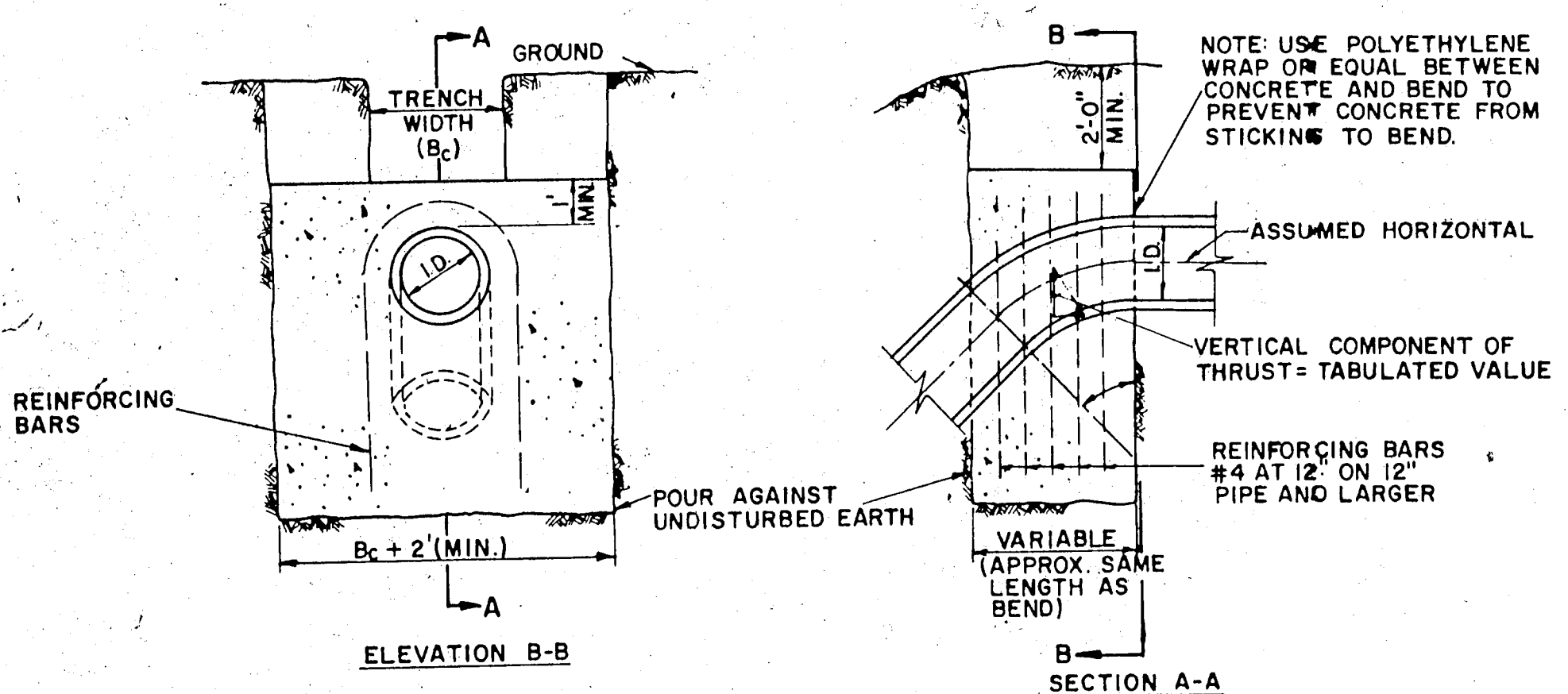


I.D. (IN.)	T (IN.)	C 11.25° FT.		C 22.50° FT.	
		A	B	A	B
4.6,8	0.4	1.5	1.5	0.9	
10,12	0.5	1.5	1.5	1.2	
16,18	0.6	1.5	1.5	1.8	
20	0.7	1.5	1.5	1.8	
24	0.9	1.5	1.5	2.1	
30	2.9	1.5	1.9	2.8	
36	4.5	1.5	2.3	3.3	
42	5.0	1.8	2.6	3.8	
48	5.3	2.0	3.0	4.3	
54	6.0	2.3	3.4	4.8	
60	6.5	2.5	3.8	5.3	
66	6.8	2.8	4.1	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	

I.D. (IN.)	G (FT.)	EARTH			ROCK			I.D. (IN.)	G (FT.)	EARTH			ROCK				
		THRUST (TONS)	A (FT.)	B (FT.)	VOL. (C.Y.)	A (FT.)	B (FT.)			VOL. (C.Y.)	THRUST (TONS)	A (FT.)	B (FT.)	VOL. (C.Y.)	A (FT.)	B (FT.)	VOL. (C.Y.)
4.6,8	0.4	1.0	1.0	1.5	0.1	1.0	1.0	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	1.0	1.5	0.1	10,12	1.1	4.4	2.0	2.5	0.3	1.3	1.5	0.1
16,18	0.8	5.0	2.0	2.5	0.3	1.5	2.0	0.2	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	3.0	0.3	20	1.8	12.3	3.5	3.5	0.7	2.0	3.5	0.4
24	1.1	8.9	3.0	3.0	0.5	1.5	3.0	0.3	24	2.2	17.7	4.0	4.5	1.0	3.0	3.0	0.5
30	1.4	10.4	3.0	3.5	0.6	2.0	3.5	0.4	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	4.0	0.5	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	5.0	0.8	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	6.0	1.1	48	4.4	52.9	8.0	7.0	5.7	4.8	6.0	2.8
54	2.5	33.7	6.0	6.0	3.0	3.0	6.0	1.4	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	7.0	1.8	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	3.1	3.5	8.0	2.7	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	8.0	3.3	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	9.0	3.9	78	7.1	139.6	12.0	12.0	22.5	8.0	9.0	11.7
84	3.8	81.5	8.5	10.0	10.3	4.5	10.0	5.3	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	10.0	6.3	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	11.0	7.4	96	8.7	211.7	15.0	14.5	41.2	10.0	11.0	21.8

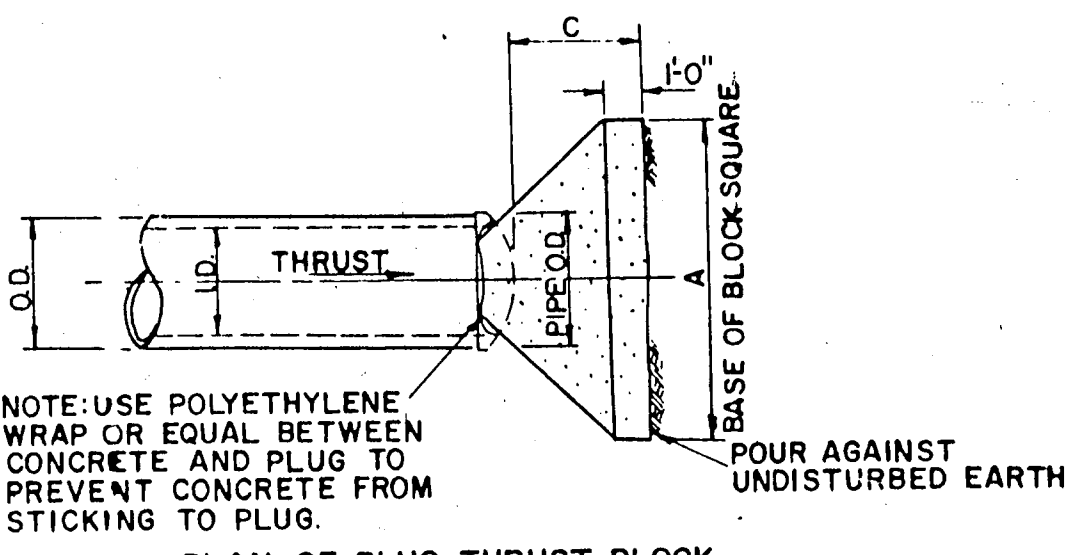
**HORIZONTAL BEND THRUST BLOCK**



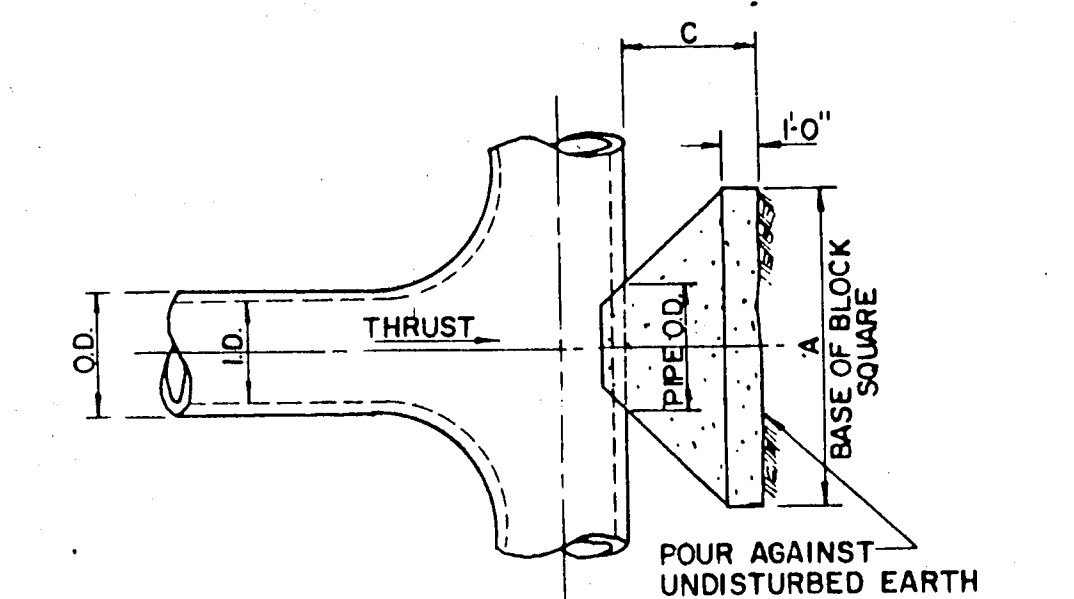
I.D. (IN.)	11.25°		22.50°		30°		45°		67.50°		90°		I.D. (IN.)
	THRUST (TONS)	VOL. (C.Y.)	THRUST (TONS)	VOL. (C.Y.)	THRUST (TONS)	VOL. (C.Y.)	THRUST (TONS)	VOL. (C.Y.)	THRUST (TONS)	VOL. (C.Y.)	THRUST (TONS)	VOL. (C.Y.)	
4.6,8	1.0	0.5	2.0	1.0	2.5	1.3	3.6	1.8	4.6	2.3	5.0	2.5	4.6,8
10,12	2.2	1.1	4.3	2.2	5.7	2.8	8.0	4.0	10.5	5.2	11.3	5.7	10,12
16,18	3.0	2.5	9.7	4.9	12.7	6.4	18.0	9.0	23.5	11.8	25.5	12.7	16,18
20	4.1	3.1	12.0	6.0	15.7	7.9	22.2	11.1	29.2	14.5	31.4	15.7	20
24	6.1	4.4	17.3	8.7	22.6	11.3	32.0	16.0	41.8	20.9	45.2	22.6	24
30	10.5	5.2	20.3	10.1	26.5	13.3	37.5	18.8	49.0	24.5	53.1	26.5	30
36	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
42	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
48	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
54	33.5	16.8	65.7	32.9	85.9	42.9	122.0	60.7	159.0	79.4	172.0	85.9	54
60	41.4	20.7	81.2	40.6	106.0	53.0	150.0	75.0	196.0	98.0	212.0	106.0	60
66	50.1	25.0	98.2	48.1	128.0	64.2	182.0	90.7	237.0	119.0	257.0	128.0	66
72	59.6	29.8	117.0	58.4	153.0	76.3	216.0	108.0	282.0	141.0	305.0	153.0	72
78	69.9	35.0	137.0	68.6	179.0	90.0	254.0	127.0	331.0	166.0	358.0	179.0	78
84	81.1	40.5	159.0	79.5	208.0	104.0	294.0	147.0	384.0	192.0	416.0	208.0	84
90	93.1	46.5	183.0	91.3	239.0	119.0	337.0	169.0	441.0	221.0	477.0	239.0	90
96	106.0	53.0	208.0	104.0	272.0	136.0	384.0	192.0	502.0	251.0	543.0	272.0	96

GENERAL NOTES - FOR ALL THRUST BLOCKS  
 1. All Calculations Are Based On Internal Pressure Of 200 P.S.I. For 24" I.D. Pipe And Smaller And 150 P.S.I. On 30" I.D. And Larger.  
 2. Volumes Of Vertical Bend Thrust Blocks Are Net Volumes Of Concrete To Be Furnished. The Corresponding Weight Of The Concrete (Class F) Is Equal To Or Greater Than The Vertical Component Of Thrust On The Vertical Bend.  
 3. Wall Thickness (T) Assumed Here For Estimating Purposes Only.  
 4. Concrete For Blocking Shall Be Class B Concrete.  
 5. Dimensions May Be Varied As Required By Field Conditions Where And As Directed By The Engineer. The Volume Of Concrete Blocking Shall Not Be Less Than Shown Here.

**VERTICAL BEND THRUST BLOCK**



PLAN OF PLUG THRUST BLOCK

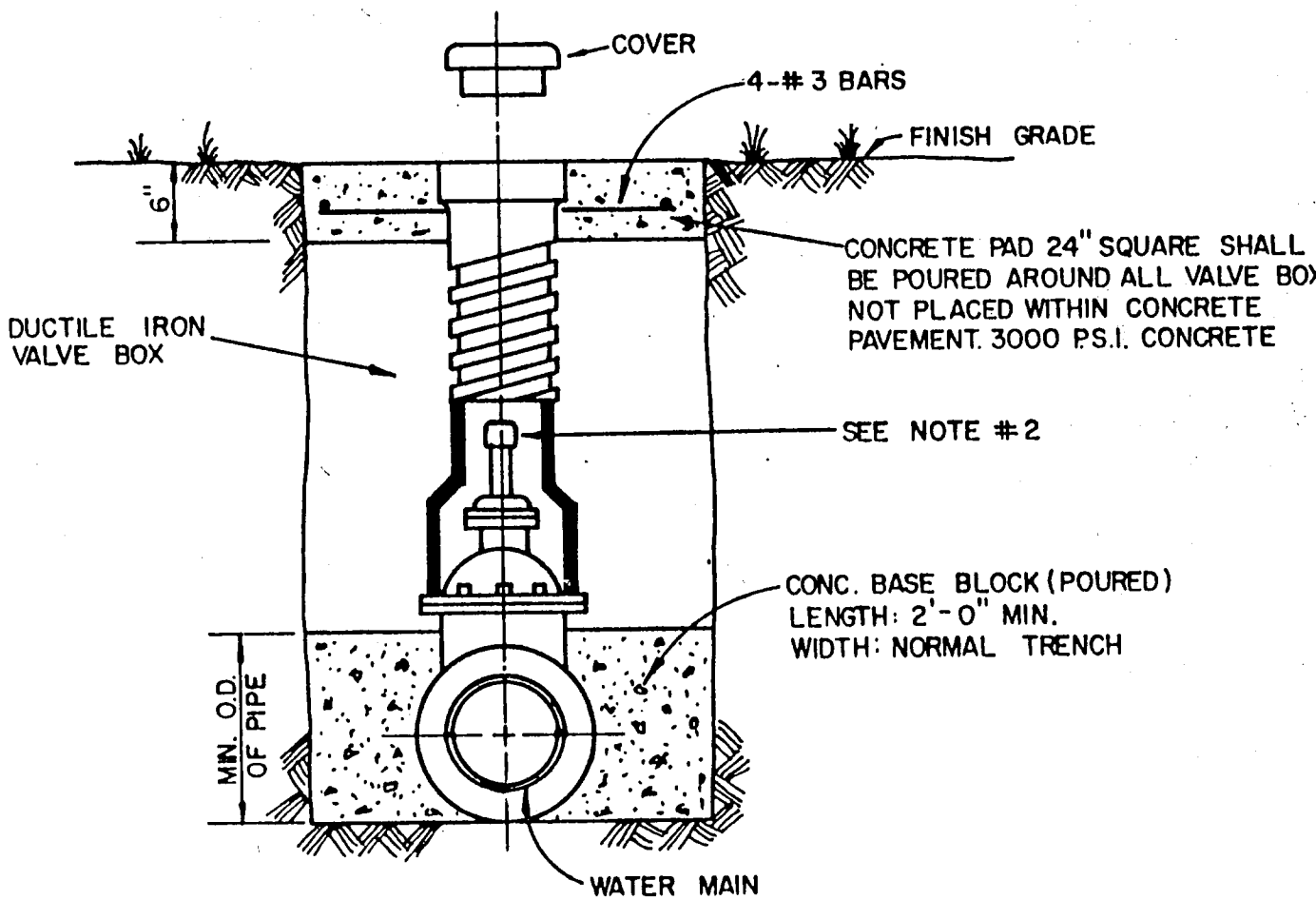


PLAN OF TEE THRUST BLOCK

I.D. (IN.)	THRUST (TONS)	EARTH		ROCK	
		A (FT.)	B (FT.)	A (FT.)	B (FT.)
4.6,8	1.0	1.5	1.5	0.9	
10,12	2.2	1.5	1.5	1.2	
16,18	3.0	1.5	1.5	1.8	
20	4.1	1.5	1.5	1.8	
24	6.1	1.5	1.5	2.1	
30	10.5	1.5	1.9	2.8	
36	14.9	1.5	2.3	3.3	
42	20.3	1.8	2.6	3.8	
48	26.5	2.0	3.0	4.3	
54	33.5	2.3	3.4	4.8	
60	41.4	2.5	3.8	5.3	
66	50.1	2.8	4.1	5.7	
72	59.6	3.0	4.5	6.3	
78	69.9	3.3	4.9	6.7	
84	81.1	3.5	5.3	7.2	
90	93.1	3.8	5.6	7.7	
96	106.0	4.0	6.0	8.2	

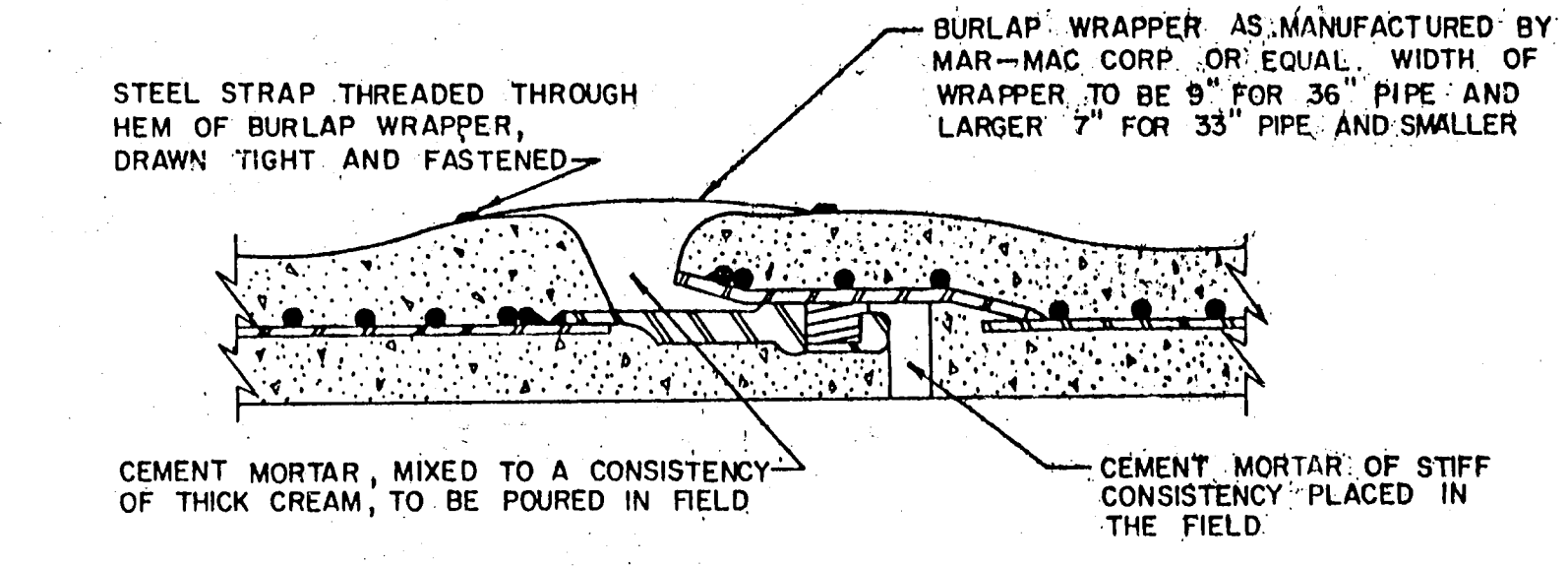
**PLUG & TEE THRUST BLOCK**

**TYPICAL VALVE SETTING AND BOX**



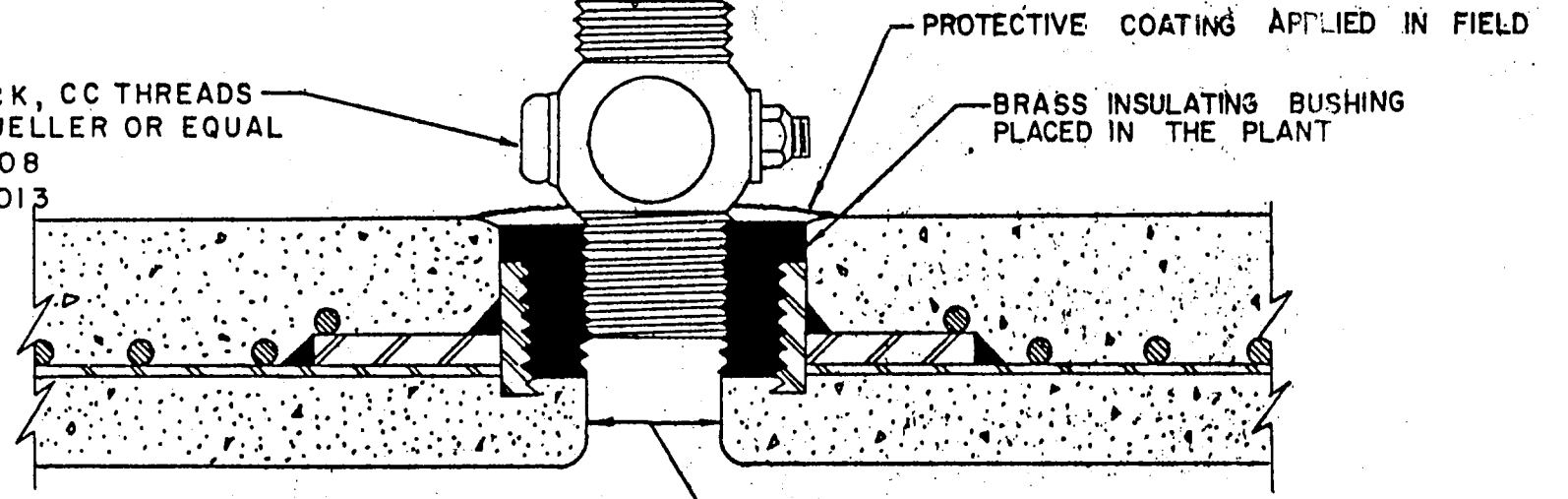
NOTE:  
 1. GATE VALVES SHALL BE IN ACCORDANCE WITH AWWA STANDARD C-509-80 OR LATEST THEREOF ALL VALVES SHALL BE "MULLER" OR APPROVED EQUAL.  
 2. A PERMANENTLY ATTACHED VALVE EXTENSION STEM SHALL BE REQUIRED FOR ANY VALVE THATS OPERATING NUT IS LOCATED IN EXCESS OF 4 FEET BELOW THE TOP OF VALVE BOX. THIS EXTENSION SHALL BE OF SUFFICIENT LENGTH TO INSURE THAT ITS TOP IS WITHIN 4" OF VALVE BOX I.D. MANUFACTURED VALVE STACK DUCTILE IRON PIPE TO BE USED FOR EXTENSION GREATER THAN 4'-0" BELL END OF STACK TO BE FITTED OVER VALVE. VALVE AND VALVE STACK IS TO BE POLY WRAPPED.  
 3. VALVES SHALL BE OF DUCTILE IRON W/RUBBER ENCAPSULATED DISK BODY BOLTS SHALL BE STAINLESS STEEL OF SAME SIZE ON EACH VALVE.

NOTE:  
 PROVIDE 1" MINIMUM THICKNESS CONCRETE OR CEMENT MORTAR COATING IN THE FIELD FOR THE PROTECTION OF ALL EXPOSED STEEL SUCH AS FLANGES, GAULKED JOINTS, THREADED OUTLETS, CLOSURES, ETC. THE CEMENT MORTAR USED SHALL CONSIST OF ONE PART PORTLAND CEMENT TO TWO AND ONE-HALF PARTS OF FINE, SHARP (PLASTER) SAND. WHERE SHOWN, COATING IS TO BE REINFORCED WITH WIRE MESH.



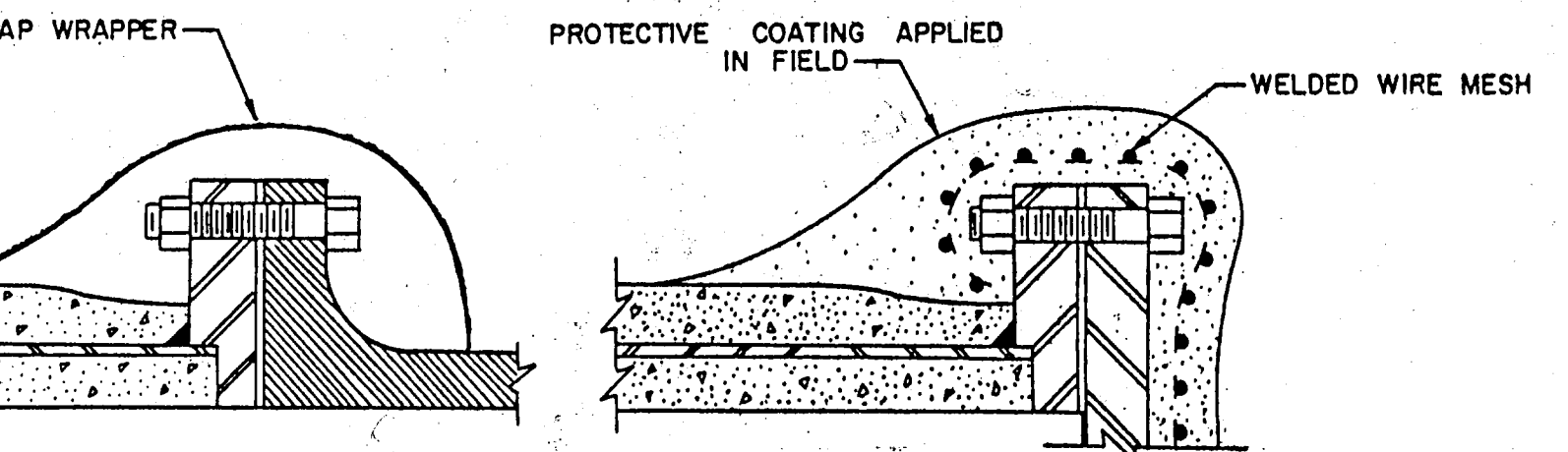
**STANDARD RUBBER GASKET JOINT**

NOTE: ALL CLOSURE SECTIONS SHALL BE FABRICATED WITH HAND TOOLS TO ALLOW WIPING INSIDE OF JOINTS AFTER CLOSURE IS IN PLACE



NOTE:  
 IF CORPORATION COCK IS NOT PROVIDED IN FIELD, THEN STEEL PLUG SHALL BE COVERED WITH CEMENT MORTAR.

**THREADED CONNECTION**



**FLANGED CONNECTIONS**

**REINFORCED CONCRETE CYLINDER PIPE DETAILS**

AS BUILTS  
 Based on visual inspection of the completed improvements, it appears this project was constructed in general conformance with these construction plans and will function as designed.

Clyde L. Sifford, P.E.  
 THE NELSON CORPORATION  
 5999 Summerside Drive, Suite 202  
 Dallas, Texas 75252

**STANDARD CONSTRUCTION DETAILS**

**WATERFORD COURT**  
**TOWN OF ADDISON, TEXAS**

Date: NOV., 1993 Scale: AS SHOWN SHEET 15 OF  
 Drawn By: TNC Approved By: TNC SHEETS

**THE NELSON CORPORATION**  
 LAND PLANNING • ENGINEERING • SURVEYING  
 5999 SUMMERSIDE DRIVE • SUITE 202 • DALLAS, TEXAS 75252 • (214) 380-2605