



QUALITY AND SERVICE COUNT.



LIGHTWEIGHT STEEL FRAMING SYSTEMS

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GENERAL INFORMATION

QUALITY AND SERVICE COUNT

MarinoWare is proud to present this catalog that details our Lightweight Steel Framing Products. For over 70 years, MarinoWare has been providing their customers with top quality steel framing products.

MarinoWare is committed to customer satisfaction. This starts with QUALITY. MarinoWare products are manufactured from quality steel and precision formed to meet or exceed industry standards established by the ASTM, SSMA and the AISI.

MarinoWare prides itself on providing the fastest delivery and finest service in the steel framing industry. Most steel framing manufacturers speak of lead times and deliveries in terms of weeks. MarinoWare with its own fleet of trucks, 3 shift operation, latest technology in roll forming capabilities and commitment to service excellence, in most cases provides next day delivery. MarinoWare stands prepared to exceed your expectations. Steel framing products, competitive prices, excellent service along with timely deliveries and technical assistance are available to you. Call MarinoWare today.

TECHNICAL SERVICES

MarinoWare's Technical Services personnel are available to assist their clients in all aspects of Cold-Formed Steel Design. This includes answering technical calls regarding products and installation applications as well as providing accurate certified shop drawings. For Technical Services, please call **1-800-MARINO-1**.

BENEFITS OF COLD-FORMED STEEL FRAMING PRODUCTS

Cold-formed steel framing is a versatile structural product for use in load bearing and curtainwall construction. The popularity of corrosion resistant galvanized steel framing can be attributed to these benefits:

High Strength to Weight Ratio

In curtainwall applications, the reduced dead load may result in primary frame and foundation material savings. Exterior retrofits are less likely to require expensive reinforcement of the existing structure. In load bearing construction, a light weight steel framing system is a benefit when the site is plagued by poor soil conditions. Multi-story residences requiring unique ground level con-

struction (parking structure, meeting or dining facilities, etc.) benefit from the reduced dead weight applied to the supporting structure.

Non-combustible Construction

The use of steel framing, protected with fire resistive materials, offers the designer numerous rated non-combustible assemblies. As an alternate to conventional wood framing, increases in floor areas and/or building heights may be attained. Non-combustible ratings may also yield long term insurance savings.

Design Versatility

Curtainwalls in various finishes and profiles are attainable. Whether used as floor joists and roof rafters or in mansard and truss framing works well independently or in combination with other structural systems. Steel framing is adaptable to numerous applications traditionally constructed with hot rolled structural steel or masonry.

Low in place and Performance Costs

Steel framing systems are conducive to prefabrication at or away from the job site. Quality is improved due to the controlled work atmosphere while its efficiency of construction may result in earlier building enclosure and ultimate occupancy.

Framing will not shrink or crack. It does not rot and is impenetrable to termites, vermin and insects. Factory punched holes permit easy installation of pipe and conduit.

WARRANTY AND LIMITATIONS

All products presented herein are warranted to the buyer to be free from defects in material and workmanship.

The foregoing warranty is non-assignable and in lieu of and excludes all other warranties not expressly set forth herein, whether express or implied by operation of law or otherwise, including but not limited to any implied warranties of merchantability or fitness for a particular purpose. All details and specifications presented herein are intended as a general guide for the use of MarinoWare framing systems. These products should not be used without evaluation by a qualified engineer or architect to determine their suitability for

a specific use. MarinoWare assumes no responsibility for failure resulting from use of its details or specifications, or for failure resulting from improper application or installation of these products.

GOVERNING LAW

All issues arising in connection with your order and all transactions associated with it shall be interpreted according to the laws of the State of New Jersey, and all actions or other proceedings arising out of such issues shall be brought only in Superior Court, State of New Jersey, County of Essex, or United States District Court for the District of New Jersey. No action may be brought more than one year after accrual of the cause of action therefore.

GENERAL INFORMATION

Steel Thickness:

Product		Design		Minimum		ASTM C955
Gauge	Mils	(in.)	(mm.)	(in.)	(mm.)	Color Code
20	33	.0346	0.879	.0329	0.838	White
18	43	.0451	1.1565	.0428	1.087	Yellow
16	54	.0566	1.4376	.0538	1.367	Green
14	68	.0713	1.8110	.0677	1.720	Orange
12	97	.1017	2.5832	.0966	2.454	Red
10	118	.1242	3.1547	.1180	3.000	Blue

Finish:

Galvanized in accordance with ASTM A924. Products will be furnished with a G-60 or equivalent coating if specified and ordered to be in conformance with ASTM C955. Otherwise a G-40 coating or equivalent coating will be provided.

Grades of Steel:

20 and 18 gauge studs and all tracks
Fy (min) = 33 KSI

16 gauge studs and joists
Fy (min) = 33 KSI
Fy (min) = 50 KSI must be requested upon ordering

14, 12 and 10 gauge studs and joists
Fy (min) = 50 KSI

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WEB CRIPPLING

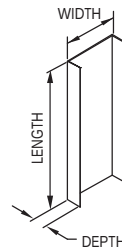
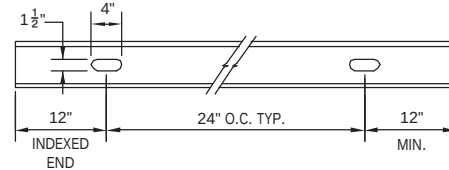
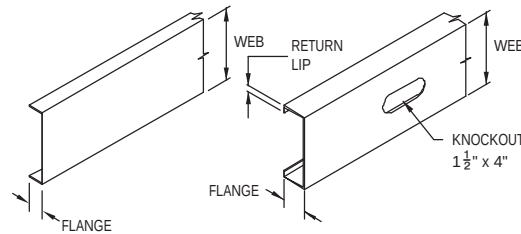
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FRAMING COMPONENTS



WEB STIFFENERS

USE:

For web reinforcement of joists.

LENGTH:

¼" less than web of stiffened member.

(Attaches to "inside" the C stud or joist, U.N.O.)

WIDTH:

Match bearing width of support or applied concentrated load.

DEPTH:

1¼" unless specified otherwise.

GAUGE: 16 Gauge. (U.N.O.)

FLAT STRAP

USE:

Tension component of shear wall assemblies. Component of strap and blocking for bridging application. (see page 13 for details).

AVAILABLE GAUGES: 20, 18, 16, 14, 12 & 10 Gauges.

AVAILABLE WIDTHS: See page 25 for standard sizes.

LENGTH: As required by purchaser.

STUD AND JOISTS (CW, SW, J, JE, JX & JXW)

Studs serve as a general all purpose framing component used in a variety of applications including exterior curtainwalls, load bearing walls, headers, floor & roof joists, soffits and truss frame components.

NOTE:

Products shown with this symbol "●" will be available subject to minimum order quantities. Contact our Customer Service or your Sales Representative.

TRACK (T & DT)

Track is used as a closure to stud and joist ends as well as head and sill conditions. It is also used for blocking and bridging conditions.

NOTE: 10'-0" Standard length. Custom orders available.

WEB KNOCKOUT SIZE AND LOCATION

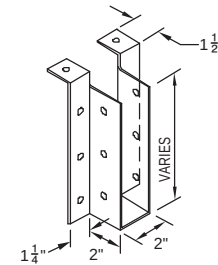
MarinoWare studs and joists are manufactured with knockouts in the web to accommodate mechanical and electrical installation. The knockout is provided 12" from the indexed end and the intermediate knockouts are placed at 24" o.c. intervals. Unpunched studs are available upon request.

C-STUDS (CW, SW, J, JE, JX & JXW)

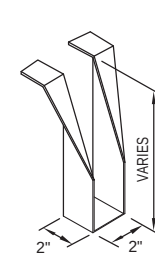
MIW	GAUGES	FLANGE	WEB	RETURN LIP
CW	20 - 14	1 3/8"	2 1/2" - 6"	3/16"
SW	20 - 10	1 5/8"	2 1/2" - 16"	1/2"
J	20 - 10	2"	3 5/8" - 16"	3/16"
JE ●	18 - 10	2 1/2"	6" - 16"	3/16"
JX ●	16 - 10	3"	8" - 16"	1"
JXW ●	16 - 10	3 1/2"	10" - 16"	1"

TRACK (T & DT)

MIW	GAUGES	FLANGE	WEB
T	20 - 10	1 1/4"	2 1/2" - 16"
DT	20 - 10	2" MIN.	2 1/2" - 16"



JOIST HANGER



BRIDLE HANGER

JOIST & BRIDLE HANGERS

USE:

A.) JOIST HANGER: (16 GA) used for the attachment of floor or roof joists to side of boxed steel headers or wood headers.

B.) BRIDLE HANGER: (12 GA) used for attachment of floor or roof joists to structural steel beams.

STANDARD SIZES:

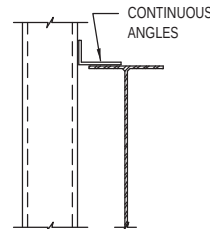
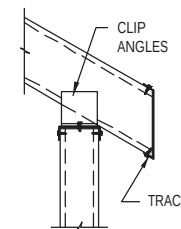
6", 8", 10", 12", 14" & 16".

Special sizes may be available upon request.

ALLOWABLE CAPACITY:

A.) Joist Hanger (1,450 lbs.)

B.) Bridle Hanger (2,415 lbs.)



BRAKE FORMED ACCESSORIES

USE:

Miscellaneous closures, continuous angles, etc.

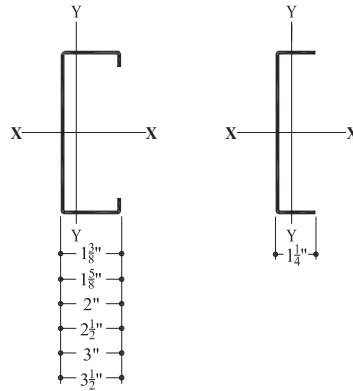
LENGTH:

10'-0" maximum. Dimensioned product drawing must accompany order.

STRUCTURAL PROPERTIES

SYMBOLS AND DEFINITIONS:

A	Gross cross sectional area of the member.
I_x, I_y	Moment of Inertia of the gross section about the principal axis.
I_{x_e}	Moment of Inertia of the effective section stressed at yield about the principal axis.
R_x, R_y	Radius of gyration of the gross section.
S_x	Section Modulus of the gross section.
S_{x_e}	Section Modulus of the effective section stressed at yield about the principal axis.
Ma	Allowable bending moment with contribution due to coldworking where applicable
Va	Allowable shear force at punched sections
Cw	Torsional warping constant of the cross section
J	St. Venant torsion constant
Ro	Polar radius of gyration of the cross section about the shear center
Beta	$1 - (X_o/R_o)^2$
Xo	Distance from shear center to centroid along the principal axis.



NOTES:

- Section properties are based on the North American Specification for the Design of Cold Formed Steel Structural Members, 2001 edition.
- Gross and torsional properties were based on the unreduced cross section of the shape.
- S_{x_e} was based on the effective section stressed at yield. For further information consult AISI Section B2.
- All products annotated by “*” exceed the h/t ratio of 200 and require a web stiffener at support and concentrated load locations.
- Allowable bending moment, Ma was calculated according to AISI Section C3.1.1, Procedure 1, based on the initiation of yielding in the effective section.
- Refer to page 3 for physical dimensions of sections.
- Weights shown are based on the uncoated base metal design thickness.
- Designer should check the Product Availability Matrix on page 3.
- Allowable shear, Va was calculated in accordance with Section C3.2.2 at punched section.

Physical and Structural Properties

Member Physical Properties						Gross Section Properties						Effective Section Properties								Torsional Properties				
MIW Type	SSMA	Flange/ Leg (in.)	Lip (in.)	Design Thickness (in.)	Weight (plf.)	Area (in. ²)	I_x (in. ⁴)	S_x (in. ³)	R_x (in.)	I_y (in. ⁴)	R_y (in.)	33ksi				50 ksi				J x1000 (in. ⁴)	Cw (in. ⁶)	Xo (in.)	Ro (in.)	β Beta
												I_{x_e} (in. ⁴)	S_{x_e} (in. ³)	Ma (k-in)	Va (k)	I_{x_e} (in. ⁴)	S_{x_e} (in. ³)	Ma (k-in)	Va (k)					

2-1/2" Members																								
212CW20	250S137-33	1 3/8"	3/8"	0.0346	0.671	0.197	0.203	0.163	1.015	0.052	0.515	0.195	0.144	3.123	0.203	0.195	0.129	3.874	0.262	0.079	0.075	-1.170	1.633	0.486
212CW18	250S137-43	1 3/8"	3/8"	0.0451	0.869	0.255	0.261	0.209	1.011	0.067	0.511	0.249	0.195	4.306	0.199	0.249	0.186	5.555	0.302	0.173	0.094	-1.158	1.620	0.489
212CW16	250S137-54	1 3/8"	3/8"	0.0566	1.075	0.316	0.318	0.255	1.004	0.080	0.504	0.304	0.243	5.487	0.182	0.304	0.231	7.766	0.276	0.337	0.113	-1.150	1.608	0.488
212CW14	250S137-68	1 3/8"	3/8"	0.0713	1.327	0.390	0.386	0.309	0.995	0.096	0.495	0.369	0.294	6.848	0.182	0.369	0.293	10.133	0.182	0.661	0.134	-1.141	1.593	0.487
212SW20	250S162-33	1 5/8"	1/2"	0.0346	0.760	0.223	0.235	0.188	1.027	0.087	0.624	0.227	0.172	3.391	0.203	0.227	0.153	4.586	0.262	0.089	0.144	-1.501	1.923	0.391
212SW18	250S162-43	1 5/8"	1/2"	0.0451	0.984	0.289	0.302	0.242	1.022	0.111	0.620	0.291	0.231	5.012	0.199	0.291	0.205	6.129	0.302	0.196	0.182	-1.489	1.909	0.392
212SW16	250S162-54	1 5/8"	1/2"	0.0566	1.219	0.358	0.370	0.296	1.016	0.135	0.614	0.356	0.284	6.301	0.182	0.356	0.271	8.969	0.276	0.383	0.219	-1.482	1.898	0.391
212SW14	250S162-68	1 5/8"	1/2"	0.0713	1.509	0.444	0.450	0.360	1.008	0.162	0.605	0.433	0.345	7.870	0.182	0.433	0.342	11.588	0.182	0.752	0.262	-1.474	1.885	0.389
212T20	250T125-33	1 1/4"	none	0.0346	0.588	0.173	0.192	0.145	1.054	0.027	0.397	0.166	0.103	2.033	1.024	0.157	0.096	2.875	1.260	0.069	0.033	-0.771	1.365	0.681
212T18	250T125-43	1 1/4"	none	0.0451	0.766	0.225	0.250	0.188	1.055	0.035	0.395	0.231	0.147	2.909	1.356	0.220	0.137	4.090	2.054	0.153	0.042	-0.766	1.362	0.684
212T16	250T125-54	1 1/4"	none	0.0566	0.961	0.282	0.318	0.236	1.062	0.044	0.392	0.310	0.203	4.013	1.692	0.297	0.188	5.640	2.563	0.301	0.054	-0.763	1.365	0.688
212T14	250T125-68	1 1/4"	none	0.0713	1.209	0.355	0.409	0.297	1.072	0.054	0.389	0.409	0.281	5.556	2.112	0.403	0.262	7.847	3.199	0.602	0.068	-0.758	1.370	0.694

3-5/8" Members																								
358CW20	362S137-33	1 3/8"	3/8"	0.0346	0.804	0.236	0.479	0.264	1.424	0.059	0.501	0.466	0.233	4.603	0.521	0.464	0.198	5.937	0.552	0.094	0.162	-1.026	1.826	0.684
358CW18	362S137-43	1 3/8"	3/8"	0.0451	1.041	0.306	0.616	0.340	1.419	0.076	0.497	0.605	0.321	6.346	0.676	0.602	0.293	8.760	0.832	0.207	0.204	-1.015	1.814	0.687
358CW16	362S137-54	1 3/8"	3/8"	0.0566	1.291	0.379	0.756	0.417	1.412	0.091	0.490	0.747	0.404	7.978	0.705	0.745	0.383	11.467	1.016	0.405	0.246	-1.006	1.801	0.688
358CW14	362S137-68	1 3/8"	3/8"	0.0713	1.600	0.470	0.923	0.509	1.401	0.109	0.481	0.913	0.500	11.656	0.662	0.913	0.496	14.845	1.004	0.797	0.294	-0.996	1.785	0.689
358SW20	362S162-33	1 5/8"	1/2"	0.0346	0.892	0.262	0.551	0.304	1.450	0.099	0.616	0.539	0.269	5.305	0.521	0.535	0.235	7.047	0.552	0.105	0.293	-1.334	2.065	0.582
358SW18	362S162-43	1 5/8"	1/2"	0.0451	1.156	0.340	0.710	0.392	1.446	0.127	0.611	0.699	0.373	7.365	0.676	0.696	0.322	9.651	0.832	0.230	0.371	-1.323	2.052	0.585
358SW16	362S162-54	1 5/8"	1/2"	0.0566	1.436	0.422	0.873	0.482	1.438	0.154	0.605	0.864	0.468	9.251	0.705	0.862	0.445	13.325	1.016	0.451	0.449	-1.314	2.040	0.585
358SW14	362S162-68	1 5/8"	1/2"	0.0713	1.782	0.524	1.069	0.590	1.429	0.186	0.596	1.060	0.581	13.244	0.662	1.060	0.577	17.259	1.004	0.887	0.540	-1.305	2.024	0.585
358SW12	362S162-97	1 5/8"	1/2"	0.1017	2.464	0.724	1.435	0.792	1.408	0.241	0.577	1.427	0.781	18.736	0.577	1.427	0.781	27.696	0.875	2.496	0.699	-1.285	1.992	0.584
358SW10	362S162-118	1 5/8"	1/2"	0.1270	2.995	0.880	1.701	0.939	1.390	0.277	0.561	1.694	0.925	23.094	0.511	1.694	0.925	33.986	0.774	4.732	0.803	-1.270	1.965	0.582
358J20	362S200-33	2"	5/8"	0.0346	1.010	0.297	0.648	0.358	1.478	0.177	0.772	0.633	0.293	5.785	0.521	0.607	0.260	7.771	0.552	0.118	0.571	-1.270	2.432	0.470
358J18	362S200-43	2"	5/8"	0.0451	1.310	0.385	0.836	0.461	1.474	0.227	0.767	0.825	0.428	8.453	0.676	0.822	0.377	11.278	0.832	0.261	0.726	-1.758	2.419	0.472
358J16	362S200-54	2"	5/8"	0.0566	1.628	0.479	1.030	0.568	1.467	0.277	0.761	1.021	0.555	10.964	0.705	1.020	0.491	14.699	1.016	0.511	0.884	-1.750	2.407	0.472
358J14	362S200-68	2"	5/8"	0.0713	2.025	0.595	1.266	0.698	1.459	0.337	0.753	1.256	0.690	15.347	0.662	1.256	0.669	20.021	1.004	1.008	1.070	-1.741	2.393	0.471
358J12	362S200-97	2"	5/8"	0.1017	2.810	0.826	1.712	0.945	1.440	0.446	0.735	1.703	0.933	21.698	0.577	1.703	0.933	32.195	0.875	2.847	1.404	-1.724	2.363	0.468
358J10	362S200-118	2"	5/8"	0.1270	3.427	1.007	2.042	1.127	1.424	0.522	0.720	2.035	1.114	26.783	0.511	2.035	1.114	39.581	0.774	5.415	1.634	-1.710	2.339	0.466
358T20	362T125-33	1 1/4"	none	0.0346	0.721	0.212	0.438	0.232	1.439	0.030	0.377	0.385	0.174	3.437	1.024	0.368	0.164	4.922	1.039	0.085	0.075	-0.667	1.630	0.833
358T18	362T125-43	1 1/4"	none	0.0451	0.939	0.276	0.572	0.302	1.439	0.039	0.375	0.531	0.245	4.839	1.739	0.508	0.230	6.892	2.141	0.187	0.097	-0.663	1.628	0.834
358T16	362T125-54	1 1/4"	none	0.0566	1.177	0.346	0.723	0.378	1.445	0.048	0.373	0.705	0.332	6.569	2.480	0.678	0.312	9.342	3.372	0.369	0.123	-0.659	1.632	0.837
358T14	362T125-68	1 1/4"	none	0.0713	1.482	0.436	0.921	0.475	1.454	0.060	0.370	0.921	0.453	8.955	3.104	0.907	0.427	12.776	4.703	0.738	0.155	-0.655	1.637	0.840
358T12	362T125-97	1 1/4"	none	0.1017	2.112	0.621	1.344	0.675	1.471	0.082	0.364	1.343	0.675	15.242	4.370	1.343	0.675	20.204	6.622	2.140	0.223	-0.646	1.648	0.846
358T10	362T125-118	1 1/4"	none	0.1270	2.635	0.774	1.708	0.839	1.485	0.100	0.359	1.707	0.839	19.508	5.398	1.707	0.839	28.945	8.178	4.163	0.281	-0.639	1.656	0.851

STRUCTURAL PROPERTIES

Physical and Structural Properties

Member Physical Properties						Gross Section Properties						Effective Section Properties								Torsional Properties						
MIW Type	SSMA	Flange/ Leg (in.)	Lip (in.)	Design Thickness (in.)	Weight (plf.)	Area (in. ²)	Ix (in. ⁴)	Sx (in. ³)	Rx (in.)	Iy (in. ⁴)	Ry (in.)	33ksi				50 ksi				J x1000 (in. ⁴)	Cw (in. ⁶)	Xo (in.)	Ro (in.)	β Beta		
												I _{xe} (in. ⁴)	S _{xe} (in. ³)	Ma (k-in)	Va (k)	I _{ye} (in. ⁴)	S _{ye} (in. ³)	Ma (k-in)	Va (k)							
4" Members																										
4CW20	400S137-33	1 3/8"	3/8"	0.0346	0.848	0.249	0.603	0.302	1.556	0.061	0.496	0.584	0.260	5.133	0.595	0.580	0.221	6.607	0.595	0.099	0.200	-0.987	1.908	0.733		
4CW18	400S137-43	1 3/8"	3/8"	0.0451	1.099	0.323	0.776	0.388	1.551	0.078	0.491	0.761	0.360	7.115	0.810	0.755	0.327	9.782	0.997	0.219	0.253	-0.976	1.897	0.736		
4CW16	400S137-54	1 3/8"	3/8"	0.0566	1.364	0.401	0.953	0.477	1.543	0.094	0.484	0.944	0.455	8.997	0.944	0.938	0.430	12.874	1.223	0.428	0.305	-0.967	1.884	0.737		
4CW14	400S137-68	1 3/8"	3/8"	0.0713	1.691	0.497	1.165	0.583	1.531	0.112	0.475	1.159	0.571	11.274	0.895	1.157	0.561	16.786	1.356	0.842	0.365	-0.956	1.867	0.738		
4SW20	400S162-33	1 5/8"	1/2"	0.0346	0.936	0.275	0.692	0.346	1.586	0.103	0.611	0.674	0.300	5.923	0.595	0.669	0.262	7.849	0.595	0.110	0.358	-1.288	2.133	0.635		
4SW18	400S162-43	1 5/8"	1/2"	0.0451	1.214	0.357	0.892	0.446	1.582	0.131	0.606	0.876	0.418	8.255	0.810	0.872	0.360	10.777	0.997	0.242	0.454	-1.276	2.121	0.638		
4SW16	400S162-54	1 5/8"	1/2"	0.0566	1.508	0.443	1.098	0.549	1.574	0.159	0.600	1.088	0.527	10.423	0.944	1.082	0.499	14.947	1.223	0.473	0.550	-1.268	2.108	0.638		
4SW14	400S162-68	1 5/8"	1/2"	0.0713	1.873	0.550	1.346	0.673	1.564	0.192	0.591	1.340	0.661	13.061	0.895	1.338	0.651	19.492	1.356	0.933	0.663	-1.258	2.092	0.639		
4SW12	400S162-97	1 5/8"	1/2"	0.1017	2.594	0.762	1.813	0.907	1.542	0.250	0.572	1.811	0.898	21.544	0.797	1.811	0.898	31.848	1.207	2.627	0.860	-1.238	2.059	0.639		
4SW10	400S162-118	1 5/8"	1/2"	0.1270	3.157	0.928	2.154	1.077	1.524	0.287	0.556	2.157	1.067	26.636	0.719	2.157	1.067	39.198	1.090	4.988	0.990	-1.222	2.031	0.638		
4J20	400S200-33	2"	5/8"	0.0346	1.054	0.310	0.812	0.406	1.619	0.183	0.769	0.791	0.327	6.463	0.595	0.758	0.289	8.666	0.595	0.124	0.689	-1.715	2.481	0.522		
4J18	400S200-43	2"	5/8"	0.0451	1.367	0.402	1.048	0.524	1.615	0.235	0.764	1.033	0.479	9.474	0.810	1.028	0.421	12.605	0.997	0.272	0.876	-1.703	2.468	0.524		
4J16	400S200-54	2"	5/8"	0.0566	1.701	0.500	1.292	0.646	1.608	0.287	0.758	1.282	0.624	12.339	0.944	1.278	0.550	16.472	1.223	0.534	1.068	-1.695	2.456	0.524		
4J14	400S200-68	2"	5/8"	0.0713	2.116	0.622	1.590	0.795	1.599	0.349	0.750	1.584	0.783	15.462	0.895	1.582	0.753	22.558	1.356	1.054	1.295	-1.686	2.441	0.523		
4J12	400S200-97	2"	5/8"	0.1017	2.940	0.864	2.156	1.078	1.580	0.463	0.732	2.153	1.069	24.852	0.797	2.153	1.069	36.874	1.207	2.978	1.704	-1.667	2.411	0.522		
4J10	400S200-118	2"	5/8"	0.1270	3.590	1.055	2.577	1.289	1.563	0.541	0.716	2.579	1.279	30.755	0.719	2.579	1.279	45.451	1.090	5.671	1.987	-1.653	2.385	0.520		
4T20	400T125-33	1 1/4"	none	0.0346	0.765	0.225	0.549	0.265	1.563	0.031	0.371	0.484	0.201	3.971	0.940	0.465	0.189	5.668	0.940	0.090	0.094	-0.639	1.729	0.863		
4T18	400T125-43	1 1/4"	none	0.0451	0.996	0.293	0.716	0.344	1.564	0.040	0.369	0.666	0.282	5.568	1.739	0.639	0.266	7.956	2.078	0.199	0.122	-0.635	1.727	0.865		
4T16	400T125-54	1 1/4"	none	0.0566	1.250	0.367	0.904	0.431	1.569	0.049	0.367	0.883	0.381	7.528	2.739	0.849	0.359	10.739	3.372	0.392	0.153	-0.631	1.731	0.867		
4T14	400T125-68	1 1/4"	none	0.0713	1.573	0.462	1.150	0.541	1.577	0.061	0.364	1.150	0.517	10.220	3.435	1.134	0.488	14.622	5.205	0.783	0.193	-0.627	1.736	0.870		
4T12	400T125-97	1 1/4"	none	0.1017	2.242	0.659	1.674	0.768	1.594	0.084	0.358	1.673	0.768	17.352	4.842	1.673	0.768	23.001	7.337	2.271	0.277	-0.618	1.747	0.875		
4T10	400T125-118	1 1/4"	none	0.1270	2.797	0.822	2.123	0.955	1.607	0.102	0.353	2.122	0.955	22.200	5.987	2.122	0.955	32.940	9.071	4.419	0.347	-0.612	1.755	0.879		
6" Members																										
6CW20	600S137-33	1 3/8"	3/8"	0.0346	1.083	0.318	1.583	0.528	2.230	0.069	0.464	1.582	0.513	10.127	0.638	1.582	0.414	12.393	0.638	0.127	0.494	-0.823	2.422	0.885		
6CW18	600S137-43	1 3/8"	3/8"	0.0451	1.406	0.413	2.042	0.681	2.224	0.087	0.459	2.042	0.670	14.801	1.240	2.042	0.648	19.394	1.240	0.280	0.625	-0.813	2.412	0.886		
6CW16	600S137-54	1 3/8"	3/8"	0.0566	1.749	0.514	2.518	0.839	2.214	0.105	0.452	2.517	0.839	18.981	1.890	2.517	0.809	27.231	1.947	0.549	0.757	-0.804	2.398	0.888		
6CW14	600S137-68	1 3/8"	3/8"	0.0713	2.177	0.640	3.095	1.032	2.200	0.126	0.443	3.094	1.031	24.048	2.339	3.094	1.030	35.603	2.879	1.084	0.911	-0.793	2.380	0.889		
6SW20	600S162-33	1 5/8"	1/2"	0.0346	1.172	0.344	1.793	0.598	2.282	0.116	0.581	1.793	0.577	11.408	0.638	1.793	0.480	14.376	0.638	0.137	0.851	-1.091	2.596	0.823		
6SW18	600S162-43	1 5/8"	1/2"	0.0451	1.521	0.447	2.316	0.772	2.277	0.148	0.576	2.316	0.767	16.679	1.240	2.316	0.706	21.121	1.240	0.303	1.082	-1.080	2.585	0.825		
6SW16	600S162-54	1 5/8"	1/2"	0.0566	1.893	0.556	2.861	0.954	2.268	0.181	0.570	2.860	0.953	21.165	1.890	2.860	0.916	30.324	1.947	0.594	1.318	-1.071	2.572	0.827		
6SW14	600S162-68	1 5/8"	1/2"	0.0713	2.358	0.693	3.525	1.175	2.256	0.218	0.561	3.525	1.175	26.784	2.339	3.525	1.164	39.465	2.879	1.174	1.596	-1.061	2.555	0.828		
6SW12	600S162-97	1 5/8"	1/2"	0.1017	3.286	0.966	4.799	1.600	2.229	0.283	0.542	4.797	1.599	38.374	2.512	4.797	1.599	56.725	3.806	3.329	2.093	-1.039	2.518	0.830		
6SW10	600S162-118	1 5/8"	1/2"	0.1270	4.022	1.182	5.756	1.919	2.207	0.326	0.525	5.754	1.918	47.864	2.376	5.754	1.918	70.438	3.600	6.354	2.434	-1.021	2.488	0.832		
6J20	600S200-33	2"	5/8"	0.0346	1.289	0.379	2.076	0.692	2.341	0.209	0.743	2.059	0.618	12.218	0.638	2.016	0.521	15.598	0.638	0.151	1.577	-1.479	2.867	0.734		
6J18	600S200-43	2"	5/8"	0.0451	1.674	0.492	2.683	0.894	2.335	0.268	0.739	2.683	0.873	17.243	1.240	2.683	0.805	24.102	1.240	0.334	2.012	-1.468	2.855	0.736		
6J16	600S200-54	2"	5/8"	0.0566	2.086	0.613	3.320	1.107	2.327	0.329	0.732	3.319	1.106	24.073	1.890	3.319	1.015	30.394	1.947	0.655	2.461	-1.459	2.843	0.737		
6J14	600S200-68	2"	5/8"	0.0713	2.601	0.764	4.101	1.367	2.317	0.400	0.723	4.100	1.367	30.416	2.339	4.100	1.317	43.707	2.879	1.295	2.997	-1.448	2.826	0.737		
6J12	600S200-97	2"	5/8"	0.1017	3.632	1.067	5.613	1.871	2.293	0.530	0.705	5.612	1.871	43.494	2.512	5.612	1.871	64.535	3.806	3.679	3.981	-1.427	2.791	0.739		
6J10	600S200-118	2"	5/8"	0.1270	4.454	1.309	6.766	2.255	2.274	0.622	0.689	6.764	2.255	54.236	2.376	6.764	2.255	80.151	3.600	7.036	4.680	-1.409	2.762	0.740		
6JE18	600S250-43	2 1/2"	5/8"	0.0451	1.828	0.537	3.083	1.028	2.396	0.458	0.923	3.082	0.918	18.139	1.240	2.977	0.816	24.438	1.240	0.364	3.379	-1.898	3.193	0.647		
6JE16	600S250-54	2 1/2"	5/8"	0.0566	2.279	0.670	3.820	1.273	2.389	0.562	0.917	3.819	1.159	22.896	1.890	3.766	1.069	31.999	1.947	0.715	4.146	-1.889	3.180	0.647		
6JE14	600S250-68	2 1/2"	5/8"	0.0713	2.844	0.836	4.728	1.576	2.379	0.688	0.908	4.727	1.508	32.824	2.339	4.723	1.386	41.490	2.879	1.416	5.071	-1.878	3.164	0.648		

