

ICC-ES Evaluation Report

ESR-4540

Reissued September 2025


This report also contains:

- [CA Supplement](#)

Subject to renewal September 2026

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<p>DIVISION: 05 00 00 - METALS</p> <p>Section: 05 40 00—Cold-Formed Metal Framing</p> <p>Section: 05 41 00—Structural Metal Stud Framing</p> <p>DIVISION: 09 00 00 - FINISHES</p> <p>Section: 09 22 16.13—Non-Structural Metal Stud Framing</p>	<p>REPORT HOLDER:</p> <p>HI-TECH BUILDING SOLUTION INC.</p> <p>ADDITIONAL LISTEE:</p> <p>XIAMEN DAHE PEB CONSTRUCTION TECHNOLOGY CO., LTD.</p>	<p>EVALUATION SUBJECT:</p> <p>COLD-FORMED STEEL FRAMING MEMBERS</p>	
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1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2024, 2021, 2018, 2015 and 2012 [International Building Code® \(IBC\)](#)

Property evaluated:

- Structural

2.0 USES

Members with a minimum G60 (Z180) or AZ50 (AZM150) coating may be used as structural members as defined by the North American Standard for Cold-Formed Steel Structural Framing (AISI S240).

Members with a minimum G40 (Z120) coating may be used as nonstructural members as defined by the North American Standard for Cold-Formed Steel Framing – Nonstructural Members (AISI S220).

3.0 DESCRIPTION

The Cold-Formed Steel Framing Members are divided into three categories: C-shaped structural studs, C-shaped nonstructural studs, and U-shaped tracks. The members are made from materials complying with Section A3.2 of AISI S100. The materials are:

- GB/T 700 Standard, Grade Q235 steel with minimum yield strength of 34 ksi (235 MPa), minimum ultimate tensile strength of 54 ksi (370 MPa), and minimum elongation of 26 percent.
- GB/T 1591 Standard, Grade Q345 with minimum yield strength of 50 ksi (345 MPa), minimum ultimate tensile strength of 68 ksi (470 MPa), and minimum elongation of 21 percent.
- GB/T 2518 Standard, Grade S350GD with minimum yield strength of 51 ksi (350 MPa), minimum ultimate tensile strength of 61 ksi (420 MPa), and minimum elongation of 16 percent.

The minimum galvanized coating is G40 for nonstructural members and G60 or AZ50 for structural members. The C-shaped studs are manufactured with and without web punch-outs. Punch-outs are a maximum of 1.5 inches (38 mm) wide by 4 inches (102 mm) long for members with depth greater than 2.5 inches (64 mm) and a maximum of ³/₄-inch-wide (19 mm) by 4 inches long (102 mm) for members with 2.5-inch-depth (64 mm) and smaller. When provided, punch-outs are located along the center line of the webs of the members with a minimum center-to-center spacing of 24 inches (610 mm). The minimum distance between the end of the stud and the near edge of the web punch-outs is 10 inches (254 mm). Dimensional properties are provided in [Tables 1A](#), [1B](#), and [2](#) along with [Figures 1](#) and [2](#) for studs and tracks.

4.0 DESIGN AND INSTALLATION

4.1 General:

The Cold-Formed Steel Framing Members and their connections must be designed and installed in accordance with IBC Section 2210 using the section properties referenced in Section 3.

4.2 Design:

The section properties and allowable moments, M_a , indicated in [Tables 3A](#), [3B](#), and [4](#) are for structural studs without punch-outs, nonstructural studs without punch-outs, and track members, respectively. All values have been determined in accordance with the North American Specification for Design of Cold-formed Steel Structural Members [AISI S100-16 (2020) / S2-20 for the 2024 and 2021 IBC, AISI S100-16 for the 2018 IBC, AISI S100-12 for the 2015 IBC, and AISI S100-07 / S2-10 for the 2012 IBC]. The allowable moments, M_a , are for use with Allowable Strength Design (ASD) and are for flexural members installed with the compression flange continuously braced. For other conditions of compression flange bracing, the allowable moment must be determined in accordance with AISI S100. The design of members must address web crippling, combined bending and web crippling, and combined bending and shear, as applicable, in accordance with the AISI S100.

4.3 Installation:

The Cold-Formed Steel Framing Members must be installed in accordance with the applicable code, the approved plans, and this report. If there is a conflict between the plans submitted for approval and this report, this report governs. The approved plans must be available at the jobsite at all times.

