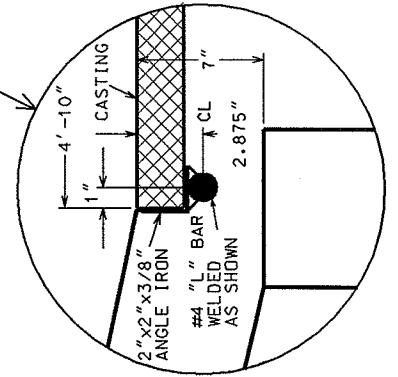
PLAN VIEW



SECTION 1

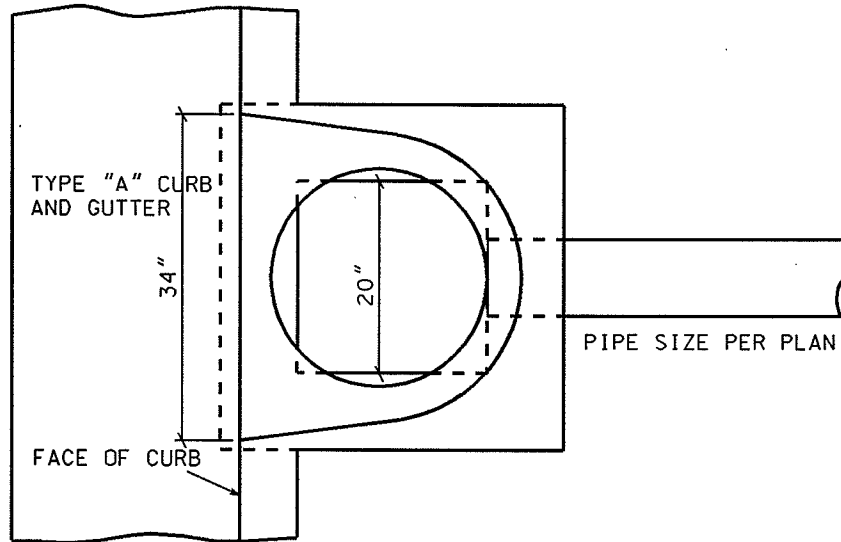


SECTION 2

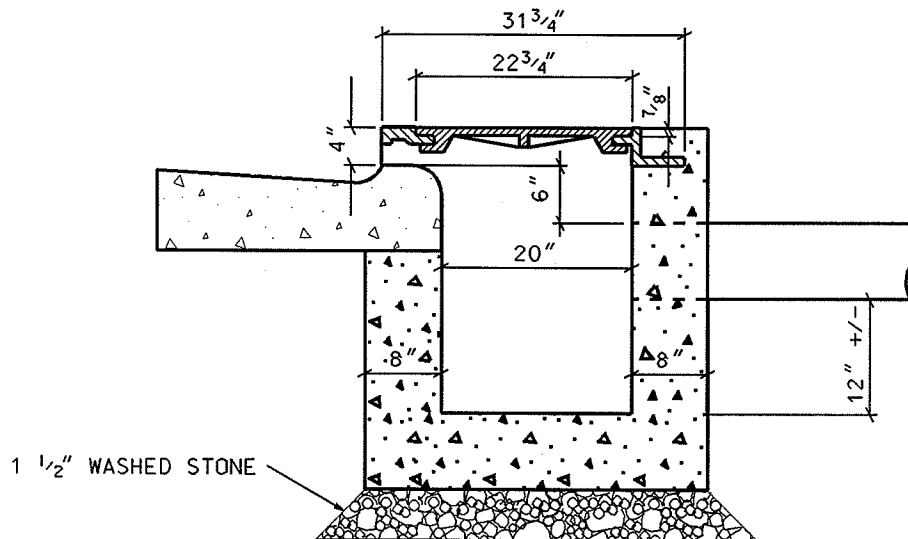


2004

CITY OF MADISON ENGINEERING DIVISION
TERRACE INLET
STANDARD DETAIL DRAWING 5.7.12



TOP VIEW



SIDE VIEW

NOTES:

- 1) TYPICAL LOCATION FOR INCOMING PIPE SHOWN. ALTERNATE INCOMING LOCATIONS FROM EITHER SIDE
- 2) CURB OUTLET STRUCTURE FRAME AND LID ARE NEENAH CASTING R-3331
- 3) MAY SUBSTITUTE PRECAST, ROUND CONCRETE STRUCTURE FOR THE SPECIFIED BOX STRUCTURE, WITH A FIELD POURED CONCRETE FLOOR.

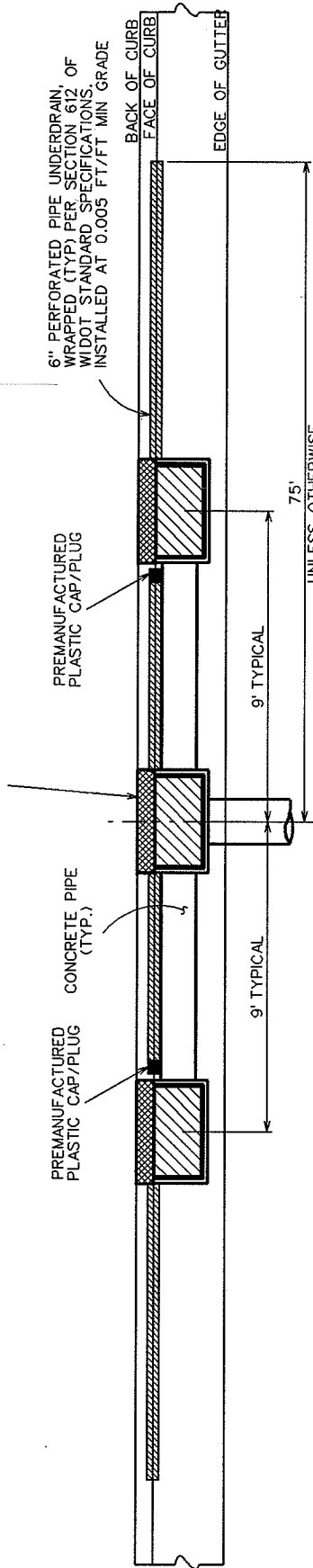
2004

CITY OF MADISON
ENGINEERING DIVISION

CURB OUTLET
STRUCTURE

STANDARD DETAIL DRAWING 5.7.13

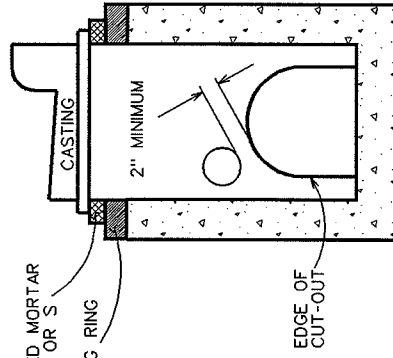
NOTE:
ATTACHMENT TO REAR OF INLET IS
SATISFACTORY IF PIPE SIZE RESTRICTS
SPACE FOR UNDERDRAIN CORE.



NOTE:
WHERE MULTIPLE INLETS ARE USED AT LOW POINTS, PERFORATED
PIPE UNDERDRAIN SHALL BE INSTALLED 75 FEET TO EITHER DIRECTION
FROM THE LOW POINT AT A MINIMUM POSITIVE GRADE OF 0.005 FT/FT.
THE SECTION OF UNDERDRAIN BETWEEN THE CENTER AND OUTER INLETS
SHALL BE PLACED TIGHT TO THE OUTER INLET, CAPPED WITH A
PREMANUFACTURED PLASTIC CAP OR PLUG, AND LAID AS SPECIFIED ABOVE
TO THE CENTER INLET.

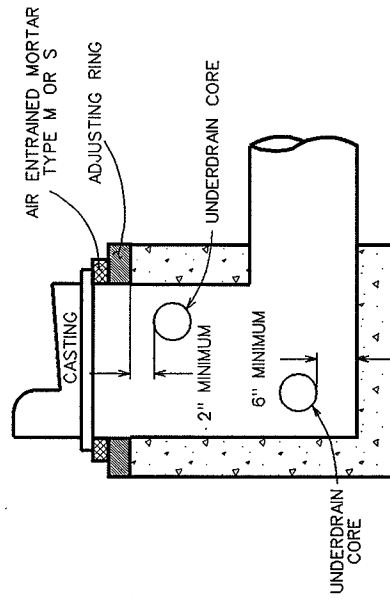
UNLESS OTHERWISE
SPECIFIED BY THE ENGINEER

TOP VIEW
TYPICAL TRIPLE INLET
CONFIGURATION WITH UNDERDRAIN



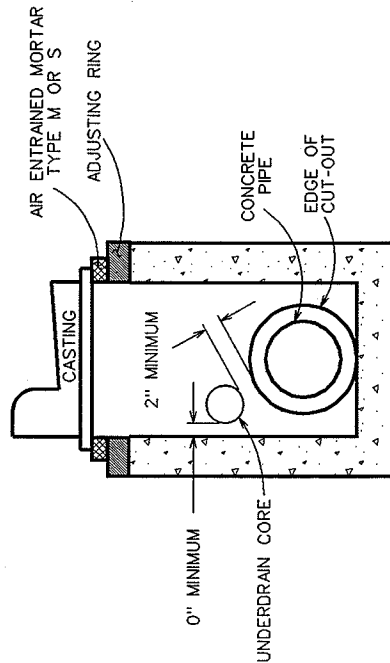
NOTE:
WHERE 'DOG HOUSES' ARE USED CORE
HOLES SHALL NOT BE INSTALLED IN THE
'DOG HOUSE' AND SHALL BE INSTALLED
2' OUTSIDE THE 'DOG HOUSE'.

CROSS-SECTION VIEW
TYPICAL 'DOG HOUSE'
INLET CONFIGURATION



NOTE:
(1) BOTTOM OF CORE PLACED A MINIMUM
OF 6" ABOVE THE FLOOR OF THE INLET.
(2) TOP OF CORE HOLES WILL BE A MINIMUM
OF 2" BELOW THE TOP OF THE INLET
STRUCTURES (BOTTOM OF RINGS)
(3) DRAIN TILES SHALL NOT BE ALLOWED IN
THE RING OF THE STRUCTURE OF INLETS
OR SEWER ACCESS STRUCTURES

CROSS-SECTION VIEW
TYPICAL INLET CONFIGURATION
WITH UNDERDRAIN CORED
INTO WALL WITH NO PIPE



NOTE:
(1) CORE HOLES SHALL PROVIDE FOR A
MINIMUM OF 2" OF CONCRETE BETWEEN
THE CUTOUT FOR A CONCRETE PIPE AND
THE EDGE OF THE CORE HOLE.
(2) CORE HOLES MAY HAVE 0" CLEARANCE
FROM THE INSIDE WALLS OF A STRUCTURE.

