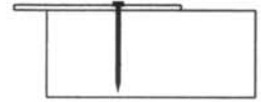


Table 11P COMMON WIRE, BOX, or SINKER NAILS: Design Values (Z) for Single Shear (two member) Connections^{1,2,3}

with ASTM A653, Grade 33 steel side plates

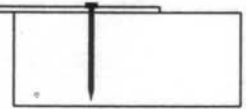


Side Member Thickness <i>t_s</i> in.	Nail Diameter <i>D</i> in.	Common Wire Nail			G=0.67 Red Oak	G=0.55 Mixed Maple Southern Pine	G=0.5 Douglas Fir-Larch	G=0.49 Douglas Fir-Larch (N)	G=0.46 Douglas Fir(S) Hem-Fir(N)	G=0.43 Hem-Fir	G=0.42 Spruce-Pine-Fir	G=0.37 Redwood (open grain)	G=0.36 Eastern Softwoods Spruce-Pine-Fir (S) Western Cedars Western Woods	G=0.35 Northern Species
		Box Nail	Sinker Nail	Pennyweight										
0.036 (20 gage)	0.099	6d	7d	69	59	54	53	51	48	47	42	41	40	
			8d	89	76	70	69	66	62	60	54	53	52	
	0.113	8d	10d	100	86	79	77	74	69	68	61	60	58	
			12d	114	97	90	88	84	79	77	69	68	66	
	0.120	10d	12d	120	102	94	92	88	82	81	72	71	69	
			14d	127	108	100	98	93	87	86	77	75	73	
	0.135	12d	14d	145	123	114	111	106	100	98	87	86	83	
			16d	155	133	124	121	116	109	106	97	95	92	
	0.048 (18 gage)	0.099	6d	7d	70	60	55	54	52	49	48	43	42	41
				8d	90	77	71	70	67	63	61	55	54	53
0.113		8d	10d	101	87	80	78	75	70	69	62	61	59	
			12d	115	98	91	89	85	80	78	70	69	67	
0.120		10d	14d	120	103	95	93	89	83	82	73	72	70	
			16d	128	109	101	99	94	88	87	78	76	74	
0.135		12d	14d	145	124	115	112	107	101	99	88	87	87	84
			16d	174	148	137	134	128	120	118	105	104	104	101
0.148		14d	20d	201	171	158	155	147	138	136	122	119	119	116
			24d	209	178	164	161	153	144	141	126	124	124	121
0.162	16d	20d	229	195	179	176	167	157	154	138	136	136	132	
		24d	229	195	179	176	167	157	154	138	136	136	132	
0.060 (16 gage)	0.099	6d	7d	72	62	57	56	54	51	50	45	44	43	
			8d	92	79	73	72	68	64	63	57	56	54	
	0.113	8d	10d	103	88	82	80	76	72	71	63	62	61	
			12d	117	100	92	91	86	81	80	72	70	68	
	0.120	10d	14d	122	104	97	95	90	85	83	75	73	71	
			16d	129	111	102	100	96	90	88	79	78	76	
	0.135	12d	14d	147	126	116	114	109	102	100	90	88	86	
			16d	175	150	138	135	129	121	119	107	105	102	
	0.148	14d	20d	202	172	159	156	149	140	137	123	121	117	
			24d	210	179	165	162	154	145	142	128	125	122	
0.162	16d	20d	229	195	180	177	168	158	155	139	137	133		
		24d	229	195	180	177	168	158	155	139	137	133		
0.075 (14 gage)	0.099	6d	7d	75	65	60	59	56	53	52	47	46	45	
			8d	95	82	76	75	71	67	66	59	58	57	
	0.113	8d	10d	106	91	85	83	79	75	73	66	65	63	
			12d	120	103	95	93	89	84	82	74	73	71	
	0.120	10d	14d	125	107	99	97	93	88	86	77	76	74	
			16d	132	113	105	103	98	93	91	82	80	78	
	0.135	12d	14d	150	129	119	117	111	105	103	92	91	88	
			16d	178	152	141	138	132	124	122	109	107	104	
	0.148	14d	20d	204	175	162	158	151	142	139	125	123	120	
			24d	212	182	168	165	157	148	145	130	128	124	
0.162	16d	20d	231	198	183	179	171	161	157	141	139	135		
		24d	231	198	183	179	171	161	157	141	139	135		
0.105 (12 gage)	0.099	6d	7d	84	73	68	67	64	60	59	53	53	51	
			8d	104	90	84	82	79	74	73	66	65	63	
	0.113	8d	10d	115	100	93	91	87	82	80	73	71	69	
			12d	129	111	103	101	97	91	90	81	79	77	
	0.120	10d	14d	134	116	107	105	101	95	93	84	82	80	
			16d	141	122	113	111	106	100	98	88	87	84	
	0.135	12d	14d	159	137	127	125	119	113	110	99	98	95	
			16d	187	161	149	146	140	132	129	116	114	111	
	0.148	14d	20d	213	183	169	166	159	149	147	132	130	126	
			24d	220	189	175	172	164	155	152	137	134	131	
0.162	16d	20d	238	205	190	186	177	167	164	147	145	141		
		24d	238	205	190	186	177	167	164	147	145	141		
0.225	24d	30d	260	223	207	203	193	182	179	161	158	153		
		36d	268	230	212	208	199	187	183	165	162	158		

