

PLAN
N.T.S.

SECTION X-X
N.T.S.

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

HORIZONTAL THRUST BLOCK
AT PIPE BEND

North Code Test Code of Materials

STANDARD SPECIFICATION REFERENCE
6.7.

DATE NOV. '96 STANDARD DRAWING NO. 4010A

I.D. (IN.)	T (IN.)	$\Delta = 11.25^\circ$ (FT.)	$\Delta = 22.50^\circ$ (FT.)	E (FT.)
4,6,8	0.4	1.5	1.5	0.9
10,12	0.5	1.5	1.5	1.2
16,18	0.6	1.5	1.5	1.6
20	0.7	1.5	1.5	1.8
24	0.9	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	5.8	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

$\Delta = 11.25^\circ$					$\Delta = 22.50^\circ$						
I.D. (IN.)	G (FT.)	EARTH		ROCK		I.D. (IN.)	G (FT.)	EARTH		ROCK	
		A (FT.)	B VOL. (C.Y.)	A (FT.)	B VOL. (C.Y.)			A (FT.)	B VOL. (C.Y.)	A (FT.)	B VOL. (C.Y.)
4,6,8	0.4	1.0	1.0	1.5	0.1	1.0	1.0	1.5	0.1	1.0	0.1
10,12	0.6	2.2	1.5	1.5	0.1	1.0	1.1	4.4	2.0	2.5	0.3
16,18	0.8	5.0	2.0	2.5	0.3	1.5	2.0	0.2	16,18	1.6	9.9
20	0.9	6.2	2.0	3.5	0.4	1.5	3.0	0.3	20	1.8	12.3
24	1.1	8.9	3.0	3.5	0.5	1.5	3.0	0.3	24	2.2	17.7
30	1.4	10.4	3.0	3.5	0.6	2.0	3.5	0.4	30	2.7	20.7
36	1.7	15.0	3.5	4.5	0.9	2.0	4.0	0.5	36	3.3	29.8
42	1.9	20.4	4.5	5.0	1.5	2.5	5.0	0.8	42	3.8	40.5
48	2.2	26.6	4.5	6.0	2.0	2.5	6.0	1.1	48	4.4	52.9
54	2.5	33.7	6.0	6.0	3.0	3.0	6.0	1.4	54	4.9	67.0
60	2.7	41.6	6.0	7.0	3.8	3.0	7.0	1.8	60	5.5	82.7
66	3.0	50.3	6.5	8.0	5.1	3.5	8.0	2.7	66	6.0	100.1
72	3.3	59.9	7.5	8.0	6.3	4.0	8.0	3.3	72	6.6	119.1
78	3.6	70.2	8.0	9.0	8.1	4.0	9.0	3.9	78	7.1	139.8
84	3.8	81.5	8.5	10.0	10.3	4.5	10.0	5.3	84	7.6	162.1
90	4.1	93.5	9.5	10.0	12.2	5.0	10.0	6.3	90	8.2	186.1
96	4.4	106.4	10.0	11.0	15.0	5.0	11.0	7.4	96	8.7	211.7

TABLES OF DIMENSIONS AND QUANTITIES

HORIZONTAL THRUST BLOCK
AT PIPE BEND

North Code Test Code of Materials

STANDARD SPECIFICATION REFERENCE
6.7.

DATE NOV. '96 STANDARD DRAWING NO. 4010B

$\Delta = 30^\circ$												$\Delta = 45^\circ$											
I.D. (IN.)	G (FT.)	EARTH		ROCK		I.D. (IN.)	G (FT.)	EARTH		ROCK		I.D. (IN.)	G (FT.)	EARTH		ROCK							
		A (FT.)	B VOL. (C.Y.)	A (FT.)	B VOL. (C.Y.)			A (FT.)	B VOL. (C.Y.)	A (FT.)	B VOL. (C.Y.)			A (FT.)	B VOL. (C.Y.)								
4,6,8	1.0	2.6	2.0	1.5	0.2	1.0	1.5	0.1	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	1.5	0.2	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	3.0	0.4	16,18	3.2	19.5	4.5	4.5	1.2	3.0	3.5	0.6						
20	2.4	16.3	4.5	4.0	1.0	3.0	3.0	0.5	20	3.6	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	3.5	0.7	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	4.0	0.9	30	5.4	40.6	8.5	5.0	3.2	5.0	4.0	1.6						
36	4.4	39.5	7.0	6.0	3.4	4.5	4.5	1.6	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	5.0	2.5	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	6.0	3.7	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	6.5	5.3	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	7.5	7.3	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	8.0	9.6	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	9.0	12.3	72	12.9	233.9	19.5	12.0	38.6	14.0	8.5	20.7						
78	9.4	185.6	14.5	13.0	30.0	10.0	9.5	15.6	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	10.5	19.5	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	11.0	23.9	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	11.5	28.9	96	17.1	415.6	26.0	16.0	89.5	18.5	11.5	48.5						

