



# Product Technical Guide

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**Contractor Steel Systems, Inc. - 1470 Dale Court, Austell, GA 30168**



Contractor Steel Systems Inc.  
1470 Dale Court  
Austell, GA 30168  
PH: 678.403.8300  
FX: 678.250.9113

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**Contractor Steel Systems Inc.**

Contractor Steel Systems Inc. has been created to provide its customers with the highest quality steel framing components available with unsurpassed customer service and exceptional delivery standards. Our focus is streamlined, not fragmented, and our goal is simple. We will provide the best quality steel framing products at the most competitive prices possible.

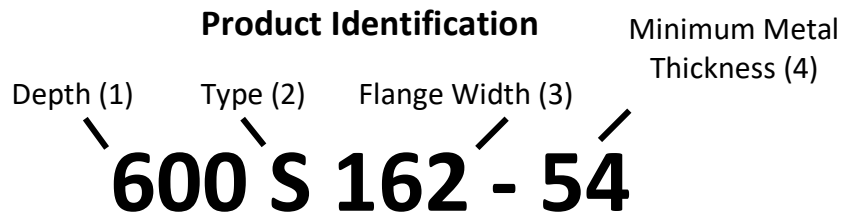
All technical data in this book is provided by Devco Engineering. All tables, notes and data is intended as a general guide and all designs should be completed by a design professional experienced with cold-formed steel design.

**LEED**

All of Contractor Steel Systems Inc.'s metal products are produced with recycled material. Whether from an integrated mill (basic oxygen furnace) or mini-mill (electric arc furnace), at least 25% of the raw material is from post-consumer or postindustrial scrap, according to the national averages available from the American Iron and Steel Institute and the Steel Framing Alliance. This exceeds the LEED standards of 5-10% minimum for credit.

**Warranty**

All Contractor Steel Systems Inc. products are guaranteed to be free of defects in material and workmanship. Our ability is expressly limited to replacement of defective goods.



1. The first set of numbers represents the depth of the member to two decimal places without the use of a decimal point. i.e.: 600 = 6.00", 362 = 3.62" web depth.
2. The alpha character represents the type of member. There are 2 different alpha characters used. S = Stud, T = Track.
3. The Second set of numbers represents the members flange width to two decimal places without the use of a decimal point. i.e.: 162 = 1.625" flange.
4. The last set of numbers is the minimum uncoated metal thickness expressed in mils (0.001in). These thicknesses correspond to reference gauges as follows: 33 (20GA), 43 (18GA), 54 (16GA), 68 (14GA). The mils define the minimum allowable uncoated metal thickness and are 5% less than the Design Thickness.

#### **Stud and Joist**

Studs are a general purpose framing component used in a number of applications; including exterior curtain walls, load-bearing walls, headers and floor and roof joists.

#### **Track**

Track is used as a closure to stud and joist ends as well as framing components to heads and sills. Note: 10' is the standard length. Custom lengths are available upon request.

#### **Drywall Product Data**

Contractor Steel Systems Inc.'s drywall framing studs and tracks meet ASTM 653 standards regarding zinc coating. As provided by ASTM C645, all drywall components will have a G-40, or equivalent coating.

The steel grade for Contractor Steel Systems Inc.'s drywall studs and tracks is  $F_y(\text{min}) = 33$  KSI

**Steel Thickness – Drywall**

Product	Design	Minimum	ASTM C645	
Gauge	Mils	(in.)	Color Code	
25	18	0.0188	0.0179	Unmarked
20	30	0.0312	0.0296	Pink

**Member Selector – Drywall**

Web Size	Punch-out Dim	Lip Return
1 5/8"	3/4" x 2 1/2"	1/4"
2 1/2"	3/4" x 2 1/2"	1/4"
3 5/8"	2 1/2" x 2 1/2"	1/4"
4"	2 1/2" x 2 1/2"	1/4"
6"	2 1/2" x 2 1/2"	1/4"

**Steel Thickness - Structural**

Product	Design	Minimum	ASTM C645	
Gauge	Mils	(in.)	(in.)	Color Code
20	33	0.0346	0.0329	White
18	43	0.0451	0.0428	Yellow
16	54	0.0566	0.0538	Green
14	68	0.0713	0.0677	Orange

**Member Selector – Structural**

Flange Size	1 5/8", 2", 2 1/2"
Gauge	20-14
Thickness	(33-68mils)
Web Sizes	2 1/2", 3 5/8", 4"
Available	6", 8", 10"
Return Lip	1/2"

**Track Selector – Structural**

Leg Size	1 1/4"	2"	2 1/2"
Gauge	20-14	20-14	20-14
Thickness	(33-68mils)	(33-68mils)	(33-68mils)
Web Sizes	2 1/2" 3 5/8", 4"	2 1/2" 3 5/8", 4"	2 1/2" 3 5/8", 4"
Available	6", 8", 10"	6", 8", 10"	6", 8", 10"



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## Material Certification

	<b>Structural</b>	<b>Non-Structural</b>
Web Depth	2 ½", 3 5/8" 4", 6", 8", 10", 12"	1 5/8", 2 ½", 3 5/8", 4", 6"
FLANGE (return lip)	1 3/8" / (3/8"), 1 5/8" / (1/2"), 2" / (5/8"), 2 ½" / (5/8")	1 ¼" / (3/16")
Yield Strength Thickness (MILS/GA)	33 and 50 KSI – 33 (20GA), 43 (18GA), 54 (16GA), 68 (14GA), 97 (12GA)	33 KSI – 18 (25GA), 30 (20GA)
PCS Member Thickness (MILS/GA)	34 (20GA), 45 (18GA), 57 (16GA), 71 (14GA), 97 (12GA)	
Protective Coating	Galvanized G-60 or Equivalent Per ASTM C 955	Galvanized G-60 or G-40 Equivalent Per ASTM C 645

### Structural Framing Standards

ASTM C 955" Standard Specification for Load Bearing (Transverse & Axial) Steel Studs, Runners (Track), and Bracing or Bridging for Screw Application of Gypsum Panel products and Metal Plaster Bases"  
 ASTM C 1007" Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories.

### Nonstructural Framing Standards

ASTM C 645" Standard Specification for Nonstructural Steel Framing Members" ASTM C 754" Standard Specification for Installation of Steel Framing Members to receive Screw-Attached Gypsum Panel Products

### Protective Coating Standards

ASTM A 942/942M" Standard Specification for General Requirements for Sheet Metal, Metallic-Coated by the Hot-Dip Process  
 ASTM A 942/942M" Standard Specification for Steel Sheet, Zinc Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process  
 ASTM A463/463M" Standard Specification for Steel Sheet, Aluminum-Coated, by the Hot-Dip Process  
 ASTM A 5911591M" Steel Sheet, Zinc-Coated, for the Light Coating Mass Applications  
 ASTM A 7921792M" Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process  
 ASTM A 875/875M" Standard Specification for Steel Sheet, Zinc, 5% Aluminum Alloy Coated by the Hot-Dip Process

Sectional and Structural Properties of Steel Framing Member have been calculated in Conformance with the AISI Specification for the design of Cold Formed Steel Structural Members.



# Section Properties

## Section Property Table Notes (Drywall and Structural)

1. Web Depth for track sections = (nominal depth + 2 x design thickness + plus bend radius).
2. Hems on non-structural track sections are ignored.
3. Effective properties include the strength increase from cold-work of forming per NASPEC section A7.2 where applicable.
4. Tabulated gross properties are based on the full, unreduced, section away from punchouts.
5. Effective properties of all 'S' sections based on punched sections. Track sections are considered unpunched.
6. For the deflection determination, use the effective moment of inertia. Effective moment of inertia is based on Procedure 1 of the NASPEC
7. Where effective properties are not listed for a section, web depth-to-thickness or flange width-to-thickness limits from the NASPEC are exceeded. Only gross properties are available.
8. Where section designations include a superscript '1', web height-to-thickness exceeds 200. Web stiffeners are required at all supports and concentrated loads.



## Sectional Properties - Drywall Studs

Section	Design		Gross							Effective Properties				Torsional Properties					Beta
	Thickness (in)	FY (ksi)	Area (in <sup>2</sup> )	Weight (lb/ft)	I <sub>x</sub> (in <sup>4</sup> )	S <sub>x</sub> (in <sup>3</sup> )	R <sub>x</sub> (in)	I <sub>y</sub> (in <sup>4</sup> )	R <sub>y</sub> (in)	I <sub>xe</sub> (in <sup>4</sup> )	S <sub>x</sub> (in <sup>3</sup> )	Ma (in-k)	V <sub>ag</sub> (lb)	J <sub>x1000</sub> (in <sup>4</sup> )	C <sub>w</sub> (in <sup>6</sup> )	X <sub>o</sub> (in)	m (in)	R <sub>o</sub> (in)	
162S125-18	0.0188	33	0.080	0.27	0.038	0.046	0.686	0.016	0.447	0.034	0.031	0.610	302	0.009	0.009	-1.029	0.594	1.315	0.388
162S125-30	0.0312	33	0.131	0.45	0.061	0.075	0.681	0.026	0.441	0.06	0.060	1.190	543	0.043	0.014	-1.014	0.585	1.298	0.39
250S125-18	0.0188	33	0.097	0.33	0.099	0.079	1.014	0.019	0.439	0.089	0.059	1.170	258	0.011	0.023	-0.904	0.543	1.427	0.599
250S125-30	0.0312	33	0.159	0.54	0.161	0.129	1.008	0.030	0.433	0.159	0.110	2.170	832	0.052	0.037	-0.889	0.534	1.412	0.603
362S125-18	0.0188	33	0.118	0.40	0.234	0.129	1.409	0.021	0.421	0.221	0.075	1.480	173	0.014	0.054	-0.786	0.49	1.667	0.778
362S125-30	0.0312	33	0.194	0.66	0.381	0.21	1.402	0.033	0.415	0.376	0.156	3.080	794	0.063	0.086	-0.773	0.482	1.654	0.782
400S125-18 (1)	0.0188	33	0.125	0.42	0.294	0.147	1.536	0.021	0.414	0.281	0.083	1.640	156	0.015	0.068	-0.754	0.475	1.76	0.816
400S125-30	0.0312	33	0.206	0.70	0.481	0.24	1.529	0.034	0.408	0.474	0.174	3.440	715	0.067	0.107	-0.741	0.467	1.748	0.820
600S125-18 (1)	0.0188	33	0.162	0.55	0.778	0.259	2.189	0.024	0.382	-	-	-	-	0.019	0.172	-0.623	0.408	2.308	0.927
600S125-30	0.0312	33	0.268	0.91	1.275	0.425	2.181	0.038	0.376	1.218	0.315	6.220	468	0.087	0.274	-0.611	0.401	2.296	0.929

1. Web height-to-thickness ratio exceeds 200. Web stiffeners are required to all support points and concentrated loads.

## Sectional Properties - Drywall Track

Section	Design		Gross							Effective Properties				Torsional Properties					Beta
	Thickness (in)	FY (ksi)	Area (in <sup>2</sup> )	Weight (lb/ft)	I <sub>x</sub> (in <sup>4</sup> )	S <sub>x</sub> (in <sup>3</sup> )	R <sub>x</sub> (in)	I <sub>y</sub> (in <sup>4</sup> )	R <sub>y</sub> (in)	I <sub>xe</sub> (in <sup>4</sup> )	S <sub>x</sub> (in <sup>3</sup> )	Ma (in-k)	V <sub>ag</sub> (lb)	J <sub>x1000</sub> (in <sup>4</sup> )	C <sub>w</sub> (in <sup>6</sup> )	X <sub>o</sub> (in)	m (in)	R <sub>o</sub> (in)	
162T125-18	0.0188	33	0.077	0.260	0.041	0.047	0.733	0.013	0.411	0.030	0.025	0.500	302	0.009	0.007	-0.878	0.503	1.215	0.478
162T125-30	0.0312	33	0.129	0.440	0.07	0.079	0.735	0.022	0.409	0.057	0.050	1.000	597	0.042	0.012	-0.87	0.50	1.210	0.483
250T125-18	0.0188	33	0.094	0.320	0.103	0.079	1.051	0.015	0.400	0.078	0.450	0.900	249	0.011	0.018	-0.769	0.460	1.362	0.681
250T125-30	0.0312	33	0.156	0.530	0.173	0.131	1.053	0.025	0.397	0.145	0.090	1.770	832	0.051	0.03	-0.762	0.456	1.359	0.686
362T125-18	0.0188	33	0.115	0.390	0.237	0.126	1.435	0.017	0.380	0.189	0.065	1.290	169	0.014	0.042	-0.665	0.413	1.627	0.833
362T125-30	0.0312	33	0.191	0.650	0.395	0.210	1.438	0.027	0.378	0.339	0.152	3.010	762	0.062	0.068	-0.659	0.410	1.626	0.836
400T125-18 (1)	0.0188	33	0.122	0.410	0.297	0.144	1.560	0.017	0.374	0.241	0.072	1.420	153	0.014	0.052	-0.637	0.400	1.726	0.864
400T125-30	0.0312	33	0.203	0.690	0.495	0.239	1.562	0.028	0.371	0.427	0.176	3.490	689	0.066	0.085	-0.632	0.397	1.726	0.866
600T125-18 (1)	0.0188	33	0.16	0.540	0.773	0.253	2.201	0.019	0.342	-	-	-	-	0.019	0.131	-0.522	0.341	2.288	0.948
600T125-30	0.0312	33	0.265	0.900	1.288	0.419	2.204	0.031	0.340	1.095	0.249	4.920	456	0.086	0.215	-0.518	0.338	2.289	0.949