STRUCTURAL PROPERTIES

Physical and Structural Properties

Member Physical Properties						Gross Section Properties						Effective Section Properties								Torsional Properties					
MIW Type	SSMA	Flange/ Leg (in.)	Lip (in.)	Design Thickness (in.)	Weight (plf.)	Area (in. ²)	Ix (in. ⁴)	Sx (in. ³)	Rx (in.)	Iy (in. ⁴)	Ry (in.)	33ksi				50 ksi				J x1000 (in. ⁴)	Cw (in. ⁶)	Xo (in.)	Ro (in.)	β Beta	
												Ix _e (in. ⁴)	Sx _e (in. ³)	Ma (k-in)	Va (k)	Ix _e (in. ⁴)	Sx _e (in. ³)	Ma (k-in)	Va (k)						
8" Members																									
8J18	800S200-43	2"	5/8"	0.0451	1.981	0.582	5.303	1.326	3.018	0.292	0.708	5.302	1.294	25.570	1.051	5.302	1.063	31.831	1.051	0.395	3.763	-1.295	3.360	0.851	
8J16	800S200-54	2"	5/8"	0.0566	2.471	0.726	6.574	1.644	3.009	0.357	0.701	6.572	1.643	35.749	2.091	6.572	1.501	44.938	2.091	0.775	4.612	-1.286	3.347	0.852	
8J14	800S200-68	2"	5/8"	0.0713	3.086	0.907	8.142	2.036	2.996	0.435	0.692	8.140	2.035	45.286	3.367	8.140	1.964	65.207	3.367	1.537	5.631	-1.275	3.329	0.853	
8J12	800S200-97	2"	5/8"	0.1017	4.324	1.271	11.206	2.801	2.970	0.576	0.674	11.203	2.801	65.120	4.824	11.203	2.801	96.622	5.938	4.381	7.524	-1.253	3.293	0.855	
8J10	800S200-118	2"	5/8"	0.1270	5.318	1.563	13.572	3.393	2.947	0.676	0.658	13.569	3.392	81.598	4.950	13.569	3.392	120.587	7.259	8.402	8.889	-1.234	3.262	0.857	
8JE18	800S250-43	2 1/2"	5/8"	0.0451	2.135	0.627	6.017	1.504	3.097	0.500	0.893	6.015	1.315	25.979	1.051	5.910	1.078	32.265	1.051	0.425	6.320	-1.695	3.641	0.784	
8JE16	800S250-54	2 1/2"	5/8"	0.0566	2.664	0.783	7.467	1.867	3.089	0.614	0.886	7.465	1.712	33.821	2.091	7.377	1.527	45.721	2.091	0.836	7.769	-1.685	3.628	0.784	
8JE14	800S250-68	2 1/2"	5/8"	0.0713	3.329	0.978	9.263	2.316	3.077	0.752	0.877	9.261	2.220	48.331	3.367	9.240	2.059	61.648	3.367	1.658	9.526	-1.674	3.611	0.785	
8JE12	800S250-97	2 1/2"	5/8"	0.1017	4.670	1.372	12.792	3.198	3.053	1.009	0.858	12.789	3.191	72.065	4.824	12.789	3.053	102.693	5.938	4.731	12.837	-1.652	3.576	0.787	
8JE10	800S250-118	2 1/2"	5/8"	0.1270	5.751	1.690	15.540	3.885	3.033	1.196	0.841	15.537	3.884	90.301	4.950	15.537	3.791	130.757	7.259	9.085	15.279	-1.633	3.546	0.788	
8JX16	800S300-54	3"	1"	0.0566	3.001	0.882	8.792	2.198	3.158	1.145	1.139	8.782	2.011	39.732	2.091	8.532	1.801	53.932	2.091	0.942	15.946	-2.354	4.100	0.670	
8JX14	800S300-68	3"	1"	0.0713	3.754	1.103	10.927	2.732	3.148	1.411	1.131	10.925	2.696	53.274	3.367	10.925	2.508	75.092	3.367	1.869	19.634	-2.344	4.084	0.671	
8JX12	800S300-97	3"	1"	0.1017	5.276	1.550	15.154	3.789	3.127	1.922	1.114	15.151	3.788	83.846	4.824	15.151	3.675	121.429	5.938	5.345	26.700	-2.323	4.051	0.671	
8JX10	800S300-118	3"	1"	0.1270	6.507	1.912	18.477	4.619	3.109	2.308	1.099	18.474	4.619	104.824	4.950	18.474	4.619	155.988	7.259	10.280	32.027	-2.306	4.023	0.672	
8T20*	800T125-33	1 1/4"	none	0.0346	1.236	0.363	2.897	0.711	2.824	0.036	0.313	2.706	0.434	8.569	0.465	2.550	0.360	10.771	0.465	0.145	0.456	-0.443	2.876	0.976	
8T18	800T125-43	1 1/4"	none	0.0451	1.610	0.473	3.774	0.925	2.824	0.046	0.311	3.600	0.740	14.623	1.030	3.545	0.597	17.867	1.030	0.321	0.588	-0.440	2.875	0.977	
8T16	800T125-54	1 1/4"	none	0.0566	2.020	0.594	4.747	1.158	2.828	0.057	0.309	4.653	1.065	21.038	2.039	4.547	0.963	28.833	2.039	0.634	0.734	-0.437	2.878	0.977	
8T14	800T125-68	1 1/4"	none	0.0713	2.544	0.748	6.000	1.455	2.833	0.070	0.307	5.998	1.409	27.844	4.087	5.925	1.355	40.578	4.087	1.267	0.919	-0.434	2.883	0.977	
8T12	800T125-97	1 1/4"	none	0.1017	3.626	1.066	8.616	2.062	2.844	0.097	0.301	8.613	2.062	46.564	8.843	8.613	2.062	61.721	10.885	3.674	1.293	-0.427	2.891	0.978	
8T10	800T125-118	1 1/4"	none	0.1270	4.526	1.330	10.817	2.562	2.852	0.117	0.297	10.813	2.561	59.536	12.274	10.813	2.561	88.338	16.975	7.150	1.595	-0.421	2.898	0.979	
10" Members																									
10SW16*	1000S162-43	1 5/8"	1/2"	0.0451	2.135	0.627	8.028	1.606	3.577	0.168	0.518	8.025	1.415	27.953	0.836	8.013	1.148	34.366	0.836	0.425	3.404	-0.836	3.710	0.949	
10SW16	1000S162-54	1 5/8"	1/2"	0.0566	2.664	0.783	9.953	1.991	3.566	0.204	0.511	9.950	1.990	39.322	1.661	9.950	1.713	51.291	1.661	0.836	4.159	-0.827	3.696	0.950	
10SW14	1000S162-68	1 5/8"	1/2"	0.0713	3.329	0.978	12.329	2.466	3.550	0.247	0.502	12.325	2.465	56.196	3.345	12.325	2.465	73.802	3.345	1.658	5.060	-0.816	3.677	0.951	
10SW12	1000S162-97	1 5/8"	1/2"	0.1017	4.670	1.372	16.972	3.394	3.517	0.320	0.483	16.966	3.393	81.427	4.824	16.966	3.393	120.368	7.177	4.731	6.707	-0.795	3.638	0.952	
10SW10	1000S162-118	1 5/8"	1/2"	0.1270	5.751	1.690	20.560	4.112	3.488	0.369	0.467	20.553	4.111	102.578	7.908	20.553	4.111	150.956	9.734	9.085	7.869	-0.777	3.604	0.954	
10J18*	1000S200-43	2"	5/8"	0.0451	2.288	0.672	9.088	1.818	3.676	0.309	0.677	9.085	1.582	31.260	0.836	9.045	1.318	39.446	0.836	0.456	6.189	-1.162	3.915	0.912	
10J16	1000S200-54	2"	5/8"	0.0566	2.856	0.839	11.281	2.256	3.666	0.378	0.671	11.278	2.256	44.570	1.661	11.278	1.835	54.943	1.661	0.896	7.595	-1.153	3.901	0.913	
10J14	1000S200-68	2"	5/8"	0.0713	3.572	1.050	13.998	2.800	3.652	0.460	0.662	13.994	2.799	62.281	3.345	13.994	2.744	82.155	3.345	1.779	9.290	-1.142	3.883	0.914	
10J12	1000S200-97	2"	5/8"	0.1017	5.016	1.474	19.341	3.868	3.622	0.610	0.643	19.335	3.867	89.913	4.824	19.335	3.867	133.409	7.177	5.082	12.460	-1.120	3.846	0.915	
10J10	1000S200-118	2"	5/8"	0.1270	6.183	1.817	23.506	4.701	3.597	0.715	0.627	23.499	4.700	113.051	7.908	23.499	4.700	167.069	9.734	9.768	14.768	-1.101	3.814	0.917	
10JE18*	1000S250-43	2 1/2"	5/8"	0.0451	2.442	0.718	10.205	2.041	3.772	0.531	0.861	10.202	1.618	31.973	0.836	10.141	1.341	40.147	0.836	0.486	10.404	-1.534	4.162	0.864	
10JE16	1000S250-54	2 1/2"	5/8"	0.0566	3.049	0.896	12.680	2.536	3.762	0.653	0.854	12.677	2.279	45.039	1.661	12.659	1.881	56.318	1.661	0.957	12.805	-1.525	4.148	0.865	
10JE14	1000S250-68	2 1/2"	5/8"	0.0713	3.814	1.121	15.755	3.151	3.749	0.799	0.844	15.751	3.028	65.929	3.345	15.738	2.771	82.961	3.345	1.899	15.726	-1.514	4.131	0.866	
10JE12	1000S250-97	2 1/2"	5/8"	0.1017	5.362	1.576	21.832	4.366	3.722	1.073	0.825	21.826	4.356	98.401	6.434	21.826	4.181	140.621	7.177	5.432	21.268	-1.491	4.094	0.867	
10JE10	1000S250-118	2 1/2"	5/8"	0.1270	6.615	1.944	26.601	5.320	3.699	1.271	0.809	26.594	5.319	123.652	7.908	26.594	5.198	179.308	9.734	10.450	25.389	-1.472	4.063	0.869	
10JX16	1000S300-54	3"	1"	0.0566	3.386	0.995	14.824	2.965	3.860	1.227	1.111	14.821	2.667	52.706	1.661	14.545	2.239	67.042	1.661	1.063	25.484	-2.153	4.557	0.777	
10JX14	1000S300-68	3"	1"	0.0713	4.239	1.246	18.451	3.690	3.849	1.513	1.102	18.446	3.646	72.041	3.345	18.446	3.384	101.320	3.345	2.111	31.425	-2.142	4.540	0.778	
10JX12	1000S300-97	3"	1"	0.1017	5.968	1.754	25.662	5.132	3.825	2.061	1.084	25.656	5.131	113.583	6.434	25.656	4.981	164.567	7.177	6.046	42.867	-2.120	4.506	0.779	
10JX10	1000S300-118	3"	1"	0.1270	7.371	2.166	31.367	6.274	3.806	2.476	1.069	31.360	6.272	142.355	7.908	31.360	6.272	211.838	9.734	11.645	51.554	-2.102	4.477	0.780	
10JXW16	1000S350-54	3 1/2"	1"	0.0566	3.579	1.052	16.223	3.245	3.928	1.768	1.297	15.948	2.760	54.531	1.661	15.584	2.316	69.326	1.661	1.123	36.305	-2.573	4.871	0.721	
10JXW14	1000S350-68	3 1/2"	1"	0.0713	4.482	1.317	20.208	4.042	3.917	2.185	1.288	20.204	3.824	75.56											

STRUCTURAL PROPERTIES

Physical and Structural Properties

Member Physical Properties						Gross Section Properties						Effective Section Properties								Torsional Properties					
M/W Type	SSMA	Flange/ Leg (in.)	Lip (in.)	Design Thickness (in.)	Weight (plf.)	Area (in. ²)	Ix (in. ⁴)	Sx (in. ³)	Rx (in.)	Iy (in. ⁴)	Ry (in.)	33ksi				50 ksi				J x1000 (in. ⁴)	Cw (in. ⁶)	Xo (in.)	Ro (in.)	β Beta	
												I _{xe} (in. ⁴)	S _{xe} (in. ³)	Ma (k-in)	Va (k)	I _{ye} (in. ⁴)	S _{ye} (in. ³)	Ma (k-in)	Va (k)						
12" Members																									
12JE16*	1200S250-54	2 1/2"	5/8"	0.0566	3.434	1.009	19.686	3.281	4.417	0.683	0.823	19.680	2.682	53.005	1.377	19.680	2.239	67.024	1.377	1.078	19.354	-1.395	4.704	0.912	
12JE14	1200S250-68	2 1/2"	5/8"	0.0713	4.300	1.263	24.490	4.082	4.403	0.836	0.813	24.483	3.963	78.309	2.771	24.483	3.262	97.676	2.771	2.141	23.796	-1.384	4.686	0.913	
12JE12	1200S250-97	2 1/2"	5/8"	0.1017	6.055	1.779	34.025	5.671	4.373	1.122	0.794	34.015	5.658	127.807	7.411	34.015	5.445	183.140	7.411	6.134	32.259	-1.361	4.649	0.914	
12JE10	1200S250-118	2 1/2"	5/8"	0.1270	7.479	2.198	41.551	6.925	4.348	1.329	0.778	41.539	6.923	160.949	9.919	41.539	6.776	233.728	11.538	11.816	38.591	-1.342	4.617	0.916	
12JX16*	1200S300-54	3"	1"	0.0566	3.771	1.108	22.847	3.808	4.541	1.292	1.080	22.841	3.165	62.532	1.377	22.571	2.680	80.248	1.377	1.183	37.836	-1.986	5.072	0.847	
12JX14	1200S300-68	3"	1"	0.0713	4.724	1.388	28.466	4.744	4.528	1.593	1.071	28.459	4.692	92.707	2.771	28.459	4.010	120.054	2.771	2.352	46.706	-1.975	5.055	0.847	
12JX12	1200S300-97	3"	1"	0.1017	6.660	1.957	39.678	6.613	4.503	2.171	1.053	39.668	6.611	146.347	7.411	39.668	6.423	212.243	7.411	6.747	63.857	-1.953	5.020	0.849	
12JX10	1200S300-118	3"	1"	0.1270	8.236	2.420	48.591	8.099	4.481	2.608	1.038	48.579	8.097	183.763	9.919	48.579	8.097	273.457	11.538	13.011	76.946	-1.935	4.990	0.850	
12JXW16*	1200S350-54	3 1/2"	1"	0.0566	3.964	1.165	24.866	4.144	4.620	1.866	1.266	24.616	3.283	64.881	1.377	24.096	2.776	83.114	1.377	1.244	53.909	-2.386	5.352	0.801	
12JXW14	1200S350-68	3 1/2"	1"	0.0713	4.967	1.460	31.003	5.167	4.609	2.306	1.257	30.995	4.908	96.977	2.771	30.921	4.051	121.294	2.771	2.473	66.669	-2.375	5.335	0.802	
12JXW12	1200S350-97	3 1/2"	1"	0.1017	7.006	2.059	43.277	7.213	4.585	3.159	1.239	43.267	7.071	154.210	7.411	43.267	6.590	197.301	7.411	7.098	91.503	-2.352	5.300	0.803	
12JXW10	1200S350-118	3 1/2"	1"	0.1270	8.668	2.547	53.067	8.845	4.565	3.811	1.223	53.055	8.842	197.150	9.919	53.055	8.442	280.722	11.538	13.694	110.624	-2.334	5.270	0.804	
12T16*	1200T125-54	1 1/4"	none	0.0566	2.791	0.820	13.341	2.187	4.034	0.060	0.271	13.266	1.666	32.914	1.355	13.116	1.364	40.846	1.355	0.876	1.820	-0.337	4.057	0.993	
12T14	1200T125-68	1 1/4"	none	0.0713	3.515	1.033	16.833	2.748	4.037	0.074	0.268	16.825	2.682	52.992	2.713	16.799	2.180	65.271	2.713	1.750	2.271	-0.334	4.060	0.993	
12T12	1200T125-97	1 1/4"	none	0.1017	5.011	1.472	24.088	3.899	4.045	0.102	0.264	24.077	3.897	88.030	7.902	24.077	3.897	116.685	7.902	5.076	3.173	-0.328	4.067	0.994	
12T10	1200T125-118	1 1/4"	none	0.1270	6.255	1.838	30.157	4.847	4.051	0.124	0.260	30.143	4.844	112.623	13.790	30.143	4.844	167.108	15.438	9.881	3.894	-0.323	4.072	0.994	
14" Members																									
14SW14	1400S162-68	1 5/8"	1/2"	0.0713	4.300	1.263	28.963	4.138	4.788	0.262	0.456	28.951	3.849	76.056	2.365	28.951	3.384	101.311	2.365	2.141	10.882	-0.667	4.856	0.981	
14SW12	1400S162-97	1 5/8"	1/2"	0.1017	6.055	1.779	40.130	5.733	4.749	0.341	0.438	40.113	5.731	137.512	6.939	40.113	5.731	171.571	6.939	6.134	14.488	-0.647	4.813	0.982	
14SW10	1400S162-118	1 5/8"	1/2"	0.1270	7.479	2.198	48.890	6.984	4.717	0.392	0.422	48.870	6.981	174.218	11.800	48.870	6.981	256.383	11.800	11.816	17.063	-0.630	4.777	0.983	
14J14	1400S200-68	2"	5/8"	0.0713	4.542	1.335	32.295	4.614	4.919	0.494	0.609	32.283	4.327	85.499	2.365	32.283	3.753	112.363	2.365	2.262	19.920	-0.949	5.047	0.965	
14J12	1400S200-97	2"	5/8"	0.1017	6.401	1.881	44.867	6.410	4.884	0.655	0.590	44.850	6.407	148.974	6.939	44.850	6.407	191.832	6.939	6.484	26.833	-0.927	5.006	0.966	
14J10	1400S200-118	2"	5/8"	0.1270	7.912	2.325	54.789	7.827	4.855	0.767	0.575	54.768	7.824	188.201	11.800	54.768	7.824	278.128	11.800	12.499	31.925	-0.910	4.972	0.967	
14JE14	1400S250-68	2 1/2"	5/8"	0.0713	4.785	1.406	35.754	5.108	5.043	0.865	0.784	35.741	4.623	91.361	2.365	35.741	3.760	112.582	2.365	2.383	33.827	-1.276	5.261	0.941	
14JE12	1400S250-97	2 1/2"	5/8"	0.1017	6.747	1.983	49.778	7.111	5.011	1.161	0.765	49.762	7.096	160.281	6.939	49.762	6.886	206.162	6.939	6.835	45.940	-1.253	5.222	0.942	
14JE10	1400S250-118	2 1/2"	5/8"	0.1270	8.344	2.452	60.899	8.700	4.984	1.375	0.749	60.879	8.697	202.187	11.800	60.879	8.523	294.007	11.800	13.181	55.041	-1.235	5.189	0.943	
14JX14	1400S300-68	3"	1"	0.0713	5.210	1.531	41.260	5.894	5.192	1.659	1.041	41.248	5.531	109.290	2.365	41.248	4.644	139.042	2.365	2.594	65.681	-1.835	5.604	0.893	
14JX12	1400S300-97	3"	1"	0.1017	7.353	2.161	57.610	8.230	5.164	2.261	1.023	57.594	8.228	182.128	6.939	57.594	8.128	243.355	6.939	7.449	89.953	-1.813	5.568	0.894	
14JX10	1400S300-118	3"	1"	0.1270	9.100	2.674	70.658	10.094	5.140	2.715	1.008	70.637	10.091	229.033	11.800	70.637	10.091	340.824	11.800	14.376	108.550	-1.794	5.537	0.895	
14JXW14	1400S350-68	3 1/2"	1"	0.0713	5.452	1.602	44.718	6.388	5.283	2.406	1.226	44.706	5.704	112.705	2.365	44.706	4.701	140.747	2.365	2.715	93.789	-2.216	5.859	0.857	
14JXW12	1400S350-97	3 1/2"	1"	0.1017	7.699	2.262	62.522	8.932	5.257	3.296	1.207	62.505	8.761	191.077	6.939	62.505	8.192	245.281	6.939	7.799	128.936	-2.193	5.823	0.858	
14JXW10	1400S350-118	3 1/2"	1"	0.1270	9.532	2.801	76.768	10.967	5.235	3.976	1.191	76.748	10.964	244.452	11.800	76.748	10.488	348.730	11.800	15.059	156.094	-2.174	5.793	0.859	
14T14	1400T125-68	1 1/4"	none	0.0713	4.000	1.175	25.208	3.538	4.631	0.076	0.254	25.195	3.062	60.504	2.322	25.195	2.483	74.354	2.322	1.992	3.191	-0.299	4.648	0.996	
14T12	1400T125-97	1 1/4"	none	0.1017	5.703	1.676	36.041	5.021	4.638	0.104	0.249	36.023	5.019	113.357	6.761	36.023	5.019	150.256	6.761	5.777	4.450	-0.294	4.654	0.996	
14T10	1400T125-118	1 1/4"	none	0.1270	7.119	2.092	45.091	6.243	4.643	0.126	0.246	45.068	6.240	145.072	13.202	45.068	6.240	215.255	13.202	11.247	5.452	-0.289	4.658	0.996	
16" Members																									
16SW14*	1600S162-68	1 5/8"	1/2"	0.0713	4.785	1.406	40.930	5.116	5.395	0.268	0.436	40.912	4.297	84.910	2.062	39.562	3.828	114.623	2.062	2.383	14.725	-0.612	5.448	0.987	
16SW12	1600S162-97	1 5/8"	1/2"	0.1017	6.747	1.983	56.846	7.106	5.355	0.348	0.419	56.821	7.103	170.439	6.043	56.821	6.696	200.465	6.043	6.835	19.629	-0.592	5.404	0.988	
16SW10	1600S162-118	1 5/8"	1/2"	0.1270	8.344	2.452	69.398	8.675	5.320	0.400	0.404	69.367	8.671	216.380	11.866	69.367	8.671	318.430	11.866	13.181	23.143	-0.576	5.367	0.989	
16J14*	1600S200-68	2"	5/8"	0.0713	5.028	1.477	45.308	5.664	5.538	0.506	0.585	45.290	4.847	95.778	2.062	44.013	4.252	127.303	2.062	2.503	26.970	-0.876	5.637	0.976	
16J12	1600S200-97	2"	5/8"	0.1017	7.093	2.084	63.072	7.884	5.501	0.671	0.567	63.047	7.881	183.238	6.043	63.047	7.476	223.841	6.043	7.186	36.380	-0.855	5.596	0.977	
16J10	1600S200-118	2"	5/8"	0.1270	8.776	2.579	77.154	9.644	5.470	0.786	0.552	77.123	9.640	231.891	11.866	77.123	9.640	342.695	11.866	13.864	43.333	-0.838	5.561	0.977	
16JE14*	1600S250-68	2 1/2"	5/8"	0.0713	5.270	1.549	49.830	6.229	5.673	0.889	0.758	49.812	5.193	102.624											



LIMITING HEIGHTS, FT.

APPLICATION:

For selection of non-axial load bearing wall elements subjected to uniform lateral (wind) loads.

USE:

Select stud in terms of spacing (inches o.c.), lateral load (psf), and deflection limit which provides an allowable height equal to or greater than the actual project requirements. The use of these tables are limited to applications involving simply supported components.

NOTES:

- Applications involving multiple spans, cantilevers, concentrated loads, etc. should be investigated separately.
- Studs shall be braced against rotation by diaphragm rated sheathing board applied full height to each side of the wall. The installation of mechanical bridging, spaced 5'-0" on center, provides adequate rotational restraint for wall under construction before the installation of sheathing.

Where the wall is not sheathed full height each side or sheathed one side only, continuous bridging spaced 5'-0" on center shall provide rotational support. Reductions in allowable bending capacity must be investigated separately.

When sheathing is used to brace the studs, the products shall maintain their structural integrity during the course of construction and the service life of the wall. The attachment of sheathing should conform to the minimum requirements of industry standards and/or product specifications.

- Stud ends shall be attached to track components at the top and bottom of the wall assembly. Exception: Where the stud terminates at a deflection track, fixed attachment to the stud should be avoided. The stud, however, should be restrained against rotation by installing mechanical bridging adjacent to the deflection track.
- Tabulated heights consider no stress increase for short term loading. The allowable bending moment M_a , as defined on page 4 was used to develop limiting heights.
- Deflections and stresses were calculated without regard to the composite contribution of facing materials.
- Calculations were based on the use of the effective structural properties.
- Contact **MarinoWare** for limiting heights of framing components not shown in the tables.
- Limiting height values for 16 gauge studs are based on steel with $F_y(\text{min}) = 33 \text{ ksi}$.**
- Check end reactions for web crippling.

Limiting Height Tables

Member		Wind Load & Spacing																							
MW Type (SSMA)	Deflection	5 PSF			15 PSF			20 PSF			25 PSF			30 PSF			35 PSF			40 PSF			50 PSF		
		12"o.c.	16"o.c.	24"o.c.	12"o.c.	16"o.c.	24"o.c.	12"o.c.	16"o.c.	24"o.c.	12"o.c.	16"o.c.	24"o.c.	12"o.c.	16"o.c.	24"o.c.	12"o.c.	16"o.c.	24"o.c.	12"o.c.	16"o.c.	24"o.c.	12"o.c.	16"o.c.	24"o.c.
2-1/2" Members																									
212SW20 (250S162-33)	L/240	14'- 4"	13'- 0"	11'- 4"	9'- 11"	9'- 0"	7'- 10"	9'- 0"	8'- 2"	7'- 2"	8'- 4"	7'- 7"	6'- 8"	7'- 10"	7'- 2"	6'- 1"	7'- 6"	6'- 9"	5'- 9"	7'- 2"	6'- 6"	5'- 0"	6'- 8"	5'- 9"	4'- 0"
	L/360	12'- 6"	11'- 4"	9'- 11"	8'- 8"	7'- 10"	6'- 10"	7'- 10"	7'- 2"	6'- 3"	7'- 4"	6'- 8"	5'- 9"	6'- 10"	6'- 3"	5'- 5"	6'- 6"	5'- 11"	5'- 2"	6'- 3"	5'- 8"	4'- 11"	5'- 9"	5'- 3"	4'- 0"
	L/600	10'- 7"	9'- 7"	8'- 4"	7'- 4"	6'- 8"	5'- 9"	6'- 8"	6'- 0"	5'- 3"	6'- 2"	5'- 7"	4'- 11"	5'- 9"	5'- 3"	4'- 7"	5'- 6"	5'- 0"	4'- 4"	5'- 3"	4'- 9"	4'- 2"	4'- 11"	4'- 5"	3'- 10"
212SW18 (250S162-43)	L/240	15'- 7"	14'- 2"	12'- 4"	10'- 9"	9'- 10"	8'- 7"	9'- 10"	8'- 11"	7'- 9"	9'- 1"	8'- 3"	7'- 3"	8'- 7"	7'- 9"	6'- 7"	8'- 2"	7'- 5"	5'- 8"	7'- 9"	7'- 1"	4'- 11"	7'- 3"	5'- 11"	3'- 11"
	L/360	13'- 7"	12'- 4"	10'- 9"	9'- 5"	8'- 7"	7'- 6"	8'- 7"	7'- 9"	6'- 9"	7'- 11"	7'- 3"	6'- 4"	7'- 6"	6'- 9"	5'- 11"	7'- 1"	6'- 5"	5'- 7"	6'- 9"	6'- 2"	4'- 11"	6'- 4"	5'- 9"	3'- 11"
	L/600	11'- 6"	10'- 5"	9'- 1"	7'- 11"	7'- 3"	6'- 4"	7'- 3"	6'- 7"	5'- 9"	6'- 8"	6'- 1"	5'- 4"	6'- 4"	5'- 9"	5'- 0"	6'- 0"	5'- 5"	4'- 9"	5'- 9"	5'- 2"	4'- 6"	5'- 4"	4'- 10"	3'- 11"
212SW16 (250S162-54)	L/240	16'- 8"	15'- 2"	13'- 3"	11'- 7"	10'- 6"	9'- 2"	10'- 6"	9'- 6"	8'- 4"	9'- 9"	8'- 10"	7'- 3"	9'- 2"	8'- 4"	6'- 0"	8'- 8"	7'- 9"	5'- 2"	8'- 4"	6'- 9"	4'- 6"	7'- 3"	5'- 5"	3'- 7"
	L/360	14'- 7"	13'- 3"	11'- 7"	10'- 1"	9'- 2"	8'- 0"	9'- 2"	8'- 4"	7'- 3"	8'- 6"	7'- 9"	6'- 9"	8'- 0"	7'- 3"	6'- 0"	7'- 7"	6'- 11"	5'- 2"	7'- 3"	6'- 7"	4'- 6"	6'- 9"	5'- 5"	3'- 7"
	L/600	12'- 3"	11'- 2"	9'- 9"	8'- 6"	7'- 9"	6'- 9"	7'- 9"	7'- 0"	6'- 1"	7'- 2"	6'- 6"	5'- 8"	6'- 9"	6'- 1"	5'- 4"	6'- 5"	5'- 10"	5'- 1"	6'- 1"	5'- 7"	4'- 6"	5'- 8"	5'- 2"	3'- 7"
212SW14 (250S162-68)	L/240	17'- 10"	16'- 2"	14'- 1"	12'- 4"	11'- 2"	9'- 9"	11'- 2"	10'- 2"	7'- 10"	10'- 5"	9'- 5"	6'- 3"	9'- 9"	7'- 10"	5'- 3"	9'- 0"	6'- 9"	4'- 6"	7'- 10"	5'- 11"	3'- 11"	6'- 3"	4'- 8"	3'- 1"
	L/360	15'- 7"	14'- 1"	12'- 4"	10'- 9"	9'- 9"	8'- 6"	9'- 9"	8'- 11"	7'- 9"	9'- 1"	8'- 3"	6'- 3"	8'- 6"	7'- 9"	5'- 3"	8'- 1"	6'- 9"	4'- 6"	7'- 9"	5'- 11"	3'- 11"	6'- 3"	4'- 8"	3'- 1"
	L/600	13'- 1"	11'- 11"	10'- 5"	9'- 1"	8'- 3"	7'- 2"	8'- 3"	7'- 6"	6'- 6"	7'- 8"	6'- 11"	6'- 1"	7'- 2"	6'- 6"	5'- 3"	6'- 10"	6'- 2"	4'- 6"	6'- 6"	5'- 11"	3'- 11"	6'- 1"	4'- 8"	3'- 1"
3-5/8" Members																									
358CW20 (362S137-33)	L/240	18'- 3"	16'- 7"	14'- 6"	12'- 8"	11'- 6"	10'- 0"	11'- 6"	10'- 5"	8'- 9"	10'- 8"	9'- 7"	7'- 10"	10'- 0"	8'- 9"	7'- 1"	9'- 4"	8'- 1"	6'- 7"	8'- 9"	7'- 7"	6'- 2"	7'- 10"	6'- 9"	5'- 6"
	L/360	15'- 11"	14'- 6"	12'- 8"	11'- 0"	10'- 0"	8'- 9"	10'- 0"	9'- 1"	7'- 11"	9'- 4"	8'- 5"	7'- 4"	8'- 9"	7'- 11"	6'- 11"	8'- 4"	7'- 7"	6'- 7"	7'- 11"	7'- 3"	6'- 2"	7'- 4"	6'- 8"	5'- 6"
	L/600	13'- 5"	12'- 2"	10'- 8"	9'- 4"	8'- 5"	7'- 4"	8'- 5"	7'- 8"	6'- 8"	7'- 10"	7'- 1"	6'- 3"	7'- 4"	6'- 8"	5'- 10"	7'- 0"	6'- 4"	5'- 7"	6'- 8"	6'- 1"	5'- 4"	6'- 3"	5'- 8"	4'- 11"
358CW18 (362S137-43)	L/240	19'- 11"	18'- 1"	15'- 9"	13'- 9"	12'- 6"	10'- 11"	12'- 6"	11'- 4"	9'- 11"	11'- 7"	10'- 7"	9'- 2"	10'- 11"	9'- 11"	8'- 4"	10'- 5"	9'- 5"	7'- 9"	9'- 11"	8'- 10"	7'- 3"	9'- 2"	7'- 11"	6'- 6"
	L/360	17'- 5"	15'- 9"	13'- 9"	12'- 0"	10'- 11"	9'- 7"	10'- 11"	9'- 11"	8'- 8"	10'- 2"	9'- 3"	8'- 1"	9'- 7"	8'- 8"	7'- 7"	9'- 1"	8'- 3"	7'- 2"	8'- 8"	7'- 10"	6'- 10"	8'- 1"	7'- 4"	6'- 5"
	L/600	14'- 8"	13'- 4"	11'- 7"	10'- 2"	9'- 3"	8'- 1"	9'- 3"	8'- 4"	7'- 4"	8'- 7"	7'- 9"	6'- 9"	8'- 1"	7'- 4"	6'- 5"	7'- 8"	6'- 11"	6'- 1"	7'- 4"	6'- 8"	5'- 9"	6'- 9"	6'- 2"	5'- 4"
358CW16 (362S137-54)	L/240	21'- 4"	19'- 5"	16'- 11"	14'- 10"	13'- 5"	11'- 9"	13'- 5"	12'- 2"	10'- 8"	12'- 6"	11'- 4"	9'- 11"	11'- 9"	10'- 8"	9'- 4"	11'- 2"	10'- 1"	8'- 8"	10'- 8"	9'- 8"	8'- 1"	9'- 11"	8'- 11"	7'- 3"
	L/360	18'- 8"	16'- 11"	14'- 10"	12'- 11"	11'- 9"	10'- 3"	11'- 9"	10'- 8"	9'- 4"	10'- 11"	9'- 11"	8'- 8"	10'- 3"	9'- 4"	8'- 1"	9'- 9"	8'- 10"	7'- 9"	9'- 4"	8'- 5"	7'- 5"	8'- 8"	7'- 10"	6'- 10"
	L/600	15'- 9"	14'- 3"	12'- 6"	10'- 11"	9'- 11"	8'- 8"	9'- 11"	9'- 0"	7'- 10"	9'- 2"	8'- 4"	7'- 3"	8'- 8"	7'- 10"	6'- 10"	8'- 2"	7'- 5"	6'- 6"	7'- 10"	7'- 1"	6'- 3"	7'- 3"	6'- 7"	5'- 9"
358CW14 (362S137-68)	L/240	22'- 10"	20'- 9"	18'- 1"	15'- 10"	14'- 4"	12'- 7"	14'- 4"	13'- 1"	11'- 5"	13'- 4"	12'- 1"	10'- 7"	12'- 7"	11'- 5"	9'- 11"	11'- 11"	10'- 10"	9'- 5"	11'- 5"	10'- 4"	9'- 0"	10'- 7"	9'- 7"	8'- 5"
	L/360	19'- 11"	18'- 1"	15'- 10"	13'- 10"	12'- 7"	10'- 11"	12'- 7"	11'- 5"	9'- 11"	11'- 8"	10'- 7"	9'- 3"	10'- 11"	9'- 11"	8'- 8"	10'- 5"	9'- 5"	8'- 3"	9'- 11"	9'- 0"	7'- 11"	9'- 3"	8'- 5"	7'- 4"
	L/600	16'- 10"	15'- 3"	13'- 4"	11'- 8"	10'- 7"	9'- 3"	10'- 7"	9'- 7"	8'- 5"	9'- 10"	8'- 11"	7'- 9"	9'- 3"	8'- 5"	7'- 4"	8'- 9"	8'- 0"	6'- 11"	8'- 5"	7'- 7"	6'- 8"	7'- 9"	7'- 1"	6'- 2"

LIMITING HEIGHTS, FT.

