



CSI: 05 40 00  
 PRODUCT: Cold Formed Steel Profiles  
 DIVISION: Metals  
 SECTION: Cold-Formed Metal Framing

**Report Holder**  
**Howick**  
**Unit 5**  
**1680 Illinois Avenue**  
**Perris, CA 92571**

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**Manufacturing Location(s)**

Additional Listee(s)	Listee Manufacturing Location(s)
KHS&S Contractors 5109 East La Palma Avenue Anaheim, CA 92807	KHS&S Contractors 7555 Evans Street Riverside, CA 92504
SurePods, LLC 2300 Principal Row Orlando, FL 32837	SurePods, LLC 2300 Principal Row Orlando, FL 32837
Z-Modular 710 Swanner Loop Killeen, TX 76543	Z-Modular 710 Swanner Loop Killeen, TX 76543

Note: See Table 9 for list of approved products per Listee

**1. SUBJECT**

**1.1 Cold-formed steel non-load bearing and load bearing framing (studs, tracks, deflection tracks, joists, and truss components)**

**2. SCOPE**

ICC NTA, LLC has evaluated the above product(s) for compliance with the applicable sections of the following codes:

- 2.1 2012, 2015 International Building Code (IBC)
- 2.2 2012, 2015 International Residential Code (IRC)
- 2.3 AISI S100 North American Specification for the Design of Cold-Formed Steel Structural Members, 2007 Edition, with Supplement 2, dated 2010
- 2.4 AISI S100 North American Specification for the Design of Cold-Formed Steel Structural Members, 2012 Edition

ICC NTA, LLC has evaluated the above product(s) in accordance with:

- 2.5 NTA IM 036 Quality System Requirements
- 2.6 NTA IM 015.1 SEP01 Light Gage and Cold-Formed Steel Structural Components

ICC NTA, LLC has evaluated the following properties of the above product(s):

- 2.7 Gross Properties
- 2.8 Effective Section Properties
- 2.9 Torsional Properties
- 2.10 Deflection (Slip Track) Properties

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**3. USES**

- 3.1 Howick's cold-formed steel profiles are recognized for use in framing of non-load bearing interior walls, curtain walls, and load bearing walls. The steel components described in this report comply with Section 2210 of the IBC and Section R301.1.3, R505, R603 and R804 of the IRC.
- 3.2 Howick's deflection track is a top track that is recognized for use in non-load-bearing, cold-formed steel framed wall assemblies where vertical movements between the top of the wall and supporting structure must be accommodated. The deflection track may accommodate up to +/-3/4-in. of vertical movement

**4. DESCRIPTION**

**4.1 General.** The structural cold-formed steel profiles recognized in this report are limited to those products noted in Table 2, and Table 4 through Table 7, as fabricated at the manufacturing facility herein. The components are formed from coils of steel in machines, such as the one shown in Figure 1, and have been designed in accordance with Section 2210 of the IBC. See Figure 1 for component cross sections. Material thickness, yield strength and section properties are provided in Table 1, Table 2, and Table 5 through Table 8.

**4.2 Materials.**

**4.2.1 Structural Members.** Structural members are cold-formed from steel coils conforming to ASTM A1003 Structural Grade 33 Type H (ST33H), Structural Grade 50 Type H (ST50H) or ASTM A653 HSLAS Grade 80. Additionally, structural members may conform to ASTM A653 Structural Steel (SS) Grade 33 or SS Grade 50 Class 1. Structural members have a minimum protective coating of G60 or AZ50 as described in ASTM A653 and ASTM A792, respectively.

**4.2.2 Non-Structural Members.** Non-Structural members are cold-formed from steel coils conforming to ASTM A1003 Structural Grade 33 Type L (ST33L), Structural Grade 50 Type L (ST50L), or ASTM A653 HSLAS Grade 80. Non-Structural members have a minimum protective coating of G40 or AZ50 as described in ASTM A653 and ASTM A792, respectively.

**4.2.3** Substitution of materials found in AISI S100 Section A2.1 which are of equivalent or better material specification and grade is acceptable.



### 4.3 Construction.

**4.3.1 Available Sections.** The sections evaluated in this report are identified in Table 2. Gross, effective, and torsional section properties are set forth in Table 2 through Table 7. Material Storage. All material shall be stored dry and shall be kept free of excessive corrosion.

**4.3.2 Web Punch-Outs.** The studs may be manufactured with or without web punch-outs. When punch-outs are provided, they are located along the center of the web and have a maximum width of 1-1/2 in. (64 mm) and maximum length of 4-1/2-in. (114 mm) in members having an out-to-out flange width of 1.625-in. Members having out-to-out flange widths of 2-in. have stiffened circular holes having a 3-in. diameter for 8-in. deep members and 5.5-in. diameter for deeper members. The holes are spaced a minimum of 24-in. on center and not less than 12-in. (254 mm) from each end of the member. Punch-outs in sections having an *h/t* ratio exceeding 200, as identified in Table 3, shall not be provided unless evaluated independently from this report. Members having flange widths greater than 2-in. have not been evaluated for web punch-outs.

**4.3.3 Track Members.** Tracks may be provided with a stiffening lip that is removed only at the stud locations (Figure 1).

**4.3.4 Deflection Track (DT) Members.** Deflection tracks consist of an unstiffened C-shape with flanges having 1/4-in. wide by up to 1-1/2 in. long vertical slots spaced every 1-in. to 24-in. on-center along the length of the section.

### 5. DESIGN

**5.1 General.** The scope of this report is limited to cold-formed steel profiles specified herein. Details related to incorporation of the product beyond that scope are the responsibility of the designer of record.

**5.2 International Building Code (IBC).** Analysis and design under the IBC shall be in accordance with IBC Section 2210. Structural capacities shall be determined in accordance with the applicable edition of AISI S100 based on structural properties provided in this report

**5.3 International Residential Code (IRC).** The S-sections lists in this report qualify for use with the prescriptive requirements of the IRC Sections R505, R603 and R804. Use of other sections or non-prescriptive design and detailing must conform to IRC Section R301.1.3.

### 6. INSTALLATION

**6.1 General.** Cold-formed steel profiles shall be fabricated, identified and erected in accordance with this report, the approved construction documents and the applicable code. In the event of a conflict between the manufacturer's published installation instructions and this report, this report shall govern. Approved construction documents shall be available at all times on the jobsite during installation.

### 7. CONDITIONS OF USE

*Cold-formed steel profiles* as described in this report comply with the codes listed in Section 2 above, subject to the following conditions:

**7.1** Components shall be installed in accordance with this report, applicable code(s), Howick's installation instructions, and the approved design document prepared by a registered design professional.

**7.2** Uncoated minimum steel thickness of cold-formed steel members, as delivered to the jobsite, shall not be less than the specified minimum in Table 1.

**7.3** Complete plans and calculations verifying compliance with this report must be submitted to the code official for each project. The calculations and drawings shall be prepared and sealed by a registered design professional where required by the statutes of the jurisdiction in which the project is constructed.

**7.4** Stud member end reactions, resulting from allowable heights and loads, as noted in the accompanying tables, shall be checked with the web crippling tables noted in this report.

**7.5** Product must be fabricated at the facility listed in this report.

### 8. EVIDENCE SUBMITTED

ICC NTA, LLC has examined the following evidence to evaluate this product:

**8.1** Qualification Calculations in accordance with AISI S100 North American Specification for the Design of Cold-Formed Steel Structural Members, 2007 Edition, with Supplement 2, dated 2010 and 2012 Edition.

**8.2** Review of plant quality assurance manual in accordance with NTA IM 036 and NTA IM 015.1.

**8.3** Plant certification inspection of manufacturer's production facilities, test procedures, frequency and quality control sampling methods, test equipment and equipment calibration procedures, test records, dates and causes of failures when applicable in accordance with NTA IM 036 and NTA IM 015.1.

**8.4** Periodic quality assurance audits of the production facility.

Evaluation evidence and data are on file with ICC NTA, LLC. ICC NTA, LLC is accredited by A2LA as follows:

ISO 17020 Inspection Agency

ISO 17025 Testing Laboratory

ISO 17065 Product Certification Agency

The scope of accreditation related to testing, inspection or product certification pertain only to the test methods and/or standard referenced therein. Design parameters and the application of building code requirements, such as special inspection, have not been reviewed by A2LA and are not covered in the accreditation. Product evaluations are performed under the direct supervision of Professional Engineers licensed in all jurisdictions within the United States as required by the building code and state engineering board rules.

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## 9. FINDINGS

All products referenced herein are manufactured under an in-plant Quality Assurance program to ensure that the production quality meets or exceeds the requirements of the codes noted herein and the criteria as established by ICC NTA, LLC. Furthermore, product must comply with the conditions of this report.

*This report is subject to annual review.*

## 10. IDENTIFICATION

Each eligible product shall be permanently marked to provide the following information:

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**10.1** The ICC NTA certification mark, shown below, or "NTA"

**10.2** NTA's NER No. NER-1042

**10.3** At a maximum of 96-in. on-center profiles are to be marked with:

**10.3.1** Roll former's plant identification (name, logo, or initials of the manufacturer forming the product)

**10.3.2** Material minimum base metal thickness (uncoated) in decimal thickness or mils.

**10.3.3** Minimum specified yield strength.

**10.3.4** Appropriate coating designator

**10.4** Additionally, each lift or bundle of like members must be labeled with:

**10.4.1** Roll former's identification (name, logo, or initials of the manufacturer forming the product)

**10.4.2** Length

**10.4.3** Quantity

**10.5** Roll former's member designator (including member depth, flange size, and minimum steel thickness)



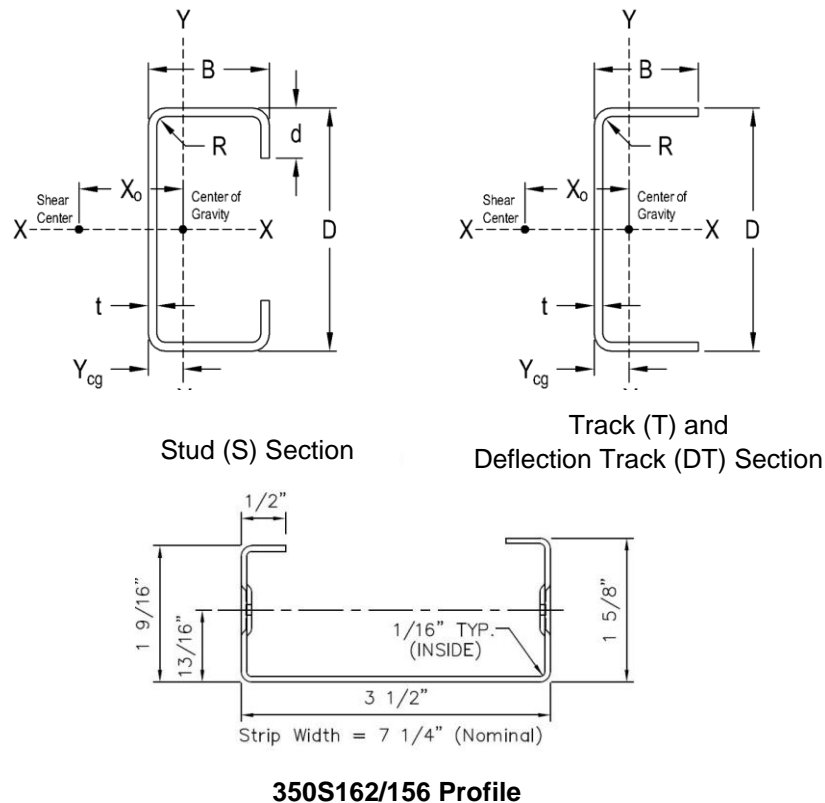
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**Table 1: Typical Base Metal Thicknesses**

Thickness (mils)	Minimum Thickness <sup>1</sup> (in.)	Design Thickness (in.)	Reference Gage <sup>2</sup>
23	0.0227	0.0239	24
27	0.0269	0.0283	22
30	0.0296	0.0312	20 - Drywall
33	0.0329	0.0346	20 - Structural
43	0.0428	0.0451	18
54	0.0538	0.0566	16
68	0.0677	0.0713	14
97	0.0966	0.1017	12

<sup>1</sup> Minimum thickness represents 95% of the design thickness and is the minimum acceptable thickness delivered to the job site in accordance with AISI S100, Section A2.4.