1. Web height-to-thickness ratio exceeds 200. Web stiffeners are required to all support points and concentrated loads.





## Sectional Properties - Structural Stud

Section	Design		Gross							Effective Properties				Torsional Properties					Beta
	Thickness (in)	FY (ksi)	Area (in <sup>2</sup> )	Weight (lb/ft)	I <sub>x</sub> (in <sup>4</sup> )	S <sub>x</sub> (in <sup>3</sup> )	R <sub>x</sub> (in)	I <sub>y</sub> (in <sup>4</sup> )	S <sub>y</sub> (in <sup>3</sup> )	R <sub>y</sub> (in)	I <sub>xe</sub> (in <sup>4</sup> )	S <sub>x</sub> (in <sup>3</sup> )	M <sub>a</sub> (in-k)	V <sub>ag</sub> (lb)	Jx1000 (in <sup>4</sup> )	C <sub>w</sub> (in <sup>6</sup> )	X <sub>o</sub> (in)	m (in)	
250S162-33	0.0346	33	0.223	0.760	0.235	0.188	1.027	0.087	0.624	0.235	0.180	3.550	975	0.089	0.146	-1.470	0.859	1.898	0.401
250S162-43	0.0451	33	0.289	0.980	0.302	0.242	1.022	0.111	0.620	0.302	0.240	5.220	1265	0.196	0.184	-1.457	0.852	1.885	0.402
250S162-54	0.0566	50	0.358	1.220	0.370	0.296	1.016	0.135	0.613	0.370	0.284	9.420	2353	0.383	0.223	-1.443	0.845	1.868	0.403
250S162-68	0.0713	50	0.443	1.510	0.450	0.360	1.007	0.162	0.605	0.045	0.357	12.11	2866	0.752	0.268	-1.424	0.835	1.846	0.405
362S162-33	0.0346	33	0.262	0.890	0.551	0.304	1.450	0.099	0.616	0.551	0.268	5.290	1024	0.105	0.297	-1.308	0.789	2.048	0.592
362S162-43	0.0451	33	0.340	1.160	0.710	0.392	1.445	0.127	0.611	0.710	0.372	7.340	1739	0.230	0.376	-1.297	0.782	2.036	0.594
362S162-54	0.0566	50	0.422	1.440	0.873	0.481	1.438	0.154	0.604	0.873	0.444	13.28	3372	0.451	0.457	-1.283	0.774	2.020	0.597
362S162-68	0.0713	50	0.524	1.780	1.069	0.590	1.429	0.186	0.596	1.069	0.574	17.18	4370	0.887	0.552	-1.264	0.765	1.998	0.600
362S200-33	0.0346	33	0.297	1.010	0.648	0.358	1.478	0.177	0.772	0.647	0.294	5.810	1024	0.118	0.577	-1.741	1.030	2.411	0.478
362S200-43	0.0451	33	0.385	1.310	0.836	0.461	1.474	0.227	0.767	0.836	0.427	8.430	1739	0.261	0.734	-1.729	1.024	2.398	0.480
362S200-54	0.0566	50	0.479	1.630	1.030	0.568	1.467	0.277	0.761	1.030	0.490	14.66	3372	0.511	0.896	-1.715	1.016	2.382	0.482
362S200-68	0.0713	50	0.595	2.020	1.265	0.698	1.458	0.337	0.753	1.265	0.666	19.95	4370	1.008	1.089	-1.696	1.006	2.360	0.484
362S250-43	0.0451	33	0.430	1.460	0.980	0.541	1.510	0.385	0.946	0.980	0.449	8.880	1739	0.292	1.230	-2.199	1.277	2.830	0.396
362S250-54	0.0566	50	0.535	1.820	1.210	0.668	1.504	0.473	0.940	1.205	0.514	15.40	3372	0.571	1.506	-2.184	1.269	2.813	0.397
362S250-68	0.0713	50	0.666	2.270	1.490	0.822	1.496	0.578	0.931	1.490	0.689	20.63	4370	1.129	1.837	-2.165	1.259	2.791	0.398
400S162-33	0.0346	33	0.275	0.940	0.692	0.346	1.586	0.103	0.611	0.692	0.299	5.910	976	0.110	0.363	-1.263	0.768	2.118	0.644
400S162-43	0.0451	33	0.357	1.210	0.892	0.446	1.581	0.131	0.606	0.892	0.417	8.230	1739	0.242	0.460	-1.252	0.761	2.106	0.647
400S162-54	0.0566	50	0.443	1.510	1.098	0.549	1.574	0.159	0.600	1.098	0.498	14.90	3372	0.473	0.560	-1.238	0.754	2.090	0.649
400S162-68	0.0713	50	0.550	1.870	1.346	0.673	1.564	0.192	0.591	1.346	0.648	19.41	4871	0.933	0.677	-1.220	0.745	2.069	0.653
400S200-33	0.0346	33	0.310	1.050	0.812	0.406	1.619	0.183	0.769	0.812	0.328	6.490	976	0.124	0.697	-1.688	1.007	2.462	0.530
400S200-43	0.0451	33	0.402	1.370	1.047	0.524	1.615	0.235	0.764	1.047	0.478	9.450	1739	0.272	0.886	-1.676	1.000	2.449	0.532
400S200-54	0.0566	50	0.500	1.700	1.292	0.646	1.608	0.287	0.758	1.292	0.549	16.43	3372	0.534	1.083	-1.662	0.993	2.433	0.534
400S200-68	0.0713	50	0.622	2.120	1.589	0.795	1.599	0.349	0.750	1.589	0.751	22.48	4871	1.054	1.318	-1.643	0.983	2.412	0.536
400S250-43	0.0451	33	0.447	1.520	1.224	0.612	1.655	0.399	0.945	1.224	0.503	9.930	1739	0.303	1.486	-2.139	1.252	2.864	0.443
400S250-54	0.0566	50	0.556	1.890	1.512	0.756	1.649	0.490	0.938	1.506	0.576	17.24	3372	0.594	1.821	-2.124	1.244	2.848	0.444
400S250-68	0.0713	50	0.693	2.360	1.864	0.932	1.640	0.599	0.929	1.864	0.775	23.19	4871	1.174	2.225	-2.105	1.235	2.826	0.445
600S162-33	0.0346	33	0.344	1.170	1.793	0.598	2.282	0.116	0.581	1.793	0.577	11.41	638	0.137	0.861	-1.072	0.677	2.587	0.828
600S162-43	0.0451	33	0.447	1.520	2.316	0.772	2.276	0.148	0.576	2.316	0.767	16.68	1416	0.303	1.095	-1.062	0.670	2.577	0.830
600S162-54	0.0566	50	0.556	1.890	2.860	0.930	2.267	0.180	0.570	2.860	0.916	30.33	2823	0.594	1.337	-1.049	0.663	2.562	0.832
600S162-68	0.0713	50	0.693	2.360	3.525	1.175	2.255	0.218	0.560	3.525	1.164	39.47	5350	1.174	1.626	-1.032	0.655	2.543	0.835
600S200-33	0.0346	33	0.379	1.290	2.075	0.692	2.340	0.209	0.743	2.058	0.621	12.28	638	0.151	1.593	-1.457	0.901	2.855	0.740
600S200-43	0.0451	33	0.492	1.670	2.683	0.894	2.335	0.268	0.739	2.683	0.873	17.24	1416	0.334	2.033	-1.446	0.894	2.844	0.742
600S200-54	0.0566	50	0.613	2.090	3.319	1.106	2.327	0.328	0.732	3.319	1.015	30.40	2823	0.655	2.493	-1.432	0.887	2.829	0.744
600S200-68	0.0713	50	0.764	2.600	4.101	1.367	2.316	0.400	0.723	4.101	1.317	43.71	5350	1.295	3.047	-1.415	0.878	2.809	0.746
600S250-43	0.0451	33	0.537	1.830	3.082	1.027	2.396	0.458	0.923	3.082	0.918	18.14	1416	0.364	3.411	-1.874	1.136	3.179	0.652
600S250-54	0.0566	50	0.670	2.280	3.819	1.273	2.388	0.562	0.917	3.766	1.069	32.00	2823	0.715	4.194	-1.860	1.129	3.163	0.654
600S250-68	0.0713	50	0.836	2.840	4.727	1.576	2.378	0.688	0.908	4.723	1.386	41.49	5350	1.416	5.145	-1.842	1.119	3.142	0.656
800S162-33 (1)	0.0346	33	0.413	1.410	3.582	0.896	2.943	0.125	0.550	3.384	0.710	14.03	474	0.165	1.630	-0.936	0.607	3.137	0.911
800S162-43	0.0451	33	0.537	1.830	4.633	1.158	2.937	0.160	0.546	4.500	1.019	20.14	1051	0.364	2.076	-0.926	0.601	3.128	0.912
800S162-54	0.0566	50	0.670	2.280	5.736	1.434	2.927	0.194	0.539	5.600	1.229	36.79	2091	0.715	2.539	-0.914	0.594	3.113	0.914
800S162-68	0.0713	50	0.836	2.840	7.089	1.772	2.913	0.235	0.530	7.070	1.663	49.80	4221	1.416	3.093	-0.899	0.586	3.094	0.916
800S200-33 (1)	0.0346	33	0.448	1.520	4.096	1.024	3.023	0.227	0.712	4.096	0.816	16.12	474	0.179	2.971	-1.288	0.817	3.363	0.853
800S200-43	0.0451	33	0.582	1.980	5.302	1.325	3.018	0.292	0.708	5.302	1.293	25.54	1051	0.395	3.797	-1.277	0.811	3.353	0.855
800S200-54	0.0566	50	0.726	2.470	6.573	1.643	3.009	0.357	0.701	6.573	1.499	44.87	2091	0.775	4.663	-1.265	0.804	3.338	0.856
800S200-68	0.0713	50	0.907	3.090	8.140	2.035	2.996	0.435	0.692	8.140	1.964	65.21	4221	1.537	5.712	-1.248	0.796	3.319	0.859
800S250-43	0.0451	33	0.627	2.130	6.015	1.504	3.097	0.500	0.893	6.015	1.313	25.95	1051	0.425	6.374	-1.675	1.043	3.632	0.787
800S250-54	0.0566	50	0.783	2.660	7.465	1.866	3.088	0.614	0.886	7.378	1.525	45.66	2091	0.836	7.850	-1.661	1.036	3.617	0.789
800S250-68	0.0713	50	0.978	3.330	9.261	2.315	3.077	0.752	0.877	9.240	2.059	61.65	4221	1.658	9.652	-1.644	1.027	3.597	0.791
1000S162-43 (1)	0.0451	33	0.627	2.130	8.025	1.605	3.577	0.168	0.518	7.230	1.302	25.74	836	0.425	3.430	-0.823	0.545	3.707	0.951
1000S162-54	0.0566	50	0.783	2.660	9.950	1.990	3.565	0.204	0.511	9.391	1.572	47.07	1661	0.836	4.198	-0.812	0.538	3.690	0.952
1000S162-68	0.0713	50	0.978	3.330	12.325	2.465	3.550	0.246	0.502	11.978	2.154	64.51	3345	1.658	5.121	-0.798	0.531	3.673	0.953
1000S200-43	0.0451	33	0.672	2.290	9.085	1.817	3.676	0.309	0.677	8.602	1.470	29.05	836	0.456	6.236	-1.147	0.743	3.910	0.914
1000S200-54	0.0566	50	0.839	2.860	11.278	2.256	3.666	0.378	0.671	10.769	1.705	51.05	1661	0.896	7.665	-1.135	0.737	3.896	0.915
1000S200-68	0.0713	50	1.050	3.570	13.994	2.799	3.652	0.460	0.662	13.665	2.420	72.46	3345	1.779	9.401	-1.120	0.729	3.876	0.917
1000S250-43	0.0451	33	0.717	2.440	10.203	2.041	3.771	0.531	0.860	10.203	1.617	31.95	836	0.486	10.481	-1.518	0.965	4.155	0.867
1000S250-54	0.0566	50	0.896	3.050	12.677	2.535	3.762	0.653	0.854	12.66	1.879	56.26	1661	0.957	12.922	-1.505	0.958	4.140	0.868
1000S250-68	0.0713	50	1.121	3.810	15.751	3.150	3.749	0.799	0.844	15.741	2.768	82.89	3345						



## Sectional Properties - Structural Track

Section	Design		Gross							Effective Properties				Torsional Properties					Beta
	Thickness (in)	FY (ksi)	Area (in <sup>2</sup> )	Weight (lb/ft)	I <sub>x</sub> (in <sup>4</sup> )	S <sub>x</sub> (in <sup>3</sup> )	R <sub>x</sub> (in)	I <sub>y</sub> (in <sup>4</sup> )	R <sub>y</sub> (in)	I <sub>xe</sub> (in <sup>4</sup> )	S <sub>x</sub> (in <sup>3</sup> )	M <sub>a</sub> (in-k)	V <sub>ag</sub> (lb)	J <sub>x1000</sub> (in <sup>6</sup> )	C <sub>w</sub> (in <sup>6</sup> )	X <sub>o</sub> (in)	m (in)	R <sub>o</sub> (in)	
250T125-33	0.0346	33	0.173	0.590	0.192	0.145	1.054	0.027	0.397	0.166	0.103	2.030	1024	0.069	0.033	-0.760	0.456	1.358	0.687
250T125-43	0.0451	33	0.225	0.770	0.250	0.188	1.055	0.035	0.395	0.231	0.147	2.910	1356	0.153	0.042	-0.755	0.453	0.356	0.690
250T125-54	0.0566	50	0.282	0.960	0.318	0.236	1.062	0.043	0.392	0.297	0.188	5.640	2563	0.301	0.054	-0.749	0.449	1.357	0.696
250T125-68	0.0713	50	0.355	1.210	0.408	0.297	1.072	0.054	0.389	0.402	0.262	7.850	3199	0.602	0.069	-0.740	0.444	1.360	0.704
250T200-33	0.0346	33	0.225	0.760	0.280	0.212	1.117	0.097	0.658	0.203	0.112	2.220	1024	0.090	0.118	-1.418	0.813	1.921	0.455
250T200-43	0.0451	33	0.293	1.000	0.366	0.275	1.118	0.126	0.657	0.288	0.163	3.210	1356	0.198	0.153	-1.413	0.810	1.918	0.457
250T200-54	0.0566	50	0.367	1.250	0.466	0.346	1.127	0.157	0.654	0.371	0.209	6.250	2563	0.392	0.195	-1.405	0.806	1.917	0.462
250T200-68	0.0713	50	0.462	1.570	0.600	0.437	1.139	0.196	0.652	0.517	0.296	8.860	3199	0.783	0.251	-1.396	0.800	1.916	0.469
362T125-33	0.0346	33	0.212	0.720	0.438	0.232	1.438	0.030	0.377	0.384	0.174	3.440	1024	0.085	0.076	-0.658	0.409	1.626	0.836
362T125-43	0.0451	33	0.276	0.940	0.571	0.302	1.439	0.039	0.375	0.531	0.245	4.840	1739	0.187	0.098	-0.654	0.407	1.625	0.838
362T125-54	0.0566	50	0.346	1.180	0.723	0.378	1.445	0.048	0.373	0.678	0.312	9.340	3372	0.369	0.123	-0.648	0.404	1.627	0.841
362T125-68	0.0713	50	0.436	1.480	0.921	0.475	1.454	0.060	0.370	0.907	0.427	12.780	4703	0.738	0.156	-0.641	0.399	1.631	0.846
362T200-33	0.0346	33	0.264	0.900	0.619	0.328	1.532	0.110	0.645	0.464	0.190	3.760	1024	0.105	0.269	-1.270	0.754	2.092	0.631
362T200-43	0.0451	33	0.343	1.170	0.808	0.427	1.534	0.142	0.643	0.649	0.270	5.340	1739	0.233	0.350	-1.265	0.752	2.090	0.633
362T200-54	0.0566	50	0.431	1.470	1.024	0.536	1.541	0.177	0.640	0.832	0.345	10.34	3372	0.460	0.442	-1.259	0.748	2.091	0.637
362T200-68	0.0713	50	0.543	1.850	1.307	0.675	1.552	0.221	0.638	1.138	0.480	14.37	4703	0.919	0.564	-1.250	0.743	2.093	0.643
362T250-43	0.0451	33	0.389	1.320	0.966	0.510	1.577	0.260	0.818	0.713	0.282	5.560	1739	0.264	0.641	-1.702	0.990	2.460	0.521
362T250-54	0.0566	50	0.488	1.660	1.225	0.641	1.585	0.324	0.816	0.914	0.360	10.77	3372	0.521	0.812	-1.695	0.986	2.460	0.525
362T250-68	0.0713	50	0.614	2.090	1.565	0.808	1.597	0.406	0.813	1.259	0.503	15.04	4703	1.040	1.038	-1.686	0.980	2.460	0.530
400T125-33	0.0346	33	0.225	0.760	0.549	0.265	1.563	0.031	0.371	0.484	0.201	3.970	940	0.090	0.095	-0.630	0.396	1.725	0.867
400T125-43	0.0451	33	0.293	1.000	0.716	0.344	1.563	0.040	0.369	0.666	0.282	5.570	1739	0.198	0.122	-0.626	0.394	1.724	0.868
400T125-54	0.0566	50	0.367	1.250	0.904	0.431	1.569	0.049	0.366	0.849	0.359	10.74	3372	0.392	0.154	-0.621	0.390	1.727	0.871
400T125-68	0.0713	50	0.462	1.570	1.150	0.541	1.577	0.061	0.363	1.134	0.488	14.62	5205	0.783	0.194	-0.614	0.386	1.731	0.874
400T200-33	0.0346	33	0.277	0.940	0.768	0.371	1.666	0.113	0.639	0.581	0.220	4.340	940	0.110	0.336	-1.229	0.737	2.166	0.678
400T200-43	0.0451	33	0.360	1.230	1.002	0.482	1.668	0.146	0.637	0.811	0.311	6.140	1739	0.244	0.436	-1.224	0.734	2.164	0.680
400T200-54	0.0566	50	0.452	1.540	1.268	0.604	1.675	0.182	0.635	1.037	0.397	11.88	3372	0.483	0.551	-1.217	0.730	2.165	0.684
400T200-68	0.0713	50	0.569	1.940	1.617	0.761	1.685	0.227	0.632	1.412	0.549	16.42	5205	0.965	0.702	-1.209	0.725	2.168	0.689
400T250-43	0.0451	33	0.406	1.380	1.193	0.573	1.715	0.268	0.813	0.888	0.324	6.400	1739	0.275	0.799	-1.653	0.970	2.517	0.569
400T250-54	0.0566	50	0.509	1.730	1.511	0.720	1.723	0.335	0.811	1.137	0.414	12.38	3372	0.543	1.011	-1.646	0.966	2.517	0.572
400T250-68	0.0713	50	0.641	2.180	1.928	0.908	1.735	0.418	0.808	1.559	0.574	17.19	5205	1.086	1.289	-1.637	0.961	2.518	0.578
600T125-33	0.0346	33	0.294	1.000	1.428	0.465	2.204	0.034	0.339	1.258	0.297	5.870	622	0.117	0.238	-0.516	0.337	2.289	0.949
600T125-43	0.0451	33	0.383	1.300	1.861	0.604	2.205	0.044	0.337	1.768	0.461	9.110	1377	0.260	0.307	-0.513	0.335	2.288	0.951
600T125-54	0.0566	50	0.480	1.630	2.344	0.756	2.209	0.054	0.335	2.241	0.592	17.730	2728	0.513	0.384	-0.508	0.332	2.291	0.951
600T125-68	0.0713	50	0.605	2.060	2.969	0.950	2.215	0.067	0.332	2.934	0.858	25.690	5350	1.025	0.483	-0.503	0.329	2.296	0.952
600T200-33	0.0346	33	0.346	1.180	1.913	0.622	2.352	0.126	0.604	1.542	0.333	6.590	622	0.138	0.847	-1.048	0.655	2.645	0.843
600T200-43	0.0451	33	0.451	1.530	2.494	0.809	2.353	0.163	0.602	2.076	0.565	11.160	1377	0.305	1.098	-1.044	0.652	2.643	0.844
600T200-54	0.0566	50	0.565	1.920	3.145	1.015	2.359	0.203	0.600	2.641	0.717	21.480	2728	0.604	1.381	-1.038	0.649	2.646	0.846
600T200-68	0.0713	50	0.712	2.420	3.990	1.277	2.367	0.254	0.597	3.540	0.973	29.120	5350	1.206	1.746	-1.031	0.644	2.650	0.849
600T250-43	0.0451	33	0.496	1.690	2.916	0.946	2.425	0.303	0.781	2.269	0.563	11.130	1377	0.336	2.004	-1.436	0.878	2.925	0.759
600T250-54	0.0566	50	0.622	2.120	3.678	1.187	2.432	0.377	0.779	2.881	0.732	21.920	2728	0.664	2.523	-1.430	0.874	2.927	0.761
600T250-68	0.0713	50	0.783	2.670	4.670	1.495	2.442	0.472	0.776	3.871	1.017	30.460	5350	1.327	3.198	-1.422	0.869	2.930	0.764
800T125-33 (1)	0.0346	33	0.363	1.240	2.950	0.711	2.824	0.036	0.313	2.441	0.407	8.030	465	0.145	0.456	-0.439	0.294	2.875	0.977
800T125-43	0.0451	33	0.473	1.610	3.773	0.924	2.824	0.046	0.311	3.484	0.640	12.650	1030	0.321	0.589	-0.436	0.292	2.874	0.977
800T125-54	0.0566	50	0.594	2.020	4.745	1.158	2.827	0.057	0.309	4.426	0.824	24.660	2039	0.634	0.735	-0.432	0.289	2.877	0.977
800T125-68	0.0713	50	0.748	2.540	5.998	1.454	2.837	0.070	0.306	5.956	1.216	36.390	4087	1.267	0.920	-0.427	0.286	2.881	0.978
800T200-33 (1)	0.0346	33	0.415	1.410	3.749	0.921	3.005	0.135	0.571	2.788	0.424	8.370	465	0.166	1.638	-0.917	0.589	3.190	0.918
800T200-43	0.0451	33	0.541	1.840	4.887	1.197	3.006	0.175	0.569	4.043	0.676	13.350	1030	0.367	2.124	-0.913	0.587	3.193	0.918
800T200-54	0.0566	50	0.679	2.310	6.152	1.501	3.011	0.218	0.567	5.149	0.871	26.090	2039	0.725	2.664	-0.908	0.584	3.196	0.919
800T200-68	0.0713	50	0.854	2.910	7.786	1.888	3.019	0.272	0.564	7.051	1.310	39.220	4087	1.448	3.357	-0.902	0.580	3.201	0.921
800T250-43	0.0451	33	0.586	1.990	5.629	1.380	3.100	0.326	0.746	4.593	0.739	14.600	1030	0.397	3.877	-1.274	0.801	3.433	0.862
800T250-54	0.0566	50	0.735	2.500	7.090	1.730	3.106	0.407	0.744	5.816	0.959	28.710	2039	0.785	4.870	-1.268	0.798	3.436	0.864
800T250-68	0.0713	50	0.926	3.150	8.978	2.177	3.114	0.509	0.741	7.588	1.560	46.720	4087	1.569	6.151	-1.261	0.793	3.441	0.866
1000T125-43	0.0451	33	0.563	1.920	6.630	1.305	3.431	0.047	0.290	5.886	0.819	16.190	822	0.382	0.973	-0.379	0.259	3.464	0.988
1000T125-54	0.0566	50	0.707	2.410	8.333	1.634	3.434	0.059	0.288	7.479	1.055	31.59	1628	0.755	1.212	-0.376	0.256	3.466	0.988
1000T125-68	0.0713	50	0.890	3.030	10.522	2.053	3.438	0.073	0.286	10.155	1.575	47.15	3261	1.508	1.515	-0.372	0.253	3.470	0.989
1000T200-43	0.0451	33	0.631	2.150	8.361	1.646	3.640	0.183	0.539	6.722	0.861	17.010	822	0.428	3.540	-0.813	0.534	3.769	0.953
1000T200-54	0.0566	50	0.792	2.690	10.516	2.062	3.645	0.228	0.537	8.560	1.111	33.26	1628	0.845	4.434	-0.809			



# Limiting Heights

## Limiting Heights Table Notes

1. Lateral Loads have not been modified for strength checks.
2. Lateral loads have been multiplied by 0.7 for deflection determination.
3. Limiting heights based on continuous support of each flange over the full length of the stud.
4. Limiting heights are based on steel properties only (non-composite).
5. Web Crippling check based on 1 inch end bearing. Where listed, limited heights are followed by “e”, web stiffeners are required.