Limiting Height Tables

Member		Wind Load & Spacing																							
MW Type (SSMA)	Deflection	5 PSF			15 PSF			20 PSF			25 PSF			30 PSF			35 PSF			40 PSF			50 PSF		
		12"o.c.	16"o.c.	24"o.c.	12"o.c.	16"o.c.	24"o.c.	12"o.c.	16"o.c.	24"o.c.	12"o.c.	16"o.c.	24"o.c.	12"o.c.	16"o.c.	24"o.c.	12"o.c.	16"o.c.	24"o.c.	12"o.c.	16"o.c.	24"o.c.	12"o.c.	16"o.c.	24"o.c.
3-5/8" Members																									
358SW20 (362S162-33)	L/240	19'-2"	17'-5"	15'-2"	13'-3"	12'-1"	10'-6"	10'-6"	10'-11"	9'-4"	11'-2"	10'-2"	8'-4"	10'-6"	9'-4"	7'-8"	10'-0"	8'-8"	7'-1"	9'-4"	8'-1"	6'-7"	8'-4"	7'-3"	5'-11"
	L/360	16'-9"	15'-2"	13'-3"	11'-7"	10'-6"	9'-2"	10'-6"	9'-7"	8'-4"	9'-9"	8'-10"	7'-9"	9'-2"	8'-4"	7'-3"	8'-9"	7'-11"	6'-11"	8'-4"	7'-7"	6'-7"	7'-9"	7'-0"	5'-11"
	L/600	14'-1"	12'-10"	11'-2"	9'-9"	8'-10"	7'-9"	8'-10"	8'-1"	7'-0"	8'-3"	7'-6"	6'-6"	7'-9"	7'-0"	6'-2"	7'-4"	6'-8"	5'-10"	7'-0"	6'-5"	5'-7"	6'-6"	5'-11"	5'-2"
358SW18 (362S162-43)	L/240	20'-11"	19'-0"	16'-7"	14'-6"	13'-2"	11'-6"	13'-2"	11'-11"	10'-5"	12'-2"	11'-1"	9'-8"	11'-6"	10'-5"	9'-0"	10'-11"	9'-11"	8'-4"	10'-5"	9'-6"	7'-10"	9'-8"	8'-6"	7'-0"
	L/360	18'-3"	16'-7"	14'-6"	12'-8"	11'-6"	10'-0"	11'-6"	10'-5"	9'-1"	10'-8"	9'-8"	8'-5"	10'-0"	9'-1"	7'-11"	9'-6"	8'-8"	7'-7"	9'-1"	8'-3"	7'-3"	8'-5"	7'-8"	6'-8"
	L/600	15'-5"	14'-0"	12'-2"	10'-8"	9'-8"	8'-5"	9'-8"	8'-9"	7'-8"	9'-0"	8'-2"	7'-1"	8'-5"	7'-8"	6'-8"	8'-0"	7'-3"	6'-4"	7'-8"	7'-0"	6'-1"	7'-1"	6'-6"	5'-8"
358SW16 (362S162-54)	L/240	22'-5"	20'-4"	17'-9"	15'-6"	14'-1"	12'-4"	14'-1"	12'-10"	11'-2"	13'-1"	11'-11"	10'-5"	12'-4"	11'-2"	9'-9"	11'-8"	10'-8"	9'-3"	11'-2"	10'-2"	8'-9"	10'-5"	9'-5"	7'-10"
	L/360	19'-7"	17'-9"	15'-6"	13'-7"	12'-4"	10'-9"	12'-4"	11'-2"	9'-9"	11'-5"	10'-5"	9'-1"	10'-9"	9'-8"	8'-6"	10'-3"	9'-3"	8'-1"	9'-9"	8'-10"	7'-9"	9'-1"	8'-3"	7'-2"
	L/600	16'-6"	15'-0"	13'-1"	11'-5"	10'-5"	9'-1"	10'-5"	9'-5"	8'-3"	9'-8"	8'-9"	7'-8"	9'-1"	8'-3"	7'-2"	8'-7"	7'-10"	6'-10"	8'-3"	7'-6"	6'-6"	7'-8"	6'-11"	6'-1"
358SW14 (362S162-68)	L/240	24'-0"	21'-10"	19'-0"	16'-8"	15'-1"	13'-2"	15'-1"	13'-9"	12'-0"	14'-0"	12'-9"	11'-1"	13'-2"	12'-0"	10'-6"	12'-6"	11'-5"	9'-11"	12'-0"	10'-11"	9'-6"	11'-1"	10'-1"	8'-10"
	L/360	21'-0"	19'-0"	16'-8"	14'-6"	13'-2"	11'-6"	13'-2"	12'-0"	10'-6"	12'-3"	11'-1"	9'-8"	11'-6"	10'-6"	9'-2"	10'-11"	9'-11"	8'-8"	10'-6"	9'-6"	8'-4"	9'-8"	8'-10"	7'-8"
	L/600	17'-8"	16'-1"	14'-0"	12'-3"	11'-1"	9'-8"	11'-1"	10'-1"	8'-10"	10'-4"	9'-4"	8'-2"	9'-8"	8'-10"	7'-8"	9'-3"	8'-4"	7'-4"	8'-10"	8'-0"	7'-0"	8'-2"	7'-5"	6'-6"
358SW12 (362S162-97)	L/240	26'-6"	24'-1"	21'-0"	18'-4"	16'-8"	14'-7"	16'-8"	15'-2"	13'-3"	15'-6"	14'-4"	12'-3"	14'-7"	13'-3"	11'-7"	13'-10"	12'-7"	11'-0"	13'-3"	12'-0"	10'-6"	12'-3"	11'-2"	9'-9"
	L/360	23'-2"	21'-0"	18'-4"	16'-0"	14'-7"	12'-9"	14'-7"	13'-3"	11'-7"	13'-6"	12'-3"	10'-9"	12'-3"	10'-9"	9'-11"	11'-7"	10'-6"	9'-7"	11'-7"	10'-6"	9'-2"	10'-9"	9'-9"	8'-6"
	L/600	19'-6"	17'-9"	15'-6"	13'-6"	12'-3"	10'-9"	12'-3"	11'-2"	9'-9"	11'-5"	10'-4"	9'-0"	10'-9"	9'-9"	8'-6"	10'-2"	9'-3"	8'-1"	9'-9"	8'-10"	7'-9"	9'-0"	8'-2"	7'-2"
358SW10 (362S162-118)	L/240	28'-1"	25'-6"	22'-3"	19'-5"	17'-8"	15'-5"	17'-8"	16'-1"	14'-0"	16'-5"	14'-11"	13'-0"	15'-5"	14'-0"	12'-3"	14'-8"	13'-4"	11'-7"	14'-0"	12'-9"	11'-1"	13'-0"	11'-10"	10'-2"
	L/360	24'-6"	22'-3"	19'-5"	17'-0"	15'-5"	13'-6"	15'-5"	14'-0"	12'-3"	14'-4"	13'-0"	11'-4"	13'-6"	12'-3"	10'-8"	12'-10"	11'-7"	12'-3"	11'-1"	9'-8"	11'-4"	10'-4"	9'-0"	
	L/600	20'-8"	18'-9"	16'-5"	14'-4"	13'-0"	11'-4"	13'-0"	11'-10"	10'-4"	12'-1"	11'-0"	9'-7"	11'-4"	10'-4"	9'-0"	10'-9"	9'-10"	8'-7"	10'-4"	9'-4"	8'-2"	9'-7"	8'-8"	7'-7"
4" Members																									
4CW20 (400S137-33)	L/240	19'-8"	17'-10"	15'-7"	13'-8"	12'-5"	10'-8"	12'-5"	11'-3"	9'-2"	11'-6"	10'-1"	8'-3"	10'-8"	9'-2"	7'-6"	9'-10"	8'-6"	6'-11"	9'-2"	8'-0"	6'-6"	8'-3"	7'-1"	5'-10"
	L/360	17'-2"	15'-7"	13'-8"	11'-11"	10'-10"	9'-5"	10'-10"	9'-10"	8'-7"	10'-0"	9'-1"	7'-11"	9'-5"	8'-7"	7'-6"	9'-0"	8'-2"	6'-11"	8'-7"	7'-9"	6'-6"	7'-11"	7'-1"	5'-10"
	L/600	14'-6"	13'-2"	11'-6"	10'-0"	9'-1"	7'-11"	9'-1"	8'-3"	7'-3"	8'-5"	7'-8"	6'-8"	7'-11"	7'-3"	6'-4"	7'-7"	6'-10"	6'-0"	7'-3"	6'-7"	5'-9"	6'-8"	6'-1"	5'-4"
4CW18 (400S137-43)	L/240	21'-6"	19'-6"	17'-1"	14'-11"	13'-6"	11'-10"	13'-6"	12'-3"	10'-9"	12'-7"	11'-5"	9'-8"	11'-10"	10'-9"	8'-10"	11'-3"	10'-0"	8'-2"	10'-9"	9'-5"	7'-8"	9'-8"	8'-5"	6'-10"
	L/360	18'-9"	17'-1"	14'-11"	13'-0"	11'-10"	10'-4"	11'-10"	10'-9"	9'-4"	10'-11"	9'-11"	8'-8"	10'-4"	9'-4"	8'-2"	9'-9"	8'-11"	7'-9"	9'-4"	8'-6"	7'-5"	8'-8"	7'-11"	6'-10"
	L/600	15'-10"	14'-4"	12'-7"	10'-11"	9'-11"	8'-8"	9'-11"	9'-0"	7'-11"	9'-3"	8'-5"	7'-4"	8'-8"	7'-11"	6'-11"	8'-3"	7'-6"	6'-6"	7'-11"	7'-2"	6'-3"	7'-4"	6'-8"	5'-10"
4CW16 (400S137-54)	L/240	23'-1"	21'-0"	18'-4"	16'-0"	14'-6"	12'-8"	14'-6"	13'-2"	11'-6"	13'-6"	12'-3"	10'-8"	12'-8"	11'-6"	9'-11"	12'-1"	10'-11"	9'-3"	11'-6"	10'-6"	8'-7"	10'-8"	9'-5"	7'-8"
	L/360	20'-2"	18'-4"	16'-0"	14'-0"	12'-8"	11'-1"	12'-8"	11'-6"	10'-1"	11'-9"	10'-8"	9'-4"	11'-1"	8'-9"	7'-10"	10'-6"	9'-7"	8'-4"	10'-1"	9'-2"	8'-0"	9'-4"	8'-6"	7'-5"
	L/600	17'-0"	15'-5"	13'-6"	11'-9"	10'-8"	9'-4"	10'-8"	9'-9"	8'-6"	9'-11"	9'-0"	7'-10"	9'-4"	8'-6"	7'-5"	8'-10"	8'-1"	7'-0"	8'-6"	6'-9"	7'-10"	7'-2"	6'-3"	
4CW14 (400S137-68)	L/240	24'-9"	22'-6"	19'-7"	17'-2"	15'-7"	13'-7"	15'-7"	14'-2"	12'-4"	14'-5"	13'-1"	11'-5"	13'-1"	11'-5"	10'-3"	12'-11"	11'-9"	10'-3"	12'-4"	11'-3"	9'-8"	11'-5"	10'-5"	8'-8"
	L/360	21'-7"	19'-7"	17'-2"	15'-0"	13'-7"	11'-10"	13'-7"	12'-4"	10'-9"	12'-7"	11'-5"	10'-0"	11'-10"	10'-9"	9'-5"	11'-3"	10'-3"	8'-11"	10'-9"	9'-9"	8'-7"	10'-0"	9'-1"	7'-11"
	L/600	18'-3"	16'-6"	14'-5"	12'-7"	11'-5"	10'-0"	11'-5"	10'-5"	9'-1"	10'-8"	9'-8"	8'-5"	10'-0"	9'-1"	7'-11"	9'-6"	8'-8"	7'-6"	9'-1"	8'-3"	7'-2"	8'-5"	7'-8"	6'-8"
4SW20 (400S162-33)	L/240	20'-8"	18'-9"	16'-4"	14'-3"	13'-0"	11'-4"	13'-0"	11'-9"	9'-11"	12'-1"	10'-10"	8'-10"	11'-4"	9'-11"	8'-1"	10'-7"	9'-2"	7'-6"	9'-11"	8'-7"	7'-0"	8'-10"	7'-8"	6'-3"
	L/360	18'-0"	16'-4"	14'-3"	12'-6"	11'-4"	9'-11"	11'-4"	10'-4"	9'-0"	10'-6"	9'-7"	8'-4"	9'-11"	9'-0"	7'-10"	9'-5"	8'-6"	7'-5"	9'-0"	8'-2"	7'-0"	8'-4"	7'-7"	6'-3"
	L/600	15'-2"	13'-10"	12'-1"	10'-6"	9'-7"	8'-4"	9'-7"	8'-8"	7'-7"	8'-10"	8'-1"	7'-0"	8'-4"	7'-0"	6'-7"	7'-11"	7'-2"	6'-3"	7'-7"	6'-11"	6'-0"	7'-0"	6'-5"	5'-7"
4SW18 (400S162-43)	L/240	22'-6"	20'-6"	17'-10"	15'-7"	14'-2"	12'-5"	14'-2"	12'-3"	11'-3"	13'-2"	11'-11"	10'-5"	12'-5"	11'-3"	9'-6"	11'-9"	10'-8"	8'-10"	11'-3"	10'-1"	8'-3"	10'-5"	9'-1"	7'-5"
	L/360	19'-8"	17'-10"	15'-7"	13'-8"	12'-5"	10'-10"	12'-5"	11'-3"	9'-10"	11'-6"	10'-5"	9'-1"	10'-10"	9'-10"	8'-7"	10'-3"	9'-4"	8'-2"	9'-10"	8'-11"	7'-9"	9'-1"	8'-3"	7'-3"
	L/600	16'-7"	15'-1"	13'-2"	11'-6"	10'-5"	9'-1"	10'-5"	9'-6"	8'-3"	9'-8"	8'-10"	7'-8"	9'-1"	8'-3"	7'-3"	8'-8"	7'-10"	6'-10"	8'-3"	7'-6"	6'-7"	7'-8"	7'-0"	6'-1"
4SW16 (400S162-54)	L/240	24'-3"	22'-0"	19'-2"	16'-9"	15'-3"	13'-4"	15'-3"	13'-10"	12'-1"	14'-2"	12'-10"	11'-3"	13'-4"	12'-1"	10'-7"	12'-8"	11'-6"	9'-11"	12'-1"	11'-0"	9'-3"	11'-3"	10'-2"	8'-4"
	L/360	21'-2"	19'-2"	16'-9"	14'-8"	13'-4"	11'-7"	13'-4"	12'-1"	10'-7"	12'-4"	11'-3"	9'-10"	11'-7"	10'-7"	9'-3"	11'-0"	10'-0"	8'-9"	10'-7"	9'-7"	8'-4"	9'-10"	8'-11"	7'-9"
	L/600	17'-10"	16'-2"	14'-2"	12'-4"	11'-3"	9'-10"	11'-3"	10'-2"	8'-11"	10'-5"	9'-5"	8'-3"	9'-10"	8'-11"	7'-9"	9'-4"	8'-5"	7'-4"	8'-11"	8'-1"	7'-1"	8'-3"	7'-6"	6'-6"
4SW14 (400S162-68)	L/240	25'-11"	23'-7"	20'-7"	18'-0"	16'-4"	14'-3"	16'-4"	14'-10"	12'-11"	15'-2"	13'-9"	12'-0"	14'-3"	12'-11"	11'-4"	13'-7"	12'-4"	10'-9"	12'-11"	11'-9"	10'-3"	12'-0"	10'-11"	9'-3"
	L/360	22'-8"	20'-7"	18'-0"	15'-8"	14'-3"	12'-5"	14'-3"	12'-11"	11'-4"	13'-3"	12'-0"	10'-6"	12'-5"	11'-4"	9'-11"	11'-10"	10'-9"	9'-5"	11'-4"	10'-3"	9'-0"	10'-6"	9'-6"	8'-4"
	L/600	19'-1"	17'-4"	15'-2"	13'-3"	12'-0"	10'-6"	12'-0"	10'-11"	9'-6"	11'-2"	10'-2"	8'-10"	10'-6"	9'-6"	8'-4"	10'-0"	9'-1"	7'-11"	9'-6"	8'-8"	7'-7"	8'-10"	8'-0"	7'-0"
4SW12 (400S162-97)	L/240	28'-8"	26'-1"	22'-9"	19'-11"	18'-1"	15'-9"	18'-1"	16'-5"	14'-4"	16'-9"	15'-3"	13'-4"	15'-9"	14'-4"	12'-6"	15'-0"	13'-7"	11'-11"	14'-4"	13'-0"	11'-4"	13'-4"	12'-1"	10'-7"
	L/360	25'-1"	22'-9"	19'-11"	17'-4"	15'-9"	13'-9"	15'-9"	14'-4"	12'-6"	14'-8"	13'-4"	11'-7"	13'-9"	12'-6"	10'-11"	13'-1"	11'-11"	10'-5"	12'-6"	11'-4"	9'-11"	11'-7"	10'-7"	9'-2"
	L/600	21'-2"	19'-2"	16'-9"	14'-8"	13'-4"	11'-7"	13'-4"	12'-1"	10'-7"	12'-4"	11'-3"	9'-9"	11'-7"	10'-7"	9'-2"	11'-0"	10'-0"	8'-9"	10'-7"	9'-7"	8'-4"	9'-9"	8'-11"	7'-9"
4SW10 (400S162-118)	L/240	30'-5"	27'-8"	24'-2"	21'-1"	19'-2"	16'-9"	19'-2"	17'-5"	15'-2"	17'-9"	16'-2"	14'-1"	16'-9"	15'-2"	13'-3"	15'-11"	14'-5"	12'-7"	15'-2"	13'-10"	12'-1"	14'-1"	12'-10"	11'-2"
	L/360	26'-7"	24'-24																						

LIMITING HEIGHTS, FT.

Limiting Height Tables

Member		Wind Load & Spacing																							
MW Type (SSMA)	Deflection	5 PSF			15 PSF			20 PSF			25 PSF			30 PSF			35 PSF			40 PSF			50 PSF		
		12"o.c.	16"o.c.	24"o.c.	12"o.c.	16"o.c.	24"o.c.	12"o.c.	16"o.c.	24"o.c.	12"o.c.	16"o.c.	24"o.c.	12"o.c.	16"o.c.	24"o.c.	12"o.c.	16"o.c.	24"o.c.	12"o.c.	16"o.c.	24"o.c.	12"o.c.	16"o.c.	24"o.c.
6" Members																									
6SW20 (600S162-33)	L/240	28'- 7"	26'- 0"	22'- 8"	19'- 10"	18'- 0"	15'- 9"	18'- 0"	16'- 4"	13'- 9"	16'- 9"	15'- 1"	12'- 3"	15'- 9"	13'- 9"	11'- 3"	14'- 8"	12'- 9"	10'- 5"	13'- 9"	11'- 11"	9'- 8"	12'- 3"	10'- 8"	8'- 8"
	L/360	25'- 0"	22'- 8"	19'- 10"	17'- 4"	15'- 9"	13'- 9"	15'- 9"	14'- 3"	12'- 6"	14'- 7"	13'- 3"	11'- 7"	13'- 9"	12'- 6"	10'- 11"	13'- 0"	11'- 10"	10'- 4"	12'- 6"	11'- 4"	9'- 8"	11'- 7"	10'- 6"	8'- 8"
	L/600	21'- 1"	19'- 2"	16'- 9"	14'- 7"	13'- 3"	11'- 7"	13'- 3"	12'- 0"	10'- 6"	12'- 4"	11'- 2"	9'- 9"	11'- 7"	10'- 6"	9'- 2"	11'- 0"	10'- 0"	8'- 9"	10'- 6"	9'- 7"	8'- 4"	9'- 9"	8'- 10"	7'- 9"
6SW18 (600S162-43)	L/240	31'- 2"	28'- 4"	24'- 9"	21'- 7"	19'- 7"	17'- 2"	19'- 7"	17'- 10"	15'- 7"	18'- 2"	16'- 6"	14'- 5"	17'- 2"	15'- 7"	13'- 7"	16'- 3"	14'- 9"	12'- 7"	15'- 7"	14'- 2"	11'- 9"	14'- 5"	12'- 10"	10'- 6"
	L/360	27'- 3"	24'- 9"	21'- 7"	18'- 10"	17'- 2"	14'- 11"	17'- 2"	15'- 7"	13'- 7"	15'- 11"	14'- 5"	12'- 7"	14'- 11"	13'- 7"	11'- 10"	14'- 2"	12'- 11"	11'- 3"	13'- 7"	12'- 4"	10'- 9"	12'- 7"	11'- 5"	10'- 0"
	L/600	22'- 11"	20'- 10"	18'- 2"	15'- 11"	14'- 5"	12'- 7"	14'- 5"	13'- 1"	11'- 5"	13'- 5"	12'- 2"	10'- 8"	12'- 7"	11'- 5"	10'- 0"	12'- 0"	10'- 11"	9'- 6"	11'- 5"	10'- 5"	9'- 1"	10'- 8"	9'- 8"	8'- 5"
6SW16 (600S162-54)	L/240	33'- 5"	30'- 4"	26'- 6"	23'- 2"	21'- 1"	18'- 5"	21'- 1"	19'- 1"	16'- 8"	19'- 6"	17'- 9"	15'- 6"	18'- 5"	16'- 8"	14'- 7"	17'- 5"	15'- 10"	13'- 10"	16'- 8"	15'- 2"	13'- 3"	15'- 6"	14'- 1"	11'- 10"
	L/360	29'- 2"	26'- 6"	23'- 2"	20'- 3"	18'- 5"	16'- 1"	18'- 5"	16'- 8"	14'- 7"	17'- 1"	15'- 6"	13'- 6"	16'- 1"	14'- 7"	12'- 9"	15'- 3"	13'- 10"	12'- 1"	14'- 7"	13'- 3"	11'- 7"	13'- 6"	12'- 3"	10'- 9"
	L/600	24'- 7"	22'- 4"	19'- 6"	17'- 1"	15'- 6"	13'- 6"	15'- 6"	14'- 1"	12'- 3"	14'- 5"	13'- 1"	11'- 5"	13'- 6"	12'- 3"	10'- 9"	12'- 10"	11'- 8"	10'- 2"	12'- 3"	11'- 2"	9'- 9"	11'- 5"	10'- 4"	9'- 1"
6SW14 (600S162-68)	L/240	35'- 10"	32'- 7"	28'- 5"	24'- 10"	22'- 7"	19'- 8"	22'- 7"	20'- 6"	17'- 11"	20'- 11"	19'- 0"	16'- 7"	19'- 8"	17'- 11"	15'- 8"	18'- 9"	17'- 0"	14'- 10"	17'- 11"	16'- 3"	14'- 2"	16'- 7"	15'- 1"	13'- 2"
	L/360	31'- 4"	28'- 5"	24'- 10"	21'- 8"	19'- 8"	17'- 3"	19'- 8"	17'- 11"	15'- 8"	18'- 3"	16'- 7"	14'- 6"	17'- 3"	15'- 8"	13'- 8"	16'- 4"	14'- 10"	13'- 0"	15'- 8"	14'- 2"	12'- 5"	14'- 6"	13'- 2"	11'- 6"
	L/600	26'- 5"	24'- 0"	20'- 11"	18'- 3"	16'- 7"	14'- 6"	16'- 7"	15'- 1"	13'- 2"	15'- 5"	14'- 0"	12'- 3"	14'- 6"	13'- 2"	11'- 6"	13'- 9"	12'- 6"	10'- 11"	13'- 2"	12'- 0"	10'- 5"	12'- 3"	11'- 1"	9'- 8"
6SW12 (600S162-97)	L/240	39'- 9"	36'- 1"	31'- 6"	27'- 6"	25'- 0"	21'- 10"	25'- 0"	22'- 9"	19'- 10"	23'- 3"	21'- 1"	18'- 5"	21'- 10"	19'- 10"	17'- 4"	20'- 9"	18'- 10"	16'- 6"	19'- 10"	18'- 0"	15'- 9"	18'- 5"	16'- 9"	14'- 7"
	L/360	34'- 8"	31'- 6"	27'- 6"	24'- 1"	21'- 10"	19'- 1"	21'- 10"	19'- 10"	17'- 4"	20'- 3"	18'- 5"	16'- 1"	19'- 1"	17'- 4"	15'- 2"	18'- 1"	16'- 6"	14'- 4"	17'- 4"	15'- 9"	13'- 9"	16'- 1"	14'- 7"	12'- 9"
	L/600	29'- 3"	26'- 7"	23'- 3"	20'- 3"	18'- 5"	16'- 1"	18'- 5"	16'- 9"	14'- 7"	17'- 1"	15'- 6"	13'- 7"	16'- 1"	14'- 7"	12'- 9"	15'- 3"	13'- 11"	12'- 1"	14'- 7"	13'- 3"	11'- 7"	13'- 7"	12'- 4"	10'- 9"
6SW10 (600S162-118)	L/240	42'- 3"	38'- 4"	33'- 6"	29'- 3"	26'- 7"	23'- 3"	26'- 7"	24'- 2"	21'- 1"	24'- 8"	22'- 5"	19'- 7"	23'- 3"	21'- 1"	18'- 5"	22'- 1"	20'- 0"	17'- 6"	21'- 1"	19'- 2"	16'- 9"	19'- 7"	17'- 9"	15'- 6"
	L/360	36'- 10"	33'- 6"	29'- 3"	25'- 7"	23'- 3"	20'- 3"	23'- 3"	21'- 1"	18'- 5"	21'- 7"	19'- 7"	17'- 1"	20'- 3"	18'- 5"	16'- 1"	19'- 3"	17'- 6"	15'- 3"	18'- 5"	16'- 9"	14'- 7"	17'- 1"	15'- 6"	13'- 7"
	L/600	31'- 1"	28'- 3"	24'- 8"	21'- 7"	19'- 7"	17'- 1"	19'- 7"	17'- 9"	15'- 6"	18'- 2"	16'- 6"	14'- 5"	17'- 1"	15'- 6"	13'- 7"	16'- 3"	14'- 9"	12'- 11"	15'- 6"	14'- 1"	12'- 4"	14'- 5"	13'- 1"	11'- 5"
8" Members																									
8CW20* (800S137-33)	L/240	34'- 8"	31'- 6"	27'- 6"	24'- 1"	20'- 11"	17'- 1"	20'- 11"	18'- 2"	14'- 10"	18'- 9"	16'- 2"	13'- 3"	17'- 1"	14'- 10"	12'- 1"	15'- 10"	13'- 8"	13'- 6"	14'- 10"	12'- 10"	11'- 10"	13'- 3"	14'- 2"	9'- 5"
	L/360	30'- 4"	27'- 6"	24'- 1"	21'- 0"	19'- 1"	16'- 8"	19'- 1"	17'- 4"	14'- 10"	17'- 8"	16'- 1"	13'- 3"	16'- 8"	14'- 10"	12'- 1"	15'- 10"	13'- 8"	11'- 2"	14'- 10"	12'- 10"	11'- 10"	13'- 3"	14'- 1"	9'- 5"
	L/600	25'- 7"	23'- 3"	20'- 3"	17'- 8"	16'- 1"	14'- 1"	16'- 1"	14'- 7"	12'- 9"	14'- 11"	13'- 7"	11'- 10"	14'- 1"	12'- 9"	11'- 2"	13'- 4"	12'- 1"	10'- 7"	12'- 9"	11'- 7"	10'- 1"	11'- 10"	10'- 9"	9'- 4"
8CW18 (800S137-43)	L/240	37'- 10"	34'- 4"	30'- 0"	26'- 2"	23'- 10"	20'- 9"	23'- 10"	21'- 7"	18'- 5"	22'- 1"	20'- 1"	16'- 6"	20'- 9"	18'- 5"	15'- 0"	19'- 8"	17'- 0"	13'- 11"	18'- 5"	15'- 11"	13'- 0"	16'- 6"	14'- 3"	11'- 8"
	L/360	33'- 0"	30'- 0"	26'- 2"	22'- 11"	20'- 9"	18'- 2"	20'- 9"	18'- 11"	16'- 6"	19'- 3"	17'- 6"	15'- 4"	18'- 2"	16'- 6"	14'- 5"	17'- 3"	15'- 8"	13'- 8"	16'- 6"	15'- 0"	13'- 0"	15'- 4"	13'- 11"	11'- 8"
	L/600	27'- 10"	25'- 3"	22'- 1"	19'- 3"	17'- 6"	15'- 4"	17'- 6"	15'- 11"	13'- 11"	16'- 3"	14'- 9"	12'- 11"	15'- 4"	13'- 11"	12'- 2"	14'- 6"	13'- 2"	11'- 6"	13'- 11"	12'- 7"	11'- 0"	12'- 11"	11'- 9"	10'- 3"
8CW16 (800S137-54)	L/240	40'- 7"	36'- 10"	32'- 2"	28'- 1"	25'- 7"	22'- 4"	25'- 7"	23'- 2"	20'- 3"	23'- 9"	21'- 6"	18'- 10"	22'- 4"	20'- 3"	17'- 8"	21'- 2"	19'- 3"	16'- 7"	20'- 3"	18'- 5"	15'- 6"	18'- 10"	16'- 11"	13'- 10"
	L/360	35'- 5"	32'- 2"	28'- 1"	24'- 7"	22'- 4"	19'- 6"	22'- 4"	20'- 3"	17'- 8"	20'- 8"	18'- 10"	16'- 5"	19'- 6"	17'- 8"	15'- 5"	18'- 6"	16'- 10"	14'- 8"	17'- 8"	16'- 5"	14'- 0"	16'- 5"	14'- 11"	13'- 0"
	L/600	29'- 11"	27'- 2"	23'- 9"	20'- 8"	18'- 10"	16'- 5"	18'- 10"	17'- 1"	14'- 11"	17'- 5"	15'- 10"	13'- 10"	16'- 5"	14'- 11"	13'- 0"	15'- 7"	14'- 2"	12'- 4"	14'- 11"	13'- 7"	11'- 10"	13'- 10"	12'- 7"	11'- 0"
8CW14 (800S137-68)	L/240	43'- 6"	39'- 6"	34'- 6"	30'- 2"	27'- 5"	23'- 11"	27'- 5"	24'- 11"	21'- 9"	25'- 5"	23'- 1"	20'- 2"	23'- 11"	21'- 9"	19'- 0"	22'- 9"	20'- 8"	18'- 0"	21'- 9"	19'- 9"	17'- 3"	20'- 2"	18'- 4"	15'- 7"
	L/360	38'- 0"	34'- 6"	30'- 2"	26'- 4"	23'- 11"	20'- 11"	23'- 11"	21'- 9"	19'- 0"	22'- 3"	20'- 2"	17'- 7"	20'- 11"	19'- 0"	16'- 7"	19'- 10"	18'- 0"	15'- 9"	19'- 0"	17'- 3"	15'- 1"	17'- 7"	16'- 0"	14'- 0"
	L/600	32'- 1"	29'- 1"	25'- 5"	22'- 3"	20'- 2"	17'- 7"	20'- 2"	18'- 4"	16'- 0"	18'- 9"	17'- 0"	14'- 10"	17'- 7"	16'- 0"	14'- 0"	16'- 9"	15'- 2"	13'- 3"	16'- 0"	14'- 6"	12'- 8"	14'- 10"	13'- 6"	11'- 9"
8SW20* (800S162-33)	L/240	36'- 0"	32'- 9"	28'- 7"	25'- 0"	22'- 4"	18'- 2"	22'- 4"	19'- 4"	15'- 9"	19'- 11"	17'- 3"	14'- 1"	18'- 2"	15'- 9"	12'- 10"	16'- 10"	14'- 7"	13'- 6"	15'- 9"	13'- 8"	11'- 10"	14'- 1"	14'- 2"	9'- 5"
	L/360	31'- 6"	28'- 7"	25'- 0"	21'- 10"	19'- 10"	17'- 4"	19'- 10"	18'- 0"	15'- 9"	18'- 5"	16'- 8"	14'- 1"	17'- 4"	15'- 9"	12'- 10"	16'- 5"	14'- 7"	11'- 11"	15'- 9"	13'- 8"	11'- 10"	14'- 1"	12'- 2"	9'- 5"
	L/600	26'- 6"	24'- 1"	21'- 1"	18'- 5"	16'- 8"	14'- 7"	16'- 8"	15'- 2"	13'- 3"	15'- 6"	14'- 1"	12'- 4"	14'- 7"	13'- 3"	11'- 7"	13'- 10"	12'- 7"	11'- 0"	13'- 3"	12'- 0"	10'- 6"	12'- 4"	11'- 2"	9'- 5"
8SW18 (800S162-43)	L/240	39'- 3"	35'- 8"	31'- 2"	27'- 3"	24'- 9"	21'- 7"	24'- 9"	22'- 5"	19'- 6"	22'- 11"	20'- 10"	17'- 5"	21'- 7"	19'- 6"	15'- 11"	20'- 6"	18'- 0"	14'- 9"	19'- 6"	16'- 10"	13'- 9"	17'- 5"	15'- 1"	12'- 4"
	L/360	34'- 4"	31'- 2"	27'- 3"	23'- 9"	21'- 7"	18'- 10"	21'- 7"	19'- 7"	17'- 2"	20'- 0"	18'- 2"	15'- 11"	18'- 10"	17'- 2"	14'- 11"	17'- 11"	16'- 3"	14'- 2"	17'- 2"	15'- 7"	13'- 7"	15'- 11"	14'- 5"	12'- 4"
	L/600	28'- 11"	26'- 3"	22'- 11"	20'- 0"	18'- 2"	15'- 11"	18'- 2"	16'- 6"	14'- 5"	16'- 11"	15'- 4"	13'- 5"	15'- 11"	14'- 5"	12'- 7"	15'- 1"	13'- 9"	12'- 0"	14'- 5"	13'- 1"	11'- 5"	13'- 5"	12'- 2"	10'- 8"
8SW16 (800S162-54)	L/240	42'- 2"	38'- 4"	33'- 6"	29'- 3"	26'- 7"	23'- 2"	26'- 7"	24'- 1"	21'- 1"	24'- 8"	22'- 5"	19'- 7"	23'- 2"	21'- 1"	18'- 5"	22'- 0"	20'- 0"	17'- 4"	21'- 1"	19'- 2"	16'- 3"	19'- 7"	17'- 9"	14'- 6"
	L/360	36'- 10"	33'- 6"	29'- 3"	25'- 6"	23'- 2"	20'- 3"	23'- 2"	21'- 1"	18'- 5"	21'- 6"	19'- 7"	17'- 1"	20'- 3"	18'- 5"	16'- 1"	19'- 3"	17'- 6"	15'- 3"	18'- 5"	16'- 9"	14'- 7"	17'- 1"	15'- 6"	13'- 7"
	L/600	31'- 1"	28'- 3"	24'- 8"	21'- 6"	19'- 7"	17'- 1"	19'- 7"	17'- 9"	15'- 6"	18'- 2"	16'- 6"	14'- 5"	17'- 1"	15'- 6"	13'- 7"	16'- 3"	14'- 9"	12'- 10"	15'- 6"	14'- 1"	12'- 4"	14'- 5"	13'- 1"	11'- 5"
8SW14 (800S162-68)	L/240	45'- 3"	41'- 1"	35'- 11"	31'- 4"	28'- 6"	24'- 11"	28'- 6"	25'- 11"	22'- 7"	26'- 5"	24'- 0"	21'- 0"	24'- 11"	22'- 7"	19'- 9"	23'- 8"	21'- 6"	18'- 9"	22'- 7"	20'- 6"	17'- 11"	21'- 0"	19'- 1"	16'- 4"
	L/360	39'- 6"	35'- 11"	31'- 4"	27'- 5"	24'- 11"	21'- 9"	24'- 11"	222																

Limiting Height Tables

Member		Wind Load & Spacing																							
MW Type (SSMA)	Deflection	5 PSF			15 PSF			20 PSF			25 PSF			30 PSF			35 PSF			40 PSF			50 PSF		
		12"o.c.	16"o.c.	24"o.c.	12"o.c.	16"o.c.	24"o.c.	12"o.c.	16"o.c.	24"o.c.	12"o.c.	16"o.c.	24"o.c.	12"o.c.	16"o.c.	24"o.c.	12"o.c.	16"o.c.	24"o.c.	12"o.c.	16"o.c.	24"o.c.	12"o.c.	16"o.c.	24"o.c.
12" Members																									
12SW16* (1200S162-54)	L/240	59'-0"	53'-8"	46'-10"	40'-11"	37'-2"	32'-0"	37'-2"	33'-9"	27'-8"	34'-6"	30'-4"	24'-9"	32'-0"	27'-8"	22'-7"	29'-7"	25'-8"	20'-11"	27'-8"	24'-0"	19'-7"	24'-9"	21'-5"	17'-6"
	L/360	51'-7"	46'-10"	40'-11"	35'-9"	32'-6"	28'-4"	32'-6"	29'-6"	25'-9"	30'-2"	27'-5"	23'-11"	28'-4"	25'-9"	22'-6"	26'-11"	24'-6"	20'-11"	25'-9"	23'-5"	19'-7"	23'-11"	21'-5"	17'-6"
	L/600	43'-6"	39'-6"	34'-6"	30'-2"	27'-5"	23'-11"	27'-5"	24'-10"	21'-9"	25'-5"	23'-1"	20'-2"	23'-11"	21'-9"	19'-0"	22'-9"	20'-8"	18'-0"	21'-9"	19'-9"	17'-3"	20'-2"	18'-4"	16'-0"
12SW14 (1200S162-68)	L/240	63'-5"	57'-8"	50'-4"	44'-0"	39'-11"	34'-11"	39'-11"	36'-4"	31'-8"	37'-1"	33'-8"	29'-3"	34'-11"	31'-8"	26'-8"	33'-2"	30'-1"	24'-8"	31'-8"	28'-4"	23'-1"	29'-3"	25'-4"	20'-8"
	L/360	55'-5"	50'-4"	44'-0"	38'-5"	34'-11"	30'-6"	34'-11"	31'-8"	27'-8"	32'-5"	29'-5"	25'-8"	30'-6"	27'-8"	24'-2"	28'-11"	26'-4"	23'-0"	27'-8"	25'-2"	22'-0"	25'-8"	23'-4"	20'-5"
	L/600	46'-9"	42'-6"	37'-1"	32'-5"	29'-5"	25'-8"	29'-5"	26'-9"	23'-4"	27'-4"	24'-10"	21'-8"	25'-8"	23'-4"	20'-5"	24'-5"	22'-2"	19'-4"	23'-4"	21'-3"	18'-6"	21'-8"	19'-8"	17'-2"
12SW12 (1200S162-97)	L/240	70'-8"	64'-2"	56'-1"	49'-0"	44'-6"	38'-10"	44'-6"	40'-5"	35'-4"	41'-4"	37'-6"	32'-9"	38'-10"	35'-4"	30'-10"	36'-11"	33'-7"	29'-4"	35'-4"	32'-1"	28'-0"	32'-9"	29'-9"	26'-0"
	L/360	61'-9"	56'-1"	49'-0"	42'-9"	38'-10"	33'-11"	38'-10"	35'-4"	30'-10"	36'-1"	32'-9"	28'-8"	33'-11"	30'-10"	26'-11"	32'-3"	29'-4"	25'-7"	30'-10"	28'-0"	24'-6"	28'-8"	26'-0"	22'-9"
	L/600	52'-1"	47'-4"	41'-4"	36'-1"	32'-9"	28'-8"	32'-9"	29'-9"	26'-0"	30'-5"	27'-8"	24'-2"	28'-8"	26'-0"	22'-9"	27'-2"	24'-8"	21'-7"	26'-0"	23'-8"	20'-8"	24'-2"	21'-11"	19'-2"
12SW10 (1200S162-118)	L/240	75'-5"	68'-6"	59'-10"	52'-3"	47'-6"	41'-6"	47'-6"	43'-2"	37'-8"	44'-1"	40'-1"	35'-0"	41'-6"	37'-8"	32'-11"	39'-5"	35'-10"	31'-3"	37'-8"	34'-3"	29'-11"	35'-0"	31'-9"	27'-9"
	L/360	65'-11"	59'-10"	52'-3"	45'-8"	41'-6"	36'-3"	41'-6"	37'-8"	32'-11"	38'-6"	35'-0"	30'-7"	36'-3"	32'-11"	28'-9"	34'-5"	31'-3"	27'-4"	32'-11"	29'-11"	26'-1"	30'-7"	27'-9"	24'-3"
	L/600	55'-7"	50'-6"	44'-1"	38'-6"	35'-0"	30'-7"	35'-0"	31'-9"	27'-9"	32'-6"	29'-6"	25'-9"	30'-7"	27'-9"	24'-3"	29'-0"	26'-4"	23'-0"	27'-9"	25'-3"	22'-0"	25'-9"	23'-5"	20'-5"

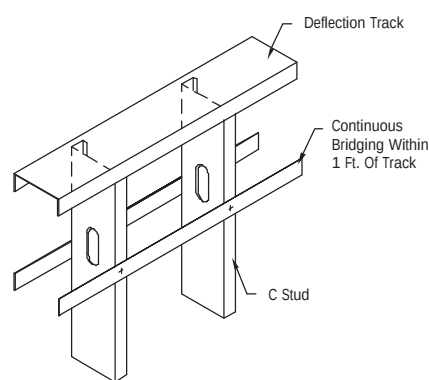
* = Exceeds the H/T ratio of 200

DEFLECTION TRACK

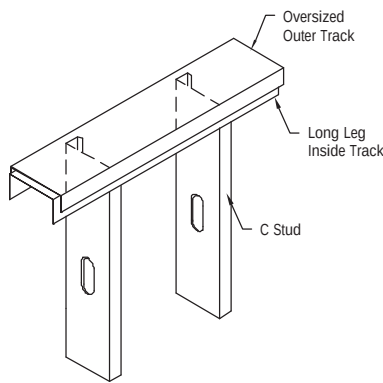
DEFLECTION TRACK

NOTES:

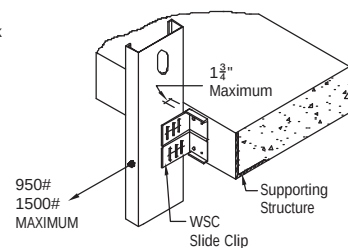
- Curtain wall deflection tracks may be required to accommodate the deflection of floor beams or floor decks above curtain wall or interior partitions. Deflection tracks cannot be used in axial load bearing stud conditions or above continuous windows spandrels.
- Deflection track details must be designed for the specific conditions of a building to accommodate the required deflection and the end reactions of the studs. The deep leg tracks are not standard and the gauge width and leg height must be specified for each particular application. All detailing and connections should be specified by a qualified engineer or architect.