5.0 CONDITIONS OF USE:

The Cold-Formed Steel Framing Members described in this report complies with, or is a suitable alternative to what is specified in those codes listed in Section 1.0 of this report, subject to the following conditions:

- 5.1 The Cold-Formed Steel Framing Members must be installed in accordance with the applicable code, the approved plans, and this report.
- 5.2 Minimum uncoated base-metal thickness of the framing members as delivered to the jobsite must be at least 95 percent of the design base-metal thickness (design base-metal thickness) noted in [Tables 1A](#), [1B](#), and [2](#).
- 5.3 Complete plans and calculations verifying compliance with this report must be submitted to the code official for each project at the time of permit application. The calculations and drawings must be prepared and sealed by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.
- 5.4 Effective section properties and allowable capacities, except V_{anet} , of Studs with punch-outs are outside the scope of this evaluation report.
- 5.5 The Cold-Formed Steel Framing Members are manufactured in Fujian, China under an approved quality control program by ICC-ES.

6.0 EVIDENCE SUBMITTED

Data in accordance with the [ICC-ES Acceptance Criteria for Cold-formed Steel Framing Members \(AC46\)](#), dated October 2024.

7.0 IDENTIFICATION

- 7.1 At a spacing not exceeding 96 inches (2440 mm) on center, each cold-formed steel member recognized in this report must be stamped with the report holder's name (ACSFA) or the additional listee; the section identification as described in [Tables 1](#) through [4](#) of this evaluation report; the acronym "ICC-ES"; the evaluation report number (ESR-4540); the minimum uncoated base-metal thickness in mils or decimal inches; the minimum yield strength; and the coating grade [at least G40 (Z120) for nonstructural members and at least G60 (Z180) or AZ50 (AZM150) for structural members.

7.2 The report holder's contact information is the following:

**HI-TECH BUILDING SOLUTION INC.
309 RICHARD JACKSON BOULEVARD SUITE 210
PANAMA CITY BEACH, FL 32407
+86 136 6608 2931
hyk531@163.com**

7.3 The additional listee's contact information is the following:

**XIAMEN DAHE PEB CONSTRUCTION TECHNOLOGY CO., LTD.
585 TIESHAN ROAD, A2
XIAGONG MACHINERY PARK,
JIMEI DISTRICT
XIAMEN, FUJIAN 361023
CHINA
+86 18060991280
linda@dahezb.com
www.dahezbforming.com**

Definitions of symbols for use with Tables 1 through 4:

F_y : Yield Strength
 L_u : Critical Unbraced Length for lateral-torsional buckling. Members are considered fully braced when unbraced length is less than L_u .
 K_ϕ : Distortional buckling moment (M_{ad}) is calculated without the beneficial effect of sheathing to rotational stiffness, $K_\phi = 0$.

Gross Properties

A_r : The cross-sectional area of the full unreduced cross-section of the studs, away from the punch-outs.
 Weight: The weight per foot of the full unreduced cross-section of the studs, away from the punch-outs.
 I_x : Moment of inertia of the gross section about the strong axis (X-X).
 R_x : Radius of gyration of the gross section about the X-X axis.
 S_x : Gross section-modulus about the strong axis (X-X).
 I_y : Moment of inertia of the gross section about the weak axis (Y-Y).
 R_y : Radius of gyration of the gross section about the Y-Y axis.
 t : Design base metal thickness.

Effective Properties

I_{ex} : Effective moment of inertia about the strong axis (X-X).
 S_{ex} : Effective section-modulus about the strong axis (X-X).
 M_{al} : Allowable bending moment based on local buckling.
 M_{ad} : Allowable bending moment based on distortional buckling, assuming $K_\phi = 0$.
 V_{ag} : Allowable strong axis shear away from punch-out.
 V_{anet} : Allowable strong axis shear at punch-out.

Torsional Properties

J : St. Venant torsional constant.
 C_w : Torsional warping constant.
 m : Distance from shear center to mid-plane of web.
 X_o : Distance from the shear center to the centroid along the principal X-axis.
 R_o : Polar radius of gyration about the centroidal principal axis.
 β : Torsional flexural constant: $1 - (X_o/R_o)^2$

