

Appendix E – Bearing Resistance Tests: Tabulated Data

Table E. 1: Tabulated performance parameters from bearing resistance tests of main members with a 6d nail simulator.

Sample #	Elastic Stiffness (lb/in)	5% Offset Yield		Maximum Yield		Bearing Length (in)	Bearing Strength (psi)	
		Load (lb)	Disp. (in)	Load (lb)	Disp. (in)		@ 5% offset load	@ maximum load
1	14931	737	0.1138	853	0.1765	1.727	3776	4370
2	16888	847	0.0589	901	0.1390	1.687	4445	4729
3	11369	729	0.1017	779	0.1316	1.694	3808	4070
4	10845	776	0.0914	799	0.1140	1.743	3941	4056
5	14010	712	0.1082	781	0.1388	1.696	3717	4078
6	16808	670	0.0813	781	0.1249	1.766	3359	3914
7	19046	699	0.0748	768	0.1128	1.695	3651	4011
8	13599	702	0.1020	785	0.1535	1.746	3558	3976
9	14625	879	0.0738	892	0.0804	1.700	4574	4641
10	38268	959	0.0440	1063	0.0657	1.776	4781	5296
11	26448	742	0.0669	867	0.1131	1.727	3801	4443
12	33953	710	0.0485	877	0.0944	1.699	3696	4567
13	22024	817	0.0681	995	0.1216	1.767	4091	4983
14	29492	722	0.0493	883	0.0977	1.688	3787	4630
15	27653	713	0.0445	859	0.0853	1.753	3600	4338
16	18731	651	0.0876	773	0.1216	1.681	3429	4071
17	19580	713	0.0595	893	0.1219	1.694	3727	4667
18	15111	906	0.0852	942	0.1029	1.724	4649	4836
19	30121	687	0.0485	961	0.0914	1.681	3617	5058
20	18972	975	0.0722	996	0.0870	1.727	4997	5104

Table E. 2: Tabulated performance parameters from bearing resistance tests of main members with a 8d nail simulator.

Sample #	Elastic Stiffness (lb/in)	5% Offset Yield		Maximum Yield		Bearing Length (in)	Bearing Strength (psi)	
		Load (lb)	Disp. (in)	Load (lb)	Disp. (in)		@ 5% offset load	@ maximum load
1	20987	780	0.0832	795	0.0939	1.719	3462	3531
2	25540	643	0.0603	745	0.1108	1.683	2916	3380
3	25663	683	0.0843	755	0.1209	1.699	3069	3392
4	28498	768	0.0679	855	0.0956	1.736	3378	3761
5	17176	823	0.0728	845	0.0874	1.691	3717	3813
6	17556	892	0.0849	946	0.1145	1.748	3895	4132
7	22920	745	0.0807	860	0.1254	1.668	3408	3934
8	10917	878	0.1007	904	0.1359	1.770	3786	3899
9	37374	812	0.0479	1060	0.1115	1.745	3551	4636
10	17859	877	0.1043	969	0.1344	1.697	3944	4360
11	20970	938	0.0703	998	0.1081	1.716	4171	4439
12	20254	936	0.1208	1029	0.1838	1.685	4239	4662
13	31023	970	0.0588	1157	0.1058	1.769	4186	4992
14	27323	911	0.0633	1073	0.1033	1.678	4144	4883
15	21296	926	0.1259	987	0.1617	1.680	4207	4484
16	12602	795	0.1269	845	0.1492	1.744	3480	3700
17	35140	873	0.0471	1083	0.2173	1.687	3951	4899
18	16297	1084	0.1576	1114	0.1854	1.727	4790	4924
19	30790	783	0.0867	954	0.1233	1.632	3663	4461
20	28933	1014	0.0678	1187	0.1191	1.753	4417	5170

Table E. 3: Tabulated performance parameters from bearing resistance tests of 'Mill A' side members with a 6d nail simulator.