<sup>2</sup> U.S. standard gage for uncoated hot- and cold-rolled sheets. Gage numbers are only provided as a reference and should not be used to order, design or specify steel studs, joists or tracks.



**Figure 1: Stud and Track Geometry**

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**Table 2: Section Designations and Gross Properties**

Designation	Section Geometry					Gross Section Properties <sup>1,2</sup>							
	Web Depth D (in.)	Flange Width B (in.)	Design Thickness t (in.)	Lip Length d (in.)	Bend Radius R (in.)	Area (in. <sup>2</sup> )	Weight (lbf/ft)	I <sub>xx</sub> (in. <sup>4</sup> )	S <sub>xx</sub> (in. <sup>3</sup> )	R <sub>x</sub> (in.)	I <sub>yy</sub> (in. <sup>4</sup> )	S <sub>yy</sub> (in. <sup>3</sup> )	R <sub>y</sub> (in.)
<b>STUD (S) GROSS SECTION PROPERTIES</b>													
162S125-27	1.625	1.250	0.0283	0.313	0.0625	0.127	0.434	0.0585	0.072	0.677	0.0280	0.0368	0.468
162S125-33	1.625	1.250	0.0346	0.313	0.0625	0.155	0.527	0.0704	0.087	0.674	0.0335	0.0441	0.465
175S256-43	1.750	2.563	0.0451	0.375	0.0625	0.329	1.12	0.194	0.221	0.767	0.272	0.187	0.908
175S256-33	1.750	2.563	0.0346	0.375	0.0625	0.254	0.865	0.151	0.173	0.771	0.212	0.146	0.914
175S256-27	1.750	2.563	0.0283	0.375	0.0625	0.209	0.711	0.125	0.143	0.774	0.176	0.121	0.917
175S256-23	1.750	2.563	0.0239	0.375	0.0625	0.177	0.602	0.107	0.122	0.776	0.149	0.103	0.919
300S162-54	3.000	1.625	0.0566	0.500	0.0625	0.389	1.32	0.568	0.379	1.209	0.146	0.140	0.612
300S162-43	3.000	1.625	0.0451	0.500	0.0625	0.312	1.06	0.460	0.307	1.214	0.119	0.115	0.618
300S162-33	3.000	1.625	0.0346	0.500	0.0625	0.241	0.821	0.359	0.239	1.219	0.0936	0.0899	0.623
300S162-27	3.000	1.625	0.0283	0.500	0.0625	0.198	0.675	0.296	0.197	1.222	0.0776	0.0746	0.626
350S162/156-43	3.500	1.563	0.0451	0.500	0.0625	0.329	1.12	0.640	0.366	1.394	0.115	0.110	0.590
350S162/156-33	3.500	1.563	0.0346	0.500	0.0625	0.254	0.865	0.498	0.285	1.399	0.090	0.0865	0.595
350S162/156-27	3.500	1.563	0.0283	0.500	0.0625	0.209	0.711	0.411	0.235	1.402	0.0747	0.0717	0.598
350S162/156-23	3.500	1.563	0.0239	0.500	0.0625	0.177	0.602	0.349	0.199	1.405	0.0637	0.0612	0.600
350S162-54	3.500	1.625	0.0566	0.500	0.0625	0.417	1.42	0.811	0.464	1.395	0.154	0.143	0.608
350S162-43	3.500	1.625	0.0451	0.500	0.0625	0.335	1.14	0.657	0.375	1.400	0.126	0.117	0.613
350S162-33	3.500	1.625	0.0346	0.500	0.0625	0.259	0.880	0.511	0.292	1.406	0.0987	0.0916	0.618
350S162-27	3.500	1.625	0.0283	0.500	0.0625	0.212	0.723	0.421	0.241	1.409	0.0819	0.0759	0.621
362S162-54	3.625	1.625	0.0566	0.500	0.0625	0.424	1.44	0.880	0.485	1.440	0.156	0.143	0.606
362S162-43	3.625	1.625	0.0451	0.500	0.0625	0.340	1.16	0.712	0.393	1.446	0.127	0.117	0.612
362S162-33	3.625	1.625	0.0346	0.500	0.0625	0.263	0.895	0.554	0.306	1.451	0.0999	0.0919	0.617
362S162-27	3.625	1.625	0.0283	0.500	0.0625	0.216	0.735	0.457	0.252	1.455	0.0829	0.0762	0.619
362S175-54	3.625	1.750	0.0566	0.500	0.0625	0.438	1.49	0.925	0.510	1.453	0.186	0.160	0.652
362S175-43	3.625	1.750	0.0451	0.500	0.0625	0.352	1.20	0.748	0.413	1.458	0.152	0.131	0.657
362S175-33	3.625	1.750	0.0346	0.500	0.0625	0.272	0.924	0.582	0.321	1.464	0.119	0.103	0.662
362S175-27	3.625	1.750	0.0283	0.500	0.0625	0.223	0.759	0.480	0.265	1.467	0.0987	0.0850	0.665
400S162-54	4.000	1.625	0.0566	0.500	0.0625	0.445	1.52	1.11	0.553	1.576	0.161	0.145	0.601
400S162-43	4.000	1.625	0.0451	0.500	0.0625	0.357	1.22	0.895	0.447	1.582	0.132	0.118	0.607
400S162-33	4.000	1.625	0.0346	0.500	0.0625	0.276	0.939	0.695	0.348	1.588	0.103	0.0929	0.612
400S162-27	4.000	1.625	0.0283	0.500	0.0625	0.227	0.771	0.573	0.287	1.591	0.0856	0.0770	0.615
400S200-54	4.000	2.000	0.0565	0.500	0.0625	0.487	1.66	1.27	0.635	1.615	0.266	0.198	0.739
400S200-43	4.000	2.000	0.0451	0.500	0.0625	0.391	1.33	1.03	0.513	1.620	0.217	0.162	0.744
400S200-33	4.000	2.000	0.0346	0.500	0.0625	0.302	1.03	0.80	0.399	1.625	0.169	0.127	0.749
550S162-54	5.500	1.625	0.0566	0.500	0.0625	0.530	1.80	2.34	0.851	2.101	0.178	0.150	0.579
550S162-43	5.500	1.625	0.0451	0.500	0.0625	0.425	1.45	1.89	0.687	2.108	0.145	0.122	0.585
550S162-33	5.500	1.625	0.0346	0.500	0.0625	0.328	1.12	1.46	0.533	2.114	0.114	0.0958	0.590
550S162-27	5.500	1.625	0.0283	0.500	0.0625	0.269	0.915	1.21	0.439	2.117	0.0945	0.0794	0.593
600S175-97	6.000	1.750	0.1017	0.500	0.0625	1.01	3.43	5.16	1.720	2.264	0.357	0.276	0.595
600S175-68	6.000	1.750	0.0713	0.500	0.0625	0.716	2.44	3.73	1.243	2.282	0.267	0.206	0.610
600S175-54	6.000	1.750	0.0566	0.500	0.0625	0.573	1.95	3.01	1.002	2.291	0.218	0.169	0.618
600S175-43	6.000	1.750	0.0451	0.500	0.0625	0.459	1.56	2.42	0.807	2.297	0.178	0.138	0.623
600S175-33	6.000	1.750	0.0346	0.500	0.0625	0.354	1.20	1.88	0.626	2.304	0.140	0.108	0.628
600S175-27 <sup>3</sup>	6.000	1.750	0.0283	0.500	0.0625	0.290	0.988	1.54	0.515	2.307	0.116	0.0894	0.631
600S162-54	6.000	1.625	0.0566	0.500	0.0625	0.559	1.90	2.88	0.960	2.271	0.182	0.151	0.571
600S162-43	6.000	1.625	0.0451	0.500	0.0625	0.448	1.52	2.32	0.774	2.278	0.149	0.123	0.577
600S162-33	6.000	1.625	0.0346	0.500	0.0625	0.345	1.17	1.80	0.600	2.284	0.117	0.0965	0.582
600S162-27	6.000	1.625	0.0283	0.500	0.0625	0.283	0.963	1.48	0.494	2.288	0.0969	0.0800	0.585
600S200-97	6.000	2.000	0.1017	0.500	0.0625	1.06	3.60	5.603	1.868	2.302	0.500	0.343	0.688
600S200-68	6.000	2.000	0.0713	0.500	0.0625	0.752	2.56	4.044	1.348	2.319	0.371	0.255	0.703
600S200-54	6.000	2.000	0.0566	0.500	0.0625	0.601	2.04	3.25	1.085	2.327	0.303	0.208	0.710
600S200-43	6.000	2.000	0.0451	0.500	0.0625	0.481	1.64	2.62	0.874	2.334	0.246	0.169	0.716
600S200-33	6.000	2.000	0.0346	0.500	0.0625	0.371	1.26	2.03	0.677	2.340	0.193	0.132	0.721
800S162-54	8.000	1.625	0.0566	0.500	0.0625	0.672	2.29	5.77	1.443	2.931	0.196	0.154	0.541
800S162-43	8.000	1.625	0.0451	0.500	0.0625	0.538	1.83	4.64	1.161	2.939	0.160	0.126	0.546
800S162-33	8.000	1.625	0.0346	0.500	0.0625	0.414	1.41	3.60	0.899	2.946	0.126	0.0986	0.551
800S162-27	8.000	1.625	0.0283	0.500	0.0625	0.340	1.16	2.96	0.739	2.950	0.104	0.0817	0.554
800S200-97	8.000	2.000	0.1017	0.500	0.0625	1.26	4.29	11.15	2.789	2.974	0.541	0.352	0.655
800S200-68	8.000	2.000	0.0713	0.500	0.0625	0.895	3.04	8.02	2.004	2.994	0.402	0.261	0.670
800S200-54	8.000	2.000	0.0566	0.500	0.0625	0.714	2.43	6.44	1.610	3.003	0.328	0.213	0.678
1000S200-97	10.000	2.000	0.1017	0.500	0.0625	1.46	4.98	19.23	3.846	3.624	0.571	0.359	0.625
1000S200-68	10.000	2.000	0.0713	0.500	0.0625	1.04	3.53	13.78	2.756	3.645	0.424	0.266	0.640
1000S200-54	10.000	2.000	0.0566	0.500	0.0625	0.827	2.82	11.05	2.211	3.655	0.346	0.217	0.647
1200S200-97	12.000	2.000	0.1017	0.500	0.0625	1.67	5.67	30.23	5.039	4.258	0.594	0.363	0.597
1200S200-68	12.000	2.000	0.0713	0.500	0.0625	1.18	4.01	21.62	3.603	4.281	0.441	0.269	0.612
1200S200-54	12.000	2.000	0.0566	0.500	0.0625	0.941	3.20	17.32	2.887	4.292	0.360	0.219	0.619