**Limiting Heights Table**  
**Drywall (Non-Axial) 5-15 PSF**

Section	FY (ksi)	Spacing (in) oc	5 PSF			10 PSF			15 PSF		
			L/120	L/240	L/360	L/120	L/240	L/360	L/120	L/240	L/360
162S125-18	33	12	9' 0"	8' 7"	7' 6"	6' 4"	6' 4"	6' 0"	5' 2"	5' 2"	5' 2"
162S125-18	33	16	7' 9"	7' 9"	6' 10"	5' 6"	5' 6"	5' 5"	4' 6"	4' 6"	4' 6"
162S125-18	33	24	6' 4"	6' 4"	6' 0"	4' 6"	4' 6"	4' 6"	3' 8" e	3' 8" e	3' 8" e
162S125-30	33	12	12' 7"	10' 5"	9' 1"	8' 11"	8' 3"	7' 3"	7' 3"	7' 3"	6' 4"
162S125-30	33	16	10' 11"	9' 5"	8' 3"	7' 9"	7' 6"	6' 7"	6' 4"	6' 4"	5' 9"
162S125-30	33	24	8' 11"	8' 3"	7' 3"	6' 4"	6' 4"	5' 9"	5' 2"	5' 2"	5' 0"
250S125-18	33	12	12' 6"	11' 10"	10' 4"	8' 10"	8' 10"	8' 3"	7' 3" e	7' 3" e	7' 2" e
250S125-18	33	16	10' 10"	10' 9"	9' 5"	7' 8"	7' 8"	7' 6"	6' 3" e	6' 3" e	6' 3" e
250S125-18	33	24	8' 10"	8' 10"	8' 3"	6' 3" e	6' 3" e	6' 3" e	5' 1" e	5' 1" e	5' 1" e
250S125-30	33	12	17' 0"	14' 5"	12' 7"	12' 0"	11' 5"	10' 0"	9' 10"	9' 10"	8' 9"
250S125-30	33	16	14' 9"	13' 1"	11' 5"	10' 5"	10' 4"	9' 1"	8' 6"	8' 6"	7' 11"
250S125-30	33	24	12' 0"	11' 5"	10' 0"	8' 6"	8' 6"	7' 11"	6' 11"	6' 11"	6' 11"
362S125-18	33	12	14' 0"	14' 0"	14' 0"	9' 11" e	9' 11" e	9' 11" e	8' 1" e	8' 1" e	8' 1" e
362S125-18	33	16	12' 2"	12' 2"	12' 2"	8' 7" e	8' 7" e	8' 7" e	7' 0" e	7' 0" e	7' 0" e
362S125-18	33	24	9' 11" e	9' 11" e	9' 11" e	7' 0" e	7' 0" e	7' 0" e	5' 9" e	5' 9" e	5' 9" e
362S125-30	33	12	20' 3"	19' 2"	16' 9"	14' 4"	14' 4"	13' 3"	11' 8"	11' 8"	11' 7"
362S125-30	33	16	17' 7"	17' 5"	15' 3"	12' 5"	12' 5"	12' 1"	10' 2"	10' 2"	10' 2"
362S125-30	33	24	14' 4"	14' 4"	13' 3"	10' 2"	10' 2"	10' 2"	8' 3"	8' 3"	8' 3"
400S125-18	33	12	14' 9" e	14' 9" e	14' 9" e	18' 11" e	18' 11" e	18' 11" e	8' 6" e	8' 6" e	8' 6" e
400S125-18	33	16	12' 10" e	12' 10" e	12' 10" e	16' 4" e	16' 4" e	16' 4" e	7' 5" e	7' 5" e	7' 5" e
400S125-18	33	24	10' 5" e	10' 5" e	10' 5" e	13' 4" e	13' 4" e	13' 4" e	6' 0" e	6' 0" e	6' 0" e
400S125-30	33	12	21' 5"	20' 8"	18' 1"	15' 2"	15' 2"	14' 4"	12' 4"	12' 4"	12' 4"
400S125-30	33	16	18' 6"	18' 6"	16' 5"	13' 1"	13' 1"	13' 1"	10' 8"	10' 8"	10' 8"
400S125-30	33	24	15' 2"	15' 2"	14' 4"	10' 8"	10' 8"	10' 8"	8' 9"	8' 9"	8' 9"
600S125-30	33	12	28' 10"	28' 10"	24' 9"	20' 4"	20' 4"	9' 8"	16' 8" e	16' 8" e	16' 8" e
600S125-30	33	16	24' 11"	24' 11"	22' 6"	17' 8"	17' 8"	17' 8"	14' 5" e	14' 5" e	14' 5" e
600S125-30	33	24	20' 4"	20' 4"	19' 8"	14' 5" e	14' 5" e	14' 5" e	11' 9" e	11' 9" e	11' 9" e



**Limiting Heights Table  
Structural (Non-Axial) 5-15 PSF**

Section	FY (ksi)	Spacing (in) oc	5 PSF			10 PSF			15 PSF		
			L/120	L/240	L/360	L/120	L/240	L/360	L/120	L/240	L/360
250S162-33	33	12	20' 8"	16' 5"	14' 4"	15' 5"	13' 0"	11' 4"	12' 7"	11' 4"	9' 11"
250S162-33	33	16	18' 9"	14' 11"	13' 0"	13' 4"	11' 10"	10' 4"	10' 11"	10' 4"	9' 0"
250S162-33	33	24	15' 5"	13' 0"	11' 4"	10' 11"	10' 4"	9' 0"	8' 11"	8' 11"	7' 11"
250S162-43	33	12	22' 5"	17' 10"	15' 7"	17' 10"	14' 2"	12' 4"	15' 3"	12' 4"	10' 10"
250S162-43	33	16	20' 5"	16' 2"	14' 2"	16' 2"	12' 10"	11' 3"	13' 2"	11' 3"	9' 10"
250S162-43	33	24	17' 10"	14' 2"	12' 4"	13' 2"	11' 3"	9' 10"	10' 9"	9' 10"	8' 7"
250S162-54	50	12	24' 0"	19' 1"	16' 8"	19' 1"	15' 2"	13' 3"	16' 8"	13' 3"	11' 7"
250S162-54	50	16	21' 10"	17' 4"	15' 2"	17' 4"	13' 9"	12' 0"	15' 2"	12' 0"	10' 6"
250S162-54	50	24	19' 1"	15' 2"	13' 3"	15' 2"	12' 0"	10' 6"	13' 3"	10' 6"	9' 2"
250S162-68	50	12	25' "	20' 4"	17' 9"	20' 4"	16' 2"	14' 1"	17' 9"	14' 1"	12' 4"
250S162-68	50	16	23' 4"	18' 6"	16' 2"	18' 6"	14' 8"	12' 10"	16' 2"	12' 10"	11' 2"
250S162-68	50	24	20' 4"	16' 2"	14' 1"	16' 2"	12' 10"	11' 2"	14' 1"	11' 2"	9' 9"
362S162-33	33	12	26' 7"	21' 9"	19' 0"	18' 9"	17' 3"	15' 1"	15' 4"	15' 1"	13' 2"
362S162-33	33	16	23' 0"	19' 9"	17' 3"	16' 3"	15' 8"	13' 9"	13' 3"	13' 3"	12' 0"
362S162-33	33	24	18' 9"	17' 3"	15' 1"	13' 3"	13' 3"	12' 0"	10' 10"	10' 10"	10' 6"
362S162-43	33	12	29' 10"	23' 8"	20' 8"	22' 2"	18' 10"	16' 5"	18' 1"	16' 5"	14' 4"
362S162-43	33	16	27' 1"	21' 6"	18' 10"	19' 2"	17' 1"	14' 11"	15' 8"	14' 11"	13' 0"
362S162-43	33	24	22' 2"	18' 10"	16' 5"	15' 8"	14' 11"	13' 0"	12' 9"	12' 9"	11' 5"
362S162-54	50	12	32' 0"	25' 5"	22' 2"	25' 5"	20' 2"	17' 7"	22' 2"	17' 7"	15' 4"
362S162-54	50	16	29' 1"	23' 1"	20' 2"	23' 1"	18' 4"	16' 0"	20' 2"	16' 0"	14' 0"
362S162-54	50	24	25' 5"	20' 2"	17' 7"	20' 2"	16' 0"	14' 0"	17' 2"	14' 0"	12' 2"
362S162-68	50	12	34' 3"	27' 2"	23' 9"	27' 2"	21' 7"	18' 10"	23' 9"	18' 10"	16' 5"
362S162-68	50	16	31' 1"	24' 8"	21' 7"	24' 8"	19' 7"	17' 1"	21' 7"	17' 1"	14' 11"
362S162-68	50	24	27' 2"	21' 7"	18' 10"	21' 7"	17' 1"	14' 11"	18' 10"	14' 11"	13' 1"
400S162-33	33	12	28' 1"	23' 6"	20' 6"	19' 10"	18' 8"	16' 3"	16' 2"	16' 2"	14' 3"
400S162-33	33	16	24' 4"	21' 4"	18' 8"	17' 2"	16' 11"	14' 10"	14' 0"	14' 0"	12' 11"
400S162-33	33	24	19' 10"	18' 8"	16' 3"	14' 0"	14' 0"	12' 11"	11' 5" e	11' 5" e	11' 4" e
400S162-43	33	12	32' 2"	25' 7"	22' 4"	23' 5"	20' 3"	17' 9"	19' 2"	17' 9"	15' 6"
400S162-43	33	16	28' 8"	23' 3"	20' 3"	20' 3"	18' 5"	16' 1"	16' 7"	16' 1"	14' 1"
400S162-43	33	24	23' 5"	20' 3"	17' 9"	16' 7"	16' 1"	14' 1"	13' 6"	13' 6"	12' 3"
400S162-54	50	12	34' 6"	27' 5"	23' 11"	27' 5"	21' 9"	19' 0"	23' 11"	19' 0"	16' 7"
400S162-54	50	16	31' 4"	24' 11"	21' 9"	24' 11"	19' 9"	17' 3"	21' 9"	17' 3"	15' 1"
400S162-54	50	24	27' 5"	21' 9"	19' 0"	21' 9"	17' 3"	15' 1"	18' 2"	15' 1"	13' 2"
400S162-68	50	12	36' 11"	29' 4"	25' 7"	29' 4"	23' 3"	20' 4"	25' 7"	20' 4"	17' 9"
400S162-68	50	16	33' 7"	26' 8"	23' 3"	26' 8"	21' 2"	18' 6"	23' 3"	18' 6"	16' 2"
400S162-68	50	24	29' 4"	23' 3"	20' 4"	23' 3"	18' 6"	16' 2"	20' 4"	16' 2"	14' 1"
600S162-33	33	12	39' 0"	32' 3"	28' 2"	27' 7"	25' 7"	22' 4"	22' 6" e	22' 4" e	19' 6"
600S162-33	33	16	33' 9"	29' 4"	25' 7"	23' 11" e	23' 3" e	20' 4"	19' 6" e	19' 6" e	17' 9" e
600S162-33	33	24	27' 7"	25' 7"	22' 4"	19' 6" e	19' 6" e	17' 9" e	15' 11" e	15' 11" e	15' 6" e
600S162-43	33	12	44' 3"	35' 2"	30' 8"	33' 4"	27' 11"	24' 4"	27' 3"	24' 4"	21' 3"
600S162-43	33	16	40' 3"	31' 11"	27' 11"	28' 11"	25' 4"	22' 2"	23' 7"	22' 2"	19' 4"
600S162-43	33	24	33' 4"	27' 11"	24' 4"	23' 7"	22' 2"	19' 4"	19' 3" e	19' 3" e	16' 11"
600S162-54	50	12	47' 6"	37' 8"	32' 11"	37' 8"	29' 11"	26' 2"	32' 11"	26' 2"	22' 10"
600S162-54	50	16	43' 2"	34' 3"	29' 11"	34' 3"	27' 2"	23' 9"	29' 11"	23' 9"	20' 9"
600S162-54	50	24	37' 8"	29' 11"	26' 2"	29' 11"	23' 9"	20' 9"	26' 0"	20' 9"	18' 1"
600S162-68	50	12	50' 11"	40' 5"	35' 4"	40' 5"	32' 1"	28' 0"	35' 4"	28' 0"	24' 6"
600S162-68	50	16	46' 3"	36' 9"	32' 1"	36' 9"	29' 2"	25' 6"	32' 1"	25' 6"	22' 3"
600S162-68	50	24	40' 5"	32' 1"	28' 0"	32' 1"	25' 6"	22' 3"	28' 0"	22' 3"	19' 5"
800S162-33	33	12	43' 3" e	39' 10" e	34' 10" e	30' 7" e	30' 7" e	27' 8" e	25' 0" e	25' 0" e	24' 2" e
800S162-33	33	16	37' 5" e	36' 3" e	31' 8" e	26' 6" e	26' 6" e	25' 1" e	21' 7" e	21' 7" e	21' 7" e
800S162-33	33	24	30' 7" e	30' 7" e	27' 8" e	21' 7" e	21' 7" e	21' 7" e	17' 8" e	17' 8" e	17' 8" e
800S162-43	33	12	51' 10"	43' 10"	38' 4"	36' 8"	34' 10"	30' 5"	29' 11"	29' 11"	26' 7"
800S162-43	33	16	44' 11"	39' 10"	34' 10"	31' 9"	31' 7"	27' 7"	25' 11" e	25' 11" e	24' 2"
800S162-43	33	24	36' 8"	34' 10"	30' 5"	25' 11" e	25' 11" e	24' 2"	21' 2" e	21' 2" e	21' 1" e
800S162-54	50	12	59' 5"	47' 2"	41' 2"	47' 2"	37' 5"	32' 8"	40' 5"	32' 8"	28' 7"
800S162-54	50	16	54' 0"	42' 10"	37' 5"	42' 10"	34' 0"	29' 9"	35' 0"	29' 9"	25' 11"
800S162-54	50	24	47' 2"	37' 5"	32' 8"	35' 0"	29' 9"	25' 11"	28' 7"	25' 11"	22' 8"
800S162-68	50	12	64' 3"	51' 0"	44' 6"	51' 0"	40' 5"	35' 4"	44' 6"	35' 4"	30' 10"
800S162-68	50	16	58' 4"	46' 4"	40' 5"	46' 4"	36' 9"	32' 1"	40' 5"	32' 1"	28' 1"
800S162-68	50	24	51' 0"	40' 5"	35' 4"	40' 5"	32' 1"	28' 1"	33' 3"	28' 1"	24' 6"



**Limiting Heights Table  
Exterior Structural (Non-Axial) 15-30**

Section	FY (ksi)	Spacing (in) oc	15 PSF			20 PSF			25 PSF			30 PSF		
			L/240	L/360	L/600	L/240	L/360	L/600	L/240	L/360	L/600	L/240	L/360	L/600
250S162-33	33	12	11' 4"	9' 11"	8' 5"	10' 4"	9' 0"	7' 7"	9' 7"	8' 5"	7' 1"	8' 11"	7' 11"	6' 8"
250S162-33	33	16	10' 4"	9' 0"	7' 7"	9' 5"	8' 2"	6' 11"	8' 5"	7' 7"	6' 5"	7' 8"	7' 2"	6' 0"
250S162-33	33	24	8' 11"	7' 11"	6' 8"	7' 8"	7' 2"	6' 0"	6' 11"	6' 8"	5' 7"	6' 3" e	6' 3" e	5' 3"
250S162-43	33	12	12' 4"	10' 10"	9' 1"	11' 3"	9' 10"	8' 3"	10' 5"	9' 1"	7' 8"	9' 10"	8' 7"	7' 3"
250S162-43	33	16	11' 3"	9' 10"	8' 3"	10' 2"	8' 11"	7' 6"	9' 6"	8' 3"	7' 0"	8' 11"	7' 9"	6' 7"
250S162-43	33	24	9' 10"	8' 7"	7' 3"	8' 11"	7' 9"	6' 7"	8' 3"	7' 3"	6' 1"	7' 7"	6' 10"	5' 9"
250S162-54	50	12	13' 3"	11' 7"	9' 9"	12' 0"	10' 6"	8' 10"	11' 2"	9' 9"	8' 3"	10' 6"	9' 2"	7' 9"
250S162-54	50	16	12' 0"	10' 6"	8' 10"	10' 11"	9' 6"	8' 0"	10' 2"	8' 10"	7' 6"	9' 6"	8' 4"	7' 0"
250S162-54	50	24	10' 6"	9' 2"	7' 9"	9' 6"	8' 4"	7' 0"	8' 10"	7' 9"	6' 6"	8' 4"	7' 3"	6' 2"
250S162-68	50	12	14' 1"	12' 4"	10' 5"	12' 10"	11' 2"	9' 5"	11' 11"	10' 5"	8' 9"	11' 2"	9' 9"	8' 3"
250S162-68	50	16	12' 10"	11' 2"	9' 5"	11' 8"	10' 2"	8' 7"	10' 10"	9' 5"	8' 0"	10' 2"	8' 11"	7' 6"
250S162-68	50	24	11' 2"	9' 9"	8' 3"	10' 2"	8' 11"	7' 6"	9' 5"	8' 3"	7' 0"	8' 11"	7' 9"	6' 7"

