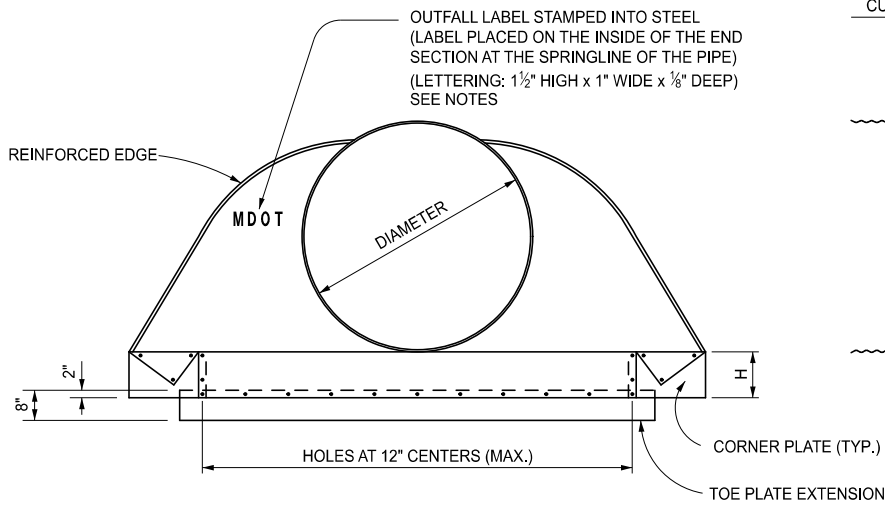


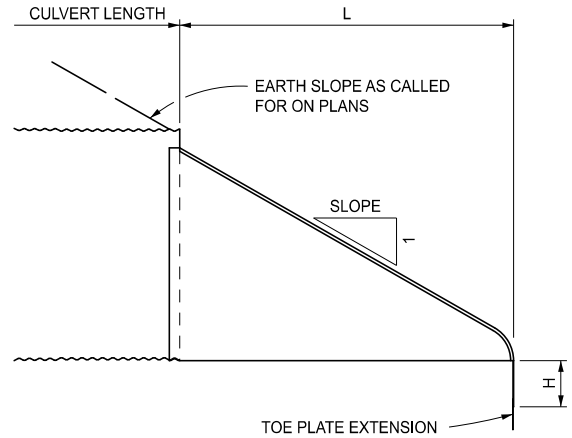
PLAN VIEW

DIMENSIONS									
DIMENSIONS IN INCHES							APPROX SLOPE	BODY	
PIPE DIAMETER	MIN. THK.	A ± 1"	B MAX.	H ± 1"	L ± 1½"	W ± 2"			
12	0.064	6	6	6	21	24	2.50	1 Pc	
15	0.064	7	8	6	26	30	2.50	1 Pc	
18	0.064	8	10	6	31	36	2.50	1 Pc	
21	0.064	9	12	6	36	42	2.50	1 Pc	
24	0.064	10	13	6	41	48	2.50	1 Pc	
30	0.079	12	16	8	51	60	2.50	1 Pc	
36	0.079	14	19	9	60	72	2.50	2 Pc	
42	0.109	16	22	11	69	84	2.50	2 Pc	
48	0.109	18	27	12	78	90	2.25	2 Pc	
54	0.109	18	30	12	84	102	2.00	2 Pc	
* 60	0.109	18	33	12	87	114	1.75	3 Pc	
* 66	0.109	18	36	12	87	120	1.50	3 Pc	
* 72	0.109	18	39	12	87	126	1.33	3 Pc	
* 78	0.109	18	42	12	87	132	1.25	3 Pc	
* 84	0.109	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

APPROVED BY: _____
DIRECTOR, BUREAU OF FIELD SERVICES

APPROVED BY: _____
DIRECTOR, BUREAU OF DEVELOPMENT



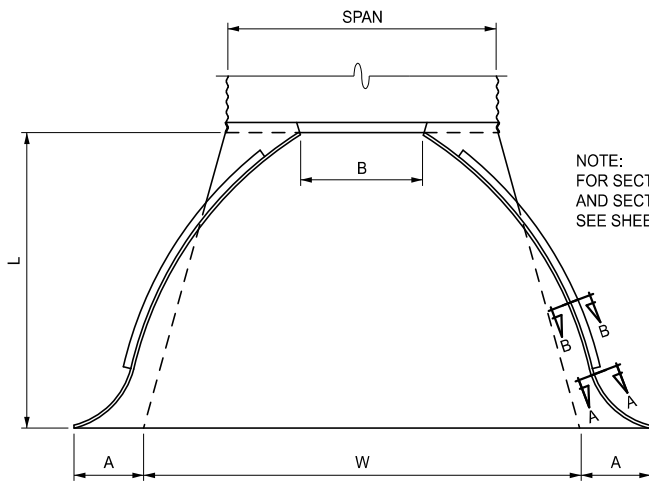
DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR
STEEL END SECTION