Table is continued. Footnotes are provided at end of table

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**Table 2: Section Designations and Gross Properties (continued)**

Designation	Section Geometry					Gross Section Properties <sup>1,2</sup>							
	Web Depth D (in.)	Flange Width B (in.)	Design Thickness t (in.)	Lip Length d (in.)	Bend Radius R (in.)	Area (in. <sup>2</sup> )	Weight (lb/ft)	I <sub>xx</sub> (in. <sup>4</sup> )	S <sub>xx</sub> (in. <sup>3</sup> )	R <sub>x</sub> (in.)	I <sub>yy</sub> (in. <sup>4</sup> )	S <sub>yy</sub> (in. <sup>3</sup> )	R <sub>y</sub> (in.)
1400S200-97	14.000	2.000	0.1017	0.500	0.0625	1.87	6.37	44.57	6.367	4.881	0.612	0.366	0.572
1400S200-68	14.000	2.000	0.0713	0.500	0.0625	1.32	4.50	31.81	4.545	4.905	0.455	0.271	0.586
1400S200-54	14.000	2.000	0.0566	0.500	0.0625	1.05	3.59	25.47	3.639	4.917	0.371	0.221	0.593
<b>TRACK (T) GROSS SECTION PROPERTIES</b>													
362T212-54	3.625	2.125	0.0566	--	0.0625	0.435	1.48	0.956	0.527	1.482	0.205	0.135	0.687
362T212-43	3.625	2.125	0.0451	--	0.0625	0.348	1.18	0.769	0.424	1.487	0.165	0.108	0.689
362T212-33	3.625	2.125	0.0346	--	0.0625	0.268	0.911	0.596	0.329	1.492	0.128	0.0833	0.691
362T216-54	3.625	2.156	0.0566	--	0.0625	0.438	1.49	0.967	0.533	1.485	0.214	0.138	0.698
362T216-43	3.625	2.156	0.0451	--	0.0625	0.351	1.19	0.778	0.429	1.490	0.172	0.111	0.700
362T216-33	3.625	2.156	0.0346	--	0.0625	0.270	0.918	0.603	0.333	1.494	0.133	0.0856	0.702
400T212-54	4.000	2.125	0.0566	--	0.0625	0.456	1.55	1.19	0.597	1.618	0.212	0.137	0.682
400T212-43	4.000	2.125	0.0451	--	0.0625	0.365	1.24	0.964	0.480	1.623	0.170	0.110	0.684
400T212-33	4.000	2.125	0.0346	--	0.0625	0.281	0.955	0.744	0.372	1.628	0.132	0.0845	0.685
400T250-54	4.000	2.500	0.0565	--	0.0625	0.498	1.69	1.36	0.679	1.651	0.329	0.185	0.813
400T250-43	4.000	2.500	0.0451	--	0.0625	0.399	1.36	1.09	0.547	1.656	0.265	0.149	0.815
400T250-33	4.000	2.500	0.0346	--	0.0625	0.307	1.04	0.85	0.423	1.661	0.205	0.114	0.817
550T212-54	5.500	2.125	0.0566	--	0.0625	0.541	1.84	2.49	0.904	2.144	0.233	0.143	0.657
550T212-43	5.500	2.125	0.0451	--	0.0625	0.432	1.47	2.00	0.726	2.149	0.187	0.114	0.658
550T212-33	5.500	2.125	0.0346	--	0.0625	0.333	1.13	1.54	0.561	2.153	0.145	0.0881	0.660
600T216-54	6.000	2.156	0.0566	--	0.0625	0.573	1.95	3.08	1.026	2.318	0.249	0.148	0.659
600T216-43	6.000	2.156	0.0451	--	0.0625	0.458	1.56	2.47	0.823	2.323	0.200	0.119	0.661
600T216-33	6.000	2.156	0.0346	--	0.0625	0.352	1.20	1.91	0.636	2.328	0.155	0.0915	0.663
600T212-54	6.000	2.125	0.0566	--	0.0625	0.569	1.94	3.05	1.016	2.313	0.239	0.144	0.648
600T212-43	6.000	2.125	0.0451	--	0.0625	0.455	1.55	2.45	0.815	2.319	0.192	0.115	0.650
600T212-33	6.000	2.125	0.0346	--	0.0625	0.350	1.19	1.89	0.629	2.323	0.148	0.0890	0.651
800T212-54	8.000	2.125	0.0566	--	0.0625	0.683	2.32	6.04	1.509	2.974	0.257	0.148	0.614
800T212-43	8.000	2.125	0.0451	--	0.0625	0.545	1.85	4.84	1.210	2.980	0.206	0.119	0.615
800T212-33	8.000	2.125	0.0346	--	0.0625	0.419	1.43	3.73	0.933	2.984	0.160	0.0917	0.617
<b>DEFLECTION TRACK (DT) GROSS SECTION PROPERTIES</b>													
362DT212-54	3.625	2.125	0.0566	--	0.0625	0.435	1.48	0.956	0.527	1.482	0.205	0.135	0.687
362DT212-43	3.625	2.125	0.0451	--	0.0625	0.348	1.18	0.769	0.424	1.487	0.165	0.108	0.689
362DT212-33	3.625	2.125	0.0346	--	0.0625	0.268	0.911	0.596	0.329	1.492	0.128	0.0833	0.691
362DT216-43	3.625	2.156	0.0451	--	0.0625	0.351	1.19	0.778	0.429	1.490	0.172	0.111	0.700
400DT212-54	4.000	2.125	0.0566	--	0.0625	0.456	1.55	1.19	0.597	1.618	0.212	0.137	0.682
400DT212-43	4.000	2.125	0.0451	--	0.0625	0.365	1.24	0.964	0.480	1.623	0.170	0.110	0.684
400DT212-33	4.000	2.125	0.0346	--	0.0625	0.281	0.955	0.744	0.372	1.628	0.132	0.0845	0.685
400DT250-54	4.000	2.500	0.0565	--	0.0625	0.498	1.69	1.36	0.679	1.651	0.329	0.185	0.813
400DT250-43	4.000	2.500	0.0451	--	0.0625	0.399	1.36	1.09	0.547	1.656	0.265	0.149	0.815
400DT250-33	4.000	2.500	0.0346	--	0.0625	0.307	1.04	0.85	0.423	1.661	0.205	0.114	0.817
550DT212-54	5.500	2.125	0.0566	--	0.0625	0.541	1.84	2.49	0.904	2.144	0.233	0.143	0.657
550DT212-43	5.500	2.125	0.0451	--	0.0625	0.432	1.47	2.00	0.726	2.149	0.187	0.114	0.658
550DT212-33	5.500	2.125	0.0346	--	0.0625	0.333	1.13	1.54	0.561	2.153	0.145	0.0881	0.660
600DT212-54	6.000	2.125	0.0566	--	0.0625	0.569	1.94	3.05	1.016	2.313	0.239	0.144	0.648
600DT212-43	6.000	2.125	0.0451	--	0.0625	0.455	1.55	2.45	0.815	2.319	0.192	0.115	0.650
600DT212-33	6.000	2.125	0.0346	--	0.0625	0.350	1.19	1.89	0.629	2.323	0.148	0.0890	0.651
600DT216-43	6.000	2.156	0.0451	--	0.0625	0.458	1.56	2.47	0.823	2.323	0.200	0.119	0.661
600DT216-54	6.000	2.156	0.0566	--	0.0625	0.573	1.95	3.08	1.026	2.318	0.249	0.148	0.659
800DT212-54	8.000	2.125	0.0566	--	0.0625	0.683	2.32	6.04	1.509	2.974	0.257	0.148	0.614
800DT212-43	8.000	2.125	0.0451	--	0.0625	0.545	1.85	4.84	1.210	2.980	0.206	0.119	0.615
800DT212-33	8.000	2.125	0.0346	--	0.0625	0.419	1.43	3.73	0.933	2.984	0.160	0.0917	0.617

<sup>1</sup> Definitions of structural properties:

- Area The cross-sectional area of the full un-reduced cross-section of the studs, away from any punch outs.
- Weight The weight per foot of the full un-reduced cross-section of the studs, away from any punch outs.
- I<sub>xx</sub> Moment of inertia of the gross section about the strong axis (X-X)
- S<sub>xx</sub> Section modulus of the gross section about the strong axis (X-X)
- R<sub>x</sub> Radius of gyration of the gross section about the strong axis (X-X)
- I<sub>yy</sub> Moment of inertia of the gross section about the weak axis (Y-Y)
- S<sub>yy</sub> Section modulus of the gross section about the weak axis (Y-Y)
- R<sub>y</sub> Radius of gyration of the gross section about the weak axis (Y-Y)

<sup>2</sup> Tabulated gross properties are based on the full un-reduced cross section of the studs, away from any pushouts.

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**Table 3: Web Depth-to-Thickness Ratios<sup>1, 2, 3</sup> (h/t)**

Designation	Web Depth, D (in.)	23 mil 0.0239 in.	27 mil 0.0283 in.	33 mil 0.0346 in.	43 mil 0.0451 in.	54 mil 0.0566 in.	68 mil 0.0713 in.	97 mil 0.1017 in.
162S	1.625	61	51	41	31	25	19	13
175S	1.750	66	55	45	34	27	21	14
300S	3.000	118	100	81	62	49	38	26
350S	3.500	139	117	96	73	58	45	31
362S	3.625	144	122	99	76	60	47	32
400S	4.000	160	135	110	84	66	52	36
550S	5.500	223	188	153	117	93	73	51
600S	6.000	244	206	168	128	102	80	56
800S	8.000	-	-	226	173	137	108	75
1000S	10.000	-	-	-	217	172	136	95
1200S	12.000	-	-	-	-	208	165	115
1400S	14.000	-	-	-	-	243	193	134

<sup>1</sup> h value used for h/t calculations is the flat width of the web, which is the out-to-out size, minus twice the thickness, minus twice the inside bend radius.  
<sup>2</sup> Where h/t values exceed 200, bearing stiffeners satisfying the requirements of AISI S100, Section C3.7.1, must be provided and holes in the web are not permitted unless evaluated independently.  
<sup>3</sup> h/t values exceeding 260 are marked with a dash (-), such members shall not be as structural members.

