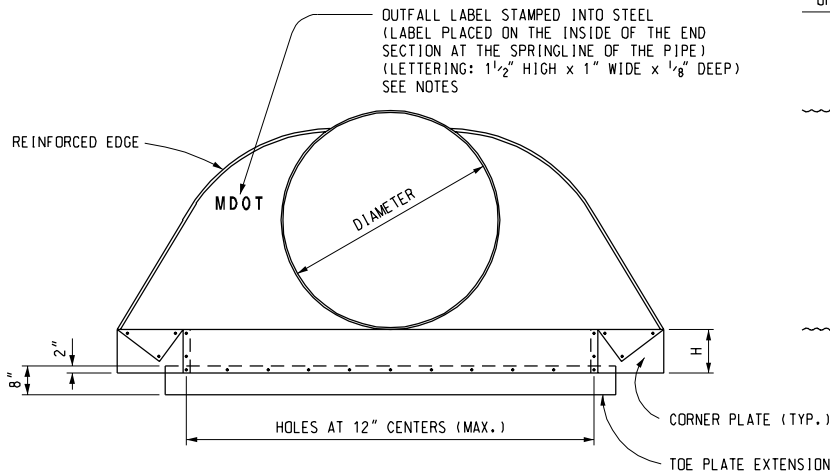


NOTE:
FOR SECTION A-A
AND SECTION B-B
SEE SHEET 4 OF 4

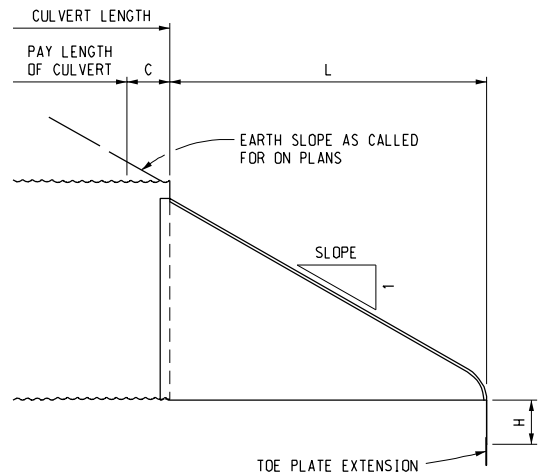
PLAN VIEW

DIMENSIONS									
DIMENSIONS IN INCHES								APPROX SLOPE	BODY
PIPE DIAMETER	MIN. THK.	C	A ± 1"	B MAX.	H ± 1"	L ± 1 1/2"	W ± 2"		
12	0.064	48	6	6	6	21	24	2.50	1 Pc
15	0.064	48	7	8	6	26	30	2.50	1 Pc
18	0.064	48	8	10	6	31	36	2.50	1 Pc
21	0.064	36	9	12	6	36	42	2.50	1 Pc
24	0.064	36	10	13	6	41	48	2.50	1 Pc
30	0.079	24	12	16	8	51	60	2.50	1 Pc
36	0.079	36	14	19	9	60	72	2.50	2 Pc
42	0.109	36	16	22	11	69	84	2.50	2 Pc
48	0.109	24	18	27	12	78	90	2.25	2 Pc
54	0.109	12	18	30	12	84	102	2.00	2 Pc
* 60	0.109	12	18	33	12	87	114	1.75	3 Pc
* 66	0.109	12	18	36	12	87	120	1.50	3 Pc
* 72	0.109	12	18	39	12	87	126	1.33	3 Pc
* 78	0.109	12	18	42	12	87	132	1.25	3 Pc
* 84	0.109	12	18	45	12	87	138	1.16	3 Pc

* ALL THREE PIECE BODIES HAVE 0.109" SIDES AND 0.138" CENTER PANELS. WIDTH OF CENTER PANEL TO BE GREATER THAN 20% OF THE PIPE PERIPHERY. MULTIPLE PANEL BODIES TO HAVE LAP SEAMS WHICH ARE TO BE TIGHTLY JOINED BY 3/8" DIAMETER GALVANIZED RIVETS OR BOLTS.



END VIEW



LONGITUDINAL VIEW

NOTE: SEE SHEET 3 FOR CONNECTION DETAILS

STEEL END SECTION FOR CORRUGATED STEEL CIRCULAR PIPE



PREPARED BY
DESIGN
SUPPORT AREA

DRAWN BY: B.L.T.

