

PROGRAM TRDP v1.1
PROJECT 70/71.6R
LOCATION Columbus, OH
DESIGNED BY
CHECKED BY
COMPANY ms Consultants
DESCRIPTION 45 horizontal combined

Sheet no. 1 of 1
Date 6/22/2020

Pipeline Information

Pipe Type (ECP, LCP, BWP, RCP)	LCP	Cylinder Outside Diameter, D_y	40.5 in.
Internal Diameter, ID	36 in.	Minimum Cylinder Thickness	0.1046 in.
Core Thickness, h'_c	2.25 in.	Bend Angle, Δ	90 deg
Mortar Coating Thickness, h_m	1 in.	Centerline Length of Fitting, L_b	1.75 ft
Core Outside Diameter, OD	40.5 in.	Pipe Laying Length (First Pipe), L_{p1}	20 ft
Pipe Outside Diameter, D_o	42.5 in.	Pipe Laying Length (Typical Pipe), L_p	20 ft

Joint Properties

Joint Type (Welded or Harnessed)	Harnessed	Concrete Strength, f'_c	4500 psi
Joint Diameter, D_j	41 in.	Steel Cylinder Yield Strength, f_{yy}	36000 psi
Joint Slack	0.0625 in.		

Material Properties

Pressures

Working Pressure, P_w	150 psi	Soil Type (I through V)	V
Transient Pressure, P_t	100 psi	Soil Stiffness, k	425 psi
Field Test Pressure, P_{ft}	150 psi	Soil Unit Weight, γ	110 pcf
$P_{well} = \max(P_w, P_{ft}/1.25, (P_w + P_t)/1.4)$	179 psi	Pipe to Soil Friction Coefficient, μ	0.3 in.
		Soil Cover, H	6 ft
		Angle of Internal Friction, Φ	20 deg

Soil Information

(Table 9-1 - Soil Type Selection Guide)

Bend Angle (deg)	Centerline Length of Fitting (ft)	Thrust (kip)	Total Footage Required (one side)	Total Heavy Gage Footage (one side)
90	1.75	417	140	140

Required Lengths for One Side

Cylinder Thickness (in.)	0.5	0.4375	0.375	0.3125	0.25	0.1875	0.1644 (8 GA)	0.1345 (10 GA)	0.1046 (12 GA)	0.0747 (14 GA)	0.0598 (16 GA)
Length Needed (ft)	0	0	0	0	0	5	24.6	24.6	85.9	0	0
Number of Pipes	0	0	0	0	0	1	1	1	4	0	0