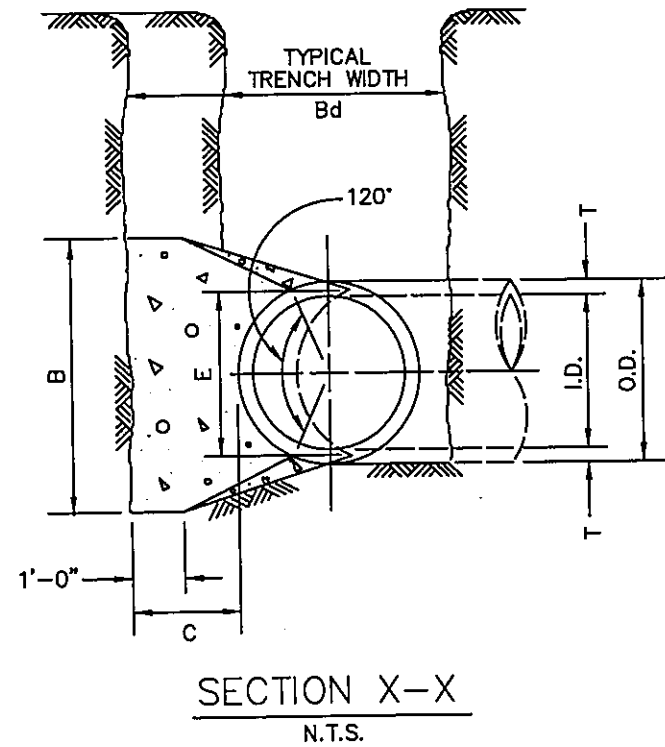
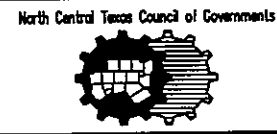


REFER TO
STD. DWG. No. 4040
FOR GENERAL NOTES.



HORIZONTAL THRUST BLOCK
AT PIPE BEND



STANDARD SPECIFICATION REFERENCE
502.4
DATE
OCT. '04
STANDARD DRAWING NO.
4010A

I.D. (IN.)	T (IN.)	Δ = 11.25°		Δ = 22.50°		E (FT.)
		C (FT.)	B (FT.)	C (FT.)	B (FT.)	
4.6, 8	0.4	1.5	1.5	1.5	0.9	
10, 12	0.5	1.5	1.5	1.5	1.2	
16, 18	0.6	1.5	1.5	1.5	1.6	
20	0.7	1.5	1.5	1.5	1.8	
24	0.9	1.5	1.5	1.5	2.1	
30	2.9	1.5	1.9	2.6		
36	4.5	1.5	2.3	3.3		
42	5.0	1.8	2.6	3.8		
48	5.5	2.0	3.0	4.3		
54	6.0	2.3	3.4	4.8		
60	6.5	2.5	3.8	5.3		
66	6.8	2.8	4.1	5.7		
72	7.5	3.0	4.5	6.3		
78	7.5	3.3	4.9	6.7		
84	8.0	3.5	5.3	7.2		
90	8.5	3.8	5.6	7.7		
96	9.0	4.0	6.0	8.2		

