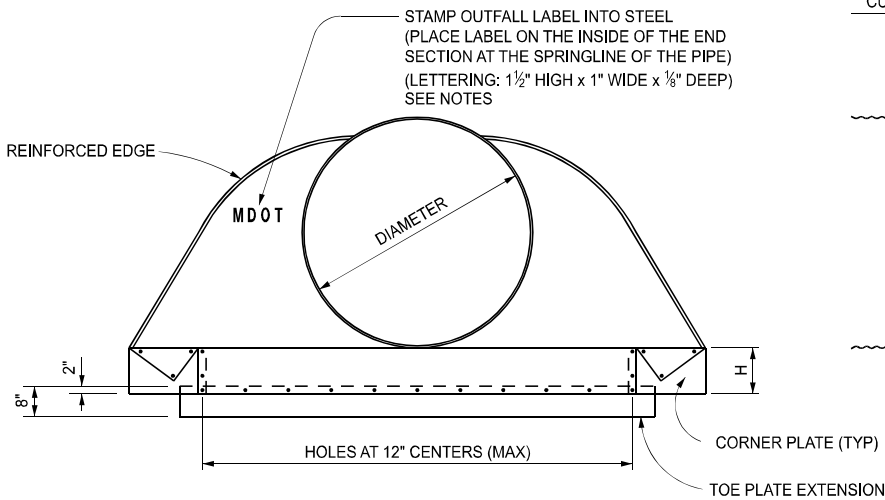


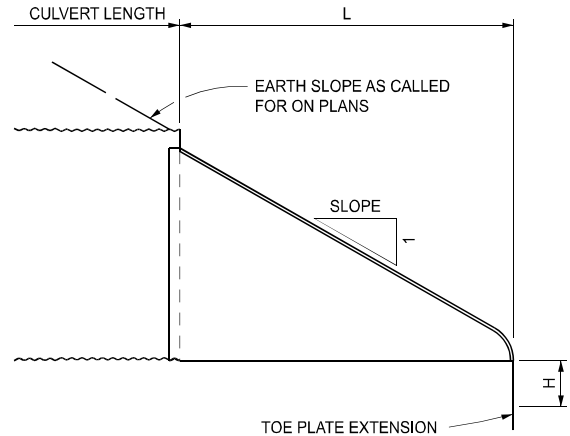
PLAN VIEW

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. ENSURE THE WIDTH OF CENTER PANEL IS GREATER THAN 20% OF THE PIPE PERIPHERY. TIGHTLY JOIN MULTIPLE PANEL BODIES AT LAP SEAMS USING 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

