

CORRUGATED STEEL PIPE CULVERTS AND END SECTIONS (ROUND PIPE)

D-630-4

This connection for 42" thru 84" diameter pipe to be bolted or riveted to the end section with $\frac{3}{8}$ " Galv. bolts or rivets.

NOTES:

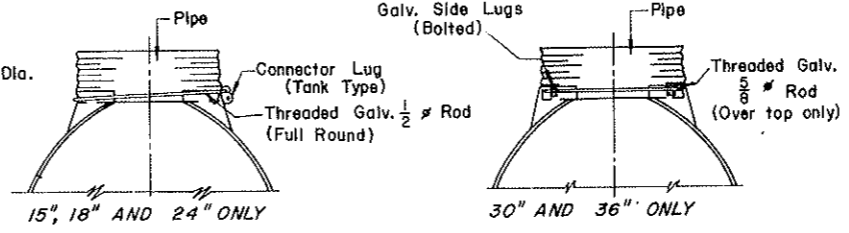
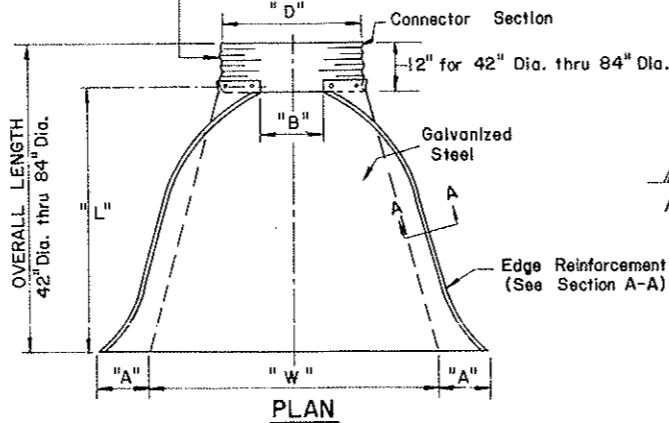
Pipe and Connecting Bands shall conform to applicable sections of 1'DSHD Standard Specifications and to AASHTO M-36.

Top edge of all End Sections to have tubing reinforcement or rolled tubing reinforcement (See Section A-A). The tubing is to be supplemented with $2" \times 2" \times \frac{1}{4}"$ Galv. Angle for 60" thru 72" Dia. and $2\frac{1}{2}" \times 2\frac{1}{2}" \times \frac{1}{4}"$ Galv. Angle for 78" and 84" Dia. Angles to be attached by Gal. $\frac{3}{8}" \phi$ bolts and nuts. Angles are to extend from Pipe to the corner wing bend.

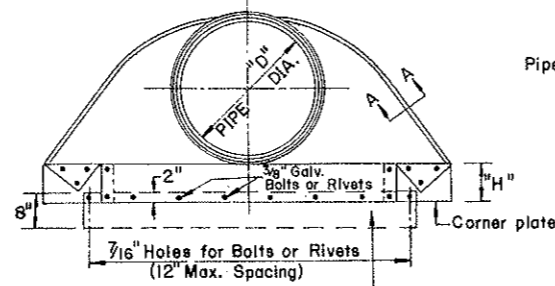
Elongated pipe shall be factory preformed so that the vertical diameter shall be 5% greater and the horizontal diameter 5% less than a circular pipe.

Fill Height Tables are based on the following criteria:

1. Embankment weight = 120 lb/ft³
2. Max. pipe deflection = 5%
3. Bedding - Class C
4. Compaction = 95% Proctor Density
5. Modulus of passive soil resistance (E') = 1400 psi
6. H-20 Live Load