(SPECIAL DETAIL) 03/07/2023
FHWA APPROVAL PLAN DATE

R-88-E

SHEET
1 OF 4

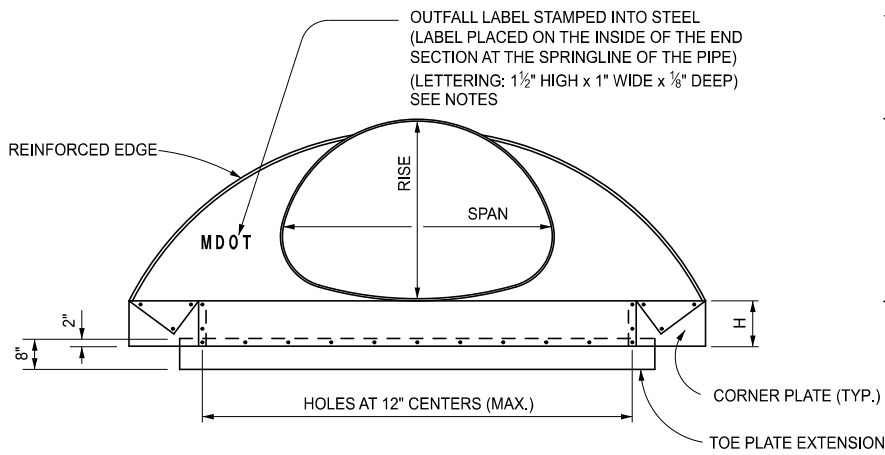


NOTE:
FOR SECTION A-A
AND SECTION B-B
SEE SHEET 4 OF 4

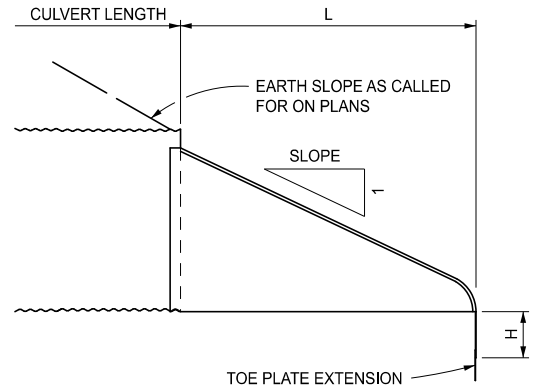
PLAN VIEW

DIMENSIONS								
DIMENSIONS IN INCHES							APPROX SLOPE	BODY
SPAN / RISE	MIN. THK.	A ± 1"	B MAX.	H ± 1"	L ± 1½"	W ± 2"		
17 x 13	0.064	7	9	6	19	30	2.50	1 Pc
21 x 15	0.064	7	10	6	23	36	2.50	1 Pc
24 x 18	0.064	8	12	6	28	42	2.50	1 Pc
28 x 20	0.064	9	14	6	32	48	2.50	1 Pc
35 x 24	0.079	10	16	6	39	60	2.50	1 Pc
42 x 29	0.079	12	18	8	46	75	2.50	1 Pc
49 x 33	0.109	13	21	9	53	85	2.50	2 Pc
57 x 38	0.109	18	26	12	63	90	2.50	2 Pc
64 x 43	0.109	18	30	12	70	102	2.25	2 Pc
* 71 x 47	0.109	18	33	12	77	114	2.25	3 Pc
* 77 x 52	0.109	18	36	12	77	126	2.00	3 Pc
* 83 x 57	0.109	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

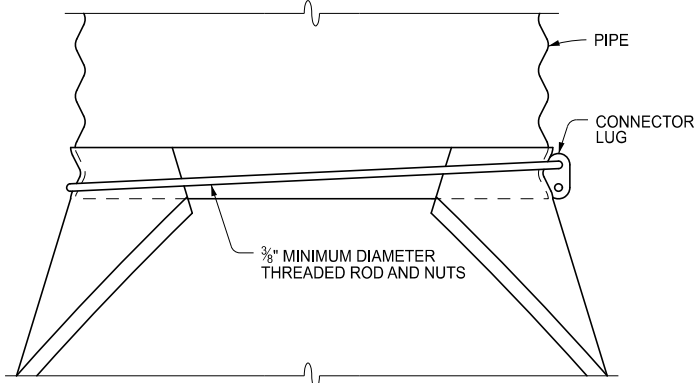
STEEL END SECTION FOR CORRUGATED STEEL PIPE ARCHES

