

Proyecto: Agua Potable de Esmeraldas
 Cálculo de bloques de anclaje - Codos 90°, 45°, 22.5° y 11.25°

The required bearing block area is $A_b = hb = \frac{T}{S_b}$

Then, for a horizontal bend, $b = \frac{2 S_f PA \sin (\Theta / 2)}{h S_b}$

Where:

S_f = safety factor (usually 1.5 for thrust block design)

P = maximum system pressure (kg/cm²)

A = cross-section area of the pipe (cm²)

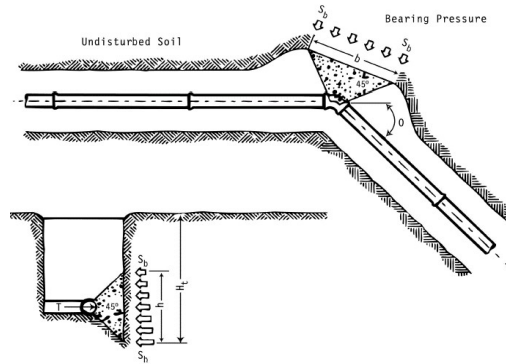
Θ = angle of the bend (°)

S_b = bearing strength of the soil (kg/m²)

T = thrust force (kg)

b = block width (m)

h = block height (m)



- S_f = 1.50 Factor de seguridad
- P = 20.00 kg/cm² (2 MPa) Presión de prueba
- S_b = 1.00 kg/cm² (1 MPa) Capacidad portante del suelo

Ø Tubería 2.0 Mpa		Dim. Calc.						Dimensiones			Volumen litros	b/h	T Actuante kg	T Bloque kg	T Blo/T Act
Ø Nominal	Ø Interior	Area Int.	b = Ancho	h = Alto	d = Profundidad	Ø Codo	Θ	- b - Ancho	- h - Alto	- d - Profundidad					
100	100	78.54	66.64	50.00	33.32	100	90	60	60	30	36.00	1.0	3,332.16	3,600.00	1.08
150	150	176.71	107.11	70.00	53.55	150	90	100	80	50	133.33	1.3	7,497.36	8,000.00	1.07
200	200	314.16	121.17	110.00	60.58	200	90	130	110	65	309.83	1.2	13,328.65	14,300.00	1.07
250	250	490.87	166.61	125.00	83.30	250	90	170	130	80	589.33	1.3	20,826.01	22,100.00	1.06
300	300	706.86	199.93	150.00	99.96	300	90	200	160	100	1,066.67	1.3	29,989.46	32,000.00	1.07
350	350	962.11	240.11	170.00	120.06	350	90	250	170	125	1,770.83	1.5	40,818.99	42,500.00	1.04
400	400	1,256.64	280.60	190.00	140.30	400	90	290	190	145	2,663.17	1.5	53,314.60	55,100.00	1.03
100	100	78.54	45.08	40.00	22.54	100	45	45	45	25	16.88	1.0	1,803.35	2,025.00	1.12
150	150	176.71	67.63	60.00	33.81	150	45	65	65	35	49.29	1.0	4,057.54	4,225.00	1.04
200	200	314.16	90.17	80.00	45.08	200	45	90	80	45	108.00	1.1	7,213.41	7,200.00	1.00
250	250	490.87	112.71	100.00	56.35	250	45	115	100	60	230.00	1.2	11,270.96	11,500.00	1.02
300	300	706.86	135.25	120.00	67.63	300	45	140	120	70	392.00	1.2	16,230.18	16,800.00	1.04
350	350	962.11	157.79	140.00	78.90	350	45	160	140	80	597.33	1.1	22,091.08	22,400.00	1.01
400	400	1,256.64	180.34	160.00	90.17	400	45	180	160	90	864.00	1.1	28,853.65	28,800.00	1.00
100	100	78.54	30.64	30.00	15.32	100	22.5	35	30	20	7.00	1.2	919.34	1,050.00	1.14
150	150	176.71	45.97	45.00	22.98	150	22.5	50	45	25	18.75	1.1	2,068.52	2,250.00	1.09
200	200	314.16	61.29	60.00	30.64	200	22.5	65	60	35	45.50	1.1	3,677.37	3,900.00	1.06
250	250	490.87	76.61	75.00	38.31	250	22.5	80	75	40	80.00	1.1	5,745.88	6,000.00	1.04
300	300	706.86	97.34	85.00	48.67	300	22.5	100	85	50	141.67	1.2	8,274.07	8,500.00	1.03

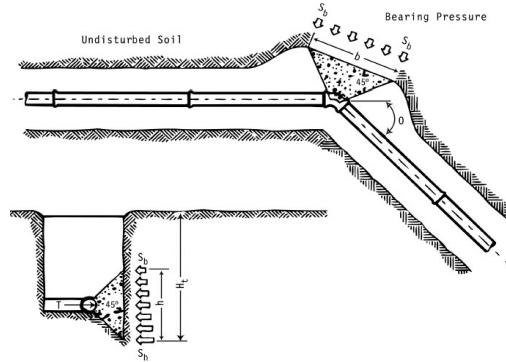
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350	350	962.11	112.62	100.00	56.31	350	22.5	115	100	60	230.00	1.2	11,261.93	11,500.00	1.02	
400	400	1,256.64	122.58	120.00	61.29	400	22.5	125	120	65	325.00	1.0	14,709.46	15,000.00	1.02	
100	100	78.54	23.09	20.00	11.55	100	11.25	25	20	15	2.50	1.3	461.89	500.00	1.08	
150	150	176.71	34.64	30.00	17.32	150	11.25	35	30	20	7.00	1.2	1,039.26	1,050.00	1.01	
200	200	314.16	46.19	40.00	23.09	200	11.25	50	40	25	16.67	1.3	1,847.58	2,000.00	1.08	
250	250	490.87	57.74	50.00	28.87	250	11.25	60	50	30	30.00	1.2	2,886.84	3,000.00	1.04	
300	300	706.86	69.28	60.00	34.64	300	11.25	70	60	35	49.00	1.2	4,157.05	4,200.00	1.01	
350	350	962.11	75.44	75.00	37.72	350	11.25	80	75	40	80.00	1.1	5,658.21	6,000.00	1.06	
400	400	1,256.64	86.94	85.00	43.47	400	11.25	90	85	45	114.75	1.1	7,390.32	7,650.00	1.04	

Esmeraldas, enero de 2018
 OCC