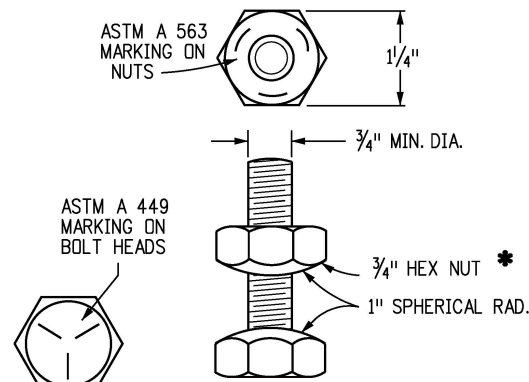


PIPE DIA.	MIN. COVER	MAX. HEIGHT OF COVER H (FT.)						
		WALL THICKNESS (IN.)						
IN.		0.109	0.138	0.168	0.188	0.218	0.249	0.280
60	12	47	68	90	100	100	100	100
66	12	43	62	81	93	100	100	100
72	12	39	57	75	86	95	100	100
76	12	36	52	69	79	90	100	100
84	12	34	49	64	73	88	100	100
90	12	31	45	60	68	82	97	100
96	12	29	43	56	64	77	91	100
102	18	28	40	52	60	73	86	94
108	18	26	38	50	57	69	81	88
114	18	25	36	47	54	65	77	84
120	18	23	34	45	51	62	73	80
126	18	22	32	42	49	59	69	76
132	18	21	31	40	46	56	66	72
138	18	20	29	39	44	54	63	69
144	18	19	28	37	43	51	61	66
150	24	19	27	36	41	49	58	64
156	24	18	26	34	39	47	56	61
162	24	17	25	33	38	46	54	59
168	24	17	24	32	36	44	52	57
174	24	16	23	31	35	42	50	55
180	24	15	22	30	34	41	48	53
186	24	15	22	29	33	40	47	51
192	24		21	28	32	38	45	50
198	30		20	27	31	37	44	48
204	30		19	26	30	36	43	47
210	30		19	25	29	35	41	45
216	30			25	28	34	40	44
222	30			24	27	33	39	43
228	30			23	27	32	38	42
234	30			23	26	31	37	41
240	30			25	31	36	40	

TABLE I - 6 IN. x 2 IN. CORRUGATIONS ROUND STEEL PIPE



PIPE BOLT AND NUT

\*INSTALL CULVERT NUTS AS SHOWN. DO NOT INVERT.

NOTES:

- NUTS MADE IN CONFORMANCE WITH ASTM A 194, GRADE 2 OR GRADE 2H, AND MARKED WITH THE GRADE SYMBOL ARE ACCEPTABLE EQUIVALENTS FOR ASTM A 563, GRADE C NUTS.
- BOLTS SHALL BE PLACED LOOSE TO ALIGN PLATES, THEN TIGHTENED TO MAINTAIN STRUCTURE SHAPE.