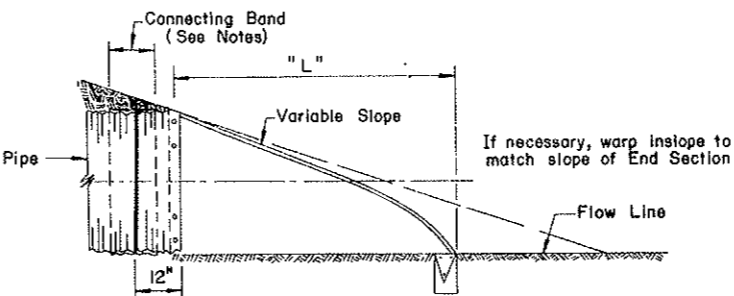


ROD CONNECTION DETAILS

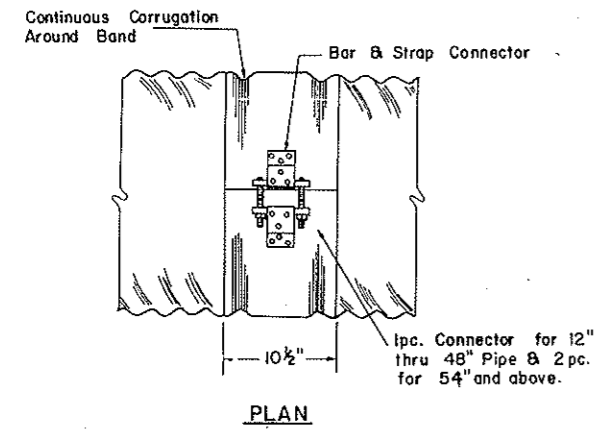


ELEVATION

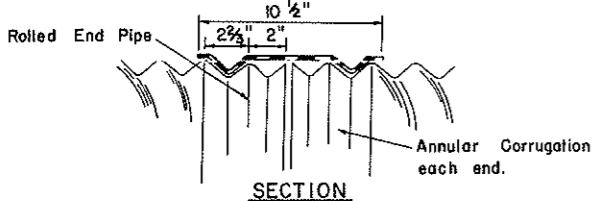
Galv. Toe Plate required on End Sections for pipe of 30" dia. or larger. Plate to be fastened to End Section in field. Thickness of Toe Plate to be same as End Section. Where Toe Plate is needed the Toe Plate, Bolts and Nuts are to be included in price bid for End Sections.



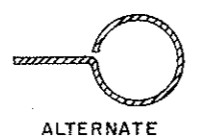
**TYPICAL CROSS-SECTION
(Showing Connector Section)**



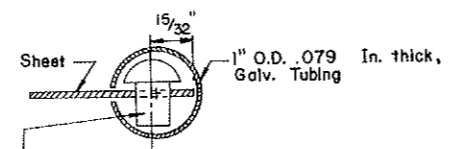
PLAN



SECTION



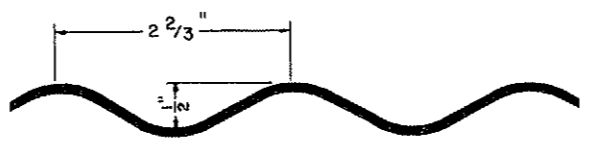
ALTERNATE



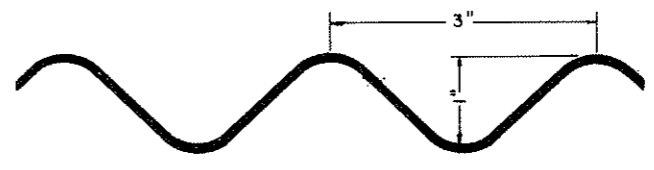
NOTE: Tubing is slipped over the sheet and rivets prior to forming operations of the End Section.

SECTION A-A

CONNECTING BAND DETAILS FOR HELICAL, WELDED-SEAM CULVERT



2 2/3" BY 1/2" CORRUGATIONS



3" BY 1" CORRUGATIONS

END SECTIONS

PIPE DIA. (In.)	GALV. THICK.	DIMENSIONS					Approx. Slope Rate	Body Pices
		A	B	H	L	W		
15	.064	7	8	6	26	30	2-1/2:1	1
18	.064	8	10	6	31	36	2-1/2:1	1
24	.064	10	13	6	41	48	2-1/2:1	1
30	.079	12	16	8	51	60	2-1/2:1	1
36	.079	14	19	9	60	72	2-1/2:1	2
42	.109	16	22	11	69	84	2-1/2:1	2
48	.109	18	27	12	78	90	2-1/4:1	2
54	.109	18	30	12	84	102	2:1	2
*60	.109	18	33	12	87	114	1-3/4:1	3
*66	.109	18	36	12	87	120	1-1/2:1	3
*72	.109	18	39	12	87	126	1-1/3:1	3
*78	.109	18	42	12	87	132	1-1/4:1	3
*84	.109	18	45	12	87	138	1-1/6:1	3