362S162-33	33	12	15' 1"	13' 2"	11' 1"	13' 3"	12' 0"	10' 1"	11' 11"	11' 1"	9' 5"	10' 10"	10' 6"	8' 10"
362S162-33	33	16	13' 3"	12' 0"	10' 1"	11' 6"	10' 11"	9' 2"	10' 3" e	10' 1" e	8' 6"	9' 5" e	9' 5" e	8' 0"
362S162-33	33	24	10' 10"	10' 6"	8' 10"	9' 5" e	9' 5" e	8' 0"	8' 5" e	8' 5" e	7' 5" e	7' 8" e	7' 8" e	7' 0" e
362S162-43	33	12	16' 5"	14' 4"	12' 1"	14' 11"	13' 0"	11' 0"	13' 10"	12' 1"	10' 2"	12' 9"	11' 5"	9' 7"
362S162-43	33	16	14' 11"	13' 0"	11' 0"	13' 7"	11' 10"	10' 0"	12' 1"	11' 0"	9' 3"	11' 1"	10' 4"	8' 9"
362S162-43	33	24	12' 9"	11' 5"	9' 7"	11' 1"	10' 4"	8' 9"	9' 11"	9' 7"	8' 1"	9' 0"	9' 0"	7' 7"
362S162-54	50	12	17' 7"	15' 4"	13' 0"	16' 0"	14' 0"	11' 9"	14' 10"	13' 0"	10' 11"	14' 0"	12' 2"	10' 3"
362S162-54	50	16	16' 0"	14' 0"	11' 9"	14' 6"	12' 8"	10' 8"	13' 6"	11' 9"	9' 11"	12' 8"	11' 1"	9' 4"
362S162-54	50	24	14' 0"	12' 2"	10' 3"	12' 8"	11' 1"	9' 4"	11' 9"	10' 3"	8' 8"	11' 1"	9' 8"	8' 2"
362S162-68	50	12	18' 10"	16' 5"	13' 10"	17' 1"	14' 11"	12' 7"	15' 11"	13' 10"	11' 8"	14' 11"	13' 1"	11' 0"
362S162-68	50	16	17' 1"	14' 11"	12' 7"	15' 6"	13' 7"	11' 5"	14' 5"	12' 7"	10' 8"	13' 7"	11' 10"	10' 0"
362S162-68	50	24	14' 11"	13' 1"	11' 0"	13' 7"	11' 10"	10' 0"	12' 7"	11' 0"	9' 3"	11' 10"	10' 4"	8' 9"

400S162-33	33	12	16' 2"	14' 3"	12' 0"	14' 0"	12' 11"	10' 11"	12' 7"	12' 0"	10' 1"	11' 5" e	11' 4" e	9' 6"
400S162-33	33	16	14' 0"	12' 11"	10' 11"	12' 2"	11' 9"	9' 11"	10' 10" e	10' 10" e	9/2"	9' 11" e	9' 11" e	8' 8" e
400S162-33	33	24	11' 5" e	11' 4" e	9' 6"	9' 11" e	9' 11" e	8' 8" e	8' 10" e	8' 10" e	8' 0" e	8' 1" e	8' 1" e	7' 7" e
400S162-43	33	12	17' 9"	15' 6"	13' 1"	16' 1"	14' 1"	11' 10"	14' 10"	13' 1"	11' 0"	13' 6"	12' 3"	10' 4"
400S162-43	33	16	16' 1"	14' 1"	11' 10"	14' 4"	12' 9"	10' 9"	12' 10"	11' 10"	10' 0"	11' 9"	11' 2"	9' 5"
400S162-43	33	24	13' 6"	12' 3"	10' 4"	11' 9"	11' 2"	9' 5"	10"	10' 4"	8' 9"	9' 7" e	9' 7" e	8' 3"
400S162-54	50	12	19' 0"	16' 7"	14' 0"	17' 3"	15' 1"	12' 9"	16' 0"	14' 0"	11' 10"	15' 1"	13' 2"	11' 1"
400S162-54	50	16	17' 3"	15' 1"	12' 9"	15' 8"	13' 8"	11' 7"	14' 7"	12' 9"	10' 9"	13' 8"	12' 0"	10' 1"
400S162-54	50	24	15' 1"	13' 2"	11' 1"	13' 8"	12' 0"	10' 1"	12' 9"	11' 1"	9' 4"	12' 0"	10' 5"	8' 10"
400S162-68	50	12	20' 4"	17' 9"	15' 0"	18' 6"	16' 2"	13' 7"	17' 2"	15' 0"	12' 8"	16' 2"	14' 1"	11' 11"
400S162-68	50	16	18' 6"	16' 2"	13' 7"	16' 9"	14' 8"	12' 4"	15' 7"	13' 7"	11' 6"	14' 8"	12' 10"	10' 10"
400S162-68	50	24	16' 2"	14' 1"	11' 11"	14' 8"	12' 10"	10' 10"	13' 7"	11' 11"	10' 0"	12' 10"	11' 2"	9' 5"

600S162-33	33	12	22' 4" e	19' 6"	16' 6"	19' 6" e	17' 9" e	15' 0"	17' 5" e	16' 6" e	13' 11" e	15' 11" e	15' 6" e	13' 1" e
600S162-33	33	16	19' 6" e	17' 9" e	15' 0"	16' 11" e	16' 2" e	13' 7" e	15' 1" e	15' 0" e	12' 8" e	13' 9" e	13' 9" e	11' 11" e
600S162-33	33	24	15' 11" e	15' 6" e	13' 1" e	13' 9" e	13' 9" e	11' 11" e	12' 4" e	12' 4" e	11' 0" e	11' 3" e	11' 3" e	10' 5" e
600S162-43	33	12	24' 4"	21' 3"	17' 11"	22' 2"	19' 4"	16' 4"	20' 7"	17' 11"	15' 2"	19' 3" e	16' 11"	14' 3"
600S162-43	33	16	22' 2"	19' 4"	16' 4"	20' 1" e	17' 7"	14' 10"	18' 3" e	16' 4" e	13' 9"	16' 8" e	15' 4" e	12' 11"
600S162-43	33	24	19' 3" e	16' 11"	14' 3"	16' 8" e	15' 4" e	12' 11"	14' 11" e	14' 3" e	12' 0" e	13' 7" e	13' 5" e	11' 4" e
600S162-54	50	12	26' 2"	22' 10"	19' 3"	23' 9"	20' 9"	17' 6"	22' 1"	19' 3"	16' 3"	20' 9"	18' 1"	15' 3"
600S162-54	50	16	23' 9"	20' 9"	17' 6"	21' 7"	18' 10"	15' 11"	20' 0"	17' 6"	14' 9"	18' 10"	16' 6"	13' 11"
600S162-54	50	24	20' 9"	18' 1"	15' 3"	18' 10"	16' 6"	13' 11"	17' 6"	15' 3"	12' 11"	16' 6"	14' 5"	12' 2"
600S162-68	50	12	28' 0"	24' 6"	20' 8"	25' 6"	22' 3"	18' 9"	23' 8"	20' 8"	17' 5"	22' 3"	19' 5"	16' 5"
600S162-68	50	16	25' 6"	22' 3"	18' 9"	23' 2"	20' 2"	17' 1"	21' 6"	18' 9"	15' 10"	20' 2"	17' 8"	14' 11"
600S162-68	50	24	22' 3"	19' 5"	16' 5"	20' 2"	17' 8"	14' 11"	18' 9"	16' 5"	13' 10"	17' 8"	15' 5"	13' 0"

800S162-33	33	12	25' 0" e	24' 2" e	20' 4" e	21' 7" e	21' 7" e	18' 6" e	19' 4" e	19' 4" e	17' 2" e	17' 8" e	17' 8" e	16' 2" e
800S162-33	33	16	21' 7" e	21' 7" e	18' 6" e	18' 9" e	18' 9" e	16' 10" e	16' 9" e	16' 9" e	15' 7" e	15' 3" e	15' 3" e	14' 8" e
800S162-33	33	24	17' 8" e	17' 8" e	16' 2" e	15' 3" e	15' 3" e	14' 8" e	13' 8" e	13' 8" e	13' 8" e	12' 6" e	12' 6" e	12' 6" e
800S162-43	33	12	29' 11"	26' 7"	22' 5"	25' 11" e	24' 2"	20' 4"	23' 2" e	22' 5" e	18' 11"	21' 2" e	21' 1" e	17' 9" e
800S162-43	33	16	25' 11" e	24' 2"	20' 4"	22' 5" e	21' 11" e	18' 6"	20' 1" e	20' 1" e	17' 2" e	18' 4" e	18' 4" e	16' 2" e
800S162-43	33	24	21' 2" e	21' 1" e	17' 9" e	18' 4" e	16' 2" e	16' 5" e	16' 5" e	16' 5" e	15' 0" e	16' 5" e	15' 0" e	14' 1" e
800S162-54	50	12	32' 8"	28' 7"	24' 1"	29' 9"	25' 11"	21' 11"	27' 7"	24' 1"	20' 4"	25' 11"	22' 8"	19' 1"
800S162-54	50	16	29' 9"	25' 11"	21' 11"	27' 0"	23' 7"	19' 11"	25' 1"	21' 11"	18' 6"	23' 7"	20' 7"	17' 4"
800S162-54	50	24	25' 11"	22' 8"	19' 1"	23' 7"	20' 7"	17' 4"	21' 11"	19' 1"	16' 2"	20' 3" e	18' 0"	15' 2"
800S162-68	50	12	35' 4"	30' 10"	26' 0"	32' 1"	28' 1"	23' 8"	29' 10"	26' 0"	22' 0"	28' 1"	24' 6"	20' 8"
800S162-68	50	16	32' 1"	28' 1"	23' 8"	29' 2"	25' 6"	21' 6"	27' 1"	23' 8"	19' 11"	25' 6"	22' 3"	18' 9"
800S162-68	50	24	28' 1"	24' 6"	20' 8"	25' 6"	22' 3"	18' 9"	23' 8"	20' 8"	17' 5"	22' 3"	19' 5"	16' 5"



**Limiting Heights Table**  
**Exterior Structural (Non-Axial) 35-50 PSF**

Section	FY (ksi)	Spacing (in) oc	35 PSF			40 PSF			50 PSF		
			L/240	L/360	L/600	L/240	L/360	L/600	L/240	L/360	L/600
250S162-33	33	12	8' 3"	7' 6"	6' 4"	7' 8"	7' 2"	6' 0"	6' 11"	6' 8"	7' 5" e
250S162-33	33	16	7' 1"	6' 10"	5' 9"	6' 8" e	6' 6" e	5' 6"	6' 0" e	6' 0" e	6' 9" e
250S162-33	33	24	5' 10" e	5' 10" e	5' 0" e	5' 5" e	5' 5" e	4' 10" e	4' 10" e	4' 10" e	5' 11" e
250S162-43	33	12	9' 4"	8' 2"	6' 10"	8' 11"	7' 9"	6' 7"	8' 3"	7' 3"	8' 1"
250S162-43	33	16	8' 6"	7' 5"	6' 3"	8' 1"	7' 1"	6' 0"	7' 3"	6' 7"	7' 4"
250S162-43	33	24	7' 1"	6' 5"	5' 5"	6' 7"	6' 2"	5' 3"	5' 11" e	5' 9"	6' 5" e
250S162-54	50	12	10' 0"	8' 8"	7' 4"	9' 6"	8' 4"	7' 0"	8' 10"	7' 9"	8' 8"
250S162-54	50	16	9' 1"	7' 11"	6' 8"	8' 8"	7' 7"	6' 5"	8' 0"	7' 0"	7' 11"
250S162-54	50	24	7' 11"	6' 11"	5' 10"	7' 7"	6' 7"	5' 7"	7' 0"	6' 2"	6' 11"
250S162-68	50	12	10' 8"	9' 4"	7' 10"	10' 2"	8' 11"	7' 6"	9' 5"	8' 3"	9' 3"
250S162-68	50	16	9' 8"	8' 5"	7' 1"	9' 3"	8' 1"	6' 10"	8' 7"	7' 6"	8' 5"
250S162-68	50	24	8' 5"	7' 5"	6' 3"	8' 1"	7' 1"	5' 11"	7' 6"	6' 7"	7' 4"
362S162-33	33	12	10' 0" e	9' 11" e	8' 5"	9' 5" e	9' 5" e	8' 0"	8' 5" e	8' 5" e	7' 5" e
362S162-33	33	16	8' 8" e	8' 8" e	7' 7" e	8' 2" e	8' 2" e	7' 3" e	7' 3" e	7' 3" e	6' 9" e
362S162-33	33	24	7' 1" e	7' 1" e	6' 8" e	6' 8" e	6' 8" e	6' 4" e	5' 11" e	5' 11" e	5' 11" e
362S162-43	33	12	11' 10"	10' 10"	9' 1"	11' 1"	10' 4"	8' 9"	9' 11"	9' 7"	8' 1"
362S162-43	33	16	10' 3"	9' 10"	8' 3"	9' 7"	9' 5"	7' 11"	8' 7" e	8' 7" e	7' 4"
362S162-43	33	24	8' 4" e	8' 4" e	7' 3"	7' 10" e	7' 10" e	6' 11" e	7' 0" e	7' 0" e	6' 5" e
362S162-54	50	12	13' 3"	11' 7"	9' 9"	12' 8"	11' 1"	9' 4"	11' 9"	10' 3"	8' 8"
362S162-54	50	16	12' 1"	10' 6"	8' 11"	11' 6"	10' 1"	8' 6"	10' 8"	9' 4"	7' 11"
362S162-54	50	24	10' 6"	9' 2"	7' 9"	10' 1"	8' 10"	7' 5"	9' 4"	8' 2"	6' 11"
362S162-68	50	12	14' 2"	12' 5"	10' 5"	13' 7"	11' 10"	10' 0"	12' 7"	11' 0"	9' 3"
362S162-68	50	16	12' 11"	11' 3"	9' 6"	12' 4"	10' 9"	9' 1"	11' 5"	10' 0"	8' 5"
362S162-68	50	24	11' 3"	9' 10"	8' 4"	10' 9"	9' 5"	7' 11"	10' 0"	8' 9"	7' 4"
400S162-33	33	12	10' 7" e	10' 7" e	9' 1"	9' 11" e	9' 11" e	8' 8" e	8' 10" e	8' 10" e	8' 0" e
400S162-33	33	16	9' 2" e	9' 2" e	8' 3" e	8' 7" e	8' 7" e	7' 10" e	7' 8" e	7' 8" e	7' 4" e
400S162-33	33	24	7' 6" e	7' 6" e	7' 2" e	7' 0" e	7' 0" e	6' 10" e	6' 3" e	6' 3" e	6' 3" e
400S162-43	33	12	12' 6"	11' 8"	9' 10"	11' 9"	11' 2"	9' 5"	10' 6"	10' 4"	8' 9"
400S162-43	33	16	10' 10"	10' 7"	8' 11"	10' 2"	10' 2"	8' 7"	9' 1" e	9' 1" e	7' 11"
400S162-43	33	24	8' 10" e	8' 10" e	7' 10"	8' 3" e	8' 3" e	7' 6" e	7' 5" e	7' 5" e	6' 11" e
400S162-54	50	12	14' 4"	12' 6"	10' 7"	13' 8"	12' 0"	10' 1"	12' 9"	11' 1"	9' 4"
400S162-54	50	16	13' 0"	11' 4"	9' 7"	12' 5"	10' 10"	9' 2"	11' 7"	10' 1"	8' 6"
400S162-54	50	24	11' 4"	9' 11"	8' 5"	10' 10"	9' 6"	8' 0"	10' 0"	8' 10"	7' 5"
400S162-68	50	12	15' 4"	13' 5"	11' 4"	14' 8"	12' 10"	10' 10"	13' 7"	11' 11"	10' 0"
400S162-68	50	16	13' 11"	12' 2"	10' 3"	13' 4"	11' 8"	9' 10"	12' 4"	10' 10"	9' 1"
400S162-68	50	24	12' 2"	10' 8"	9' 0"	11' 8"	10' 2"	8' 7"	10' 10"	9' 5"	8' 0"
600S162-33	33	12	14' 9" e	14' 9" e	12' 5" e	13' 9" e	13' 9" e	11' 11" e	12' 4" e	12' 4" e	11' 0" e
600S162-33	33	16	12' 9" e	12' 9" e	11' 3" e	11' 11" e	11' 11" e	10' 10" e	10' 8" e	10' 8" e	10' 0" e
600S162-33	33	24	10' 5" e	10' 5" e	9' 10" e	9' 9" e	9' 9" e	9' 5" e	8' 9" e	8' 9" e	8' 9" e
600S162-43	33	12	17' 10" e	16' 1" e	13' 6"	16' 8" e	15' 4" e	12' 11"	14' 11" e	14' 3" e	12' 0" e
600S162-43	33	16	15' 5" e	14' 7" e	12' 4" e	14' 5" e	13' 11" e	11' 9" e	12' 11" e	12' 11" e	10' 11" e
600S162-43	33	24	12' 7" e	12' 7" e	10' 9" e	11' 9" e	11' 9" e	10' 3" e	10' 7" e	10' 7" e	9' 6" e
600S162-54	50	12	19' 8"	17' 3"	14' 6"	18' 10"	16' 6"	13' 11"	17' 6"	15' 3"	12' 11"
600S162-54	50	16	17' 11"	15' 8"	13' 2"	17' 2"	15' 0"	12' 7"	15' 11"	13' 11"	11' 9"
600S162-54	50	24	15' 8"	13' 8"	11' 6"	15' 0"	13' 1"	11' 0"	13' 11" e	12' 2" e	10' 3"
600S162-68	50	12	21' 2"	18' 5"	15' 7"	20' 2"	17' 8"	14' 11"	18' 9"	16' 5"	13' 10"
600S162-68	50	16	19' 2"	16' 9"	14' 2"	18' 4"	16' 0"	13' 6"	17' 1"	14' 11"	12' 7"
600S162-68	50	24	16' 9"	14' 8"	12' 4"	16' 0"	14' 0"	11' 10"	14' 11"	13' 0"	11' 0"
800S162-33	33	12	16' 4" e	16' 4" e	15' 4" e	15' 3" e	15' 3" e	14' 8" e	13' 8" e	13' 8" e	13' 8" e
800S162-33	33	16	14' 2" e	14' 2" e	13' 11" e	13' 3" e	13' 3" e	13' 3" e	11' 10" e	11' 10" e	11' 10" e
800S162-33	33	24	11' 7" e	11' 7" e	11' 7" e	10' 10" e	10' 10" e	10' 10" e	9' 6" e	9' 6" e	9' 6" e
800S162-43	33	12	19' 7" e	19' 7" e	16' 11" e	18' 4" e	18' 4" e	16' 2" e	16' 5" e	16' 5" e	15' 0" e
800S162-43	33	16	17' 0" e	17' 0" e	15' 4" e	15' 10" e	15' 10" e	14' 8" e	14' 2" e	14' 2" e	13' 7" e
800S162-43	33	24	13' 10" e	13' 10" e	13' 5" e	12' 11" e	12' 11" e	12' 10" e	11' 7" e	11' 7" e	11' 7" e
800S162-54	50	12	24' 8"	21' 6"	18' 2"	23' 7"	20' 7"	17' 4"	21' 11"	19' 1"	16' 2"
800S162-54	50	16	22' 5"	19' 7"	16' 6"	21' 5"	18' 9"	15' 9"	19' 2" e	17' 4" e	14' 8"
800S162-54	50	24	18' 9" e	17' 1" e	14' 5"	17' 6" e	16' 4" e	13' 9"	15' 8" e	15' 2" e	12' 10" e
800S162-68	50	12	26' 8"	23' 3"	19' 8"	25' 6"	22' 3"	18' 9"	23' 8"	20' 8"	17' 5"
800S162-68	50	16	24' 3"	21' 2"	17' 10"	23' 2"	20' 3"	17' 1"	21' 6"	18' 9"	15' 10"
800S162-68	50	24	21' 2"	18' 6"	15' 7"	20' 3"	17' 8"	14' 11"	18' 3" e	16' 5" e	13' 10"



# Combined Axial & Lateral Load Tables

## Combined Loading Allowable Axial Load Table Notes

1. Allowable axial loads listed in kips (1 kip = 1,000 pounds)
2. Allowable axial loads determined in accordance with section C5 of the NASPEC, with section D4 used for treatment of punchouts.
3. Listed lateral pressures and axial loads have not been modified for strength checks based on wind/earthquake or multiple transient loads.
4. Allowable axial loads based on bracing  $K_yL_y = K_tL_t = 48$  inches.
5. Superscripts represent exceeded deflection: <sup>1</sup> = L/120 exceeded; <sup>2</sup> = L/240 exceeded; <sup>3</sup> = L/360 exceeded; <sup>6</sup> = L/600 exceeded; <sup>7</sup> = L/720 exceeded.
6. Lateral pressures have been multiplied by 0.7 for deflection checks.
7. Studs are assumed to be adequately braced to develop full allowable moment,  $M_a$ .
8. Check end reactions for web crippling.