PIPE SIZE SPAN x RISE	MIN. COVER	MIN. WALL THICKNESS	CORNER RADII	MAX. H
6-1 x 4-7	12	0.109	18	15
6-4 x 4-9	12	0.109	18	15
6-9 x 4-11	12	0.109	18	14
7-0 x 5-1	12	0.109	18	14
7-3 x 5-3	12	0.109	18	13
7-8 x 5-5	12	0.109	18	13
7-11 x 5-7	12	0.109	18	12
8-2 x 5-9	18	0.109	18	12
8-7 x 5-11	18	0.109	18	11
8-10 x 6-1	18	0.109	18	11
9-4 x 6-3	18	0.109	18	10
9-6 x 6-5	18	0.109	18	10
9-9 x 6-7	18	0.109	18	10
10-3 x 6-9	18	0.109	18	9
10-8 x 6-11	18	0.109	18	9
10-11 x 7-1	18	0.109	18	9
11-5 x 7-3	18	0.109	18	8
11-7 x 7-5	18	0.109	18	7
11-10 x 7-7	18	0.109	18	7
12-4 x 7-9	30	0.109	18	6
12-6 x 7-11	30	0.109	18	6
12-8 x 8-1	30	0.109	18	6
12-10 x 8-4	30	0.109	18	6
13-3 x 9-4	30	0.109	31	13
13-6 x 9-6	30	0.109	31	12
14-0 x 9-8	30	0.109	31	12
14-2 x 9-10	30	0.109	31	12
14-5 x 10-0	30	0.109	31	11
14-11 x 10-2	30	0.109	31	11
15-4 x 10-4	30	0.109	31	11
15-7 x 10-6	30	0.109	31	11
15-10 x 10-8	30	0.109	31	10
16-3 x 10-10	30	0.138	31	10
16-6 x 11-0	30	0.138	31	10
17-0 x 11-2	30	0.138	31	10
17-2 x 11-4	30	0.138	31	10
17-5 x 11-6	30	0.138	31	9
17-11 x 11-8	30	0.138	31	9
18-1 x 11-10	30	0.168	31	9
18-7 x 12-0	30	0.168	31	9
18-9 x 12-2	30	0.168	31	9
19-3 x 12-4	30	0.168	31	8
19-6 x 12-6	30	0.168	31	8
19-8 x 12-8	30	0.168	31	7
19-11 x 12-10	30	0.168	31	7
20-5 x 13-0	36	0.188	31	7
20-7 x 13-2	36	0.188	31	6

TABLE II - 6 IN. x 2 IN. CORRUGATIONS STEEL PIPE-ARCH

▣ - PIPE-ARCH IS INTENDED FOR USE WHERE MINIMUM COVER REQUIREMENTS FOR ROUND PIPE CANNOT BE MET. USE ROUND PIPE WHEN H EXCEEDS 15 FT.

PIPE SIZE SPAN x RISE	MIN. COVER	MIN. WALL THICKNESS	CORNER RADII	MAX. H
6-2 x 5-0	21	0.100	27	15
6-7 x 4-11	21	0.100	27	15
6-7 x 5-8	21	0.100	32	15
6-11 x 5-9	21	0.100	32	15
7-3 x 5-11	21	0.100	32	15
7-9 x 6-0	24	0.100	32	15
8-1 x 6-1	24	0.100	32	15
8-5 x 6-3	24	0.100	32	15
8-10 x 6-4	27	0.100	32	15
9-3 x 6-5	27	0.100	32	15
9-7 x 6-6	27	0.100	32	15
9-11 x 6-8	27	0.100	32	15
10-3 x 6-9	27	0.100	32	15
10-9 x 6-10	30	0.100	32	14
11-1 x 7-0	30	0.100	32	14
11-5 x 7-1	30	0.100	32	14
11-9 x 7-2	33	0.100	32	13
12-3 x 7-3	33	0.100	32	13
12-7 x 7-5	33	0.100	32	12
12-11 x 7-6	33	0.100	32	12
13-1 x 8-2	33	0.100	32	12
13-1 x 8-4	33	0.100	32	12
13-11 x 8-5	30	0.125	32	13
14-0 x 8-7	33	0.125	32	13
13-11 x 9-5	30	0.125	32	13
14-3 x 9-7	33	0.125	32	12
14-8 x 9-8	33	0.125	32	12
14-11 x 9-10	33	0.125	32	12
15-4 x 10-0	33	0.125	32	12
15-7 x 10-2	30	0.150	32	11
16-1 x 10-4	33	0.150	32	11
16-4 x 10-6	33	0.150	32	11
16-9 x 10-8	33	0.150	32	11
17-0 x 10-10	33	0.150	32	10
17-3 x 11-0	33	0.175	32	10
17-9 x 11-2	30	0.175	32	10
18-0 x 11-4	33	0.175	32	10
18-5 x 11-6	33	0.175	32	10
18-8 x 11-8	33	0.175	32	9
19-2 x 11-9	30	0.200	32	9
19-5 x 11-11	30	0.200	32	9
19-10 x 12-1	33	0.200	32	9
20-1 x 12-3	33	0.200	32	9
20-1 x 12-6	33	0.200	32	9
20-10 x 12-7	30	0.225	32	8
21-1 x 12-9	33	0.225	32	8
21-6 x 12-11	33	0.225	32	8

TABLE III - 9 IN. x 2 1/2 IN. CORRUGATIONS ALUMINUM PIPE-ARCH

H - HEIGHT OF COVER LIMIT. MAXIMUM HEIGHT OF FILL OVER THE TOP OF THE PIPE TO THE BOTTOM OF THE PAVEMENT: HMA OR PCCP. FILL HEIGHTS GREATER THAN MAXIMUM ALLOWED IN THE FILL HEIGHT TABLE REQUIRE SPECIAL DESIGN.