Δ = 11.25°										Δ = 22.50°									
I.D. (IN.)	G (FT.)	THRUST (TONS)	EARTH		ROCK		I.D. (IN.)	G (FT.)	THRUST (TONS)	VOL. (C.Y.)	EARTH		ROCK		I.D. (IN.)	G (FT.)	THRUST (TONS)	VOL. (C.Y.)	VOL. (C.Y.)
			A (FT.)	B (FT.)	A (FT.)	B (FT.)					A (FT.)	B (FT.)	A (FT.)	B (FT.)					
4.6, 8	0.4	1.0	1.0	1.5	0.1	0.1	4.6, 8	0.8	2.0	1.5	1.5	0.1	1.0	1.0	0.1				
10, 12	0.6	2.2	1.5	1.5	0.1	0.1	10, 12	1.1	4.4	2.0	2.5	0.3	1.5	1.5	0.1				
16, 18	0.8	5.0	2.0	2.5	0.3	1.5	16, 18	1.6	9.9	3.0	3.5	0.6	2.0	2.5	0.3				
20	0.9	6.2	2.0	3.5	0.4	1.5	20	1.8	12.3	3.5	3.5	0.7	2.0	3.0	0.4				
24	1.1	8.9	3.0	3.5	0.5	1.5	24	2.2	17.7	4.0	4.5	1.0	3.0	3.5	0.5				
30	1.4	10.4	3.0	3.5	0.6	2.0	30	2.7	20.7	5.0	4.5	1.5	3.0	4.0	0.8				
36	1.7	15.0	3.5	4.5	0.9	2.0	36	3.3	29.8	5.5	5.5	2.3	4.0	4.0	1.3				
42	1.9	20.4	4.5	5.0	1.5	2.5	42	3.8	40.5	7.0	6.0	3.9	4.5	5.0	2.1				
48	2.2	26.6	4.5	6.0	2.0	2.5	48	4.4	52.9	8.0	7.0	5.7	4.5	6.0	2.8				
54	2.5	33.7	6.0	6.0	3.0	3.0	54	4.9	67.0	9.0	8.0	8.0	6.0	6.0	4.1				
60	2.7	41.6	6.0	7.0	3.8	3.0	60	5.5	82.7	9.5	9.0	10.6	6.0	7.0	5.3				
66	3.0	50.3	6.5	8.0	5.1	3.5	66	6.0	100.1	10.5	10.0	14.1	6.5	8.0	7.2				
72	3.3	59.9	7.5	8.0	6.3	4.0	72	6.6	119.1	11.0	11.0	17.6	7.5	8.0	9.1				
78	3.6	70.2	8.0	9.0	8.1	4.0	78	7.1	139.8	12.0	12.0	22.5	8.0	9.0	11.7				
84	3.9	81.5	8.5	10.0	10.3	4.5	84	7.6	162.1	13.0	12.5	27.2	8.5	10.0	14.8				
90	4.1	93.5	9.5	10.0	12.2	5.0	90	8.2	186.1	14.0	13.5	33.7	9.5	10.0	17.7				
96	4.4	106.4	10.0	11.0	15.0	5.0	96	8.7	211.7	15.0	14.5	41.2	10.0	11.0	21.8				

TABLES OF DIMENSIONS AND QUANTITIES

HORIZONTAL THRUST BLOCK
AT PIPE BEND



STANDARD SPECIFICATION REFERENCE
502.4
DATE
OCT. '04
STANDARD DRAWING NO.
4010B

Δ = 30°										Δ = 45°									
I.D. (IN.)	G (FT.)	THRUST (TONS)	EARTH		ROCK		I.D. (IN.)	G (FT.)	THRUST (TONS)	VOL. (C.Y.)	EARTH		ROCK		I.D. (IN.)	G (FT.)	THRUST (TONS)	VOL. (C.Y.)	VOL. (C.Y.)
			A (FT.)	B (FT.)	A (FT.)	B (FT.)					A (FT.)	B (FT.)	A (FT.)	B (FT.)					
4.6, 8	1.0	2.6	2.0	1.5	0.2	1.0	4.6, 8	1.5	3.9	2.0	2.0	0.2	1.5	1.5	0.1				
10, 12	1.5	5.9	2.5	2.5	0.3	2.0	10, 12	2.2	8.7	3.5	2.5	0.5	2.0	2.5	0.3				
16, 18	2.2	13.2	3.5	4.0	0.8	2.5	16, 18	3.2	19.5	4.5	4.5	1.2	3.0	3.5	0.8				
20	2.4	16.3	4.5	4.0	1.0	3.0	20	3.0	24.1	5.5	4.5	1.5	3.5	3.5	0.7				
24	2.9	23.4	6.0	4.0	1.4	3.5	24	4.3	34.6	8.0	4.5	2.3	4.5	4.0	1.1				
30	3.6	27.5	6.5	5.0	1.9	3.5	30	5.4	40.6	8.5	5.0	3.2	5.5	4.0	1.6				
36	4.4	39.5	7.0	6.0	3.4	4.5	36	6.5	58.5	10.0	6.0	5.3	6.5	4.5	2.6				
42	5.1	53.8	8.0	7.0	5.1	5.5	42	7.5	79.6	11.5	7.0	8.1	8.0	5.0	4.2				
48	5.8	70.3	9.0	8.0	7.4	6.0	48	8.6	104.0	13.0	8.0	11.9	9.0	6.0	6.3				
54	6.5	89.0	10.0	9.0	10.3	7.0	54	9.7	131.5	15.0	9.0	17.1	10.5	6.5	8.9				
60	7.3	110.0	11.0	10.0	13.9	7.5	60	10.7	162.4	16.5	10.0	23.1	11.0	7.5	12.0				
66	8.0	132.9	12.5	11.0	18.9	8.5	66	11.8	196.5	18.0	11.0	30.1	12.0	8.5	16.2				
72	8.7	158.2	13.5	12.0	24.0	9.0	72	12.9	233.9	19.5	12.0	38.5	14.0	8.5	20.7				
78	9.4	185.6	14.5	13.0	30.0	10.0	78	13.9	274.5	21.5	13.0	49.8	14.5	9.5	25.9				
84	10.1	215.3	15.5	14.0	37.1	10.5	84	15.0	318.4	23.0	14.0	61.2	15.5	10.5	32.6				
90	10.9	247.1	16.5	15.0	45.0	11.5	90	16.1	365.5	24.5	15.0	74.5	17.5	10.5	39.6				
96	11.6	281.2	18.0	16.0	55.5	12.5	96	17.1	415.6	26.0	16.0	89.5	18.5	11.5	46.5				