1. Tabulated lateral design values (Z) shall be multiplied by all applicable adjustment factors (see Table 10.3.1).
 2. Tabulated lateral design values (Z) are for common wire, box and sinker nails (see Appendix L) inserted in side grain with nail axis perpendicular to wood fibers; minimum nail penetration, p, into the main member equal to 10D; dowel bearing strength (F_b) of 61,850 psi for ASTM A653, Grade 33 steel and nail bending yield strengths (F_y):
 F_y = 100,000 psi for 0.099" ≤ D ≤ 0.142" F_y = 90,000 psi for 0.142" < D ≤ 0.177" F_y = 80,000 psi for 0.177" < D ≤ 0.236" F_y = 70,000 psi for 0.236" < D ≤ 0.273"
 3. When 6D_s < p < 10D, tabulated lateral design values (Z) shall be multiplied by p/10D.

Table 11P COMMON WIRE, BOX, or SINKER NAILS: Design Values (Z) for Single Shear (two member) Connections^{1,2,3}

with ASTM A653, Grade 33 steel side plates



NAILS

DOWEL-TYPE FASTENERS

11

Side Member Thickness <i>t_s</i> in.	Nail Diameter <i>D</i> in.	Common Wire Nail		G=0.67 Red Oak	G=0.55 Mixed Maple Southern Pine	G=0.5 Douglas Fir-Larch	G=0.49 Douglas Fir-Larch (N)	G=0.46 Douglas Fir(S) Hem-Fir(N)	G=0.43 Hem-Fir	G=0.42 Spruce-Pine-Fir	G=0.37 Redwood (open grain)	G=0.36 Eastern Softwoods Spruce-Pine-Fir (S) Western Cedars Western Woods	G=0.35 Northern Species
		Box Nail	Sinker Nail										
0.120 (11 gage)	0.099	6d	7d	90	78	72	71	68	64	63	57	56	53
		6d	8d	110	95	89	87	83	79	77	70	68	66
	0.113	8d	8d	121	105	97	96	91	86	85	76	75	73
		10d	10d	134	116	108	106	101	96	94	85	83	81
	0.120	8d	8d	140	121	112	110	105	99	97	88	86	84
		16d	12d	147	127	118	116	110	104	102	92	91	88
	0.128	10d	20d	165	143	133	130	124	117	115	104	102	99
		16d	40d	193	166	154	152	145	137	134	121	119	115
	0.177	20d	20d	218	188	174	171	163	154	151	136	134	130
		30d	30d	226	195	181	177	169	159	156	141	138	135
	0.207	40d	40d	244	210	194	191	182	172	168	151	149	145
		50d	50d	265	228	211	207	198	186	183	164	161	157
0.225	60d	60d	272	234	217	213	203	191	187	169	166	161	
	60d	60d	272	234	217	213	203	191	187	169	166	161	
0.134 (10 gage)	0.099	6d	7d	95	82	76	74	71	66	65	58	56	54
		6d	8d	116	100	93	92	88	83	81	73	72	69
	0.113	8d	8d	127	110	102	100	96	91	89	80	79	76
		10d	10d	140	122	113	111	106	100	98	89	87	85
	0.120	8d	8d	146	126	117	115	110	104	102	92	90	88
		16d	12d	153	132	123	121	115	109	107	96	95	92
	0.148	10d	20d	172	148	138	135	129	122	120	108	106	104
		16d	40d	199	172	160	157	150	142	139	125	123	120
	0.162	20d	20d	224	194	180	176	169	159	156	141	138	135