* These sizes have 0.138 in. center panels.
 ** Pipe diameter is equal to dimension "D" of end section.
 Manufacturers tolerances of above dimensions will be allowed.
 Splices to be the lap riveted type.
 Multiple panel bodies shall have lap seams which are to be tightly joined with $\frac{3}{8}" \phi$ galv. bolts or rivets. Nuts to be torqued to 25 lbs. ft.

FILL HEIGHT TABLES

RIVETED, WELDED OR HELICAL FABRICATION

WATERWAY AREA SQ. FT.	PIPE DIA. (IN.)	MIN. COVER (IN.)	MAX. FILL HEIGHTS OVER TOP OF PIPE					WATERWAY AREA SQ. FT.	PIPE DIA. (IN.)	MIN. COVER (IN.)	MAX. FILL HEIGHTS OVER TOP OF PIPE				
			GALV METAL THICKNESS (IN.)								GALV METAL THICKNESS (IN.)				
			.064	.079	.109	.138	.168				.064	.079	.109	.138	.168
7.1	36	12	48	60	78 (88)	89 (106)	101 (118)	1.2	15	12	67	73			
9.6	42	12	41	51	64 (76)	71 (91)	79 (101)	1.8	18	12	56	61			
12.6	48	12	36	45	57 (66)	61 (80)	66 (88)	3.1	24	12	42	46	59		
15.9	54	12	32	40	52 (59)	55 (71)	59 (79)	4.9	30	12	34	36	47		
19.6	60	12	29	36	49 (53)	51 (64)	54 (71)	7.1	36	12	28	30	39	41	
23.8	66	12	26	33	47	49 (58)	51 (64)	9.6	42	12	31	33	46 (67)	48 (70)	50 (73)
28.3	72	12	24	30	44	47 (53)	49 (59)	12.6	48	12	27	37	45 (58)	46 (61)	47 (63)
33.2	78	12	22	28	41	46 (49)	47 (54)	15.9	54	12		33	43 (52)	44 (54)	45 (57)
38.5	84	12	21	26	38	45	46 (51)	19.6	60	12			43 (47)	43 (49)	44 (51)
44.2	90	12	19	24	35	43	45	23.8	66	12			42	43	43 (47)
50.3	96	12	18	22	33	40	44	28.3	72	12				41	43
56.7	102	24	17	21	31	36	42	33.2	78	12					39
63.6	108	24		20	30	35	39	38.5	84	12					35
70.9	114	24			19	28	34	37							
78.5	120	24				27	32	35							