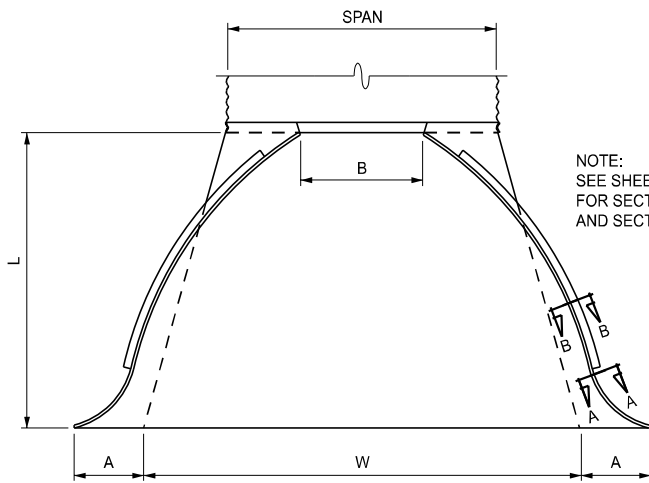
STANDARD PLAN FOR
STEEL END SECTION

12/18/2024
FHWA APPROVAL

06/12/2024
PLAN DATE

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SHEET
1 OF 4

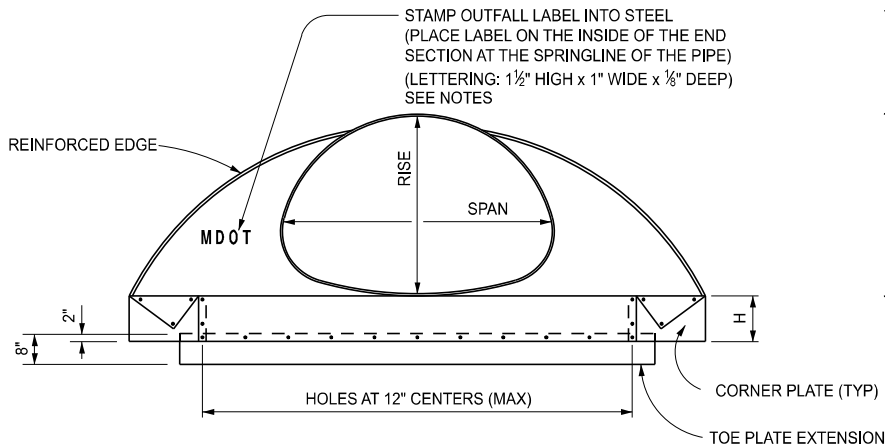


NOTE:
SEE SHEET 4 OF 4
FOR SECTION A-A
AND SECTION B-B

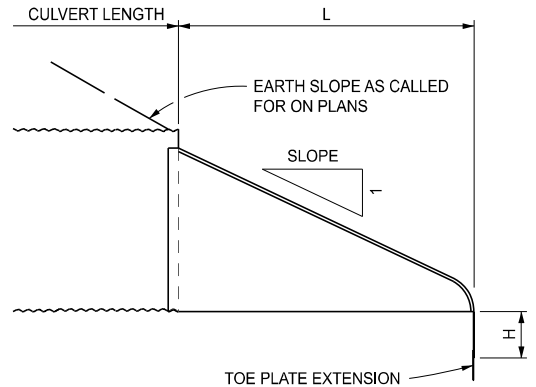
PLAN VIEW

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. ENSURE THE WIDTH OF CENTER PANEL IS GREATER THAN 20% OF THE PIPE PERIPHERY. TIGHTLY JOIN MULTIPLE PANEL BODIES AT LAP SEAMS USING 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