**Table 4: Torsional Properties<sup>1</sup>**

Designation	Design Thickness (in.)	J (in. <sup>4</sup> )	C <sub>w</sub> (in. <sup>6</sup> )	r <sub>o</sub> (in.)	x <sub>o</sub> (in.)	m (in.)	j (in.)	β
<b>STUD (S) TORSIONAL PROPERTIES</b>								
162S125-27	0.0283	0.0000340	0.0192	1.39	-1.123	0.648	1.35	0.350
162S125-33	0.0346	0.0000618	0.0228	1.38	-1.115	0.644	1.34	0.350
175S256-43	0.0451	0.000223	0.217	2.69	-2.409	1.32	2.57	0.196
175S256-33	0.0346	0.000101	0.172	2.70	-2.422	1.33	2.58	0.196
175S256-27	0.0283	0.0000558	0.143	2.71	-2.430	1.33	2.59	0.196
175S256-23	0.0239	0.0000337	0.123	2.72	-2.435	1.34	2.59	0.196
300S162-54	0.0566	0.000415	0.314	1.93	-1.367	0.812	1.91	0.495
300S162-43	0.0451	0.000212	0.259	1.94	-1.381	0.819	1.92	0.493
300S162-33	0.0346	0.0000963	0.205	1.95	-1.393	0.826	1.93	0.491
300S162-27	0.0283	0.0000529	0.171	1.96	-1.401	0.830	1.93	0.490
350S162/156-43	0.0451	0.000223	0.320	1.97	-1.257	0.758	2.02	0.592
350S162/156-33	0.0346	0.000101	0.253	1.98	-1.269	0.765	2.03	0.590
350S162/156-27	0.0283	0.0000558	0.211	1.99	-1.276	0.769	2.03	0.588
350S162/156-23	0.0239	0.0000337	0.180	1.99	-1.281	0.772	2.04	0.587
350S162-54	0.0566	0.000445	0.426	2.00	-1.300	0.782	2.05	0.578
350S162-43	0.0451	0.000227	0.350	2.02	-1.313	0.789	2.06	0.575
350S162-33	0.0346	0.000103	0.277	2.03	-1.325	0.796	2.07	0.573
350S162-27	0.0283	0.0000567	0.230	2.04	-1.332	0.800	2.07	0.572
362S162-54	0.0566	0.000453	0.457	2.02	-1.284	0.774	2.10	0.597
362S162-43	0.0451	0.000231	0.376	2.04	-1.297	0.782	2.10	0.594
362S162-33	0.0346	0.000105	0.297	2.05	-1.309	0.789	2.11	0.592
362S162-27	0.0283	0.0000576	0.247	2.06	-1.316	0.793	2.11	0.591
362S175-54	0.0566	0.000468	0.543	2.12	-1.396	0.837	2.17	0.565
362S175-43	0.0451	0.000238	0.446	2.13	-1.410	0.844	2.18	0.563
362S175-33	0.0346	0.000108	0.352	2.15	-1.422	0.851	2.18	0.561
362S175-27	0.0283	0.0000595	0.293	2.15	-1.429	0.855	2.19	0.559
400S162-54	0.0566	0.000476	0.560	2.09	-1.239	0.754	2.24	0.650
400S162-43	0.0451	0.000242	0.460	2.11	-1.252	0.761	2.24	0.647
400S162-33	0.0346	0.000110	0.363	2.12	-1.264	0.768	2.24	0.644
400S162-27	0.0283	0.0000605	0.302	2.13	-1.271	0.772	2.25	0.643
400S200-54	0.0565	0.000518	0.910	2.37	-1.573	0.939	2.44	0.560
400S200-43	0.0451	0.000265	0.746	2.39	-1.586	0.947	2.44	0.558
400S200-33	0.0346	0.000120	0.587	2.40	-1.598	0.953	2.45	0.556

Table is continued. Footnotes are provided at end of table.

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**Table 4: Torsional Properties<sup>1</sup> (continued)**

Designation	Design Thickness (in.)	J (in. <sup>4</sup> )	C <sub>w</sub> (in. <sup>6</sup> )	r <sub>o</sub> (in.)	x <sub>o</sub> (in.)	m (in.)	j (in.)	β
550S162-54	0.0566	0.000566	1.10	2.44	-1.091	0.684	3.01	0.800
550S162-43	0.0451	0.000288	0.905	2.45	-1.103	0.691	3.01	0.797
550S162-33	0.0346	0.000131	0.713	2.46	-1.115	0.697	3.00	0.795
550S162-27	0.0283	0.0000718	0.592	2.47	-1.121	0.701	3.00	0.794
600S175-97	0.1017	0.003471	2.58	2.59	-1.102	0.694	3.34	0.819
600S175-68	0.0713	0.001214	1.94	2.62	-1.134	0.713	3.32	0.813
600S175-54	0.0566	0.000612	1.59	2.64	-1.150	0.722	3.31	0.810
600S175-43	0.0451	0.000311	1.30	2.65	-1.162	0.729	3.30	0.808
600S175-33	0.0346	0.000141	1.02	2.66	-1.173	0.735	3.30	0.806
600S175-27	0.0283	0.0000775	0.848	2.67	-1.180	0.739	3.29	0.804
600S162-54	0.0566	0.000596	1.34	2.57	-1.050	0.663	3.34	0.833
600S162-43	0.0451	0.000303	1.10	2.58	-1.062	0.670	3.33	0.830
600S162-33	0.0346	0.000138	0.861	2.59	-1.073	0.677	3.33	0.828
600S162-27	0.0283	0.0000756	0.715	2.60	-1.080	0.681	3.32	0.827
600S200-97	0.1017	0.003646	3.557	2.73	-1.304	0.811	3.31	0.773
600S200-68	0.0713	0.001274	2.661	2.77	-1.337	0.830	3.30	0.767
600S200-54	0.0566	0.000642	2.18	2.78	-1.353	0.839	3.30	0.764
600S200-43	0.0451	0.000326	1.78	2.80	-1.366	0.846	3.30	0.762
600S200-33	0.0346	0.000148	1.39	2.81	-1.377	0.853	3.29	0.760
800S162-54	0.0566	0.000717	2.54	3.12	-0.916	0.594	5.05	0.914
800S162-43	0.0451	0.000365	2.08	3.13	-0.927	0.601	5.01	0.912
800S162-33	0.0346	0.000165	1.63	3.14	-0.937	0.607	4.99	0.911
800S162-27	0.0283	0.0000907	1.35	3.15	-0.943	0.610	4.97	0.910
800S200-97	0.1017	0.004347	6.81	3.25	-1.147	0.733	4.72	0.876
800S200-68	0.0713	0.001516	5.07	3.29	-1.178	0.751	4.67	0.872
800S200-54	0.0566	0.000763	4.14	3.30	-1.193	0.760	4.65	0.870
1000S200-97	0.1017	0.005048	11.32	3.82	-1.026	0.670	6.64	0.928
1000S200-68	0.0713	0.001758	8.41	3.85	-1.055	0.687	6.53	0.925
1000S200-54	0.0566	0.000884	6.86	3.86	-1.069	0.696	6.49	0.923
1200S200-97	0.1017	0.005750	17.18	4.40	-0.930	0.617	9.05	0.955
1200S200-68	0.0713	0.001999	12.74	4.43	-0.957	0.634	8.87	0.953
1200S200-54	0.0566	0.001004	10.39	4.44	-0.970	0.642	8.80	0.952
1400S200-97	0.1017	0.006451	24.43	4.99	-0.851	0.572	11.95	0.971
1400S200-68	0.0713	0.002241	18.10	5.02	-0.876	0.588	11.70	0.969
1400S200-54	0.0566	0.001125	14.75	5.03	-0.889	0.596	11.58	0.969
<b>TRACK (T) TORSIONAL PROPERTIES</b>								
362T212-54	0.0566	0.000464	0.460	2.14	-1.389	0.817	2.24	0.580
362T212-43	0.0451	0.000236	0.372	2.15	-1.392	0.819	2.25	0.581
362T212-33	0.0346	0.000107	0.289	2.16	-1.395	0.821	2.25	0.581
362T216-54	0.0566	0.000468	0.479	2.17	-1.416	0.832	2.26	0.573
362T216-43	0.0451	0.000238	0.387	2.17	-1.419	0.834	2.26	0.574
362T216-33	0.0346	0.000108	0.301	2.18	-1.422	0.836	2.27	0.574
400T212-54	0.0566	0.000487	0.580	2.21	-1.344	0.798	2.36	0.631
400T212-43	0.0451	0.000247	0.469	2.22	-1.347	0.800	2.37	0.631
400T212-33	0.0346	0.000112	0.364	2.22	-1.350	0.802	2.37	0.631
400T250-54	0.0566	0.000530	0.901	2.49	-1.670	0.976	2.57	0.549
400T250-43	0.0451	0.000270	0.729	2.49	-1.673	0.978	2.57	0.549
400T250-33	0.0346	0.000122	0.566	2.50	-1.676	0.980	2.58	0.549
550T212-54	0.0566	0.000578	1.23	2.54	-1.192	0.732	3.03	0.780
550T212-43	0.0451	0.000293	0.990	2.55	-1.195	0.734	3.03	0.780
550T212-33	0.0346	0.000133	0.768	2.55	-1.198	0.736	3.04	0.779
600T212-54	0.0566	0.000608	1.51	2.66	-1.149	0.712	3.31	0.814
600T212-43	0.0451	0.000308	1.22	2.67	-1.152	0.714	3.32	0.814
600T212-33	0.0346	0.000140	0.942	2.68	-1.155	0.716	3.33	0.813
600T216-54	0.0566	0.000612	1.57	2.68	-1.174	0.726	3.31	0.808
600T216-43	0.0451	0.000310	1.26	2.69	-1.177	0.728	3.32	0.808
600T216-33	0.0346	0.000140	0.980	2.69	-1.180	0.730	3.32	0.808
800T212-54	0.0566	0.000729	2.96	3.20	-1.007	0.643	4.76	0.901
800T212-43	0.0451	0.000370	2.39	3.21	-1.010	0.645	4.77	0.901
800T212-33	0.0346	0.000167	1.85	3.21	-1.013	0.647	4.77	0.900

Table is continued. Footnotes are provided at end of table.