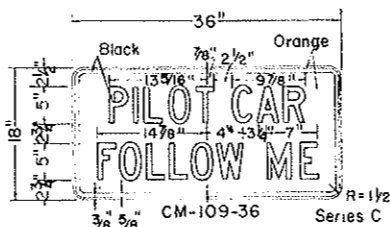
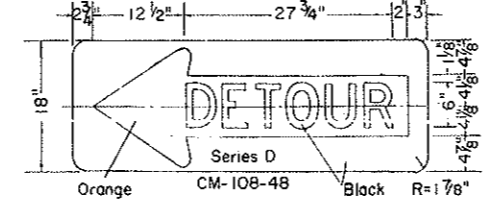
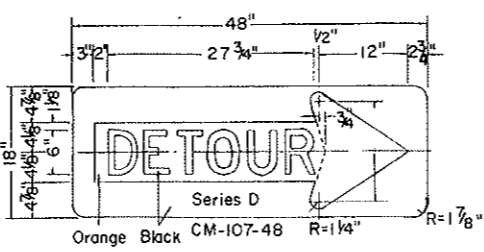
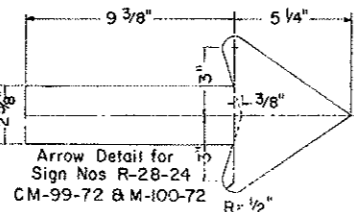
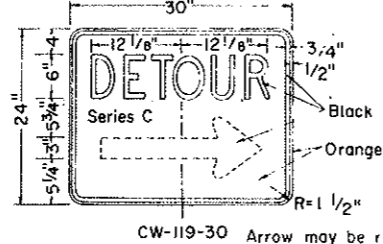
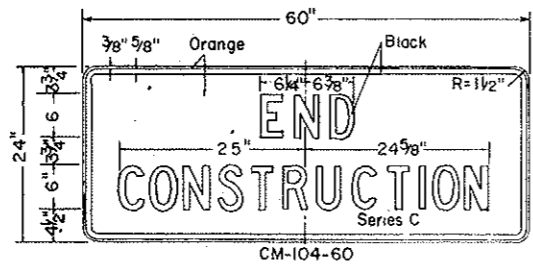
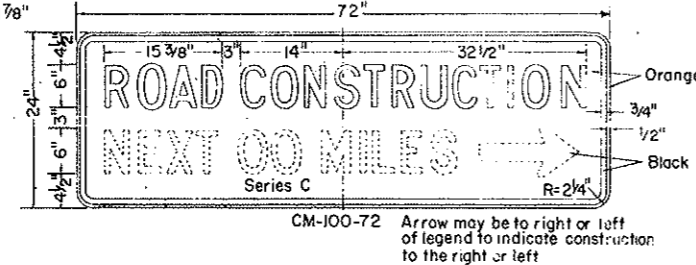
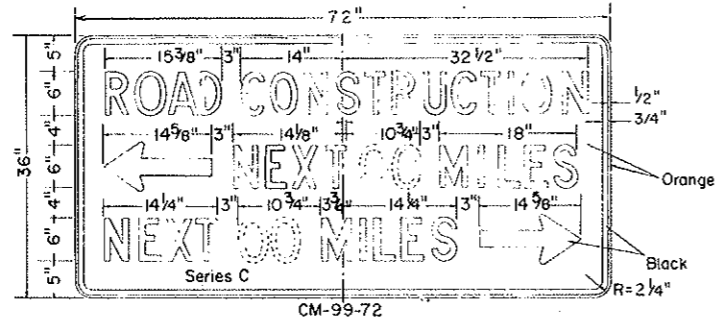
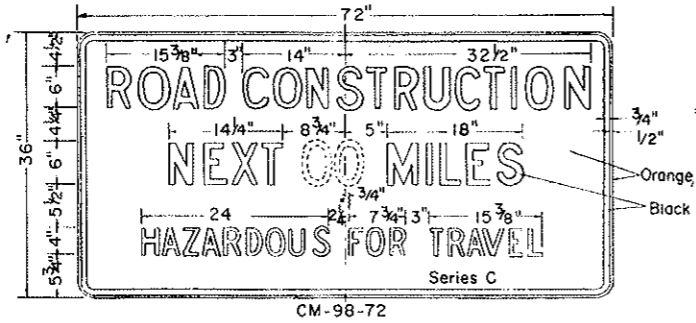
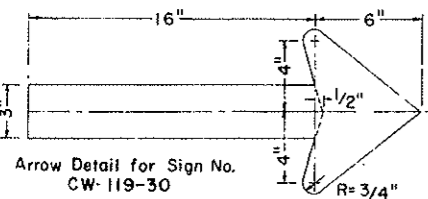
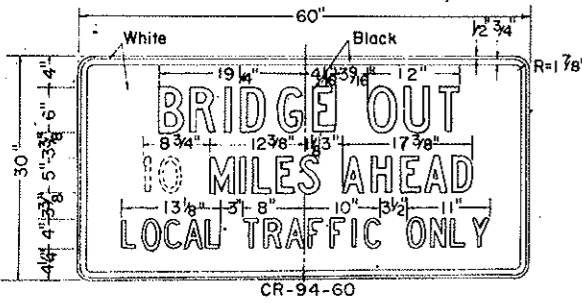
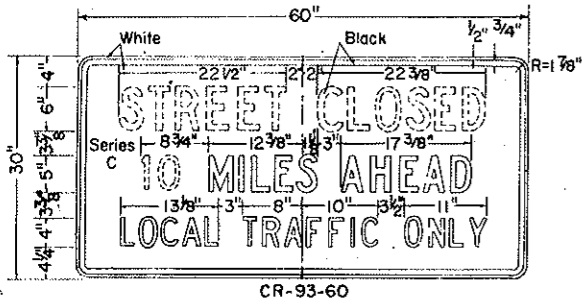
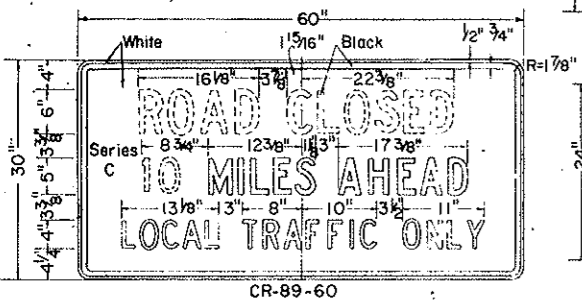
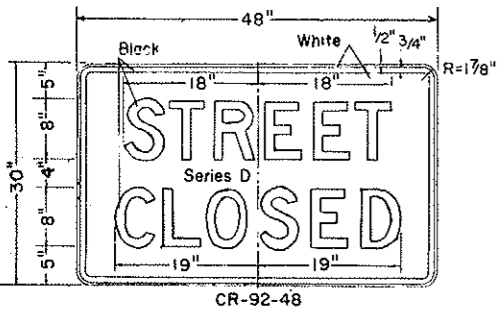
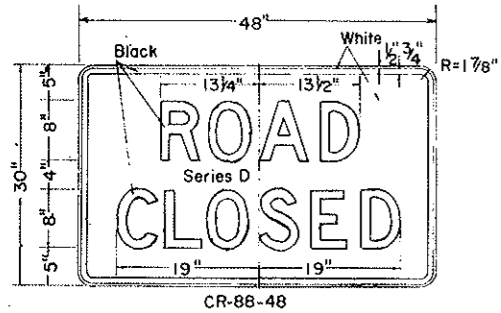
VALUES FOR ELONGATED PIPE ARE SHOWN IN PARENTHESES

