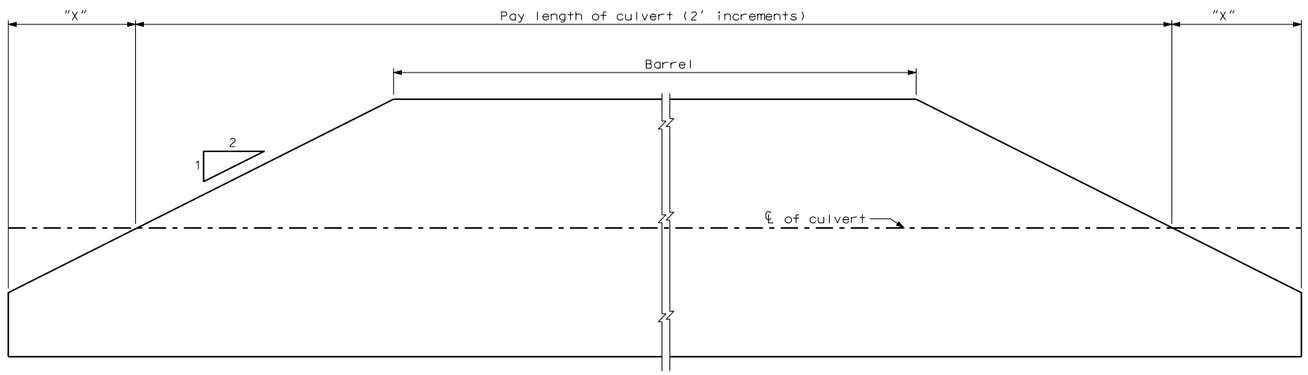
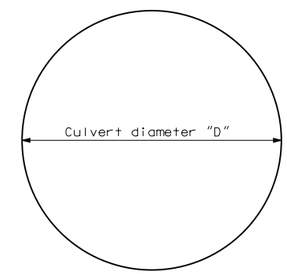
STEEL STRUCTURAL PLATE PIPE
(SLOPED ENDS)

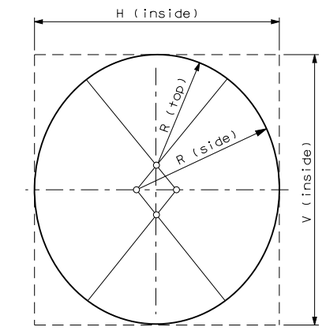
D-638-3



LONGITUDINAL VIEW OF CULVERT



END VIEW
ROUND PIPE

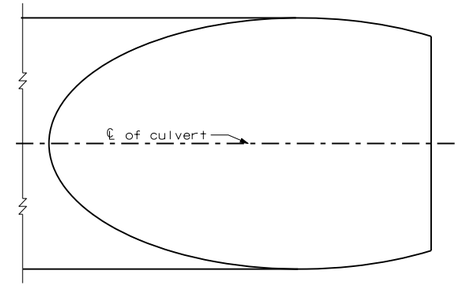


END VIEW
ELLIPTICAL PIPE
(5% ELONGATED)