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**Table 4: Torsional Properties<sup>1</sup> (continued)**

Designation	Design Thickness (in.)	J (in. <sup>4</sup> )	C <sub>w</sub> (in. <sup>6</sup> )	r <sub>o</sub> (in.)	x <sub>o</sub> (in.)	m (in.)	j (in.)	β
<b>DEFLECTION TRACK (DT) TORSIONAL PROPERTIES</b>								
362DT212-54	0.0566	0.000464	0.460	2.14	-1.389	0.817	2.24	0.580
362DT212-43	0.0451	0.000236	0.372	2.15	-1.392	0.819	2.25	0.581
362DT212-33	0.0346	0.000107	0.289	2.16	-1.395	0.821	2.25	0.581
362DT216-43	0.0451	0.000238	0.387	2.17	-1.419	0.834	2.26	0.574
400DT212-54	0.0566	0.000487	0.580	2.21	-1.344	0.798	2.36	0.631
400DT212-43	0.0451	0.000247	0.469	2.22	-1.347	0.800	2.37	0.631
400DT212-33	0.0346	0.000112	0.364	2.22	-1.350	0.802	2.37	0.631
400DT250-54	0.0565	0.000530	0.901	2.49	-1.670	0.976	2.57	0.549
400DT250-43	0.0451	0.000270	0.729	2.49	-1.673	0.978	2.57	0.549
400DT250-33	0.0346	0.000122	0.566	2.50	-1.676	0.980	2.58	0.549
550DT212-54	0.0566	0.000578	1.23	2.54	-1.192	0.732	3.03	0.780
550DT212-43	0.0451	0.000293	0.990	2.55	-1.195	0.734	3.03	0.780
550DT212-33	0.0346	0.000133	0.768	2.55	-1.198	0.736	3.04	0.779
600DT212-54	0.0566	0.000608	1.51	2.66	-1.149	0.712	3.31	0.814
600DT212-43	0.0451	0.000308	1.22	2.67	-1.152	0.714	3.32	0.814
600DT212-33	0.0346	0.000140	0.942	2.68	-1.155	0.716	3.33	0.813
600DT216-43	0.0451	0.000310	1.26	2.69	-1.177	0.728	3.32	0.808
600DT216-54	0.0566	0.000612	1.57	2.68	-1.174	0.726	3.31	0.808
800DT212-54	0.0566	0.000729	2.96	3.20	-1.007	0.643	4.76	0.901
800DT212-43	0.0451	0.000370	2.39	3.21	-1.010	0.645	4.77	0.901
800DT212-33	0.0346	0.000167	1.85	3.21	-1.013	0.647	4.77	0.900

<sup>1</sup> Definitions of torsional properties:

- J St. Venant torsional constant
- C<sub>w</sub> Torsional warping constant
- r<sub>o</sub> Polar radius of gyration about the shear center
- x<sub>o</sub> Distance from the shear center to the centroid along the principal X-Axis
- m Distance from the shear center to the mid-plane of the web
- j Section property for torsional-flexural buckling
- β  $1 - (x_o/r_o)^2$

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**Table 5: Effective Section Properties (33 ksi)<sup>1, 2, 3</sup>**

Designation	Design Thickness (in.)	F <sub>y</sub> = 33 ksi, F <sub>u</sub> = 45 ksi							
		I <sub>xe</sub> (in. <sup>4</sup> )	S <sub>xe</sub> (in. <sup>3</sup> )	F <sub>ya</sub> (ksi)	M <sub>al</sub> (kip-in.)	M <sub>ad</sub> (kip-in.)	L <sub>u</sub> (in.)	V <sub>a</sub> (lb)	V <sub>aPO</sub> (lb)
<b>STUD (S) EFFECTIVE SECTION PROPERTIES</b>									
162S125-27	0.0283	0.0585	0.0650	33.0	1.28	1.36	31.9	505	--
162S125-33	0.0346	0.0704	0.0828	36.4	1.80	1.87	30.2	613	--
175S256-43 <sup>4</sup>	0.0451	0.194	0.205	33.0	3.38	2.90	59.9	857	--
175S256-33 <sup>4</sup>	0.0346	0.151	0.135	33.0	2.22	2.05	60.3	666	--
175S256-27 <sup>4</sup>	0.0283	0.121	0.0969	33.0	1.60	1.56	60.5	549	--
175S256-23 <sup>4</sup>	0.0239	0.0966	0.0734	33.0	1.21	1.25	60.6	466	--
300S162-54	0.0566	0.568	0.379	36.9	8.36	8.74	40.5	1934	399
300S162-43	0.0451	0.460	0.305	36.2	6.62	6.57	41.1	1554	410
300S162-33	0.0346	0.359	0.227	35.6	4.83	4.65	41.7	1024	358
300S162-27	0.0283	0.293	0.176	35.2	3.71	3.55	42.2	685	295
350S162/156-43	0.0451	0.640	0.366	36.4	7.96	7.77	39.8	1739	637
350S162/156-33	0.0346	0.498	0.277	33.0	5.47	5.18	42.0	1024	495
350S162/156-27	0.0283	0.410	0.215	33.0	4.25	3.99	42.3	608	362
350S162/156-23	0.0239	0.339	0.172	33.0	3.39	3.19	42.5	365	258
350S162-54	0.0566	0.811	0.464	36.9	10.2	10.5	40.7	2285	658
350S162-43	0.0451	0.657	0.373	36.2	8.10	7.85	41.2	1739	637
350S162-33	0.0346	0.511	0.277	35.6	5.92	5.53	41.9	1024	495
350S162-27	0.0283	0.419	0.215	35.2	4.55	4.21	42.4	608	362
362S162-54	0.0566	0.880	0.485	36.9	10.7	11.0	40.7	2372	732
362S162-43	0.0451	0.712	0.391	36.2	8.48	8.18	41.2	1739	682
362S162-33	0.0346	0.554	0.291	35.6	6.20	5.75	41.9	1024	529
362S162-27	0.0283	0.454	0.226	35.2	4.76	4.38	42.4	586	372
362S175-54	0.0566	0.925	0.508	36.6	11.1	11.2	43.5	2372	732
362S175-43	0.0451	0.748	0.395	36.0	8.52	8.33	44.2	1739	682
362S175-33	0.0346	0.582	0.296	35.4	6.28	5.85	44.8	1024	529
362S175-27	0.0283	0.473	0.231	35.1	4.86	4.44	45.3	586	372
400S162-54	0.0566	1.11	0.553	36.9	12.2	12.3	40.7	2635	975
400S162-43	0.0451	0.895	0.445	36.2	9.65	9.16	41.3	1739	816
400S162-33	0.0346	0.695	0.331	35.6	7.06	6.42	41.9	969	598
400S162-27	0.0283	0.571	0.258	35.2	5.44	4.88	42.4	528	401
400S200-54	0.0565	1.27	0.607	36.2	13.1	13.0	49.4	2630	975
400S200-43	0.0451	1.03	0.466	33.0	9.20	9.11	52.1	1739	816
400S200-33	0.0346	0.796	0.352	33.0	6.96	6.42	52.4	969	598
550S162-54	0.0566	2.34	0.851	36.9	18.8	17.9	40.4	2739	1686
550S162-43	0.0451	1.89	0.683	36.2	14.8	13.2	41.1	1545	1200
550S162-33	0.0346	1.46	0.510	35.6	10.9	9.11	41.7	695	695
550S162-27	0.0283	1.21	0.378	33.0	7.47	6.59	43.8	379	379
600S175-97	0.1017	5.16	1.47	33.0	29.1	37.9	44.9	7138	2711
600S175-68	0.0713	3.71	1.24	37.3	27.8	27.5	42.5	4347	2389
600S175-54	0.0566	3.01	0.997	36.6	21.9	20.1	43.3	2739	1910
600S175-43	0.0451	2.42	0.775	36.0	16.7	14.7	44.0	1411	1241
600S175-33	0.0346	1.88	0.591	33.0	11.7	9.67	46.3	635	635
600S175-27	0.0283	1.54	0.418	33.0	8.25	7.33	46.9	347	347
600S162-54	0.0566	2.88	0.960	36.9	21.2	19.8	40.3	2739	1910
600S162-43	0.0451	2.32	0.770	36.2	16.7	14.5	40.9	1411	1241
600S162-33	0.0346	1.80	0.567	35.6	12.1	9.99	43.2	635	635
600S162-27	0.0283	1.48	0.410	33.0	8.11	7.21	43.7	347	347
600S200-43	0.0451	2.62	0.800	33.0	15.8	14.3	52.1	1411	1241
600S200-33	0.0346	2.03	0.594	33.0	11.7	9.94	52.5	635	635
800S162-54	0.0566	5.75	1.34	33.0	26.4	25.1	41.8	2079	2079
800S162-43	0.0451	4.53	1.02	33.0	20.2	18.4	42.3	1049	1049
800S162-33	0.0346	3.42	0.715	33.0	14.1	12.7	42.8	472	472
800S162-27	0.0283	2.75	0.523	33.0	10.3	9.51	43.2	258	258
800S200-97	0.1017	10.32	2.77	38.2	63.2	64.4	46.2	8843	4470
800S200-68	0.0713	8.02	1.96	36.8	43.3	39.2	47.9	4171	3040
800S200-54	0.0566	6.43	1.45	33.0	28.6	26.6	51.2	2079	1919
1000S200-97	0.1017	19.2	3.68	33.0	72.8	75.2	48.7	8843	4657
1000S200-68	0.0713	13.6	2.55	33.0	50.3	46.3	49.7	3314	2516
1000S200-54	0.0566	10.8	1.86	33.0	36.7	33.3	50.4	1653	1589
1200S200-97	0.1017	30.2	4.63	33.0	91.6	92.0	47.6	8020	5684
1200S200-68	0.0713	20.8	3.14	33.0	62.0	55.3	48.7	2749	2749
1200S200-54	0.0566	16.5	2.27	33.0	44.8	39.4	49.4	1372	1372
1400S200-97	0.1017	44.5	5.59	33.0	110.4	107.5	46.5	6846	6099
1400S200-68	0.0713	29.8	3.73	33.0	73.6	63.3	47.6	2349	2349
1400S200-54	0.0566	23.7	2.68	33.0	52.9	44.6	48.3	1172	1172

Table is continued. Footnotes are provided after Table 7.

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**Table 5: Effective Section Properties (continued) (33 ksi)<sup>1, 2, 3</sup>**

TRACK (T) EFFECTIVE SECTION PROPERTIES									
362T212-54	0.0566	0.799	0.348	33.0	6.87	6.87	48.6	2372	--
362T212-43	0.0451	0.602	0.256	33.0	5.06	5.06	48.8	1739	--
362T212-33	0.0346	0.432	0.180	33.0	3.57	3.57	49.0	1024	--
362T216-54	0.0566	0.804	0.349	33.0	6.89	6.89	49.3	2372	--
362T216-43	0.0451	0.605	0.257	33.0	5.07	5.07	49.5	1739	--
362T216-33	0.0346	0.435	0.181	33.0	3.58	3.58	49.7	1024	--
400T212-54	0.0566	1.00	0.400	33.0	7.91	7.91	48.6	2635	--
400T212-43	0.0451	0.757	0.296	33.0	5.85	5.85	48.8	1739	--
400T212-33	0.0346	0.546	0.210	33.0	4.14	4.14	49.0	969	--
400T250-54	0.0565	1.07	0.412	33.0	8.15	8.15	57.3	2630	--
400T250-43	0.0451	0.809	0.305	33.0	6.02	6.02	57.5	1739	--
400T250-33	0.0346	0.583	0.211	33.0	4.17	4.17	57.8	969	--
550T212-54	0.0566	2.12	0.640	33.0	12.6	12.6	48.3	2739	--
550T212-43	0.0451	1.61	0.478	33.0	9.45	9.45	48.5	1545	--
550T212-33	0.0346	1.20	0.295	33.0	5.83	5.83	49.1	695	--
600T212-54	0.0566	2.61	0.729	33.0	14.4	14.4	48.1	2739	--
600T212-43	0.0451	1.99	0.547	33.0	10.8	10.8	48.3	141	--
600T212-33	0.0346	1.49	0.321	33.0	6.35	6.35	49.0	635	--
600T216-54	0.0566	2.63	0.731	33.0	14.5	14.5	48.9	2739	--
600T216-43	0.0451	2.00	0.549	33.0	10.8	10.8	49.0	1411	--
600T216-33	0.0346	1.49	0.321	33.0	6.35	6.35	49.8	635	--
800T212-54	0.0566	5.26	1.14	33.0	22.5	22.5	47.1	2079	--
800T212-43	0.0451	4.11	0.722	33.0	14.3	14.3	47.6	1049	--
800T212-33	0.0346	3.08	0.428	33.0	8.46	8.46	48.2	472	--
DEFLECTION TRACK (DT) EFFECTIVE SECTION PROPERTIES									
362DT212-54	0.0566	0.799	0.348	33.0	6.87	6.87	48.6	2372	--
362DT212-43	0.0451	0.602	0.256	33.0	5.06	5.06	48.8	1739	--
362DT212-33	0.0346	0.432	0.180	33.0	3.57	3.57	49.0	1024	--
362DT216-43	0.0451	0.605	0.257	33.0	5.07	5.07	49.5	1739	--
400DT212-54	0.0566	1.00	0.400	33.0	7.91	7.91	48.6	2635	--
400DT212-43	0.0451	0.757	0.296	33.0	5.85	5.85	48.8	1739	--
400DT212-33	0.0346	0.546	0.210	33.0	4.14	4.14	49.0	969	--
400DT250-54	0.0565	1.07	0.412	33.0	8.15	8.15	57.3	2630	--
400DT250-43	0.0451	0.809	0.305	33.0	6.02	6.02	57.5	1739	--
400DT250-33	0.0346	0.583	0.211	33.0	4.17	4.17	57.8	969	--
550DT212-54	0.0566	2.12	0.640	33.0	12.6	12.6	48.3	2739	--
550DT212-43	0.0451	1.61	0.478	33.0	9.45	9.45	48.5	1545	--
550DT212-33	0.0346	1.20	0.295	33.0	5.83	5.83	49.1	695	--
600DT212-54	0.0566	2.61	0.729	33.0	14.4	14.4	48.1	2739	--
600DT212-43	0.0451	1.99	0.547	33.0	10.8	10.8	48.3	141	--
600DT212-33	0.0346	1.49	0.321	33.0	6.35	6.35	49.0	635	--
600DT216-43	0.0451	2.00	0.549	33.0	10.8	10.8	49.0	1411	--
600DT216-54	0.0566	2.63	0.731	33.0	14.5	14.5	48.9	2739	--
800DT212-54	0.0566	5.26	1.14	33.0	22.5	22.5	47.1	2079	--
800DT212-43	0.0451	4.11	0.722	33.0	14.3	14.3	47.6	1049	--
800DT212-33	0.0346	3.08	0.428	33.0	8.46	8.46	48.2	472	--

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**Table 6: Effective Section Properties (50 ksi)<sup>1, 2, 3</sup>**

Designation	Design Thickness (in.)	F <sub>y</sub> = 50 ksi, F <sub>u</sub> = 65 ksi							
		I <sub>xe</sub> (in. <sup>4</sup> )	S <sub>xe</sub> (in. <sup>3</sup> )	F <sub>ya</sub> (ksi)	M <sub>al</sub> (kip-in.)	M <sub>ad</sub> (kip-in.)	L <sub>u</sub> (in.)	V <sub>a</sub> (lb)	V <sub>aPO</sub> (lb)
<b>STUD (S) EFFECTIVE SECTION PROPERTIES</b>									
162S125-2	0.0283	0.0579	0.0590	50.0	1.77	1.81	26.1	766	--
162S125-33	0.0346	0.0703	0.0746	50.0	2.23	2.35	26.0	928	--
175S256-43 <sup>4</sup>	0.0451	0.190	0.179	50.0	4.46	3.76	49.1	1298	--
175S256-33 <sup>4</sup>	0.0346	0.141	0.117	50.0	2.92	2.64	49.4	1009	--
175S256-27 <sup>4</sup>	0.0283	0.112	0.0837	50.0	2.09	1.99	49.5	832	--
175S256-23 <sup>4</sup>	0.0239	0.0886	0.0632	50.0	1.58	1.59	49.6	601	--
300S162-54	0.0566	0.568	0.363	55.1	12.0	11.8	33.3	2931	605
300S162-43	0.0451	0.460	0.271	54.2	8.81	8.72	35.3	2141	565
300S162-33	0.0346	0.358	0.207	53.4	6.62	6.09	35.4	1260	440
300S162-27	0.0283	0.287	0.164	50.0	4.92	4.46	35.6	716	309
350S162/156-43	0.0451	0.640	0.338	50.0	10.1	9.72	34.1	2141	784
350S162/156-33	0.0346	0.497	0.256	50.0	7.67	6.85	34.3	1115	539
350S162/156-27	0.0283	0.396	0.200	50.0	5.98	5.22	34.5	608	362
350S162/156-23	0.0239	0.328	0.150	50.0	4.49	4.14	34.9	365	258
350S162-54	0.0566	0.811	0.444	55.1	14.6	14.1	33.4	3372	972
350S162-43	0.0451	0.657	0.333	54.2	10.8	10.4	35.4	2141	784
350S162-33	0.0346	0.511	0.254	53.4	8.13	7.22	35.6	1115	539
350S162-27	0.0283	0.410	0.202	50.0	6.05	5.27	35.7	608	362
362S162-54	0.0566	0.880	0.465	55.1	15.3	14.7	33.4	3372	1041
362S162-43	0.0451	0.712	0.349	54.2	11.3	10.8	35.4	2141	839
362S162-33	0.0346	0.554	0.266	53.4	8.52	7.50	35.6	1074	555
362S162-27	0.0283	0.445	0.212	50.0	6.35	5.47	35.7	586	372
362S175-54	0.0566	0.925	0.466	54.7	15.3	14.9	35.8	3372	1041
362S175-43	0.0451	0.748	0.362	50.0	10.8	10.4	37.8	2141	839
362S175-33	0.0346	0.579	0.274	50.0	8.22	7.31	37.9	1074	555
362S175-27	0.0283	0.462	0.216	50.0	6.47	5.56	38.2	586	372
400S162-54	0.0566	1.11	0.529	55.1	17.5	16.4	33.4	3372	1248
400S162-43	0.0451	0.895	0.398	54.2	12.9	12.1	35.4	2141	1004
400S162-33	0.0346	0.695	0.304	53.4	9.73	8.36	35.6	969	598
400S162-27	0.0283	0.560	0.235	50.0	7.02	6.09	35.9	528	401
400S200-54	0.0565	1.27	0.549	50.0	16.4	16.2	42.3	3360	1245
400S200-43	0.0451	1.01	0.427	50.0	12.8	12.0	42.6	2141	1004
400S200-33	0.0346	0.765	0.320	50.0	9.59	8.36	42.8	969	598
550S162-54	0.0566	2.34	0.816	55.1	26.9	23.6	33.2	3066	1887
550S162-43	0.0451	1.89	0.617	54.2	20.0	17.1	35.1	1545	1200
550S162-33	0.0346	1.46	0.445	50.0	13.3	11.3	35.5	695	695
550S162-27	0.0283	1.19	0.320	50.0	9.59	8.52	35.9	379	379
600S175-97	0.1017	4.91	1.72	57.7	59.5	59.4	33.7	10815	4108
600S175-68	0.0713	3.73	1.20	55.7	39.9	36.5	34.9	5350	2941
600S175-54	0.0566	3.01	0.923	54.7	30.3	26.3	35.6	2800	1952
600S175-43	0.0451	2.42	0.720	50.0	21.6	18.2	37.5	1411	1241
600S175-33	0.0346	1.88	0.485	50.0	14.5	12.5	38.0	635	635
600S175-27	0.0283	1.52	0.355	50.0	10.6	9.44	38.5	347	347
600S162-54	0.0566	2.88	0.921	55.1	30.4	26.0	33.0	2800	1952
600S162-43	0.0451	2.32	0.689	54.2	22.4	18.8	35.0	1411	1241
600S162-33	0.0346	1.80	0.483	50.0	14.5	12.4	35.5	635	635
600S162-27	0.0283	1.47	0.349	50.0	10.5	9.30	35.9	347	347
600S200-97	0.1017	5.480	1.814	56.8	61.7	61.0	38.6	10815	4108
600S200-68	0.0713	4.044	1.277	50.0	38.2	35.0	41.8	5350	2941
600S200-54	0.0566	3.25	0.954	50.0	28.6	25.5	42.2	2800	1952
600S200-43	0.0451	2.59	0.731	50.0	21.9	18.6	42.6	1411	1241
600S200-33	0.0346	1.99	0.488	50.0	14.6	12.8	43.2	635	635

Table is continued. Footnotes are provided after Table 7.

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**Table 6: Effective Section Properties (continued) (50 ksi)<sup>1, 2, 3</sup>**

800S162-54	0.0566	5.66	1.23	50.0	36.8	33.0	34.1	2079	2079
800S162-43	0.0451	4.46	0.866	50.0	25.9	23.9	34.6	1049	1049
800S162-33	0.0346	3.36	0.617	50.0	18.5	16.3	35.0	472	472
800S162-27	0.0283	2.65	0.456	50.0	13.7	12.2	35.3	258	258
800S200-97	0.1017	10.82	2.71	56.8	92.3	85.7	37.9	10885	5502
800S200-68	0.0713	8.02	1.87	55.0	61.7	51.1	39.2	4171	3040
800S200-54	0.0566	6.35	1.24	50.0	37.1	34.7	42.0	2079	1919
1000S200-97	0.1017	18.25	3.67	50.0	110.0	100.8	39.6	9678	5097
1000S200-68	0.0713	13.55	2.28	50.0	68.3	60.5	40.6	3314	2516
1000S200-54	0.0566	10.63	1.58	50.0	47.3	43.1	41.2	1653	1589
1200S200-97	0.1017	28.03	4.56	50.0	136.6	121.7	38.7	8020	5684
1200S200-68	0.0713	20.78	2.79	50.0	83.5	71.6	39.8	2749	2749
1200S200-54	0.0566	16.21	1.92	50.0	57.5	50.5	40.4	1372	1372
1400S200-97	0.1017	40.12	5.45	50.0	163.2	140.6	37.9	6846	6099
1400S200-68	0.0713	29.87	3.30	50.0	98.7	81.4	38.9	2349	2349
1400S200-54	0.0566	23.17	2.26	50.0	67.6	56.9	39.5	1172	1172
<b>TRACK (T) EFFECTIVE SECTION PROPERTIES</b>									
362T212-54	0.0566	0.753	0.321	50.0	9.62	9.62	39.6	3372	--
362T212-43	0.0451	0.568	0.238	50.0	7.13	7.13	39.8	2141	--
362T212-33	0.0346	0.414	0.157	50.0	4.71	4.71	40.1	1074	--
362T216-54	0.0566	0.758	0.322	50.0	9.65	9.65	40.2	3372	--
362T216-43	0.0451	0.571	0.239	50.0	7.15	7.15	40.4	2141	--
362T216-33	0.0346	0.417	0.157	50.0	4.71	4.71	40.7	1074	--
400T212-54	0.0566	0.948	0.372	50.0	11.1	11.1	39.7	3372	--
400T212-43	0.0451	0.717	0.277	50.0	8.28	8.28	39.8	2141	--
400T212-33	0.0346	0.528	0.174	50.0	5.22	5.22	40.3	969	--
400T250-54	0.0565	1.01	0.382	50.0	11.4	11.4	46.7	3360	--
400T250-43	0.0451	0.764	0.284	50.0	8.51	8.51	46.9	2141	--
400T250-33	0.0346	0.564	0.173	50.0	5.18	5.18	47.5	969	--
550T212-54	0.0566	2.02	0.601	50.0	18.0	18.0	39.4	3066	--
550T212-43	0.0451	1.56	0.408	50.0	12.2	12.2	39.7	1545	--
550T212-33	0.0346	1.16	0.242	50.0	7.25	7.25	40.3	695	--
600T212-54	0.0566	2.49	0.687	50.0	20.6	20.6	39.2	2800	--
600T212-43	0.0451	1.94	0.444	50.0	13.3	13.3	39.7	1411	--
600T212-33	0.0346	1.45	0.265	50.0	7.93	7.93	40.2	635	--
600T216-54	0.0566	2.51	0.689	50.0	20.6	20.6	39.8	2800	--
600T216-43	0.0451	1.95	0.444	50.0	13.3	13.3	40.3	1411	--
600T216-33	0.0346	1.46	0.265	50.0	7.93	7.93	40.9	635	--
800T212-54	0.0566	5.14	0.926	50.0	27.7	27.7	38.6	2079	--
800T212-43	0.0451	4.02	0.590	50.0	17.7	17.7	39.1	1049	--
800T212-33	0.0346	2.67	0.356	50.0	10.6	10.6	39.5	472	--
<b>DEFLECTION TRACK (DT) EFFECTIVE SECTION PROPERTIES</b>									
362DT212-54	0.0566	0.753	0.321	50.0	9.62	9.62	39.6	3372	--
362DT212-43	0.0451	0.568	0.238	50.0	7.13	7.13	39.8	2141	--
362DT212-33	0.0346	0.414	0.157	50.0	4.71	4.71	40.1	1074	--
362DT216-43	0.0451	0.571	0.239	50.0	7.15	7.15	40.4	2141	--
400DT212-54	0.0566	0.948	0.372	50.0	11.1	11.1	39.7	3372	--
400DT212-43	0.0451	0.717	0.277	50.0	8.28	8.28	39.8	2141	--
400DT212-33	0.0346	0.528	0.174	50.0	5.22	5.22	40.3	969	--
400DT250-54	0.0565	1.01	0.382	50.0	11.4	11.4	46.7	3360	--
400DT250-43	0.0451	0.764	0.284	50.0	8.51	8.51	46.9	2141	--
400DT250-33	0.0346	0.564	0.173	50.0	5.18	5.18	47.5	969	--
550DT212-54	0.0566	2.02	0.601	50.0	18.0	18.0	39.4	3066	--
550DT212-43	0.0451	1.56	0.408	50.0	12.2	12.2	39.7	1545	--
550DT212-33	0.0346	1.16	0.242	50.0	7.25	7.25	40.3	695	--
600DT212-54	0.0566	2.49	0.687	50.0	20.6	20.6	39.2	2800	--
600DT212-43	0.0451	1.94	0.444	50.0	13.3	13.3	39.7	1411	--
600DT212-33	0.0346	1.45	0.265	50.0	7.93	7.93	40.2	635	--
600DT216-43	0.0451	1.95	0.444	50.0	13.3	13.3	40.3	1411	--
600DT216-54	0.0566	2.51	0.689	50.0	20.6	20.6	39.8	2800	--
800DT212-54	0.0566	5.14	0.926	50.0	27.7	27.7	38.6	2079	--
800DT212-43	0.0451	4.02	0.590	50.0	17.7	17.7	39.1	1049	--
800DT212-33	0.0346	2.67	0.356	50.0	10.6	10.6	39.5	472	--

Footnotes are provided after Table 7.

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**Table 7: Effective Section Properties (80 ksi)<sup>1, 2, 3</sup>**

Designation	Design Thickness (in.)	F <sub>y</sub> = 80 ksi, F <sub>u</sub> = 90 ksi							
		I <sub>xe</sub> (in. <sup>4</sup> )	S <sub>xe</sub> (in. <sup>3</sup> )	F <sub>ya</sub> (ksi)	M <sub>al</sub> (kip-in.)	M <sub>ad</sub> (kip-in.)	L <sub>u</sub> (in.)	V <sub>a</sub> (lb)	V <sub>aPo</sub> (lb)
<b>STUD (S) EFFECTIVE SECTION PROPERTIES</b>									
162S125-2	0.0283	0.0538	0.0528	80.0	2.53	2.45	20.8	1066	--
162S125-33	0.0346	0.0675	0.0668	80.0	3.20	3.21	20.7	1485	--
175S256-43 <sup>4</sup>	0.0451	0.1530	0.1200	80.0	5.76	6.33	39.1	2077	--
175S256-33 <sup>4</sup>	0.0346	0.1130	0.0857	80.0	4.11	4.39	39.3	1594	--
175S256-27 <sup>4</sup>	0.0283	0.0893	0.0667	80.0	3.20	3.32	39.5	1066	--
175S256-23 <sup>4</sup>	0.0239	0.0743	0.0528	80.0	2.53	2.62	39.6	760	--
300S162-54	0.0566	0.568	0.320	80.0	15.3	15.2	27.9	4265	880
300S162-43	0.0451	0.458	0.249	80.0	12.0	11.2	28.0	2708	714
300S162-33	0.0346	0.349	0.187	80.0	8.96	7.85	28.2	1314	459
300S162-27	0.0283	0.277	0.145	80.0	6.95	5.95	28.4	716	309
350S162/156-43	0.0451	0.637	0.304	80.0	14.6	13.2	27.1	2485	911
350S162/156-33	0.0346	0.479	0.228	80.0	10.9	9.21	27.3	1115	539
350S162/156-27	0.0283	0.383	0.168	80.0	8.06	6.96	27.6	608	362
350S162/156-23	0.0239	0.316	0.124	80.0	5.96	5.49	28.0	365	258
350S162-54	0.0566	0.811	0.394	80.0	18.9	18.1	27.9	4265	1229
350S162-43	0.0451	0.656	0.307	80.0	14.7	13.3	28.1	2485	911
350S162-33	0.0346	0.499	0.228	80.0	10.9	9.28	28.3	1115	539
350S162-27	0.0283	0.398	0.170	80.0	8.12	7.02	28.6	608	362
362S162-54	0.0566	0.880	0.413	80.0	19.8	18.8	27.9	4265	1316
362S162-43	0.0451	0.712	0.322	80.0	15.4	13.9	28.1	2394	939
362S162-33	0.0346	0.542	0.236	80.0	11.3	9.64	28.4	1074	555
362S162-27	0.0283	0.432	0.176	80.0	8.4	7.28	28.7	586	372
362S175-54	0.0566	0.919	0.422	80.0	20.2	19.2	29.8	4265	1316
362S175-43	0.0451	0.732	0.328	80.0	15.7	14.1	30.0	2394	939
362S175-33	0.0346	0.560	0.236	80.0	11.3	9.78	30.3	1074	555
362S175-27	0.0283	0.447	0.177	80.0	8.46	7.38	30.6	586	372
400S162-54	0.0566	1.110	0.472	80.0	22.6	21.1	27.9	4265	1578
400S162-43	0.0451	0.895	0.369	80.0	17.7	15.5	28.1	2157	1012
400S162-33	0.0346	0.682	0.260	80.0	12.4	10.7	28.4	969	598
400S162-27	0.0283	0.544	0.194	80.0	9.30	8.09	28.7	528	401
400S200-54	0.0565	1.21	0.498	80.0	23.9	21.9	33.7	4250	1575
400S200-43	0.0451	0.941	0.385	80.0	18.5	16.1	33.9	2157	1012
400S200-33	0.0346	0.730	0.260	80.0	12.5	11.1	34.4	969	598
550S162-54	0.0566	2.34	0.738	80.0	35.3	30.0	27.7	3066	1887
550S162-43	0.0451	1.89	0.529	80.0	25.4	21.8	28.0	1545	1200
550S162-33	0.0346	1.45	0.356	80.0	17.0	15.0	28.5	695	695
550S162-27	0.0283	1.15	0.268	80.0	12.8	11.2	28.7	379	379
600S175-97	0.1017	5.07	1.66	80.0	79.6	75.1	28.7	13769	5229
600S175-68	0.0713	3.73	1.130	80.0	53.9	46.3	29.2	5627	3093
600S175-54	0.0566	3.01	0.837	80.0	40.1	33.5	29.6	2800	1952
600S175-43	0.0451	2.42	0.580	80.0	27.8	24.3	30.0	1411	1241
600S175-33	0.0346	1.85	0.389	80.0	18.7	16.6	30.5	635	635
600S175-27	0.0283	1.42	0.294	80.0	14.1	12.4	30.7	347	347
600S162-54	0.0566	2.88	0.829	80.0	39.7	33.0	27.5	2800	1952
600S162-43	0.0451	2.32	0.575	80.0	27.6	23.9	28.0	1411	1241
600S162-33	0.0346	1.79	0.388	80.0	18.6	16.4	28.4	635	635
600S162-27	0.0283	1.38	0.292	80.0	14.0	12.3	28.7	347	347
600S200-97	0.1017	5.603	1.760	80.0	84.3	77.4	32.6	13769	5229
600S200-68	0.0713	3.949	1.144	80.0	54.8	47.4	33.2	5627	3093
600S200-54	0.0566	3.12	0.848	80.0	40.6	34.2	33.6	2800	1952
600S200-43	0.0451	2.46	0.586	80.0	28.1	24.8	34.1	1411	1241
600S200-33	0.0346	1.92	0.391	80.0	18.7	16.9	34.6	635	635
800S162-54	0.0566	5.57	1.01	80.0	48.4	44.1	27.2	2079	2079
800S162-43	0.0451	4.38	0.735	80.0	35.2	31.6	27.6	1049	1049
800S162-33	0.0346	3.25	0.509	80.0	24.4	21.4	27.9	472	472
800S162-27	0.0283	2.49	0.387	80.0	18.6	15.9	28.1	258	258
800S200-97	0.1017	11.13	2.64	80.0	126.5	107.7	32.0	12201	6167
800S200-68	0.0713	8.02	1.65	80.0	79.1	64.6	32.7	4171	3040
800S200-54	0.0566	6.13	1.05	80.0	50.5	46.1	33.5	2079	1919
1000S200-97	0.1017	18.94	3.28	80.0	157.1	136.9	31.5	9678	5097
1000S200-68	0.0713	13.31	1.89	80.0	90.6	80.6	32.4	3314	2516
1000S200-54	0.0566	10.26	1.34	80.0	64.0	57.0	32.9	1653	1589
1200S200-97	0.1017	29.01	4.03	80.0	193.0	163.6	30.8	8020	5684
1200S200-68	0.0713	20.32	2.30	80.0	110.2	94.7	31.7	2749	2749
1200S200-54	0.0566	15.71	1.62	80.0	77.5	66.3	32.1	1372	1372
1400S200-97	0.1017	41.50	4.78	80.0	229.0	187.4	30.1	6846	6099
1400S200-68	0.0713	29.10	2.71	80.0	129.7	106.9	30.9	2349	2349
1400S200-54	0.0566	22.56	1.90	80.0	91.0	74.2	31.4	1172	1172

Table is continued. Footnotes are provided after Table 7.