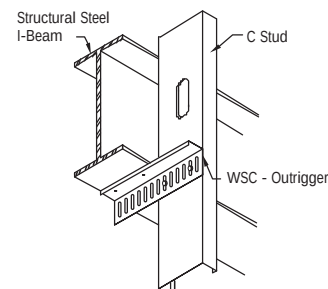
SINGLE TRACK CONDITION



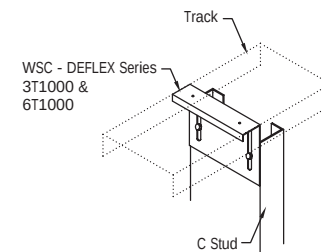
DOUBLE TRACK CONDITION



WSC-950 & WSC-1500



WSC-OUTRIGGER



WSC-DEFLEX SERIES

CURTAINWALL: WSC SLIDE CLIPS

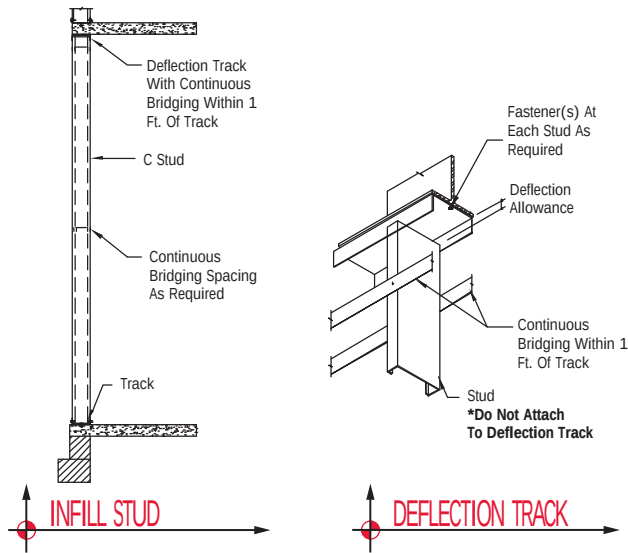
WSC SLIDE CLIP FAMILY

NOTES:

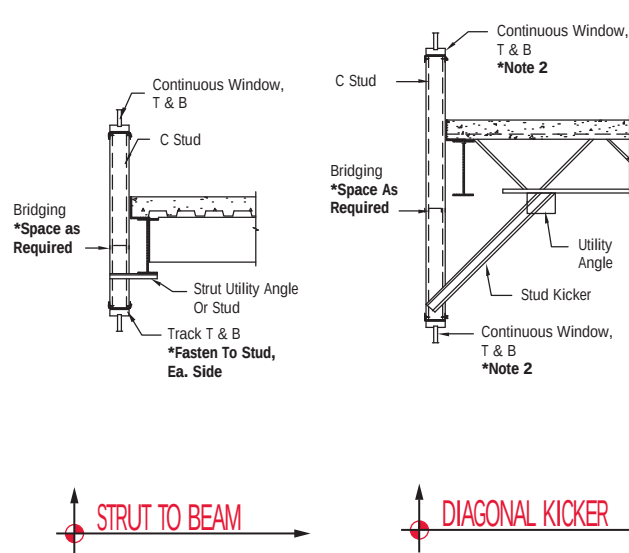
- Screw connections from WSC-950 and WSC-1500 slide clips to the stud must always be done in pairs i.e. if one screw is required to overcome the load, minimum of two screws shall be used. Screws shall be installed in equal numbers in the upper and lower slots.
- Screws shall be located in the center of the vertical slots to allow for vertical movement in either direction, or at the bottom of the vertical slot for downward vertical movement at the roof level.
- Maximum vertical displacement shall not exceed $\frac{3}{4}$ " at intermediate floors in multiple story buildings and $1\frac{1}{2}$ " at the roof level.
- Connections from all WSC Slide Clips to the supporting structure shall be accomplished by using PAFs, screws or welds. A minimum of two PAFs or screws shall be used.
- Maximum capacity of all WSC Slide Clips shall not exceed amount stated. Actual capacity will vary depending upon the capacity of the fastening method to the supporting structure.
- Screw connections from all WSC Slide Clips shall be installed snug with underside of the screw head against the slide clip.
- Maximum allowable tolerance from the slab edge angle to the stud flange shall not exceed $1\frac{3}{4}$ " for the WSC-950 & WSC-1500.

CURTAINWALL ILLUSTRATIONS

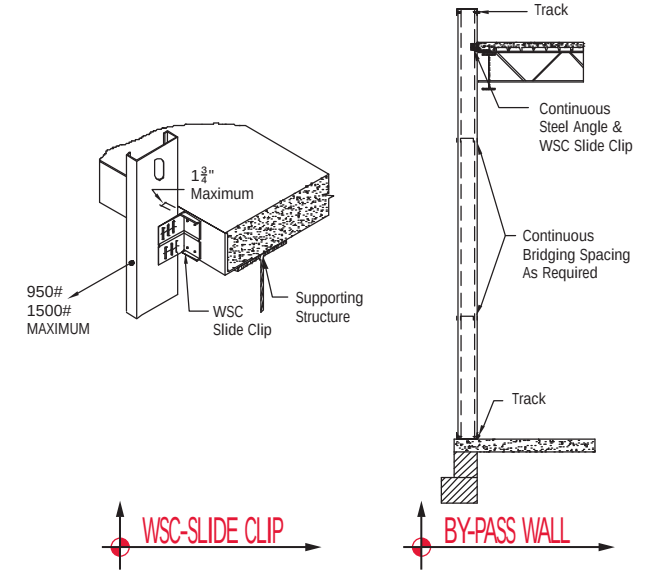
INFILL WALL APPLICATION



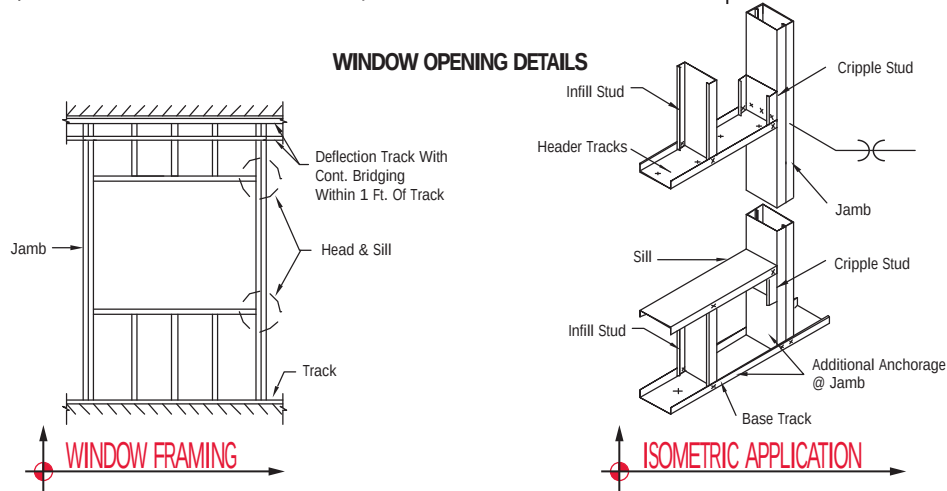
SPANDREL APPLICATION



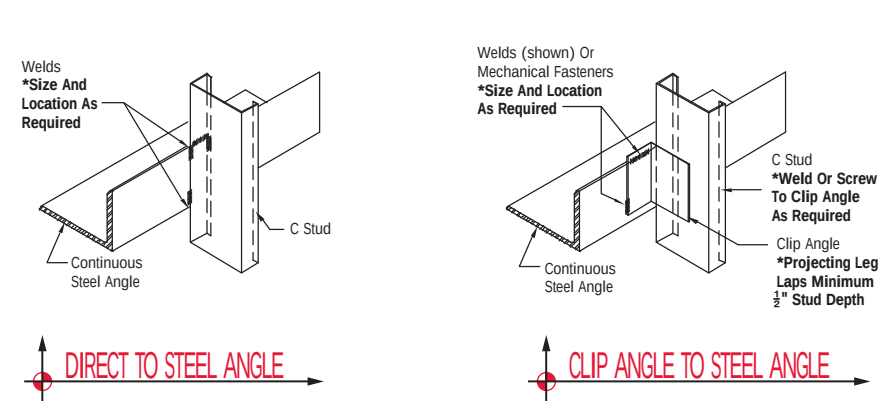
BY-PASS WALL APPLICATION



WINDOW OPENING DETAILS



GRAVITY/LATERAL ATTACHMENT ALTERNATIVES



NOTES:

1. Size, spacing and anchorage of framing components shall be qualified by design.
2. Vertical deflection of the primary frame shall be accommodated in the window head.

AXIAL APPLICATIONS:

For selection of studs, braced by mechanical bridging spaced not to exceed 4 feet on center, which are subjected to axial load in the presence or absence of uniform lateral wind loads.

USE:

Select a stud, in terms of spacing(inches o.c.), lateral load(psf), and height(ft) which provides an allowable axial load, in kips per stud, equal to or greater than the applied axial load.

Deflections due to lateral loads do not exceed $L/720$ unless the following subscripted values are shown:

- Values followed by the subscript (6) do not exceed $L/600$
- Values followed by the subscript (3) do not exceed $L/360$
- Values followed by the subscript (2) do not exceed $L/240$
- $L/240$ is exceeded where load values have been omitted.

NOTES:

- Allowable axial load values for 16 gauge studs are based on steel with F_y (min) = 50 ksi.
- The values represent the least allowable axial load of the stud in the presence or absence of lateral load. A minimum live load to dead load ratio of 2:1 has been assumed in the preparation of these tables. A stress increase of 33 $\frac{1}{3}$ % has been incorporated (where permissible) on live and wind loads only. For conditions where live loads do not exist or where live load to dead load ratios is less than 2:1, contact MarinoWare's Technical Services Department.
- Values assume axial loads are applied concentrically to the stud.
- Studs shall be braced against rotation before loading. Install bridging spaced at intervals not exceeding 4'-0" on center. Refer to page 25 for bridging types and installation methods.
- Stud ends shall be attached to each side of continuous track by welds or screws before loading. Refer to page 20 for attachment alternatives. Stud ends shall be installed seated squarely against the web (within $\frac{1}{16}$ ") of the tracks to assure transfer of axial load. See reference page 31, Specification Section 3.5, for additional information.
- Deflections and allowable stresses were calculated without regard to the composite contribution of sheathing products.
- Contact MarinoWare for allowable capacities of framing components not shown in these tables.
- Minimum order requirements may apply to some sections shown in these tables.

DIAGONAL RACKING BRACING

Diagonal bracing and connections must be designed for the specific conditions of a building.

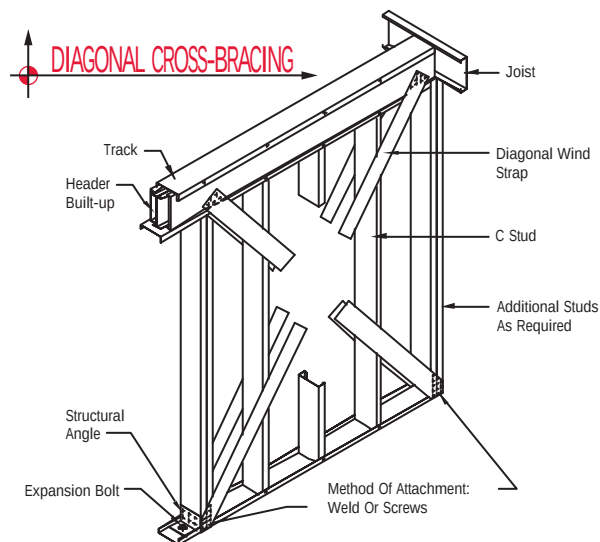
For allowable load capacities of MarinoWare members and assistance in developing connections, please contact MarinoWare's Technical Services Department. Buildings must be properly braced to resist racking under wind and seismic loads. In steel-framed construction, diagonal strap bracing offers an economical and effective means to provide this resistance. Straps are sloped to resist racking forces in tension. They are installed over framing members and easily covered with facing materials. Diagonal strap ends are secured by screws or welded to transfer the tension loads to the wall framing and floor assembly. End connections must be designed to transfer accumulated design loads. At the foundation, floor anchors must be adequate to prevent uplift and horizontal shear. Splicing of strapping is not recommended.

APPLICATION:

For selection of Flat Strap (FS) subjected to tension loads in shear wall assemblies or miscellaneous applications.

USE:

Select a flat strap which provides an allowable tensile capacity equal to or greater than the applied tension load.



Cross Bracing: Allowable Tension Capacity

Flat strap bracing	Area	Pa	Pa
(thickness)	(in. ²)	with 1/3 increase (kip)	without 1/3 increase (kip)
2" X 18ga (43mil)	0.0902	2.38	1.78
4" X 18ga (43mil)	0.1804	4.76	3.57
2" X 16ga (54mil)	0.1132	4.52	3.39
4" X 16ga (54mil)	0.2264	9.05	6.79
2" X 14ga (68mil)	0.1426	5.70	4.28
4" X 14ga (68mil)	0.2852	11.41	8.56

NOTES:

- Strap end connections shall be designed to transfer the tensile load.
- 20 and 18 gauge strap: F_y (min) = 33 KSI
16 and 14 gauge strap: F_y (min) = 50 KSI



AXIAL LOADS, KIPS

Allowable Axial Loads

3-5/8" Members							Wind Load = 5psf						
Height	Spacing	MarinoWare - (SSMA)											
		3-5/8SW-gauge - (362S162-mils)						3-5/8J-gauge - (362S200-mils)					
		20-(33)	18-(43)	16-(54)	14-(68)	12-(97)	10-(118)	20-(33)	18-(43)	16-(54)	14-(68)	12-(97)	10-(118)
		33ksi	33ksi	50ksi	50ksi	50ksi	50ksi	33ksi	33ksi	50ksi	50ksi	50ksi	50ksi
8ft.	12"	2.09	2.85	4.28	5.45	7.82	9.86	2.49	3.51	5.34	6.76	9.49	11.75
	16"	2.09	2.85	4.28	5.45	7.82	9.86	2.49	3.51	5.34	6.76	9.49	11.75
	24"	2.09	2.85	4.28	5.45	7.82	9.86	2.49	3.51	5.34	6.76	9.49	11.75
9ft.	12"	2.02	2.75	4.05	5.12	7.32	9.18	2.41	3.37	5.03	6.33	8.85	10.92
	16"	2.02	2.75	4.05	5.12	7.32	9.18	2.41	3.37	5.03	6.33	8.85	10.92
	24"	1.88	2.75	4.05	5.12	7.32	9.18	2.32	3.37	5.03	6.33	8.85	10.92
10ft.	12"	1.93	2.64	3.79	4.76	6.76	8.44	2.32	3.22	4.68	5.85	8.15	10.03
	16"	1.87	2.64	3.79	4.76	6.76	8.44	2.30	3.22	4.68	5.85	8.15	10.03
	24"	1.66	2.48	3.79	4.76	6.76	8.44	2.06	3.14	4.68	5.85	8.15	10.03
11ft.	12"	1.79	2.51	3.48	4.35	6.15	7.65	2.21	3.05	4.31	5.35	7.43	9.11
	16"	1.66	2.44	3.48	4.35	6.15	7.65	2.06	3.05	4.31	5.35	7.43	9.11
	24"	1.43(6)	2.19	3.43	4.35	6.15	7.65	1.80	2.79	4.31	5.35	7.43	9.11
12ft.	12"	1.59	2.33	3.17	3.95	5.53	6.83	1.98	2.88	3.90	4.82	6.67	8.15
	16"	1.45	2.17	3.17	3.95	5.53	6.83	1.82	2.74	3.90	4.82	6.67	8.15
	24"	1.20(3)	1.89(6)	2.96	3.88	5.53	6.83	1.54(3)	2.43	3.75	4.82	6.67	8.15
14ft.	12"	1.21(6)	1.82	2.59	3.23	4.47	5.44	1.53	2.29	3.18	3.92	5.39	6.54
	16"	1.06(3)	1.65(6)	2.44	3.17	4.47	5.44	1.35(3)	2.10(6)	3.06	3.92	5.39	6.54
	24"	0.80(2)	1.35(3)	2.17(3)	2.89(6)	4.27	5.36	1.05(3)	1.78(3)	2.77(3)	3.69	5.39	6.54
16ft.	12"	0.88(3)	1.36(3)	1.99(6)	2.57	3.64	4.39	1.12(3)	1.74(6)	2.48	3.21	4.39	5.30
	16"	0.73(2)	1.20(3)	1.84(3)	2.41(6)	3.52	4.37	0.95(3)	1.56(3)	2.32(3)	3.06	4.39	5.30
	24"	0.91(2)	1.58(2)	2.14(3)	3.21(3)	4.03(6)	4.03(6)	0.65(2)	1.24(2)	2.03(3)	2.77(3)	4.11(6)	5.13

3-5/8" Members							Wind Load = 15psf						
Height	Spacing	MarinoWare - (SSMA)											
		3-5/8SW-gauge - (362S162-mils)						3-5/8J-gauge - (362S200-mils)					
		20-(33)	18-(43)	16-(54)	14-(68)	12-(97)	10-(118)	20-(33)	18-(43)	16-(54)	14-(68)	12-(97)	10-(118)
		33ksi	33ksi	50ksi	50ksi	50ksi	50ksi	33ksi	33ksi	50ksi	50ksi	50ksi	50ksi
8ft.	12"	1.89	2.80	4.28	5.45	7.82	9.86	2.33	3.51	5.34	6.76	9.49	11.75
	16"	1.69	2.59	4.28	5.45	7.82	9.86	2.11	3.33	5.34	6.76	9.49	11.75
	24"	1.32(3)	2.20(6)	3.97	5.35	7.82	9.86	1.70(6)	2.91	5.16	6.76	9.49	11.75
9ft.	12"	1.63	2.50	4.05	5.12	7.32	9.18	2.04	3.19	5.03	6.33	8.85	10.92
	16"	1.40(3)	2.25	3.86	5.12	7.32	9.18	1.78(6)	2.93	4.95	6.33	8.85	10.92
	24"	0.97(3)	1.79(3)	3.40(6)	4.65	7.13	9.18	1.31(3)	2.43(3)	4.45	6.07	8.85	10.92
10ft.	12"	1.37(3)	2.17	3.61	4.76	6.76	8.44	1.74(6)	2.81	4.60	5.85	8.15	10.03
	16"	1.11(3)	1.89(3)	3.34(6)	4.46	6.74	8.44	1.45(3)	2.50(6)	4.30	5.76	8.15	10.03
	24"	0.94(2)	1.38(3)	2.83(3)	3.93(3)	6.12	7.94	0.84(2)	1.95(3)	3.74(3)	5.20(6)	7.86	10.00
11ft.	12"	1.11(3)	1.85(3)	3.10(6)	4.12	6.15	7.65	1.45(3)	2.42(6)	3.99	5.29	7.43	9.11
	16"	0.83(2)	1.54(3)	2.81(3)	3.80(6)	5.80	7.43	1.13(3)	2.08(3)	3.66(6)	4.95	7.37	9.11
	24"	0.89(2)	2.28(2)	3.24(3)	5.14(3)	6.71(6)	0.19(2)	1.49(2)	3.07(3)	4.36(3)	6.71(6)	8.57	
12ft.	12"	0.87(2)	1.53(3)	2.62(3)	3.51(6)	5.28	6.71	1.17(3)	2.04(3)	3.38(6)	4.53	6.67	8.15
	16"	0.41(2)	1.21(2)	2.32(3)	3.19(3)	4.91(6)	6.30	0.76(2)	1.69(3)	3.04(3)	4.19(3)	6.31	7.97
	24"	0.41(2)	1.21(2)	2.32(3)	3.19(3)	4.91(6)	6.30	0.76(2)	1.69(3)	3.04(3)	4.19(3)	6.31	7.97
14ft.	12"	0.98(2)	1.83(2)	2.52(3)	3.85(3)	4.90(6)	0.56(2)	1.37(2)	2.39(3)	3.30(3)	4.96(6)	6.24	
	16"	0.98(2)	1.83(2)	2.52(3)	3.85(3)	4.90(6)	0.56(2)	1.37(2)	2.39(3)	3.30(3)	4.96(6)	6.24	
	24"	0.98(2)	1.83(2)	2.52(3)	3.85(3)	4.90(6)	0.56(2)	1.37(2)	2.39(3)	3.30(3)	4.96(6)	6.24	
16ft.	12"	1.78(2)	2.80(3)	3.59(3)				1.67(2)	2.40(2)	3.69(3)	4.68(3)		
	16"	2.46(2)	3.21(2)					2.08(2)	3.33(2)	4.28(3)			
	24"												

3-5/8" Members							Wind Load = 20psf						
Height	Spacing	MarinoWare - (SSMA)											
		3-5/8SW-gauge - (362S162-mils)						3-5/8J-gauge - (362S200-mils)					
		20-(33)	18-(43)	16-(54)	14-(68)	12-(97)	10-(118)	20-(33)	18-(43)	16-(54)	14-(68)	12-(97)	10-(118)
		33ksi	33ksi	50ksi	50ksi	50ksi	50ksi	33ksi	33ksi	50ksi	50ksi	50ksi	50ksi
8ft.	12"	1.69	2.59	4.28	5.45	7.82	9.86	2.11	3.33	5.34	6.76	9.49	11.75
	16"	1.44(6)	2.33	4.10	5.45	7.82	9.86	1.83	3.05	5.29	6.76	9.49	11.75
	24"	0.97(3)	1.83(3)	3.61(6)	4.97	7.67	9.86	1.32(3)	2.52(6)	4.76	6.53	9.49	11.75
9ft.	12"	1.40(3)	2.25	3.86	5.12	7.32	9.18	1.78(6)	2.93	4.95	6.33	8.85	10.92
	16"	1.11(3)	1.93(3)	3.55(6)	4.80	7.30	9.18	1.46(3)	2.59(6)	4.61	6.23	8.85	10.92
	24"	0.22(2)	1.37(3)	2.99(3)	4.20(3)	6.62	8.65	0.67(2)	1.97(3)	3.99(3)	5.61(6)	8.54	10.90
10ft.	12"	1.11(3)	1.89(3)	3.34(6)	4.46	6.74	8.44	1.45(3)	2.50(6)	4.30	5.76	8.15	10.03
	16"	0.73(2)	1.54(3)	2.99(3)	4.10(6)	6.32	8.16	1.10(3)	2.12(3)	3.92(6)	5.38	8.06	10.03
	24"	0.67(2)	1.38(2)	2.38(2)	3.44(3)	5.56(3)	7.32(6)	0.00	1.45(2)	3.24(3)	4.69(3)	7.30(6)	9.38
11ft.	12"	0.83(2)	1.54(3)	2.81(3)	3.80(6)	5.80	7.43	1.13(3)	2.08(3)	3.66(6)	4.95	7.37	9.11
	16"	0.83(2)	1.54(3)	2.81(3)	3.80(6)	5.80	7.43	1.13(3)	2.08(3)	3.66(6)	4.95	7.37	9.11
	24"	0.83(2)	1.54(3)	2.81(3)	3.80(6)	5.80	7.43	1.13(3)	2.08(3)	3.66(6)	4.95	7.37	9.11
12ft.	12"	0.41(2)	1.21(2)	2.32(3)	3.19(3)	4.91(6)	6.30	0.76(2)	1.69(3)	3.04(3)	4.19(3)	6.31	7.97
	16"	0.41(2)	1.21(2)	2.32(3)	3.19(3)	4.91(6)	6.30	0.76(2)	1.69(3)	3.04(3)	4.19(3)	6.31	7.97
	24"	0.41(2)	1.21(2)	2.32(3)	3.19(3)	4.91(6)	6.30	0.76(2)	1.69(3)	3.04(3)	4.19(3)	6.31	7.97
14ft.	12"	0.81(2)	1.51(2)	2.42(3)	3.31(3)	4.91(6)	6.30	1.13(3)	2.08(3)	3.66(6)	4.95	7.37	9.11
	16"	0.81(2)	1.51(2)	2.42(3)	3.31(3)	4.91(6)	6.30	1.13(3)	2.08(3)	3.66(6)	4.95	7.37	9.11
	24"	0.81(2)	1.51(2)	2.42(3)	3.31(3)	4.91(6)	6.30	1.13(3)	2.08(3)	3.66(6)	4.95	7.37	9.11
16ft.	12"	2.46(2)	3.32(2)	4.28(3)				2.08(2)	3.33(2)	4.28(3)			
	16"	2.46(2)	3.32(2)	4.28(3)				2.08(2)	3.33(2)	4.28(3)			
	24"	2.46(2)	3.32(2)	4.28(3)				2.08(2)	3.33(2)	4.28(3)			

3-5/8" Members							Wind Load = 25psf						
Height	Spacing	MarinoWare - (SSMA)											
		3-5/8SW-gauge - (362S162-mils)						3-5/8J-gauge - (362S200-mils)					
		20-(33)	18-(43)	16-(54)	14-(68)	12-(97)	10-(118)	20-(33)	18-(43)	16-(54)	14-(68)	12-(97)	10-(118)
		33ksi	33ksi	50ksi	50ksi	50ksi	50ksi	33ksi	33ksi	50ksi	50ksi	50ksi	50ksi
8ft.	12"	1.50(6)	2.39	4.16	5.45	7.82	9.86	1.90	3.12	5.34	6.76	9.49	11.75
	16"	1.20(3)	2.07(6)	3.85	5.22	7.82	9.86	1.57(3)	2.78	5.02	6.76	9.49	11.75
	24"	0.29(2)	1.49(3)	3.27(3)	4.60(6)	7.26	9.52	0.80(3)	2.14(3)	4.38(6)	6.15	9.35	11.75
9ft.	12"	1.18(3)	2.01(6)	3.63	4.88	7.32	9.18	1.54(3)	2.67(6)	4.69	6.32	8.85	10.92
	16"	0.79(2)	1.64(3)	3.26(3)	4.49(6)	6.95	9.02	1.16(3)	2.27(3)	4.29(6)	5.91	8.85	10.92
	24"	0.70(2)	2.60(3)	3.79(3)	6.14(6)	8.12	0.00	1.55(2)	3.56(3)	5.17(3)	8.06	10.39	
10ft.	12"	0.87(2)	1.62(3)	3.08(3)	4.19(6)	6.42	8.27	1.18(3)	2.21(3)	4.01(6)	5.47	8.15	10.03
	16"	0.11(2)	1.22(2)	2.68(3)	3.76(3)	5.93(6)	7.73	0.50(2)	1.77(3)	3.57(3)	5.02(3)	7.67	9.79
	24"	0.11(2)	1.22(2)	2.68(3)	3.76(3)	5.93(6)	7.73	0.50(2)	1.77(3)	3.57(3)	5.02(3)	7.67	9.79
11ft.	12"	0.34(2)	1.26(2)	2.53(3)	3.51(3)	5.46(6)	7.06	0.72(2)	1.78(3)	3.35(3)	4.65(3)	7.03	8.92
	16"	0.56(2)	2.12(2)	3.06(3)	4.94(3)	6.49(6)	8.35	1.29(2)	2.89(3)	4.18(3)	6.50(6)	8.35	
	24"	0.56(2)	2.12(2)	3.06(3)	4.94(3)	6.49(6)	8.35	1.29(2)	2.89(3)	4.18(3)	6.50(6)	8.35	
12ft.	12"	0.81(2)	2.04(2)	2.89(3)	4.57(3)	5.92(6)		1.37(2)	2.74(3)	3.88(3)	5.95(6)	7.59	
	16"	0.81(2)	2.04(2)	2.89(3)	4.57(3)	5.92(6)		1.37(2)	2.74(3)	3.88(3)	5.95(6)	7.59	
	24"	0.81(2)	2.04(2)	2.89(3)	4.57(3)	5.92(6)		1.37(2)	2.74(3)	3.88(3)	5.95(6)	7.59	
14ft.	12"	1.91(2)	3.15(2)	4.13(3)				2.66(2)	4.23(3)	5.45(3)			
	16"	2.65(2)	3.59(2)					3.72(2)	4.89(2)				
	24"	2.65(2)	3.59(2)					3.72(2)	4.89(2)				
16ft.	12"							3.00(2)	3.93(2)				
	16"							3.00(2)	3.93(2)				
	24"							3.00(2)	3.93(2)				

3-5/8" Members							Wind Load = 20psf						
Height	Spacing	MarinoWare - (SSMA)											
		3-5/8SW-gauge - (362S162-mils)						3-5/8J-gauge - (362S200-mils)					
		20-(33)	18-(43)	16-(54)	14-(68)	12-(97)	10-(118)	20-(33)	18-(43)	16-(54)	14-(68)	12-(97)	10-(118)
		33ksi	33ksi	50ksi	50ksi	50ksi	50ksi	33ksi	33ksi	50ksi	50ksi	50ksi	50ksi
8ft.	12"	1.69	2.59	4.28	5.45	7.82	9.86	2.11	3.33	5.34	6.76	9.49	11.75
	16"	1.44(6)	2.33	4.10	5.45	7.82	9.86	1.83	3.05	5.29	6.76	9.49	11.75
	24"	0.97(3)	1.83(3)	3.61(6)	4.97	7.67	9.86	1.32(3)	2.52(6)	4.76	6.53	9.49	11.75
9ft.	12"	1.40(3)	2.25	3.86	5.12	7.32	9.18	1.78(6)	2.93	4.95	6.33	8.85	10.92
	16"	1.11(3)	1.93(3)	3.55(6)	4.80	7.30	9.18	1.46(3)	2.59(6)	4.61	6.23	8.85	10.92
	24"	0.22(2)	1.37(3)	2.99(3)	4.20(3)	6.62	8.65	0.67(2)	1.97(3)	3.99(3)	5.61(6)	8.54	10.90
10ft.	12"	1.11(3)	1.89(3)	3.34(6)	4.46	6.74	8.44	1.45(3)	2.50(6)	4.30	5.76	8.15	10.03
	16"	0.73(2)	1.54(3)	2.99(3)	4.10(6)	6.32	8.16	1.10(3)	2.12(3)	3.92(6)	5.38	8.06	10.03
	24"	0.67(2)	2.38(2)	3.44(3)	5.56(3)	7.32(6)	9.38	0.00	1.45(2)	3.24(3)	4.69(3)	7.30(6)	9.38
11ft.	12"	0.83(2)	1.54(3)	2.81(3)	3.80(6)	5.80	7.43	1.13(3)	2.08(3)	3.66(6)	4.95	7.37	9.11
	16"	1.17(2)	2.45(3)	3.42(3)	5.35(6)	6.94	0.54(2)	1.68(3)	3.26(3)	4.55(3)	6.92	8.80	10.92
	24"	1.82(2)	2.74(2)	4.56(3)	6.07(3)	7.92(6)	9.38	0.62(2)	2.56(2)	3.83(3)	6.11(3)	7.92(6)	9.38
12ft.	12"	0.41(2)	1.21(2)	2.32(3)	3.19(3)	4.91(6)	6.30	0.76(2)	1.69(3)	3.04(3)	4.19(3)	6.31	7.97
	16"	1.95(2)	2.80(3)	4.46(3)	5.80(3)	7.46(6)	9.38	1.27(2)	2.64(2)	3.78(3)	5.84(3)	7.46(6)	9.38
	24"	2.12(2)	3.67(2)	4.93(3)	6.58(3)	8.15	10.03	2.12(2)	3.67(2)	4.93(3)	6.58(3)	8.15	10.03
14ft.	12"	1.53(2)	2.20(2)	3.48(3)	4.49(3)	6.30	7.97	2.06(2)	2.96(3)	4.58(3)	5.83(3)	8.15	10.03
	16"	3.05(2)	4.02(3)	5.33(3)	6.58(3)	8.15	10.03	3.05(2)	4.02(3)	5.33(3)	6.58(3)	8.15	10.03
	24"	4.49(2)	5.99(3)	7.30(6)	8.54	10.90	10.92	4.49(2)	5.99(3)	7.30(6)	8.54	10.90	10.92
16ft.	12"	3.21(2)	4.28(3)	5.33(3)	6.33(2)	7.32(2)	8.31(2)	4.28(3)	5.33(3)	6.33(2)	7.32(2)	8.31(2)	9.38
	16"	2.77(2)	3.81(2)	4.85(2)	5.89(2)	6.92(2)	7.95(2)	3.81(2)	4.85(2)	5.89(2)	6.92(2)	7.95(2)	8.98
	24"	2.27(2)	3.31(2)	4.35(2)	5.39(2)	6.43(2)	7.47(2)	3.31(2)	4.35(2)	5.39(2)	6.43(2)	7.47(2)	8.51

