

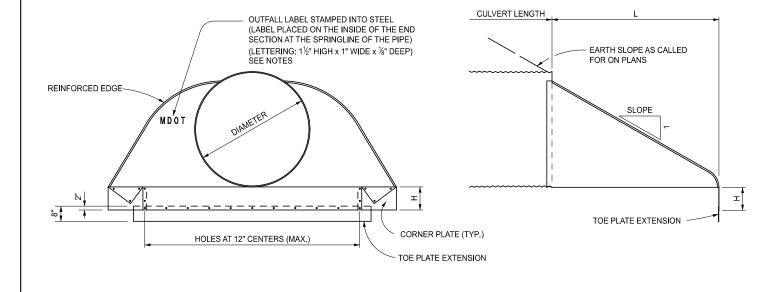
DIMENSIONS							
DIMENSIONS IN INCHES							
MIN. THK	A ± 1"	B MAX.	H ± 1"	L ± 1½"	W ± 2"	SLOPE	BODY
0.064	6	6	6	21	24	2.50	1 Pc
0.064	7	8	6	26	30	2.50	1 Pc
0.064	8	10	6	31	36	2.50	1 Pc
0.064	9	12	6	36	42	2.50	1 Pc
0.064	10	13	6	41	48	2.50	1 Pc
0.079	12	16	8	51	60	2.50	1 Pc
0.079	14	19	9	60	72	2.50	2 Pc
0.109	16	22	11	69	84	2.50	2 Pc
0.109	18	27	12	78	90	2.25	2 Pc
0.109	18	30	12	84	102	2.00	2 Pc
0.109	18	33	12	87	114	1.75	3 Pc
0.109	18	36	12	87	120	1.50	3 Pc
0.109	18	39	12	87	126	1.33	3 Pc
0.109	18	42	12	87	132	1.25	3 Pc
0.109	18	45	12	87	138	1.16	3 Pc
	MIN. THK. 0.064 0.064 0.064 0.064 0.079 0.079 0.109 0.109 0.109 0.109 0.109 0.109	MIN. A ±1"  0.064 6  0.064 7  0.064 8  0.064 9  0.064 10  0.079 12  0.079 14  0.109 16  0.109 18  0.109 18  0.109 18  0.109 18  0.109 18  0.109 18	DIMENSIONS IN INCH MIN. A B THK. ±1" MAX. 0.064 6 6 0.064 7 8 0.064 8 10 0.064 9 12 0.064 10 13 0.079 12 16 0.079 14 19 0.109 16 22 0.109 18 27 0.109 18 30 0.109 18 33 0.109 18 39 0.109 18 39 0.109 18 39	DIMENSIONS IN INCHES           MIN. THK.         A ±1"         B MAX.         ±1"           0.064         6         6         6           0.064         7         8         6           0.064         8         10         6           0.064         9         12         6           0.064         10         13         6           0.079         12         16         8           0.079         14         19         9           0.109         16         22         11           0.109         18         27         12           0.109         18         30         12           0.109         18         33         12           0.109         18         36         12           0.109         18         39         12           0.109         18         39         12           0.109         18         42         12	DIMENSIONS IN INCHES           MIN. THK.         A ± 1"         B MAX.         ± 1"         ± 1½"           0.064         6         6         6         21           0.064         7         8         6         26           0.064         8         10         6         31           0.064         9         12         6         36           0.064         10         13         6         41           0.079         12         16         8         51           0.079         14         19         9         60           0.109         16         22         11         69           0.109         18         27         12         78           0.109         18         30         12         84           0.109         18         33         12         87           0.109         18         36         12         87           0.109         18         39         12         87           0.109         18         39         12         87           0.109         18         39         12         87 <t< td=""><td>DIMENSIONS IN INCHES           MIN. THK.         A ± 1"         B MAX.         ± 1" ± 1½"         ± ½" ± 2"           0.064         6         6         6         21         24           0.064         7         8         6         26         30           0.064         8         10         6         31         36           0.064         9         12         6         36         42           0.064         10         13         6         41         48           0.079         12         16         8         51         60           0.079         14         19         9         60         72           0.109         16         22         11         69         84           0.109         18         27         12         78         90           0.109         18         30         12         84         102           0.109         18         33         12         87         114           0.109         18         36         12         87         120           0.109         18         39         12         87         126<td>DIMENSIONS IN INCHES         APPROX SLOPE           MIN. THK.         A ± 1"         B MAX.         ± 1"         ± ½"         ± ½"         ± 2"         SLOPE           0.064         6         6         6         21         24         2.50           0.064         7         8         6         26         30         2.50           0.064         8         10         6         31         36         2.50           0.064         9         12         6         36         42         2.50           0.064         10         13         6         41         48         2.50           0.079         12         16         8         51         60         2.50           0.079         14         19         9         60         72         2.50           0.109         16         22         11         69         84         2.50           0.109         18         27         12         78         90         2.25           0.109         18         30         12         84         102         2.00           0.109         18         36         12</td></td></t<>	DIMENSIONS IN INCHES           MIN. THK.         A ± 1"         B MAX.         ± 1" ± 1½"         ± ½" ± 2"           0.064         6         6         6         21         24           0.064         7         8         6         26         30           0.064         8         10         6         31         36           0.064         9         12         6         36         42           0.064         10         13         6         41         48           0.079         12         16         8         51         60           0.079         14         19         9         60         72           0.109         16         22         11         69         84           0.109         18         27         12         78         90           0.109         18         30         12         84         102           0.109         18         33         12         87         114           0.109         18         36         12         87         120           0.109         18         39         12         87         126 <td>DIMENSIONS IN INCHES         APPROX SLOPE           MIN. THK.         A ± 1"         B MAX.         ± 1"         ± ½"         ± ½"         ± 2"         SLOPE           0.064         6         6         6         21         24         2.50           0.064         7         8         6         26         30         2.50           0.064         8         10         6         31         36         2.50           0.064         9         12         6         36         42         2.50           0.064         10         13         6         41         48         2.50           0.079         12         16         8         51         60         2.50           0.079         14         19         9         60         72         2.50           0.109         16         22         11         69         84         2.50           0.109         18         27         12         78         90         2.25           0.109         18         30         12         84         102         2.00           0.109         18         36         12</td>	DIMENSIONS IN INCHES         APPROX SLOPE           MIN. THK.         A ± 1"         B MAX.         ± 1"         ± ½"         ± ½"         ± 2"         SLOPE           0.064         6         6         6         21         24         2.50           0.064         7         8         6         26         30         2.50           0.064         8         10         6         31         36         2.50           0.064         9         12         6         36         42         2.50           0.064         10         13         6         41         48         2.50           0.079         12         16         8         51         60         2.50           0.079         14         19         9         60         72         2.50           0.109         16         22         11         69         84         2.50           0.109         18         27         12         78         90         2.25           0.109         18         30         12         84         102         2.00           0.109         18         36         12

