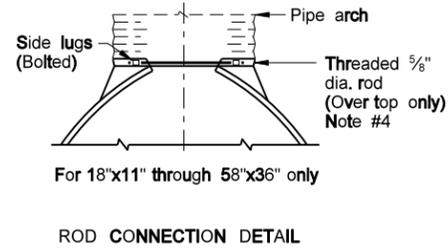
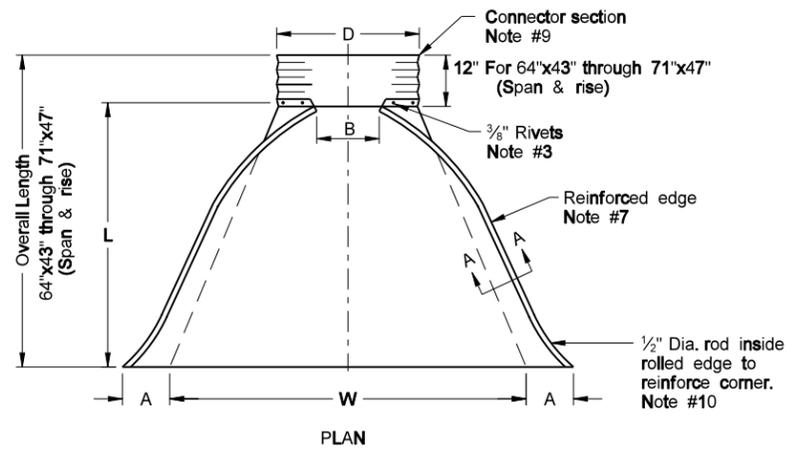
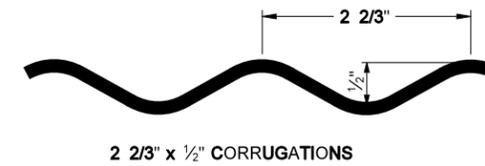


### CORRUGATED ALUMINUM PIPE ARCH CULVERTS AND END SECTIONS



Pipe size	Length-in.
18"x11"	14 3/8
22"x13"	16
25"x16"	17 1/2
29"x18"	19
36"x22"	22 1/4
43"x27"	25 3/8
50"x31"	28 1/2
58"x36"	31 5/8

1 1/4" Thread length both ends. 5/8"-11 UNC thread

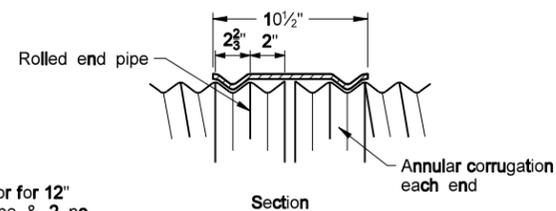
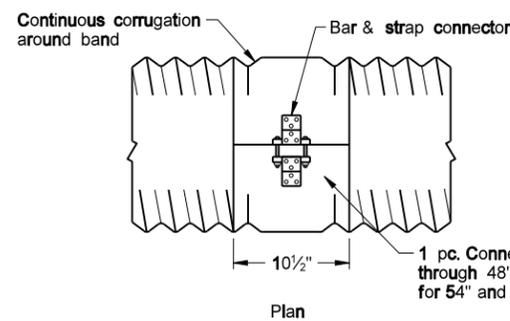
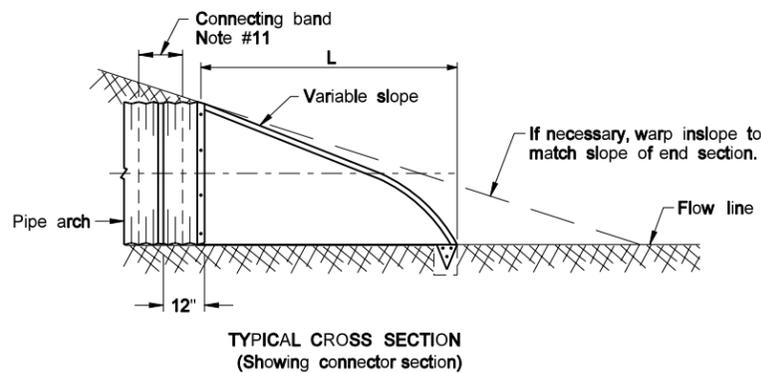
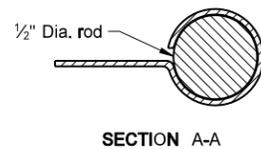
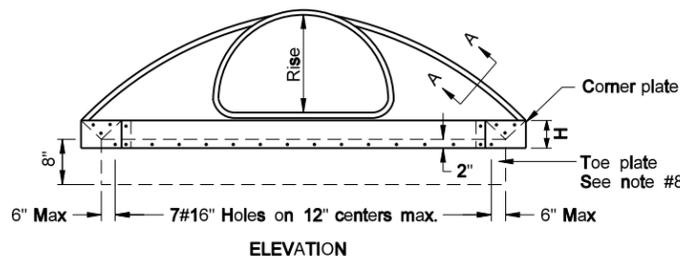