TABLE 1A—STRUCTURAL C-SHAPE STUD SECTIONS⁶

SECTION	DEPTH ⁴ (in)	FLANGE (in)	LIP (in)	DESIGN THICK., t ⁵ (in)	SECTION	DEPTH ⁴ (in)	FLANGE (in)	LIP (in)	DESIGN THICK., t ⁵ (in)
250S137-33	2.5	1.375	0.375	0.0346	362S150-27	3.625	1.5	0.375	0.0283
250S137-43	2.5	1.375	0.375	0.0451	362S150-30	3.625	1.5	0.375	0.0312
250S137-54	2.5	1.375	0.375	0.0566	362S162-18	3.625	1.625	0.5	0.0188
250S137-68	2.5	1.375	0.375	0.0713	362S162-27	3.625	1.625	0.5	0.0283
250S137-97	2.5	1.375	0.375	0.1017	362S162-30	3.625	1.625	0.5	0.0312
250S162-33	2.5	1.625	0.5	0.0346	362S162-33	3.625	1.625	0.5	0.0346
250S162-43	2.5	1.625	0.5	0.0451	362S162-43	3.625	1.625	0.5	0.0451
250S162-54	2.5	1.625	0.5	0.0566	362S162-54	3.625	1.625	0.5	0.0566
250S162-68	2.5	1.625	0.5	0.0713	362S162-68	3.625	1.625	0.5	0.0713
250S162-97	2.5	1.625	0.5	0.1017	362S162-97	3.625	1.625	0.5	0.1017
250S200-33	2.5	2	0.625	0.0346	362S200-18 ³	3.625	2	0.625	0.0188
250S200-43	2.5	2	0.625	0.0451	362S200-27	3.625	2	0.625	0.0283
250S200-54	2.5	2	0.625	0.0566	362S200-30	3.625	2	0.625	0.0312
250S200-68	2.5	2	0.625	0.0713	362S200-33	3.625	2	0.625	0.0346
250S200-97	2.5	2	0.625	0.1017	362S200-43	3.625	2	0.625	0.0451
250S250-43	2.5	2.5	0.625	0.0451	362S200-54	3.625	2	0.625	0.0566
250S250-54	2.5	2.5	0.625	0.0566	362S200-68	3.625	2	0.625	0.0713
250S250-68	2.5	2.5	0.625	0.0713	362S200-97	3.625	2	0.625	0.1017
250S250-97	2.5	2.5	0.625	0.1017	400S150-18 ¹	4	1.5	0.375	0.0188
300S137-33	3	1.375	0.375	0.0346	400S150-27	4	1.5	0.375	0.0283
300S137-43	3	1.375	0.375	0.0451	400S150-30	4	1.5	0.375	0.0312
300S137-54	3	1.375	0.375	0.0566	400S137-33	4	1.375	0.375	0.0346
300S137-68	3	1.375	0.375	0.0713	400S137-43	4	1.375	0.375	0.0451
300S137-97	3	1.375	0.375	0.1017	400S137-54	4	1.375	0.375	0.0566
300S162-33	3	1.625	0.5	0.0346	400S137-68	4	1.375	0.375	0.0713
300S162-43	3	1.625	0.5	0.0451	400S137-97	4	1.375	0.375	0.1017
300S162-54	3	1.625	0.5	0.0566	400S162-18 ¹	4	1.625	0.5	0.0188
300S162-68	3	1.625	0.5	0.0713	400S162-27	4	1.625	0.5	0.0283
300S162-97	3	1.625	0.5	0.1017	400S162-30	4	1.625	0.5	0.0312
300S200-33	3	2	0.625	0.0346	400S162-33	4	1.625	0.5	0.0346
300S200-43	3	2	0.625	0.0451	400S162-43	4	1.625	0.5	0.0451
300S200-54	3	2	0.625	0.0566	400S162-54	4	1.625	0.5	0.0566
300S200-68	3	2	0.625	0.0713	400S162-68	4	1.625	0.5	0.0713
300S200-97	3	2	0.625	0.1017	400S162-97	4	1.625	0.5	0.1017
350S137-33	3.5	1.375	0.375	0.0346	400S200-18 ³	4	2	0.625	0.0188
350S137-43	3.5	1.375	0.375	0.0451	400S200-27	4	2	0.625	0.0283
350S137-54	3.5	1.375	0.375	0.0566	400S200-30	4	2	0.625	0.0312
350S137-68	3.5	1.375	0.375	0.0713	400S200-33	4	2	0.625	0.0346
350S137-97	3.5	1.375	0.375	0.1017	400S200-43	4	2	0.625	0.0451
350S162-27	3.5	1.625	0.5	0.0346	400S200-54	4	2	0.625	0.0566
350S162-43	3.5	1.625	0.5	0.0451	400S200-68	4	2	0.625	0.0713
350S162-54	3.5	1.625	0.5	0.0566	400S200-97	4	2	0.625	0.1017
350S162-68	3.5	1.625	0.5	0.0713	550S137-33	5.5	1.375	0.375	0.0346
350S162-97	3.5	1.625	0.5	0.1017	550S137-43	5.5	1.375	0.375	0.0451
350S200-33	3.5	2	0.625	0.0346	550S137-54	5.5	1.375	0.375	0.0566
350S200-43	3.5	2	0.625	0.0451	550S137-68	5.5	1.375	0.375	0.0713
350S200-54	3.5	2	0.625	0.0566	550S137-97	5.5	1.375	0.375	0.1017
350S200-68	3.5	2	0.625	0.0713	550S162-33	5.5	1.625	0.5	0.0346
350S200-97	3.5	2	0.625	0.1017	550S162-43	5.5	1.625	0.5	0.0451
350S250-43	3.5	2.5	0.625	0.0451	550S162-54	5.5	1.625	0.5	0.0566
350S250-54	3.5	2.5	0.625	0.0566	550S162-68	5.5	1.625	0.5	0.0713
350S250-68	3.5	2.5	0.625	0.0713	550S162-97	5.5	1.625	0.5	0.1017
350S250-97	3.5	2.5	0.625	0.1017	550S200-33	5.5	2	0.625	0.0346
362S137-33	3.625	1.375	0.375	0.0346	550S200-43	5.5	2	0.625	0.0451
362S137-43	3.625	1.375	0.375	0.0451	550S200-54	5.5	2	0.625	0.0566
362S137-54	3.625	1.375	0.375	0.0566	550S200-68	5.5	2	0.625	0.0713
362S137-68	3.625	1.375	0.375	0.0713	550S200-97	5.5	2	0.625	0.1017
362S137-97	3.625	1.375	0.375	0.1017	600S137-33	6	1.375	0.375	0.0346
362S150-18	3.625	1.5	0.375	0.0188	600S137-43	6	1.375	0.375	0.0451