CROSS-SECTION VIEW
TYPICAL INLET IN SUMP
CONDITION WITH
UNDERDRAIN CORED
INTO WALL WITH PIPE

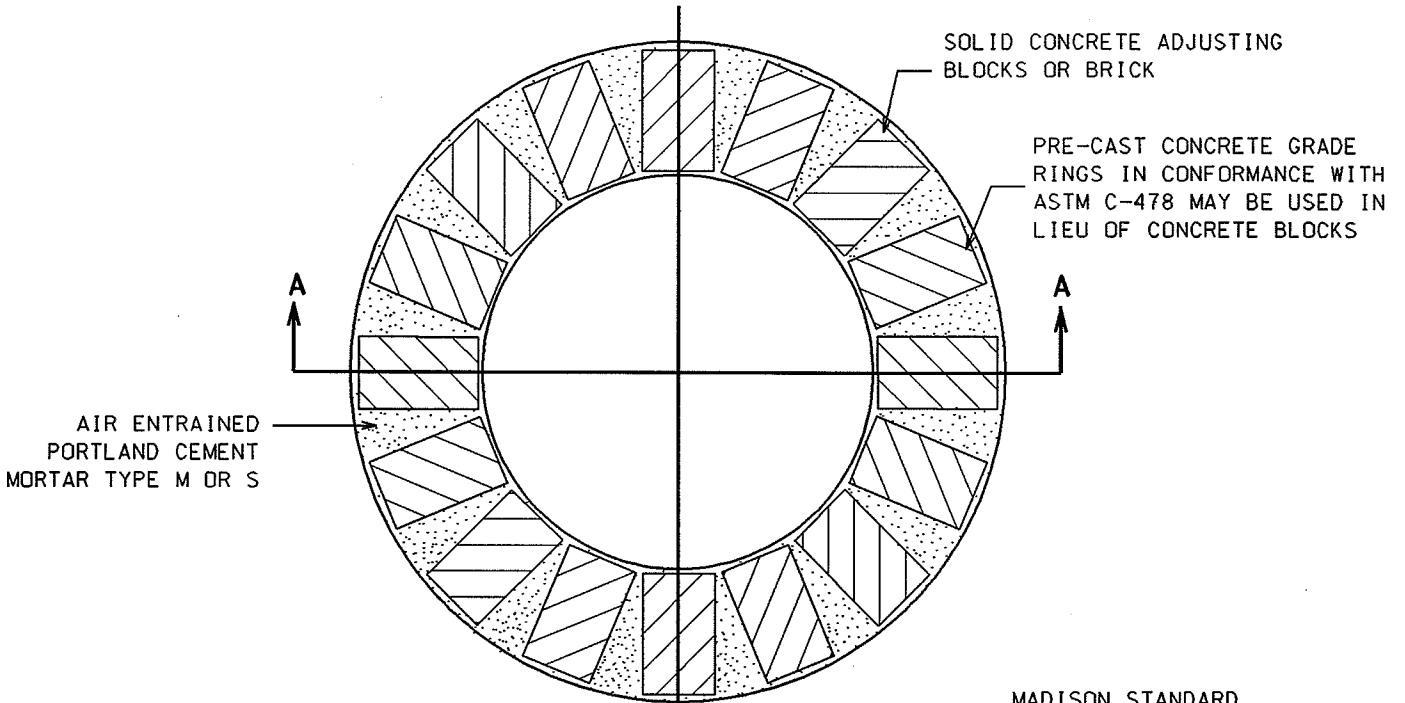
2004

CITY OF MADISON
ENGINEERING DIVISION

UNDERDRAIN

DRAWING NOT TO SCALE

STANDARD DETAIL DRAWING 5.7.14



SOLID CONCRETE ADJUSTING
BLOCKS OR BRICK

PRE-CAST CONCRETE GRADE
RINGS IN CONFORMANCE WITH
ASTM C-478 MAY BE USED IN
LIEU OF CONCRETE BLOCKS

AIR ENTRAINED
PORTLAND CEMENT
MORTAR TYPE M OR S

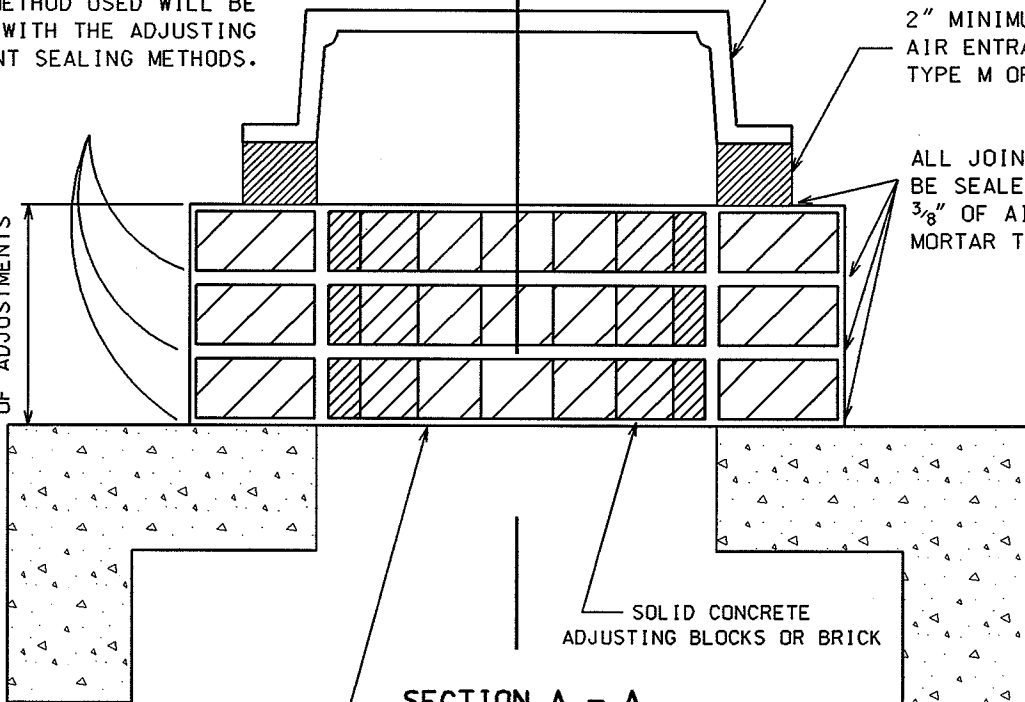
THE OUTSIDE OF ADJUSTING
RINGS SHALL BE SEALED WITH
A 1/2" THICK, AIR ENTRAINED
MORTAR TYPE M OR S SEAL.
THE METHOD USED WILL BE
COMPATIBLE WITH THE ADJUSTING
RING JOINT SEALING METHODS.

MADISON STANDARD
MACHINED CAST IRON
ACCESS STRUCTURE COVER

2" MINIMUM BED OF
AIR ENTRAINED MORTAR
TYPE M OR S

ALL JOINTS SHALL
BE SEALED WITH
3/8" OF AIR ENTRAINED
MORTAR TYPE M OR S.

MIN. 3" / MAX. 9"
OF ADJUSTMENTS



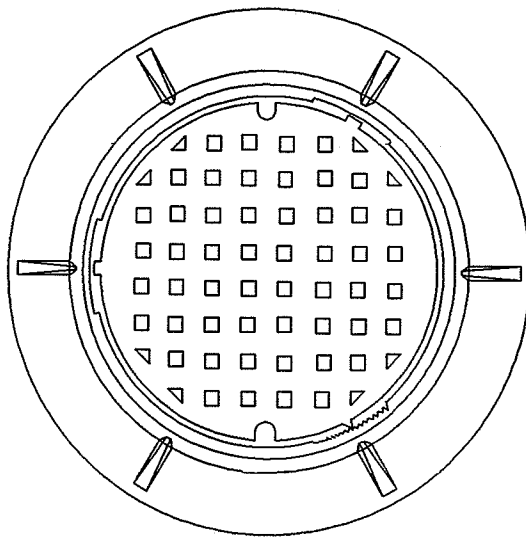
SOLID CONCRETE
ADJUSTING BLOCKS OR BRICK

SECTION A - A

PRE-CAST CONCRETE GRADE
RINGS IN CONFORMANCE WITH
ASTM C-478 MAY BE USED IN
LIEU OF CONCRETE BLOCKS

2004

CITY OF MADISON ENGINEERING DIVISION
SAS CHIMNEY AND CASTING
STANDARD DETAIL DRAWING 5.7.15



NOTES:

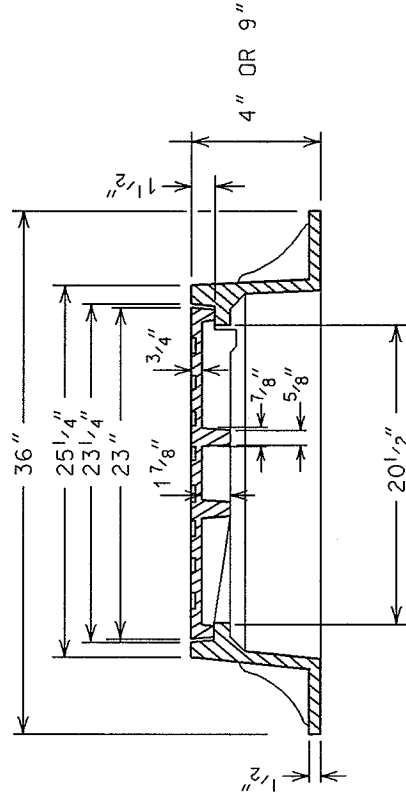
1. FRAME AND COVER SHALL BE MACHINED AND FITTED SO THAT ROCKING AND CHATTERING WILL BE ELIMINATED.
2. ALL LIDS SHALL BE SELF-SEALING EXCEPT FOR STORM SEWER.

APPROXIMATE TOTAL WEIGHTS:

R-1550, 9" FRAME AND LID = 238 LBS.
 R-1689, 4" FRAME AND LID = 272 LBS.
 R-1920, 83/4" FRAME AND LID = 300 LBS.

THE FOLLOWING NEEHAH FOUNDRY CASTINGS (OR EQUAL CASTINGS) SHALL BE ACCEPTABLE:

1. A) R-1550, 9" NON-ROCKING ACCESS STRUCTURE FRAME.
 B) R-1550 TYPE 'B' NON-ROCKING ACCESS STRUCTURE LIDS ONLY WITH CONCEALED PICK HOLES.
2. A) R-1689, 4" NON-ROCKING ACCESS STRUCTURE FRAME (WHEN REQUESTED BY THE CITY CONSTRUCTION ENGINEER).
 B) R-1689 TYPE 'B' NON-ROCKING ACCESS STRUCTURE LIDS ONLY WITH CONCEALED PICK HOLES.
3. R-1920, 83/4" ACCESS STRUCTURE FRAME WITH LOCKING LID, TYPE 'F' LOCKS, AND CONCEALED PICK HOLES. TO BE USED IN GREENWAYS AND EASEMENTS.

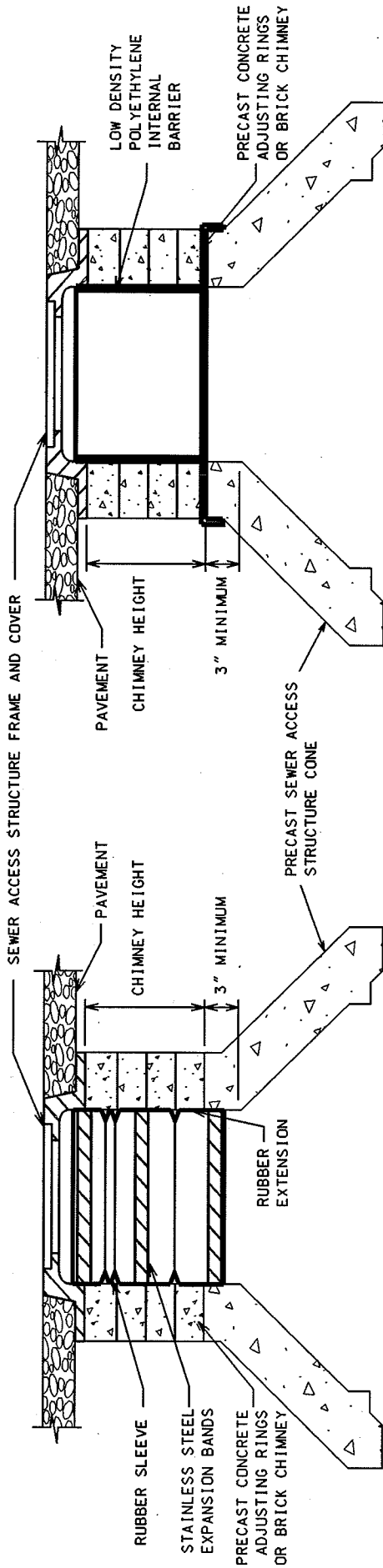


2004

CITY OF MADISON
 ENGINEERING DIVISION

SAS FRAME & COVER

STANDARD DETAIL DRAWING 5.7.16



FLEXIBLE INTERNAL RUBBER SLEEVE

LOW DENSITY POLYETHYLENE INTERNAL BARRIER

AN INTERNAL CHIMNEY SEAL WHERE NEEDED, SHALL BE INSTALLED TO COVER THE ENTIRE CHIMNEY AREA IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. FRAME SEALS SHALL CONSIST OF ONE OF THE FOLLOWING TYPES OF INTERNAL SEALS:

1) FLEXIBLE INTERNAL RUBBER SLEEVE

A FLEXIBLE INTERNAL RUBBER SLEEVE, INTERLOCKING EXTENSIONS AND STAINLESS STEEL EXPANSION BANDS AS MANUFACTURED BY CRETEX SPECIALTY PRODUCTS OR AN APPROVED EQUAL CONFORMING TO THE FOLLOWING REQUIREMENTS.

THE SEAL SHALL REMAIN FLEXIBLE THROUGHOUT A 25 YEAR DESIGN LIFE, ALLOWING REPEATED VERTICAL MOVEMENT OF THE FRAME OF NOT LESS THAN 2 INCHES AND/OR REPEATED HORIZONTAL MOVEMENTS OF NOT LESS THAN 1/2 INCH. THE SLEEVE PORTION OF THE SEAL SHALL BE EITHER DOUBLE OR TRIPLE PLEATED WITH A MINIMUM UNEXPANDED VERTICAL HEIGHT OF EITHER 8 INCHES OR 10 INCHES, RESPECTIVELY. THE SLEEVE AND EXTENSION SHALL HAVE A MINIMUM THICKNESS OF 3/16 INCHES AND SHALL BE MADE FROM A HIGH QUALITY RUBBER COMPOUND CONFORMING TO THE APPLICABLE REQUIREMENTS OF ASTM C-923, WITH A MINIMUM 1500 PSI TENSILE STRENGTH, A MAXIMUM 18% COMPRESSION SET AND A HARDNESS (DUROMETER) OF 48 +/- . THE BANDS SHALL BE FABRICATED FROM 16 GAUGE STAINLESS STEEL CONFORMING TO ASTM A-240, TYPE 304 AND SHALL HAVE A MINIMUM ADJUSTMENT RANGE OF 2 DIAMETER INCHES AND A POSITIVE LOCKING MECHANISM. ANY SCREWS, BOLTS OR NUTS USED FOR THIS MECHANISM SHALL BE STAINLESS STEEL CONFORMING TO ASTM F-593 AND 594, TYPE 304.

2) LOW DENSITY POLYETHYLENE INTERNAL BARRIER

A LOW DENSITY POLYETHYLENE INTERNAL BARRIER SHALL MAINTAIN THEIR ADHESION ALLOWING REPEATED HORIZONTAL MOVEMENT OF NOT LESS THAN 1 INCH. THE BARRIER SHALL HAVE A MINIMUM THICKNESS OF 1/4 INCH AND CONFORM TO THE REQUIREMENTS OF THE FOLLOWING STANDARDS:

ASTM D 790/1505, D 1238, D 638, D 790, D 648 AND D 1693.

