

Wheatland Tube Co. Schedule 40 Pipe

Table-1

Schedule 40 (See Note 1 Table 1) Pipe Properties													
Pipe NPS In.	Pipe 't' In.	Pipe ID 'd' In.	Pipe OD 'D' In.	Inside Area 'Ai' In ²	Metal Area 'Am' In ²	Wt Per ft. 'w ₁ ' Lb.	Wt of Water. 'w ₂ ' Lb.	Moment of Inertia 'I' In ⁴	Section Mod. 'S' In ³	Radius of Gyration 'r' In	Weight 'w' Lb/Ft w ₁ + w ₂	Hanger Span Ft. (max)	Trapeze Load P Lb. = w+250
1	0.133	1.049	1.315	0.86	0.49	1.68	0.37	0.09	0.13	0.42	2.05	15	281
1 1/4	0.140	1.380	1.660	1.49	0.67	2.27	0.65	0.19	0.23	0.54	2.92	15	294
1 1/2	0.145	1.610	1.900	2.03	0.80	2.72	0.88	0.31	0.33	0.62	3.60	15	304
2	0.154	2.067	2.375	3.35	1.07	3.65	1.45	0.67	0.56	0.79	5.11	15	327
2 1/2	0.203	2.469	2.875	4.79	1.70	5.79	2.08	1.53	1.06	0.95	7.87	15	368
3	0.216	3.068	3.500	7.39	2.23	7.58	3.20	3.02	1.72	1.16	10.78	15	412
4	0.237	4.026	4.500	12.72	3.17	10.79	5.52	7.23	3.22	1.51	16.31	15	495
5	0.258	5.047	5.563	20.00	4.30	14.62	8.67	15.16	5.45	1.88	23.29	15	599
6	0.280	6.065	6.625	28.88	5.58	18.97	12.53	28.14	8.50	2.25	31.50	15	722

Note 1: Pipe Diameter 1"-2" Material A795,
 Pipe Diameter 1"-4" Material A53, Type F, Gr. A,
 Pipe Diameter 2"-6" Material A53, Type E, Gr. B

Table-2

Table 9.1.1.6.1(a) Section Modulus Required (minimum) for Trapeze Member In ³									
Nominal Diameter of Schedule 40, (See Note 1 Table 1) Pipe Being Supported									
Span of Trapeze 'a' ↓	1 In.	1 1/4 In.	1 1/2 In.	2 In.	2 1/2 In.	3 In.	4 In.	5 In.	6 In.
	Section Modulus Required (Minimum)								
1'-6"	0.08	0.09	0.09	0.10	0.11	0.12	0.15	0.18	0.22
2'-0"	0.11	0.12	0.12	0.13	0.15	0.16	0.20	0.24	0.29
2'-6"	0.14	0.15	0.15	0.16	0.18	0.21	0.25	0.30	0.36
3'-0"	0.17	0.18	0.18	0.20	0.22	0.25	0.30	0.36	0.43
4'-0"	0.22	0.24	0.24	0.26	0.29	0.33	0.40	0.48	0.58
5'-0"	0.28	0.29	0.30	0.33	0.37	0.41	0.49	0.60	0.72
6'-0"	0.34	0.35	0.36	0.39	0.44	0.49	0.59	0.72	0.87
7'-0"	0.39	0.41	0.43	0.46	0.52	0.58	0.69	0.84	1.01
8'-0"	0.45	0.47	0.49	0.52	0.59	0.66	0.79	0.96	1.16
9'-0"	0.51	0.53	0.55	0.59	0.66	0.74	0.89	1.08	1.30
10'-0"	0.56	0.59	0.61	0.65	0.74	0.82	0.99	1.20	1.44

The Table is based on a maximum allowable bending stress of 15 ksi and a mid-span concentrated load from a the span of water-filled pipe specified in NFPA 13, Sec. 9.2.2.1, plus 250 lb.



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Table-3

ZONE OF INFLUENCE LOAD CAPACITY (Lb) AT THE CENTER OF THE SPAN					
Lateral Sway Brace Spacing (Ft)^a on Schedule 40, (See Note 1 Table 1) Pipe (Fy = 30 ksi)^f					
Pipe Diameter (In)	20^b	25^b	30^c	35^c	40^d
1	124	99	81	69	58
1 1/4	218	175	143	123	103
1 1/2	304	243	199	171	143
2	522	418	342	293	246
2 1/2	991	793	649	557	466
3	1606	1284	1052	902	755
4	2993	2395	1962	1682	1408
5	5076	4061	3327	2852	2388
6^e	7912	6329	5185	4445	3722

Notes:

^a The tables for the maximum load F_{pw} in zone of influence are based on specific configurations of mains and branch lines.

^b Assumes branch lines at center of pipe span and near each support.

^c Assumes branch lines at third-points of pipe span and near each support.

^d Assumes branch lines at quarter-points of pipe span and near each support.

^e Larger diameter pipe may be used when justified by engineering analysis.

^f ASTM A-795-E, A53 Type F Gr. A, and A53 Type E Gr. B has Yield Strength $F_y = 30$ ksi. Effect on overall stresses in the pipe due to operational stresses is not considered.

Table-4

Sway Brace Load Capacity (Ref. NFPA 13, Section 9.3.5.8.7 (a))

Maximum Horizontal Loads For Sway Brace with $kl/r = 100$ for steel brace $F_y = 30$ksi Schedule 40, (See Note 1 Table 1) Pipe							
Pipe Diameter NPS In.	Metal Area 'Am' In²	Radius of Gyration 'r' In	Maximum Length for $kl/r = 100$ Ft	Fa Allowable Compressive Stress, psi	Max. Horizontal Load Lb.		
					Angle From 30° - 44°	Angle From 45° - 59°	Angle From 60° - 90°
1	0.49	0.42	3'-6"	11705	2889	4085	5004
1 ¼	0.67	0.54	4'-6"	11705	3910	5529	6773
1 ½	0.80	0.62	5'-0"	11705	4676	6612	8099
2	1.07	0.79	6'-6"	11705	6285	8887	10886

Sway Brace Load Capacity (Ref. NFPA 13, Section 9.3.5.8.7 (b))

Maximum Horizontal Loads For Sway Brace with $kl/r = 200$ for steel brace $F_y = 30$ksi Schedule 40, (See Note 1 Table 1) Pipe							
Pipe Diameter NPS In.	Metal Area 'Am' In²	Radius of Gyration 'r' In	Maximum Length for $kl/r = 200$ Ft	Fa Allowable Compressive Stress, psi	Max. Horizontal Load Lb.		
					Angle From 30° - 44°	Angle From 45° - 59°	Angle From 60° - 90°
1	0.49	0.42	7'-0"	3730	920	1302	1594
1 ¼	0.67	0.54	9'-0"	3730	1246	1762	2158
1 ½	0.80	0.62	10'-0"	3730	1490	2107	2581
2	1.07	0.79	13'-0"	3730	2003	2832	3469

Sway Brace Load Capacity (Ref. NFPA 13, Section 9.3.5.8.7 (c))

Maximum Horizontal Loads For Sway Brace with $kl/r = 300$ for steel brace $F_y = 30$ksi Schedule 40, (See Note 1 Table 1) Pipe							
Pipe Diameter NPS In.	Metal Area 'Am' In²	Radius of Gyration 'r' In	Maximum Length for $kl/r = 300$ Ft	Fa Allowable Compressive Stress, psi	Max. Horizontal Load Lb.		
					Angle From 30° - 44°	Angle From 45° - 59°	Angle From 60° - 90°
1	0.49	0.42	10'-6"	1658	409	578	709
1 ¼	0.67	0.54	13'-6"	1658	554	783	959
1 ½	0.80	0.62	15'-0"	1658	662	936	1147
2	1.07	0.79	19'-6"	1658	890	1259	1542