**Combined Axial & Bending  
Load Table - 5 PSF**

Wall Height (ft)	Spacing (in) o.c.	362S162			
		33 ksi		50 ksi	
		33	43	54	68
8	12	1.87	2.65	4.15	5.38
	16	1.80	2.57	4.08	5.31
	24	1.65	2.42	3.94	5.17
9	12	1.74	2.48	3.86	4.99
	16	1.64	2.38	3.77	4.90
	24	1.46	2.19	3.60	4.72
10	12	1.58	2.29	3.53	4.55
	16	1.47	2.17	3.42	4.44
	24	1.26	1.95	3.22	4.23
12	12	1.25	1.87	2.79	3.60
	16	1.11	1.72	2.66	3.47
	24	0.86 <sup>7</sup>	1.44	2.42	3.22
14	12	0.93	1.44	2.14	2.78
	16	0.78 <sup>7</sup>	1.28	2.00	2.64
	24	0.52 <sup>6</sup>	0.99 <sup>6</sup>	1.75 <sup>7</sup>	2.38
16	12	0.65 <sup>7</sup>	1.06	1.63	2.14
	16	0.51 <sup>6</sup>	0.9 <sup>6</sup>	1.49 <sup>7</sup>	2.00
	24	0.25 <sup>3</sup>	0.62 <sup>6</sup>	1.25 <sup>6</sup>	1.74 <sup>6</sup>

Wall Height (ft)	Spacing (in) o.c.	400S162			
		33 ksi		50 ksi	
		33	43	54	68
8	12	2.03	2.87	4.62	6.18
	16	1.96	2.80	4.55	6.11
	24	1.82	2.66	4.42	5.97
9	12	1.91	2.72	4.37	5.85
	16	1.82	2.63	4.28	5.76
	24	1.65	2.46	4.11	5.59
10	12	1.77	2.56	4.08	5.47
	16	1.67	2.45	3.97	5.36
	24	1.46	2.23	3.77	5.14
12	12	1.46	2.17	3.41	4.54
	16	1.32	2.02	3.27	4.39
	24	1.06	1.74	3.01	4.12
14	12	1.14	1.75	2.71	3.57
	16	0.98	1.58	2.55	3.41
	24	0.7 <sup>6</sup>	1.26	2.27	3.10
16	12	0.84	1.35	2.12	2.78
	16	0.68 <sup>6</sup>	1.17	1.96	2.61
	24	0.39 <sup>6</sup>	0.85 <sup>6</sup>	1.67 <sup>7</sup>	2.31

Wall Height (ft)	Spacing (in) o.c.	600S162			
		33 ksi		50 ksi	
		33	43	54	68
8	12	2.44	3.41	5.63	7.46
	16	2.40	3.38	5.59	7.42
	24	2.32	3.3	5.52	7.35
9	12	2.41	3.38	5.59	7.42
	16	2.36	3.33	5.55	7.38
	24	2.26	3.24	5.46	7.29
10	12	2.37	3.34	5.56	7.38
	16	2.30	3.28	5.50	7.33
	24	2.18	3.16	5.39	7.21
12	12	2.22	3.19	5.39	7.28
	16	2.13	3.1	5.30	7.19
	24	1.95	2.93	5.13	7.01
14	12	2.03	2.97	5.00	6.81
	16	1.91	2.85	4.88	6.68
	24	1.67	2.61	4.64	6.43
16	12	1.80	2.69	4.49	6.15
	16	1.65	2.54	4.34	5.98
	24	1.36	2.25	4.05	5.66

Wall Height (ft)	Spacing (in) o.c.	800S162			
		33 ksi		50 ksi	
		33	43	54	68
8	12	2.40	3.36	5.44	7.25
	16	2.37	3.33	5.42	7.23
	24	2.31	3.28	5.37	7.18
9	12	2.38	3.34	5.42	7.23
	16	2.34	3.30	5.39	7.2
	24	2.27	3.23	5.32	7.14
10	12	2.35	3.31	5.40	7.21
	16	2.30	3.26	5.35	7.17
	24	2.21	3.17	5.27	7.09
12	12	2.28	3.24	5.33	7.15
	16	2.21	3.18	5.27	7.09
	24	2.08	3.04	5.15	6.96
14	12	2.20	3.16	5.26	7.07
	16	2.10	3.07	5.17	6.98
	24	1.92	2.88	5.00	6.81
16	12	2.10	3.06	5.16	6.96
	16	1.97	2.94	5.04	6.85
	24	1.73	2.69	4.81	6.61



**Combined Axial & Bending Load Table - 15 PSF**

Wall Height (ft)	Spacing (in) o.c.	362S162			
		33 ksi		50 ksi	
		33	43	54	68
8	12	1.44	2.20	3.74	4.96
	16	1.23	1.99	3.55	4.76
	24	0.85	1.59	3.17	4.38
9	12	1.21	1.93	3.35	4.47
	16	0.97	1.68	3.12	4.23
	24	0.53 <sup>6</sup>	1.21	2.68	3.77
10	12	0.97	1.64	2.94	3.94
	16	0.71 <sup>7</sup>	1.36	2.67	3.66
	24	0.23 <sup>6</sup>	0.84 <sup>6</sup>	2.18 <sup>7</sup>	3.15
12	12	0.53 <sup>6</sup>	1.08 <sup>7</sup>	2.10	2.88
	16	0.24 <sup>3</sup>	0.76 <sup>6</sup>	1.81 <sup>6</sup>	2.58 <sup>7</sup>
	24	-	.20 <sup>3</sup>	1.29 <sup>6</sup>	2.03 <sup>6</sup>
14	12	0.18 <sup>3</sup>	.61 <sup>6</sup>	1.42 <sup>6</sup>	2.03 <sup>6</sup>
	16	-	.29 <sup>3</sup>	1.14 <sup>3</sup>	1.73 <sup>6</sup>
	24	-	-	.64 <sup>2</sup>	1.19 <sup>3</sup>
16	12	-	.26 <sup>3</sup>	.93 <sup>3</sup>	1.41 <sup>6</sup>
	16	-	-	.66 <sup>2</sup>	1.12 <sup>3</sup>
	24	-	-	.19 <sup>2</sup>	.62 <sup>2</sup>

Wall Height (ft)	Spacing (in) o.c.	400S162			
		33 ksi		50 ksi	
		33	43	54	68
8	12	1.62	2.45	4.22	5.77
	16	1.42	2.25	4.04	5.57
	24	1.05	1.86	3.67	5.18
9	12	1.40	2.20	3.87	5.33
	16	1.17	1.95	3.64	5.08
	24	0.73 <sup>7</sup>	1.49	3.20	4.61
10	12	1.17	1.93	3.48	4.83
	16	0.9	1.64	3.21	4.54
	24	.41 <sup>6</sup>	1.12 <sup>7</sup>	2.70	3.99
12	12	.72 <sup>7</sup>	1.37	2.65	3.73
	16	.41 <sup>6</sup>	1.03 <sup>6</sup>	2.33 <sup>7</sup>	3.38
	24	-	.43 <sup>6</sup>	1.75 <sup>6</sup>	2.76 <sup>6</sup>
14	12	.33 <sup>6</sup>	.86 <sup>6</sup>	1.89 <sup>6</sup>	2.70
	16	.01 <sup>3</sup>	.50 <sup>6</sup>	1.56 <sup>6</sup>	2.35 <sup>6</sup>
	24	-	-	.98 <sup>3</sup>	1.72 <sup>6</sup>
16	12	.03 <sup>3</sup>	.44 <sup>3</sup>	1.30 <sup>6</sup>	1.92 <sup>6</sup>
	16	-	.09 <sup>3</sup>	.98 <sup>3</sup>	1.58 <sup>6</sup>
	24	-	-	.42 <sup>2</sup>	.98 <sup>3</sup>

Wall Height (ft)	Spacing (in) o.c.	600S162			
		33 ksi		50 ksi	
		33	43	54	68
8	12	2.21	3.19	5.42	7.25
	16	2.10	3.08	5.32	7.15
	24	1.87	2.87	5.12	6.94
9	12	2.11	3.10	5.33	7.15
	16	1.97	2.96	5.20	7.02
	24	1.68	2.68	4.94	6.75
10	12	2.00	2.99	5.22	7.04
	16	1.82	2.81	5.06	6.87
	24	1.47	2.47	4.73	6.53
12	12	1.70	2.68	4.88	6.74
	16	1.45	2.43	4.64	6.48
	24	0.98	1.96	4.17	5.98
14	12	1.34	2.28	4.31	6.06
	16	1.03	1.96	3.99	5.72
	24	.46 <sup>6</sup>	1.37 <sup>7</sup>	3.40	5.06
16	12	.98 <sup>7</sup>	1.84	3.65	5.22
	16	.62 <sup>6</sup>	1.47 <sup>7</sup>	3.27	4.80
	24	-	.80 <sup>6</sup>	2.60 <sup>6</sup>	4.05 <sup>7</sup>

Wall Height (ft)	Spacing (in) o.c.	800S162			
		33 ksi		50 ksi	
		33	43	54	68
8	12	2.23	3.19	5.29	7.10
	16	2.14	3.11	5.21	7.03
	24	1.96	2.94	5.06	6.88
9	12	2.15	3.12	5.23	7.04
	16	2.04	3.01	5.13	6.94
	24	1.82	2.79	4.94	6.75
10	12	2.07	3.04	5.15	6.97
	16	1.93	2.90	5.03	6.85
	24	1.66	2.64	4.79	6.61
12	12	1.87	2.85	4.97	6.79
	16	1.68	2.65	4.79	6.61
	24	1.29	2.26	4.44	6.25
14	12	1.64	2.61	4.75	6.55
	16	1.37	2.34	4.50	6.30
	24	0.86	1.83	4.01	5.81
16	12	1.37	2.33	4.47	6.27
	16	1.03	1.99	4.14	5.93
	24	0.39 <sup>7</sup>	1.34	3.51	5.29



**Combined Axial & Bending Load Table - 20 PSF**

Wall Height (ft)	Spacing (in) o.c.	362S162			
		33 ksi		50 ksi	
		33	43	54	68
8	12	1.23	1.99	3.55	4.76
	16	0.98	1.72	3.30	4.50
	24	.50 <sup>7</sup>	1.21	2.82	4.01
9	12	0.97	1.68	3.12	4.23
	16	.67 <sup>7</sup>	1.36	2.82	3.92
	24	.13 <sup>6</sup>	.78 <sup>6</sup>	2.27 <sup>7</sup>	3.34
10	12	.71 <sup>7</sup>	1.36	2.67	3.66
	16	.38 <sup>6</sup>	1.01 <sup>6</sup>	2.34	3.32
	24	-	.38 <sup>6</sup>	1.74 <sup>6</sup>	2.69 <sup>7</sup>
12	12	.24 <sup>3</sup>	.76 <sup>6</sup>	1.81 <sup>6</sup>	2.58 <sup>7</sup>
	16	-	.38 <sup>3</sup>	1.45 <sup>6</sup>	2.20 <sup>6</sup>
	24	-	-	.84 <sup>3</sup>	1.55 <sup>3</sup>
14	12	-	.29 <sup>3</sup>	1.14 <sup>3</sup>	1.73 <sup>6</sup>
	16	-	-	.79 <sup>3</sup>	1.36 <sup>3</sup>
	24	-	-	.21 <sup>2</sup>	.73 <sup>2</sup>
16	12	-	-	.66 <sup>2</sup>	1.12 <sup>3</sup>
	16	-	-	.34 <sup>2</sup>	.77 <sup>2</sup>
	24	-	-	-	.19 <sup>2</sup>

Wall Height (ft)	Spacing (in) o.c.	400S162			
		33 ksi		50 ksi	
		33	43	54	68
8	12	1.42	2.25	4.04	5.57
	16	1.17	1.99	3.79	5.31
	24	0.70	1.50	3.32	4.81
9	12	0.17	1.95	3.64	5.08
	16	0.87	1.64	3.34	4.76
	24	.33 <sup>6</sup>	1.07 <sup>7</sup>	2.78	4.16
10	12	0.9	1.64	3.21	4.54
	16	.57 <sup>6</sup>	1.29	2.87	4.17
	24	-	.64 <sup>6</sup>	2.24 <sup>7</sup>	3.48
12	12	.41 <sup>6</sup>	1.03 <sup>6</sup>	2.33 <sup>7</sup>	3.38
	16	.04 <sup>3</sup>	.62 <sup>6</sup>	1.94 <sup>6</sup>	2.96 <sup>7</sup>
	24	-	-	1.25 <sup>3</sup>	2.20 <sup>6</sup>
14	12	.01 <sup>3</sup>	.50 <sup>6</sup>	1.56 <sup>6</sup>	2.35 <sup>6</sup>
	16	-	.08 <sup>3</sup>	1.16 <sup>3</sup>	1.92 <sup>6</sup>
	24	-	-	.48 <sup>2</sup>	1.18 <sup>3</sup>
16	12	-	.09 <sup>3</sup>	.98 <sup>3</sup>	1.58 <sup>6</sup>
	16	-	-	.60 <sup>2</sup>	1.17 <sup>3</sup>
	24	-	-	-	.48 <sup>2</sup>

Wall Height (ft)	Spacing (in) o.c.	600S162			
		33 ksi		50 ksi	
		33	43	54	68
8	12	2.10	3.08	5.32	7.15
	16	1.95	2.94	5.19	7.01
	24	1.65	2.66	4.92	6.74
9	12	1.97	2.96	5.20	7.02
	16	1.77	2.77	5.03	6.84
	24	1.40	2.41	4.69	6.49
10	12	1.82	2.81	5.06	6.87
	16	1.58	2.58	4.84	6.64
	24	1.13	2.14	4.41	6.20
12	12	1.45	2.43	4.64	6.48
	16	1.13	2.11	4.32	6.14
	24	.53 <sup>6</sup>	1.51	3.72	5.49
14	12	1.03	1.96	3.99	5.72
	16	.65 <sup>6</sup>	1.56 <sup>7</sup>	3.59	5.28
	24	-	.83 <sup>6</sup>	2.85 <sup>6</sup>	4.46
16	12	.62 <sup>6</sup>	1.47 <sup>7</sup>	3.27	4.80
	16	.19 <sup>6</sup>	1.01 <sup>6</sup>	2.81 <sup>6</sup>	4.29
	24	-	.20 <sup>3</sup>	1.98 <sup>6</sup>	3.36 <sup>6</sup>

Wall Height (ft)	Spacing (in) o.c.	800S162			
		33 ksi		50 ksi	
		33	43	54	68
8	12	2.14	3.11	5.21	7.03
	16	2.02	2.99	5.11	6.93
	24	1.79	2.77	4.91	6.73
9	12	2.04	3.01	5.13	6.94
	16	1.89	2.87	5.00	6.82
	24	1.60	2.58	4.74	6.56
10	12	1.93	2.90	5.03	6.85
	16	1.75	2.72	4.87	6.69
	24	1.39	2.37	4.55	6.37
12	12	1.68	2.65	4.79	6.61
	16	1.41	2.39	4.56	6.37
	24	0.91	1.89	4.09	5.91
14	12	1.37	2.34	4.5	6.30
	16	1.03	2.00	4.17	5.98
	24	.37 <sup>7</sup>	1.33	3.54	5.34
16	12	1.03	1.99	4.14	5.93
	16	.60 <sup>7</sup>	1.55	3.72	5.50
	24	-	.72 <sup>7</sup>	2.91	4.67



**Combined Axial & Bending Load Table - 25 PSF**

Wall Height (ft)	Spacing (in) o.c.	362S162			
		33 ksi		50 ksi	
		33	43	54	68
8	12	1.04	1.78	3.36	4.57
	16	0.73	1.46	3.05	4.25
	24	.16 <sup>6</sup>	.86 <sup>7</sup>	2.48	3.66
9	12	.74 <sup>7</sup>	1.44	2.89	3.99
	16	.39 <sup>6</sup>	1.06 <sup>7</sup>	0.54	3.62
	24	-	.39 <sup>6</sup>	1.89 <sup>6</sup>	2.94 <sup>7</sup>
10	12	.46 <sup>6</sup>	1.09 <sup>7</sup>	2.42	3.40
	16	.08 <sup>6</sup>	.68 <sup>6</sup>	2.03 <sup>6</sup>	2.99
	24	-	-	1.34 <sup>6</sup>	2.26 <sup>6</sup>
12	12	-	.47 <sup>6</sup>	1.54 <sup>6</sup>	2.29 <sup>6</sup>
	16	-	.03 <sup>3</sup>	1.13 <sup>3</sup>	1.86 <sup>6</sup>
	24	-	-	.43 <sup>2</sup>	1.11 <sup>3</sup>
14	12	-	-	.87 <sup>3</sup>	1.45 <sup>3</sup>
	16	-	-	.48 <sup>2</sup>	1.04 <sup>3</sup>
	24	-	-	-	.32 <sup>2</sup>
16	12	-	-	.41 <sup>2</sup>	.86 <sup>2</sup>
	16	-	-	.05 <sup>2</sup>	.47 <sup>2</sup>
	24	-	-	-	-