INTERNAL CHIMNEY SEALS SHALL BE USED ON ALL SANITARY SEWER ACCESS STRUCTURES AT THE FOLLOWING LOCATIONS:

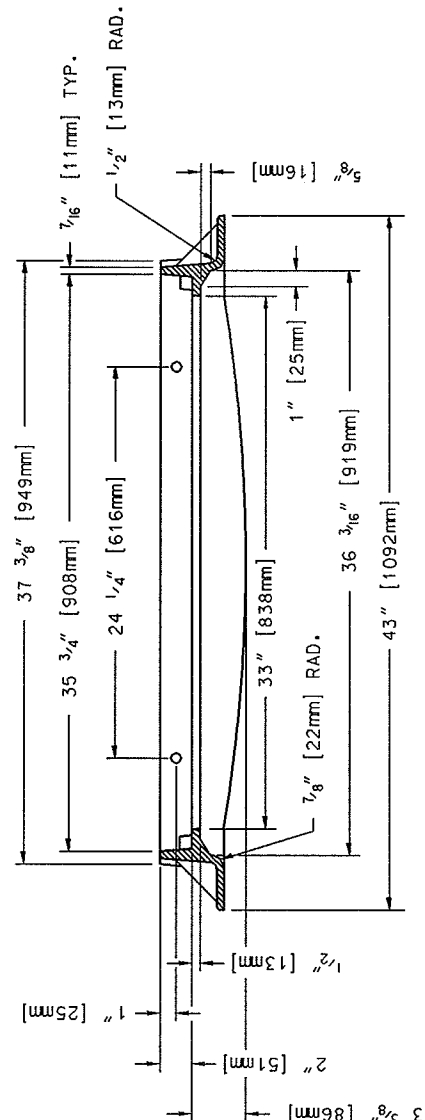
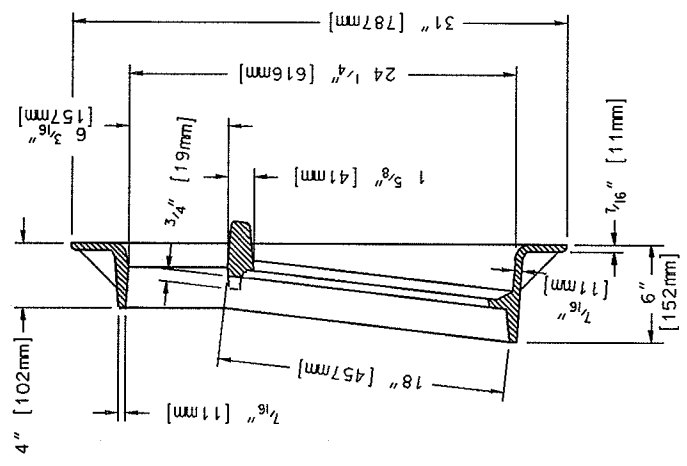
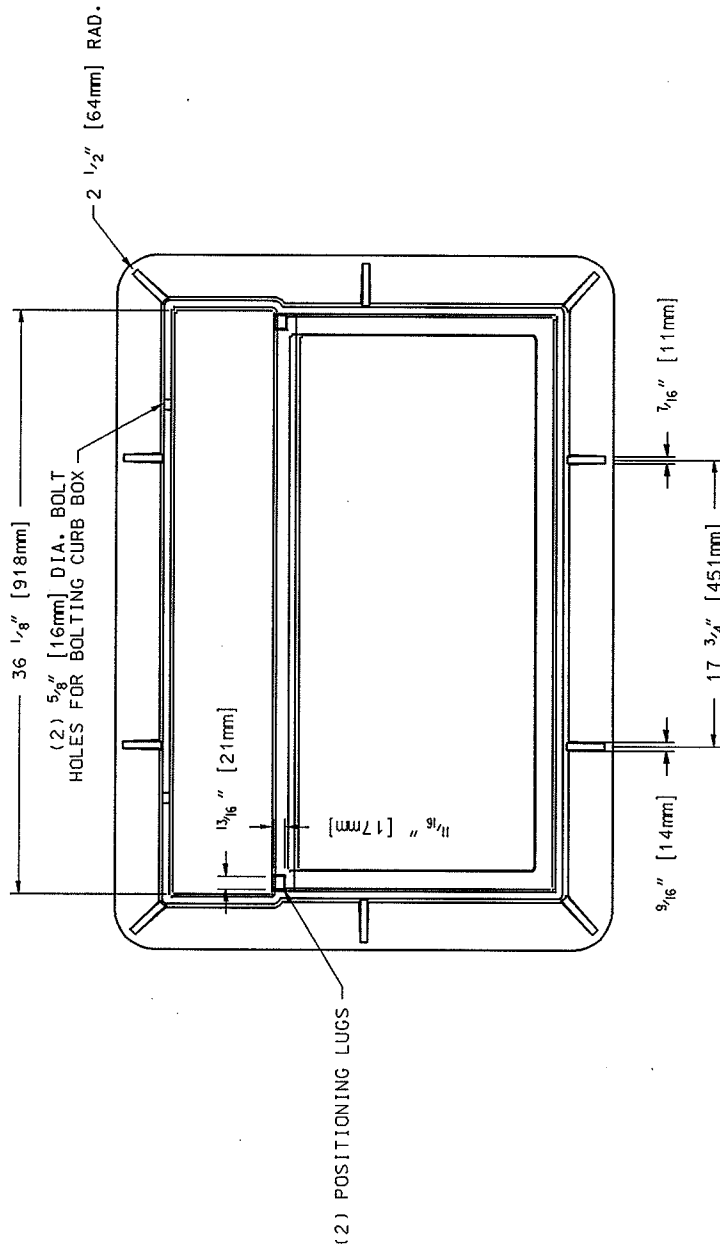
- 1) WITHIN 100' OF A STREET LOW POINT
- 2) ALL GREENWAYS
- 3) WHERE SPECIFIED BY THE ENGINEER

2004

CITY OF MADISON
ENGINEERING DIVISION

SAS INTERNAL
CHIMNEY SEAL

STANDARD DETAIL DRAWING 5.7.17



NOTES: ALL DIMENSIONS ARE SHOWN IN ENGLISH AND [METRIC].
 ALL DRAFT ANGLES ARE 5° UNLESS OTHERWISE SHOWN.
 MATERIAL: CAST GRAY IRON ASTM A-48, CLASS 35B
 FINISH: NOT PAINTED
 WEIGHT: APPROX. 207#

NEENAH FOUNDRY CASTINGS

1. R-3067 CURB INLET FRAME WITH DIAGONAL GRATE (TYPE R) SHALL BE USED FOR TYPE "H" INLETS AT ALL LOW POINTS AND WHERE LONGITUDINAL ROAD SLOPE IS LESS THAN 1%. GRATE PER STANDARD DETAIL DRAWING 5.7.20
2. R-3067-V CURB INLET FRAME WITH VANE GRATE (TYPE V) SHALL BE USED FOR "H" INLETS AT ALL LOCATIONS HAVING A LONGITUDINAL ROAD SLOPE EQUAL TO OR GREATER THAN 1%. GRATE PER STANDARD DETAIL DRAWING 5.7.21

NOTE: ALL DIMENSIONS ARE SHOWN IN ENGLISH AND [METRIC].

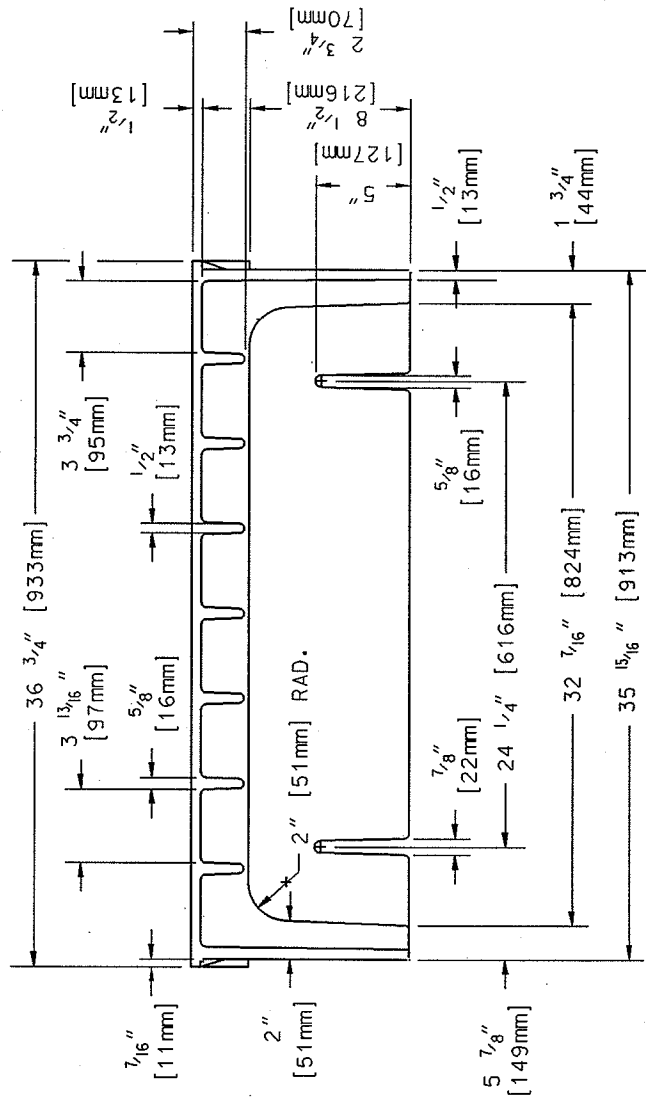
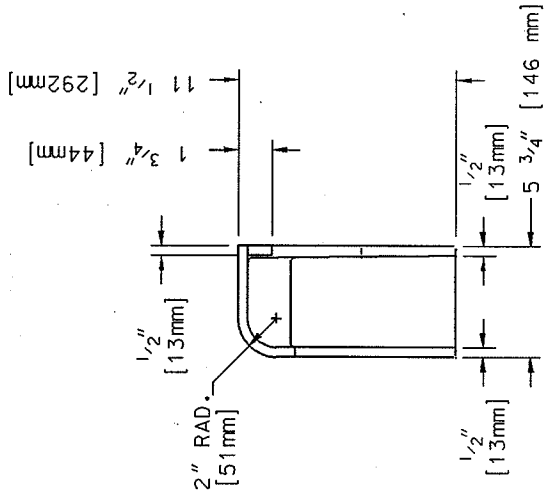
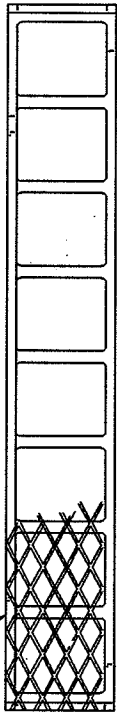
2004

CITY OF MADISON ENGINEERING DIVISION
R-3067 FRAME
STANDARD DETAIL DRAWING 5.7.18

GENERAL NOTES:

1. DETAILS OF CONSTRUCTION, MATERIALS, AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.
2. DETAIL DRAWINGS FOR PROPOSED ALTERNATE DESIGNS FOR INLET COVERS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PROVIDING THAT SUCH ALTERNATE DESIGNS MAKE PROVISION FOR EQUIVALENT CAPACITY AND STRENGTH.
3. ROUND FRAMES AND COVERS SHALL HAVE CONTINUOUSLY MACHINED BALL BEARING SURFACES TO PREVENT ROCKING AND RATTLING.
4. ACTUAL WEIGHT OF COVERS MAY VARY WITHIN 5 PERCENT (PLUS OR MINUS) OF THE APPROXIMATE WEIGHT.
5. INLETS SHALL BE DEPRESSED IN THE CURB FLOW LINE. SEE MADISON STANDARD DETAIL DRAWING 5.7.7

TYPE "C"
CHECKERED
TOP DESIGN



NOTE: CURB BOX HEIGHT ADJUSTABLE 6" TO 9" FOR BOTH COVER TYPES.

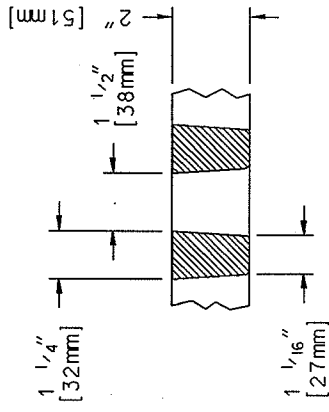
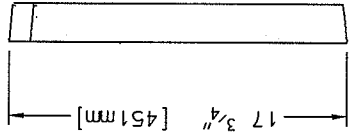
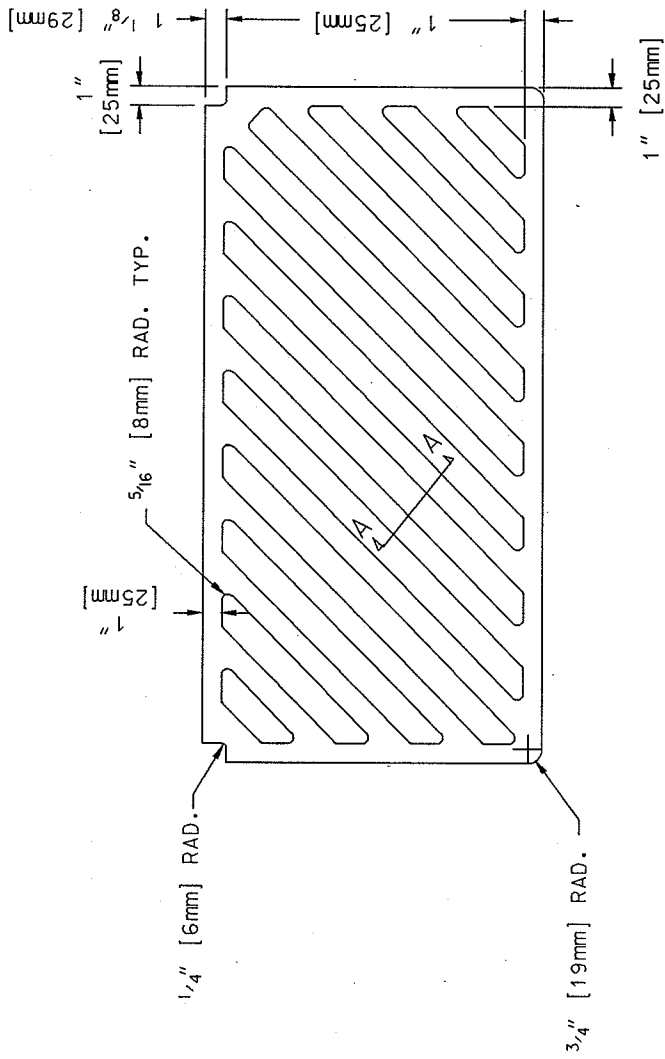
2004

CITY OF MADISON
ENGINEERING DIVISION

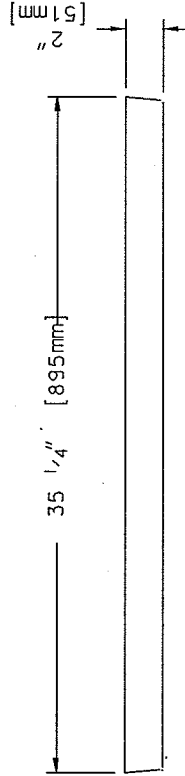
R-3067
CURB BOX

STANDARD DETAIL DRAWING 5.7.19

NOTE: ALL DIMENSIONS ARE SHOWN IN ENGLISH AND [METRIC].
MATERIAL: CAST GRAY IRON ASTM A-48, CLASS 35B
FINISH: NO PAINT
WEIGHT: 116#