3-5/8" Members							Wind Load = 25psf						
Height	Spacing	MarinoWare - (SSMA)											
		3-5/8SW-gauge - (362S162-mils)						3-5/8J-gauge - (362S200-mils)					
		20-(33)	18-(43)	16-(54)	14-(68)	12-(97)	10-(118)	20-(33)	18-(43)	16-(54)	14-(68)	12-(97)	10-(118)
		33ksi	33ksi	50ksi	50ksi	50ksi	50ksi	33ksi	33ksi	50ksi	50ksi	50ksi	50ksi
8ft.	12"	1.50(6)	2.39	4.16	5.45	7.82	9.86	1.90	3.12	5.34	6.76	9.49	11.75
	16"	1.20(3)	2.07(6)	3.85	5.22	7.82	9.86	1.57(3)	2.78	5.02	6.76	9.49	11.75
	24"	0.29(2)	1.49(3)	3.27(3)	4.60(6)	7.26	9.52	0.80(3)	2.14(3)	4.38(6)	6.15	9.35	11.75
9ft.	12"	1.18(3)	2.01(6)	3.63	4.88	7.32	9.18	1.54(3)	2.67(6)	4.69	6.32	8.85	10.92
	16"	0.79(2)	1.64(3)	3.26(3)	4.49(6)	6.95	9.02	1.16(3)	2.27(3)	4.29(6)	5.91	8.85	10.92
	24"	0.70(2)	2.60(3)	3.79(3)	6.14(6)	8.12	0.00	1.55(2)	3.56(3)	5.17(3)	8.06	10.39	10.92
10ft.	12"	0.87(2)	1.62(3)	3.08(3)	4.19(6)	6.42	8.27	1.18(3)	2.21(3)	4.01(6)	5.47	8.15	10.03
	16"	0.11(2)	1.22(2)	2.68(3)	3.78(3)	5.93(6)	7.73	0.50(2)	1.77(3)	3.57(3)	5.02(3)	7.67	9.79
	24"	0.55(2)	1.97(2)	3.00(2)	5.05(3)	6.75(3)	8.51	0.55(2)	2.79(2)	4.22(3)	6.77(3)	8.81(6)	10.92
11ft.	12"	0.34(2)	1.26(2)	2.53(3)	3.51(3)	5.46(6)	7.06	0.72(2)	1.78(3)	3.35(3)	4.65(3)	7.03	8.92
	16"	0.56(2)	2.12(2)	3.06(3)	4.94(3)	6.49(6)	8.35	1.29(2)	2.89(3)	4.18(3)	6.50(6)	8.35	10.92
	24"	2.29(2)	4.04(2)	5.48(3)	7.06	8.64	10.22	2.09(2)	3.35(2)	5.57(3)	7.33(3)	9.11	10.92
12ft.	12"	0.81(2)	2.04(2)	2.89(3)	4.57(3)	5.92(6)	7.59	1.37(2)	2.74(3)	3.88(3)	5.95(6)	7.59	9.79
	16"	2.45(2)	4.05(3)	5.35(3)	6.75(3)	8.15	9.55	2.28(2)	3.41(2)	4.52(3)	6.63(3)	8.74	10.92
	24"	3.15(2)	4.36(2)	5.57(3)	6.78(3)	7.99(3)	9.20	2.89(2)	4.10(2)	5.31(3)	6.52(3)	7.73(3)	8.94
14ft.	12"	1.91(2)	3.15(2)	4.13(3)	5.13(3)	6.13(3)	7.13	2.66(2)	4.23(3)	5.45(3)	6.67(3)	7.89(3)	9.11
	16"	2.65(2)	3.59(2)	4.53(3)	5.47(3)	6.41(3)	7.35	3.72(2)	4.89(2)	5.93(3)	6.97(3)	8.01(3)	9.05
	24"	3.34(2)	4.48(2)	5.62(3)	6.76(3)	7.90(3)	9.04	4.48(2)	5.62(3)	6.76(3)	7.90(3)	9.04	10.18
16ft.	12"	2.88(2)	3.92(2)	4.96(3)	5.99(3)	7.03(3)	8.07	3.00(2)	4.04(2)	5.08(3)	6.12(3)	7.16(3)	8.20
	16"	2.48(2)	3.52(2)	4.56(3)	5.59(3)	6.63(3)	7.67	2.60(2)	3.64(2)	4.68(3)	5.72(3)	6.76(3)	7.80
	24"	2.08(2)	3.12(2)	4.16(3)	5.19(3)	6.23(3)	7.27	2.20(2)	3.24(2)	4.28(3)	5.32(3)	6.36(3)	7.40

AXIAL LOADS, KIPS

Allowable Axial Loads														
3-5/8" Members										Wind Load = 30psf				
Height	Spacing	MarinoWare - (SSMA)												
		3-5/8SW-gauge - (362S162-mils)						3-5/8J-gauge - (362S200-mils)						
		20-(33) 33ksi	18-(43) 33ksi	16-(54) 50ksi	14-(68) 50ksi	12-(97) 50ksi	10-(118) 50ksi	20-(33) 33ksi	18-(43) 33ksi	16-(54) 50ksi	14-(68) 50ksi	12-(97) 50ksi	10-(118) 50ksi	
8ft.	12"	1.32(3)	2.20(6)	3.97	5.35	7.82	9.86	1.70(6)	2.91	5.16	6.76	9.49	11.75	
	16"	0.97(3)	1.83(3)	3.61(6)	4.97	7.67	9.86	1.32(3)	2.52(6)	4.76	6.53	9.49	11.75	
	24"		1.04(2)	2.94(3)	4.25(3)	6.86	9.08	0.02(2)	1.78(3)	4.01(3)	5.79(6)	8.96	11.53	
9ft.	12"	0.97(3)	1.79(3)	3.40(6)	4.65	7.13	9.18	1.31(3)	2.43(3)	4.45	6.07	8.85	10.92	
	16"	0.22(2)	1.37(3)	2.99(3)	4.20(3)	6.62	8.65	0.67(2)	1.97(3)	3.99(3)	5.61(6)	8.54	10.90	
	24"			2.23(2)	3.39(3)	5.69(3)	7.62(6)		0.77(2)	3.16(3)	4.76(3)	7.61(6)	9.89	
10ft.	12"	0.41(2)	1.38(3)	2.83(3)	3.93(3)	6.12	7.94	0.84(2)	1.95(3)	3.74(3)	5.20(6)	7.86	10.00	
	16"		0.67(2)	2.38(2)	3.44(3)	5.56(3)	7.32(6)		1.45(2)	3.24(3)	4.69(3)	7.30(6)	9.38	
	24"				2.59(2)	4.57(3)	6.22(3)			2.36(2)	3.78(2)	6.28(3)	8.28(3)	
11ft.	12"		0.89(2)	2.28(2)	3.24(3)	5.14(3)	6.71(6)	0.19(2)	1.49(2)	3.07(3)	4.36(3)	6.71(6)	8.57	
	16"			1.82(2)	2.74(2)	4.56(3)	6.07(3)		0.62(2)	2.56(2)	3.83(3)	6.11(3)	7.92(6)	
	24"					3.55(2)	4.94(2)			2.91(2)	5.07(2)	6.78(3)		
12ft.	12"			1.79(2)	2.62(2)	4.25(3)	5.57(3)		0.92(2)	2.45(2)	3.59(3)	5.63(3)	7.23(6)	
	16"				2.12(2)	3.67(2)	4.93(3)				3.06(2)	5.03(3)	6.58(3)	
	24"						3.83(2)				3.99(2)	5.44(2)		
14ft.	12"					2.84(2)	3.80(2)				2.38(2)	3.92(2)	5.11(3)	
	16"						3.19(2)					3.34(2)	4.48(2)	
	24"													
16ft.	12"												3.60(2)	
	16"													
	24"													

3-5/8" Members														
3-5/8" Members										Wind Load = 35psf				
Height	Spacing	MarinoWare - (SSMA)												
		3-5/8SW-gauge - (362S162-mils)						3-5/8J-gauge - (362S200-mils)						
		20-(33) 33ksi	18-(43) 33ksi	16-(54) 50ksi	14-(68) 50ksi	12-(97) 50ksi	10-(118) 50ksi	20-(33) 33ksi	18-(43) 33ksi	16-(54) 50ksi	14-(68) 50ksi	12-(97) 50ksi	10-(118) 50ksi	
8ft.	12"	1.14(3)	2.01(6)	3.79	5.16	7.82	9.86	1.51(3)	2.71	4.95	6.73	9.49	11.75	
	16"	0.54(2)	1.60(3)	3.38(3)	4.72(6)	7.39	9.67	1.08(3)	2.26(3)	4.50(6)	6.28	9.49	11.75	
	24"		0.31(2)	2.63(3)	3.92(3)	6.48(6)	8.65		1.33(3)	3.67(3)	5.44(3)	8.58	11.12	
9ft.	12"	0.64(2)	1.57(3)	3.19(3)	4.42(6)	6.87	8.93	1.09(3)	2.19(3)	4.21(6)	5.83	8.79	10.92	
	16"		0.98(2)	2.73(3)	3.92(3)	6.30(6)	8.30	0.08(2)	1.69(3)	3.70(3)	5.31(3)	8.22	10.56	
	24"				1.89(2)	3.02(2)	5.26(3)	7.15(3)			2.78(2)	4.37(3)	7.17(3)	9.42(6)
10ft.	12"		1.14(2)	2.60(3)	3.68(3)	5.84(6)	7.62	0.34(2)	1.69(3)	3.49(3)	4.94(3)	7.57	9.68	
	16"			2.10(2)	3.14(2)	5.22(3)	6.94(3)		0.86(2)	2.93(2)	4.37(3)	6.95(3)	9.00(6)	
	24"					4.12(2)	5.72(3)				3.37(2)	5.82(3)	7.77(3)	
11ft.	12"			2.04(2)	2.98(2)	4.85(3)	6.38(3)		1.12(2)	2.81(2)	4.09(3)	6.40(3)	8.24(6)	
	16"				2.43(2)	4.21(3)	5.67(3)			2.24(2)	3.51(2)	5.75(3)	7.52(3)	
	24"					3.10(2)	4.44(2)					4.60(2)	6.26(2)	
12ft.	12"				2.36(2)	3.95(3)	5.24(3)			2.19(2)	3.32(2)	5.32(3)	6.90(3)	
	16"					3.32(2)	4.54(2)				2.74(2)	4.67(2)	6.18(3)	
	24"												4.93(2)	
14ft.	12"						3.49(2)					3.62(2)	4.78(2)	
	16"												4.10(2)	
	24"													
16ft.	12"													
	16"													
	24"													

3-5/8" Members														
3-5/8" Members										Wind Load = 40psf				
Height	Spacing	MarinoWare - (SSMA)												
		3-5/8SW-gauge - (362S162-mils)						3-5/8J-gauge - (362S200-mils)						
		20-(33) 33ksi	18-(43) 33ksi	16-(54) 50ksi	14-(68) 50ksi	12-(97) 50ksi	10-(118) 50ksi	20-(33) 33ksi	18-(43) 33ksi	16-(54) 50ksi	14-(68) 50ksi	12-(97) 50ksi	10-(118) 50ksi	
8ft.	12"	0.97(3)	1.83(3)	3.61(6)	4.97	7.67	9.86	1.32(3)	2.52(6)	4.76	6.53	9.49	11.75	
	16"	0.05(2)	1.37(3)	3.16(3)	4.49(6)	7.12	9.37	0.53(3)	2.02(3)	4.25(3)	6.03	9.22	11.75	
	24"			2.32(2)	3.60(3)	6.11(3)	8.24(6)		0.57(2)	3.33(3)	5.10(3)	8.21(6)	10.72	
9ft.	12"	0.22(2)	1.37(3)	2.99(3)	4.20(3)	6.62	8.65	0.67(2)	1.97(3)	3.99(3)	5.61(6)	8.54	10.90	
	16"		0.43(2)	2.47(2)	3.65(3)	5.99(3)	7.95(6)		1.34(2)	3.42(3)	5.03(3)	7.91(6)	10.22	
	24"			2.67(2)	4.85(3)	6.69(3)			2.41(2)	4.00(2)	6.75(3)	8.97(3)		
10ft.	12"		0.67(2)	2.38(2)	3.44(3)	5.56(3)	7.32(6)		1.45(2)	3.24(3)	4.69(3)	7.30(6)	9.38	
	16"			1.84(2)	2.86(2)	4.89(3)	6.57(3)		0.26(2)	2.64(2)	4.07(3)	6.61(3)	8.63(6)	
	24"					3.69(2)	5.24(2)			2.98(2)	5.38(2)	7.29(3)		
11ft.	12"			1.82(2)	2.74(2)	4.56(3)	6.07(3)		0.62(2)	2.56(2)	3.83(3)	6.11(3)	7.92(6)	
	16"					3.87(2)	5.30(3)			3.20(2)	5.40(3)	7.14(3)		
	24"						3.96(2)				4.15(2)	5.77(2)		
12ft.	12"				2.12(2)	3.67(2)	4.93(3)				3.06(2)	5.03(3)	6.58(3)	
	16"					2.99(2)	4.17(2)				4.32(2)	5.80(2)		
	24"													
14ft.	12"						3.19(2)					3.34(2)	4.48(2)	
	16"													
	24"													
16ft.	12"													
	16"													
	24"													

3-5/8" Members														
3-5/8" Members										Wind Load = 50psf				
Height	Spacing	MarinoWare - (SSMA)												
		3-5/8SW-gauge - (362S162-mils)						3-5/8J-gauge - (362S200-mils)						
		20-(33) 33ksi	18-(43) 33ksi	16-(54) 50ksi	14-(68) 50ksi	12-(97) 50ksi	10-(118) 50ksi	20-(33) 33ksi	18-(43) 33ksi	16-(54) 50ksi	14-(68) 50ksi	12-(97) 50ksi	10-(118) 50ksi	
8ft.	12"	0.29(2)	1.49(3)	3.27(3)	4.60(6)	7.26	9.52	0.80(3)	2.14(3)	4.38(6)	6.15	9.35	11.75	
	16"		0.55(2)	2.73(3)	4.03(3)	6.60(6)	8.79		1.55(3)	3.78(3)	5.55(3)	8.70	11.26	
	24"			1.61(2)	2.98(2)	5.40(3)	7.46(3)			2.70(2)	4.46(3)	7.50(3)	9.95(6)	
9ft.	12"		0.70(2)	2.60(3)	3.79(3)	6.14(6)	8.12		1.55(2)	3.56(3)	5.17(3)	8.06	10.39	
	16"			2.00(2)	3.14(2)	5.40(3)	7.30(3)		0.23(2)	2.90(2)	4.50(3)	7.31(3)	9.58(6)	
	24"					4.08(2)	5.84(3)				3.30(2)	5.97(3)	8.11(3)	
10ft.	12"			1.97(2)	3.00(2)	5.05(3)	6.75(3)		0.55(2)	2.79(2)	4.22(3)	6.77(3)	8.81(6)	
	16"				2.33(2)	4.26(2)	5.88(3)			2.09(2)	3.51(2)	5.97(3)	7.94(3)	
	24"					4.36(2)						4.56(2)	6.39(2)	
11ft.	12"				2.29(2)	4.04(2)	5.48(3)			2.09(2)	3.35(2)	5.57(3)	7.33(3)	
	16"					3.24(2)	4.60(2)					4.75(2)	6.43(3)	
	24"												4.87(2)	
12ft.	12"					3.15(2)	4.36(2)					4.49(2)	5.99(3)	
	16"												5.10(2)	
	24"													
14ft.	12"													
	16"													
	24"													
16ft.	12"													
	16"													
	24"													



AXIAL LOADS, KIPS

Allowable Axial Loads

6" Members Wind Load = 5psf													
Height	Spacing	MarinoWare - (SSMA)											
		6SW-gauge - (600S162-mils)						6J-gauge - (600S200-mils)					
		20-(33)	18-(43)	16-(54)	14-(68)	12-(97)	10-(118)	20-(33)	18-(43)	16-(54)	14-(68)	12-(97)	10-(118)
		33ksi	33ksi	50ksi	50ksi	50ksi	50ksi	33ksi	33ksi	50ksi	50ksi	50ksi	50ksi
8ft.	12"	2.56	3.52	5.73	7.56	11.51	14.70	3.00	4.45	7.56	10.03	15.60	20.58
	16"	2.56	3.52	5.73	7.56	11.51	14.70	3.00	4.45	7.56	10.03	15.60	20.58
	24"	2.56	3.52	5.73	7.56	11.51	14.70	3.00	4.45	7.56	10.03	15.60	20.58
9ft.	12"	2.56	3.52	5.73	7.56	11.51	14.70	2.98	4.41	7.46	9.89	15.38	20.28
	16"	2.56	3.52	5.73	7.56	11.51	14.70	2.98	4.41	7.46	9.89	15.38	20.28
	24"	2.56	3.52	5.73	7.56	11.51	14.70	2.98	4.41	7.46	9.89	15.38	20.28
10ft.	12"	2.55	3.52	5.73	7.56	11.51	14.70	2.95	4.36	7.33	9.72	15.11	19.91
	16"	2.55	3.52	5.73	7.56	11.51	14.70	2.95	4.36	7.33	9.72	15.11	19.91
	24"	2.55	3.52	5.73	7.56	11.51	14.70	2.95	4.36	7.33	9.72	15.11	19.91
11ft.	12"	2.52	3.49	5.71	7.56	11.51	14.70	2.92	4.30	7.18	9.52	14.79	19.46
	16"	2.52	3.49	5.71	7.56	11.51	14.70	2.92	4.30	7.18	9.52	14.79	19.46
	24"	2.52	3.49	5.71	7.56	11.51	14.70	2.92	4.30	7.18	9.52	14.79	19.46
12ft.	12"	2.49	3.45	5.60	7.52	11.51	14.70	2.88	4.22	7.00	9.28	14.40	18.92
	16"	2.49	3.45	5.60	7.52	11.51	14.70	2.88	4.22	7.00	9.28	14.40	18.92
	24"	2.49	3.45	5.60	7.52	11.51	14.70	2.88	4.22	7.00	9.28	14.40	18.92
14ft.	12"	2.41	3.33	5.32	7.14	11.29	14.70	2.79	4.04	6.55	8.69	13.46	17.62
	16"	2.41	3.33	5.32	7.14	11.29	14.70	2.79	4.04	6.55	8.69	13.46	17.62
	24"	2.19	3.25	5.32	7.14	11.29	14.70	2.61	4.04	6.55	8.69	13.46	17.62
16ft.	12"	2.28	3.17	4.94	6.62	10.42	13.75	2.66	3.82	6.02	7.98	12.33	16.08
	16"	2.12	3.14	4.94	6.62	10.42	13.75	2.54	3.82	6.02	7.98	12.33	16.08
	24"	1.84(6)	2.81	4.88	6.62	10.42	13.75	2.23	3.55	6.02	7.98	12.33	16.08

6" Members Wind Load = 20psf													
Height	Spacing	MarinoWare - (SSMA)											
		6SW-gauge - (600S162-mils)						6J-gauge - (600S200-mils)					
		20-(33)	18-(43)	16-(54)	14-(68)	12-(97)	10-(118)	20-(33)	18-(43)	16-(54)	14-(68)	12-(97)	10-(118)
		33ksi	33ksi	50ksi	50ksi	50ksi	50ksi	33ksi	33ksi	50ksi	50ksi	50ksi	50ksi
8ft.	12"	2.56	3.52	5.73	7.56	11.51	14.70	3.00	4.45	7.56	10.03	15.60	20.58
	16"	2.53	3.52	5.73	7.56	11.51	14.70	3.00	4.45	7.56	10.03	15.60	20.58
	24"	2.24	3.37	5.73	7.56	11.51	14.70	2.72	4.42	7.56	10.03	15.60	20.58
9ft.	12"	2.54	3.52	5.73	7.56	11.51	14.70	2.98	4.41	7.46	9.89	15.38	20.28
	16"	2.36	3.49	5.73	7.56	11.51	14.70	2.83	4.41	7.46	9.89	15.38	20.28
	24"	1.99	3.11	5.73	7.56	11.51	14.70	2.45	4.10	7.46	9.89	15.38	20.28
10ft.	12"	2.39	3.52	5.73	7.56	11.51	14.70	2.84	4.36	7.33	9.72	15.11	19.91
	16"	2.16	3.28	5.73	7.56	11.51	14.70	2.60	4.24	7.33	9.72	15.11	19.91
	24"	1.72(6)	2.81	5.46	7.55	11.51	14.70	2.14	3.73	7.25	9.72	15.11	19.91
11ft.	12"	2.20	3.32	5.71	7.56	11.51	14.70	2.64	4.24	7.18	9.52	14.79	19.46
	16"	1.93	3.02	5.67	7.56	11.51	14.70	2.35	3.93	7.18	9.52	14.79	19.46
	24"	1.41(3)	2.46(6)	5.08	7.13	11.51	14.70	1.81(6)	3.33	6.70	9.44	14.79	19.46
12ft.	12"	1.99	3.08	5.60	7.52	11.51	14.70	2.42	3.96	7.00	9.28	14.40	18.92
	16"	1.68(6)	2.74	5.28	7.41	11.51	14.70	2.09(6)	3.59	6.84	9.28	14.40	18.92
	24"	1.09(3)	2.09(3)	4.59(6)	6.63	10.96	14.51	1.46(3)	2.90(6)	6.09	8.71	14.40	18.92
14ft.	12"	1.55(3)	2.54(6)	4.85	6.82	11.29	14.70	1.93(3)	3.32	6.22	8.68	13.46	17.62
	16"	1.16(3)	2.11(3)	4.39(6)	6.29	10.61	14.23	1.52(3)	2.86(3)	5.72(6)	8.13	13.34	17.62
	24"		1.17(2)	3.55(3)	5.32(3)	9.36(6)	12.78	0.19(2)	2.02(3)	4.80(3)	7.13(3)	12.09	16.41
16ft.	12"	1.09(2)	1.97(3)	3.98(3)	5.68(6)	9.51	12.85	1.43(3)	2.65(3)	5.13(6)	7.29	11.91	15.86
	16"	0.26(2)	1.48(2)	3.46(3)	5.07(3)	8.72(6)	11.91	0.72(2)	2.12(3)	4.56(3)	6.66(3)	11.12	14.93
	24"			2.53(2)	3.99(2)	7.33(3)	10.27(3)		0.65(2)	3.55(2)	5.54(3)	9.71(3)	13.29(6)

(2) = L/240

(3) = L/360

(6) = L/600

6" Members Wind Load = 15psf													
Height	Spacing	MarinoWare - (SSMA)											
		6SW-gauge - (600S162-mils)						6J-gauge - (600S200-mils)					
		20-(33)	18-(43)	16-(54)	14-(68)	12-(97)	10-(118)	20-(33)	18-(43)	16-(54)	14-(68)	12-(97)	10-(118)
		33ksi	33ksi	50ksi	50ksi	50ksi	50ksi	33ksi	33ksi	50ksi	50ksi	50ksi	50ksi
8ft.	12"	2.56	3.52	5.73	7.56	11.51	14.70	3.00	4.45	7.56	10.03	15.60	20.58
	16"	2.56	3.52	5.73	7.56	11.51	14.70	3.00	4.45	7.56	10.03	15.60	20.58
	24"	2.45	3.52	5.73	7.56	11.51	14.70	2.95	4.45	7.56	10.03	15.60	20.58
9ft.	12"	2.56	3.52	5.73	7.56	11.51	14.70	2.98	4.41	7.46	9.89	15.38	20.28
	16"	2.54	3.52	5.73	7.56	11.51	14.70	2.98	4.41	7.46	9.89	15.38	20.28
	24"	2.26	3.40	5.73	7.56	11.51	14.70	2.73	4.41	7.46	9.89	15.38	20.28
10ft.	12"	2.55	3.52	5.73	7.56	11.51	14.70	2.95	4.36	7.33	9.72	15.11	19.91
	16"	2.39	3.52	5.73	7.56	11.51	14.70	2.84	4.36	7.33	9.72	15.11	19.91
	24"	2.04	3.16	5.73	7.56	11.51	14.70	2.49	4.11	7.33	9.72	15.11	19.91
11ft.	12"	2.41	3.49	5.71	7.56	11.51	14.70	2.86	4.30	7.18	9.52	14.79	19.46
	16"	2.20	3.32	5.71	7.56	11.51	14.70	2.64	4.24	7.18	9.52	14.79	19.46
	24"	1.79(6)	2.88	5.52	7.56	11.51	14.70	2.21	3.77	7.18	9.52	14.79	19.46
12ft.	12"	2.24	3.35	5.60	7.52	11.51	14.70	2.68	4.22	7.00	9.28	14.40	18.92
	16"	1.99	3.08	5.60	7.52	11.51	14.70	2.42	3.96	7.00	9.28	14.40	18.92
	24"	1.53(3)	2.57(6)	5.10	7.21	11.51	14.70	1.93(6)	3.41	6.65	9.28	14.40	18.92
14ft.	12"	1.86(6)	2.89	5.22	7.14	11.29	14.70	2.26	3.69	6.55	8.69	13.46	17.62
	16"	1.55(3)	2.54(6)	4.85	6.82	11.29	14.70	1.93(3)	3.32	6.22	8.68	13.46	17.62
	24"	0.89(2)	1.91(3)	4.17(3)	6.03(6)	10.28	13.85	1.32(3)	2.64(3)	5.48(6)	7.87	13.02	17.49
16ft.	12"	1.45(3)	2.37(3)	4.41	6.19	10.17	13.63	1.81(3)	3.08(6)	5.60	7.81	12.33	16.08
	16"	1.09(2)	1.97(3)	3.98(3)	5.68(6)	9.51	12.85	1.43(3)	2.65(3)	5.13(6)	7.29	11.91	15.86
	24"		1.10(2)	3.21(3)	4.79(3)	8.35(6)	11.47	0.25(2)	1.88(2)	4.30(3)	6.37(3)	10.74(6)	14.49

6" Members Wind Load = 25psf													
Height	Spacing	MarinoWare - (SSMA)											
		6SW-gauge - (600S162-mils)						6J-gauge - (600S200-mils)					
		20-(33)	18-(43)	16-(54)	14-(68)	12-(97)	10-(118)	20-(33)	18-(43)	16-(54)	14-(68)	12-(97)	10-(118)
		33ksi	33ksi	50ksi	50ksi	50ksi	50ksi	33ksi	33ksi	50ksi	50ksi	50ksi	50ksi
8ft.	12"	2.56	3.52	5.73	7.56	11.51	14.70	3.00	4.45	7.56	10.03	15.60	20.58
	16"	2.38	3.52	5.73	7.56	11.51	14.70	2.88	4.45	7.56	10.03	15.60	20.58
	24"	2.03	3.15	5.73	7.56	11.51	14.70	2.50	4.18	7.56	10.03	15.60	20.58

AXIAL LOADS, KIPS

Allowable Axial Loads

6" Member

Wind Load = 30psf

Height	Spacing	MarinoWare - (SSMA)											
		6SW-gauge - (600S162-mils)						6J-gauge - (600S200-mils)					
		20-(33)	18-(43)	16-(54)	14-(68)	12-(97)	10-(118)	20-(33)	18-(43)	16-(54)	14-(68)	12-(97)	10-(118)
		33ksi	33ksi	50ksi	50ksi	50ksi	50ksi	33ksi	33ksi	50ksi	50ksi	50ksi	50ksi
8ft.	12"	2.45	3.52	5.73	7.56	11.51	14.70	2.95	4.45	7.56	10.03	15.60	20.58
	16"	2.24	3.37	5.73	7.56	11.51	14.70	2.72	4.42	7.56	10.03	15.60	20.58
	24"	1.82	2.92	5.62	7.56	11.51	14.70	2.27	3.94	7.56	10.03	15.60	20.58
9ft.	12"	2.26	3.40	5.73	7.56	11.51	14.70	2.73	4.41	7.46	9.89	15.38	20.28
	16"	1.99	3.11	5.73	7.56	11.51	14.70	2.45	4.10	7.46	9.89	15.38	20.28
	24"	1.47(6)	2.55	5.22	7.29	11.51	14.70	1.89	3.49	7.11	9.89	15.38	20.28
10ft.	12"	2.04	3.16	5.73	7.56	11.51	14.70	2.49	4.11	7.33	9.72	15.11	19.91
	16"	1.72(6)	2.81	5.46	7.55	11.51	14.70	2.14	3.73	7.25	9.72	15.11	19.91
	24"	1.05(3)	2.13(6)	4.76	6.78	11.18	14.70	1.47(3)	3.00(6)	6.47	9.27	15.11	19.91
11ft.	12"	1.79(6)	2.88	5.52	7.56	11.51	14.70	2.21	3.77	7.18	9.52	14.79	19.46
	16"	1.41(3)	2.46(6)	5.08	7.13	11.51	14.70	1.81(6)	3.33	6.70	9.44	14.79	19.46
	24"	0.06(2)	1.67(3)	4.24(3)	6.20(6)	10.45	13.98	0.67(3)	2.48(3)	5.78(6)	8.46	14.26	19.40
12ft.	12"	1.53(3)	2.57(6)	5.10	7.21	11.51	14.70	1.93(6)	3.41	6.65	9.28	14.40	18.92
	16"	1.09(3)	2.09(3)	4.59(6)	6.63	10.96	14.51	1.46(3)	2.90(6)	6.09	8.71	14.40	18.92
	24"		0.76(2)	3.64(3)	5.54(3)	9.64	13.03	0.00	1.94(3)	5.05(3)	7.59(6)	13.04	17.84
14ft.	12"	0.89(2)	1.91(3)	4.17(3)	6.03(6)	10.28	13.85	1.32(3)	2.64(3)	5.48(6)	7.87	13.02	17.49
	16"		1.17(2)	3.55(3)	5.32(3)	9.36(6)	12.78	0.19(2)	2.02(3)	4.80(3)	7.13(3)	12.09	16.41
	24"			2.43(2)	4.02(2)	7.70(3)	10.87(3)			3.58(2)	5.79(3)	10.43(3)	14.47(6)
16ft.	12"		1.10(2)	3.21(3)	4.79(3)	8.35(6)	11.47	0.25(2)	1.88(2)	4.30(3)	6.37(3)	10.74(6)	14.49
	16"			2.53(2)	3.99(2)	7.33(3)	10.27(3)		0.65(2)	3.55(2)	5.54(3)	9.71(3)	13.29(6)
	24"					5.56(2)	8.20(3)			4.10(2)	7.90(2)	11.20(3)	

6" Member

Wind Load = 40psf

Height	Spacing	MarinoWare - (SSMA)											
		6SW-gauge - (600S162-mils)						6J-gauge - (600S200-mils)					
		20-(33)	18-(43)	16-(54)	14-(68)	12-(97)	10-(118)	20-(33)	18-(43)	16-(54)	14-(68)	12-(97)	10-(118)
		33ksi	33ksi	50ksi	50ksi	50ksi	50ksi	33ksi	33ksi	50ksi	50ksi	50ksi	50ksi
8ft.	12"	2.24	3.37	5.73	7.56	11.51	14.70	2.72	4.42	7.56	10.03	15.60	20.58
	16"	1.96	3.07	5.73	7.56	11.51	14.70	2.42	4.10	7.56	10.03	15.60	20.58
	24"	1.41(6)	2.49	5.18	7.26	11.51	14.70	1.84	3.46	7.17	10.03	15.60	20.58
9ft.	12"	1.99	3.11	5.73	7.56	11.51	14.70	2.45	4.10	7.46	9.89	15.38	20.28
	16"	1.64	2.73	5.40	7.50	11.51	14.70	2.07	3.69	7.32	9.89	15.38	20.28
	24"	0.70(3)	2.00(6)	4.66	6.69	11.10	14.70	1.35(3)	2.90	6.49	9.34	15.38	20.28
10ft.	12"	1.72(6)	2.81	5.46	7.55	11.51	14.70	2.14	3.73	7.25	9.72	15.11	19.91
	16"	1.29(3)	2.35(6)	4.99	7.03	11.48	14.70	1.69(6)	3.24	6.73	9.54	15.11	19.91
	24"		1.39(3)	4.08(3)	6.04(6)	10.30	13.84	0.11(3)	2.30(3)	5.73(6)	8.48	14.43	19.72
11ft.	12"	1.41(3)	2.46(6)	5.08	7.13	11.51	14.70	1.81(6)	3.33	6.70	9.44	14.79	19.46
	16"	0.65(3)	1.93(3)	4.51(6)	6.50	10.82	14.38	1.29(3)	2.75(3)	6.08	8.78	14.65	19.46
	24"		0.04(2)	3.45(3)	5.32(3)	9.40(6)	12.81		1.39(3)	4.92(3)	7.54(6)	13.14	18.12
12ft.	12"	1.09(3)	2.09(3)	4.59(6)	6.63	10.96	14.51	1.46(3)	2.90(6)	6.09	8.71	14.40	18.92
	16"		1.47(3)	3.95(3)	5.89(6)	10.07	13.51	0.33(2)	2.25(3)	5.39(3)	7.95(6)	13.48	18.35
	24"			2.76(2)	4.54(3)	8.42(3)	11.67(6)		0.09(3)	4.09(3)	6.55(3)	11.76(6)	16.37
14ft.	12"		1.17(2)	3.55(3)	5.32(3)	9.36(6)	12.78	0.19(2)	2.02(3)	4.80(3)	7.13(3)	12.09	16.41
	16"			2.79(2)	4.44(3)	8.23(3)	11.48(6)		0.63(2)	3.97(2)	6.21(3)	10.96(6)	15.09
	24"				2.62(2)	6.24(2)	9.18(3)			4.59(2)	8.94(3)	12.75(3)	
16ft.	12"			2.53(2)	3.99(2)	7.33(3)	10.27(3)		0.65(2)	3.55(2)	5.54(3)	9.71(3)	13.29(6)
	16"				3.05(2)	6.12(2)					4.55(2)	8.47(3)	11.85(3)
	24"					6.42(2)					6.34(2)	9.39(2)	

(2) = L/240

(3) = L/360

(6) = L/600

6" Member

Wind Load = 35psf

Height	Spacing	MarinoWare - (SSMA)											
		6SW-gauge - (600S162-mils)						6J-gauge - (600S200-mils)					
		20-(33)	18-(43)	16-(54)	14-(68)	12-(97)	10-(118)	20-(33)	18-(43)	16-(54)	14-(68)	12-(97)	10-(118)
		33ksi	33ksi	50ksi	50ksi	50ksi	50ksi	33ksi	33ksi	50ksi	50ksi	50ksi	50ksi
8ft.	12"	2.35	3.48	5.73	7.56	11.51	14.70	2.84	4.45	7.56	10.03	15.60	20.58
	16"	2.10	3.22	5.73	7.56	11.51	14.70	2.57	4.26	7.56	10.03	15.60	20.58
	24"	1.61	2.70	5.40	7.50	11.51	14.70	2.05	3.70	7.42	10.03	15.60	20.58
9ft.	12"	2.13	3.25	5.73	7.56	11.51	14.70	2.59	4.25	7.46	9.89	15.38	20.28
	16"	1.82	2.92	5.59	7.56	11.51	14.70	2.26	3.89	7.46	9.89	15.38	20.28
	24"	1.21(3)	2.27(6)	4.94	6.99	11.45	14.70	1.62(6)	3.19	6.80	9.67	15.38	20.28
10ft.	12"	1.88	2.99	5.64	7.56	11.51	14.70	2.31	3.92	7.33	9.72	15.11	19.91
	16"	1.50(6)	2.58	5.22	7.29	11.51	14.70	1.91(6)	3.48	6.99	9.72	15.11	19.91
	24"	0.26(3)	1.80(3)	4.42(6)	6.40	10.73	14.32	0.93(3)	2.65(6)	6.10	8.87	14.89	19.91
11ft.	12"	1.60(6)	2.67	5.30	7.38	11.51	14.70	2.01(6)	3.55	6.94	9.52	14.79	19.46
	16"	1.16(3)	2.19(3)	4.79	6.82	11.19	14.70	1.54(3)	3.04(6)	6.38	9.11	14.79	19.46
	24"		0.95(3)	3.84(3)	5.75(3)	9.92	13.39		2.07(3)	5.34(3)	7.99(6)	13.69	18.75
12ft.	12"	1.31(3)	2.33(6)	4.84	6.91	11.31	14.70	1.69(3)	3.15(6)	6.37	9.01	14.40	18.92
	16"	0.42(2)	1.78(3)	4.26(3)	6.25(6)	10.51	14.00	1.03(3)	2.57(3)	5.73(6)	8.33	13.94	18.88
	24"			3.19(3)	5.03(3)	9.02(6)	12.34		1.00(2)	4.56(3)	7.06(3)	12.39	17.09
14ft.	12"	0.28(2)	1.61(3)	3.85(3)	5.67(3)	9.81	13.31	0.81(2)	2.33(3)	5.13(3)	7.49(6)	12.54	16.94
	16"		0.35(2)	3.16(2)	4.87(3)	8.78(3)	12.11(6)		1.46(2)	4.38(3)	6.66(3)	11.51(6)	15.74
	24"				3.44(2)	6.95(3)	10.00(3)			3.03(2)	5.17(2)	9.66(3)	13.59(3)
16ft.	12"		0.40(2)	2.86(2)	4.38(3)	7.83(3)	10.85(6)		1.36(2)	3.92(3)	5.94(3)	10.21(6)	13.87
	16"				3.51(2)	6.71(3)	9.54(3)			3.10(2)	5.03(2)	9.07(3)	12.55(3)
	24"					4.77(2)	7.28(2)					7.10(2)	10.26(3)