Sample #	Elastic Stiffness (lb/in)	5% Offset Yield		Maximum Yield		Bearing Length (in)	Bearing Strength (psi)	
		Load (lb)	Disp. (in)	Load (lb)	Disp. (in)		@ 5% offset load	@ maximum load
1	14901	270	0.0324	435	0.0906	0.443	5387	8693
2	13589	150	0.0190	361	0.1472	0.429	3086	7455
3	16161	196	0.0285	407	0.2858	0.461	3766	7815
4	21126	277	0.0304	583	0.1199	0.446	5498	11569
5	12146	209	0.0340	464	0.2113	0.431	4282	9521
6	17722	205	0.0288	430	0.4039	0.437	4156	8703
7	10934	213	0.0376	607	0.3256	0.457	4127	11758
8	15773	255	0.0257	534	0.1022	0.447	5039	10576
9	14296	194	0.0327	518	0.2304	0.456	3770	10059
10	14241	202	0.0383	543	0.2583	0.451	3970	10662
11	22216	268	0.0315	492	0.1093	0.455	5222	9577
12	16290	266	0.0455	490	0.5443	0.456	5159	9514
13	9469	151	0.0522	540	0.6026	0.443	3015	10790
14	13650	275	0.0351	445	0.1763	0.450	5412	8755
15	15523	209	0.0224	530	0.4471	0.456	4047	10287
16	18462	196	0.0276	547	0.2943	0.456	3805	10624
17	12929	186	0.0361	534	0.2326	0.444	3704	10650
18	11815	228	0.0437	425	0.3025	0.443	4556	8489
19	24245	274	0.0360	551	0.3204	0.443	5471	11000
20	19627	214	0.0291	435	0.1835	0.441	4300	8725

Table E. 4: Tabulated performance parameters from bearing resistance tests of 'Mill B' side members with a 6d nail simulator.

Sample #	Elastic Stiffness (lb/in)	5% Offset Yield		Maximum Yield		Bearing Length (in)	Bearing Strength (psi)	
		Load (lb)	Disp. (in)	Load (lb)	Disp. (in)		@ 5% offset load	@ maximum load
1	11021	187	0.0429	565	0.4669	0.465	3553	10755
2	15736	218	0.0319	423	0.1537	0.447	4319	8378
3	18337	226	0.0295	418	0.0912	0.471	4245	7860
4	18746	185	0.0236	542	0.1642	0.466	3510	10298
5	15710	182	0.0351	379	0.4910	0.450	3580	7458
6	17632	198	0.0342	476	0.3831	0.456	3844	9233
7	18460	188	0.0319	532	0.1108	0.449	3706	10487
8	10749	174	0.0356	565	0.3835	0.459	3346	10894
9	14888	196	0.0339	508	0.3622	0.457	3801	9833
10	15711	194	0.0292	373	0.0870	0.464	3705	7123
11	9514	185	0.0309	500	0.2057	0.465	3513	9524
12	16282	227	0.0382	531	0.1826	0.451	4457	10416
13	23391	247	0.0296	654	0.3912	0.476	4600	12155
14	14907	165	0.0358	356	0.1329	0.459	3185	6857
15	17451	253	0.0253	551	0.3870	0.467	4792	10442
16	16963	223	0.0338	516	0.2951	0.443	4462	10314
17	9382	147	0.0521	444	0.5233	0.451	2882	8720
18	16790	157	0.0226	499	0.2547	0.461	3009	9587
19	7064	134	0.0367	256	0.2119	0.456	2609	4971
20	13856	170	0.0353	411	0.2976	0.450	3348	8075

Table E. 5: Tabulated performance parameters from bearing resistance tests of 'Mill C' side members with a 6d nail simulator.