SECTION A-A



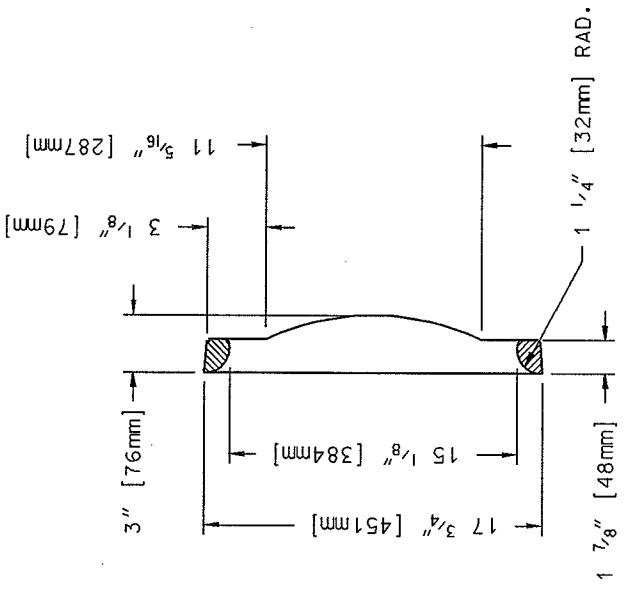
2004

CITY OF MADISON
ENGINEERING DIVISION

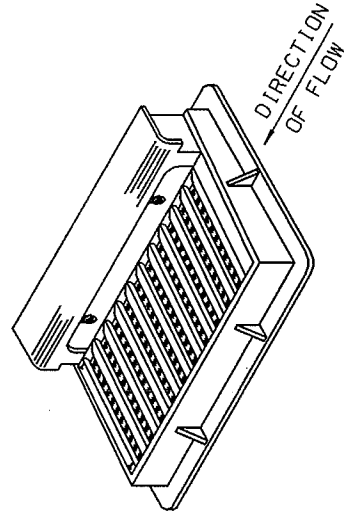
R-3067
TYPE R GRATE

STANDARD DETAIL DRAWING 5.7.20

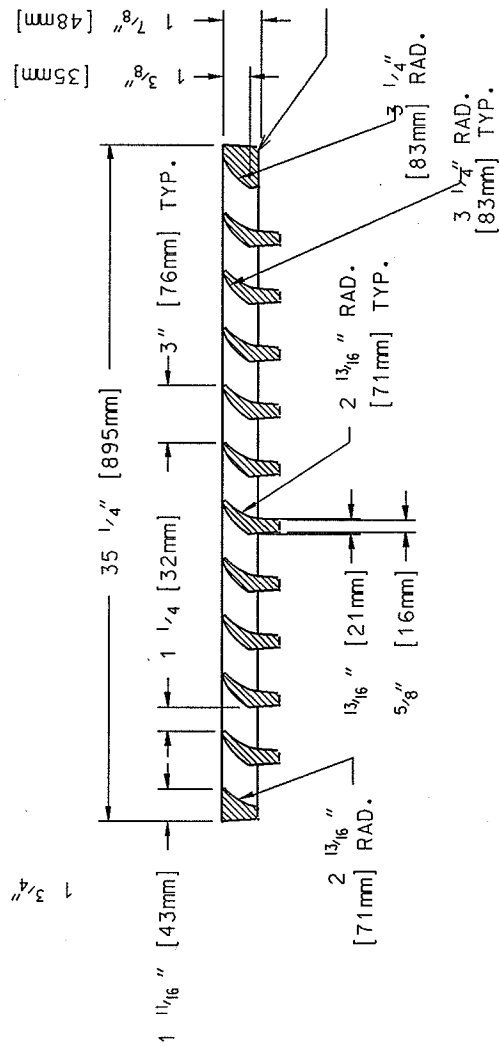
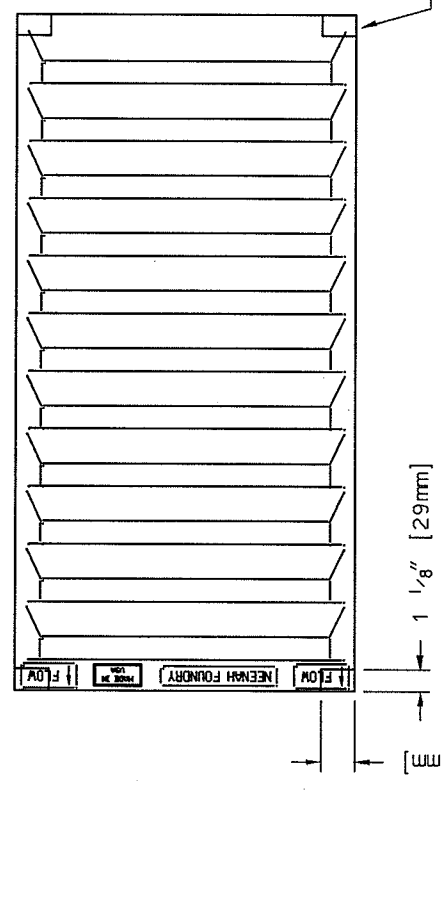
FREE OPEN AREA: 282 SQUARE INCHES
NOTE: ALL DIMENSIONS ARE SHOWN IN ENGLISH AND [METRIC].
MATERIAL: CAST GRAY IRON ASTM A-48, CLASS 35B
FINISH: NO PAINT
WEIGHT: 172#



(4) POSITION NOTCHES



RECESSED LETTERING:
COMPONENT NO. AND
HEAT DATE



FREE OPEN AREA = 347 SQUARE INCHES
 MATERIAL: CAST GRAY IRON ASTM A-48, CLASS 35B
 FINISH: NO PAINT
 WEIGHT: 132#

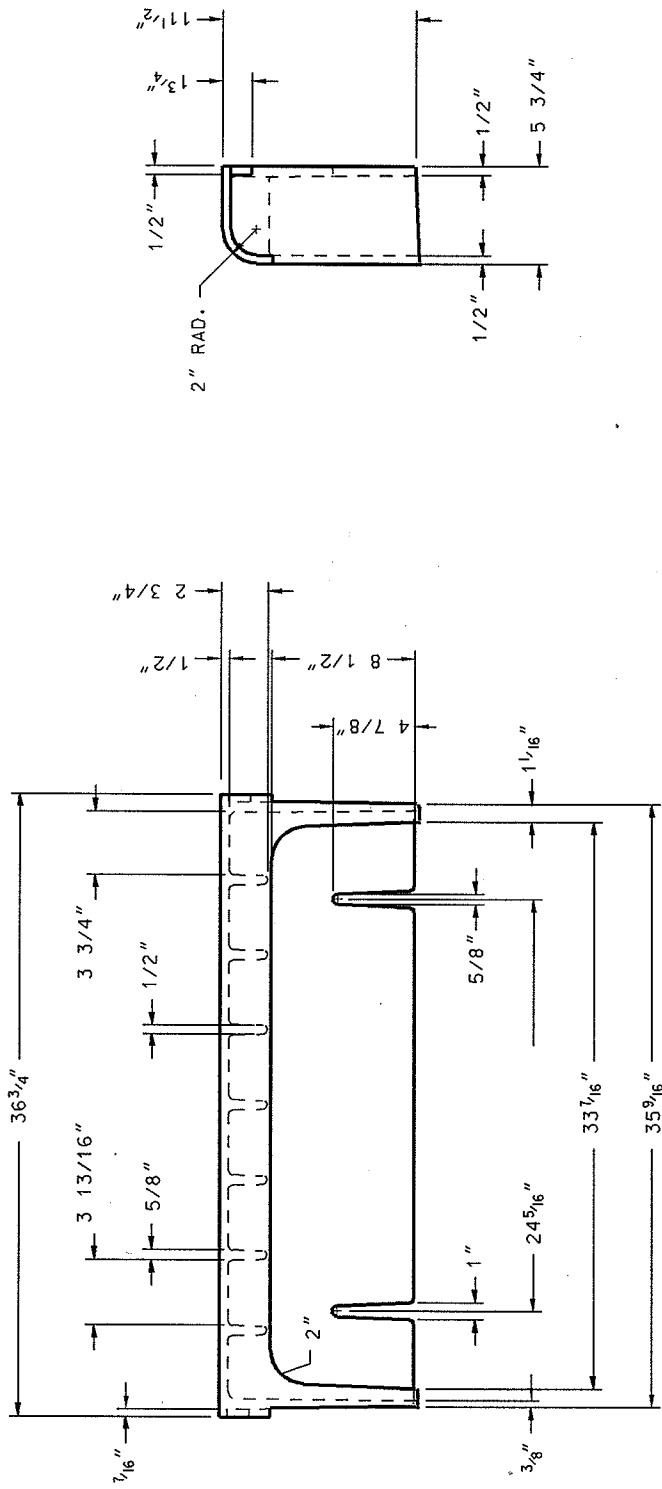
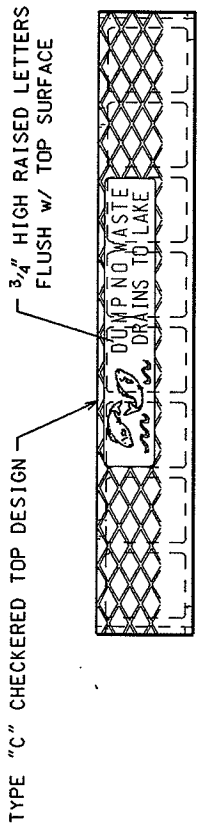
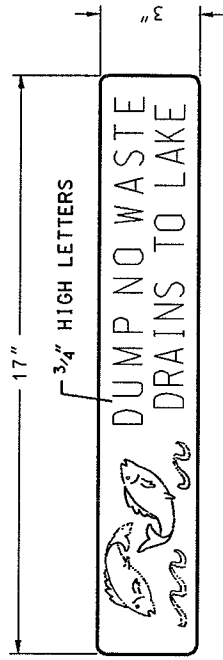
NOTE: GRATE IS REVERSIBLE. R-3067-V
 (LEFT FLOW) IS SHOWN IN DETAILS

CITY OF MADISON
 ENGINEERING DIVISION

R-3067
 TYPE V GRATE (VANE)

STANDARD DETAIL DRAWING 5.7.21

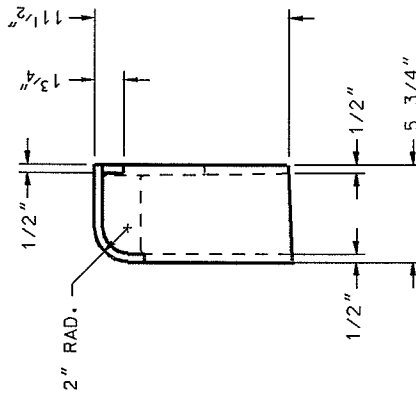
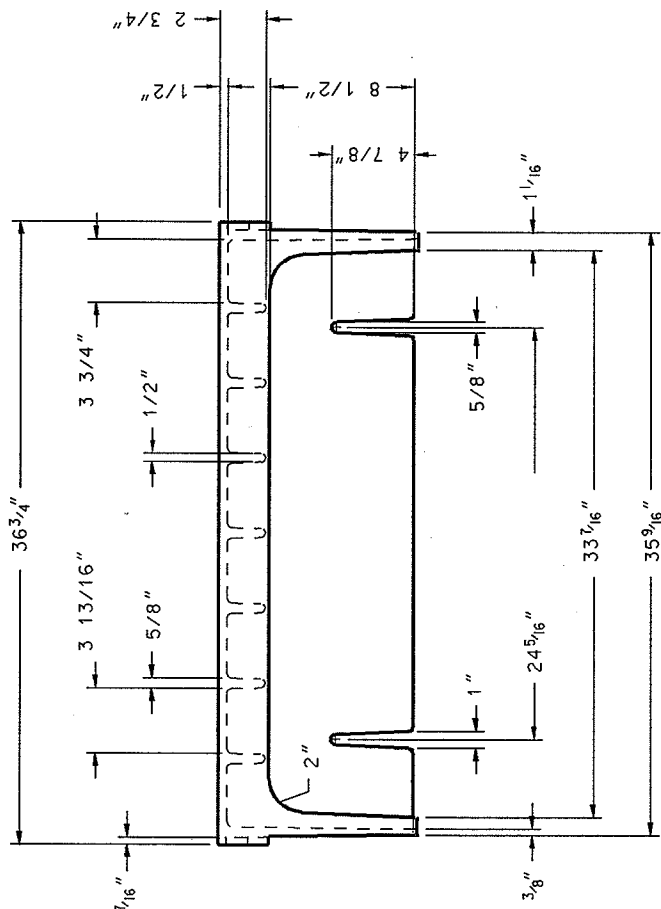
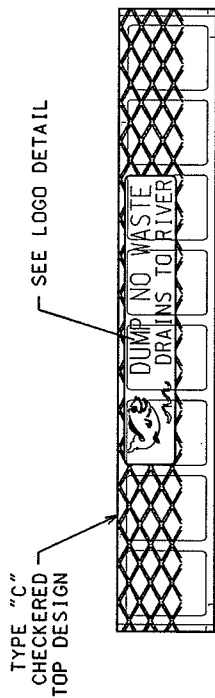
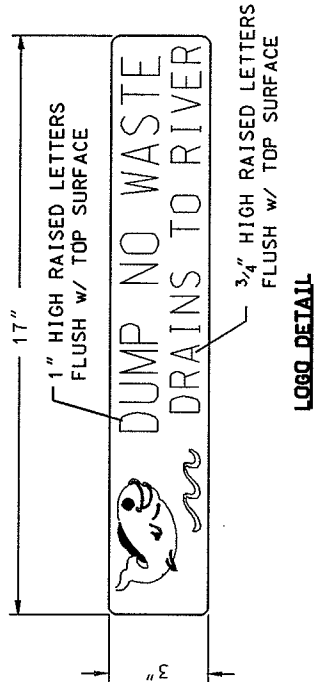
2004