CHECKED BY: W.K.P.

DEPARTMENT DIRECTOR
Gloria J. Jeff

APPROVED BY: _____
ENGINEER OF DELIVERY

APPROVED BY: _____
ENGINEER OF DEVELOPMENT

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT STANDARD PLAN FOR

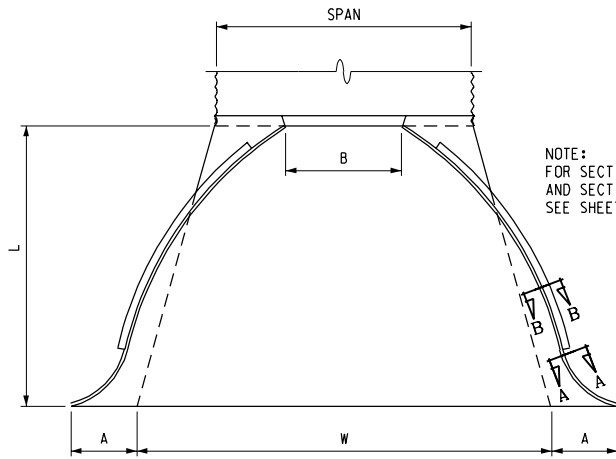
STEEL END SECTION

F.H.W.A. APPROVAL

4-22-2005
PLAN DATE

R-88-D

SHEET
1 OF 4

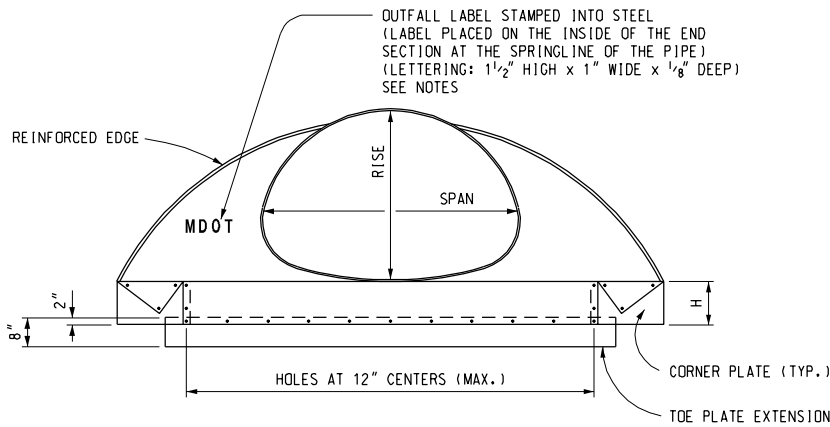


NOTE:
FOR SECTION A-A
AND SECTION B-B
SEE SHEET 4 OF 4

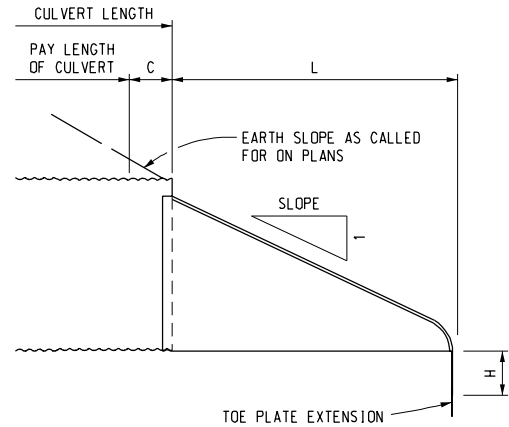
PLAN VIEW

DIMENSIONS									
DIMENSIONS IN INCHES								APPROX SLOPE	BODY
SPAN / RISE	MIN. THK.	C	A ± 1"	B MAX.	H ± 1"	L ± 1 1/2"	W ± 2"		
17 x 13	0.064	48	7	9	6	19	30	2.50	1 Pc
21 x 15	0.064	48	7	10	6	23	36	2.50	1 Pc
24 x 18	0.064	36	8	12	6	28	42	2.50	1 Pc
28 x 20	0.064	36	9	14	6	32	48	2.50	1 Pc
35 x 24	0.079	24	10	16	6	39	60	2.50	1 Pc
42 x 29	0.079	36	12	18	8	46	75	2.50	1 Pc
49 x 33	0.109	36	13	21	9	53	85	2.50	2 Pc
57 x 38	0.109	24	18	26	12	63	90	2.50	2 Pc
64 x 43	0.109	12	18	30	12	70	102	2.25	2 Pc
* 71 x 47	0.109	12	18	33	12	77	114	2.25	3 Pc
* 77 x 52	0.109	12	18	36	12	77	126	2.00	3 Pc
* 83 x 57	0.109	12	18	39	12	77	138	2.00	3 Pc