Wall Height (ft)	Spacing (in) o.c.	400S162			
		33 ksi		50 ksi	
		33	43	54	68
8	12	1.23	2.05	3.85	5.37
	16	0.93	1.74	3.55	5.06
	24	.37 <sup>7</sup>	1.15	2.98	4.45
9	12	0.94	1.72	3.41	4.84
	16	.59 <sup>7</sup>	1.35	3.06	4.45
	24	-	.66 <sup>6</sup>	2.39 <sup>7</sup>	3.73
10	12	.65 <sup>7</sup>	1.38	2.95	4.26
	16	.26 <sup>6</sup>	.96 <sup>7</sup>	2.54	3.82
	24	-	.20 <sup>6</sup>	1.81 <sup>6</sup>	3.01 <sup>7</sup>
12	12	.13 <sup>3</sup>	.72 <sup>6</sup>	2.03 <sup>6</sup>	3.06 <sup>7</sup>
	16	-	.25 <sup>3</sup>	1.58 <sup>6</sup>	2.56 <sup>6</sup>
	24	-	-	.78 <sup>3</sup>	1.70 <sup>3</sup>
14	12	-	.18 <sup>3</sup>	1.26 <sup>6</sup>	2.02 <sup>6</sup>
	16	-	-	.81 <sup>3</sup>	1.54 <sup>3</sup>
	24	-	-	.03 <sup>2</sup>	.70 <sup>2</sup>
16	12	-	-	.68 <sup>3</sup>	1.27 <sup>3</sup>
	16	-	-	.25 <sup>2</sup>	.81 <sup>2</sup>
	24	-	-	-	.02 <sup>2</sup>

Wall Height (ft)	Spacing (in) o.c.	600S162			
		33 ksi		50 ksi	
		33	43	54	68
8	12	1.98	2.98	5.22	7.04
	16	1.80	2.80	5.06	6.87
	24	1.43	2.44	4.73	6.53
9	12	1.82	2.82	5.07	6.88
	16	1.59	2.59	4.86	6.66
	24	1.13	2.15	4.44	6.23
10	12	1.64	2.64	4.89	6.70
	16	1.36	2.36	4.62	6.42
	24	0.81	1.82	4.10	5.87
12	12	1.21	2.19	4.40	6.22
	16	.82 <sup>7</sup>	1.80	4.02	5.81
	24	.11 <sup>6</sup>	1.08 <sup>7</sup>	3.29	5.03
14	12	.74 <sup>6</sup>	1.66	3.69	5.39
	16	.28 <sup>6</sup>	1.19 <sup>6</sup>	3.21 <sup>7</sup>	4.86
	24	-	.32 <sup>6</sup>	2.34 <sup>6</sup>	3.89 <sup>6</sup>
16	12	.29 <sup>6</sup>	1.13 <sup>6</sup>	2.93 <sup>7</sup>	4.41
	16	-	.59 <sup>6</sup>	2.39 <sup>6</sup>	3.81 <sup>6</sup>
	24	-	-	1.42 <sup>3</sup>	2.73 <sup>6</sup>

Wall Height (ft)	Spacing (in) o.c.	800S162			
		33 ksi		50 ksi	
		33	43	54	68
8	12	2.05	3.02	5.14	6.95
	16	1.91	2.88	5.01	6.83
	24	1.62	2.60	4.76	6.58
9	12	1.93	2.90	5.03	6.85
	16	1.50	2.72	4.87	6.69
	24	1.38	2.37	4.55	6.37
10	12	1.79	2.77	4.91	6.73
	16	1.57	2.55	4.71	6.53
	24	1.12	2.11	4.31	6.13
12	12	1.48	2.46	4.62	6.43
	16	1.16	2.14	4.32	6.14
	24	0.54	1.52	3.75	5.56
14	12	1.11	2.08	4.25	6.06
	16	0.69	1.66	3.85	5.65
	24	-	0.85	3.09	4.87
16	12	0.71	1.66	3.82	5.61
	16	.19 <sup>6</sup>	1.13	3.31	5.08
	24	-	.14 <sup>6</sup>	2.34 <sup>7</sup>	4.08



**Combined Axial & Bending Load Table - 30 PSF**

Wall Height (ft)	Spacing (in) o.c.	362S162			
		33 ksi		50 ksi	
		33	43	54	68
8	12	0.85	1.59	3.17	4.38
	16	.50 <sup>7</sup>	1.21	2.82	4.01
	24	-	.52 <sup>6</sup>	2.16 <sup>7</sup>	3.32
9	12	.53 <sup>6</sup>	1.21	2.68	3.77
	16	.13 <sup>6</sup>	.78 <sup>6</sup>	2.27 <sup>7</sup>	3.34
	24	-	.02 <sup>6</sup>	1.54 <sup>6</sup>	2.57 <sup>6</sup>
10	12	.23 <sup>6</sup>	.84 <sup>6</sup>	2.18 <sup>7</sup>	3.15
	16	-	.38 <sup>6</sup>	1.74 <sup>6</sup>	2.69 <sup>7</sup>
	24	-	-	.96 <sup>3</sup>	1.86 <sup>6</sup>
12	12	-	.20 <sup>3</sup>	1.29 <sup>6</sup>	2.03 <sup>6</sup>
	16	-	-	.84 <sup>3</sup>	1.55 <sup>3</sup>
	24	-	-	.05 <sup>2</sup>	.71 <sup>2</sup>
14	12	-	-	.64 <sup>2</sup>	1.19 <sup>3</sup>
	16	-	-	.21 <sup>2</sup>	.73 <sup>2</sup>
	24	-	-	-	-
16	12	-	-	.19 <sup>2</sup>	.62 <sup>2</sup>
	16	-	-	-	.19 <sup>2</sup>
	24	-	-	-	-

Wall Height (ft)	Spacing (in) o.c.	400S162			
		33 ksi		50 ksi	
		33	43	54	68
8	12	1.05	1.86	3.67	5.18
	16	0.7	1.50	3.32	4.81
	24	.05 <sup>6</sup>	.81 <sup>7</sup>	2.66	4.10
9	12	.73 <sup>7</sup>	1.49	3.20	4.61
	16	.33 <sup>6</sup>	1.07 <sup>7</sup>	2.78	4.16
	24	-	.28 <sup>6</sup>	2.02 <sup>6</sup>	3.33 <sup>7</sup>
10	12	.41 <sup>6</sup>	1.12 <sup>7</sup>	2.70	3.99
	16	-	.64 <sup>6</sup>	2.24 <sup>7</sup>	3.48
	24	-	-	1.40 <sup>6</sup>	2.57 <sup>6</sup>
12	12	-	0.43 <sup>6</sup>	1.75 <sup>6</sup>	2.76 <sup>6</sup>
	16	-	-	1.25 <sup>3</sup>	2.20 <sup>6</sup>
	24	-	-	.36 <sup>2</sup>	1.23 <sup>3</sup>
14	12	-	-	.98 <sup>3</sup>	1.72 <sup>6</sup>
	16	-	-	.48 <sup>2</sup>	1.18 <sup>3</sup>
	24	-	-	-	.25 <sup>2</sup>
16	12	-	-	.42 <sup>2</sup>	.98 <sup>3</sup>
	16	-	-	-	.48 <sup>2</sup>
	24	-	-	-	-

Wall Height (ft)	Spacing (in) o.c.	600S162			
		33 ksi		50 ksi	
		33	43	54	68
8	12	1.87	2.87	5.12	6.94
	16	1.65	2.66	4.92	6.74
	24	1.21	2.24	4.53	6.33
9	12	1.68	2.68	4.94	6.75
	16	1.40	2.41	4.69	6.49
	24	0.86	1.89	4.19	5.97
10	12	1.47	2.14	4.73	6.53
	16	1.13	1.51	4.41	6.20
	24	.49 <sup>7</sup>	1.96	3.80	5.56
12	12	0.98	1.51	4.17	5.98
	16	.53 <sup>6</sup>	.67 <sup>6</sup>	3.72	5.49
	24	-	1.37 <sup>7</sup>	2.88 <sup>7</sup>	4.58
14	12	.46 <sup>6</sup>	.83 <sup>6</sup>	3.40	5.06
	16	-	-	2.85 <sup>6</sup>	4.46
	24	-	.80 <sup>6</sup>	1.85 <sup>6</sup>	3.35 <sup>6</sup>
16	12	-	.20 <sup>3</sup>	2.60 <sup>6</sup>	4.05 <sup>7</sup>
	16	-	-	1.98 <sup>6</sup>	3.36 <sup>6</sup>
	24	-	-	.91 <sup>3</sup>	2.15 <sup>3</sup>

Wall Height (ft)	Spacing (in) o.c.	800S162			
		33 ksi		50 ksi	
		33	43	54	68
8	12	1.60	2.94	5.06	6.88
	16	1.79	2.77	4.91	6.73
	24	1.44	2.43	4.61	6.43
9	12	1.82	2.79	4.94	6.75
	16	1.60	2.58	4.74	6.56
	24	1.17	2.16	4.36	6.18
10	12	1.66	2.64	4.79	6.61
	16	1.39	2.37	4.55	6.37
	24	0.86	1.85	4.08	5.90
12	12	1.29	2.26	4.44	6.25
	16	0.91	1.89	4.09	5.91
	24	0.18	1.16	3.41	5.22
14	12	0.86	1.83	4.01	5.81
	16	.37 <sup>7</sup>	1.33	3.54	5.34
	24	-	.38 <sup>7</sup>	2.64	4.42
16	12	.39 <sup>7</sup>	1.34	3.51	5.29
	16	-	.72 <sup>7</sup>	2.91	4.67
	24	-	-	1.80 <sup>6</sup>	3.51 <sup>7</sup>



**Combined Axial & Bending Load Table - 35 PSF**

Wall Height (ft)	Spacing (in) o.c.	362S162			
		33 ksi		50 ksi	
		33	43	54	68
8	12	.67 <sup>7</sup>	1.40	2.99	4.19
	16	.27 <sup>6</sup>	.98 <sup>7</sup>	2.59	3.77
	24	-	.20 <sup>6</sup>	1.85 <sup>6</sup>	2.99 <sup>7</sup>
9	12	.33 <sup>6</sup>	.99 <sup>7</sup>	2.47	3.55
	16	-	.52 <sup>6</sup>	2.02 <sup>6</sup>	3.07 <sup>7</sup>
	24	-	-	1.20 <sup>6</sup>	2.21 <sup>6</sup>
10	12	.01 <sup>3</sup>	.60 <sup>6</sup>	1.96 <sup>6</sup>	2.92 <sup>7</sup>
	16	-	.10 <sup>3</sup>	1.47 <sup>6</sup>	2.40 <sup>6</sup>
	24	-	-	.61 <sup>3</sup>	1.48 <sup>3</sup>
12	12	-	-	1.06 <sup>3</sup>	1.78 <sup>6</sup>
	16	-	-	.56 <sup>3</sup>	1.25 <sup>3</sup>
	24	-	-	-	.34 <sup>2</sup>
14	12	-	-	.41 <sup>2</sup>	.96 <sup>3</sup>
	16	-	-	-	.45 <sup>2</sup>
	24	-	-	-	-
16	12	-	-	-	.39 <sup>2</sup>
	16	-	-	-	-
	24	-	-	-	-

Wall Height (ft)	Spacing (in) o.c.	400S162			
		33 ksi		50 ksi	
		33	43	54	68
8	12	0.87	1.68	3.49	4.99
	16	.47 <sup>7</sup>	1.26	3.09	4.57
	24	-	.49 <sup>6</sup>	2.34 <sup>7</sup>	3.76
9	12	.52 <sup>7</sup>	1.28	2.99	4.38
	16	.07 <sup>6</sup>	.79 <sup>6</sup>	2.52	3.87
	24	-	-	1.66 <sup>6</sup>	2.94 <sup>6</sup>
10	12	.19 <sup>6</sup>	.88 <sup>6</sup>	2.47 <sup>7</sup>	3.73
	16	-	.35 <sup>6</sup>	1.95 <sup>6</sup>	3.17 <sup>7</sup>
	24	-	-	1.02 <sup>3</sup>	2.15 <sup>6</sup>
12	12	-	.16 <sup>3</sup>	1.49 <sup>6</sup>	2.47 <sup>6</sup>
	16	-	-	.93 <sup>3</sup>	1.86 <sup>6</sup>
	24	-	-	-	.79 <sup>3</sup>
14	12	-	-	.17 <sup>2</sup>	1.44 <sup>3</sup>
	16	-	-	-	.85 <sup>2</sup>
	24	-	-	.18 <sup>2</sup>	-
16	12	-	-	-	.72 <sup>2</sup>
	16	-	-	-	.17 <sup>2</sup>
	24	-	-	-	-

Wall Height (ft)	Spacing (in) o.c.	600S162			
		33 ksi		50 ksi	
		33	43	54	68
8	12	1.76	2.76	5.02	6.84
	16	1.50	2.51	4.79	6.60
	24	1.00	2.03	4.34	6.13
9	12	1.54	2.55	4.81	6.62
	16	1.22	2.24	4.52	6.31
	24	0.60	1.63	3.94	5.72
10	12	1.30	2.31	4.57	6.36
	16	0.91	1.93	4.21	5.98
	24	.18 <sup>6</sup>	1.20	3.50	5.24
12	12	.75 <sup>7</sup>	1.73	3.94	5.73
	16	.25 <sup>6</sup>	1.22 <sup>7</sup>	3.43	5.18
	24	-	.28 <sup>6</sup>	2.48 <sup>6</sup>	4.15 <sup>7</sup>
14	12	.20 <sup>6</sup>	1.10 <sup>6</sup>	3.12 <sup>7</sup>	4.76
	16	-	.49 <sup>6</sup>	2.50 <sup>6</sup>	4.07 <sup>7</sup>
	24	-	-	1.39 <sup>3</sup>	2.84 <sup>6</sup>
16	12	-	.49 <sup>6</sup>	2.28 <sup>6</sup>	3.70 <sup>6</sup>
	16	-	-	1.61 <sup>3</sup>	2.94 <sup>6</sup>
	24	-	-	.41 <sup>2</sup>	1.61 <sup>3</sup>

Wall Height (ft)	Spacing (in) o.c.	800S162			
		33 ksi		50 ksi	
		33	43	54	68
8	12	1.88	2.85	4.99	6.81
	16	1.67	2.65	4.81	6.63
	24	1.27	2.26	4.46	6.29
9	12	1.71	2.69	4.84	6.66
	16	1.45	2.44	4.62	6.44
	24	0.95	1.95	4.17	6.00
10	12	1.52	2.5	4.67	6.49
	16	1.21	2.20	4.39	6.21
	24	0.60	1.59	3.84	5.67
12	12	1.09	2.07	4.27	6.08
	16	0.66	1.64	3.60	5.68
	24	-	0.80	3.08	4.89
14	12	0.61	1.58	3.78	5.57
	16	.0 <sup>6</sup>	1.01	3.24	5.03
	24	-	-	2.21 <sup>7</sup>	3.97
16	12	.09 <sup>6</sup>	1.02 <sup>7</sup>	3.21	4.97
	16	-	.33 <sup>6</sup>	2.53 <sup>7</sup>	4.27
	24	-	-	1.27 <sup>6</sup>	2.96 <sup>6</sup>



**Combined Axial & Bending Load Table - 40 PSF**

Wall Height (ft)	Spacing (in) o.c.	362S162			
		33 ksi		50 ksi	
		33	43	54	68
8	12	.50 <sup>7</sup>	1.21	2.82	4.01
	16	.06 <sup>6</sup>	.75 <sup>6</sup>	2.37 <sup>7</sup>	3.54
	24	-	-	1.56 <sup>6</sup>	2.68 <sup>6</sup>
9	12	.13 <sup>6</sup>	.78 <sup>6</sup>	2.27 <sup>7</sup>	3.34
	16	-	.26 <sup>6</sup>	1.77 <sup>6</sup>	2.82 <sup>7</sup>
	24	-	-	.87 <sup>3</sup>	1.86 <sup>6</sup>
10	12	-	.38 <sup>6</sup>	1.74 <sup>6</sup>	2.69 <sup>7</sup>
	16	-	-	1.21 <sup>6</sup>	2.12 <sup>6</sup>
	24	-	-	.27 <sup>3</sup>	1.12 <sup>3</sup>
12	12	-	-	.84 <sup>3</sup>	1.55 <sup>3</sup>
	16	-	-	.30 <sup>2</sup>	.97 <sup>3</sup>
	24	-	-	-	-
14	12	-	-	.21 <sup>2</sup>	.73 <sup>2</sup>
	16	-	-	-	.19 <sup>2</sup>
	24	-	-	-	-
16	12	-	-	-	.19 <sup>2</sup>
	16	-	-	-	-
	24	-	-	-	-

Wall Height (ft)	Spacing (in) o.c.	400S162			
		33 ksi		50 ksi	
		33	43	54	68
8	12	0.70	1.50	3.32	4.81
	16	.26 <sup>6</sup>	1.30	2.87	4.33
	24	-	.18 <sup>6</sup>	2.04 <sup>7</sup>	3.44
9	12	.33 <sup>6</sup>	1.07 <sup>7</sup>	2.78	4.16
	16	-	.53 <sup>6</sup>	2.26 <sup>7</sup>	3.6
	24	-	-	1.32 <sup>6</sup>	2.57 <sup>6</sup>
10	12	-	.64 <sup>6</sup>	2.24 <sup>7</sup>	3.48
	16	-	.06 <sup>6</sup>	1.67 <sup>6</sup>	2.86 <sup>6</sup>
	24	-	-	.66 <sup>3</sup>	1.75 <sup>6</sup>
12	12	-	-	1.25 <sup>3</sup>	2.20 <sup>6</sup>
	16	-	-	.64 <sup>3</sup>	1.53 <sup>3</sup>
	24	-	-	-	.38 <sup>2</sup>
14	12	-	-	.48 <sup>2</sup>	1.18 <sup>3</sup>
	16	-	-	-	.55 <sup>2</sup>
	24	-	-	-	-
16	12	-	-	-	.48 <sup>2</sup>
	16	-	-	-	-
	24	-	-	-	-

Wall Height (ft)	Spacing (in) o.c.	600S162			
		33 ksi		50 ksi	
		33	43	54	68
8	12	1.65	2.66	4.92	6.74
	16	1.36	2.37	4.66	6.47
	24	0.90	1.82	4.15	5.93
9	12	1.40	2.41	4.69	6.49
	16	1.04	2.06	4.35	6.14
	24	.35 <sup>7</sup>	1.38	3.70	5.46
10	12	1.13	2.14	4.41	6.20
	16	0.70	1.71	4.00	5.77
	24	-	.90 <sup>7</sup>	3.21	4.94
12	12	.53 <sup>6</sup>	1.51	3.72	5.49
	16	-	.94 <sup>6</sup>	3.15 <sup>7</sup>	4.88
	24	-	-	2.10 <sup>6</sup>	3.73 <sup>6</sup>
14	12	-	.83 <sup>6</sup>	2.85 <sup>6</sup>	4.46
	16	-	.16 <sup>3</sup>	2.17 <sup>6</sup>	3.71 <sup>6</sup>
	24	-	-	.95 <sup>3</sup>	2.35 <sup>6</sup>
16	12	-	.20 <sup>3</sup>	1.98 <sup>6</sup>	3.36 <sup>6</sup>
	16	-	-	1.25 <sup>3</sup>	2.54 <sup>6</sup>
	24	-	-	-	1.09 <sup>3</sup>