		30d	30d	232	200	186	182	174	164	161	145	143	139
	0.177	40d	40d	249	215	199	196	187	176	173	156	153	149
		50d	50d	270	233	216	212	202	191	187	168	165	161
0.207	60d	60d	277	239	221	217	207	195	192	173	170	165	
	60d	60d	277	239	221	217	207	195	192	173	170	165	
0.179 (7 gage)	0.099	6d	7d	97	82	76	74	71	66	65	58	56	54
		6d	8d	126	107	99	97	92	86	84	76	74	70
	0.113	8d	8d	142	121	111	109	104	97	95	85	83	79
		10d	10d	161	137	126	124	118	111	108	97	94	90
	0.120	8d	8d	168	144	132	130	123	116	114	102	99	94
		16d	12d	175	152	141	138	131	123	121	108	105	100
	0.148	10d	20d	195	170	158	155	148	140	137	123	121	117
		16d	40d	224	194	180	177	169	160	157	142	140	136
	0.162	20d	20d	249	215	200	197	188	178	174	157	155	151
		30d	30d	256	222	206	203	194	183	179	162	159	155
	0.177	40d	40d	272	236	219	215	205	194	190	172	169	164
		50d	50d	292	252	234	230	220	207	203	184	180	176
0.207	60d	60d	299	258	240	235	225	212	208	188	185	180	
	60d	60d	299	258	240	235	225	212	208	188	185	180	
0.239 (3 gage)	0.099	6d	7d	97	82	76	74	71	66	65	58	56	54
		6d	8d	126	107	99	97	92	86	84	76	74	70
	0.113	8d	8d	142	121	111	109	104	97	95	85	83	79
		10d	10d	161	137	126	124	118	111	108	97	94	90
	0.120	8d	8d	168	144	132	130	123	116	114	102	99	94
		16d	12d	180	153	141	138	131	123	121	108	105	100
	0.148	10d	20d	205	174	160	157	149	140	137	123	121	117
		16d	40d	245	209	192	188	179	168	165	147	145	140
	0.162	20d	20d	284	241	222	218	207	195	191	170	167	162
		30d	30d	295	251	231	227	216	202	198	177	174	169
	0.177	40d	40d	310	270	251	246	236	222	217	194	191	185
		50d	50d	328	285	265	260	249	235	231	209	205	200
0.207	60d	60d	336	291	271	266	254	240	236	213	210	204	
	60d	60d	336	291	271	266	254	240	236	213	210	204	

1. Tabulated lateral design values (Z) shall be multiplied by all applicable adjustment factors (see Table 10.3.1).
 2. Tabulated lateral design values (Z) are for common wire, box and sinker nails (see Appendix L) inserted in side grain with nail axis perpendicular to wood fibers; minimum nail penetration, *p*, into the main member equal to 10*D*; dowel bearing strength (*F_b*) of 61,850 psi for ASTM A653, Grade 33 steel and nail bending yield strengths (*F_y*):
 $F_{yb} = 100,000 \text{ psi for } 0.099 \leq D \leq 0.142"$ $F_{yb} = 90,000 \text{ psi for } 0.142 < D \leq 0.177"$ $F_{yb} = 80,000 \text{ psi for } 0.177 < D \leq 0.236"$ $F_{yb} = 70,000 \text{ psi for } 0.236 < D \leq 0.273"$
 3. When $6D \leq p < 10D$, tabulated lateral design values (Z) shall be multiplied by *p*/10*D*.