* ALL THREE PIECE BODIES HAVE 0.109" SIDES AND 0.138" CENTER PANELS. WIDTH OF CENTER PANEL TO BE GREATER THAN 20% OF THE PIPE PERIPHERY. MULTIPLE PANEL BODIES TO HAVE LAP SEAMS WHICH ARE TO BE TIGHTLY JOINED BY 3/8" DIAMETER GALVANIZED RIVETS OR BOLTS.



END VIEW



LONGITUDINAL VIEW

NOTE: SEE SHEET 3 FOR CONNECTION DETAILS

STEEL END SECTION FOR CORRUGATED STEEL PIPE ARCHES

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT STANDARD PLAN FOR

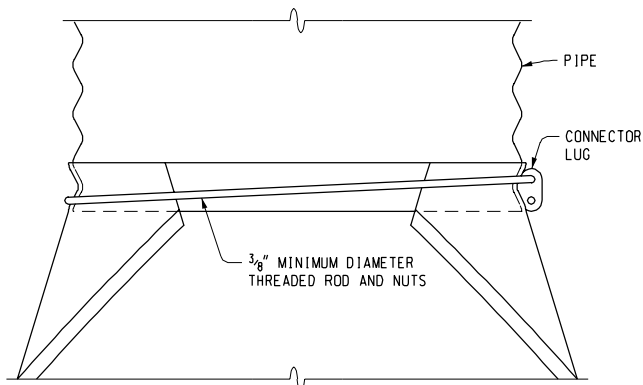
STEEL END SECTION

F.H.W.A. APPROVAL

5-22-2005
PLAN DATE

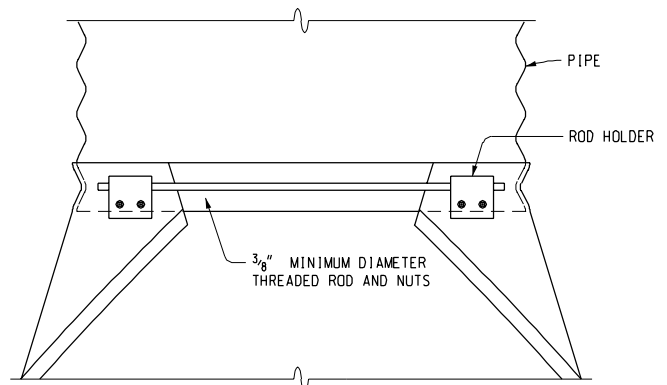
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SHEET
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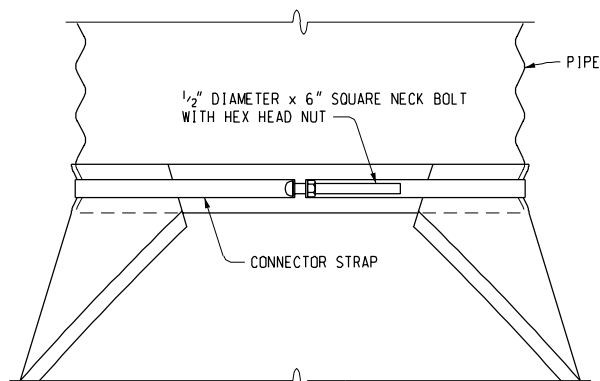
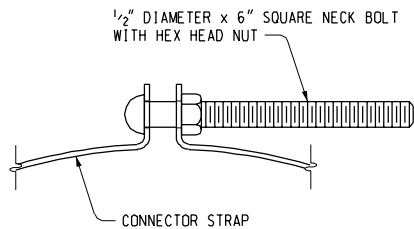
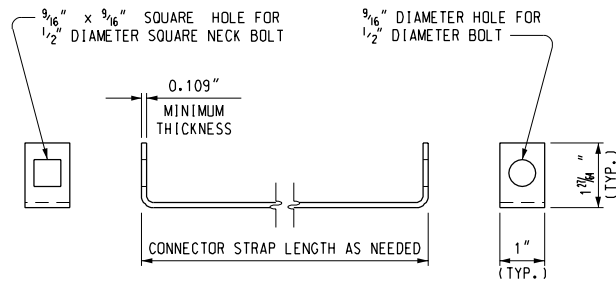
TYPE 1 CONNECTOR

