

PREDL SYSTEMS NORTH AMERICA

7520 Conrad Street, Burnaby, BC V5A 2H7

PVC Material Information

PVC Pipe Dia.	60.000	inch
Wall Thickness	1.208	inch
I of Wall	0.147	inch ⁴ /in
Material Modulus	400000.000	psi
Poisson Ratio	0.380	
Tensile Strength	1000.000	psi
Comp. strength	4000.000	psi
Axial Strain Limit	0.035	
Ring Strain Limit	0.050	

Soil Information

Soil Dry Density	120.000	lb/sq.ft.
Soil Sat. Density	135.000	lb/sq.ft.
Soil Inter. Friction Angle	30.000	
Friction Coefficient	0.400	
Soil Modulus	1000.000	psi, E'
Active Earth Pres. Coef.	0.333	

Other

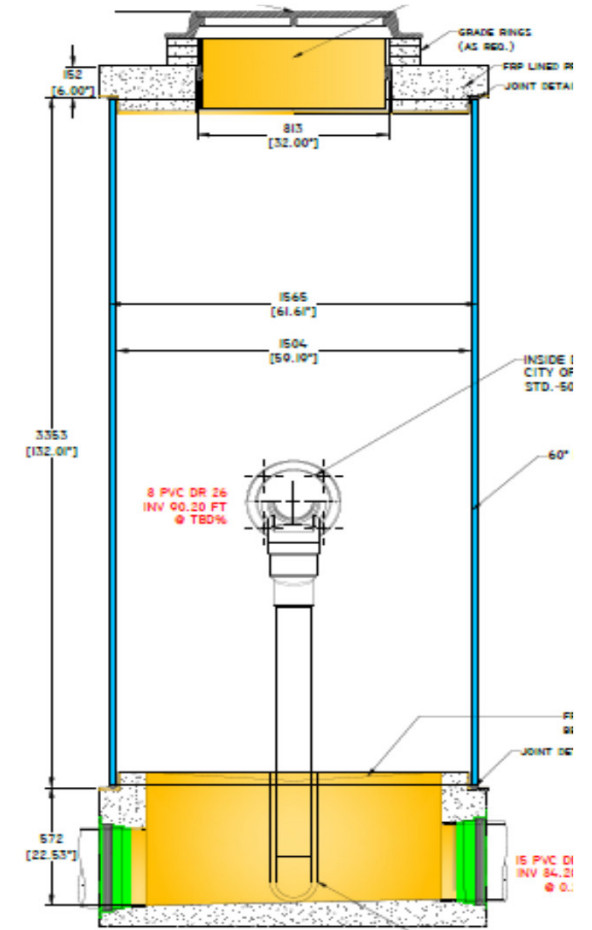
Critical R.T., Dry	2721.393	lb/in
Critical Axial Strain	0.025	
H2O Wheel Load	16000	lbs

Design Calculation For 60" Dia. PVC Manhole Riser

Considerations and Assumptions to ASTM F 1759-97 (2004)

1. Dry Soil and Saturated Soil Conditions.
2. H2O Live Load.
3. Soil Modulus = 1000 psi
4. Backfill Width 24" Minimum.
5. Ring Thrust Compression and Bending.
6. Axial Soil Down Drag Load.
7. PVC Pipe Material to "Hand Book of PVC PIPE DESIGN AND CONSTRUCTION", 5th Edition.

Note: Cells in yellow are the input variables. Outputs are the Safety Factors which are reflecting the performance of Pipe Ring Deformation, Ring Stress, Axial Deformation, respectively. All Safety Factors should be greater than 2.0



Calculation Sheet

Manhole Depth ft	PVC Length ft	Dry Radial Pres. lb/sf	Wet Radial Pres. lb/sf	D.D. Shear Stress lb/sf	D.D. Force lbs	R.T. Stress lb/in	R. B. Stress lb/in	Strain of T+B %	Strain of Axial %	C.R.T. Stress lb/in	Safety Factor Index		
											Ring Deform.	Ring Stress	Axial Deform.
10.00	7.00	411.40	779.30	92.57	10587.89	165.62	50.69	0.086%	0.029%	1246.81	58	8	86
11.00	8.00	459.80	870.98	103.46	13524.03	185.11	56.65	0.097%	0.032%	1275.10	52	7	78
12.00	9.00	508.20	962.66	114.35	16816.06	204.59	62.61	0.107%	0.035%	1303.43	47	6	70
13.00	10.00	556.60	1054.34	125.24	20463.99	224.08	68.58	0.117%	0.039%	1331.76	43	6	63
14.00	11.00	605.00	1146.03	136.13	24467.81	243.56	74.54	0.127%	0.044%	1360.07	39	6	57
15.00	12.00	653.40	1237.71	147.02	28827.53	263.05	80.50	0.137%	0.048%	1388.30	36	5	51
16.00	13.00	701.80	1329.39	157.91	33543.15	282.53	86.47	0.147%	0.053%	1416.41	34	5	46
17.00	14.00	750.20	1421.07	168.80	38614.66	302.02	92.43	0.158%	0.059%	1444.37	32	5	42
18.00	15.00	798.60	1512.75	179.69	44042.06	321.50	98.39	0.168%	0.065%	1472.13	30	5	38
19.00	16.00	847.00	1604.44	190.58	49825.36	340.99	104.36	0.178%	0.071%	1499.64	28	4	35
20.00	17.00	895.40	1696.12	201.47	55964.56	360.47	110.32	0.188%	0.077%	1526.88	27	4	32

D.D. FORCE: Down Drag Force
R.T. Stress: Ring Thrust stress
R.B. Stress: Ring Bending Stress
Strain of T+B: Combine Strain of Ring Thrust and Bending
C.R.T. Stress: Critical Ring Thrust Stress

Counter Weight (Conc. Base & Lid) = 5000 lbs
PVC Riser Weight (per foot length) = 155 lbs



8/8/2019