6" Member

Wind Load = 50psf

Height	Spacing	MarinoWare - (SSMA)												
		6SW-gauge - (600S162-mils)						6J-gauge - (600S200-mils)						
		20-(33)	18-(43)	16-(54)	14-(68)	12-(97)	10-(118)	20-(33)	18-(43)	16-(54)	14-(68)	12-(97)	10-(118)	
		33ksi	33ksi	50ksi	50ksi	50ksi	50ksi	33ksi	33ksi	50ksi	50ksi	50ksi	50ksi	
8ft.	12"	2.03	3.15	5.73	7.56	11.51	14.70	2.50	4.18	7.56	10.03	15.60	20.58	
	16"	1.68	2.78	5.47	7.56	11.51	14.70	2.13	3.78	7.50	10.03	15.60	20.58	
	24"	0.81(3)	2.06(6)	4.75	6.80	11.25	14.70	1.41(6)	3.00	6.69	9.60	15.60	20.58	
9ft.	12"	1.73	2.82	5.50	7.56	11.51	14.70	2.16	3.79	7.43	9.89	15.38	20.28	
	16"	1.30(3)	2.36	5.03	7.09	11.51	14.70	1.71(6)	3.29	6.90	9.78	15.38	20.28	
	24"		1.38(3)	4.12(6)	6.10	10.41	13.98	0.04(3)	2.34(3)	5.88(6)	8.71	14.83	20.28	
10ft.	12"	1.40(3)	2.46	5.10	7.16	11.51	14.70	1.80(6)	3.36	6.86	9.68	15.11	19.91	
	16"	0.52(3)	1.91(3)	4.53(6)	6.53	10.88	14.48	1.21(3)	2.76(6)	6.22	9.00	15.05	19.91	
	24"			3.44(3)	5.32(3)	9.45	12.90		1.22(3)	5.01(3)	7.72(6)	13.52	18.68	
11ft.	12"	0.95(3)	2.06(3)	4.65(6)	6.66	11.00	14.59	1.42(3)	2.89(6)	6.23	8.94	14.79	19.46	
	16"		1.26(3)	3.97(3)	5.90(6)	10.09	13.58	0.06(3)	2.21(3)	5.49(3)	8.15	13.88	18.96	
	24"			2.71(2)	4.49(3)	8.40(3)	11.70(6)			4.10(3)	6.66(3)	12.08(6)	16.90	
12ft.	12"	0.10(2)	1.64(3)	4.10(3)	6.07(6)	10.28	13.76	0.67(3)	2.41(3)	5.56(6)	8.14	13.71	18.61	
	16"		0.09(2)	3.34(3)	5.20(3)	9.22(6)	12.57		1.36(3)	4.72(3)	7.23(3)	12.60	17.34	
	24"			1.31(2)	3.61(2)	7.28(3)	10.39(3)			3.20(2)	5.57(3)	10.57(3)	15.00(6)	
14ft.	12"			2.97(2)	4.65(3)	8.50(3)	11.79(6)		1.04(2)	4.17(3)	6.43(3)	11.23(6)	15.41	
	16"			1.82(2)	3.63(2)	7.20(3)	10.29(3)			3.21(2)	5.37(2)	9.91(3)	13.88(3)	
	24"					4.90(2)	7.65(2)					7.58(2)	11.19(3)	
16ft.	12"					3.27(2)	6.41(3)	9.19(3)			2.88(2)	4.79(2)	8.77(3)	12.20(3)
	16"						5.03(2)	7.58(2)					7.36(2)	10.57(3)
	24"													7.77(2)



AXIAL LOADS, KIPS

Allowable Axial Loads

8" Members

Wind Load = 5psf

Height	Spacing	MarinoWare - (SSMA)											
		8SW-gauge - (800S162-mils)						8J-gauge - (800S200-mils)					
		20-(33)	18-(43)	16-(54)	14-(68)	12-(97)	10-(118)	20-(33)	18-(43)	16-(54)	14-(68)	12-(97)	10-(118)
		33ksi	33ksi	50ksi	50ksi	50ksi	50ksi	33ksi	33ksi	50ksi	50ksi	50ksi	50ksi
8ft.	12"	2.49	3.45	5.52	7.33	11.34	14.77	3.07	4.58	7.85	10.38	16.07	21.13
	16"	2.49	3.45	5.52	7.33	11.34	14.77	3.07	4.58	7.85	10.38	16.07	21.13
	24"	2.49	3.45	5.52	7.33	11.34	14.77	3.07	4.58	7.85	10.38	16.07	21.13
9ft.	12"	2.49	3.45	5.52	7.33	11.34	14.77	3.07	4.58	7.85	10.38	16.07	21.13
	16"	2.49	3.45	5.52	7.33	11.34	14.77	3.07	4.58	7.85	10.38	16.07	21.13
	24"	2.49	3.45	5.52	7.33	11.34	14.77	3.07	4.58	7.85	10.38	16.07	21.13
10ft.	12"	2.49	3.45	5.52	7.33	11.34	14.77	3.07	4.58	7.85	10.38	16.07	21.13
	16"	2.49	3.45	5.52	7.33	11.34	14.77	3.07	4.58	7.85	10.38	16.07	21.13
	24"	2.49	3.45	5.52	7.33	11.34	14.77	3.07	4.58	7.85	10.38	16.07	21.13
11ft.	12"	2.49	3.45	5.52	7.33	11.34	14.77	3.07	4.58	7.85	10.38	16.07	21.13
	16"	2.49	3.45	5.52	7.33	11.34	14.77	3.07	4.58	7.85	10.38	16.07	21.13
	24"	2.49	3.45	5.52	7.33	11.34	14.77	3.07	4.58	7.85	10.38	16.07	21.13
12ft.	12"	2.49	3.45	5.52	7.33	11.34	14.77	3.07	4.58	7.85	10.38	16.07	21.13
	16"	2.49	3.45	5.52	7.33	11.34	14.77	3.07	4.58	7.85	10.38	16.07	21.13
	24"	2.49	3.45	5.52	7.33	11.34	14.77	3.07	4.58	7.85	10.38	16.07	21.13
14ft.	12"	2.49	3.45	5.52	7.33	11.34	14.77	3.03	4.51	7.70	10.26	16.07	21.13
	16"	2.49	3.45	5.52	7.33	11.34	14.77	3.03	4.51	7.70	10.26	16.07	21.13
	24"	2.49	3.45	5.52	7.33	11.34	14.77	3.03	4.51	7.70	10.26	16.07	21.13
16ft.	12"	2.49	3.45	5.52	7.33	11.34	14.77	2.97	4.40	7.42	9.88	15.53	20.70
	16"	2.49	3.45	5.52	7.33	11.34	14.77	2.97	4.40	7.42	9.88	15.53	20.70
	24"	2.33	3.45	5.52	7.33	11.34	14.77	2.85	4.40	7.42	9.88	15.53	20.70

8" Members

Wind Load = 20psf

Height	Spacing	MarinoWare - (SSMA)											
		8SW-gauge - (800S162-mils)						8J-gauge - (800S200-mils)					
		20-(33)	18-(43)	16-(54)	14-(68)	12-(97)	10-(118)	20-(33)	18-(43)	16-(54)	14-(68)	12-(97)	10-(118)
		33ksi	33ksi	50ksi	50ksi	50ksi	50ksi	33ksi	33ksi	50ksi	50ksi	50ksi	50ksi
8ft.	12"	2.49	3.45	5.52	7.33	11.34	14.77	3.07	4.58	7.85	10.38	16.07	21.13
	16"	2.49	3.45	5.52	7.33	11.34	14.77	3.07	4.58	7.85	10.38	16.07	21.13
	24"	2.41	3.45	5.52	7.33	11.34	14.77	3.04	4.58	7.85	10.38	16.07	21.13
9ft.	12"	2.49	3.45	5.52	7.33	11.34	14.77	3.07	4.58	7.85	10.38	16.07	21.13
	16"	2.49	3.45	5.52	7.33	11.34	14.77	3.07	4.58	7.85	10.38	16.07	21.13
	24"	2.24	3.45	5.52	7.33	11.34	14.77	2.85	4.58	7.85	10.38	16.07	21.13
10ft.	12"	2.49	3.45	5.52	7.33	11.34	14.77	3.07	4.58	7.85	10.38	16.07	21.13
	16"	2.37	3.45	5.52	7.33	11.34	14.77	3.00	4.58	7.85	10.38	16.07	21.13
	24"	2.05	3.27	5.52	7.33	11.34	14.77	2.63	4.52	7.85	10.38	16.07	21.13
11ft.	12"	2.42	3.45	5.52	7.33	11.34	14.77	3.05	4.58	7.85	10.38	16.07	21.13
	16"	2.22	3.44	5.52	7.33	11.34	14.77	2.83	4.58	7.85	10.38	16.07	21.13
	24"	1.83	3.07	5.52	7.33	11.34	14.77	2.39	4.28	7.85	10.38	16.07	21.13
12ft.	12"	2.30	3.45	5.52	7.33	11.34	14.77	2.91	4.58	7.85	10.38	16.07	21.13
	16"	2.06	3.28	5.52	7.33	11.34	14.77	2.64	4.53	7.85	10.38	16.07	21.13
	24"	1.60	2.84	5.39	7.33	11.34	14.77	2.12	4.02	7.85	10.38	16.07	21.13
14ft.	12"	2.01	3.23	5.52	7.33	11.34	14.77	2.56	4.39	7.70	10.26	16.07	21.13
	16"	1.70	2.92	5.45	7.33	11.34	14.77	2.20	4.04	7.70	10.26	16.07	21.13
	24"	1.09(3)	2.33(6)	4.84	6.86	11.34	14.77	1.52(3)	3.36	7.08	10.05	16.07	21.13
16ft.	12"	1.69(6)	2.90	5.39	7.33	11.34	14.77	2.15	3.91	7.42	9.88	15.53	20.70
	16"	1.29(3)	2.51(6)	4.98	7.00	11.34	14.77	1.71(3)	3.47	6.96	9.82	15.53	20.70
	24"		1.76(3)	4.21(3)	6.12(6)	10.43	14.17	0.27(3)	2.63(3)	6.05(6)	8.83	15.00	20.60

8" Members

Wind Load = 15psf

Height	Spacing	MarinoWare - (SSMA)											
		8SW-gauge - (800S162-mils)						8J-gauge - (800S200-mils)					
		20-(33)	18-(43)	16-(54)	14-(68)	12-(97)	10-(118)	20-(33)	18-(43)	16-(54)	14-(68)	12-(97)	10-(118)
		33ksi	33ksi	50ksi	50ksi	50ksi	50ksi	33ksi	33ksi	50ksi	50ksi	50ksi	50ksi
8ft.	12"	2.49	3.45	5.52	7.33	11.34	14.77	3.07	4.58	7.85	10.38	16.07	21.13
	16"	2.49	3.45	5.52	7.33	11.34	14.77	3.07	4.58	7.85	10.38	16.07	21.13
	24"	2.49	3.45	5.52	7.33	11.34	14.77	3.07	4.58	7.85	10.38	16.07	21.13
9ft.	12"	2.49	3.45	5.52	7.33	11.34	14.77	3.07	4.58	7.85	10.38	16.07	21.13
	16"	2.49	3.45	5.52	7.33	11.34	14.77	3.07	4.58	7.85	10.38	16.07	21.13
	24"	2.44	3.45	5.52	7.33	11.34	14.77	3.07	4.58	7.85	10.38	16.07	21.13
10ft.	12"	2.49	3.45	5.52	7.33	11.34	14.77	3.07	4.58	7.85	10.38	16.07	21.13
	16"	2.49	3.45	5.52	7.33	11.34	14.77	3.07	4.58	7.85	10.38	16.07	21.13
	24"	2.29	3.45	5.52	7.33	11.34	14.77	2.90	4.58	7.85	10.38	16.07	21.13
11ft.	12"	2.49	3.45	5.52	7.33	11.34	14.77	3.07	4.58	7.85	10.38	16.07	21.13
	16"	2.42	3.45	5.52	7.33	11.34	14.77	3.05	4.58	7.85	10.38	16.07	21.13
	24"	2.13	3.35	5.52	7.33	11.34	14.77	2.72	4.58	7.85	10.38	16.07	21.13
12ft.	12"	2.48	3.45	5.52	7.33	11.34	14.77	3.07	4.58	7.85	10.38	16.07	21.13
	16"	2.30	3.45	5.52	7.33	11.34	14.77	2.91	4.58	7.85	10.38	16.07	21.13
	24"	1.94	3.17	5.52	7.33	11.34	14.77	2.51	4.40	7.85	10.38	16.07	21.13
14ft.	12"	2.26	3.45	5.52	7.33	11.34	14.77	2.83	4.51	7.70	10.26	16.07	21.13
	16"	2.01	3.23	5.52	7.33	11.34	14.77	2.56	4.39	7.70	10.26	16.07	21.13
	24"	1.54(6)	2.77	5.29	7.33	11.34	14.77	2.03	3.87	7.62	10.26	16.07	21.13
16ft.	12"	2.00	3.21	5.52	7.33	11.34	14.77	2.49	4.26	7.42	9.88	15.53	20.70
	16"	1.69(6)	2.90	5.39	7.33	11.34	14.77	2.15	3.91	7.42	9.88	15.53	20.70
	24"	1.09(3)	2.31(3)	4.78	6.77	11.22	14.77	1.49(3)	3.25(6)	6.73	9.57	15.53	20.70

8" Members

Wind Load = 25psf

Height	Spacing	MarinoWare - (SSMA)											
		8SW-gauge - (800S162-mils)						8J-gauge - (800S200-mils)					
		20-(33)	18-(43)	16-(54)	14-(68)	12-(97)	10-(118)	20-(33)	18-(43)	16-(54)	14-(68)	12-(97)	10-(118)
		33ksi	33ksi	50ksi	50ksi	50ksi	50ksi	33ksi	33ksi	50ksi	50ksi	50ksi	50ksi
8ft.	12"	2.49	3.45	5.52	7.33	11.34	14.77	3.07	4.58	7.85	10.38	16.07	21.13
	16"	2.49	3.45	5.52	7.33	11.34	14.77	3.07	4.58	7.85	10.38	16.07	21.13
	24"	2.26	3.45	5.52	7.33	11.34	14.77	2.87	4.58	7.85	10.38	16.07	21.13
9ft.	12"	2.49	3.45	5.52	7.33	11.34	14.77	3.07	4.58	7.85	10.38	16.07	21.13
	16"	2.37	3.45	5.52	7.33	11.34	14.77	3.00	4.58	7.85	10.38	16.07	21.13
	24"	2.04	3.27	5.52	7.33	11.34	14.77	2.63	4.53	7.85	10.38	16.07	21.13
10ft.	12"	2.41	3.45	5.52	7.33	11.34	14.77	3.04	4.58	7.85	10.38	16.07	21.13
	16"	2.21	3.43	5.52	7.33	11.34	14.77	2.81	4.58	7.85	10.38	16.07	21.13
	24"	1.81	3.05	5.52	7.33	11.34	14.77	2.36	4.26	7.85	10.38	16.07	21.13
11ft.	12"	2.27	3.45	5.52	7.33	11.34	14.77	2.89	4.58	7.85	10.38	16.07	21.13
	16"	2.03	3.25	5.52	7.33	11.34	14.77	2.61	4.50	7.85	10.38	16.07	21.13
	24"	1.54	2.79	5.35	7.33	11.34	14.77	2.06	3.97	7.85	10.38	16.07	21.13
12ft.	12"	2.12	3.34	5.52	7.33	11.34	14.77	2.71	4.58	7.85	10.38	16.07	21.13
	16"	1.83	3.06	5.52	7.33	11.34	14.77	2.38	4.27	7.85	10.38	16.07	21.13
	24"	1.26(6)	2.52	5.06	7.12	11.34	14.77	1.74	3.64	7.51	10.38	16.07	21.13
14ft.	12"	1.77	3.00	5.52	7.33	11.34	14.77	2.29	4.13	7.70	10.26	16.07	21.13
	16"	1.39(6)	2.62	5.14	7.19	11.34	14.77	1.86(6)	3.70	7.44	10.26	16.07	21.13
	24"		1.90(3)	4.41(6)	6.37	10.79	14.61	0.57(3)	2.88(6)	6.54	9.49	15.99	21.13
16ft.	12"	1.38(3)	2.60(6)	5.08	7.11	11.34	14.77	1.81(6)	3.58	7.08	9.88	15.53	20.70
	16"	0.62(3)	2.13(3)	4.59(6)	6.55	10.95	14.76	1.27(3)	3.04(6)	6.50	9.32	15.53	20.70
	24"		0.82(2)	3.66(3)	5.51(3)	9.68	13.32		2.05(3)	5.40(3)	8.13(6)	14.13	19.62

AXIAL LOADS, KIPS

Allowable Axial Loads													
8" Members							Wind Load = 30psf						
Height	Spacing	MarinoWare - (SSMA)											
		8SW-gauge - (800S162-mils)						8J-gauge - (800S200-mils)					
		20-(33)	18-(43)	16-(54)	14-(68)	12-(97)	10-(118)	20-(33)	18-(43)	16-(54)	14-(68)	12-(97)	10-(118)
		33ksi	33ksi	50ksi	50ksi	50ksi	50ksi	33ksi	33ksi	50ksi	50ksi	50ksi	50ksi
8ft.	12"	2.49	3.45	5.52	7.33	11.34	14.77	3.07	4.58	7.85	10.38	16.07	21.13
	16"	2.41	3.45	5.52	7.33	11.34	14.77	3.04	4.58	7.85	10.38	16.07	21.13
	24"	2.10	3.33	5.52	7.33	11.34	14.77	2.70	4.58	7.85	10.38	16.07	21.13
9ft.	12"	2.44	3.45	5.52	7.33	11.34	14.77	3.07	4.58	7.85	10.38	16.07	21.13
	16"	2.24	3.45	5.52	7.33	11.34	14.77	2.85	4.58	7.85	10.38	16.07	21.13
	24"	1.85	3.09	5.52	7.33	11.34	14.77	2.41	4.32	7.85	10.38	16.07	21.13
10ft.	12"	2.29	3.45	5.52	7.33	11.34	14.77	2.90	4.58	7.85	10.38	16.07	21.13
	16"	2.05	3.27	5.52	7.33	11.34	14.77	2.63	4.52	7.85	10.38	16.07	21.13
	24"	1.57	2.82	5.39	7.33	11.34	14.77	2.09	4.00	7.85	10.38	16.07	21.13
11ft.	12"	2.13	3.35	5.52	7.33	11.34	14.77	2.72	4.58	7.85	10.38	16.07	21.13
	16"	1.83	3.07	5.52	7.33	11.34	14.77	2.39	4.28	7.85	10.38	16.07	21.13
	24"	1.26(6)	2.52	5.08	7.14	11.34	14.77	1.75	3.66	7.55	10.38	16.07	21.13
12ft.	12"	1.94	3.17	5.52	7.33	11.34	14.77	2.51	4.40	7.85	10.38	16.07	21.13
	16"	1.60	2.84	5.39	7.33	11.34	14.77	2.12	4.02	7.85	10.38	16.07	21.13
	24"	0.65(3)	2.20(6)	4.75	6.77	11.29	14.77	1.37(6)	3.28	7.12	10.11	16.07	21.13
14ft.	12"	1.54(6)	2.77	5.29	7.33	11.34	14.77	2.03	3.87	7.62	10.26	16.07	21.13
	16"	1.09(3)	2.33(6)	4.84	6.86	11.34	14.77	1.52(3)	3.36	7.08	10.05	16.07	21.13
	24"		1.46(3)	3.98(3)	5.90(6)	10.22	13.98		2.40(3)	6.03(6)	8.93	15.33	20.92
16ft.	12"	1.09(3)	2.31(3)	4.78	6.77	11.22	14.77	1.49(3)	3.25(6)	6.73	9.57	15.53	20.70
	16"		1.76(3)	4.21(3)	6.12(6)	10.43	14.17	0.27(3)	2.63(3)	6.05(6)	8.83	15.00	20.63
	24"			3.13(3)	4.91(3)	8.95(6)	12.50		0.85(2)	4.78(3)	7.45(3)	13.30(6)	18.65

8" Members													
8" Members							Wind Load = 35psf						
Height	Spacing	MarinoWare - (SSMA)											
		8SW-gage - (800S162-mils)						8J-gauge - (800S200-mils)					
		20-(33)	18-(43)	16-(54)	14-(68)	12-(97)	10-(118)	20-(33)	18-(43)	16-(54)	14-(68)	12-(97)	10-(118)
		33ksi	33ksi	50ksi	50ksi	50ksi	50ksi	33ksi	33ksi	50ksi	50ksi	50ksi	50ksi
8ft.	12"	2.49	3.45	5.52	7.33	11.34	14.77	3.07	4.58	7.85	10.38	16.07	21.13
	16"	2.31	3.45	5.52	7.33	11.34	14.77	2.93	4.58	7.85	10.38	16.07	21.13
	24"	1.95	3.19	5.52	7.33	11.34	14.77	2.53	4.43	7.85	10.38	16.07	21.13
9ft.	12"	2.34	3.45	5.52	7.33	11.34	14.77	2.96	4.58	7.85	10.38	16.07	21.13
	16"	2.11	3.33	5.52	7.33	11.34	14.77	2.70	4.58	7.85	10.38	16.07	21.13
	24"	1.66	2.91	5.48	7.33	11.34	14.77	2.20	4.11	7.85	10.38	16.07	21.13
10ft.	12"	2.17	3.39	5.52	7.33	11.34	14.77	2.77	4.58	7.85	10.38	16.07	21.13
	16"	1.89	3.12	5.52	7.33	11.34	14.77	2.45	4.35	7.85	10.38	16.07	21.13
	24"	1.33	2.60	5.17	7.24	11.34	14.77	1.83	3.75	7.66	10.38	16.07	21.13
11ft.	12"	1.98	3.21	5.52	7.33	11.34	14.77	2.55	4.44	7.85	10.38	16.07	21.13
	16"	1.64	2.88	5.44	7.33	11.34	14.77	2.17	4.07	7.85	10.38	16.07	21.13
	24"	0.79(6)	2.25	4.82	6.85	11.34	14.77	1.43(6)	3.35	7.22	10.23	16.07	21.13
12ft.	12"	1.77	3.01	5.52	7.33	11.34	14.77	2.32	4.21	7.85	10.38	16.07	21.13
	16"	1.37(6)	2.62	5.17	7.23	11.34	14.77	1.87	3.77	7.64	10.38	16.07	21.13
	24"		1.88(6)	4.43	6.42	10.88	14.75	0.43(3)	2.92(6)	6.73	9.70	16.07	21.13
14ft.	12"	1.31(3)	2.55	5.07	7.10	11.34	14.77	1.77(6)	3.61	7.35	10.26	16.07	21.13
	16"	0.31(3)	2.04(3)	4.55(6)	6.53	10.98	14.77	0.99(3)	3.04(6)	6.72	9.67	16.07	21.13
	24"		0.40(3)	3.57(3)	5.44(3)	9.67	13.36		1.91(3)	5.53(3)	8.40(6)	14.68	20.19
16ft.	12"	0.39(3)	2.03(3)	4.49(6)	6.44	10.82	14.62	1.01(3)	2.94(3)	6.38	9.19	15.44	20.70
	16"		1.25(3)	3.84(3)	5.71(3)	9.93	13.60		2.24(3)	5.61(3)	8.36(6)	14.41	19.95
	24"			2.62(2)	4.34(3)	8.26(3)	11.71(6)			4.19(3)	6.81(3)	12.50(6)	17.72

8" Members													
8" Members							Wind Load = 40psf						
Height	Spacing	MarinoWare - (SSMA)											
		8SW-gauge - (800S162-mils)						8J-gauge - (800S200-mils)					
		20-(33)	18-(43)	16-(54)	14-(68)	12-(97)	10-(118)	20-(33)	18-(43)	16-(54)	14-(68)	12-(97)	10-(118)
		33ksi	33ksi	50ksi	50ksi	50ksi	50ksi	33ksi	33ksi	50ksi	50ksi	50ksi	50ksi
8ft.	12"	2.41	3.45	5.52	7.33	11.34	14.77	3.04	4.58	7.85	10.38	16.07	21.13
	16"	2.21	3.43	5.52	7.33	11.34	14.77	2.81	4.58	7.85	10.38	16.07	21.13
	24"	1.80	3.04	5.52	7.33	11.34	14.77	2.35	4.27	7.85	10.38	16.07	21.13
9ft.	12"	2.24	3.45	5.52	7.33	11.34	14.77	2.85	4.58	7.85	10.38	16.07	21.13
	16"	1.98	3.21	5.52	7.33	11.34	14.77	2.56	4.46	7.85	10.38	16.07	21.13
	24"	1.47	2.73	5.31	7.33	11.34	14.77	1.98	3.90	7.84	10.38	16.07	21.13
10ft.	12"	2.05	3.27	5.52	7.33	11.34	14.77	2.63	4.52	7.85	10.38	16.07	21.13
	16"	1.73	2.97	5.52	7.33	11.34	14.77	2.27	4.18	7.85	10.38	16.07	21.13
	24"	1.10(6)	2.38	4.95	7.00	11.34	14.77	1.57	3.49	7.40	10.38	16.07	21.13
11ft.	12"	1.83	3.07	5.52	7.33	11.34	14.77	2.39	4.28	7.85	10.38	16.07	21.13
	16"	1.45	2.70	5.26	7.33	11.34	14.77	1.96	3.86	7.76	10.38	16.07	21.13
	24"	0.01(3)	1.99(6)	4.56	6.57	11.07	14.77	0.73(6)	3.05	6.90	9.89	16.07	21.13
12ft.	12"	1.60	2.84	5.39	7.33	11.34	14.77	2.12	4.02	7.85	10.38	16.07	21.13
	16"	1.15(6)	2.41	4.96	7.00	11.34	14.77	1.62(6)	3.52	7.38	10.38	16.07	21.13
	24"		1.58(3)	4.13(6)	6.08	10.48	14.31		2.56(6)	6.35	9.31	15.71	21.13
14ft.	12"	1.09(3)	2.33(6)	4.84	6.86	11.34	14.77	1.52(3)	3.36	7.08	10.05	16.07	21.13
	16"		1.76(3)	4.27(6)	6.22	10.60	14.40	0.16(3)	2.72(3)	6.37(6)	9.30	15.77	21.13
	24"			3.17(3)	4.99(3)	9.13(6)	12.75		0.76(3)	5.04(3)	7.87(3)	14.04	19.47
16ft.	12"		1.76(3)	4.21(3)	6.12(6)	10.43	14.17	0.27(3)	2.63(3)	6.05(6)	8.83	15.00	20.63
	16"		0.40(2)	3.48(3)	5.31(3)	9.43(6)	13.04		1.76(3)	5.19(3)	7.90(3)	13.85	19.29
	24"			1.76(2)	3.79(2)	7.58(3)	10.94			3.62(2)	6.18(3)	11.74(3)	16.82(6)

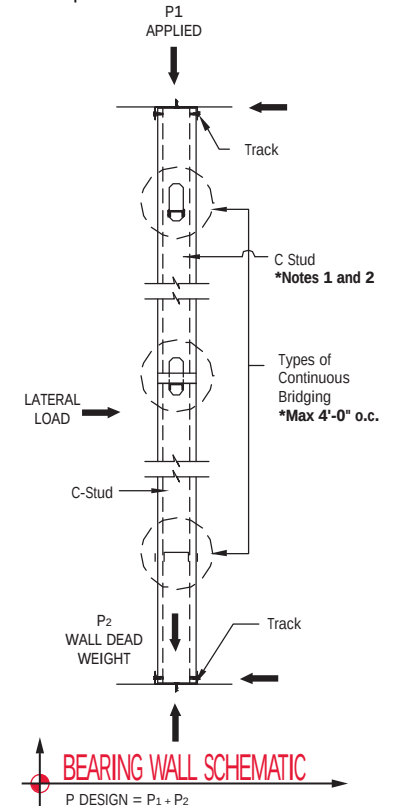
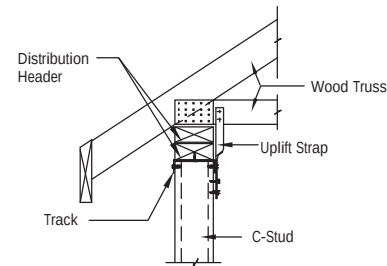
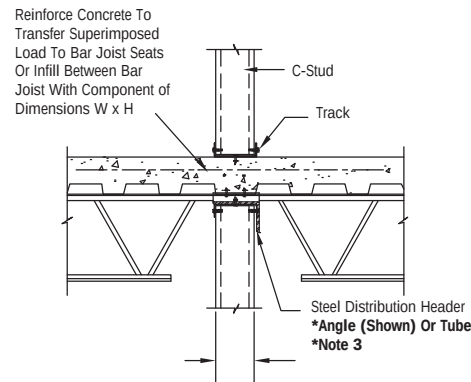
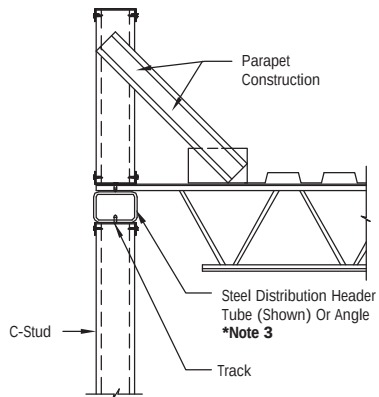
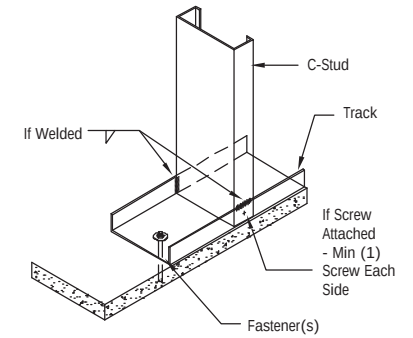
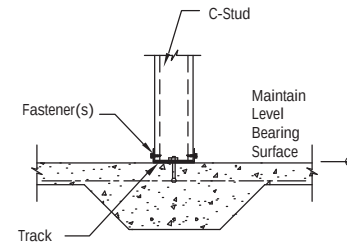
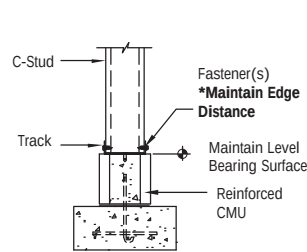
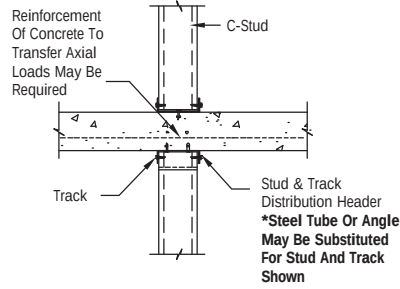
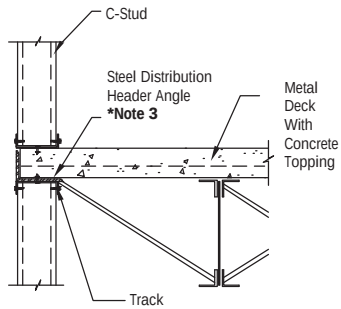
8" Members														
8" Members							Wind Load = 50psf							
Height	Spacing	MarinoWare - (SSMA)												
		8SW-gauge - (800S162-mils)						8J-gauge - (800S200-mils)						
		20-(33)	18-(43)	16-(54)	14-(68)	12-(97)	10-(118)	20-(33)	18-(43)	16-(54)	14-(68)	12-(97)	10-(118)	
		33ksi	33ksi	50ksi	50ksi	50ksi	50ksi	33ksi	33ksi	50ksi	50ksi	50ksi	50ksi	
8ft.	12"	2.26	3.45	5.52	7.33	11.34	14.77	2.87	4.58	7.85	10.38	16.07	21.13	
	16"	2.00	3.24	5.52	7.33	11.34	14.77	2.58	4.48	7.85	10.38	16.07	21.13	
	24"	1.49	2.76	5.34	7.33	11.34	14.77	2.02	3.94	7.85	10.38	16.07	21.13	
9ft.	12"	2.04	3.27	5.52	7.33	11.34	14.77	2.63	4.53	7.85	10.38	16.07	21.13	
	16"	1.72	2.97	5.52	7.33	11.34	14.77	2.27	4.18	7.85	10.38	16.07	21.13	
	24"	1.09	2.37	4.96	7.01	11.34	14.77	1.56	3.49	7.42	10.38	16.07	21.13	
10ft.	12"	1.81	3.05	5.52	7.33	11.34	14.77	2.36	4.26	7.85	10.38	16.07	21.13	
	16"	1.41	2.67	5.24	7.32	11.34	14.77	1.92	3.83	7.75	10.38	16.07	21.13	
	24"		1.94	4.52	6.53	11.04	14.77	0.52(6)	2.99	6.87	9.88	16.07	21.13	
11ft.	12"	1.54	2.79	5.35	7.33	11.34	14.77	2.06	3.97	7.85	10.38	16.07	21.13	
	16"	1.05(6)	2.34	4.91	6.95	11.34	14.77	1.54	3.45	7.33	10.34	16.07	21.13	
	24"		1.41(3)	4.04(6)	6.00	10.40	14.23		2.45(6)	6.27	9.23	15.66	21.13	
12ft.	12"	1.26(6)	2.52	5.06	7.12	11.34	14.77	1.74	3.64	7.51	10.38	16.07	21.13	
	16"	0.06(3)	1.99(6)	4.54	6.54	11.02	14.77	0.76(3)	3.04	6.86	9.84	16.07	21.13	
	24"		0.05(3)	3.52(3)	5.41(6)	9.69	13.43		1.65(3)	5.61(3)	8.53	14.80	20.40	
14ft.	12"		1.90(3)	4.41(6)	6.37	10.79	14.61	0.57(3)	2.88(6)	6.54	9.49	15.99	21.13	
	16"		0.75(3)	3.71(3)	5.59(6)	9.85	13.57		2.10(3)	5.69(3)	8.57(6)	14.89	20.43	
	24"			2.37(2)	4.12(3)	8.08(3)	11.58(6)			4.10(3)	6.86(3)	12.82(6)	18.07	
16ft.	12"			0.82(2)	3.66(3)	5.51(3)	9.68	13.32		2.05(3)	5.40(3)	8.13(6)	14.13	19.62
	16"				2.79(2)	4.53(3)	8.49(3)	11.97(6)			4.38(3)	7.02(3)	12.77(6)	18.02
	24"					2.13(2)	6.29(3)	9.48(3)			1.66(2)	5.00(2)	10.27(3)	15.12(3)

(2) = L/240

(3) = L/360

(6) = L/600

AXIAL LOAD ILLUSTRATIONS



NOTES:

1. Size, spacing and anchorage of framing components shall be qualified by design.
2. Reference page 31, Specification Section 3.6, Fasteners and Attachments, for additional information.
3. Detail shows the installation of a distribution header to accommodate potential non-alignment with bearing studs. At framed openings (i.e. width of opening exceeds typical stud spacing), investigate the installation of independent headers as shown on page 26. This may be avoided if the distribution header is sized to transfer the loads over the increased span.