Sample #	Elastic Stiffness (lb/in)	5% Offset Yield		Maximum Yield		Bearing Length (in)	Bearing Strength (psi)	
		Load (lb)	Disp. (in)	Load (lb)	Disp. (in)		@ 5% offset load	@ maximum load
1	11220	244	0.0302	576	0.6044	0.470	4587	10836
2	23765	272	0.0317	505	0.3245	0.459	5245	9746
3	13093	174	0.0378	382	0.1935	0.430	3589	7862
4	9755	151	0.0389	352	0.3452	0.447	2992	6959
5	13038	256	0.0428	438	0.1948	0.461	4910	8403
6	17227	249	0.0326	542	0.1816	0.445	4958	10771
7	10161	152	0.0370	489	0.2353	0.448	2996	9654
8	21485	204	0.0307	498	0.2056	0.457	3957	9646
9	14403	306	0.0348	413	0.0763	0.446	6065	8187
10	15666	192	0.0292	397	0.3125	0.451	3767	7795
11	25481	294	0.0247	592	0.0983	0.448	5798	11692
12	13508	157	0.0244	418	0.2717	0.467	2979	7929
13	8574	125	0.0384	324	0.2079	0.441	2506	6496
14	16303	183	0.0270	560	0.3102	0.463	3502	10698
15	9446	123	0.0310	323	0.2577	0.442	2472	6469
16	11071	149	0.0245	240	0.0653	0.445	2967	4765
17	17813	193	0.0288	537	0.2780	0.461	3697	10306
18	10268	159	0.0389	370	0.3452	0.447	3150	7325
19	13224	177	0.0204	468	0.2073	0.461	3388	8977
20	10740	139	0.0232	481	0.6329	0.444	2769	9593

Table E. 6: Tabulated performance parameters from bearing resistance tests of 'Mill D' side members with a 6d nail simulator.

Sample #	Elastic Stiffness (lb/in)	5% Offset Yield		Maximum Yield		Bearing Length (in)	Bearing Strength (psi)	
		Load (lb)	Disp. (in)	Load (lb)	Disp. (in)		@ 5% offset load	@ maximum load
1	17110	291	0.0232	545	0.0849	0.462	5582	10432
2	16566	196	0.0197	395	0.2967	0.463	3754	7548
3	20837	235	0.0178	420	0.0825	0.463	4492	8031
4	17392	263	0.0221	547	0.1733	0.467	4985	10375
5	15507	193	0.0211	367	0.3478	0.437	3916	7432
6	9358	429	0.0546	589	0.2098	0.470	8079	11091
7	19247	201	0.0176	515	0.2439	0.477	3732	9558
8	8176	122	0.0296	364	0.3910	0.453	2390	7115
9	13996	196	0.0289	492	0.1965	0.471	3679	9245
10	14581	208	0.0234	460	0.3331	0.469	3918	8683
11	8144	136	0.0354	436	0.3238	0.434	2782	8895
12	14156	217	0.0261	448	0.2495	0.468	4111	8465
13	13292	165	0.0256	290	0.1304	0.465	3147	5510
14	13703	228	0.0342	390	0.2362	0.462	4364	7467
15	12502	154	0.0219	380	0.2088	0.462	2950	7279
16	10486	263	0.0452	381	0.0835	0.430	5423	7841
17	10266	145	0.0335	302	0.1030	0.458	2802	5836
18	5851	101	0.0344	305	0.2062	0.450	1983	6001
19	13018	216	0.0342	370	0.2362	0.433	4424	7569
20	13102	174	0.0341	448	0.2305	0.463	3332	8571

Table E. 7: Tabulated performance parameters from bearing resistance tests of 'Mill E' side members with a 8d nail simulator.

Sample #	Elastic Stiffness (lb/in)	5% Offset Yield		Maximum Yield		Bearing Length (in)	Bearing Strength (psi)	
		Load (lb)	Disp. (in)	Load (lb)	Disp. (in)		@ 5% offset load	@ maximum load
1	10351	680	0.0837	986	0.1683	0.611	8501	12320
2	16170	361	0.0408	878	0.2458	0.614	4493	10915
3	12750	289	0.0507	850	0.3392	0.610	3614	10633
4	12363	358	0.0523	939	0.1895	0.618	4428	11595
5	27620	434	0.0362	825	0.2339	0.613	5400	10278
6	18848	388	0.0390	882	0.4230	0.611	4843	11023
7	18888	370	0.0367	1008	0.4594	0.610	4630	12617
8	24265	740	0.0461	1092	0.2384	0.613	9220	13599
9	17228	358	0.0391	770	0.1619	0.607	4506	9686
10	27742	405	0.0400	709	0.1413	0.613	5048	8826
11	20529	433	0.0364	868	0.2195	0.610	5420	10865
12	12102	246	0.0331	852	0.3049	0.605	3103	10749
13	17034	301	0.0400	770	0.1635	0.609	3767	9657
14	14459	362	0.0474	783	0.3410	0.613	4508	9746
15	14860	431	0.0431	719	0.1810	0.613	5370	8957
16	20808	509	0.0515	1034	0.1976	0.613	6339	12877
17	17388	354	0.0392	839	0.4574	0.613	4414	10448
18	19740	494	0.0440	897	0.1822	0.611	6169	11204
19	14533	272	0.0380	656	0.1301	0.610	3406	8206
20	22301	408	0.0345	827	0.1923	0.614	5068	10276

Table E. 8: Tabulated performance parameters from bearing resistance tests of ‘Mill F’ side members with a 6d nail simulator.

