

Table D.1: Dowel bending variables for 1/4 in. lag screw bending at shank

Specimen ID	Cap (lbs)	5% Off Yield (lbs)	Elastic Stiff (lbs/in)	Cap Displ (in)	5% Off Yield Displ (in)	Cap Moment (in-lbs)	5% Off Yield Moment (in-lbs)	Cap Strength (psi)	5% Off Yield Strength (psi)
1/4 shank									
1	61.5	46.3	130	0.974	0.367	184	139	82105	61867
2	61.2	37.8	203	0.965	0.187	184	113	81692	50419
3	66.8	52.4	151	1.177	0.358	200	157	89231	69968
4	62.8	41.4	240	1.088	0.186	188	124	83805	55252
5	66.9	33.1	212	0.835	0.172	201	99	89366	44129
6	60.8	35.0	205	0.988	0.192	183	105	81232	46673
7	63.2	43.7	224	0.852	0.217	189	131	84332	58383
8	66.3	49.2	220	0.855	0.238	199	148	88499	65670
9	63.9	48.3	131	0.923	0.362	192	145	85342	64508
10	63.6	48.1	136	1.117	0.345	191	144	84864	64157
11	62.8	42.7	217	1.176	0.219	188	128	83788	57000
12	66.6	45.9	228	1.176	0.225	200	138	88968	61335
13	62.5	43.3	236	1.071	0.214	187	130	83432	57774
14	64.4	43.1	235	1.123	0.202	193	129	85946	57567
15	65.8	48.4	215	0.971	0.252	197	145	87881	64647
Mean	63.9	43.9	199	1.019	0.249	192	132	85365	58623
Std Dev	2.1	5.4	40	0.122	0.071	6	16	2823	7240
COV	0.033	0.124	0.203	0.120	0.285	0.033	0.124	0.033	0.124

Table D.2: Dowel bending variables for 1/4 in. lag screw bending at threaded portion

Specimen ID	Cap (lbs)	5% Off Yield (lbs)	Elastic Stiff (lbs/in)	Cap Displ (in)	5% Off Yield Displ (in)	Cap Moment (in-lbs)	5% Off Yield Moment (in-lbs)	Cap Strength (psi)	5% Off Yield Strength (psi)
1/4 thread									
1	33.1	20.6	174	0.725	0.130	99	62	94129	58693
2	32.3	20.6	188	0.873	0.119	97	62	91739	58426
3	34.9	23.0	180	0.720	0.140	105	69	99174	65487
4	35.5	23.0	171	0.799	0.145	106	69	100822	65247
5	36.9	24.6	169	0.730	0.156	111	74	104761	70028
6	32.7	20.6	187	0.788	0.121	98	62	93015	58526
7	34.0	21.5	172	0.790	0.135	102	65	96613	61144
8	31.7	20.0	158	0.753	0.143	95	60	90155	56915
9	29.7	18.4	154	1.130	0.132	89	55	84311	52285
10	33.2	21.9	194	0.824	0.124	100	66	94457	62208
11	35.9	22.6	185	0.965	0.132	108	68	102005	64243
12	34.5	21.6	182	0.692	0.129	104	65	98200	61293
13	32.8	20.5	180	0.786	0.123	98	62	93113	58292
14	33.0	20.9	179	0.761	0.127	99	63	93933	59317
15	34.5	22.9	170	0.936	0.146	103	69	97999	65173
Mean	33.6	21.5	176	0.818	0.133	101	65	95628	61152
Std Dev	1.8	1.5	11	0.116	0.011	5	5	5138	4389
COV	0.054	0.072	0.063	0.142	0.080	0.054	0.072	0.054	0.072

Table D.3: Dowel bending variables for 3/8 in. lag screw bending at shank

Specimen ID	Cap (lbs)	5% Off Yield (lbs)	Elastic Stiff (lbs/in)	Cap Displ (in)	5% Off Yield Displ (in)	Cap Moment (in-lbs)	5% Off Yield Moment (in-lbs)	Cap Strength (psi)	5% Off Yield Strength (psi)
3/8 shank									
1	215.7	145.7	686	0.991	0.265	647	437	82518	55761
2	213.2	133.6	670	0.869	0.216	640	401	81573	51130
3	214.8	130.8	843	0.835	0.180	644	392	82185	50035
4	222.7	164.0	552	0.893	0.305	668	492	85225	62730
5	213.0	139.9	639	0.725	0.229	639	420	81491	53532
6	231.7	150.5	693	0.954	0.244	695	452	88668	57591
7	223.6	141.4	698	0.895	0.220	671	424	85550	54100
8	230.6	151.3	728	1.040	0.215	692	454	88212	57883
9	225.5	133.7	817	0.991	0.186	677	401	86284	51151
10	202.5	132.2	647	1.003	0.212	608	397	77478	50580
11	206.8	141.8	602	0.959	0.244	620	425	79133	54236
12	206.8	125.0	775	0.754	0.177	620	375	79131	47833
13	233.7	141.3	850	0.910	0.184	701	424	89413	54061
14	226.7	141.3	634	0.837	0.234	680	424	86733	54076
15	232.2	153.0	716	0.946	0.241	697	459	88831	58556
Mean	220.0	141.7	703	0.907	0.223	660	425	84162	54217
Std Dev	10.3	10.1	87	0.091	0.035	31	30	3928	3868
COV	0.047	0.071	0.124	0.100	0.155	0.047	0.071	0.047	0.071

Table D.4: Dowel bending variables for 3/8 in. lag screw bending at threaded portion