\* 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 %" DIAMETER GALVANIZED RIVETS OR BOLTS.

LONGITUDINAL VIEW

PLAN VIEW

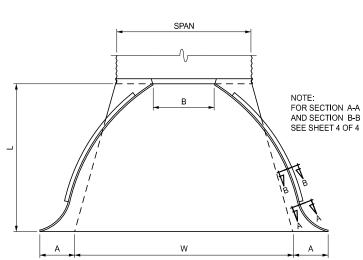
**END VIEW** 



## STEEL END SECTION FOR CORRUGATED STEEL CIRCULAR PIPE

NOTE: SEE SHEET 3 FOR CONNECTION DETAILS

APPROVED BY:	MIchigan Department of Transportation	STANDARD PLAN FOR STEEL END SECTION					
APPROVED BY:	DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE	(SPECIAL DETAIL) FHWA APPROVAL	03/07/2023 PLAN DATE	R-88-E	SHEET 1 OF 4		

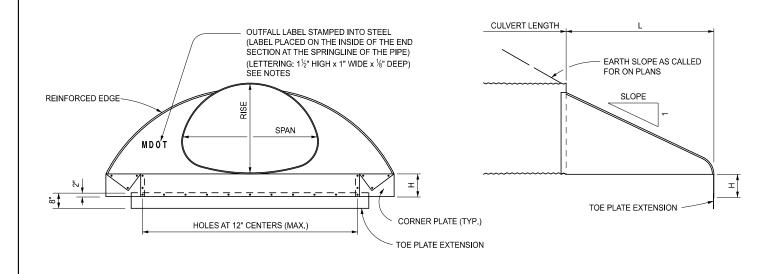


DIMENSIONS								
DIMENSIONS IN INCHES								
SPAN / RISE	MIN. THK.	A ± 1"	B MAX.	H ± 1"	L ± 1½"	W ± 2"	APPROX SLOPE	BODY
17 x 13	0.064	7	9	6	19	30	2.50	1 Pc
21 x 15	0.064	7	10	6	23	36	2.50	1 Pc
24 x 18	0.064	8	12	6	28	42	2.50	1 Pc
28 x 20	0.064	9	14	6	32	48	2.50	1 Pc
35 x 24	0.079	10	16	6	39	60	2.50	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 TUDES DISCS DODIES HAVE A 100" SIDES AND A 120" CENTED DANIELS								

\* 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 %" DIAMETER GALVANIZED RIVETS OR BOLTS.