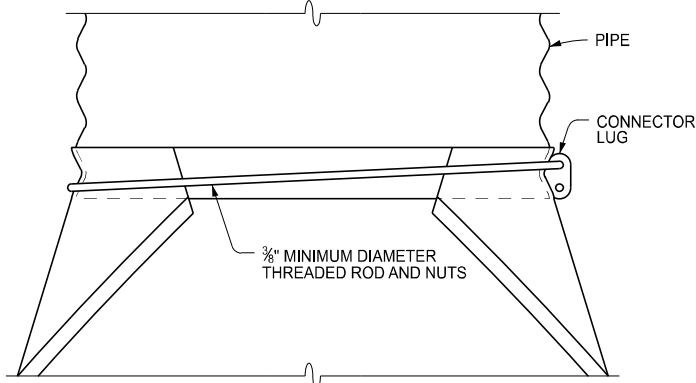
STANDARD PLAN FOR
STEEL END SECTION

12/18/2024
FHWA APPROVAL

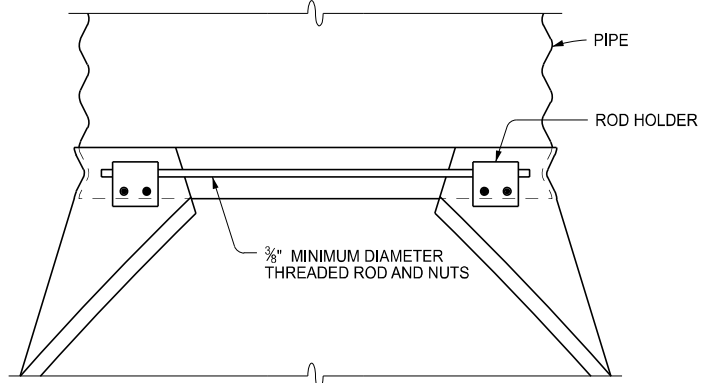
06/12/2024
PLAN DATE

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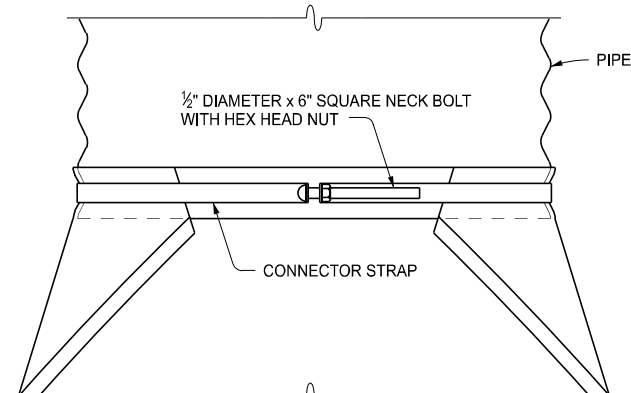
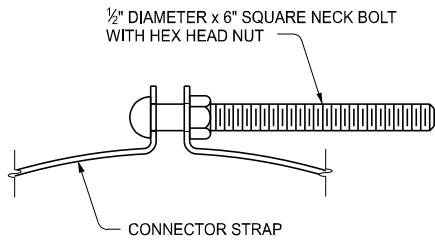
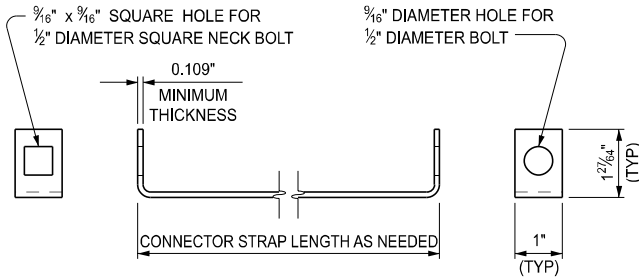
SHEET
2 OF 4



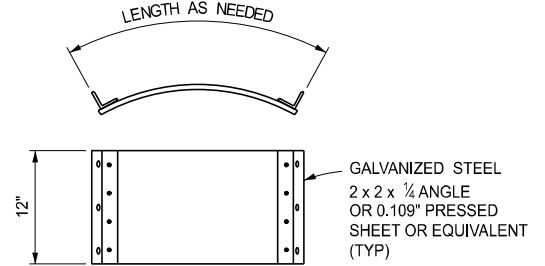
TYPE 1 CONNECTOR
USE ON CIRCULAR PIPE DIAMETERS 12" THROUGH 24"



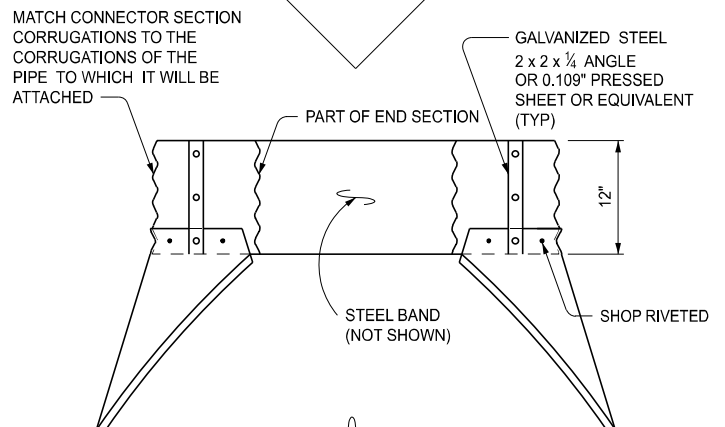
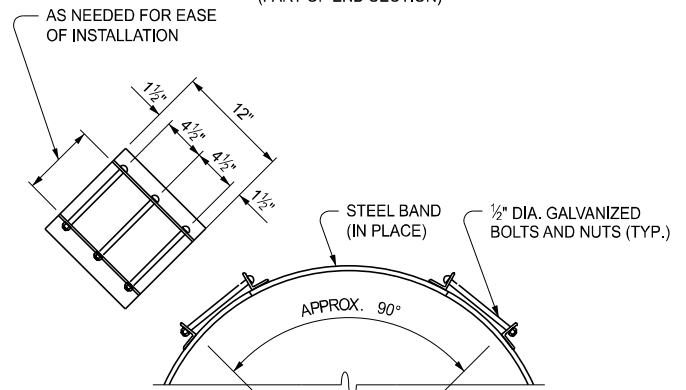
TYPE 2 CONNECTOR
USE ON CIRCULAR PIPE DIAMETERS 30" AND 36"
AND FOR ARCH PIPE SIZES 35" x 24" AND 42" x 29"