Specimen ID	Cap (lbs)	5% Off Yield (lbs)	Elastic Stiff (lbs/in)	Cap Displ (in)	5% Off Yield Displ (in)	Cap Moment (in-lbs)	5% Off Yield Moment (in-lbs)	Cap Strength (psi)	5% Off Yield Strength (psi)
3/8 thread									
1	105.6	69.2	506	1.212	0.138	317	208	91359	59898
2	115.6	77.4	447	0.923	0.182	347	232	100053	66967
3	111.0	89.3	450	0.865	0.206	333	268	96085	77255
4	123.1	85.6	477	0.757	0.185	369	257	106557	74124
5	127.5	100.0	375	0.751	0.285	383	300	110374	86549
6	123.6	95.4	436	0.705	0.237	371	286	106959	82562
7	122.2	75.7	417	0.734	0.194	367	227	105758	65553
8	108.6	81.6	362	0.625	0.221	326	245	93981	70650
9	122.2	84.2	403	0.705	0.213	367	253	105773	72855
10	112.2	69.9	388	0.697	0.185	337	210	97147	60533
11	114.0	84.4	364	0.692	0.241	342	253	98646	73039
12	116.0	84.9	421	0.670	0.212	348	255	100437	73507
13	102.1	84.1	327	0.689	0.258	306	252	88364	72826
14	107.5	73.1	442	0.671	0.173	323	219	93059	63293
15	103.2	78.4	406	0.658	0.217	310	235	89316	67887
Mean	114.3	82.2	415	0.757	0.210	343	247	98925	71166
Std Dev	8.1	8.7	47	0.148	0.036	24	26	6981	7507
COV	0.071	0.105	0.114	0.196	0.174	0.071	0.105	0.071	0.105

Table D.5: Dowel bending variables for 1/2 in. lag screw bending at shank

Specimen ID	Cap (lbs)	5% Off Yield (lbs)	Elastic Stiff (lbs/in)	Cap Displ (in)	5% Off Yield Displ (in)	Cap Moment (in-lbs)	5% Off Yield Moment (in-lbs)	Cap Strength (psi)	5% Off Yield Strength (psi)
1/2" shank									
1	544.7	434.0	1658	1.120	0.341	1634	1302	87015	69326
2	497.1	419.2	1716	0.682	0.308	1491	1258	79417	66972
3	491.7	402.7	1815	0.844	0.297	1475	1208	78546	64325
4	526.0	401.8	1963	0.789	0.280	1578	1206	84021	64192
5	540.8	418.5	1713	0.931	0.326	1623	1256	86398	66858
6	506.5	389.9	1929	0.852	0.298	1519	1170	80908	62290
7	485.2	384.3	1776	0.829	0.359	1456	1153	77511	61387
8	511.7	382.5	1861	0.865	0.271	1535	1147	81741	61096
9	547.0	435.1	1791	0.803	0.321	1641	1305	87378	69505
10	508.6	414.4	2002	0.758	0.269	1526	1243	81241	66197
11	525.0	406.6	2054	0.812	0.260	1575	1220	83861	64956
12	486.9	393.7	1783	0.769	0.339	1461	1181	77782	62885
13	497.1	402.2	1767	0.775	0.365	1491	1206	79404	64243
14	501.3	407.1	1704	0.811	0.320	1504	1221	80084	65027
15	517.3	399.1	1692	0.828	0.331	1552	1197	82630	63753
Mean	512.5	406.1	1815	0.831	0.312	1537	1218	81862	64867
Std Dev	20.5	15.9	122	0.097	0.033	61	48	3272	2548
COV	0.040	0.039	0.067	0.117	0.104	0.040	0.039	0.040	0.039

Table D.6: Dowel bending variables for 1/2 in. lag screw bending at threaded portion

Specimen ID	Cap (lbs)	5% Off Yield (lbs)	Elastic Stiff (lbs/in)	Cap Displ (in)	5% Off Yield Displ (in)	Cap Moment (in-lbs)	5% Off Yield Moment (in-lbs)	Cap Strength (psi)	5% Off Yield Strength (psi)
1/2" thread									
1	291.6	235.2	2033	0.400	0.143	875	706	101969	82243
2	317.4	277.4	1633	0.540	0.222	952	832	110966	96979
3	315.8	267.4	1779	0.451	0.183	947	802	110430	93496
4	317.0	273.8	1688	0.442	0.195	951	821	110832	95735
5	290.6	249.0	1600	0.479	0.208	872	747	101609	87080
6	311.1	283.1	1539	0.512	0.237	933	849	108770	98979
7	292.5	253.2	1747	0.424	0.184	877	760	102273	88550
8	296.0	253.1	1669	0.462	0.198	888	759	103509	88486
9	289.0	253.7	1586	0.438	0.203	867	761	101053	88709
10	275.3	234.1	1945	0.393	0.151	826	702	96244	81870
11	314.5	272.4	1786	0.443	0.212	944	817	109984	95262
12	310.3	258.2	2199	0.407	0.153	931	774	108514	90267
13	283.4	264.4	1122	0.495	0.267	850	793	99088	92436
14	291.3	256.9	1451	0.424	0.200	874	771	101871	89830
15	311.4	275.6	1455	0.557	0.265	934	827	108900	96355
Mean	300.5	260.5	1682	0.458	0.201	901	781	105067	91085
Std Dev	13.9	14.7	259	0.050	0.037	42	44	4877	5153
COV	0.046	0.057	0.154	0.109	0.184	0.046	0.057	0.046	0.057