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**Table 7: Effective Section Properties (continued) (80 ksi)<sup>1, 2, 3</sup>**

TRACK (T) EFFECTIVE SECTION PROPERTIES									
362T212-54	0.0566	0.706	0.296	80.0	14.2	14.2	31.5	4265	--
362T212-43	0.0451	0.538	0.211	80.0	10.1	10.1	31.7	2394	--
362T212-33	0.0346	0.399	0.127	80.0	6.07	6.07	32.1	1074	--
362T216-54	0.0566	0.710	0.297	80.0	14.2	14.2	31.9	4265	--
362T216-43	0.0451	0.541	0.211	80.0	10.1	10.1	32.1	2394	--
362T216-33	0.0346	0.402	0.127	80.0	6.07	6.07	32.6	1074	--
400T212-54	0.0566	0.891	0.344	80.0	16.5	16.5	31.5	4265	--
400T212-43	0.0451	0.685	0.234	80.0	11.2	11.2	31.8	2157	--
400T212-33	0.0346	0.510	0.141	80.0	6.75	6.75	32.2	969	--
400T250-54	0.0565	0.948	0.353	80.0	16.9	16.9	37.1	4250	--
400T250-43	0.0451	0.733	0.232	80.0	11.1	11.1	37.5	2157	--
400T250-33	0.0346	0.543	0.140	80.0	6.72	6.72	38.0	969	--
550T212-54	0.0566	1.94	0.508	80.0	24.4	24.4	31.4	3066	--
550T212-43	0.0451	1.51	0.325	80.0	15.6	15.6	31.8	1545	--
550T212-33	0.0346	1.03	0.197	80.0	9.43	9.43	32.2	695	--
600T212-54	0.0566	2.42	0.554	80.0	26.5	26.5	31.3	2800	--
600T212-43	0.0451	1.89	0.355	80.0	17.0	17.0	31.7	1466	--
600T212-33	0.0346	1.23	0.216	80.0	10.3	10.3	32.1	635	--
600T216-54	0.0566	2.43	0.554	80.0	26.5	26.5	31.9	2800	--
600T216-43	0.0451	1.90	0.355	80.0	17.0	17.0	32.2	1411	--
600T216-33	0.0346	1.24	0.216	80.0	10.3	10.3	32.6	635	--
800T212-54	0.0566	5.02	0.736	80.0	35.3	35.3	30.8	2079	--
800T212-43	0.0451	3.55	0.477	80.0	22.9	22.9	31.2	1049	--
800T212-33	0.0346	2.25	0.291	80.0	13.9	13.9	31.5	472	--
DEFLECTION TRACK (DT) EFFECTIVE SECTION PROPERTIES									
362DT212-54	0.0566	0.706	0.296	80.0	14.2	14.2	31.5	4265	--
362DT212-43	0.0451	0.538	0.211	80.0	10.1	10.1	31.7	2394	--
362DT212-33	0.0346	0.399	0.127	80.0	6.07	6.07	32.1	1074	--
362DT216-43	0.0451	0.541	0.211	80.0	10.1	10.1	32.1	2394	--
400DT212-54	0.0566	0.891	0.344	80.0	16.5	16.5	31.5	4265	--
400DT212-43	0.0451	0.685	0.234	80.0	11.2	11.2	31.8	2157	--
400DT212-33	0.0346	0.510	0.141	80.0	6.75	6.75	32.2	969	--
400DT250-54	0.0565	0.948	0.353	80.0	16.9	16.9	37.1	4250	--
400DT250-43	0.0451	0.733	0.232	80.0	11.1	11.1	37.5	2157	--
400DT250-33	0.0346	0.543	0.140	80.0	6.72	6.72	38.0	969	--
550DT212-54	0.0566	1.94	0.508	80.0	24.4	24.4	31.4	3066	--
550DT212-43	0.0451	1.51	0.325	80.0	15.6	15.6	31.8	1545	--
550DT212-33	0.0346	1.03	0.197	80.0	9.43	9.43	32.2	695	--
600DT212-54	0.0566	2.42	0.554	80.0	26.5	26.5	31.3	2800	--
600DT212-43	0.0451	1.89	0.355	80.0	17.0	17.0	31.7	1466	--
600DT212-33	0.0346	1.23	0.216	80.0	10.3	10.3	32.1	635	--
600DT216-43	0.0451	1.90	0.355	80.0	17.0	17.0	32.2	1411	--
600DT216-54	0.0566	2.43	0.554	80.0	26.5	26.5	31.9	2800	--
800DT212-54	0.0566	5.02	0.736	80.0	35.3	35.3	30.8	2079	--
800DT212-43	0.0451	3.55	0.477	80.0	22.9	22.9	31.2	1049	--
800DT212-33	0.0346	2.25	0.291	80.0	13.9	13.9	31.5	472	--

Footnotes are provided after Table 7.

**Table 5, 6 and 7: Effective Section Properties (footnotes)**

<sup>1</sup> Definitions of structural properties:

- $I_{xe}$  Moment of inertia for deflection calculations about the strong axis (X-X)
- $S_{xe}$  Effective section modulus about the strong axis (X-X) Stress =  $F_{ya}$  based on local buckling
- $F_{ya}$  Average yield stress of section considering the cold work of forming
- $M_{al}$  Allowable bending moment limited by local buckling only about the X-X axis
- $M_{ad}$  Allowable bending moment limited by distortional buckling, assuming  $K\phi = 0$  (no bracing from sheathing) and  $\beta = 1.0$  (no moment gradient)
- $L_u$  Maximum unbraced length for lateral-torsional buckling. Members are considered fully braced when the unbraced length is less than  $L_u$ . If the unbraced length exceeds  $L_u$  then lateral-torsional buckling must be evaluated independently.
- $V_a$  Allowable strong axis (X-X) shear load, away from punch-out
- $V_{aPO}$  Allowable strong axis (X-X) shear at the punch-out, see limitations in note 3

<sup>2</sup> For deflection calculations, use the effective moment of inertia

<sup>3</sup> Where  $h/t$  values exceed 200, bearing stiffeners satisfying the requirements of AISI S100, Section C3.7.1, must be provided and the shear strengths provided do not apply.

<sup>4</sup> Members evaluated using the direct strength analysis method due to elements exceeding slenderness limits in AISI S100, Section B1.1.

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**Table 8: Deflection Track (DT) Allowable Stud Lateral End Reaction (lbf)<sup>1</sup>**

Designation	Max. Gap <sup>2</sup> (in.)	F <sub>y</sub> = 33 ksi			F <sub>y</sub> = 50 ksi			F <sub>y</sub> = 80 ksi		
		Stud Spacing (in. on-center)			Stud Spacing (in. on-center)			Stud Spacing (in. on-center)		
		12	16	24	12	16	24	12	16	24
362DT216-43	0.50	144	163	163	218	247	247	349	396	396
600DT216-43	0.50	144	163	163	218	247	247	349	396	396
600DT216-54	0.50	213	213	213	323	323	323	516	516	516
362DT216-43	0.75	96	123	123	145	187	187	232	299	299
600DT216-43	0.75	96	123	123	145	187	187	232	299	299
600DT216-54	0.75	151	158	158	229	240	240	366	384	384
362DT212-54	1.00	113	129	129	172	195	195	275	313	313
362DT212-43	1.00	72	96	102	109	145	154	174	232	247
362DT212-33	1.00	42	56	80	64	86	121	103	137	193
400DT212-54	1.00	113	129	129	172	195	195	275	313	313
400DT212-43	1.00	72	96	102	109	145	154	174	232	247
400DT212-33	1.00	42	56	80	64	86	121	103	137	193
400DT250-54	1.00	113	129	129	172	195	195	275	313	313
400DT250-43	1.00	72	96	102	109	145	154	174	232	247
400DT250-33	1.00	42	56	80	64	86	121	103	137	193
550DT212-54	1.00	113	129	129	172	195	195	275	313	313
550DT212-43	1.00	72	96	102	109	145	154	174	232	247
550DT212-33	1.00	42	56	80	64	86	121	103	137	193
600DT212-54	1.00	113	129	129	172	195	195	275	313	313
600DT212-43	1.00	72	96	102	109	145	154	174	232	247
600DT212-33	1.00	42	56	80	64	86	121	103	137	193
800DT212-54	1.00	113	129	129	172	195	195	275	313	313
800DT212-43	1.00	72	96	102	109	145	154	174	232	247
800DT212-33	1.00	42	56	80	64	86	121	103	137	193

<sup>1</sup> The allowable reaction is the point load allowed into the deflection track imposed by a single stud.

<sup>2</sup> Values apply where the distance between the stud web at the end of the stud and the track web does not exceed stated maximum gap.

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**Table 9: List of Approved Products per Listee<sup>1</sup>**

<b>Designation</b>	<b>Listee</b>
162S125-27	SurePods, LLC
162S125-33	SurePods, LLC
362S175-43	KHS&S Contractors
362S175-33	KHS&S Contractors
400S200-54	KHS&S Contractors
400S200-43	KHS&S Contractors
600S175-54	KHS&S Contractors
600S175-43	KHS&S Contractors
600S175-33	KHS&S Contractors
362T216-43	KHS&S Contractors
362T216-33	KHS&S Contractors
400T250-54	KHS&S Contractors
400T250-43	KHS&S Contractors
600T216-54	KHS&S Contractors
600T216-43	KHS&S Contractors
600T216-33	KHS&S Contractors
362DT216-43	KHS&S Contractors
400DT250-54	KHS&S Contractors
400DT250-43	KHS&S Contractors
600DT216-43	KHS&S Contractors
600DT216-54	KHS&S Contractors
362S162-54	Z Modular
362S162-43	Z Modular
362S162-33	Z Modular
362S162-27	Z Modular
400S162-54	Z Modular
400S162-43	Z Modular
400S162-33	Z Modular
400S162-27	Z Modular
550S162-54	Z Modular
550S162-43	Z Modular
550S162-33	Z Modular
550S162-27	Z Modular
600S162-54	Z Modular
600S162-43	Z Modular
600S162-33	Z Modular
600S162-27	Z Modular
800S162-54	Z Modular
800S162-43	Z Modular
800S162-33	Z Modular
362T212-54	Z Modular
362T212-43	Z Modular
362T212-33	Z Modular
400T212-54	Z Modular
400T212-43	Z Modular
400T212-33	Z Modular

Table is continued. Footnotes are provided after Table.

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**Table 9: List of Approved Products per Listee (continued)<sup>1</sup>**

Designation	Listee
550T212-54	Z Modular
550T212-43	Z Modular
550T212-33	Z Modular
600T212-54	Z Modular
600T212-43	Z Modular
600T212-33	Z Modular
800T212-54	Z Modular
800T212-43	Z Modular
800T212-33	Z Modular
362DT212-54	Z Modular
362DT212-43	Z Modular
362DT212-33	Z Modular
400DT212-54	Z Modular
400DT212-43	Z Modular
400DT212-33	Z Modular
550DT212-54	Z Modular
550DT212-43	Z Modular
550DT212-33	Z Modular
600DT212-54	Z Modular
600DT212-43	Z Modular
600DT212-33	Z Modular
800DT212-54	Z Modular
800DT212-43	Z Modular
800DT212-33	Z Modular

<sup>1</sup> Table defines which products are approved to be manufactured from each Listee.



**Figure 2: Howick Frama 5600 Roll-Forming Machine**

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