TYPE 1A CONNECTOR
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
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

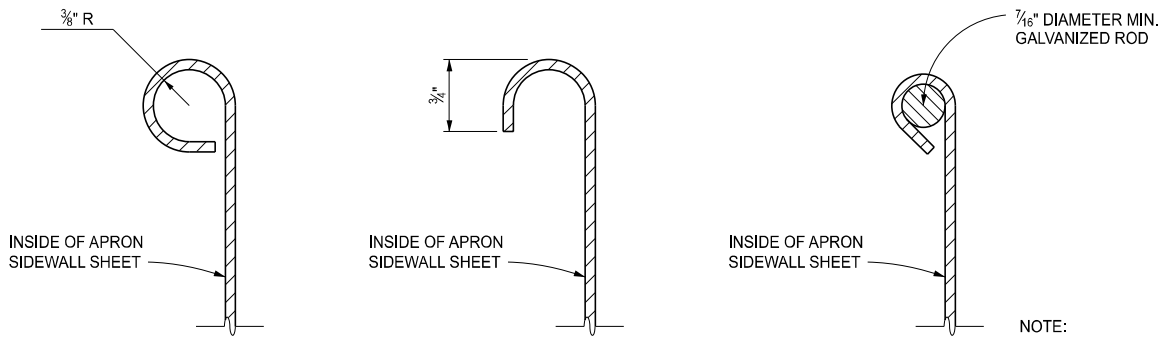
STANDARD PLAN FOR
STEEL END SECTION

12/18/2024
FHWA APPROVAL

06/12/2024
PLAN DATE

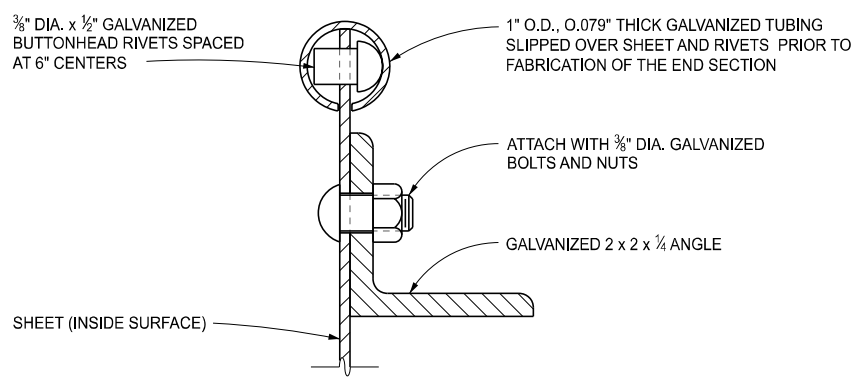
R-88-E

SHEET
3 OF 4



NOTE:
SEE SHEET 1 OF 4
FOR PLAN VIEW

SECTION A - A
REINFORCED EDGE ALTERNATIVES



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

NOTES:

ENSURE GALVANIZED STEEL MEETS 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.

MATCH PUNCH GALVANIZED TOE PLATE EXTENSIONS TO FIT HOLES IN THE TOE PLATE AND SUPPLY LOOSE, COMPLETE WITH 3/8" DIAMETER GALVANIZED BOLTS. LENGTH OF THE TOE PLATE EXTENSION = W + A (FOR ALL SIZES).

ENSURE ALL CONNECTOR SECTIONS, TOE PLATES EXTENSIONS AND CORNER PLATES ARE GALVANIZED AND MATCH THE THICKNESS OF THE APRON CENTER PANEL.

THE USE OF CONNECTOR TYPES DESIGNATED FOR LARGER CORRUGATED STEEL PIPES WILL BE ALLOWED ON SMALLER CORRUGATED PIPES.

CIRCULAR AND ARCH PIPES 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.

THE DEPARTMENT WILL ACCEPT ALTERNATE DESIGNS THAT HAVE PRIOR APPROVAL.

USE OUTFALL LABELS ONLY WHERE STORMWATER WILL DISCHARGE DIRECTLY INTO THE WATERS OF THE STATE.

<p>DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE</p>	STANDARD PLAN FOR STEEL END SECTION		R-88-E	SHEET 4 OF 4
	12/18/2024 FHWA APPROVAL	06/12/2024 PLAN DATE		