6-1-74		NORTH DAKOTA STATE HIGHWAY DEPARTMENT
REVISIONS		
DATE	CHANGE	Submitted: <i>E. P. Thomas</i> Design Engineer
1-1-75	Connecting Band	Recommended: <i>Asst. Chief Engineer Pre-Construction</i>
		Approved: <i>W. Handley</i> Chief Engineer

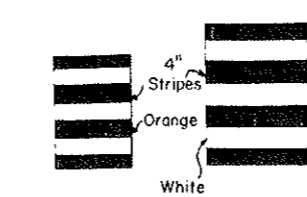
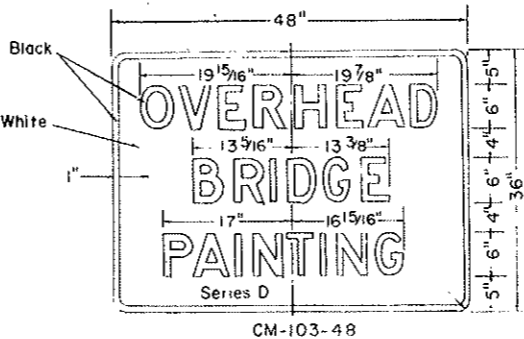
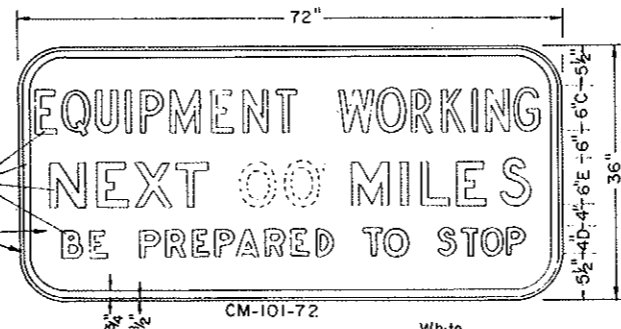
CONSTRUCTION SIGNS AND BARRICADE DETAILS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SECT. NO.	TOTAL SHEETS
8	N.D.				32