FOR USE ON CIRCULAR PIPE DIAMETERS 12" THROUGH 24"



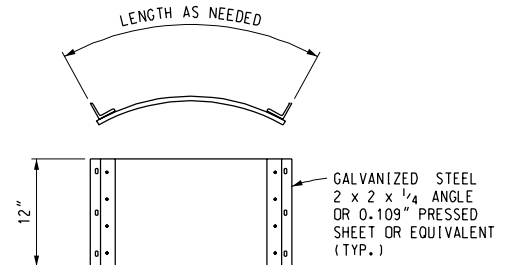
TYPE 2 CONNECTOR

FOR USE ON CIRCULAR PIPE DIAMETERS 30" AND 36"
AND FOR ARCH PIPE SIZES 35" x 24" AND 42" x 29"



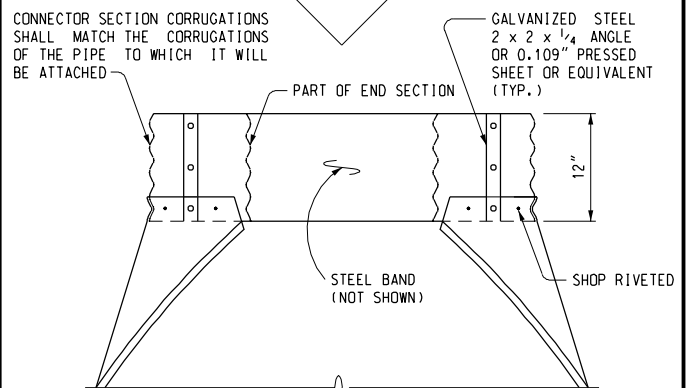
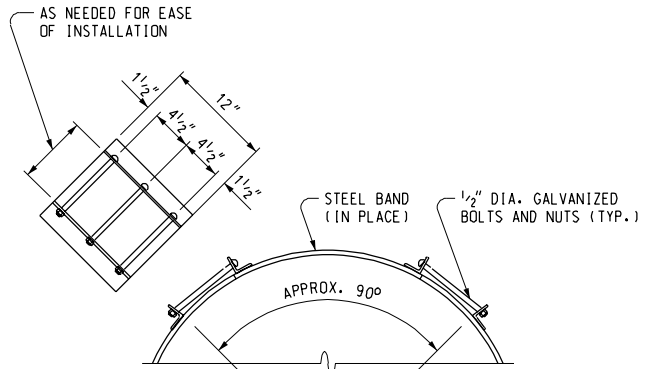
TYPE 1A CONNECTOR

FOR USE ON CIRCULAR PIPE DIAMETERS 12" THROUGH 24"
AND FOR ARCH PIPE SIZES 17" x 13" THROUGH 28" x 20"



STEEL BAND

(PART OF END SECTION)



TYPE 3 CONNECTOR

FOR USE ON CIRCULAR PIPE DIAMETERS 42" THROUGH 84"
AND FOR ARCH PIPE SIZES 49" x 33" THROUGH 83" x 57"