Sample #	Elastic Stiffness (lb/in)	5% Offset Yield		Maximum Yield		Bearing Length (in)	Bearing Strength (psi)	
		Load (lb)	Disp. (in)	Load (lb)	Disp. (in)		@ 5% offset load	@ maximum load
1	18569	287	0.0371	623	0.1843	0.435	5831	12673
2	16935	256	0.0354	537	0.1587	0.431	5257	11031
3	21971	273	0.0315	636	0.1937	0.447	5396	12588
4	16897	245	0.0290	534	0.1496	0.437	4967	10819
5	18117	269	0.0338	679	0.1664	0.448	5319	13408
6	17851	265	0.0280	561	0.1612	0.456	5147	10893
7	14626	264	0.0370	616	0.3559	0.445	5259	12245
8	24332	236	0.0429	570	0.1509	0.453	4607	11134
9	14007	316	0.0375	762	0.2161	0.450	6205	14991
10	20455	248	0.0209	631	0.2457	0.441	4967	12666
11	20221	298	0.0331	685	0.1427	0.456	5783	13291
12	20095	261	0.0304	568	0.2284	0.433	5328	11608
13	16043	275	0.0341	612	0.2096	0.454	5369	11920
14	15331	245	0.0281	554	0.1732	0.456	4753	10758
15	16615	246	0.0312	627	0.1445	0.430	5065	12913
16	16052	268	0.0324	552	0.3254	0.449	5276	10872
17	13663	260	0.0373	620	0.2741	0.449	5117	12221
18	17903	246	0.0254	528	0.1402	0.425	5122	10989
19	17690	283	0.0358	604	0.3104	0.455	5500	11754
20	12136	273	0.0369	517	0.2971	0.443	5452	10335

Table E. 9: Tabulated performance parameters from bearing resistance tests of 6d wire nails.

Sample #	Elastic Stiffness (lb/in)	5% Offset Yield		Maximum Yield		Dowel Moment Resistance (in-lbs)	Bending yield strength (psi)
		Load (lb)	Disp. (in)	Load (lb)	Disp. (in)		
1	3734	75	0.0269	90	0.1392	41.6	172886
2	4464	77	0.0236	96	0.1589	42.5	176657
3	4309	69	0.0222	89	0.0698	38.2	158941
4	4240	80	0.0250	92	0.0584	44.1	183192
5	4408	76	0.0233	97	0.0926	41.7	173286
6	4506	72	0.0228	89	0.1625	40.0	166209
7	4329	73	0.0232	95	0.1374	40.5	168272
8	4349	77	0.0240	93	0.0973	42.7	177461
9	4382	76	0.0234	93	0.0739	42.0	174621
10	4239	72	0.0233	90	0.0601	40.0	166262

Table E. 10: Tabulated performance parameters from bearing resistance tests of 8d wire nails.

Sample #	Elastic Stiffness (lb/in)	5% Offset Yield		Maximum Yield		Dowel Moment Resistance (in-lbs)	Bending yield strength (psi)
		Load (lb)	Disp. (in)	Load (lb)	Disp. (in)		
1	4836	117	0.0324	132	0.0571	74.6	199129
2	5273	109	0.0275	129	0.0584	69.3	184886
3	5051	110	0.0287	148	0.1089	70.0	186910
4	5189	113	0.0285	141	0.0799	71.7	191302
5	5364	111	0.0275	140	0.0771	70.6	188431
6	5351	115	0.0285	146	0.1238	73.2	195290
7	5206	103	0.0267	136	0.0901	65.3	174159
8	5331	109	0.0273	143	0.1505	69.5	185407
9	5157	110	0.0289	140	0.1495	70.0	186723
10	5288	118	0.0288	150	0.1543	74.9	199784