Wall Height (ft)	Spacing (in) o.c.	800S162			
		33 ksi		50 ksi	
		33	43	54	68
8	12	1.79	2.77	4.91	6.73
	16	1.56	2.54	4.71	6.53
	24	1.10	2.10	4.31	6.14
9	12	1.60	2.58	4.74	6.56
	16	1.31	2.30	4.49	6.31
	24	0.74	1.74	3.98	5.81
10	12	1.39	2.37	4.55	6.37
	16	1.03	2.02	4.23	6.05
	24	0.34	1.34	3.61	5.43
12	12	0.91	1.89	4.09	5.91
	16	0.41	1.40	3.64	5.45
	24	-	0.45	2.76	4.56
14	12	.37 <sup>7</sup>	1.33	3.54	5.34
	16	-	.69 <sup>7</sup>	2.94	4.72
	24	-	-	1.79 <sup>6</sup>	3.54
16	12	-	.72 <sup>7</sup>	2.91	4.67
	16	-	-	2.16 <sup>6</sup>	3.88
	24	-	-	.77 <sup>6</sup>	2.43 <sup>6</sup>



**Combined Axial & Bending Load Table - 50 PSF**

Wall Height (ft)	Spacing (in) o.c.	362S162			
		33 ksi		50 ksi	
		33	43	54	68
8	12	.16 <sup>6</sup>	.86 <sup>7</sup>	2.48	3.66
	16	-	.31 <sup>6</sup>	1.96 <sup>6</sup>	3.10 <sup>7</sup>
	24	-	-	.99 <sup>6</sup>	2.08 <sup>6</sup>
9	12	-	.39 <sup>6</sup>	1.89 <sup>6</sup>	2.94 <sup>7</sup>
	16	-	-	1.31 <sup>6</sup>	2.32 <sup>6</sup>
	24	-	-	.27 <sup>3</sup>	1.21 <sup>3</sup>
10	12	-	-	1.34 <sup>6</sup>	2.26 <sup>6</sup>
	16	-	-	.72 <sup>3</sup>	1.61 <sup>6</sup>
	24	-	-	-	.45 <sup>3</sup>
12	12	-	-	.43 <sup>2</sup>	1.11 <sup>3</sup>
	16	-	-	-	.46 <sup>2</sup>
	24	-	-	-	-
14	12	-	-	-	.32 <sup>2</sup>
	16	-	-	-	-
	24	-	-	-	-
16	12	-	-	-	-
	16	-	-	-	-
	24	-	-	-	-

Wall Height (ft)	Spacing (in) o.c.	400S162			
		33 ksi		50 ksi	
		33	43	54	68
8	12	.37 <sup>7</sup>	1.15	2.98	4.45
	16	-	.59 <sup>6</sup>	2.45	3.87
	24	-	-	1.46 <sup>6</sup>	2.81 <sup>6</sup>
9	12	-	.66 <sup>6</sup>	2.39 <sup>7</sup>	3.73
	16	-	.04 <sup>6</sup>	1.78 <sup>6</sup>	3.07 <sup>7</sup>
	24	-	-	.68 <sup>3</sup>	1.87 <sup>6</sup>
10	12	-	.20 <sup>6</sup>	1.81 <sup>6</sup>	3.01 <sup>7</sup>
	16	-	-	1.14 <sup>6</sup>	2.29 <sup>6</sup>
	24	-	-	-	1.00 <sup>3</sup>
12	12	-	-	.78 <sup>3</sup>	1.70 <sup>3</sup>
	16	-	-	.09 <sup>2</sup>	.94 <sup>3</sup>
	24	-	-	-	-
14	12	-	-	.03 <sup>2</sup>	.70 <sup>2</sup>
	16	-	-	-	-
	24	-	-	-	-
16	12	-	-	-	.02 <sup>2</sup>
	16	-	-	-	-
	24	-	-	-	-

Wall Height (ft)	Spacing (in) o.c.	600S162			
		33 ksi		50 ksi	
		33	43	54	68
8	12	1.43	2.44	4.73	6.53
	16	1.07	2.10	4.40	6.20
	24	0.38	1.42	3.77	5.54
9	12	1.13	2.15	4.44	6.23
	16	0.69	1.72	4.03	5.80
	24	-	.88 <sup>7</sup>	3.23	4.97
10	12	0.81	1.82	4.10	5.87
	16	.28 <sup>7</sup>	1.30	3.60	5.35
	24	-	.32 <sup>6</sup>	2.64 <sup>7</sup>	4.33
12	12	.11 <sup>6</sup>	1.08 <sup>7</sup>	3.29	5.03
	16	-	.41 <sup>6</sup>	2.61 <sup>6</sup>	4.29 <sup>7</sup>
	24	-	-	1.37 <sup>6</sup>	2.93 <sup>6</sup>
14	12	-	.32 <sup>6</sup>	2.34 <sup>6</sup>	3.89 <sup>6</sup>
	16	-	-	1.54 <sup>3</sup>	3.01 <sup>6</sup>
	24	-	-	.13 <sup>2</sup>	1.43 <sup>3</sup>
16	12	-	-	1.42 <sup>3</sup>	2.73 <sup>6</sup>
	16	-	-	.57 <sup>2</sup>	1.79 <sup>3</sup>
	24	-	-	-	.13 <sup>2</sup>

Wall Height (ft)	Spacing (in) o.c.	800S162			
		33 ksi		50 ksi	
		33	43	54	68
8	12	1.62	2.60	4.76	6.58
	16	1.33	2.32	4.51	6.34
	24	0.77	1.77	4.02	5.85
9	12	1.38	2.37	4.55	6.37
	16	1.02	2.02	4.24	6.06
	24	0.32	1.32	3.61	5.44
10	12	1.12	2.11	4.31	6.13
	16	0.68	1.68	3.92	5.74
	24	-	0.84	3.15	4.97
12	12	0.54	1.52	3.75	5.56
	16	-	0.92	3.19	5.00
	24	-	-	2.12	3.91
14	12	-	0.85	3.09	4.87
	16	-	.08 <sup>6</sup>	2.35 <sup>7</sup>	4.12
	24	-	-	.97 <sup>6</sup>	2.69 <sup>6</sup>
16	12	-	.14 <sup>6</sup>	2.34 <sup>7</sup>	4.08
	16	-	-	1.45 <sup>6</sup>	3.14 <sup>6</sup>
	24	-	-	-	1.41 <sup>6</sup>





# Floor Joist Span Tables

## Allowable Floor Joist Span Tables Notes

1. Spans are based on continuous support of each flange over the full length of the joist.
2. For two, equal spans listed span is the distance from either end to the center support, with the joist continuous over the center support.
3. Joists must be braced against rotation at all supports.
4. End shear and web crippling capacity have not been reduced for punchouts.
5. Web crippling check based on 3.5" end and interior bearing. Where listed allowable spans are followed by "e", web stiffeners are required at ends, "I" web stiffeners required at interior support, and "a" web stiffeners are required at all supports.
6. Total load deflection limited to  $L/240$ . Live load deflection limit as noted.
7. Alternate span live loading has been considered for two, equal span condition.

### **Bridging Recommendations**

Floor Joist bridging may be spaced as indicated below, except where member design requires an alternate spacing.

Span (ft)	Minimum Number of Rows
up to 14	1 rows at mid-span
14 to 20	2 rows at 1/3 point
20 to 26	3 rows at 1/4 point



## Floor Joist Table

### 10 PSF Dead Load & 20 PSF Live Load

Section	Fy (ksi)	L/360 Live Load Deflection						L/480 Live Load Deflection					
		Single Span			Double Span			Single Span			Double Span		
		Spacing (in) on center			Spacing (in) on center			Spacing (in) on center			Spacing (in) on center		
		12	16	24	12	16	24	12	16	24	12	16	24
600S162-33	33	15' 9"	13' 9" e	11' 3" e	15' 11" i	13' 9" i	11' 3" a	14' 4"	13' 0" e	11' 3" e	15' 11" i	13' 9" i	11' 3" a
600S162-43	33	17' 2"	15' 7"	13' 7" e	19' 3" i	16' 8" i	13' 7" i	15' 7"	14' 2"	12' 5"	17' 6" i	15' 11" i	13' 7" i
600S162-54	50	18' 5"	16' 9"	14' 7"	20' 8"	18' 9"	16' 5" i	16' 9"	15' 2"	13' 3"	18' 9"	17' 1"	14' 11"
600S162-68	50	19' 9"	17' 11"	15' 8"	22' 2"	20' 2"	17' 7"	17' 11"	16' 4"	14' 3"	20' 2"	18' 4"	16' 0"
800S162-33	33	17' 8" e	15' 3" e	12' 6" e	17' 8" a	14' 6" a	10' 9" a	17' 8" e	15' 3" e	12' 6" e	17' 8" a	14' 6" a	10' 9" a
800S162-43	33	21' 2"	18' 4"	15' 0" e	21' 2" i	18' 4" i	15' 0" i	19' 6"	17' 8"	15' 0" e	21' 2" i	18' 4" i	15' 0" i
800S162-54	50	23' 1"	20' 11"	18' 3"	25' 10" i	23' 6" i	20' 3" i	20' 11"	19' 0"	16' "	23' 6"	21' 4" i	18' 8" i
800S162-68	50	24' 11"	22' 8"	19' 9"	28' 0"	25' 5"	22' 2" i	22' 8"	20' 7"	18' 0"	25' 5"	23' 1"	20' 2"
1000S162-43	33	23' 11" e	20' 9" e	16' 11" e	23' 11" a	20' 9" a	16' 5" a	23' 1" e	20' 9" e	16' 11" e	23' 11" a	20' 9" a	16' 5" a
1000S162-54	50	27' 5"	24' 10"	21' 9"	30' 9" i	27' 11" i	22' 10" i	24' 10"	22' 7"	19' 9"	27' 11" i	25' 4" i	22' 2" i
1000S162-68	50	29' 8"	27' 0"	23' 7"	33' 4"	30' 3" i	26' 6" i	27' 0"	24' 6"	21' 5"	30' 3"	27' 6"	24' 0" i

### 10 PSF Dead Load & 30 PSF Live Load

Section	Fy (ksi)	L/360 Live Load Deflection						L/480 Live Load Deflection					
		Single Span			Double Span			Single Span			Double Span		
		Spacing (in) on center			Spacing (in) on center			Spacing (in) on center			Spacing (in) on center		
		12	16	24	12	16	24	12	16	24	12	16	24
600S162-33	33	13' 9" e	11' 11" e	9' 9" e	13' 9" i	11' 11" i	9' 5" a	12' 6" e	11' 4" e	9' 9" e	13' 9" i	11' 11" i	9' 5" a
600S162-43	33	15' 0"	13' 8"	11' 9" e	16' 8" i	14' 5" i	11' 9" i	13' 8"	12' 5"	10' 10" e	15' 4" i	13' 11" i	11' 9" i
600S162-54	50	16' 1"	14' 7"	12' 9"	18' 1"	16' 5"	14' 4" i	14' 7"	13' 3"	11' 7"	16' 5"	14' 11"	13' 0" i
600S162-68	50	17' 3"	15' 8"	13' 8"	19' 4"	17' 7"	15' 4"	15' 8"	14' 3"	12' 5"	17' 7"	16' 0"	14' 0"
800S162-33	33	15' 3" e	13' 3" e	10' 10" e	14' 6" a	11' 9" a	8' 8" a	15' 3" e	13' 3" e	10' 10" e	14' 6" a	11' 9" a	8' 8" a
800S162-43	33	18' 4"	15' 10" e	12' 11" e	18' 4" i	15' 10" i	12' 11" a	17' 0"	15' 5" e	12' 11" e	18' 4" i	15' 10" i	12' 11" a
800S162-54	50	20' 2"	18' 3"	16' 0"	22' 7" i	20' 6" i	17' 6" i	18' 3"	16' 7"	14' 6"	20' 6"	18' 8" i	16' 4" i
800S162-68	50	21' 9"	19' 9"	17' 3"	24' 5"	22' 2"	19' 5" i	19' 9"	18' 0"	15' 8"	22' 2"	20' 2"	17' 7" i
1000S162-43	33	20' 9" e	17' 11" e	14' 8" e	20' 9" a	17' 10" a	13' 4" a	20' 2" e	17' 11" e	14' 8" e	20' 9" a	17' 10" a	13' 4" a
1000S162-54	50	23' 11"	21' 9"	19' 0"	26' 10" i	24' 3" i	19' 10" i	21' 9"	19' 9"	17' 3"	24' 5" i	22' 2" i	19' 4" i
1000S162-68	50	25' 11"	23' 7"	20' 7"	29' 1"	26' 6" i	23' 1" i	23' 7"	21' 5"	18' 8"	26' 6"	24' 0"	21' 0" i

"e" : web stiffeners are required at ends.  
 "i" : web stiffeners are required at interior support  
 "a" : web stiffener are required at all supports.



## Floor Joist Table

### 10 PSF Dead Load & 40 PSF Live Load

Section	Fy (ksi)	L/360 Live Load Deflection						L/480 Live Load Deflection					
		Single Span			Double Span			Single Span			Double Span		
		Spacing (in) on center			Spacing (in) on center			Spacing (in) on center			Spacing (in) on center		
		12	16	24	12	16	24	12	16	24	12	16	24
600S162-33	33	12' 4" e	10' 8" e	8' 9" e	12' 4" i	10' 8" a	8' 1" a	11' 4" e	10' 4" e	8' 9" e	12' 4" i	10' 8" a	8' 1" a
600S162-43	33	13' 8"	12' 5" e	10' 7" e	14' 11" i	12' 11" i	10' 7" i	12' 5"	11' 3"	9' 10" e	13' 11" i	12' 8" i	10' 7" i
600S162-54	50	14' 7"	13' 3"	11' 7"	16' 5"	14' 11" i	13' 0" i	13' 3"	12' 1"	10' 7"	14' 11"	13' 7"	11' 10" i
600S162-68	50	15' 8"	14' 3"	12' 5"	17' 7"	16' 0"	14' 0" i	14' 3"	12' 11"	11' 4"	16' 0"	14' 6"	12' 8"
800S162-33	33	13' 8" e	11' 10" e	9' 6" e	12' 4" a	10' 0" a	7' 3" a	13' 8" e	11' 10" e	9' 6" e	12' 4" a	10' 0" a	7' 3" a
800S162-43	33	16' 5" e	14' 2" e	11' 7" e	16' 5" i	14' 2" i	11' 7" a	15' 5" e	14' 0" e	11' 7" e	16' 5" i	14' 2" i	11' 7" a
800S162-54	50	18' 3"	16' 7"	14' 6"	20' 6" i	18' 8" i	15' 8" i	16' 7"	15' 1"	13' 2"	18' 8" i	16' 11" i	14' 10" i
800S162-68	50	19' 9"	18' 0"	15' 8"	22' 2"	20' 2" i	17' 7" i	18' 0"	16' 4"	14' 3"	20' 2"	18' 4"	16' 0" i
1000S162-43	33	18' 6" e	16' 1" e	13' 1" e	18' 6" a	15' 3" a	11' 4" a	18' 4" e	16' 1" e	13' 1" e	18' 6" a	15' 3" a	11' 4" a
1000S162-54	50	21' 9"	19' 9"	17' 3" e	24' 5" i	21' 8" i	17' 9" i	19' 9"	17' 11"	15' 8"	22' 2" i	20' 2" i	17' 7" i
1000S162-68	50	23' 7"	21' 5"	18' 8"	26' 6" i	24' 0" i	20' 9" i	21' 5"	19' 5"	17' 0"	24' 0"	21' 10" i	19' 1" i

### 10 PSF Dead Load & 50 PSF Live Load

Section	Fy (ksi)	L/360 Live Load Deflection						L/480 Live Load Deflection					
		Single Span			Double Span			Single Span			Double Span		
		Spacing (in) on center			Spacing (in) on center			Spacing (in) on center			Spacing (in) on center		
		12	16	24	12	16	24	12	16	24	12	16	24
600S162-33	33	11' 3" e	9' 9" e	8' 0" e	11' 3" a	9' 5" a	7' 1" a	10' 7" e	9' 7" e	8' 0" e	11' 3" a	9' 5" a	7' 1" a
600S162-43	33	12' 8"	11' 6" e	9' 8" e	13' 7" i	11' 9" i	9' 8" a	11' 6"	10' 5" e	9' 1" e	12' 11" i	11' 9" i	9' 8" a
600S162-54	50	13' 7"	12' 4"	10' 9"	15' 3"	13' 10" i	12' 1" i	12' 4"	11' 2"	9' 9"	13' 10"	12' 7" i	11' 0" i
600S162-68	50	14' 7"	13' 3"	11' 7"	16' 4"	14' 10"	13' 0" i	13' 3"	12' 0"	10' 6"	14' 10"	13' 6"	11' 9" i
800S162-33	33	12' 6" e	10' 10" e	7' 11" e	10' 9" a	8' 8" a	6' 3" a	12' 6" e	10' 10" e	7' 11" e	10' 9" a	8' 8" a	6' 3" a
800S162-43	33	15' 0" e	12' 11" e	10' 7" e	15' 0" i	12' 11" a	10' 3" a	14' 4" e	12' 11" e	10' 7" e	15' 0" i	12' 11" a	10' 3" a
800S162-54	50	17' 0"	15' 5"	13' 6"	19' 1" i	17' 4" i	14' 4" i	15' 5"	14' 0"	12' 3"	17' 4" i	15' 9" i	13' 9" i
800S162-68	50	18' 4"	16' 8"	14' 7"	20' 7"	18' 9" i	16' 4" i	16' 8"	15' 2"	13' 3"	18' 9"	17' 0"	14' 10" i
1000S162-43	33	16' 11" e	14' 8" e	11' 11" e	16' 5" a	13' 4" a	9' 11" a	16' 11" e	14' 8" e	11' 11" e	16' 5" a	13' 4" a	9' 11" a
1000S162-54	50	20' 2"	18' 4"	16' 0" e	22' 8" i	19' 10" i	15' 11" i	18' 4"	16' 8"	14' 7" e	20' 7" i	18' 8" i	15' 11" i
1000S162-68	50	21' 11"	19' 11"	17' 4"	24' 7" i	22' 4" i	18' 11" i	19' 11"	18' 1"	15' 9"	22' 4"	20' 3" i	17' 9" i

"e" : web stiffeners are required at ends.  
 "i" : web stiffeners are required at interior support  
 "a" : web stiffener are required at all supports.