PLAN VIEW

**END VIEW** 



# STEEL END SECTION FOR CORRUGATED STEEL PIPE ARCHES

NOTE: SEE SHEET 3 FOR CONNECTION DETAILS

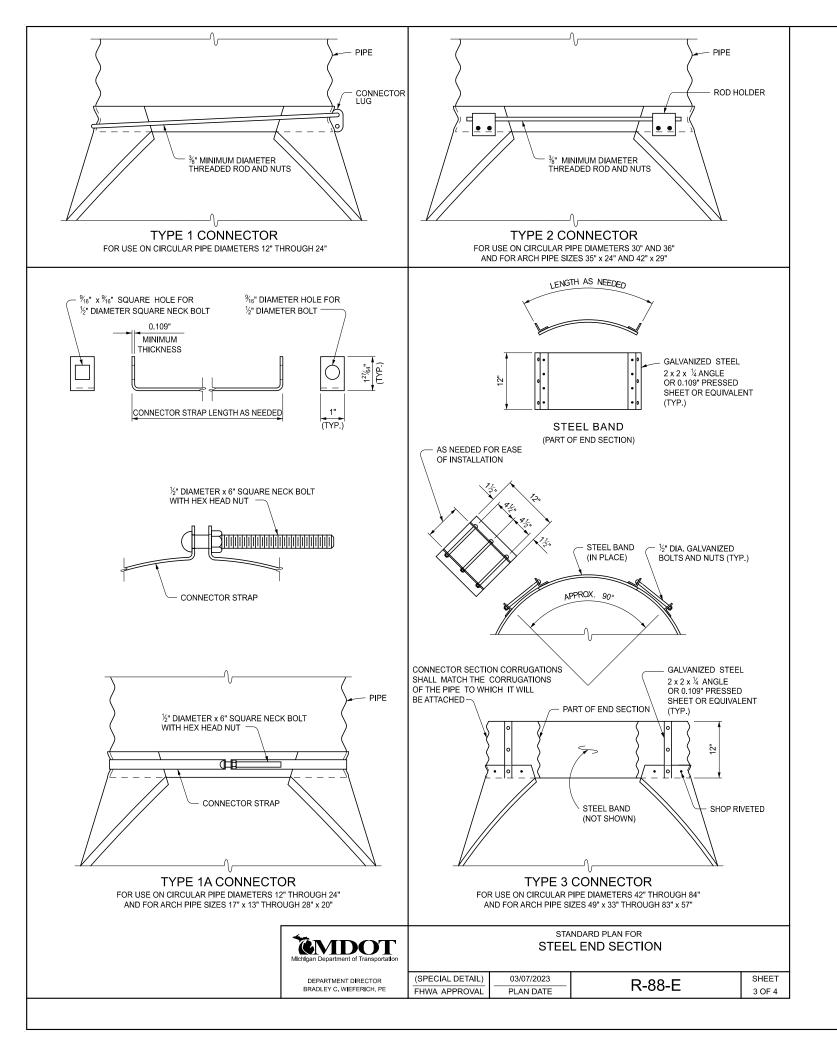
Michigan Department of Transportation	
DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE	(

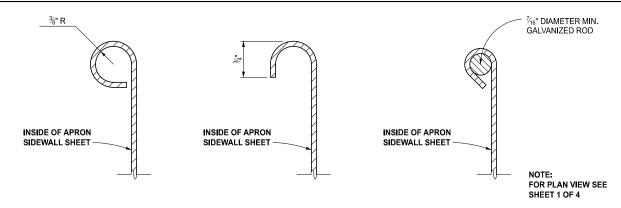
STANDARD PLAN FOR STEEL END SECTION

LONGITUDINAL VIEW

TOR (SPECIAL DETAIL) 03/07/2023
H, PE FHWA APPROVAL PLAN DATE

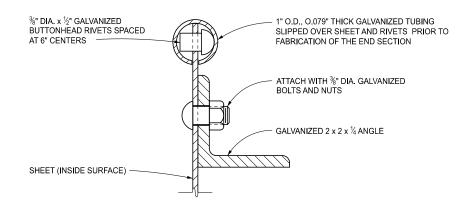
R-88-E SHEET 2 OF 4





## 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:

- WHEN INDICATED ON THE PLANS.
   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

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%" x ½" 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

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



STANDARD PLAN FOR STEEL END SECTION

(SPECIAL DETAIL) BRADLEY C. WIEFERICH, PE FHWA APPROVAL 03/07/2023 PLAN DATE

SHEET R-88-E 4 OF 4

SECT