$\Delta = 67.50^\circ$						$\Delta = 90^\circ$											
I.D. (IN.)	G (FT.)	EARTH		ROCK		I.D. (IN.)	G (FT.)	EARTH		ROCK							
		A (FT.)	B VOL. (C.Y.)	A (FT.)	B VOL. (C.Y.)			A (FT.)	B VOL. (C.Y.)								
4,6,8	2.1	5.6	3.0	2.0	0.3	2.0	1.5	0.2	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	0.8	3.5	2.0	0.4	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	3.0	0.9	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	3.5	1.2	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	4.0	1.6	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	4.0	2.2	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	4.5	3.8	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	5.5	6.3	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	6.0	9.2	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	6.5	12.9	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	35.6	16.0	7.5	17.6	60	19.9	299.8	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	8.0	23.0	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	9.0	28.4	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	9.5	37.4	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	10.5	46.5	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	11.0	58.2	90	29.0	674.6	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	12.0	70.0	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

North Code Test Code of Materials

STANDARD SPECIFICATION REFERENCE
6.7.

DATE NOV. '96 STANDARD DRAWING NO. 4010C

PLAN OF PLUG THRUST BLOCK
N.T.S.

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

PLAN OF TEE THRUST BLOCK
N.T.S.

I.D. (IN.)	THRUST (TONS)	C (FT.)	EARTH		ROCK	
			A (FT.)	B VOL. (C.Y.)	A (FT.)	B VOL. (C.Y.)
4,6,8	5.1	1.5	2.5	0.3	2.0	0.2
10,12	11.3	1.5	3.5	0.6	2.5	0.3
16,18	25.5	2.0	5.5	1.6	4.0	0.9
20	31.5	2.0	6.0	1.9	4.0	0.9
24	45.2	2.5	7.0	3.1	5.0	1.7
30	53.0	3.0	7.5	4.1	5.5	2.4
36	76.3	4.0	9.0	7.3	6.5	4.2
42	104.0	4.5	10.5	11.0	7.5	6.2
48	136.0	5.0	12.0	15.6	8.5	8.7
54	172.0	5.5	13.5	21.4	9.5	11.9
60	212.0	6.0	15.0	28.4	10.5	15.7
66	257.0	6.5	16.5	36.8	11.5	20.5
72	305.0	7.5	17.5	47.2	12.5	27.2
78	358.0	8.0	19.0	59.9	13.5	33.7
84	416.0	8.5	20.5	72.3	14.5	41.2
90	477.0	9.0	22.0	87.7	15.5	49.7
96	543.0	9.5	23.5	104.8	16.5	61.0

HORIZONTAL THRUST BLOCK
AT TEES AND PLUGS

North Code Test Code of Materials

STANDARD SPECIFICATION REFERENCE
6.7.

DATE NOV. '96 STANDARD DRAWING NO. 4020

ELEVATION "B-B"
N.T.S.

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

SECTION "A-A"
N.T.S.

Δ	11.25°	22.50°	30°	45°	67.50°	90°	Δ							
I.D. (IN.)	1.0	0.5	2.0	1.0	2.5	1.3	3.6	1.8	4.6	2.3	5.0	2.5	4,6,8	
THRUST (TONS)	2.2	1.1	4.3	2.2	5.7	2.8	8.0	4.0	10.5	5.2	11.3	5.7	10,12	
VOL. (C.Y.)	5.0	2.5	9.7	4.9	12.7	6.4	18.0	9.0	23.5	11.8	25.5	12.7	16,18	
I.D. (IN.)	6.0	6.1	3.1	12.0	6.0	15.7	7.9	22.2	11.1	29.2	14.5	31.4	15.7	20
THRUST (TONS)	8.2	4.4	17.3	8.7	22.6	11.3	32.0	16.0	41.8	20.9	45.2	22.6	24	
VOL. (C.Y.)	5.2	20.3	10.1	26.5	13.3	37.5	18.8	49.0	24.5	53.1	26.5	30	30	
I.D. (IN.)	14.9	7.5	29.2	14.6	38.2	19.1	54.0	27.0	70.5	35.3	76.4	38.2	36	
THRUST (TONS)	20.3	10.1	39.8	19.9	52.0	26.0	73.5	36.7	96.0	48.0	104.0	52.0	42	
VOL. (C.Y.)	26.5	13.2	51.9	26.0	67.9	33.9	96.0	48.0	126.0	62.7	136.0	67.9	48	
I.D. (IN.)	33.5	16.8	65.7											