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT STANDARD PLAN FOR

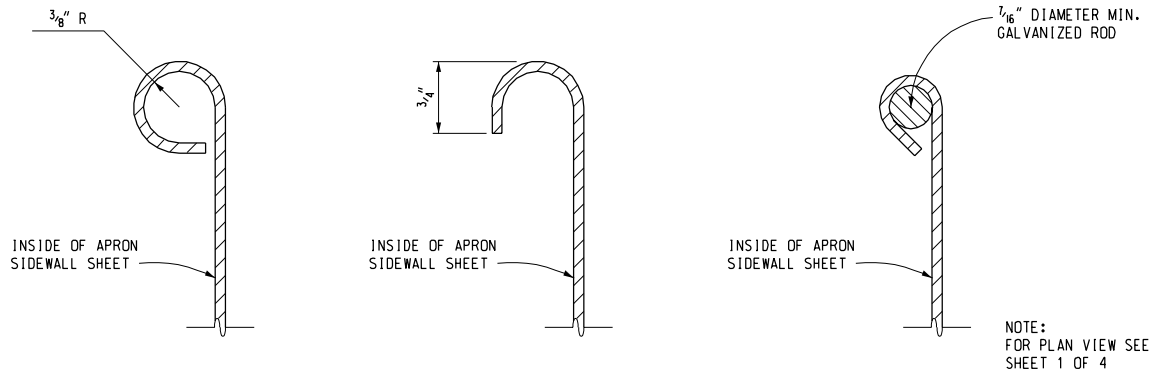
STEEL END SECTION

F.H.W.A. APPROVAL

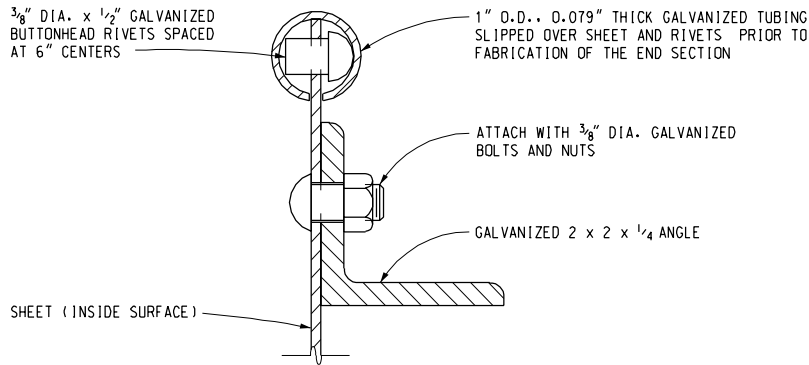
4-22-2005
PLAN DATE

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SHEET
3 OF 4



SECTION A - A
REINFORCED EDGE ALTERNATIVES



SECTION B - B
TO BE USED ON CIRCULAR PIPE DIAMETERS 60" THROUGH 84"
AND FOR ARCH PIPE SIZES 77" x 52" AND 83" x 57"

NOTES:

GALVANIZED STEEL SHALL MEET THE REQUIREMENTS SPECIFIED IN THE CURRENT STANDARD SPECIFICATIONS FOR CONSTRUCTION.

GALVANIZED TOE PLATE EXTENSIONS ARE REQUIRED ON STEEL END SECTIONS AS FOLLOWS:

1. WHEN INDICATED ON THE PLANS.
2. WHEN AUTHORIZED BY THE ENGINEER.
3. WHEN THE HEIGHT OF FILL IS 10' OR MORE.
4. WHEN THE CULVERT GRADE IS 10% OR MORE.

GALVANIZED TOE PLATE EXTENSIONS SHALL BE MATCH PUNCHED TO FIT HOLES IN THE TOE PLATE AND SUPPLIED LOOSE. COMPLETE WITH 3/8" DIAMETER GALVANIZED BOLTS. LENGTH OF THE TOE PLATE EXTENSION IS W + A FOR ALL SIZES.

CONNECTOR SECTIONS, TOE PLATE EXTENSIONS AND CORNER PLATES SHALL BE THE SAME THICKNESS AS THE APRON CENTER PANEL, AND SHALL BE GALVANIZED.

THE "C" PORTION OF THE CULVERT IS INCLUDED IN THE STEEL END SECTION.

CONNECTOR TYPES DESIGNATED FOR LARGER CORRUGATED STEEL PIPES MAY BE USED ON SMALLER CORRUGATED PIPES.

CIRCULAR AND ARCH PIPE SIZES SHOWN ON THIS PLAN HAVE 2 2/3" x 1/2" CORRUGATIONS; EQUIVALENT PIPE SIZES WITH 3" x 1" OR 5" x 1" CORRUGATIONS WILL BE ALLOWED.

ALTERNATE DESIGNS THAT HAVE PRIOR APPROVAL BY THE DEPARTMENT WILL BE ACCEPTED.

OUTFALL LABEL TO BE USED ONLY WHERE STORMWATER WILL DISCHARGE DIRECTLY TO THE WATERS OF THE STATE.

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT STANDARD PLAN FOR

STEEL END SECTION