## Floor Joist Table

### 15 PSF Dead Load & 125 PSF Live Load

Section	Fy (ksi)	L/360 Live Load Deflection						L/480 Live Load Deflection					
		Single Span			Double Span			Single Span			Double Span		
		Spacing (in) on center						Spacing (in) on center					
		12	16	24	12	16	24	12	16	24	12	16	24
600S162-33	33	7' 4" e	6' 5" e	4' 7" e	6' 3" a	5' 1" a	3' 8" a	7' 4" e	6' 5" e	4' 7" e	6' 3" a	5' 1" a	3' 8" a
600S162-43	33	8' 11" e	7' 9" e	6' 4" e	8' 11" a	7' 9" a	6' 1" a	8' 6" e	7' 8" e	6' 4" e	8' 11" a	7' 9" a	6' 1" a
600S162-54	50	10' 0" e	9' 1" e	7' 11" e	11' 3" i	10' 2" i	8' 6" i	9' 1" e	8' 3" e	7' 3" e	10' 2" i	9' 3" i	8' 1" i
600S162-68	50	10' 9" e	9' 9" e	8' 6" e	12' 0" i	10' 11" i	9' 7" i	9' 9" e	8' 10" e	7' 9" e	10' 11" i	9' 11" i	8' 8" i
800S162-33	33	6' 9" e	5' 1" e	3' 5" e	5' 5" a	4' 1" a	2' 9" a	6' 9" e	5' 1" e	3' 5" e	5' 5" a	4' 1" a	2' 9" a
800S162-43	33	9' 10" e	8' 6" e	6' 11" e	9' 3" a	7' 6" a	5' 6" a	9' 10" e	8' 6" e	6' 11" e	9' 3" a	7' 6" a	5' 6" a
800S162-54	50	12' 6" e	11' 4" e	9' 4" e	13' 3" i	11' 6" i	9' 0" a	11' 4" e	10' 4" e	9' 0" e	12' 9" i	11' 6" i	9' 0" a
800S162-68	50	13' 6" e	12' 3" e	10' 9" e	15' 2" i	13' 4" i	10' 11" i	12' 3" e	11' 2" e	9' 9" e	13' 10" i	12' 6" i	10' 11" i
1000S162-43	33	11' 1" e	8' 11" e	6' 0" e	8' 10" a	7' 0" a	4' 9" a	11' 1" e	8' 11" e	6' 0" e	8' 10" a	7' 0" a	4' 9" a
1000S162-54	50	14' 10" e	13' 0" e	10' 7" e	14' 4" i	11' 8" i	8' 7" a	13' 6" e	12' 3" e	10' 7" e	14' 4" i	11' 8" i	8' 7" a
1000S162-68	50	16' 1" e	14' 8" e	12' 5" e	17' 6" i	15' 2" i	12' 5" a	14' 8" e	13' 4" e	11' 7" e	16' 5" i	14' 11" i	12' 5" a

### 40 PSF Dead Load & 125 PSF Live Load

Section	Fy (ksi)	L/360 Live Load Deflection						L/480 Live Load Deflection					
		Single Span			Double Span			Single Span			Double Span		
		Spacing (in) on center						Spacing (in) on center					
		12	16	24	12	16	24	12	16	24	12	16	24
600S162-33	33	6' 9" e	5' 10" e	3' 10" e	5' 7" a	4' 5" a	3' 1" a	6' 9" e	5' 10" e	3' 10" e	5' 7" a	4' 5" a	3' 1" a
600S162-43	33	8' 3" e	7' 1" e	5' 10" e	8' 3" a	7' 1" a	5' 5" a	8' 3" e	7' 1" e	5' 10" e	8' 3" a	7' 1" a	5' 5" a
600S162-54	50	10' 0" e	9' 1" e	7' 10" e	11' 1" i	9' 7" i	7' 10" a	9' 1" e	8' 3" e	7' 3" e	10' 2" i	9' 3" i	7' 10" a
600S162-68	50	10' 9" e	9' 9" e	8' 6" e	12' 0" i	10' 11" i	8' 11" i	9' 9" e	8' 10" e	7' 9" e	10' 11" i	9' 11" i	8' 8" i
800S162-33	33	5' 9" e	4' 4" e	2' 10" e	4' 7" a	3' 5" a	2' 4" a	5' 9" e	4' 4" e	2' 10" e	4' 7" a	3' 5" a	2' 4" a
800S162-43	33	9' 0" e	7' 10" e	6' 4" e	8' 2" a	6' 8" a	4' 10" a	9' 0" e	7' 10" e	6' 4" e	8' 2" a	6' 8" a	4' 10" a
800S162-54	50	12' 2" e	10' 7" e	8' 7" e	12' 2" i	10' 7" i	8' 0" a	11' 4" e	10' 4" e	8' 7" e	12' 2" i	10' 7" i	8' 0" a
800S162-68	50	13' 6" e	12' 3" e	10' 0" e	14' 2" i	12' 3" i	10' 0" i	12' 3" e	11' 2" e	9' 9" e	13' 10" i	12' 3" i	10' 0" i
1000S162-43	33	10' 2" e	7' 7" e	5' 1" e	7' 9" a	6' 1" a	4' 1" a	10' 2" e	7' 7" e	5' 1" e	7' 9" a	6' 1" a	4' 1" a
1000S162-54	50	13' 9" e	11' 11" e	9' 9" e	12' 9" i	10' 4" a	7' 7" a	13' 6" e	11' 11" e	9' 9" e	12' 9" i	10' 4" a	7' 7" a
1000S162-68	50	16' 1" e	14' 0" e	11' 5" e	16' 2" i	14' 0" i	11' 5" a	14' 8" e	13' 4" e	11' 5" e	16' 2" i	14' 0" i	11' 5" a

"e" : web stiffeners are required at ends.  
 "i" : web stiffeners are required at interior support  
 "a" : web stiffener are required at all supports.



# Header Load Tables

## Header Allowable Uniform Load Table Notes

1. Total load deflection limit is  $L/360$ .
2. Allowable loads have not been modified for strength or deflection clips.
3. Headers consist of two members.
  - a. Boxed
  - b. Back-to-back
4. Allowable moment, shear, web crippling and moment of inertia are based on twice the value for a single member.
5. Web crippling check based on 1" end bearing. Where listed allowable loads are followed by "e", web stiffeners are required.
6. Web crippling and shear checks are based on unpunched webs. If web punchouts occur near supports, members must be checked for reduced shear and web crippling in accordance with the NASPEC.
7. Members are assumed adequately braced to develop their full flexural strength.
8. Allowable loads are for simply supported headers with uniform bending loads only.



## Header Allowable Uniform Loads (lb/ft)

Section	FY (ksi)	Span						
		3(ft)	4(ft)	5(ft)	6(ft)	8(ft)	10(ft)	12(ft)
<b>362S162-33</b>	33	783.8e	440.9e	282.2e	195.9e	94.1e	48.2	27.9
<b>362S162-43</b>	33	1088.0e	612.0e	391.7e	272.0e	121.2	62	35.9
<b>362S162-54</b>	50	1967.4e	1106.7e	610.3e	353.2	149	76.3	44.1
<b>362S162-68</b>	50	2545.5e	1431.9e	747.3	432.5	182.4	93.4	54.1
<b>400S162-33</b>	33	875.0e	492.2e	315.0e	218.8e	118.2e	60.5	35
<b>400S162-43</b>	33	1219.6e	686.0e	439.0e	304.9e	152.3e	78	45.1
<b>400S162-54</b>	50	2206.8e	1241.3e	767.6e	444.2e	187.4	95.9	55.5
<b>400S162-68</b>	50	2875.0e	1617.2e	941.2e	544.7	229.8	117.7	68.1
<b>600S162-33</b>	33	850.8e	638.1e	510.5e	422.5e	237.7e	152.1e	90.7e
<b>600S162-43</b>	33	1887.6e	1390.0e	889.6e	617.8e	347.5e	202.4e	117.1e
<b>600S162-54</b>	50	3763.8e	2527.1e	1617.4e	1123.2e	488.3e	250.0e	144.7
<b>600S162-68</b>	50	5846.8e	3288.8e	2104.9e	1426.3e	601.7e	308.1	178.3
<b>800S162-33</b>	33	632.0e	474.0e	379.2e	316.0e	237.0e	187.0e	129.9e
<b>800S162-43</b>	33	1401.5e	101.2e	840.9e	700.8e	419.6e	268.5e	186.5e
<b>800S162-54</b>	50	2788.4e	2091.3e	1673.0e	1362.6e	766.5e	489.5e	283.3e
<b>800S162-68</b>	50	5627.6e	4150.2e	2656.1e	1844.5e	1037.6e	617.9e	357.6e
<b>1000S162-43</b>	33	1114.6e	835.9e	668.7e	557.3e	418.0e	334.4e	238.3e
<b>1000S162-54</b>	50	2214.5e	1660.8e	1328.7e	1107.2e	830.4e	627.5e	435.8e
<b>1000S162-68</b>	50	4460.5e	3345.4e	2676.3e	2230.3e	1343.9e	860.1e	597.3e



# Web Crippling Tables

## Header Allowable Uniform Load Table Notes

1. Listed allowable loads apply only to members with stiffened flanges (i.e. S-sections).
2. Listed allowable loads are based on members “fastened to supports”.
3. Listed allowable loads are for unpunched webs. Capacity reductions for end and interior one flange loading (Conditions 1 and 2) near punchouts are listed per NASPEC C3.4.2.
4. For listed punchout reduction factors,  $RC_x$  is the nearest distance between the web hole and edge of bearing in inches.



**Web Crippling Table - Single Members  
400S - 1000S (Conditions 1-3)**

Section	Design Thickness (in)	Mil Thickness (mil)	Fy (ksi)	Condition 1 Fasten to Support				Condition 2 Fasten to Support				Condition 3 Fasten to Support			
				Bearing Length (in)				Bearing Length (in)				Bearing Length (in)			
				1	3.5	4	6	1	3.5	4	6	1	3.5	4	6
162	0.0188	18	33	55	89 <sup>1</sup>	95 <sup>1,2</sup>	112 <sup>1,2</sup>	87	125 <sup>1</sup>	131 <sup>1,2</sup>	151 <sup>1,2</sup>	45	64 <sup>1</sup>	67 <sup>1,2</sup>	76 <sup>1,2</sup>
162	0.0312	30	33	148	233 <sup>1</sup>	246 <sup>1</sup>	290 <sup>1</sup>	269	373 <sup>1</sup>	388 <sup>1</sup>	442 <sup>1</sup>	137	185 <sup>1</sup>	192 <sup>1</sup>	217 <sup>1</sup>
250	0.0188	18	33	52	84	89 <sup>2</sup>	106 <sup>1,2</sup>	85	122	128 <sup>2</sup>	147 <sup>1,2</sup>	37	51	54 <sup>2</sup>	61 <sup>1,2</sup>
250	0.0312	30	33	141	223	235	277 <sup>1</sup>	264	365	381	433 <sup>1</sup>	119	161	167	189 <sup>1</sup>
250	0.0346	33	33	173	271	285	336 <sup>1</sup>	330	453	472	535 <sup>1</sup>	150	201	209	235 <sup>1</sup>
250	0.0451	43	33	287	443	466	547 <sup>1</sup>	580	780	810	913	267	351	364	407 <sup>1</sup>
250	0.0566	54	50	656	996	1046	1222 <sup>1</sup>	1350	1785	1850	2075 <sup>1</sup>	652	842	870	968 <sup>1</sup>
250	0.0713	68	50	990	1480	1552	1805 <sup>1</sup>	2073	2693	2785	3106 <sup>1</sup>	1049	1333	1375	1521 <sup>1</sup>
362	0.0188	18	33	49	79	84 <sup>2</sup>	99 <sup>2</sup>	82	119	124 <sup>2</sup>	143 <sup>2</sup>	27	39	40 <sup>2</sup>	46 <sup>2</sup>
362	0.0312	30	33	135	213	224	265	258	358	373	424	101	136	141	160
362	0.0346	33	33	165	259	273	322	323	444	462	525	129	173	179	202
362	0.0451	43	33	277	427	449	526	570	767	796	898	236	311	322	360
362	0.0566	54	50	634	963	1012	1182	1329	1758	1822	2043	588	760	785	874
362	0.0713	68	50	962	1437	1507	1752	2044	2657	2747	3064	961	1221	1259	1393
400	0.0312	30	33	133	210	221	261	257	356	370	421	95	129	134	151
400	0.0346	33	33	163	256	269	317	322	442	460	522	122	164	170	192
400	0.0451	43	33	274	422	444	520	567	763	792	893	227	299	309	346
400	0.0566	54	50	628	954	1002	1170	1323	1750	1813	2034	569	735	760	846
400	0.0713	68	50	953	1424	1494	1737	2036	2646	2736	3051	936	1188	1226	1356
600	0.0312	30	33	124	196	206	243	249	345	359	409	70	95	98	111
600	0.0346	33	33	153	240	253	297	313	430	447	507	93	125	130	146
600	0.0451	43	33	259	400	420	493	553	745	773	872	185	243	252	282
600	0.0566	54	50	599	909	956	1116	1295	1713	1775	191	482	623	644	716
600	0.0713	68	50	914	1366	1433	1666	1998	2596	2685	2994	816	1036	1069	1183
800	0.0451	43	33	247	381	401	470	542	730	757	854	150	197	204	228
800	0.0566	54	50	575	872	917	1070	1272	1682	1743	1955	409	529	547	608
800	0.0713	68	50	882	1318	1382	1607	1966	2555	2642	2946	716	910	939	1038
1000	0.0566	54	50	553	840	882	1031	1251	1655	1715	1923	346	447	462	514
1000	0.0713	68	50	854	1275	1338	1538	1938	2518	2604	2904	629	799	824	912

1. Bearing length to web height ratio, N/h, exceeds NASPEC limit of 2.

2. Bearing length to thickness ratio, N/t, exceeds limit of 210.

1,2. Bearing length to web height ratio, N/h, exceeds NASPEC limit of 2 and bearing length to thickness ratio, N/t, exceeds NASPEC limit of 210.





**Web Crippling Table - Single Members**  
**400S-1000S (Conditions 4 & Punchout Reductions)**

Section	Design Thickness (in)	Mil Thickness (mil)	Fy (ksi)	Condition 4 Fasten to Support				Punchout Reductions	
				Bearing Length (in)				Rc (E1F)	Rc (I1F)
				1	3.5	4	6		
162	0.0188	18	33	122	161 <sup>1</sup>	166 <sup>1,2</sup>	186 <sup>1,2</sup>	0.838 + 0.059x <= 1.0	0.875 + 0.037x <= 1.0
162	0.0312	30	33	356	452 <sup>1</sup>	466 <sup>1</sup>	516 <sup>1</sup>	0.837 + 0.059x <= 1.0	0.875 + 0.038x <= 1.0
250	0.0188	18	33	109	145	150 <sup>2</sup>	168 <sup>1,2</sup>	0.904 + 0.036x <= 1.0	0.885 + 0.023x <= 1.0
250	0.0312	30	33	330	420	433	479 <sup>1</sup>	0.903 + 0.036x <= 1.0	0.885 + 0.023x <= 1.0
250	0.0346	33	33	411	519	535	591 <sup>1</sup>	0.903 + 0.036x <= 1.0	0.885 + 0.023x <= 1.0
250	0.0451	43	33	720	892	918	1006 <sup>1</sup>	0.902 + 0.037x <= 1.0	0.884 + 0.023x <= 1.0
250	0.0566	54	50	1730	2109	2165	2361 <sup>1</sup>	0.900 + 0.037x <= 1.0	0.884 + 0.024x <= 1.0
250	0.0713	68	50	2750	3302	3385	3669 <sup>1</sup>	0.896 + 0.039x <= 1.0	0.884 + 0.025x <= 1.0
362	0.0188	18	33	97	128	132 <sup>2</sup>	149 <sup>2</sup>	0.867 + 0.024x <= 1.0	0.879 + 0.016x <= 1.0
362	0.0312	30	33	304	386	398	441	0.867 + 0.024x <= 1.0	0.879 + 0.016x <= 1.0
362	0.0346	33	33	381	480	495	547	0.867 + 0.024x <= 1.0	0.879 + 0.016x <= 1.0
362	0.0451	43	33	675	836	860	943	0.866 + 0.024x <= 1.0	0.879 + 0.016x <= 1.0
362	0.0566	54	50	1635	1994	2047	2232	0.864 + 0.025x <= 1.0	0.879 + 0.016x <= 1.0
362	0.0713	68	50	2618	3143	3221	3492	0.861 + 0.025x <= 1.0	0.878 + 0.016x <= 1.0
400	0.0312	30	33	296	376	388	429	0.881 + 0.022x <= 1.0	0.881 + 0.014x <= 1.0
400	0.0346	33	33	372	469	483	534	0.881 + 0.022x <= 1.0	0.881 + 0.014x <= 1.0
400	0.0451	43	33	662	819	843	924	0.881 + 0.022x <= 1.0	0.881 + 0.014x <= 1.0
400	0.0566	54	50	1607	1960	2012	2194	0.879 + 0.022x <= 1.0	0.881 + 0.014x <= 1.0
400	0.0713	68	50	2579	3096	3173	3440	0.876 + 0.023x <= 1.0	0.881 + 0.015x <= 1.0
600	0.0312	30	33	260	330	340	377	0.926 + 0.014x <= 1.0	0.888 + 0.009x <= 1.0
600	0.0346	33	33	329	416	429	473	0.926 + 0.014x <= 1.0	0.888 + 0.009x <= 1.0
600	0.0451	43	33	600	743	764	838	0.925 + 0.014x <= 1.0	0.888 + 0.009x <= 1.0
600	0.0566	54	50	1478	1802	1850	2017	0.925 + 0.015x <= 1.0	0.888 + 0.009x <= 1.0
600	0.0713	68	50	239	2881	2952	3201	0.924 + 0.015x <= 1.0	0.888 + 0.009x <= 1.0
800	0.0451	43	33	548	678	698	765	0.947 + 0.011x <= 1.0	0.891 + 0.007x <= 1.0
800	0.0566	54	50	1370	1670	1714	1869	0.947 + 0.011x <= 1.0	0.891 + 0.007x <= 1.0
800	0.0713	68	50	2250	2701	2768	3001	0.946 + 0.011x <= 1.0	0.891 + 0.007x <= 1.0
1000	0.0566	54	50	1275	1554	1595	1740	0.960 + 0.009x <= 1.0	0.893 + 0.005x <= 1.0
1000	0.0713	68	50	119	2544	2607	2826	0.959 + 0.009x <= 1.0	0.893 + 0.005x <= 1.0

1. Bearing length to web height ratio, N/h, exceeds NASPEC limit of 2.  
2. Bearing length to thickness ratio, N/t, exceeds limit of 210.  
1,2. Bearing length to web height ratio, N/h, exceeds NASPEC limit of 2 and bearing length to thickness ratio, N/t, exceeds NASPEC limit of 210.