PIPE ARCH DIMENSION	SPAN	RISE	GALV. THICK.	END SECTION DIMENSIONS					APPROX. SLOPE RATE	BODY PIECE
				A	B	H	L	W		
IN	IN	IN		IN	IN	IN	IN	IN		
17	13	0.060		7	9	6	19	30	2 1/2:1	1
21	15	0.060		7	10	6	23	36	2 1/2:1	1
24	18	0.060		8	12	6	28	42	2 1/2:1	1
28	20	0.060		9	14	6	32	48	2 1/2:1	1
35	24	0.075		10	16	6	39	60	2 1/2:1	1 or 2
42	29	0.075		12	18	8	47	75	2 1/2:1	1 or 2
49	33	0.105		13	21	9	53	85	2 1/2:1	2
57	38	0.105		18	26	12	63	90	2 1/2:1	2
64	43	0.105		18	30	12	70	102	2 1/2:1	2
* 71	47	0.105		18	33	12	77	114	2 1/2:1	3

\* These sizes have 0.135" thick center panels. Manufacturers tolerances of above dimensions will be allowed.

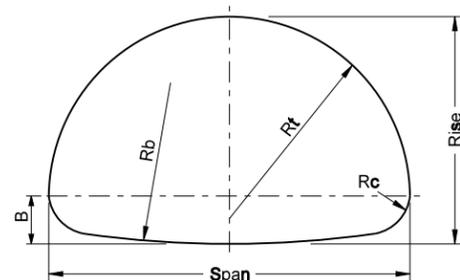
**END SECTION NOTES:**

- End sections shall be made in accordance with specifications AASHTO M-196
- Corner plate shall be the same material and thickness as end section.
- Rivets shall be aluminum alloy 6053-T4.
- Threaded rods shall be aluminum alloy 6061-T6.
- Side lugs, bolts, and nuts shall be hot-dipped galvanized steel.
- Multiple panel bodies shall have 2" lap seams which are to be tightly joined with 3/8" diameter rivets spaced 6" c. to c.
- Top edge of all end sections to have rolled edge reinforcement (See section A-A).
- Aluminum alloy toe plate required on end sections for pipe arch of 29" rise or larger. Thickness of toe plate to be same as end section. Where toe plate is needed, toe plate, nuts, and bolts are to be included in price bid for end sections.
- Connector section, when specified, shall be corrugated aluminum alloy pipe arch culvert.
- Reinforcement for edge of end section shall be alloy 6063-F.
- Connection bands shall conform to AASHTO M-196.



**RIVETED OR HELICAL FABRICATION**

DIA. OF EQUAL PIPE	SPAN	RISE	WATER-WAY SQ. FT.	LAYOUT DIMENSIONS			
				B	Rc	Rt	Rb
IN	IN	IN		IN	IN	IN	IN
15	18	11	1.1	4 1/2	3 1/2	10 1/16	19 1/8
18	22	13	1.6	4 3/4	4	11 1/8	37 1/16
21	25	16	2.2	5 1/4	4	12 3/4	33 1/2
24	29	18	2.8	5 1/2	4 1/2	14 3/4	55
30	36	22	4.4	6 1/4	5	18 1/4	73 1/4
36	43	27	6.4	7	5 1/2	21 1/16	91 1/16
42	50	31	8.7	8	6	25 1/8	97 1/4
48	58	36	11.4	9 1/4	7	29 1/8	115 1/16
54	65	40	14.3	10 1/2	8	32 3/4	129 3/16
60	72	44	17.6	11 1/4	9	36 5/16	142 5/16



**PIPE ARCH CULVERT NOTES:**

All dimensions are measured from the inside crests of the corrugations. A tolerance of plus or minus one inch will be permissible in span, rise, and B. The dimension B shall be measured vertically from a horizontal line drawn across the widest portion of the arch.

The lapped longitudinal seams shall be factory riveted and shall be staggered so as to alternate on each side of the center of the top of the arch by approximately fifteen percent of the periphery.

Pipe arch culverts shall conform to the applicable requirements of AASHTO M-196 or M219-66.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-1-86	
REVISIONS	
DATE	CHANGE
04-28-89	Toe plate note
06-25-03	Revised layout
12-01-04	PE Stamp added
12-08-08	Removed min/max fill info

This document was originally issued and sealed by Terrence R. Udland, Registration Number PE- 2674, on 12/08/2008 and the original document is stored at the North Dakota Department of Transportation