Δ = 67.50°										Δ = 90°									
I.D. (IN.)	G (FT.)	THRUST (TONS)	EARTH		ROCK		I.D. (IN.)	G (FT.)	THRUST (TONS)	VOL. (C.Y.)	EARTH		ROCK		I.D. (IN.)	G (FT.)	THRUST (TONS)	VOL. (C.Y.)	VOL. (C.Y.)
			A (FT.)	B (FT.)	A (FT.)	B (FT.)					A (FT.)	B (FT.)	A (FT.)	B (FT.)					
4.6, 8	2.1	5.6	3.0	2.0	0.3	2.0	4.6, 8	2.7	7.1	5.0	1.5	0.4	2.0	2.0	0.2				
10, 12	3.1	12.6	5.5	2.5	0.6	3.5	10, 12	4.0	16.0	6.5	2.5	1.0	3.5	2.5	0.5				
16, 18	4.7	28.3	7.5	4.0	1.9	5.5	16, 18	6.0	36.0	9.0	4.0	2.4	4.5	4.0	1.0				
20	5.2	34.9	9.0	4.0	2.3	5.5	20	6.6	44.4	10.0	4.5	3.1	6.0	4.0	1.5				
24	6.2	50.3	11.5	4.5	3.5	6.5	24	7.9	64.0	14.5	4.5	5.0	8.0	4.0	2.1				
30	7.8	58.9	12.0	5.0	4.8	7.5	30	9.9	75.0	15.0	5.0	6.7	10.0	4.0	3.3				
36	9.4	84.9	14.5	6.0	8.2	9.5	36	11.9	108.0	18.0	6.0	11.4	12.0	4.5	5.3				
42	10.9	115.5	17.0	7.0	12.8	11.0	42	13.9	147.0	21.0	7.0	17.8	14.0	5.5	8.7				
48	12.5	150.9	19.0	8.0	18.4	13.0	48	15.9	192.0	24.0	8.0	26.2	16.0	6.0	12.4				
54	14.0	191.0	21.5	9.0	26.0	15.0	54	17.9	243.0	27.0	9.0	36.9	18.0	7.0	18.1				
60	15.6	235.8	24.0	10.0	35.8	16.0	60	19.9	298.8	30.0	10.0	50.3	20.0	7.5	24.0				
66	17.1	285.3	26.0	11.0	46.0	18.0	66	21.8	362.8	33.0	11.0	66.2	22.0	8.5	32.5				
72	18.7	339.5	28.5	12.0	57.8	19.0	72	23.8	431.8	36.0	12.0	85.6	24.0	9.0	41.0				
78	20.2	398.5	31.0	13.0	75.7	21.0	78	25.7	506.7	39.0	13.0	108.2	26.0	10.0	53.2				
84	21.8	462.1	33.5	14.0	94.7	22.0	84	27.7	587.7	42.0	14.0	134.4	28.0	10.5	64.8				
90	23.3	530.5	35.5	15.0	114.4	24.5	90	29.0	674.8	45.0	15.0	164.9	30.0	11.5	81.2				
96	24.9	603.6	38.0	16.0	138.9	25.5	96	31.6	767.5	48.0	16.0	199.0	32.0	12.0	95.1				

TABLES OF DIMENSIONS AND QUANTITIES

HORIZONTAL THRUST BLOCK
AT PIPE BEND



STANDARD SPECIFICATION REFERENCE
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4010C