MDOT
Michigan Department of Transportation

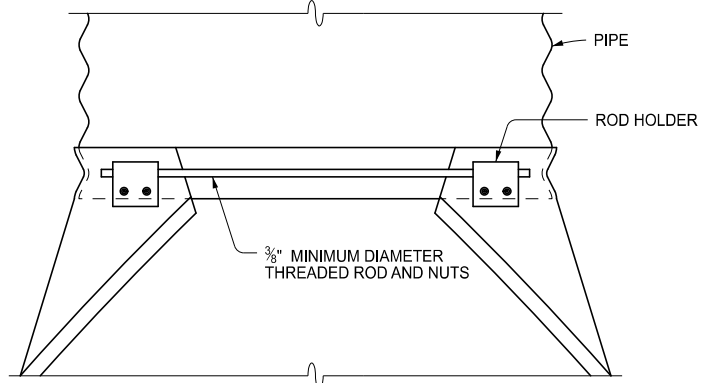
DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR
STEEL END SECTION

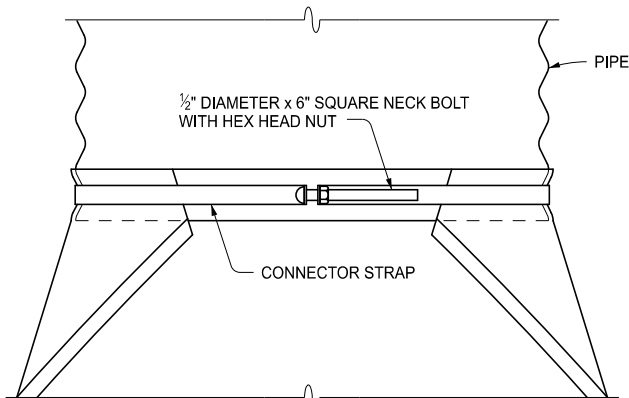
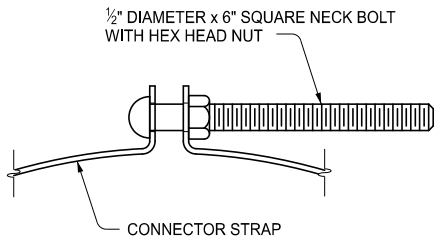
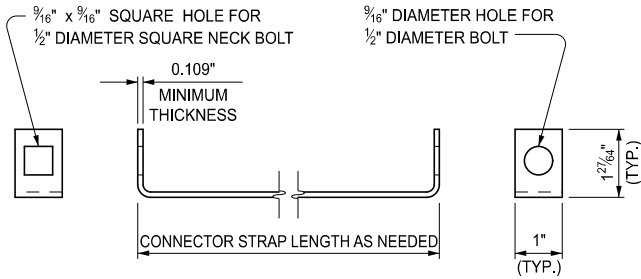
(SPECIAL DETAIL)	03/07/2023	R-88-E	SHEET 2 OF 4
FHWA APPROVAL	PLAN DATE		



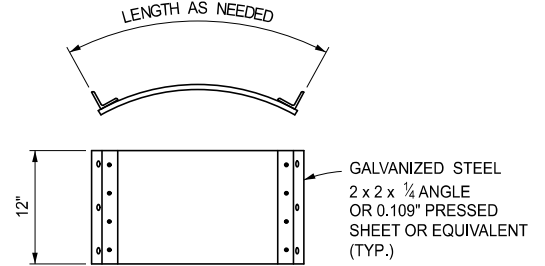
TYPE 1 CONNECTOR
FOR USE ON CIRCULAR PIPE DIAMETERS 12" THROUGH 24"



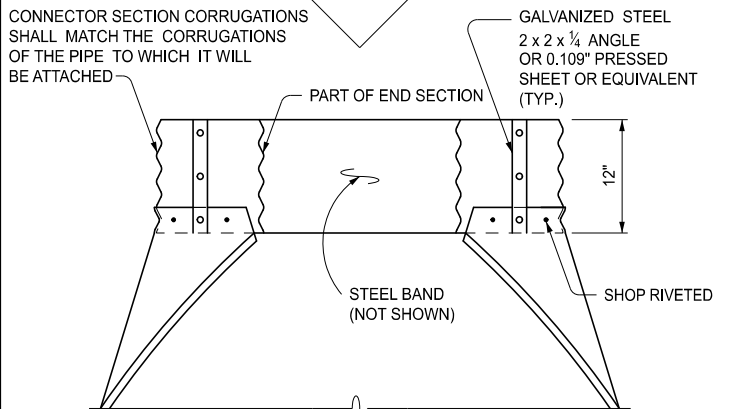
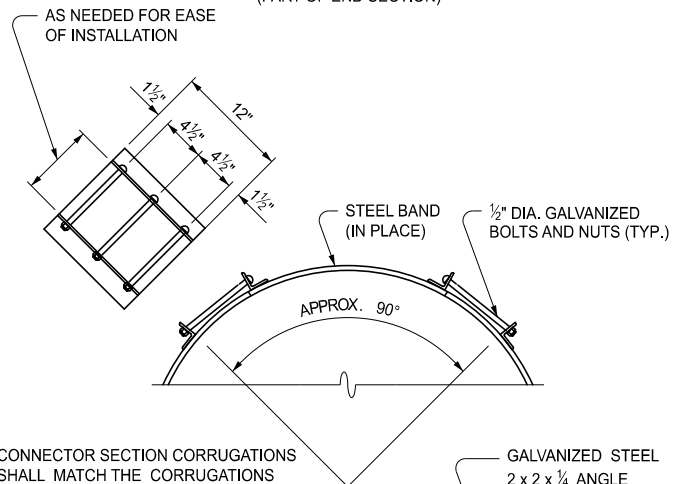
TYPE 2 CONNECTOR
FOR USE ON CIRCULAR PIPE DIAMETERS 30" AND 36"
AND FOR ARCH PIPE SIZES 35" x 24" AND 42" x 29"



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"



DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

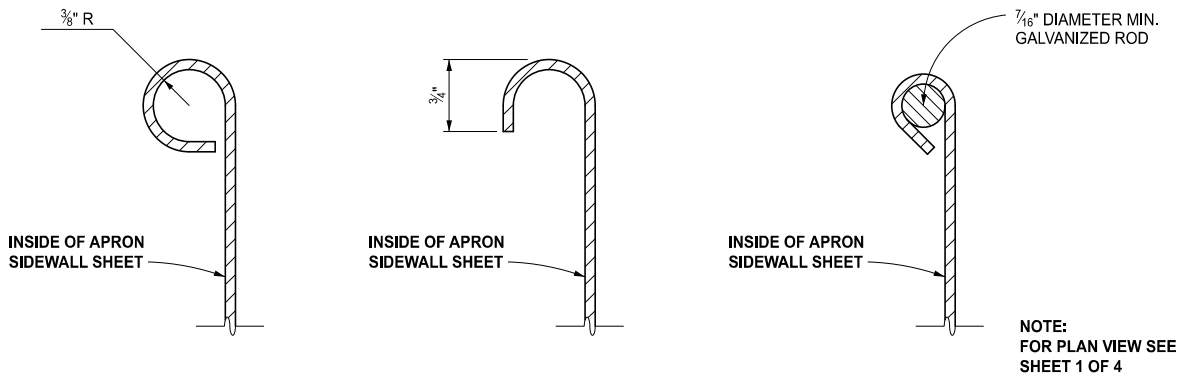
STANDARD PLAN FOR
STEEL END SECTION

(SPECIAL DETAIL)
FHWA APPROVAL

03/07/2023
PLAN DATE

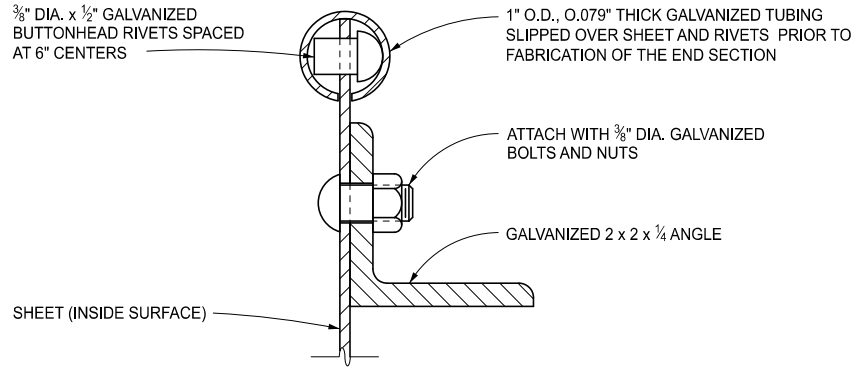
R-88-E

SHEET
3 OF 4



NOTE:
FOR PLAN VIEW SEE
SHEET 1 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 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.

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

CIRCULAR AND ARCH PIPE SIZES SHOWN ON THIS PLAN HAVE 2 2/8" 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.

 DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE	STANDARD PLAN FOR STEEL END SECTION			R-88-E	SHEET 4 OF 4
	(SPECIAL DETAIL) FHWA APPROVAL	03/07/2023 PLAN DATE			