MAXIMUM FILL HEIGHT CHART

DIA. FT-IN	WATERWAY AREA SQ FT	MIN. COVER IN	DIM. "X" FT	MAXIMUM FILL HEIGHTS OVER TOP OF PIPE (FT) GALV. METAL THICKNESS (IN) 0.109	0.138	0.168	0.188	0.218	0.249	0.280	ELLIPTICAL PIPE DIA. INCHES	H INCHES	V INCHES	R.(SIDE) INCHES	R.(TOP) INCHES
5-0	19.6	12	2	43	62	81	93	106(111)	116(132)	126(144)	60	56.0	62.0	33.7	26.3
5-6	23.8	12	2	39	57	74	86	90(102)	98(120)	105(131)	66	61.7	68.4	37.8	29.3
6-0	28.3	12	3	36	52	68	73(78)	79(93)	85(110)	91(120)	72	67.4	74.7	41.8	32.3
6-6	33.2	12	3	33	48	61	65(72)	71(86)	75(102)	80(111)	78	73.3	81.2	44.7	34.7
7-0	38.5	12	3	31	44	58	61(67)	65(79)	69(94)	72(103)	84	79.2	87.7	47.6	37.2
7-6	44.2	12	3	29	41	54	56(62)	60(74)	64(88)	66(96)	90	85.4	94.5	49.4	37.8
8-0	50.3	12	4	27	39	51	55(58)	57(69)	60(82)	62(90)	96	91.1	100.8	53.1	41.1
8-6	56.7	24	4	25	36	48	52(55)	54(65)	56(78)	59(85)	102	96.8	107.1	56.9	44.4
9-0	63.6	24	4	24	34	45	50	52(62)	54(73)	56(80)	108	102.8	113.8	59.5	45.6
9-6	70.9	24	4	23	33	43	49	50(59)	52(69)	54(76)	114	108.5	120.1	63.2	48.9
10-0	78.5	24	5	22	31	41	47	49(56)	50(66)	52(72)	120	114.6	126.7	65.8	49.9
10-6	86.6	24	5	21	30	39	44	48(53)	49(63)	50(69)	126	120.3	133.1	69.5	53.4
11-0	95.0	24	5	20	28	37	42	47(51)	48(60)	49(66)	132	126.1	139.7	72.8	55.4
11-6	103.9	24	5	19	27	35	40	46	47(57)	48(63)	138	132.2	146.3	75.6	56.0
12-0	113.1	24	6	18	26	34	39	45	46(55)	47(60)	144	137.9	152.6	79.2	59.7
12-6	122.7	24	6	17	25	33	37	45	46(53)	47(58)	150	143.8	159.1	82.5	61.7
13-0	132.7	24	6	17	24	31	36	43	45(50)	46(56)	156	149.6	165.6	85.7	63.8
13-6	143.1	24	6	16	23	30	35	41	45(49)	46(53)	162	155.5	172.1	88.9	65.8
14-0	153.9	24	7	15	22	29	33	40	44(47)	45(52)	168	161.4	178.6	92.2	67.8
14-6	165.1	24	7	15	21	28	32	38	44	45(50)	174	166.1	183.7	100.2	78.4
15-0	176.7	24	7	14	21	27	31	37	44	44(48)	180	171.5	189.7	106.9	82.3
15-6	188.7	24	7	14	20	26	30	36	43	44(47)					
16-0	201.1	24	8		19	25	29	35	41	43					
16-6	213.8	36	8		19	25	28	34	40	43					
17-0	227.0	36	8		18	24	27	33	39	43					
17-6	240.5	36	8		18	23	27	32	38	41					
18-0	254.5	36	9			23	26	31	37	40					
18-6	268.8	36	9			22	25	30	36	39					
19-0	283.5	36	9			21	25	29	35	38					
19-6	298.6	36	9			21	24	29	34	37					
20-0	314.2	36	10				23	28	33	36					
20-6	330.1	36	10				23	27	32	35					
21-0	346.4	36	10					27	31	34					

The maximum fill height for elliptical (5% elongated) pipe are shown in parentheses.



PART PLAN

CONVERSION OF GALV. THICKNESS TO NOMINAL GAUGE		
THICKNESS (mm)	THICKNESS (INCHES)	GAUGE
1.63	0.064	16
2.01	0.079	14
2.77	0.109	12
3.51	0.138	10
4.27	0.168	8
4.78	0.188	7
5.54	0.218	5
6.32	0.249	3
7.11	0.280	1

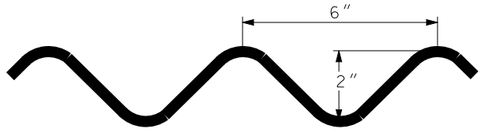
NOTES:

Structural Plate Pipe shall conform to the requirements listed and shown on this sheet and to the American Association of State Highway and Transportation Officials "Standard Specifications for Highway Bridges"

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.

When it is specified on the plans that the beveled ends are to be of a greater thickness than the barrel of the culvert, all plates outside of the barrel or that have a portion extending outside of the barrel shall be of the greater thickness.

Fill height chart is based on the following criteria:
1. Embankment weight = 120 lb/cu ft
2. Max. pipe deflection = 5%
3. Bedding - class C
4. Compaction = 95% proctor density
5. H-20 live load
6. Modulus of passive soil resistance (E') = 1400 psi



6" x 2" CORRUGATIONS

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-1-86	
REVISIONS	
DATE	CHANGE
06-03-03	Layout revision
12-01-04	PE Stamp added

This document was originally issued and sealed by MARK S. GAYDOS Registration Number PE- 4518 , on 12/01/04 and the original document is stored at the North Dakota Department of Transportation