PIPE DIA.	MIN. COVER	MAX. HEIGHT OF COVER H (FT.)						
		WALL THICKNESS (IN.)						
IN.		0.100	0.125	0.150	0.175	0.200	0.225	0.250
60	15	31	45	60	70	81	92	100
66	18	28	41	54	64	74	84	94
72	21	25	37	50	58	67	77	86
78	21	23	35	46	54	62	71	79
84	21	22	32	42	50	58	66	73
90	24	20	30	40	47	54	61	68
96	24	19	28	37	44	50	57	64
102	24	18	26	35	41	47	54	60
108	27	17	25	33	39	45	51	57
114	27	16	23	31	37	42	48	54
120	27	15	22	30	35	40	46	51
126	30	14	21	28	33	38	44	49
132	30	14	20	27	32	37	42	46
138	30	13	19	26	30	35	40	44
144	33	12	18	25	29	33	38	42
150	30		18	24	28	32	36	40
156	30		17	23	27	31	35	38
162	30		17	22	26	30	34	37
168	30		21	25	29	32	35	38
174	30		20	24	28	31	34	37
180	27			23	27	30	33	36
186	27			22	26	29	32	35
192	27				25	28	30	32
198	27				24	27	29	31
204	27				23	26	28	30
210	27				23	25	27	29
216	27							26
222	27							25
228	27							25

TABLE IV - 9 IN. x 2 1/2 IN. CORRUGATIONS ROUND ALUMINUM PIPE

GENERAL NOTES

- PIPE OR PIPE-ARCH WITH ENDS CUT TO FIT A SLOPE AND REPAIRED IN ACCORDANCE WITH SUBSECTION 707.09, SHALL BE REINFORCED AS SHOWN ON THE PLANS.
- WHERE MULTIPLE PIPES ARE USED, THEY SHALL BE SPACED SO THAT ADJACENT SIDES OF THE PIPE SHALL BE AT LEAST ONE-HALF DIAMETER OR ONE-HALF SPAN APART TO PERMIT CAREFUL TAMPING OF THE BACKFILL MATERIAL, EXCEPT THAT THE CLEAR DISTANCE BETWEEN ADJACENT SIDES SHALL NOT BE MORE THAN 3 FT.
- MINIMUM COVER FOR STRUCTURAL PLATE PIPE OR PIPE ARCH IS MEASURED FROM THE TOP OF THE PIPE TO THE BOTTOM OF THE PAVEMENT: HMA OR PCCP. DURING CONSTRUCTION, ADEQUATE COVER SHALL BE PROVIDED TO PROTECT THE STRUCTURE FROM DAMAGE. THE COVER DURING CONSTRUCTION SHALL BE AT LEAST 1 FT.

▽ - PIPE ARCH WITH EQUAL PERIPHERY AND WITH SPAN AND RISE DIMENSIONS APPROXIMATELY EQUAL TO THOSE SPECIFIED ON THE PLANS WILL BE PERMITTED.

PIPE OR PIPE-ARCH CONFORMING TO SECTION 603 SHALL NOT BE SUBSTITUTED FOR STRUCTURAL PLATE PIPE OR PIPE-ARCH. PIPE-ARCH DESIGN IS BASED ON CORNER BEARING PRESSURE ON THE SOIL OF 2 TONS PER SQUARE FT.

Computer File Information	
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 Project Development Branch JBK

**STRUCTURAL PLATE  
 PIPE H-20 LOADING**  
 Issued by the Project Development Branch: July 31, 2019

**STANDARD PLAN NO.  
 M-510-1**  
 Standard Sheet No. 1 of 1  
 Project Sheet Number: