Appendix B
Pipe Piles

B-1. Dimensions and Properties.

Table B-1 lists the dimensions and properties for design of some of the more commonly used sizes of pipe piles. The source of this information is Pile Buck, Inc. (1988) or FHWA-DP-66-1 (Revision 1), "Manual on Design and Construction of Driven Piles Foundations."[1] Data from this table are used for analysis of design stresses in stell piles, Chapter 2, in applications of tabuluar members. For reference to a particular member, use designation $PPB_o \; x \; t_w$ where B_o is the outside diameter in inches and t_w is the wall thickness in inches. I is the moment of inertia, inches^4, and determined by $I = Ar^2$. A ' B$t_w(B_o$ & $t_w)$, the cross-sectional area of the tube, inches^2. S is the elastic section modulus, inches^3, and r is the radius of gyration, inches. The External Collapse Index in the last column is a nondimensional function of the diameter to the wall thickness ratio and is for general guidance only. The higher the number, the greater is the resistance to collapse. Refer to ASTM A 252 for material specifications.

[1]References are listed in Appendix A.

Table B-1
Dimensions and Properties for Design of Pipe Piles

Designation and Outside Diameter	Wall Thickness	Area A	Weight per Foot	Section Properties I	Section Properties S	Section Properties r	Area of Exterior Surface	Inside Cross-Sectional Area	Inside Volume	External Collapse Index
in.	in.	in.^{2}	lb	in.^{4}	in.^{3}	in.	ft^2/ft	in.^{2}	yd^3/ft	!
PP10	.109	3.39	11.51	41.4	8.28	3.50	2.62	75.2	.0193	62
	.120	3.72	12.66	45.5	9.09	3.49	2.62	74.8	.0192	83
	.134	4.15	14.12	50.5	10.1	3.49	2.62	74.4	.0191	116
	.141	4.37	14.85	53.1	10.6	3.49	2.62	74.2	.0191	135
	.150	4.64	15.78	56.3	11.3	3.48	2.62	73.9	.0190	163
	.164	5.07	17.23	61.3	12.3	3.48	2.62	73.5	.0189	214
	.172	5.31	18.05	64.1	12.8	3.48	2.62	73.2	.0188	247
	.179	5.52	18.78	66.6	13.3	3.47	2.62	73.0	.0188	279
	.188	5.80	19.70	69.8	14.0	3.47	2.62	72.7	.0187	324
	.203	6.25	21.24	75.0	15.0	3.46	2.62	72.3	.0186	409
	.219	6.73	22.88	80.5	16.1	3.46	2.62	71.8	.0185	515
	.230	7.06	24.00	84.3	16.9	3.46	2.62	71.5	.0184	588
	.250	7.66	26.03	91.1	18.2	3.45	2.62	70.9	.0182	719
PP10-3/4	.109	3.64	12.39	51.6	9.60	3.76	2.81	87.1	.0224	50
	.120	4.01	13.62	56.6	10.5	3.76	2.81	86.8	.0223	67
	.125	4.17	14.18	58.9	11.0	3.76	2.81	86.6	.0223	76
	.141	4.70	15.98	66.1	12.3	3.75	2.81	86.1	.0221	109
	.150	5.00	16.98	70.2	13.1	3.75	2.81	85.8	.0221	131
	.156	5.19	17.65	72.9	13.6	3.75	2.81	85.6	.0220	148
	.164	5.45	18.54	76.4	14.2	3.74	2.81	85.3	.0219	172
	.172	5.72	19.43	80.0	14.9	3.74	2.81	85.0	.0219	199
	.179	5.94	20.21	83.1	15.5	3.74	2.81	84.8	.0218	224
	.188	6.24	21.21	87.0	16.2	3.73	2.81	84.5	.0217	260
	.219	7.25	24.63	100	18.7	3.72	2.81	83.5	.0215	414
	.230	7.60	25.84	105	19.6	3.72	2.81	83.2	.0214	480
	.250	8.25	28.04	114	21.2	3.71	2.81	82.5	.0212	605
	.279	9.18	31.20	126	23.4	3.70	2.81	81.6	.0210	781
	.307	10.1	34.24	137	25.6	3.69	2.81	80.7	.0208	951
	.344	11.2	38.23	152	28.4	3.68	2.81	79.5	.0205	1,180
	.365	11.9	40.48	161	29.9	3.67	2.81	78.9	.0203	1,320
	.438	14.2	48.24	189	35.2	3.65	2.81	76.6	.0197	1,890
	.500	16.1	54.74	212	39.4	3.63	2.81	74.7	.0192	2,380

Note: Metric properties of pipe piles are available from the American Institute of Steel Construction, 1 E. Wacker Drive, Chicago, IL 60601.

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Table B-1 (Continued)

Designation and Outside Diameter	Wall Thickness	Area A	Weight per Foot	Section Properties I	Section Properties S	Section Properties r	Area of Exterior Surface	Inside Cross-Sectional Area	Inside Volume	External Collapse Index
in.	in.	in.^{2}	lb	in.^{4}	in.^{3}	in.	ft^2/ft	in.^{2}	yd^3/ft	!
PP12	.134	5.00	16.98	87.9	14.7	4.20	3.14	108	.0278	67
	.141	5.25	17.86	92.4	15.4	4.19	3.14	108	.0277	78
	.150	5.58	18.98	98.0	16.3	4.19	3.14	108	.0277	94
	.172	6.39	21.73	112	18.6	4.18	3.14	107	.0274	142
	.179	6.65	22.60	116	19.4	4.18	3.14	106	.0274	161
	.188	6.98	23.72	122	20.3	4.18	3.14	106	.0273	186
	.203	7.52	25.58	131	21.8	4.17	3.14	106	.0272	235
	.219	8.11	27.55	141	23.4	4.17	3.14	105	.0270	296
	.230	8.50	28.91	147	24.6	4.16	3.14	105	.0269	344
	.250	9.23	31.37	159	26.6	4.16	3.14	104	.0267	443
	.281	10.3	35.17	178	29.6	4.14	3.14	103	.0264	616
	.312	11.5	38.95	196	32.6	4.13	3.14	102	.0261	784
PP12-3/4	.109	4.33	14.72	86.5	13.6	4.47	3.34	123	.0317	30
	.125	4.96	16.85	98.8	15.5	4.46	3.34	123	.0316	45
	.134	5.31	18.06	106	16.6	4.46	3.34	122	.0315	56
	.150	5.94	20.19	118	18.5	4.46	3.34	122	.0313	78
	.156	6.17	20.98	122	19.2	4.45	3.34	122	.0313	88
	.164	6.48	22.04	128	20.1	4.45	3.34	121	.0312	103
	.172	6.80	23.11	134	21.1	4.45	3.34	121	.0311	118
	.179	7.07	24.03	140	21.9	4.45	3.34	121	.0310	134
	.188	7.42	25.22	146	23.0	4.44	3.34	120	.0309	155
	.203	8.00	27.20	158	24.7	4.44	3.34	120	.0308	196
	.230	9.05	30.75	177	27.8	4.43	3.34	119	.0305	286
	.250	9.82	33.38	192	30.1	4.42	3.34	118	.0303	368
	.281	11.0	37.42	214	33.6	4.41	3.34	117	.0300	526
	.312	12.2	41.45	236	37.0	4.40	3.34	115	.0297	684
	.330	12.9	43.77	248	39.0	4.39	3.34	115	.0295	776
	.344	13.4	45.58	258	40.5	4.39	3.34	114	.0294	848
	.375	14.6	49.56	279	43.8	4.38	3.34	113	.0291	1,010
	.406	15.7	53.52	300	47.1	4.37	3.34	112	.0288	1,170
	.438	16.9	57.59	321	50.4	4.36	3.34	111	.0285	1,350
	.500	19.2	65.42	362	56.7	4.33	3.34	108	.0279	1,760

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Table B-1 (Continued)

Designation and Outside Diameter	Wall Thickness	Area A	Weight per Foot	Section Properties I	Section Properties S	Section Properties r	Area of Exterior Surface	Inside Cross-Sectional Area	Inside Volume	External Collapse Index
in.	in.	in.^{2}	lb	in.^{4}	in.^{3}	in.	ft^2/ft	in.^{2}	yd^3/ft	!
PP14	.134	5.84	19.84	140	20.0	4.90	3.67	148	.0381	42
	.141	6.14	20.87	147	21.1	4.90	3.67	148	.0380	49
	.150	6.53	22.19	157	22.4	4.90	3.67	147	.0379	59
	.156	6.78	23.07	163	23.2	4.89	3.67	147	.0378	66
	.172	7.47	25.40	179	25.5	4.89	3.67	146	.0377	89
	.179	7.77	26.42	186	26.5	4.89	3.67	146	.0376	101
	.188	8.16	27.73	195	27.8	4.88	3.67	146	.0375	117
	.203	8.80	29.91	209	29.9	4.88	3.67	145	.0373	147
	.210	9.10	30.93	216	30.9	4.88	3.67	145	.0373	163
	.219	9.48	32.23	225	32.2	4.87	3.67	144	.0372	185
	.230	9.95	33.82	236	33.7	4.87	3.67	144	.0370	215
	.250	10.8	36.71	255	36.5	4.86	3.67	143	.0368	277
	.281	12.1	41.17	285	40.7	4.85	3.67	142	.0365	395
	.344	14.8	50.17	344	49.2	4.83	3.67	139	.0358	691
	.375	16.1	54.57	373	53.3	4.82	3.67	138	.0355	835
	.438	18.7	63.44	429	61.4	4.80	3.67	135	.0348	1,130
	.469	19.9	67.78	457	65.3	4.79	3.67	134	.0345	1,280
	.500	21.2	72.09	484	69.1	4.78	3.67	133	.0341	1,460
PP16	.134	6.68	22.71	210	26.3	5.61	4.19	194	.0500	28
	.141	7.02	23.88	221	27.6	5.61	4.19	194	.0499	33
	.150	7.47	25.39	235	29.3	5.60	4.19	194	.0498	39
	.164	8.16	27.74	256	32.0	5.60	4.19	193	.0496	52
	.172	8.55	29.08	268	33.5	5.60	4.19	193	.0495	60
	.179	8.90	30.25	278	34.8	5.59	4.19	192	.0494	67
	.188	9.34	31.75	292	36.5	5.59	4.19	192	.0493	78
	.203	10.1	34.25	314	39.3	5.59	4.19	191	.0491	98
	.219	10.9	36.91	338	42.3	5.58	4.19	190	.0489	124
	.230	11.4	38.74	354	44.3	5.58	4.19	190	.0488	144
	.250	12.4	42.05	384	48.0	5.57	4.19	189	.0485	185
	.281	13.9	47.17	429	53.6	5.56	4.19	187	.0481	264
	.312	15.4	52.27	473	59.2	5.55	4.19	186	.0478	362

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Table B-1 (Concluded)

Designation and Outside Diameter	Wall Thickness	Area A	Weight per Foot	Section Properties I	Section Properties S	Section Properties r	Area of Exterior Surface	Inside Cross-Sectional Area	Inside Volume	External Collapse Index
in.	in.	in.^{2}	lb	in.^{4}	in.^{3}	in.	ft^2/ft	in.^{2}	yd^3/ft	!
PP16	.344	16.9	57.52	519	64.8	5.54	4.19	184	.0474	487
(cont'd)	.375	18.4	62.58	562	70.3	5.53	4.19	183	.0470	617
	.438	21.4	72.80	649	81.1	5.50	4.19	180	.0462	874
	.469	22.9	77.79	691	86.3	5.49	4.19	178	.0458	1,000
	.500	24.3	82.77	732	91.5	5.48	4.19	177	.0455.	1,130

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