JOIST / RAFTER APPLICATIONS

APPLICATION:

For selection of floor and roof joists subjected to uniform live and dead loads.

USE:

The TOTAL LOAD values denote the total safe uniformly distributed load carrying capacity of the section expressed in pounds per square foot (PSF), which will not generate deflections in excess of $L/240$ of the span length. The LIVE LOAD values denote the live load in pounds per square foot (PSF), which will produce a deflection of $L/360$ of the span.

To determine live load deflection limits of $L/480$, multiply the LIVE LOAD values shown by a factor of 0.75.

To determine live load deflection limits of $L/240$, multiply the LIVE LOAD values shown by a factor of 1.5. In this case, ensure that the adjusted value does not exceed the TOTAL LOAD capacity of the joist.

The uses of these tables are limited to simply supported conditions installed to a maximum slope of $\frac{1}{2}$ " per foot.

NOTES:

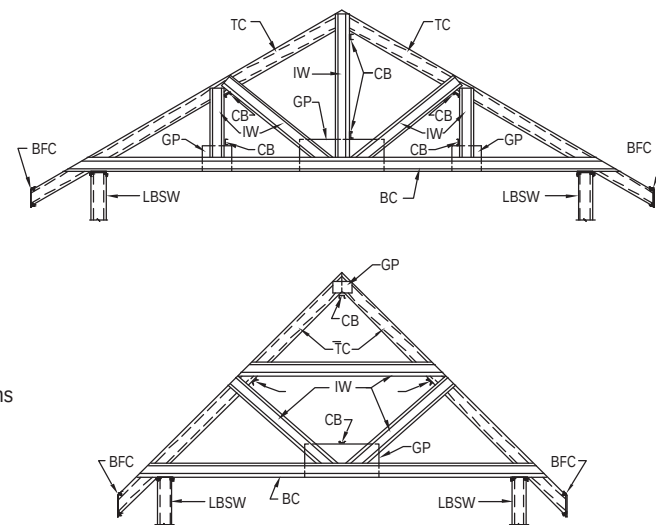
- Applications involving multiple spans, cantilevers, concentrated loads, impact loading, etc. should be investigated separately.
- Web crippling should be investigated in accordance with AISI Section C3.4. Web stiffeners are recommended at all support and concentrated load locations. Please reference page 28 for web crippling capacities.
- Joists shall be restrained against rotation at each end. Joists shall be attached to track components or restrained by the installation of continuous solid blocking.
- Minimum end bearing shall be $1\frac{1}{2}$ ".
- Deflections and stresses were calculated without regard to the composite contribution of facing materials.
- The compression flange of the section should be braced by the attachment of continuous diaphragm rated sheathing or decking. Additionally, mechanical bridging shall be installed at intervals not to exceed 7'-0" on center. Please reference page 25 for bridging methods. The installation of bridging shall be completed before loading the floor/roof system.
- Calculations were based on the use of the effective structural properties shown on pages 4 through 7.
- Contact MarinoWare for uniform load capacities of framing components not shown in these tables.
- Load values for 16 gauge products are based on steel with F_y (min) = 50 KSI.

TRUSS APPLICATIONS

KEY	COMPONENT	REFERENCE NOTES
TC	Top Chord	2, 3, & 4
BC	Bottom Chord	2, 3, & 4
IW	Internal Web	2 & 4
CB	Continuous Bridging	5
BFC	Brake Formed Closure	
GP	Gusset Plate	6
LBSW	Load Bearing Stud Wall	7

NOTES:

- Size, spacing, and anchorage of truss frames shall be qualified by design.
- Install continuous components (avoid splicing). The use of components with unpunched webs is recommended.
- Chords subjected to uniform loading shall satisfy the interaction equations of AISI Section C5, Combined Axial and Bending.
- Installation of intermediate bridging will reduce the member's unbraced length, thus increasing its axial capacity yet adding to the installation costs.
- Use $1\frac{1}{2}$ " CR 16 gauge channel if trusses spaced 24" o.c. or less. Use $2\frac{1}{2}$ " T 20 gauge track if trusses spaced between 24" and 48" o.c.
- Use flat plate or section of heavy gauge C stud or track.
- Align webs of bottom chord and stud or install continuous distribution header at top of wall below. Installation of a web stiffener at support locations may be required.
- Reference page 31, Specification Section 3.5, Installation: Joist for additional information.





JOIST SPAN, P.S.F.

Floor and Roof Applications

Member		Spans													
MW Type (SSMA)	O.C.	11'-0"		12'-0"		13'-0"		14'-0"		15'-0"		16'-0"		17'-0"	
		T	L	T	L	T	L	T	L	T	L	T	L	T	L

6" Members

6SW18 (600S162-43)	12"	92	76	77	59	66	46	55	37	45	30	37	25	31	21
	16"	69	57	58	44	49	35	41	28	34	22	28	19	23	15
	24"	46	38	39	29	33	23	28	18	22	15	19	12	15	10
6SW16 (600S162-54)	12"	141	94	109	72	85	57	68	46	56	37	46	31	38	25
	16"	106	70	81	54	64	43	51	34	42	28	34	23	29	19
	24"	70	47	54	36	43	28	34	23	28	19	23	15	19	13
6SW14 (600S162-68)	12"	174	116	134	89	105	70	84	56	68	46	56	38	47	31
	16"	130	87	100	67	79	53	63	42	51	34	42	28	35	24
	24"	87	58	67	45	53	35	42	28	34	23	28	19	24	16
6SW12 (600S162-97)	12"	236	158	182	121	143	95	115	76	93	62	77	51	64	43
	16"	177	118	136	91	107	72	86	57	70	47	58	38	48	32
	24"	118	79	91	61	72	48	57	38	47	31	38	26	32	21
6J18 (600S200-43)	12"	95	88	80	68	68	53	59	43	51	35	43	29	36	24
	16"	71	66	60	51	51	40	44	32	38	26	32	21	27	18
	24"	48	44	40	34	34	27	29	21	26	17	21	14	18	12
6J16 (600S200-54)	12"	163	109	126	84	99	66	79	53	64	43	53	35	44	30
	16"	123	82	94	63	74	50	59	40	48	32	40	27	33	22
	24"	82	54	63	42	50	33	40	26	32	21	27	18	22	15
6J14 (600S200-68)	12"	202	135	156	104	122	82	98	65	80	53	66	44	55	36
	16"	151	101	117	78	92	61	73	49	60	40	49	33	41	27
	24"	101	67	78	52	61	41	49	33	40	27	33	22	27	18
6J12 (600S200-97)	12"	276	184	213	142	167	112	134	89	109	73	90	60	75	50
	16"	207	138	160	106	126	84	101	67	82	55	67	45	56	37
	24"	138	92	106	71	84	56	67	45	55	36	45	30	37	25

8" Members

8SW18 (800S162-43)	12"	126	126	106	106	90	90	78	74	68	60	60	49	53	41
	16"	95	95	79	79	68	68	58	55	51	45	45	37	40	31
	24"	63	63	53	53	45	45	39	37	34	30	30	25	26	21
8SW16 (800S162-54)	12"	231	188	194	145	165	114	137	91	111	74	92	61	77	51
	16"	173	141	145	109	124	86	103	69	84	56	69	46	57	38
	24"	115	94	97	73	83	57	69	46	56	37	46	31	38	26
8SW14 (800S162-68)	12"	328	233	269	179	212	141	169	113	138	92	113	76	95	63
	16"	246	175	202	134	159	106	127	85	103	69	85	57	71	47
	24"	164	116	134	90	106	71	85	56	69	46	57	38	47	32
8SW12 (800S162-97)	12"	475	319	368	246	290	193	232	155	189	126	155	104	130	86
	16"	356	239	276	184	217	145	174	116	141	94	117	78	97	65
	24"	237	159	184	123	145	97	116	77	94	63	78	52	65	43
8J18 (800S200-43)	12"	141	141	118	118	101	101	87	84	76	69	67	57	59	47
	16"	106	106	89	89	76	76	65	63	57	51	50	42	44	35
	24"	70	70	59	59	50	50	43	42	38	34	33	28	29	24
8J16 (800S200-54)	12"	248	216	208	166	177	131	153	105	128	85	105	70	88	58
	16"	186	162	156	125	133	98	115	79	96	64	79	53	66	44
	24"	124	108	104	83	89	65	76	52	64	43	53	35	44	29
8J14 (800S200-68)	12"	359	267	302	206	243	162	194	130	158	105	130	87	109	72
	16"	269	200	226	154	182	121	146	97	119	79	98	65	81	54
	24"	180	134	151	103	121	81	97	65	79	53	65	43	54	36
8J12 (800S200-97)	12"	532	368	425	283	334	223	268	178	218	145	179	120	149	100
	16"	399	276	319	213	251	167	201	134	163	109	134	90	112	75
	24"	266	184	213	142	167	111	134	89	109	73	90	60	75	50

* = Exceeds the H/T ratio of 200

Member		Spans																	
MW Type (SSMA)	O.C.	18'-0"		19'-0"		20'-0"		21'-0"		22'-0"		23'-0"		24'-0"					
		T	L	T	L	T	L	T	L	T	L	T	L	T	L				

10" Members

10SW18* (1000S162-43)	12"	58	58	52	51	47	44	42	38	39	33	35	29	32	25
	16"	43	43	39	38	35	33	32	28	29	25	26	22	24	19
	24"	29	29	26	26	23	22	21	19	19	16	18	14	16	13
10SW16 (1000S162-54)	12"	105	75	95	63	82	54	70	47	61	41	54	36	47	31
	16"	79	56	71	48	61	41	53	35	46	31	40	27	35	24
	24"	53	37	47	32	41	27	35	23	31	20	27	18	24	16
10SW14 (1000S162-68)	12"	139	92	118	79	101	67	87	58	76	51	66	44	58	39
	16"	104	69	88	59	76	50	65	44	57	38	50	33	44	29
	24"	69	46	59	39	50	34	44	29	38	25	33	22	29	19
10SW12 (1000S162-97)	12"	191	127	162	108	139	93	120	80	104	70	91	61	80	54
	16"	143	95	122	81	104	70	90	60	78	52	69	46	60	40
	24"	95	64	81	54	70	46	60	40	52	35	46	30	40	27
10J18* (1000S200-43)	12"	64	64	58	58	52	50	47	43	43	37	39	33	36	29
	16"	48	48	43	43	39	37	35	32	32	28	30	24	27	22
	24"	32	32	29	29	26	25	24	21	22	19	20	16	18	14
10J16 (1000S200-54)	12"	113	85	101	72	92	62	80	53	69	46	61	41	53	36
	16"	85	63	76	54	69	46	60	40	52	35	46	30	40	27
	24"	57	42	51	36	46	31	40	27	35	23	30	20	27	18
10J14 (1000S200-68)	12"	157	105	134	89	115	76	99	66	86	57	75	50	66	44
	16"	118	79	100	67	86	57	74	50	65	43	57	38	50	33
	24"	79	52	67	45	57	38	50	33	43	29	38	25	33	22
10J12 (1000S200-97)	12"	217	145	185	123	158	106	137	91	119	79	104	69	92	61
	16"	163	109	139	92	119	79	103	68	89	60	78	52	69	46
	24"	109	72	92	62	79	53	68	46	60	40	52	35	46	31

12" Members

12SW16* (1200S162-54)	12"	124	118	111	100	101	86	91	74	83	65	76	56	70	50
	16"	93	88	84	75	75	64	68	56	62	48	57	42	52	37
	24"	62	59	56	50	50	43	46	37	42	32	38	28	35	25
12SW14 (1200S162-68)	12"	181	146	162	124	147	107	133	92	120	80	105	70	93	62
	16"	136	110	122	93	110	80	100	69	90	60	79	53	69	46
	24"	90	73	81	62	73	53	66	46	60	40	53	35	46	31
12SW12 (1200S162-97)	12"	303	202	258	172	221	147	191	127	166	111	145	97	128	85
	16"	227	152	193	129	166	110	143	95	125	83	109	73	96	64
	24"	152	101	129	86	110	74	95	64	83	55	73	48	64	43
12SW10 (1200S162-118)	12"	368	246	313	209	269	179	232	155	202	134	177	118	155	104
	16"	276	184	235	157	201	134	174	116	151	101	132	88	117	78
	24"	184	123	157	104	134	90	116	77	101	67	88	59	78	52
12J16* (1200S200-54)	12"	134	132	120	113	109	96	98	83	90	72	82	63	75	56
	16"	101	99	90	84	81	72	74	63	67	54	62	48	57	42
	24"	67	66	60	56	54	48	49	42	45	36	41	32	38	28
12J14 (1200S200-68)	12"	201	164	181	140	163	120	148	104	135	90	118	79	104	69
	16"	151	123	136	105	122	90	111	78	101	68	89	59	78	52
	24"	101	82	90	70	82	60	74	52	67	45	59	39	52	35
12J12 (1200S200-97)	12"	342	228	291	194	249	166	215	144	187	125	164	109	144	96
	16"	256	171	218	145	187	125	161	108	140	94	123	82	108	72
	24"	171	114	145	97	125	83	108	72	94	62	82	55	72	48
12J10 (1200S200-118)	12"	417	278	354	236	304	202	262	175	228	152	200	133	176	117
	16"	312	208	266	177	228	152	197	131	171	114	150	100	132	88
	24"	208	139	177	118	152	101	131	87	114	76	100	67	88	59

Floor and Roof Applications

Member		Spans													
MW Type (SSMA)	o.c.	23'-0"		24'-0"		25'-0"		26'-0"		27'-0"		28'-0"		29'-0"	
		T	L	T	L	T	L	T	L	T	L	T	L	T	L

12" Members

12J14 (1200S200-68)	12"	118	79	104	69	92	61	82	55	73	49	66	44	59	39
	16"	89	59	78	52	69	46	61	41	55	37	49	33	44	29
	24"	59	39	52	35	46	31	41	27	37	24	33	22	29	20
12J12 (1200S200-97)	12"	164	109	144	96	128	85	113	76	101	68	91	61	82	55
	16"	123	82	108	72	96	64	85	57	76	51	68	45	61	41
	24"	82	55	72	48	64	43	57	38	51	34	45	30	41	27
12J10 (1200S200-118)	12"	200	133	176	117	156	104	138	92	123	82	111	74	100	66
	16"	150	100	132	88	117	78	104	69	93	62	83	55	75	50
	24"	100	67	88	59	78	52	69	46	62	41	55	37	50	33
12JE16* (1200S250-54)	12"	84	71	78	62	71	55	66	49	61	44	57	39	53	35
	16"	63	53	58	47	54	41	50	37	46	33	43	29	40	26
	24"	42	35	39	31	36	28	33	24	31	22	28	20	26	18
12JE14 (1200S250-68)	12"	123	88	113	77	103	68	91	61	82	54	73	49	66	44
	16"	92	66	85	58	77	51	68	46	61	41	55	37	49	33
	24"	62	44	57	39	51	34	46	30	41	27	37	24	33	22
12JE12 (1200S250-97)	12"	183	122	161	108	143	95	127	85	113	76	102	68	91	61
	16"	137	92	121	81	107	71	95	63	85	57	76	51	69	46
	24"	92	61	81	54	71	48	63	42	57	38	51	34	46	30
12JE10 (1200S250-118)	12"	224	149	197	131	174	116	155	103	138	92	124	83	112	74
	16"	168	112	148	98	131	87	116	77	104	69	93	62	84	56
	24"	112	75	98	66	87	58	77	52	69	46	62	41	56	37

14" Members

14J14 (1400S200-68)	12"	142	116	130	102	120	90	111	80	103	72	96	64	87	58
	16"	106	87	98	77	90	68	83	60	77	54	72	48	65	43
	24"	71	58	65	51	60	45	55	40	51	36	48	32	43	29
14J12 (1400S200-97)	12"	242	161	213	142	188	125	167	112	149	100	134	89	121	80
	16"	181	121	160	106	141	94	125	84	112	75	100	67	90	60
	24"	121	81	106	71	94	63	84	56	75	50	67	45	60	40
14J10 (1400S200-118)	12"	295	197	260	173	230	153	204	136	182	122	164	109	147	98
	16"	221	148	195	130	172	115	153	102	137	91	123	82	110	74
	24"	148	98	130	87	115	77	102	68	91	61	82	55	74	49
14JE12 (1400S250-97)	12"	260	179	236	157	209	139	186	124	166	110	149	99	134	89
	16"	195	134	177	118	157	104	139	93	124	83	111	74	100	67
	24"	130	89	118	79	104	70	93	62	83	55	74	50	67	45
14JE10 (1400S250-118)	12"	328	219	289	192	255	170	227	151	203	135	182	121	164	109
	16"	246	164	217	144	192	128	170	114	152	101	136	91	123	82
	24"	164	109	144	96	128	85	114	76	101	68	91	61	82	55
14JX12 (1400S300-97)	12"	307	207	273	182	242	161	215	143	192	128	172	115	155	103
	16"	230	155	205	137	181	121	161	107	144	96	129	86	116	77
	24"	153	103	137	91	121	81	107	72	96	64	86	57	77	52
14JX10 (1400S300-118)	12"	381	254	335	223	296	198	263	176	235	157	211	141	190	127
	16"	285	190	251	167	222	148	198	132	176	118	158	105	142	95
	24"	190	127	167	112	148	99	132	88	118	78	105	70	95	63
14JXW12 (1400S350-97)	12"	309	225	284	198	262	175	233	155	208	139	187	124	168	112
	16"	232	168	213	148	196	131	175	117	156	104	140	93	126	84
	24"	155	112	142	99	131	87	117	78	104	69	93	62	84	56
14JXW10 (1400S350-118)	12"	414	276	364	243	322	215	286	191	256	170	229	153	206	138
	16"	310	207	273	182	242	161	215	143	192	128	172	115	155	103
	24"	207	138	182	121	161	107	143	95	128	85	115	76	103	69

* = Exceeds the H/T ratio of 200

Member		Spans															
MW Type (SSMA)	o.c.	30'-0"		31'-0"		32'-0"		33'-0"		34'-0"		35'-0"		36'-0"			
		T	L	T	L	T	L	T	L	T	L	T	L	T	L		

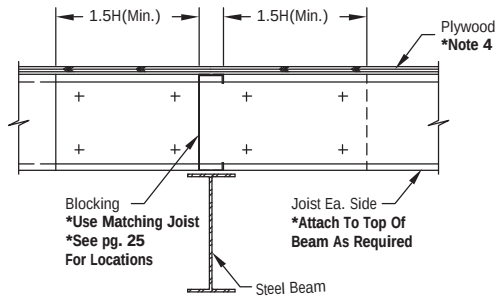
14" Members

14JE10 (1400S250-118)	12"	148	99	134	89	122	81	111	74	102	68	93	62	86	57
	16"	111	74	100	67	91	61	83	56	76	51	70	47	64	43
	24"	74	49	67	45	61	41	56	37	51	34	47	31	43	29
14JX14 (1400S300-68)	12"	100	67	91	61	83	55	75	50	69	46	63	42	58	39
	16"	75	50	68	45	62	41	56	38	52	34	47	32	43	29
	24"	50	33	45	30	41	28	38	25	34	23	32	21	29	19
14JX12 (1400S300-97)	12"	140	93	127	84	115	77	105	70	96	64	88	59	81	54
	16"	105	70	95	63	86	58	79	53	72	48	66	44	61	40
	24"	70	47	63	42	58	38	53	35	48	32	44	29	40	27
14JX10 (1400S300-118)	12"	172	114	155	104	141	94	129	86	118	79	108	72	99	66
	16"	129	86	117	78	106	71	97	64	88	59	81	54	74	50
	24"	86	57	78	52	71	47	64	43	59	39	54	36	50	33
14JXW14 (1400S350-68)	12"	104	72	98	66	89	60	82	54	75	50	68	46	63	42
	16"	78	54	73	49	67	45	61	41	56	37	51	34	47	31
	24"	52	36	49	33	45	30	41	27	37	25	34	23	31	21
14JXW12 (1400S350-97)	12"	152	101	138	92	125	83	114	76	104	70	96	64	88	59
	16"	114	76	103	69	94	63	86	57	78	52	72	48	66	44
	24"	76	51	69	46	63	42	57	38	52	35	48	32	44	29
14JXW10 (1400S350-118)	12"	186	124	169	113	154	102	140	93	128	85	117	78	108	72
	16"	140	93	127	84	115	77	105	70	96	64	88	59	81	54
	24"	93	62	84	56	77	51	70	47	64	43	59	39	54	36

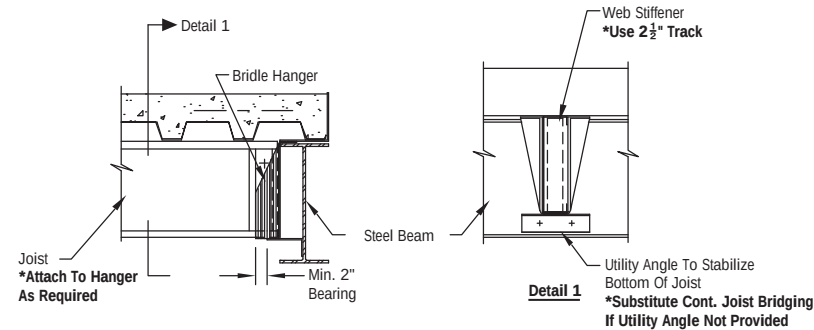
16" Members

16J14* (1600S200-68)	12"	94	71	88	65	83	59	78	54	73	49	67	45	62	41
	16"	71	53	66	48	62	44	58	40	55	37	50	34	46	31
	24"	47	36	44	32	41	29	39	27	37	24	34	22	31	21
16J12 (1600S200-97)	12"	153	102	139	92	126	84	115	77	105	70	96	64	89	59
	16"	115	77	104	69	95	63	86	58	79	53	72	48	66	44
	24"	77	51	69	46	63	42	58	38	53	35	48	32	44	30
16J10 (1600S200-118)	12"	187	125	170	113	154	103	141	94	129	86	118	79	108	72
	16"	140	94	127	85	116	77	106	70	96	64	88	59	81	54
	24"	94	62	85	57	77	51	70	47	64	43	59	39	54	36
16JE12 (1600S250-97)	12"	169	112	153	102	139	93	127	84	116	77	106	71	98	65
	16"	127	84	115	76	104	69	95	63	87	58	80	53	73	49
	24"	84	56	76	51	69	46	63	42	58	39	53	35	49	33
16JE10 (1600S250-118)	12"	207	138	187	125	170	114	155	104	142	95	130	87	120	80
	16"	155	103	140	94	128	85	116	78	106	71	98	65	90	60
	24"	103	69	94	62	85	57	78	52	71	47	65	43	60	40
16JX12 (1600S300-97)	12"	194	129	176	117	160	106	146	97	133	89	122	81	112	75
	16"	145	97	132	88	120	80	109	73	100	67	92	61	84	56
	24"	97	65	88	59	80	53	73	49	67	44	61	41	56	37
16JX10 (1600S300-118)	12"	238	159	216	144	196	131	179	119	164	109	150	100	138	92
	16"	179	119	162	108	147	98	134	89	123	82	112	75	103	69
	24"	119	79	108	72	98	65	89	60	82	55	75	50	69	46
16JXW12 (1600S350-97)	12"	204	140	190	127	173	115	157	105	144	96	132	88	121	81
	16"	153	105	142	95	129	86	118	79	108	72	99	66	91	61
	24"	102	70	95	63	86	58	79	52	72	48	66	44	61	40
16JXW10 (1600S350-118)	12"	257	172	233	156	212	141	193	129	177	118	162	108	149	99
	16"	193	129	175	117	159	106	145	97	133	88	122	81	112	74
	24"	129	86	117	78	106	71	97	64	88	59	81	54	74	50

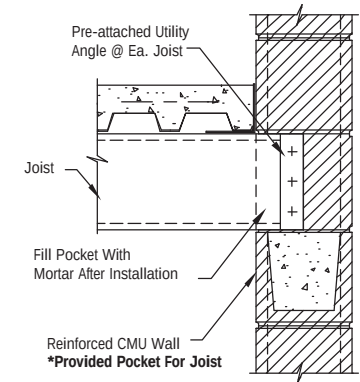
JOIST / RAFTER ILLUSTRATIONS



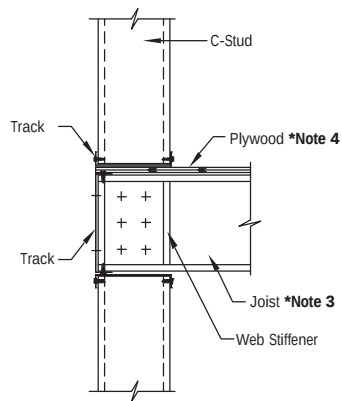
LAPPED JOIST @ INTERIOR SUPPORT



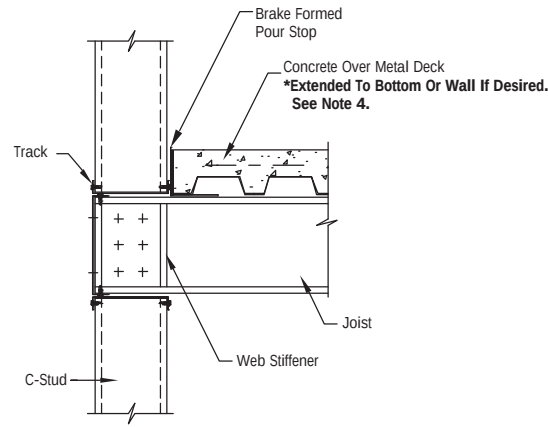
JOIST @ STEEL BEAM W/ BRIDLE HANGER



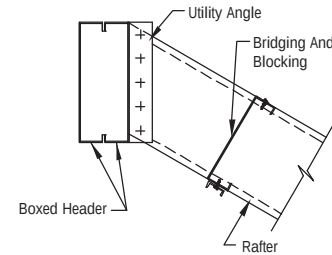
JOIST @ REINFORCED CMU WALL



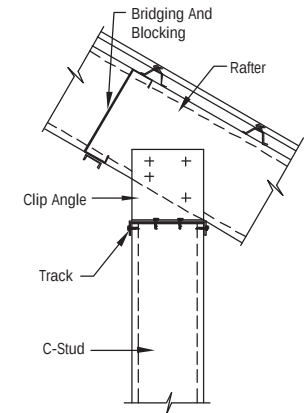
JOIST @ EXTERIOR BEARING WALL



JOIST @ EXTERIOR BEARING WALL



RAFTER @ RIDGE BEAM



RAFTER @ STUD BEARING WALL

NOTES:

1. Size, spacing and anchorage of framing components shall be qualified by design.
2. Reference page 31, Specification Section 3.5, Installation: Joist, for additional information.
3. Align webs of joist and stud or install continuous distribution header at top of wall below.
4. Investigate capacity of flooring materials to transfer axial load through system.
5. Connections between lapped joists, see detail above, are not moment resisting.

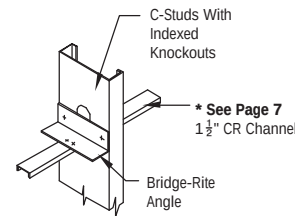
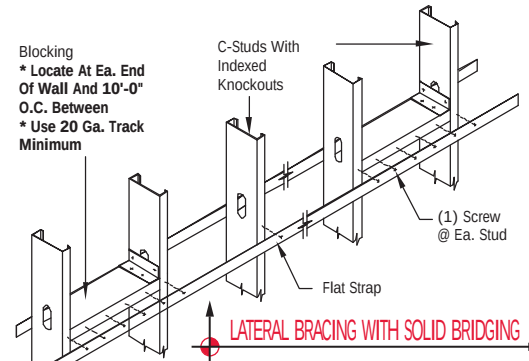
MECHANICAL BRIDGING

MAXIMUM VERTICAL SPACING OF BRIDGING

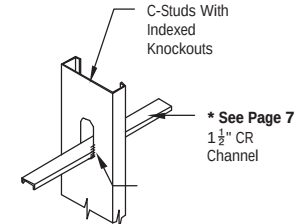
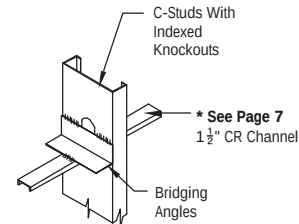
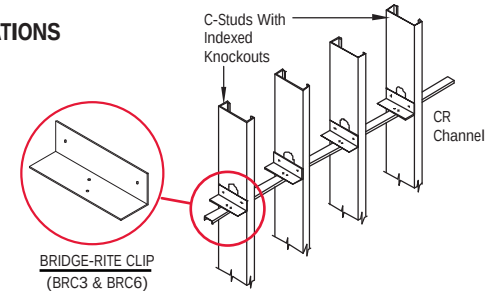
Maximum Depth of Stud	Non-Axial (Curtainwall)		Axial (Load Bearing)	
	First Row	Balance	First Row	Balance
4"	5'-0"	4'-0" O.C.	3'-0"	4'-0" O.C.
6"	5'-0"	4'-0" O.C.	3'-0"	4'-0" O.C.
All Depths	5'-0" O.C. Max.		4'-0" O.C. Max.	

NOTES:

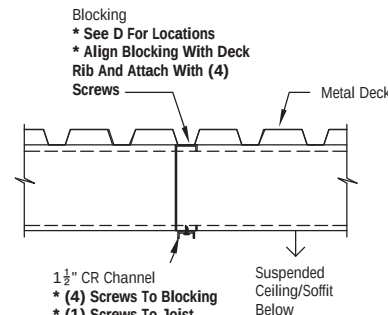
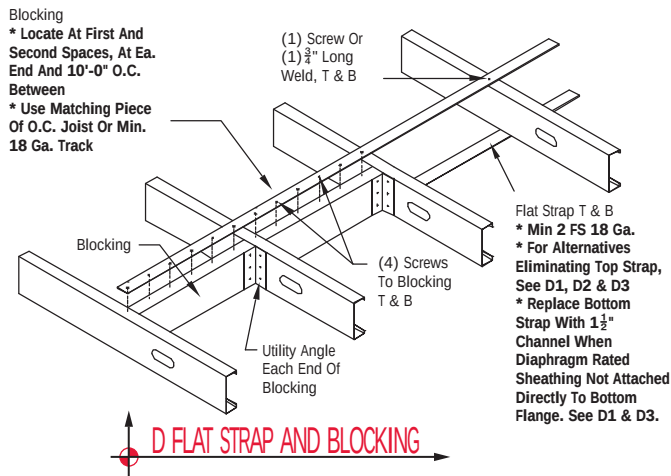
- In curtainwall construction, studs shall be braced against rotation by diaphragm rated sheathing board applied full height to each side of the wall. The installation of mechanical bridging, spaced 5'-0" on center, provides adequate rotational restraint for walls under construction before the installation of sheathing. Where the wall is not sheathed full height each side or sheathed on one side only, continuous bridging spaced 5'-0" on center shall provide rotational support. Reductions in allowable bending capacity must be investigated separately. When sheathing is used to brace the studs, the products shall maintain their structural integrity during the course of construction and the service life of the wall. The attachment of the sheathing should conform to the minimum requirements of industry standards and/or products specifications.
- In axial load bearing construction, studs shall be braced against rotation before loading. Install bridging spaced at intervals not exceeding 4'-0" on center.
- Reference page 3 for additional information regarding indexing of stud web knockouts. The first knockout occurs 12" from the indexed end and 24" on center thereafter.



WALL APPLICATIONS

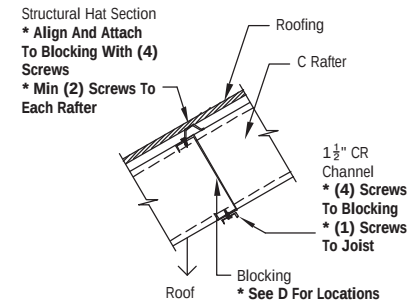
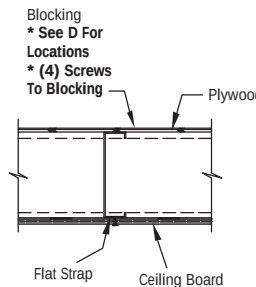


FLOOR/ROOF APPLICATIONS



NOTE:

- The compression flange of the section should be braced by the attachment of continuous diaphragm rated sheathing or decking. Additionally mechanical bridging shall be installed at intervals not to exceed 7'-0" on center.



HEADER NOTES & ILLUSTRATIONS

APPLICATION:

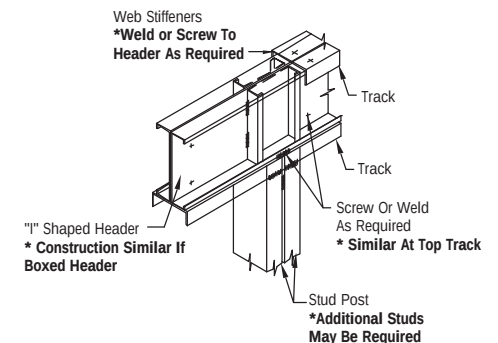
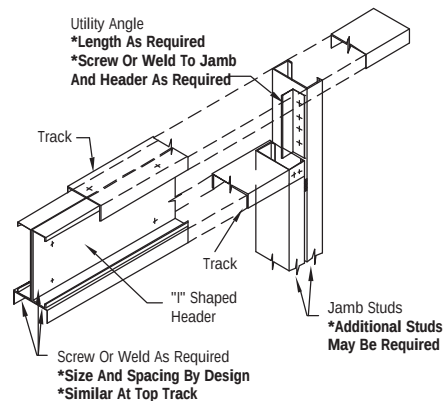
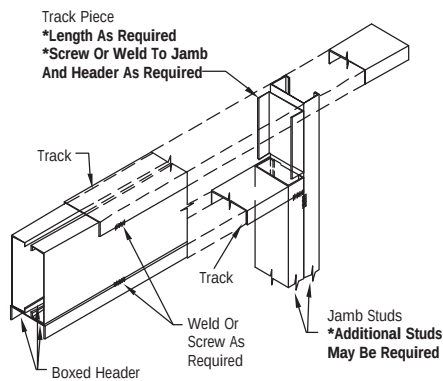
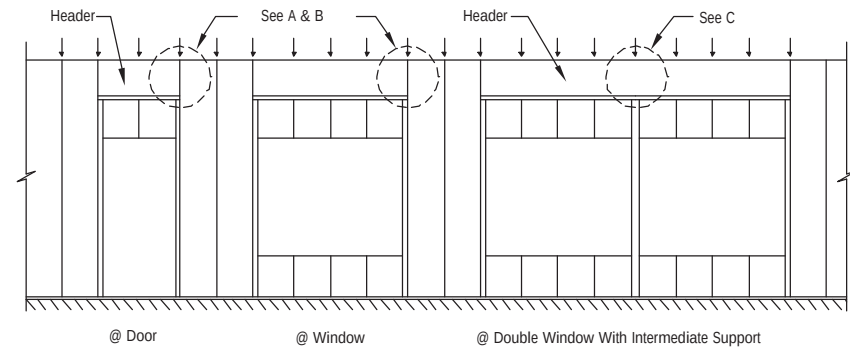
For selection of simply supported "I" or boxed shaped header subjected to uniform load.

USE:

Select a header providing an allowable uniform load in excess of the applied load.

NOTES:

1. The values on the following page represent the allowable total load, in pounds per linear foot (PLF), limited by bending or shear capacity of the header. Deflection is limited to $L/360$ of span length.
2. The use of these tables is limited to simply supported members. Applications involving cantilevers, concentrated loads, eccentricities, multiple spans, impact loading, etc. should be investigated separately.
3. Web crippling should be analyzed separately. Shapes having multiple unreinforced webs subjected to interaction of concentrated load or reaction and bending shall be analyzed to meet the requirements of AISI Section C3.4. Referenced page 28 for additional information. Reinforcement of the web is required when a knockout is located within a distance equaling $1.5 \times$ depth of the member (h) from the edge of bearing.
4. The compression flange of the header shall be laterally braced at intervals not to exceed 24" on center.
5. Contact MarinoWare for allowable load capacities of sections not shown herein.