D-754-71-1

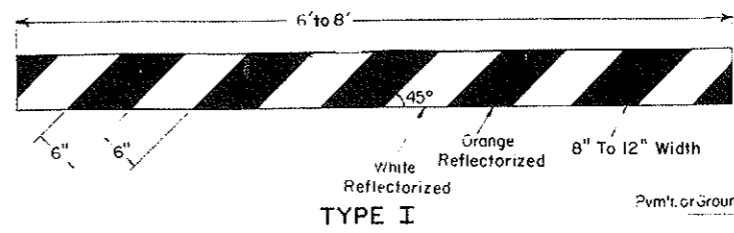


Pilot Car sign shall be mounted on rear of a vehicle used for guiding controlled one-way traffic through a construction area.



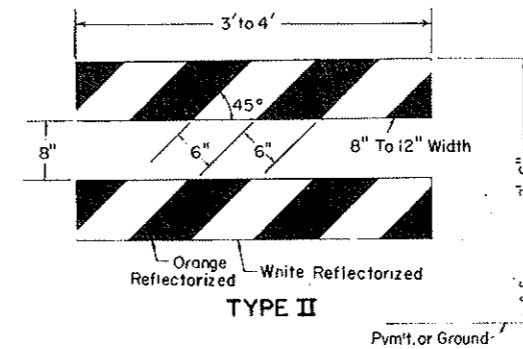
Adjustment due to odd size drums should be divided between the upper and lower stripes.

ReflectORIZED delineator drum shall be an oil drum striped as shown. The entire drum shall be given 2 coats of orange paint in accordance with Section 870 of the Std. Specs. Reflective sheeting shall be applied after painting.

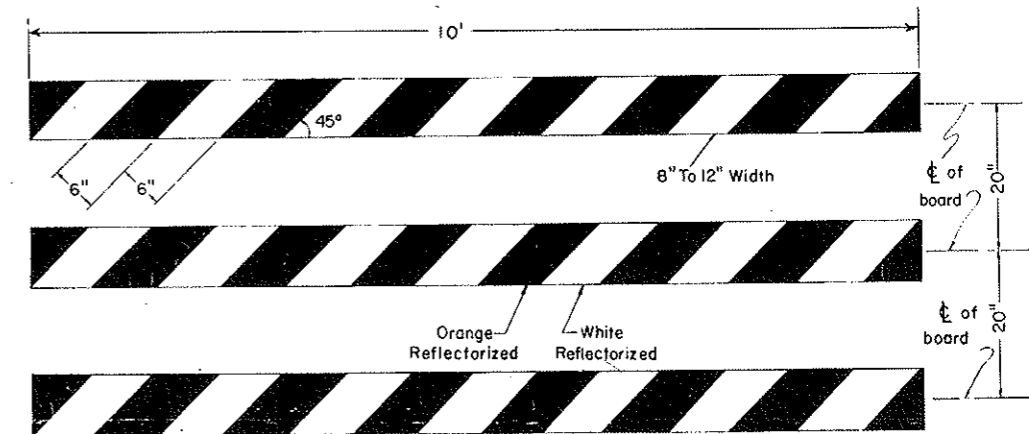


Approx. Wt./Ft. In Lbs. = 1.277

Extruded Aluminum Barricade Bar Detail



Each movable barricade shall be weighted down by a sufficient number of sand bags or other suitable weight so that it will not be blown over by the wind unless the movable supporting structure is constructed in such a manner that the wind cannot blow it over. Weight used shall be approved by the Engineer in the field. Generally the stripes shall slant downward toward the side which traffic is to pass. Barricades used at the beginning of a project shall face traffic entering that project.



3-13-72 REVISIONS	
DATE	CHANGE
6-5-72	Barricade Details
9-19-73	Sign Size

NORTH DAKOTA STATE HIGHWAY DEPARTMENT
 Submitted: *R.P. Roman* Design Engineer
 Recommended: *C. J. ...* Asst. Chief Engineer, Pre-Constr.
 Approved: *C. J. ...* Chief Engineer