2004

CITY OF MADISON ENGINEERING DIVISION
R-3067 EL CURB BOX
STANDARD DETAIL DRAWING 5.7.22

NEENAH FOUNDRY PRODUCT NUMBER 30677004
 MATERIAL: CAST GRAY IRON ASTM A-48, CLASS 35B
 FINISH: NO PAINT
 WEIGHT: 126#



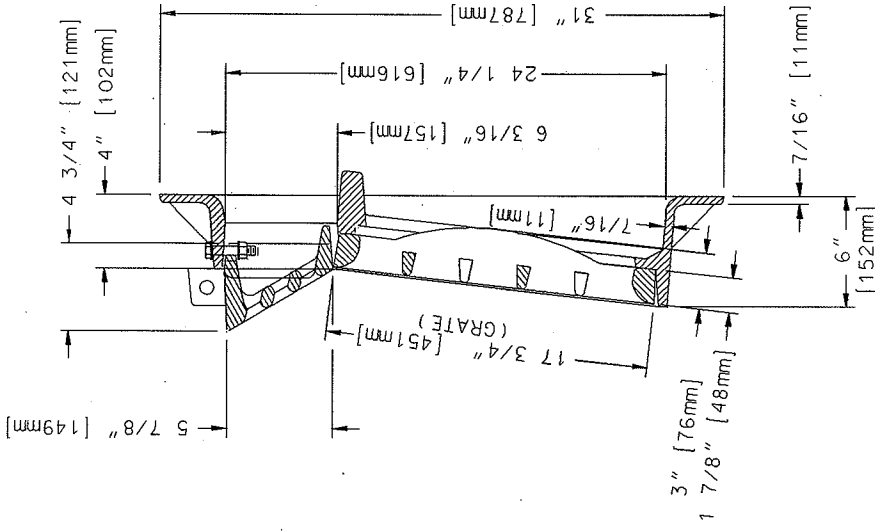
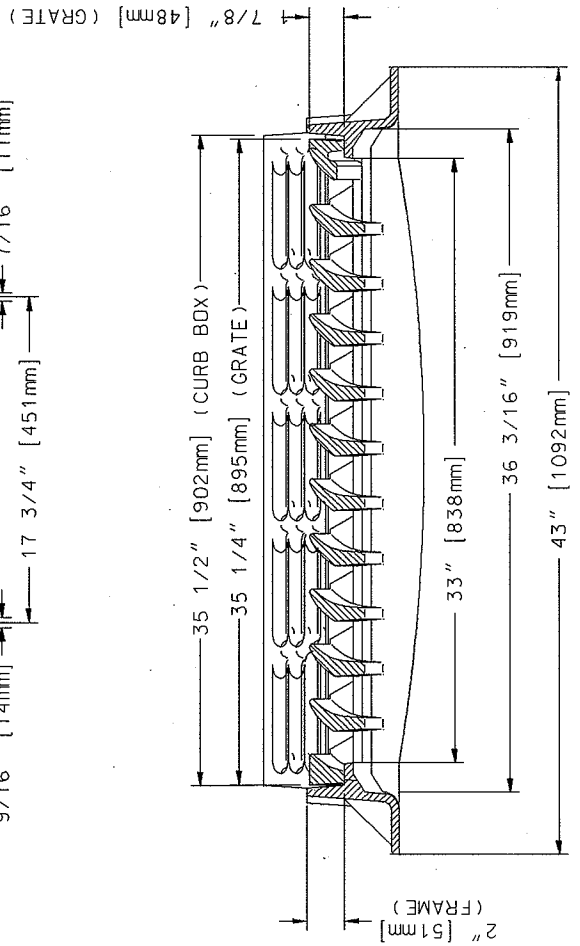
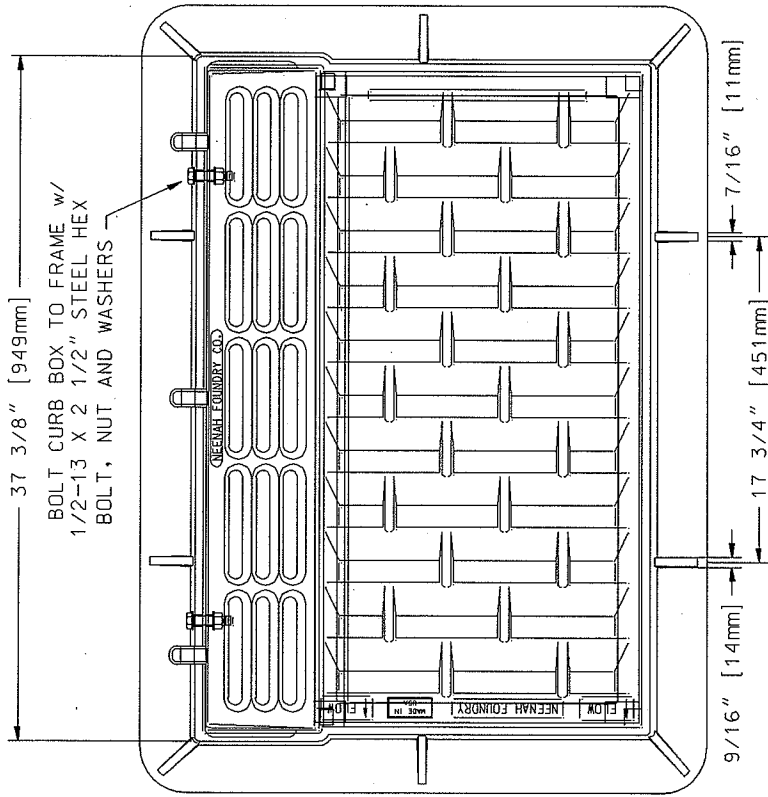
2004

CITY OF MADISON
ENGINEERING DIVISION

R-3067 ER CURB BOX

NEENAH FOUNDRY PRODUCT NUMBER 3067T003
MATERIAL: CAST GRAY IRON ASTM A-48, CLASS 35B
FINISH: NO PAINT
WEIGHT: 126#

STANDARD DETAIL DRAWING 5.7.23



SHOWN WITH TYPE L GRATE (STAGGERED VANE).
 SPECIFIED AS R-3067-L-CDS. OMIT "L" FOR TYPE R GRATE.

NOTE: ALL DIMENSIONS SHOWN ARE IN ENGLISH AND [METRIC].

COMPONENT NO'S: FRAME 3067-2000; GRATE 3067-3000; CURB BOX 3067-7001

MATERIAL: CAST GRAY IRON ASTM A-48, CLASS 35B

FINISH: NO PAINT

WEIGHT: FRAME 184#; GRATE 131#; CURB BOX 68#

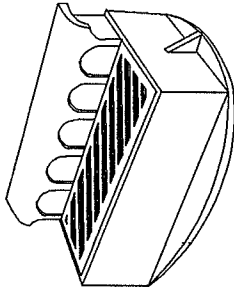
2004

CITY OF MADISON
 ENGINEERING DIVISION

R-3067 CDS
 CURB BOX

STANDARD DETAIL DRAWING 5.7.24

1" DIAGONAL BARS WITH 1 1/4" OPENINGS



NOTE: CURB BOX HEIGHT ADJUSTABLE 4 1/2" TO 9" FOR BOTH COVER TYPES.

DIAGONAL GRATE
FOR TYPE "S" INLET
(R-3281-B)

MEASURES 28 3/4" x 11 5/8" x 1 3/4"
APPROXIMATE TOTAL WEIGHT = 485 LBS.
DIAGONAL BAR GRATE IS REVERSIBLE
FOR RIGHT OR LEFT HAND FLOW
(RIGHT FLOW IS SHOWN)

NEENAH FOUNDRY CASTINGS

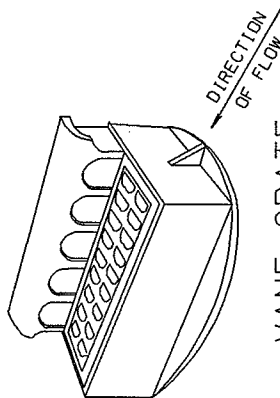
1. CURB INLET FRAME R-3281-B WITH DIAGONAL REVERSIBLE GRATE SHALL BE USED FOR TYPE "S" INLETS AT ALL LOW POINTS AND WHERE LONGITUDINAL ROAD SLOPE IS LESS THAN 1%.
2. CURB INLET FRAME R-3281-A (L OR R) SHALL BE USED FOR TYPE "S" INLETS AT ALL LOCATIONS HAVING A LONGITUDINAL ROAD SLOPE EQUAL TO OR GREATER THAN 1%.

2004

CITY OF MADISON
ENGINEERING DIVISION

R-3281

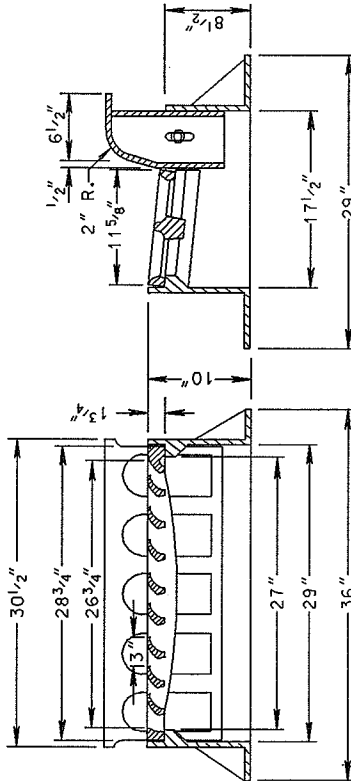
STANDARD DETAIL DRAWING 5.7.25



VANE GRATE
FOR TYPE "S" INLET
(R-3281-AL OR -AR)

MEASURES 28 3/4" x 11 5/8" x 1 3/4"
APPROXIMATE TOTAL WEIGHT = 480 LBS.

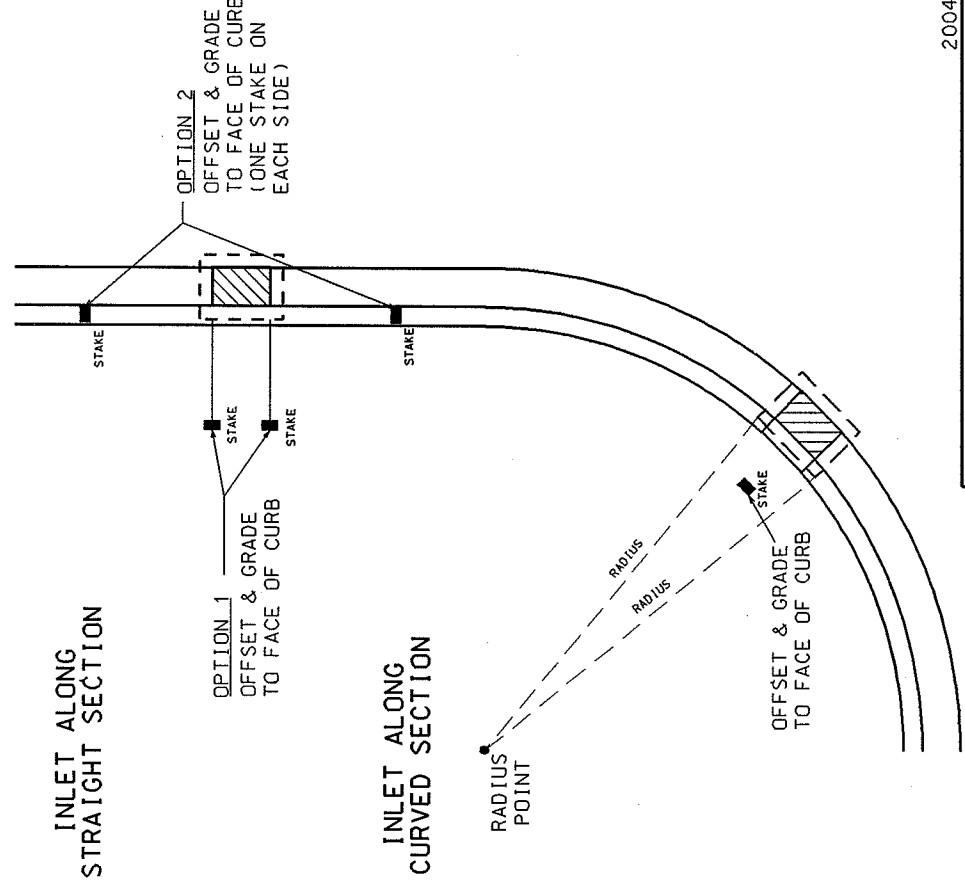
NOTE: GRATE IS NOT REVERSIBLE. R-3281-AL (LEFT) GRATE IS SHOWN IN DETAILS. R-3281-AR (RIGHT) GRATE IS SIMILAR.



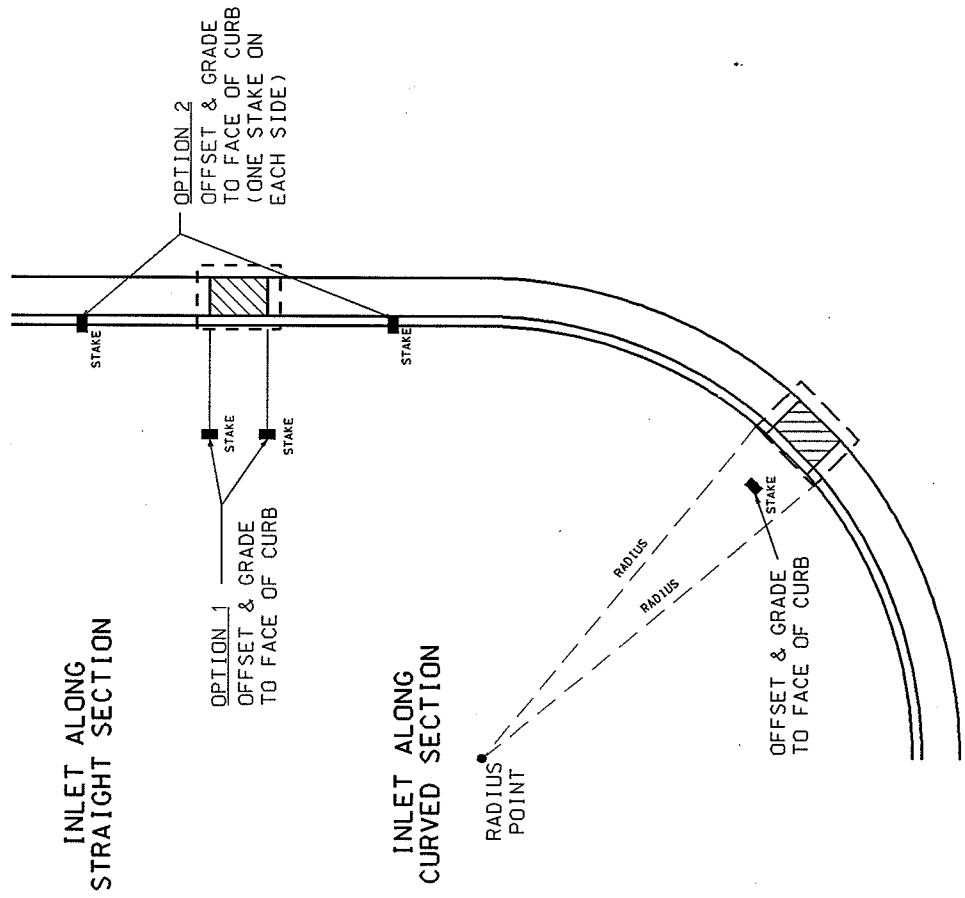
GENERAL NOTES:

1. DETAILS OF CONSTRUCTION, MATERIALS, AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.
2. DETAIL DRAWINGS FOR PROPOSED ALTERNATE DESIGNS FOR INLET COVERS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PROVIDING THAT SUCH ALTERNATE DESIGNS MAKE PROVISION FOR EQUIVALENT CAPACITY AND STRENGTH.
3. ROUND FRAMES AND COVERS SHALL HAVE CONTINUOUSLY MACHINED BALL BEARING SURFACES TO PREVENT ROCKING AND RATTLING.
4. THE ACTUAL WEIGHT OF COVERS MAY VARY WITHIN 5 PERCENT (PLUS OR MINUS) OF THE APPROXIMATE WEIGHT.
5. THE INSIDE DIMENSIONS OF THE STANDARD "H" INLET SHALL BE ALTERED TO 2' - 4" X 1' - 6" WHEN A TYPE "S" INLET IS SPECIFIED PER STANDARD DETAIL DRAWING 5.7.7
6. INLETS SHALL BE DERESSED IN THE CURB FLOW LINE. SEE MADISON STANDARD DETAIL DRAWING 5.5.7

TYPE 'B' CURB

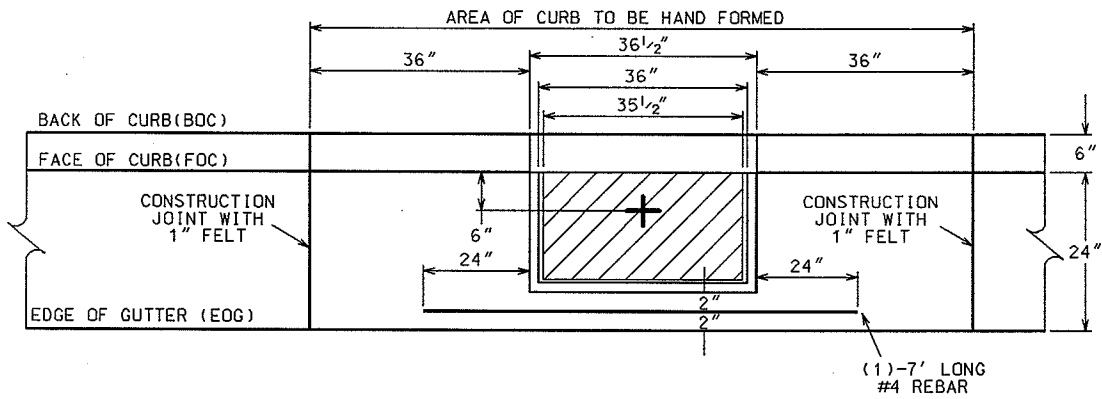


TYPE 'A' CURB

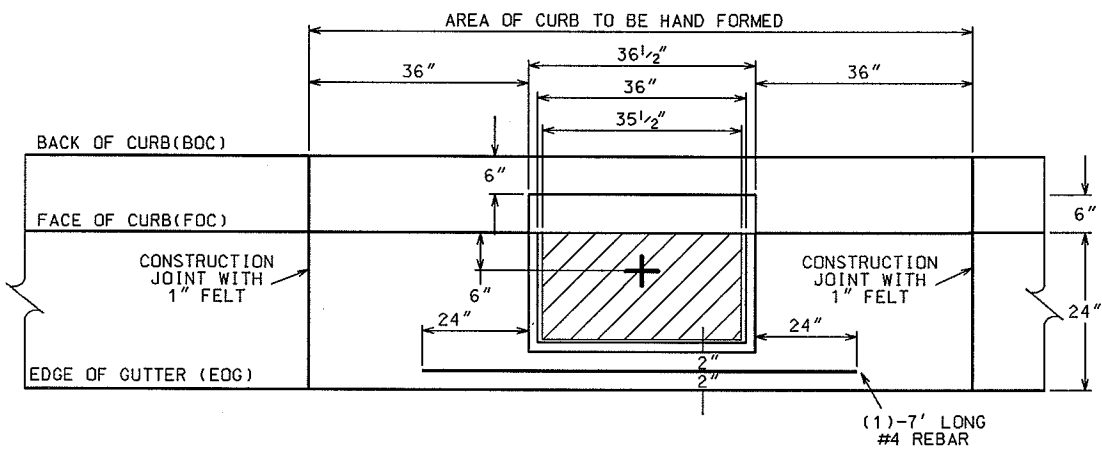


2004

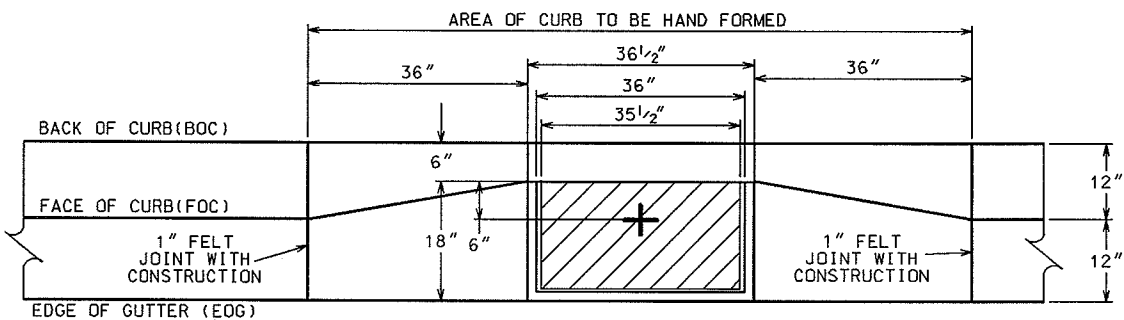
CITY OF MADISON ENGINEERING DIVISION
CONSTRUCTION STORM STAKING LAYOUT
STANDARD DETAIL DRAWING 5.7.26



TYPE "A" CURB AND GUTTER
PLAN VIEW



TYPE "B" CURB AND GUTTER
PLAN VIEW



TYPE "H" CURB AND GUTTER
PLAN VIEW

+ = CENTER OF STRUCTURE
(STATION AND OFFSET
AS INDICATED ON THE
STORM SCHEDULE)

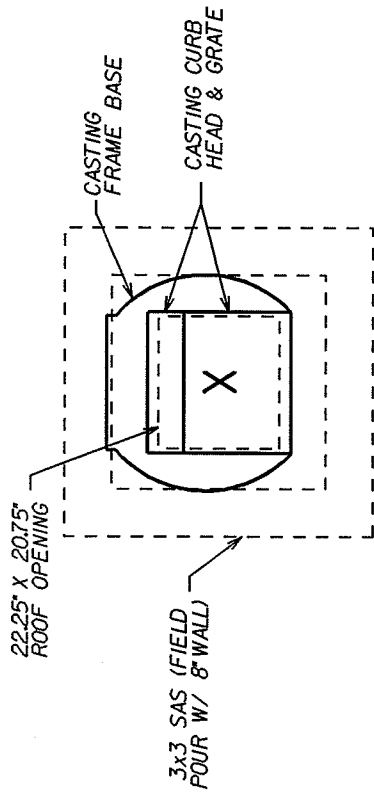
2004

CITY OF MADISON
ENGINEERING DIVISION

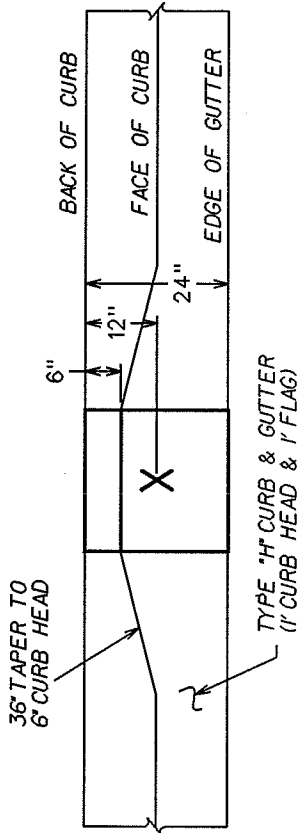
**H INLET LOCATIONS
IN DIFFERENT
CURB TYPES**

DRAWING NOT TO SCALE

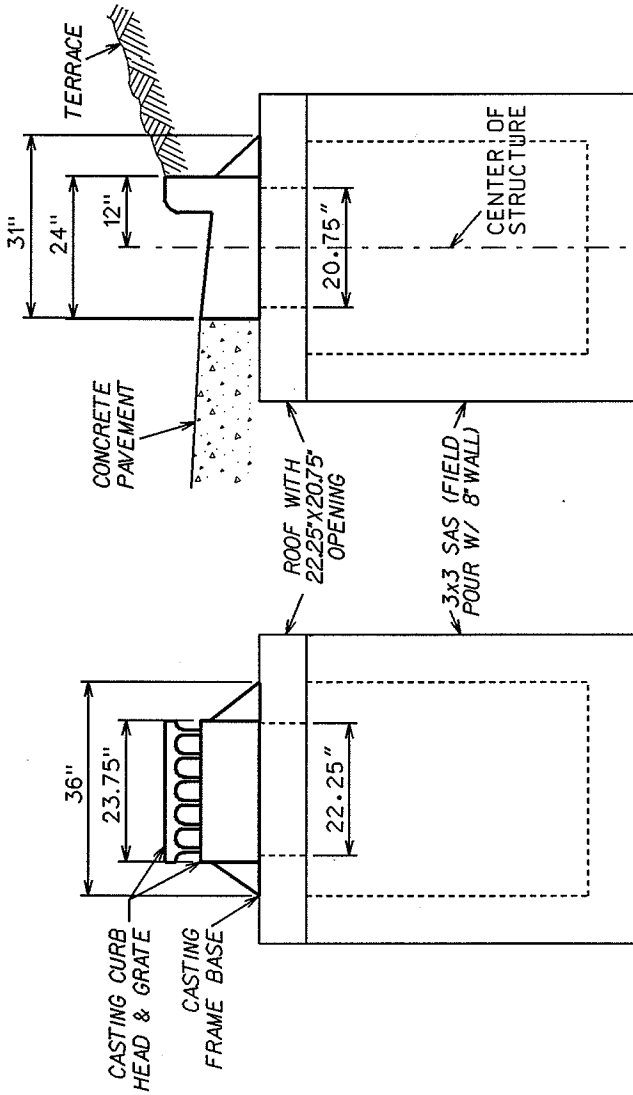
STANDARD DETAIL DRAWING 5.7.27



TOP VIEW
STRUCTURE WITH CASTING



TOP VIEW
CASTING WITH CURB & GUTTER



FRONT VIEW

SIDE VIEW

NOTES:

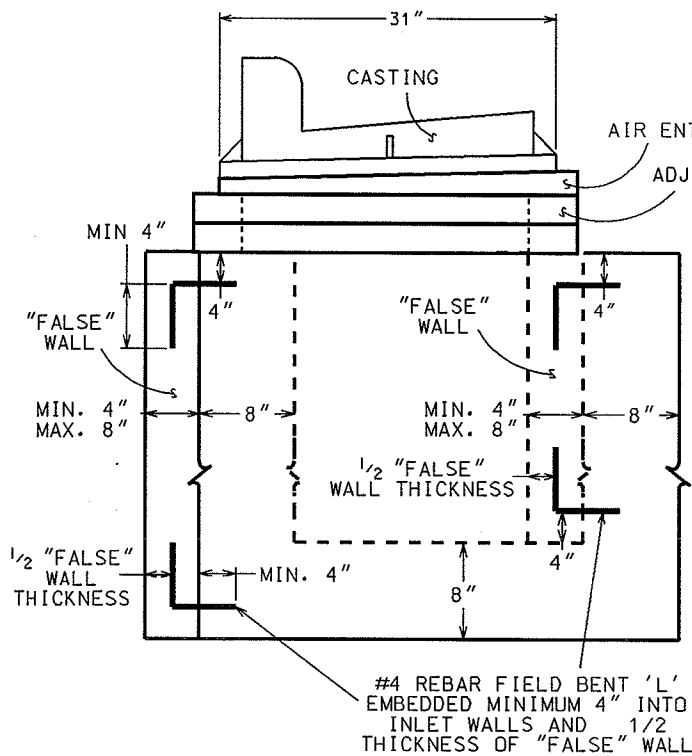
- (1) TYPE "H" CURB & GUTTER TYPICALLY USED IN MEDIAN DESIGN & CONSTRUCTION.
- (2) NEENAH CASTING NUMBERS: INLETS AT LOW POINTS [R-3278-A] INLETS ON GRADE [R-3278-AL]
- (3) CONSTRUCT SEWER ACCESS STRUCTURE (SAS) PER STANDARD DETAIL DRAWING 5.4.11
- (4) CONSTRUCT CURB TAPER PER STANDARD DETAIL DRAWING 5.7.27