Headers																													
M/W Type	SSMA	4FT	5FT	6FT	7FT	8FT	9FT	10FT	11FT	12FT	13FT	14FT	15FT	16FT	17FT	18FT	19FT	20FT	21FT	22FT	23FT	24FT	25FT	26FT	27FT	28FT	29FT	30FT	
3-5/8" Members																													
358SW20	362S162-33	442	283	196	137	92	65	47	35	27	21	17	14	11															
358SW18	362S162-43	614	393	273	178	119	84	61	46	35	28	22	18	15	12	10													
358SW16	362S162-54	1110	602	349	220	147	103	75	57	44	34	27	22	18	15	13	11												
358SW14	362S162-68	1438	741	429	270	181	127	93	70	54	42	34	27	23	19	16	14	12	10										
358SW12	362S162-97	1948	998	577	364	244	171	125	94	72	57	45	37	30	25	21	18	16	13	12	10								
358SW10	362S162-118	2309	1184	685	432	289	203	148	111	86	67	54	44	36	30	25	22	19	16	14	12	11							
6" Members																													
6SW20	600S162-33	836	608	422	310	238	188	152	118	91	71	57	46	38	32	27	23	20	17	15	13	11	10						
6SW18	600S162-43	836	669	557	415	318	251	202	152	117	92	74	60	49	41	35	30	25	22	19	17	15	13	12	10				
6SW16	600S162-54	2313	1480	1028	729	488	343	250	188	145	114	91	74	61	51	43	36	31	27	23	21	18	16	14	13	11	10		
6SW14	600S162-68	2931	1876	1303	898	602	423	308	231	178	140	112	91	75	63	53	45	39	33	29	25	22	20	18	16	14	13	11	
6SW12	600S162-97	3990	2553	1773	1223	819	575	419	315	243	191	153	124	102	85	72	61	52	45	39	34	30	27	24	21	19	17	16	
6SW10	600S162-118	4786	3063	2127	1466	982	690	503	378	291	229	183	149	123	102	86	73	63	54	47	41	36	32	29	26	23	21	19	
8" Members																													
8SW20*	800S162-33	836	669	554	407	312	246	200	165	139	118	102	89	76	64	54	46	39	34	29	26	23	20	18	16	14	13	12	
8SW18	800S162-43	836	669	557	478	418	372	305	252	212	181	148	120	99	82	69	59	51	44	38	33	29	26	23	21	18	17	15	
8SW16	800S162-54	3486	2231	1550	1138	872	688	501	377	290	228	183	149	122	102	86	73	63	54	47	41	36	32	29	25	23	21	19	
8SW14	800S162-68	4422	2830	1965	1444	1105	850	620	466	359	282	226	184	151	126	106	90	77	67	58	51	45	40	35	31	28	25	23	
8SW12	800S162-97	6058	3877	2693	1978	1515	1165	849	638	491	386	309	252	207	173	146	124	106	92	80	70	61	54	48	43	39	35	31	
8SW10	800S162-118	7309	4678	3248	2387	1827	1405	1024	770	593	466	373	303	250	208	176	149	128	111	96	84	74	66	58	52	47	42	38	
10" Members																													
10SW18*	1000S162-43	836	669	557	478	418	372	334	304	259	221	190	166	146	129	115	102	88	76	66	58	51	45	40	36	32	29	26	
10SW16	1000S162-54	4274	2735	1900	1396	1069	844	684	565	475	396	317	258	212	177	149	127	109	94	82	71	63	56	49	44	40	36	32	
10SW14	1000S162-68	6150	3936	2733	2008	1538	1215	984	809	623	490	393	319	263	219	185	157	135	116	101	89	78	69	61	55	49	44	40	
10SW12	1000S162-97	8466	5418	3763	2764	2117	1672	1355	1114	858	675	540	439	362	302	254	216	185	160	139	122	107	95	84	75	68	61	55	
10SW10	1000S162-118	10256	6564	4558	3349	2564	2026	1641	1350	1040	818	655	532	439	366	308	262	225	194	169	148	130	115	102	91	82	74	67	
12" Members																													
12SW16*	1200S162-54	5053	3234	2246	1650	1263	998	808	668	561	478	412	359	316	280	236	200	172	148	129	113	99	88	78	70	63	56	51	
12SW14	1200S162-68	7372	4718	3277	2407	1843	1456	1180	975	819	698	602	505	416	347	293	249	213	184	160	140	123	109	97	87	78	70	63	
12SW12	1200S162-97	11213	7176	4983	3661	2803	2215	1794	1483	1246	1062	859	698	575	480	404	344	295	254	221	194	170	151	134	120	107	97	87	
12SW10	1200S162-118	11866	8721	6056	4449	3406	2692	2180	1802	1514	1290	1044	849	699	583	491	418	358	309	269	235	207	183	163	146	130	117	106	
14" Members																													
14SW14	1400S162-68	8443	5403	3752	2757	2111	1668	1351	1116	938	799	689	600	528	467	417	369	316	273	238	208	183	162	144	129	115	104	94	
14SW12	1400S162-97	11866	9150	6354	4669	3574	2824	2288	1891	1589	1354	1167	1017	856	714	601	511	438	379	329	288	254	224	199	178	160	144	130	
14SW10	1400S162-118	11866	9492	7742	5688	4355	3441	2787	2303	1935	1649	1422	1239	1043	869	732	623	534	461	401	351	309	273	243	217	195	175	158	
16" Members																													
16SW14*	1600S162-68	9552	6113	4245	3119	2388	1887	1528	1263	1061	904	780	679	597	529	472	423	382	347	316	284	250	221	197	176	158	142	128	
16SW12	1600S162-97	11866	9492	7425	5455	4176	3300	2673	2209	1856	1582	1364	1188	1044	925	825	724	621	536	466	408	359	318	283	252	226	204	184	
16SW10	1600S162-118	11866	9492	7910	6780	5408	4273	3461	2861	2404	2048	1766	1538	1352	1198	1040	884	758	655	569	498	439	388	345	308	276	249	225	

The values represented in this chart are calculated for (2) of each member stated.

* = Exceeds the H/T ratio of 200

WEB CRIPPLING STRENGTH

Allowable Web Crippling Strength

Member	AISI Equation	20 gauge (33 ksi)			18 gauge (33 ksi)			16 gauge (33 ksi)			16 gauge (50 ksi)			14 gauge (50 ksi)			12 gauge (50 ksi)			10 gauge (50 ksi)		
		Base Width (in.)			Base Width (in.)			Base Width (in.)			Base Width (in.)			Base Width (in.)			Base Width (in.)			Base Width (in.)		
		1.5	3.5	6	1.5	3.5	6	1.5	3.5	6	1.5	3.5	6	1.5	3.5	6	1.5	3.5	6	1.5	3.5	6
358	End (1) Flange	0.1712	0.2341	0.2905	0.2835	0.3835	0.4730	0.4266	0.5713	0.7010	0.6464	0.8657	1.0621	0.9745	1.2912	1.5749	1.8348	2.3897	2.8868	2.7299	3.5163	4.2206
	Int (1) Flange	0.3390	0.4247	0.5015	0.5896	0.7286	0.8530	0.9029	1.1024	1.2810	1.3680	1.6703	1.9410	2.0924	2.5240	2.9106	4.0389	4.7839	5.4512	6.1104	7.1575	8.0953
	End (2) Flange	0.1253	0.1417	0.1563	0.2528	0.2826	0.3093	0.4191	0.4643	0.5048	0.6349	0.7035	0.7649	1.0372	1.1393	1.2307	2.1847	2.3703	2.5366	3.4664	3.7345	3.9747
	Int (2) Flange	0.2142	0.2703	0.3205	0.5162	0.6425	0.7557	0.8101	0.9963	1.1631	1.2275	1.5096	1.7623	1.8578	2.2572	2.6150	3.5330	4.2143	4.8244	5.2999	6.2509	7.1027
4	End (1) Flange	0.1689	0.2310	0.2867	0.2803	0.3791	0.4677	0.4224	0.5657	0.6940	0.6400	0.8571	1.0515	0.9659	1.2799	1.5611	1.8214	2.3724	2.8658	2.7121	3.4933	4.1930
	Int (1) Flange	0.3370	0.4222	0.4985	0.5866	0.7249	0.8487	0.8988	1.0974	1.2752	1.3618	1.6627	1.9321	2.0839	2.5138	2.8988	4.0251	4.7675	5.4325	6.0914	7.1352	8.0702
	End (2) Flange	0.1209	0.1367	0.1508	0.2455	0.2745	0.3005	0.4089	0.4531	0.4926	0.6195	0.6864	0.7464	1.0157	1.1156	1.2052	2.1483	2.3309	2.4944	3.4156	3.6798	3.9164
	Int (2) Flange	0.2141	0.2701	0.3204	0.5160	0.6422	0.7553	0.8098	0.9959	1.1626	1.2270	1.5090	1.7616	1.8571	2.2564	2.6140	3.5319	4.2129	4.8228	5.2984	6.2491	7.1006
6	End (1) Flange	0.1584	0.2166	0.2688	0.2654	0.3590	0.4429	0.4028	0.5394	0.6618	0.6102	0.8173	1.0027	0.9265	1.2277	1.4975	1.7600	2.2923	2.7691	2.6303	3.3880	4.0666
	Int (1) Flange	0.3277	0.4105	0.4848	0.5726	0.7076	0.8284	0.8797	1.0741	1.2482	1.3329	1.6274	1.8912	2.0447	2.4665	2.8442	3.9614	4.6921	5.3466	6.0046	7.0335	7.9551
	End (2) Flange	0.1004	0.1135	0.1253	0.2120	0.2370	0.2594	0.3618	0.4009	0.4359	0.5482	0.6074	0.6604	0.9162	1.0064	1.0871	1.9812	2.1496	2.3004	3.1830	3.4292	3.6497
	Int (2) Flange	0.2135	0.2695	0.3196	0.5148	0.6408	0.7536	0.8082	0.9940	1.1604	1.2245	1.5060	1.7581	1.8538	2.2524	2.6094	3.5266	4.2066	4.8156	5.2912	6.2406	7.0910
8	End (1) Flange				0.2529	0.3422	0.4221	0.3864	0.5174	0.6348	0.5854	0.7840	0.9619	0.8937	1.1842	1.4444	1.7090	2.2260	2.6890	2.5629	3.3011	3.9623
	Int (1) Flange				0.5609	0.6931	0.8115	0.8638	1.0547	1.2256	1.3088	1.5980	1.8570	2.0120	2.4270	2.7987	3.9086	4.6296	5.2753	5.9329	6.9496	7.8602
	End (2) Flange				0.1839	0.2056	0.2250	0.3224	0.3573	0.3884	0.4885	0.5413	0.5885	0.8333	0.9153	0.9888	1.8427	1.9993	2.1395	2.9910	3.2224	3.4296
	Int (2) Flange				0.5139	0.6396	0.7523	0.8069	0.9923	1.1584	1.2225	1.5035	1.7552	1.8511	2.2491	2.6056	3.5222	4.2014	4.8096	5.2852	6.2336	7.0830
10	End (1) Flange				0.3720	0.4982	0.6112	0.6370	0.9482	0.6112	0.5636	0.7548	0.9261	0.8649	1.1461	1.3979	1.6645	2.1681	2.6190	2.5041	3.2254	3.8714
	Int (1) Flange				0.8499	1.0377	1.2058	0.8499	1.0377	1.2058	1.2877	1.5722	1.8270	1.9833	2.3925	2.7589	3.8625	4.5750	5.2131	5.8705	6.8765	7.7775
	End (2) Flange				0.2879	0.3190	0.3469	0.2879	0.3190	0.3469	0.4362	0.4834	0.5256	0.7607	0.8356	0.9026	1.7217	1.8680	1.9990	2.8238	3.0422	3.2379
	Int (2) Flange				0.8057	0.9909	1.1568	0.8057	0.9909	1.1568	1.2208	1.5014	1.7527	1.8487	2.2462	2.6022	3.5184	4.1968	4.8044	5.2800	6.2275	7.0761
12	End (1) Flange													0.8390	1.1118	1.3560	1.6246	2.1160	2.5561	2.4513	3.1574	3.7899
	Int (1) Flange													1.9576	2.3614	2.7230	3.8211	4.5259	5.1572	5.8145	6.8108	7.7033
	End (2) Flange													0.6953	0.7638	0.8251	1.6129	1.7500	1.8727	2.6737	2.8805	3.0657
	Int (2) Flange													1.8466	2.2436	2.5992	3.5149	4.1927	4.7997	5.2754	6.2220	7.0698
14	End (1) Flange													0.8153	1.0803	1.3176	1.5879	2.0682	2.4984	2.4030	3.0952	3.7152
	Int (1) Flange													1.9339	2.3328	2.6901	3.7831	4.4810	5.1060	5.7632	6.7508	7.6353
	End (2) Flange													0.6354	0.6979	0.7539	1.5132	1.6418	1.7570	2.5362	2.7324	2.9082
	Int (2) Flange													1.8446	2.2412	2.5964	3.5118	4.1889	4.7954	5.2711	6.2170	7.0641
16	End (1) Flange																1.5539	2.0239	2.4449	2.3582	3.0375	3.6459
	Int (1) Flange																3.7479	4.4392	5.0584	5.7156	6.6950	7.5723
	End (2) Flange																1.4207	1.5415	1.6496	2.4088	2.5951	2.7620
	Int (2) Flange																3.5089	4.1854	4.7914	5.2672	6.2123	7.0588

APPLICATION:

ALLOWABLE CONCENTRATED LOADS OR REACTIONS, (Kips)

For determination of the web crippling capacity of a single unreinforced web subjected to concentrated loads or reactions.

USE:

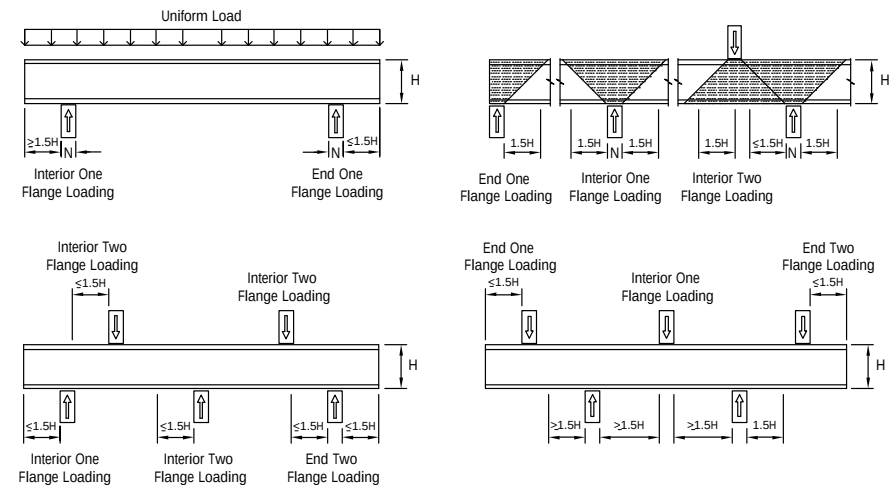
Compare the applied concentrated load or reaction to the maximum allowable values, P_a , listed above. Where the applied load exceeds the allowable, reinforcement with a web stiffener is required.

For members with multiple webs (i.e. boxed or "I" shaped headers), P_a shall be computed for each individual web and the results added to obtain the allowable load or reaction for the multiple web.

Due to the high degree of restraint against rotation of an "I" shaped section, web crippling strengths exceeding those shown above are attainable. Consult AISI Specification Section C3.4, equations C3.4-3, 5, 7, and 9.

NOTES:

- H/t exceeds 200 where values have been omitted. When h/t exceeds 200, web stiffeners at concentrated load or reaction points are required.
- Components with unreinforced flat webs, subjected to combined bending and web crippling, shall be designed to meet the requirements of the following interaction equations: $1.2 (P/P_a) + (M/M_a) < 1.5$ where
 - P = Concentrated load or reaction in the absence of bending moment
 - P_a = Allowable concentrated load or reaction in the absence of bending moment
 - M = Applied bending moment at, or immediately adjacent to, the application of the concentrated load or reaction
 - M_a = Allowable bending moment if bending alone exists
- Avoid locating a web knockout within the shaded areas shown in the diagram. Should a knockout be located in this area, install a web stiffener, minimum 6" wide, centered over the knockout.



SUGGESTED CONNECTION INFORMATION

Suggested Capacities for Screw Connections (lbs.)

Gauge	Fy (ksi)	No. 8-18 D = .164		No. 10-16 D = .190		No. 12-14 D = .216		No. 1/4-14 D = .250	
		Shear	Tension	Shear	Tension	Shear	Tension	Shear	Tension
10	33	280	266	373	308	500	340	691	405
10	50	280	384	373	444	500	491	691	585
12	33	280	213	373	246	500	272	691	324
12	50	280	307	373	356	500	393	691	468
14	33	280	149	373	173	500	191	600	227
14	50	280	215	373	249	500	276	691	328
16	33	280	118	370	137	389	152	424	180
16	50	280	171	373	198	500	219	613	261
18	33	244	94	263	109	277	121	302	144
20	33	165	73	178	84	187	93	204	111

NOTES:

- Values are based on AISI Specification Section E4.
- Screw spacing and edge distance shall be at least $\frac{1}{2}$ ". Consult AISI Specification Section E4.3.2 for additional screw capacity information.
- Ultimate screw capacities have been considered. Ultimate screw capacities are based upon Kwik-Pro self drilling screws as published by Hilti, Inc in their 2002 product technical guide. (Contact Hilti at 1-800-879-8000 for a copy)
- When connecting materials of two different thicknesses, the value for the thinner material should be used.

Suggested Shear Design Loads For P.A.F.s Driven Into Concrete (KIPS)

Gauge	Thickness	Yield	Ult	.145" Diameter P.A.F. (pin type X-DNI)	.177" Diameter P.A.F. (pin type DS)
				1" Embedment	1-7/16" embedment
10	0.1242	33	45	0.125	0.285
12	0.1017	33	45	0.125	0.285
14	0.0713	33	45	0.125	0.285
16	0.0566	33	45	0.125	0.285
18	0.0451	33	45	0.125	0.285
20	0.0347	33	45	0.125	0.249

Suggested Shear Design Loads For P.A.F.s Driven Into Structural Steel (KIPS)

Structural Steel Thickness		1/4	3/8	1/2	1/4	3/8	3/8	1/2	1/2
Structural Steel Classification		A36/A572	A36/A572	A36/A572	A36	A36	A572	A36	A572
Gauge	Thickness	Yield	Ult	.145" Diameter P.A.F. (type X-EDNI)		.177" Diameter P.A.F. (type EDS)			
				Base Steel Thickness		Base Steel Thickness			
10	0.1242	33	45	0.465	0.660	0.605	0.910	0.970	0.745
12	0.1017	33	45	0.465	0.597	0.597	0.729	0.970	0.729
14	0.0713	33	45	0.419	0.419	0.419	0.511	0.970	0.511
16	0.0566	33	45	0.332	0.332	0.332	0.406	0.970	0.406
18	0.0451	33	45	0.265	0.265	0.265	0.323	0.970	0.323
20	0.0347	33	45	0.204	0.204	0.204	0.249	0.970	0.249

CONCRETE NOTES:

- Capacities shown are for cured, regular weight aggregate concrete or lightweight concrete (3000 PSI min). Minimum base thickness of the concrete shall be 1.3 X depth of embedment of fastener. Minimum fastener spacing = 4". Minimum fastener edge distance = 3".
- Multiple fasteners are recommended for increased reliability.
- Values are from the 2002 "Product Technical Guide" published by Hilti, Inc. (Contact Hilti at 1-800-879-8000 for copy).

Suggested Capacities for Weld Connections (lbs. per in.)

Gauge	Fy (ksi)	Fu (ksi)	Fillet Welds		Flare Groove Welds	
			Longitudinal	Transverse	Longitudinal	Transverse
10	33	45	2065	2432	1531	1867
12	33	45	1618	1947	1226	1495
14	33	45	1081	1365	859	1048
16	33	45	822	1084	682	832
18	33	45	619	864	544	663

NOTES:

- Values are based on AISI Specification Section E2.
- When connecting materials of two different thicknesses, the value for the thinner material should be used.
- Although values for 20 gauge steel are included, welding of 20 gauge steel is only recommended under environmentally controlled conditions.
- Welds may be obtained with $\frac{3}{32}$ " or $\frac{1}{8}$ " diameter, type E-60 or E-70 welding rods. Shop welding is best accomplished with 0.030" to 0.035" diameter, type E70 wire.

Suggested Tension Design Loads For P.A.F.s Driven Into Concrete (KIPS)

Gauge	Thickness	Yield	Ult	.145" Diameter P.A.F. (pin type X-DNI)	.177" Diameter P.A.F. (pin type DS)
				1" Embedment	1-7/16" embedment
10	0.1242	33	45	0.110	0.205
12	0.1017	33	45	0.110	0.205
14	0.0713	33	45	0.110	0.205
16	0.0566	33	45	0.110	0.205
18	0.0451	33	45	0.110	0.205
20	0.0347	33	45	0.110	0.205

Suggested Tension Design Loads For P.A.F.s Driven Into Structural Steel (KIPS)

Structural Steel Thickness		1/4	3/8	1/2	1/4	3/8	3/8	1/2	1/2
Structural Steel Classification		A36/A572	A36/A572	A36/A572	A36	A36	A572	A36	A572
Gauge	Thickness	Yield	Ult	.145" Diameter P.A.F. (type X-EDNI)		.177" Diameter P.A.F. (type EDS)			
				Base Steel Thickness		Base Steel Thickness			
10	0.1242	33	45	0.265	0.300	0.325	0.335	0.400	0.320
12	0.1017	33	45	0.265	0.300	0.325	0.335	0.400	0.320
14	0.0713	33	45	0.233	0.233	0.233	0.284	0.284	0.284
16	0.0566	33	45	0.185	0.185	0.185	0.225	0.225	0.225
18	0.0451	33	45	0.147	0.147	0.147	0.180	0.180	0.180
20	0.0347	33	45	0.113	0.113	0.113	0.138	0.138	0.138

STRUCTURAL NOTES:

- Shear and tension capacities shown are for knurl shanked powder actuated fasteners. Fasteners shall be driven to a penetration where the full diameter of the shank pierces the base steel.
- Minimum fastener spacing = $1\frac{1}{2}$ ". Minimum fastener edge distance = $\frac{1}{2}$ ".
- Multiple fasteners are recommended for increased reliability.
- Values are from the 2002 "Product Technical Guide" published by Hilti, Inc. (Contact Hilti at 1-800-879-8000 for copy).

SUGGESTED SPECIFICATIONS

The following suggested specification is intended to serve as a general guide. It must be modified to suit the conditions of use, with particular attention given to the deletion of inapplicable provisions.

DIVISION 5 – METALS

REFERENCE NO. 05400 – COLD FORMED METAL FRAMING

PART 1 – GENERAL

Related Work Specified Elsewhere

(Architect Note: List appropriate specifications sections of related work here).

1.2 Quality Assurance

(Architect Note: Quality Assurance sections should include provisions for checking shop drawings, controlled on-site inspections, etc).

1.3 Submittals – The following items shall be furnished by the contractor for approval prior to fabrication or delivery of material to the site:

- 1.3.1 Shop Drawings – Shop drawings shall be documents illustrating materials, shop coatings, steel thickness, details of fabrication, details of attachment to adjoining work, size, location and spacing of fasteners for attaching framing to itself, details of attachment to the structure, accessories and their installation, and critical installation procedures. Drawings may include plans, elevations, sections and details.
- 1.3.2 Samples – Samples shall be representative pieces of all framing component parts and accessories. Unless otherwise specified, pieces shall be 12" long and tagged with name of part and manufacturer.
- 1.3.3 Certifications – Certifications shall be statements from the manufacturer certifying that the materials conform to the appropriate requirements as outlined in the contract documents.
- 1.3.4 Calculations – Engineering calculations or data shall be submitted verifying the framing assembly's ability to meet or exceed design requirements as required by local codes and authorities or by the Architect. These calculations shall include, but not be limited to the following items:
 - 1.3.4.1 Steel Framing used to support rigid materials shall be designed for an allowable deflection of L/360. Steel framing used to support semi-rigid materials shall be designed for an allowable deflection of L/240. (Architect Note: Insert any special criteria such as more stringent deflection, wind loading etc., in this section).
 - 1.3.4.2 All connections (member to member and member to structure) shall be thoroughly examined and designed.
 - 1.3.4.3 Selected exterior and interior walls, as required, shall be designed to provide frame stability and lateral load resistance. If diagonal steel strapping is used to transfer lateral loads to the structure and foundation, additional studs may be required to resist the vertical component of the load from the diagonal bracing.

- 1.3.4.4 Wall bridging shall be designed to provide resistance to minor axis bending and rotation of wall studs.
- 1.3.4.5 In accordance with AISI Specifications, rigid collateral facing materials may be considered as adequate support of members against rotation
- 1.3.5 Descriptive Literature – Manufacturer's literature containing product and installation specifications and details shall be submitted for approval.

1.4 Applicable Documents

- 1.4.1 ASTM Standards:
 - A653 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
 - A924 Standard Requirements for Steel Sheet, Metallic-Coated by the Hot-Dipped Process
 - C 840 Standard Specifications for the Application and Finishing of Gypsum Board
 - C 842 Standard Specification for the Application of Gypsum Veneer Plaster
 - C926 Standard Specification for the Application of Portland Cement-Based Plaster
 - C 954 Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in to 0.112 in. in Thickness
 - C 955 Standard Specifications for Load Bearing (Transverse and Axial) Steel Studs, Runners (Track) and Bracing or Bridging for Screw Application of Gypsum Panel Products and Metal Plaster Bases
 - C 1007 Standard Specification for the installation of Load-Bearing (Transverse and Axial) Steel Studs and Related Accessories.
- 1.4.2 American Iron and Steel Institute (AISI);
"North American Specification for the Design of Cold-Formed Steel Structural Members", latest edition.
- 1.4.3 American Welding Society (AWS)
Structural Welding code (D1.1) Specifications for Welding Sheet Steel in Structures (E1.3)
- 1.4.4 Military Specification (Mil. Spec):
MIL-P-21035...Paint, High Zinc Dust Content, Galvanizing Repair.
- 1.4.5 Federal Specification (Fed Spec):
FF-P-395...Pin, Drive, Guided and Pin Drive, Power Actuated Fasteners for Power Actuated and Hand Actuated Fastening Tools
FF-S-325.Shield, Expansion; Nail, Expansion; and Nail, Drive Screw (Devices, Anchoring Masonry)

PART 2 – PRODUCTS

2.1 Materials

- 2.1.1 All Materials shall be equal to those manufactured by MarinoWare, 400 Metuchen Road, South Plainfield, NJ, 07080. Phone: 800-627-4661.

- 2.1.2 All studs and/or joists and accessories shall be of the type, size, steel thickness and spacing shown on the plans. Studs, runners (track), bracing and bridging shall be manufactured per ASTM Specification C 955.
- 2.1.3 All galvanized studs, joists and accessories, 16ga or heavier, shall be formed from steel that conforms to the requirement of ASTM A653 with a yield of either 50 KSI or 33 KSI as specified.
- 2.1.4 All galvanized studs, joists and accessories, 18ga and lighter and all track sections shall be formed from steel that conforms to the requirements of ASTM A653, with a yield of 33 KSI minimum.
- 2.1.5 All galvanized studs, joists and accessories shall have a minimum G-60 coating if required to be in conformance with ASTM C 955. Otherwise G-40 or equivalent we be provided.
- 2.1.6 Physical properties and allowable load capabilities of members shall be developed in accordance with AISI, "North American Specification for the Design of Cold-Formed Steel Structural Members", latest edition.

PART 3 – EXECUTION

3.1 Storage of Materials

- 3.1.1 Products shall be protected from conditions that may cause any physical damage.
- 3.1.2 Materials shall be stored on a flat plane.
- 3.1.3 It shall be the responsibility of the project architect or engineer or their appointed personnel to determine what material is damaged (e.g. rusted, dented, bent or twisted). Any damaged materials shall be removed from the job site immediately.

3.2 Installation General

- 3.2.1 Methods of construction may be either piece by piece (stick-built), or by fabrication into panels either on or off site.
- 3.2.2 Connections shall be accomplished with self drilling screws or welding so that the connection meets or exceeds the design loads required at that connection.
- 3.2.3 Transversely loaded studs need not sit squarely in tracks but must be attached to them with the exception of special slip conditions that must be designed accordingly.
- 3.2.4 Axially loaded studs shall be installed seated squarely (within $\frac{1}{16}$ ") against the web portion of the top and bottom tracks. Tracks shall rest on a continuous, uniform bearing surface.
- 3.2.5 Cutting of steel framing members may be accomplished with a saw or shear. Torch cutting of load bearing members is not permitted. Cutting of loaded members is not permitted unless under supervision of the project architect or engineer.
- 3.2.6 Temporary bracing shall be provided and left in place until work is permanently stabilized.
- 3.2.7 Bridging shall be of size and type shown on the drawings and as called for in the design calculations.

SUGGESTED SPECIFICATIONS

- 3.2.8 Diaphragm rated sheathing materials may be substituted for bridging, however, it shall be installed prior to loading the wall. If such a material is installed on one side of the wall only, then the other stud flanges shall be bridged with suitable bridging. This bridging may be removed if and when such diaphragm rated sheathing is installed.
- 3.2.9 Install headers in all openings that is larger than the stud spacing in that wall. Form headers as shown on the drawings.
- 3.2.10 Insulation equal to the job requirements shall be placed in all jamb and header type conditions that will be inaccessible after their installation into the wall.
- 3.2.11 Provide jack studs to support each end of headers. These studs shall be securely connected to the header and must seat squarely in the lower track of the wall and be properly attached to it.
- 3.2.12 If by design a header is low in the wall, the less than full-height studs (cripples) that occur over the header shall be designed to carry all imposed loads.
- 3.2.13 Wall track shall not be used to support any load unless specifically designed for that purpose.
- 3.2.14 All axially loaded members shall be aligned vertically, to allow for full transfer of the loads down to the foundation. Vertical alignment shall be maintained at floor/wall intersections or alternate provisions for load transfer may be made.
- 3.2.15 Holes that are field cut into steel framing members shall be within the limitations of the product and its design. Provide reinforcement where holes are cut through load bearing members in accordance with manufacturer's recommendations and as approved by project architect or engineer.
- 3.2.16 Touch up all steel bared by welding using zinc rich paint.
- 3.2.17 Studs shall be spaced to suit the design requirements and limitations of collateral facing materials.
- 3.2.18 Gypsum board shall be attached to steel studs in accordance with ASTM Specification C 840, except that the steel drill screws used (Specification ASTM C 954) shall be spaced not more than 8" on center at the edges and ends, and not more than 12" on center in the field of the board.
- 3.2.19 Metal plaster bases shall be attached in accordance with ASTM Specification C 841, except screw heads shall be of size and type suitable for positive (no movement) attachment.
- 3.2.20 Care should be taken to allow for additional studs at intersections, corners, doors, windows, control joints, etc., and as called for in the shop drawings or design calculations.
- 3.3.21 Provision for structure movement (expansion) shall be allowed where indicated and necessary by design or code requirements.
- 3.2.22 Splicing of axially loaded members shall be not permitted.
- 3.2.23 Wire tying of members is not permitted.

3.3 Installation: Panelized Construction

- 3.3.1 Panels shall be designed to resist construction and handling loads as well as live loads.

- 3.3.2 Handling and lifting of prefabricated panels shall not cause permanent distortion in any member or collateral material.
- 3.3.3 Make all stud to track connections prior to hoisting of panel.
- 3.3.4 Where splicing of track is necessary between stud spacing a piece of stud shall be placed in the track fastened with two screws or welds per flange to each piece of track.
- 3.3.5 Complete bearing shall be maintained under tracks to provide for load transfer in axially loaded assemblies. If the erecting contractor is bearing on work set by another trade, it is his responsibility to insure that bearing criteria are met. Any discrepancy shall be brought to the attention of the project architect or engineer.
- 3.3.6 Attachment of the panel to the structure shall be as shown on the shop drawings.
- 3.3.7 Align all panels to provide continuity of any wall/floor surface.

3.4 Installation: Stick-Built Construction

- 3.4.1 Align track accurately at supporting structure and fasten to structure as shown on shop drawings.
- 3.4.2 Track intersections shall butt evenly.
- 3.4.3 Studs shall be plumbed, aligned, and securely attached to flanges or webs of upper and lower tracks. Axially loaded studs shall be seated squarely in both top and bottom tracks.
- 3.4.4 Where splicing of track is necessary between stud spacing, a piece of stud shall be placed in the track fastened with two screws or welds per flange to each piece of track.
- 3.4.5 Complete bearing shall be maintained under tracks to provide for load transfer in axially loaded assemblies. If the erecting contractor is bearing on work set by another trade, it is his responsibility to insure that bearing criteria are met. Any discrepancy shall be brought to the attention of the project architect or engineer prior to the commencement of work.

3.5 Installation: Joists

- 3.5.1 Joist shall be located directly over bearing studs or a load distribution member shall be provided to transfer loads.
- 3.5.2 Provide web stiffeners where necessary at reaction points, and at points of concentrated loads.
- 3.5.3 Joists shall be installed with their web area perpendicular to the bearing surface.
- 3.5.4 Bridging, either steel strap or solid, shall be provided as shown on the shop design calculations.
- 3.5.5 Provide additional joists under parallel partitions where the partition length exceeds $\frac{1}{2}$ " of the joist span.
- 3.5.6 Provide additional framing around all floor/roof openings that are larger than the joist spacing.
- 3.5.7 End blocking shall be provided where joist ends are not otherwise restrained from rotation.
- 3.5.8 Joist ends must be built solidly into masonry construction prior to placing any load on the joist.

- 3.5.9 All bridging, bracing, blocking, strapping, web reinforcement, etc., must be in place prior to loading of floors.
- 3.5.10 If the floor is to be of concrete, care must be exercised in its placement.
- 3.5.11 Care must be taken by all trades not to disturb joist placement, alignment, plumbness, etc., prior to the completion of the floor system.
- 3.5.12 Care must be taken not to overload the floor system during construction. Please place heavy loads, materials, equipment, etc., directly over structural supports, bearing walls or as directed by the architect or engineer.

3.6 Fastenings and Attachments

- 3.6.1 Anchorage of the tracks to the structure shall be with methods designed for that specific application. Size, penetration, type, and spacing shall be determined by design.
- 3.6.2 Welds shall conform to the requirements of AWS E1.3 AWS D1.3, and AISI Manual. Welds may be butt, fillet, spot or groove type the appropriateness of which shall be determined by and within the design calculations. All welds shall be touched up using zinc rich paint
- 3.6.3 Steel drill screws shall be of the minimum diameter indicated by the design of that particular attachment detail. Penetration through joined materials shall not be less than 3 exposed threads.
- 3.6.4 Screws shall have a protective coating at least equivalent to zinc plating when used in exterior assemblies.

3.7 Tolerances

- 3.7.1 Vertical alignment (plumbness) of studs shall be within $\frac{1}{800}$ th ($\frac{1}{8}$ " in 10'-0") of the span.
- 3.7.2 Horizontal alignment (levelness) of walls shall be within $\frac{1}{800}$ th ($\frac{1}{8}$ " in 10'-0") of their respective lengths.
- 3.7.3 Spacing of studs shall not be more than $\frac{1}{8}$ " +/- from the designed spacing providing that the cumulative error does not exceed the requirements of the finishing materials.
- 3.7.4 Prefabricated panels shall be not more than $\frac{1}{8}$ " +/- out of square within the length of that panel.

3.8 Inspections

- 3.8.1 Inspections by a qualified/independent authority shall be performed in order to assure strict conformance to the shop drawings at all phases of construction.
- 3.8.2 All members shall be checked for bearing, completeness of attachments, reinforcement, etc.
- 3.8.3 All attachments shall be checked for conformance with the shop drawings and/or the design calculations. All welds shall be touched up in accordance with Section 3.6.2.
- 3.8.4 General inspection of structure shall be completed prior to applying loads to those members.
- 3.8.5 Inspections where and as required by local codes shall be controlled inspection.



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