2004

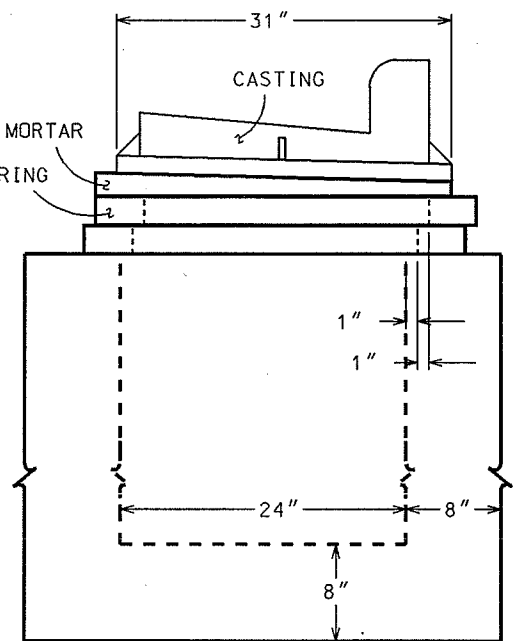
CITY OF MADISON
ENGINEERING DIVISION

INLETS IN
TYPE "H" CURB & GUTTER
WITH CONCRETE PAVEMENT

STANDARD DETAIL DRAWING 5.7.28



OFFSET USING FALSE WALL
INLET SIDE VIEW

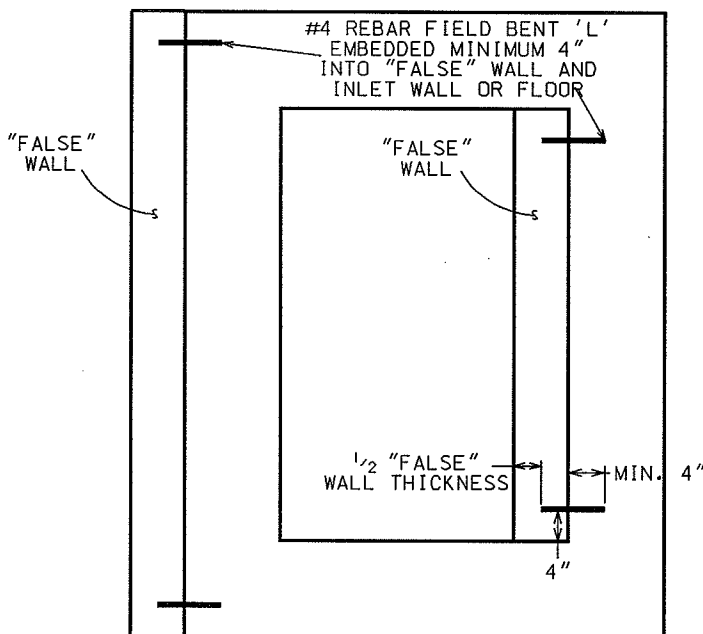


OFFSET USING ADJUSTING RINGS
INLET SIDE VIEW

NOTE:

TO INSURE THE INLET CASTING IS ALIGNED CORRECTLY WITH THE CURB AND GUTTER, AN OFFSET OF THE INLET CASTING MAY BE REQUIRED. THE ACCEPTABLE INLET CASTING OFFSETS ARE SHOWN AND THE GUIDELINES ARE AS FOLLOWS:

- (1) IF THE ADJUSTMENT REQUIRED IS LESS THAN TWO (2) INCHES, THIS CAN BE OBTAINED BY TWO ONE (1) INCH SHIFTS OF THE ADJUSTING RINGS A MAXIMUM OF ONE (1) INCH EACH AND/OR A ONE (1) INCH SHIFT OF THE CASTING.
- (2) IF THE ADJUSTMENT REQUIRED IS GREATER THAN TWO (2) INCHES AND LESS THAN FOUR (4) INCHES, THE INLET CASTING OFFSET SHALL BE OBTAINED BY THE CONSTRUCTION OF ONE FOUR (4) INCH THICK "FALSE" WALL ADJACENT TO THE INLET WALL THAT PROVIDES FULL SUPPORT OF THE CASTING. THE PLACEMENT AND ANCHORING SHALL BE CONSTRUCTED IN THE MANNER SHOWN.
- (3) IF THE ADJUSTMENT REQUIRED IS GREATER THAN FOUR (4) INCHES AND LESS THAN EIGHT (8) INCHES, THE INLET CASTING OFFSET SHALL BE OBTAINED BY THE CONSTRUCTION OF TWO FALSE WALLS WITH EQUAL WALL THICKNESSES VARYING FROM FOUR (4) TO EIGHT (8) INCHES DEPENDING ON THE OFFSET REQUIRED. THE PLACEMENT AND ANCHORING SHALL BE CONSTRUCTED IN THE MANNER SHOWN.
- (4) IF THE ADJUSTMENT REQUIRED IS GREATER THAN EIGHT (8) INCHES, THE INLET SHALL BE REPOSITIONED OR RECONSTRUCTED TO REDUCE THE OFFSET.



OFFSET USING FALSE WALL
INLET TOP VIEW

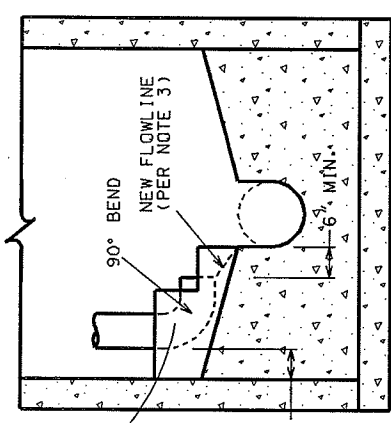
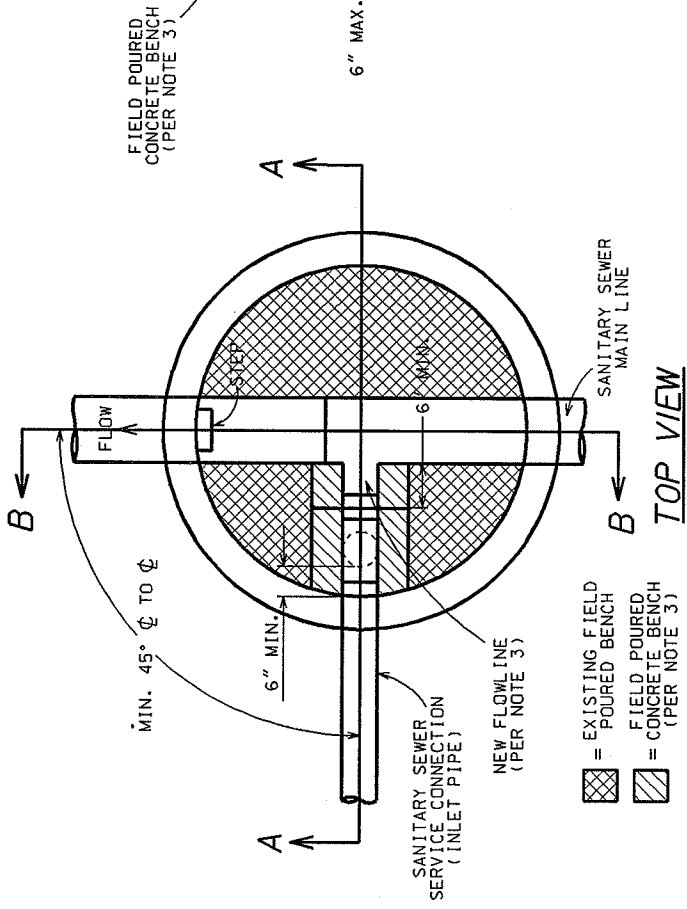
THESE SPECIFICATIONS ARE APPLICABLE FOR BOTH POURED-IN-PLACE AND PRECAST INLETS. THE DETAIL SHOWS A POURED-IN-PLACE INLET. A PRECAST INLET WOULD ONLY DIFFER WITH A WALL THICKNESS OF 5".

2004

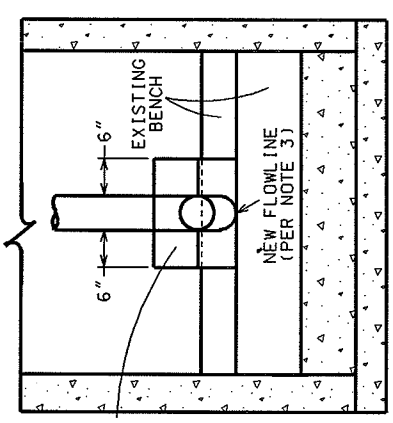
CITY OF MADISON
ENGINEERING DIVISION

INLET CASTING
OFFSET CRITERIA
FOR H INLETS

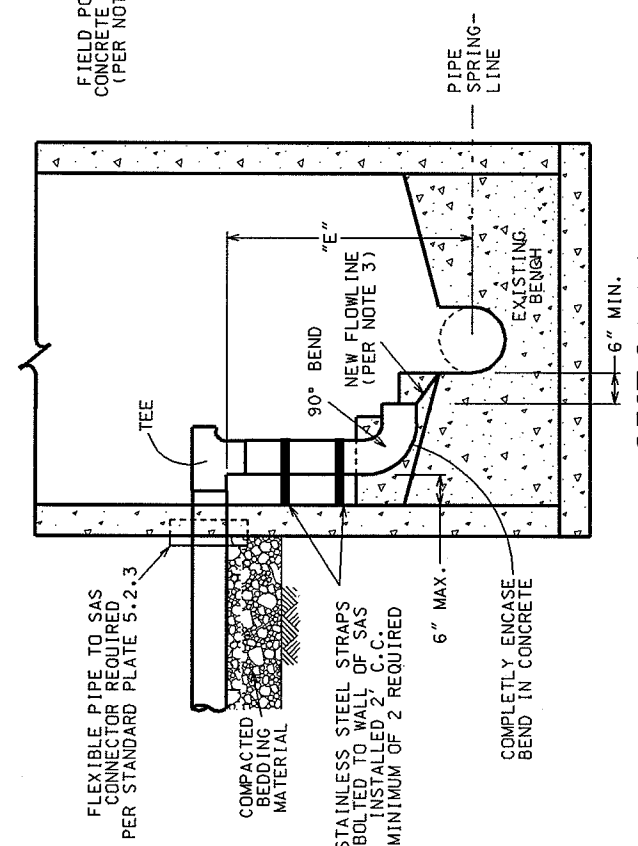
STANDARD DETAIL DRAWING 5.7.29



SIDE VIEW
FIELD POURED
CONCRETE BENCH



SECTION B-B



SECTION A-A

NOTES:

- 1) INSIDE DROP INLETS SHALL BE USED ONLY WHERE SITE CONDITIONS MAKE AN OUTSIDE DROP CONNECTION INFEASIBLE TO CONSTRUCT. THIS DETERMINATION SHALL BE MADE BY THE ENGINEER IN THE FIELD. THE CONTRACTOR SHALL OBTAIN APPROVAL FOR INSTALLATION OF THE INSIDE DROP INLET FROM THE ENGINEER PRIOR TO CONSTRUCTION.
- 2) DROP INLET SHALL BE BUILT WHEN "E" IS GREATER THAN 24" AND THE INLET PIPE DIAMETER IS 6" OR LESS. INLET PIPES GREATER THAN 6" SHALL HAVE AN OUTSIDE DROP CONNECTION PER STANDARD DETAIL DRAWING 5.7.2 "E" SHALL BE MEASURED FROM THE INVERT OF THE INCOMING PIPE TO THE SPRINGLINE OF THE OUTGOING SEWER.
- 3) ENCASE INLET PIPE IN CONCRETE FROM THE EXISTING BENCH TO FIRST JOINT ABOVE THE 90° BEND. FORM NEW SMOOTH FLOWLINE FROM PIPE END TO MAIN CHANNEL. ROUGH BRUSH FINISH ALL OTHER SURFACES OF THE NEW CONCRETE ENCASUREMENT.

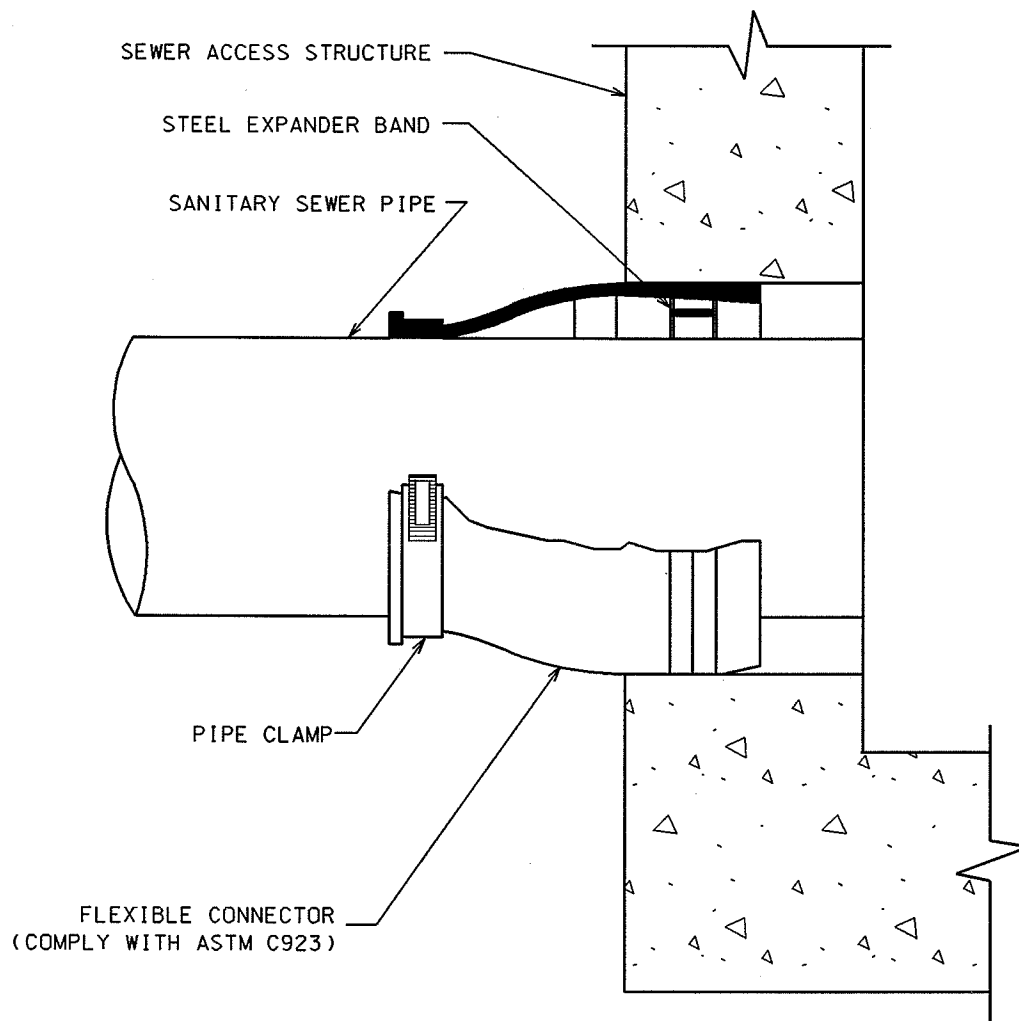
2004

CITY OF MADISON
ENGINEERING DIVISION

**INSIDE DROP FOR
SANITARY LATERAL**

DRAWING NOT TO SCALE

STANDARD DETAIL DRAWING 5.7.30

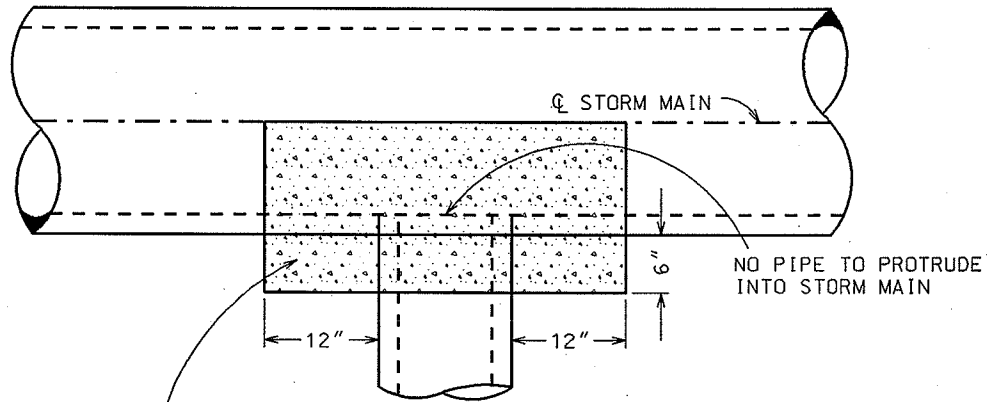


NOTES:

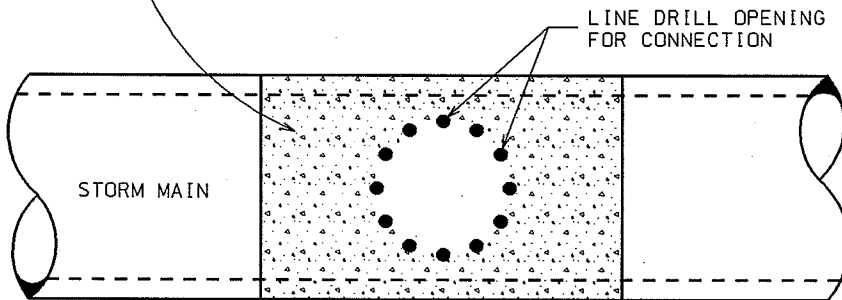
1. S.A.S. CONNECTIONS FOR SANITARY SEWER MAINS SHALL BE MADE USING FLEXIBLE, WATERTIGHT CONNECTIONS SUCH AS KOR-N-SEAL I OR APPROVED EQUAL, UNLESS DIRECTED OTHERWISE BY ENGINEER.
2. ALL STAINLESS STEEL ELEMENTS OF CONNECTOR SHALL BE TOTALLY NON-MAGNETIC SERIES 304 STAINLESS, EXCLUDING THE WORM SCREW FOR TIGHTENING THE STEEL BAND AROUND THE PIPE WHICH SHALL BE SERIES 305 STAINLESS. THE WORM SCREW FOR TIGHTENING THE STEEL BAND SHALL BE TORQUED BY A BREAK-AWAY TORQUE WRENCH AVAILABLE FOR THE PRECAST S.A.S SUPPLIER AND SET FOR 60 - 70 INCH/LBS.
3. THE CONNECTOR SHALL BE INSTALLED IN THE S.A.S. WALL BY ACTIVATING THE EXPANDING MECHANISM IN STRICT ACCORDANCE WITH THE RECOMMENDATIONS OF THE CONNECTOR MANUFACTURER.
4. THE CONNECTOR SHALL BE OF A SIZE SPECIFICALLY DESIGNED FOR THE PIPE MATERIAL AND SIZE BEING UTILIZED ON THE PROJECT.
5. ALL COSTS SHALL BE CONSIDERED INCIDENTAL TO THE S.A.S. AND/OR PIPE. THE ENGINEER RESERVES THE RIGHT TO REQUIRE A "CONCRETE ENCASEMENT" CONNECTION AT NO ADDITIONAL EXPENSE IN THE EVENT OF DESIGN CHANGE.
6. FLEXIBLE, WATERTIGHT CONNECTIONS SHALL ALSO BE USED AS REQUIRED FOR STORM SEWER CONNECTIONS.

2004

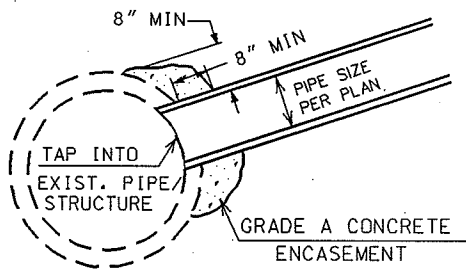
CITY OF MADISON ENGINEERING DIVISION
FLEXIBLE PIPE TO S.A.S. CONNECTOR
STANDARD DETAIL DRAWING 5.7.31



TOP VIEW



SIDE VIEW



ALTERNATE CONCRETE ENCASEMENT

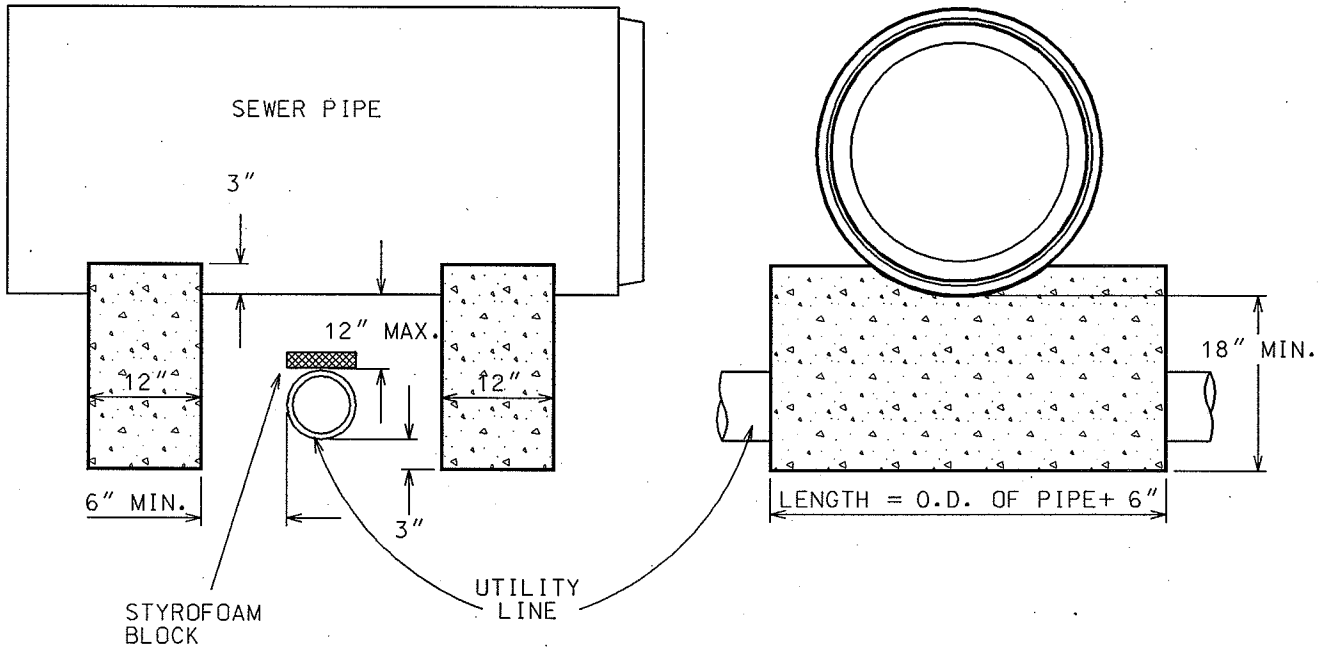
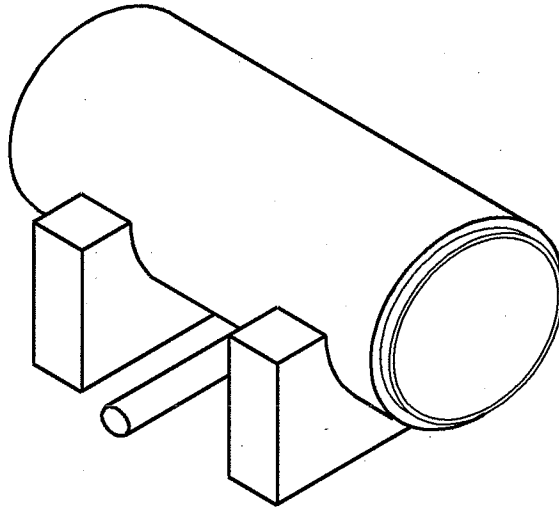
DRAWING NOT TO SCALE

2004

CITY OF MADISON
ENGINEERING DIVISION

STORM SEWER
TAP DETAIL

STANDARD DETAIL DRAWING 5.7.32



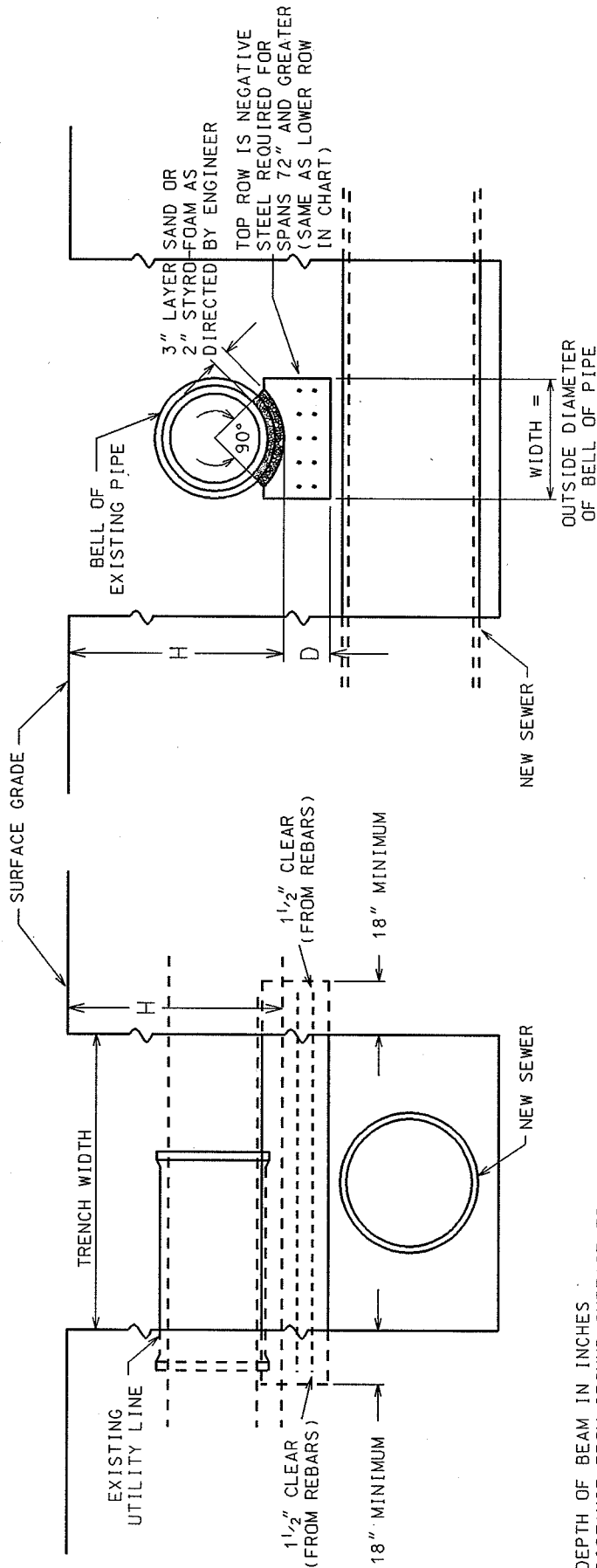
NOTE:

FIELD POURED, CONCRETE PIPE SUPPORTS SHALL BE INSTALLED FOR SEWERS OVER 10" IN DIAMETER WHEN CLEARANCE BETWEEN BOTTOM OF PIPE & TOP OF UTILITY LINE IS 12" OR LESS.

2004

CITY OF MADISON ENGINEERING DIVISION
CONCRETE SUPPORTS
STANDARD DETAIL DRAWING 5.8.1

REINFORCED CONCRETE BEAM UTILITY LINE SUPPORT TO BE USED WHEN NEW SEWER EXCAVATION IS CROSSING UNDER AN EXISTING UTILITY LINE (SEWER LINES, WATER LINES, GAS LINES, ETC.) AS DIRECTED BY THE ENGINEER.



D = DEPTH OF BEAM IN INCHES
H = DISTANCE FROM GROUND SURFACE TO BOTTOM OF PIPE SAND/STYRO-FOAM SUBSURFACE

TRENCH WIDTH	24" - 43"	44" - 58"	59" - 72"	73" - 87"				
H, ft	D	STEEL REQ'D	D	STEEL REQ'D	D	STEEL REQ'D	D	STEEL REQ'D
4 TO 5	6	#4 - 6" OC	7	#4 - 5" OC	8	#5 - 6" OC	9	#5 - 5" OC
5 TO 7	6	#4 - 6" OC	7	#5 - 6" OC	8	#5 - 6" OC	9	#5 - 5" OC
7 TO 9	6	#4 - 6" OC	7	#5 - 6" OC	8	#5 - 6" OC	9	#5 - 4" OC
9 TO 12	7	#4 - 6" OC	8	#5 - 6" OC	9	#5 - 4" OC	10	#5 - 4" OC
12 TO 15	7	#4 - 5" OC	9	#5 - 6" OC	10	#5 - 4" OC	12	#5 - 4" OC

2004

CITY OF MADISON
ENGINEERING DIVISION

REINFORCED CONCRETE BEAM
UTILITY LINE SUPPORT

STANDARD DETAIL DRAWING 5.8.2