(Continued)

TABLE 1A—STRUCTURAL C-SHAPE STUD SECTIONS⁶ (CONTINUED)

SECTION	DEPTH ⁴ (in)	FLANGE (in)	LIP (in)	DESIGN THICK. ⁵ (in)	SECTION	DEPTH ⁴ (in)	FLANGE (in)	LIP (in)	DESIGN THICK. ⁵ (in)
600S137-54	6	1.375	0.375	0.0566	800S200-33 ¹	8	2	0.625	0.0346
600S137-68	6	1.375	0.375	0.0713	800S200-43	8	2	0.625	0.0451
600S137-97	6	1.375	0.375	0.1017	800S200-54	8	2	0.625	0.0566
600S137-118	6	1.375	0.375	0.1242	800S200-68	8	2	0.625	0.0713
600S150-18 ²	6	1.5	0.375	0.0188	800S200-97	8	2	0.625	0.1017
600S150-27 ¹	6	1.5	0.375	0.0283	800S200-118	8	2	0.625	0.1242
600S150-30	6	1.5	0.375	0.0312	1000S162-43 ¹	10	1.625	0.5	0.0451
600S162-18 ²	6	1.625	0.5	0.0188	1000S162-54	10	1.625	0.5	0.0566
600S162-27 ¹	6	1.625	0.5	0.0283	1000S162-68	10	1.625	0.5	0.0713
600S162-30	6	1.625	0.5	0.0312	1000S162-97	10	1.625	0.5	0.1017
600S162-33	6	1.625	0.5	0.0346	1000S162-118	10	1.625	0.5	0.1242
600S162-43	6	1.625	0.5	0.0451	1000S200-43 ¹	10	2	0.625	0.0451
600S162-54	6	1.625	0.5	0.0566	1000S200-54	10	2	0.625	0.0566
600S162-68	6	1.625	0.5	0.0713	1000S200-68	10	2	0.625	0.0713
600S162-97	6	1.625	0.5	0.1017	1000S200-97	10	2	0.625	0.1017
600S162-118	6	1.625	0.5	0.1242	1000S200-118	10	2	0.625	0.1242
600S200-18 ²	6	2	0.625	0.0188	1200S162-54 ¹	12	1.625	0.5	0.0566
600S200-27 ¹	6	2	0.625	0.0283	1200S162-68	12	1.625	0.5	0.0713
600S200-30	6	2	0.625	0.0312	1200S162-97	12	1.625	0.5	0.1017
600S200-33	6	2	0.625	0.0346	1200S162-118	12	1.625	0.5	0.1242
600S200-43	6	2	0.625	0.0451	1200S200-54 ¹	12	2	0.625	0.0566
600S200-54	6	2	0.625	0.0566	1200S200-68	12	2	0.625	0.0713
600S200-68	6	2	0.625	0.0713	1200S200-97	12	2	0.625	0.1017
600S200-97	6	2	0.625	0.1017	1200S200-118	12	2	0.625	0.1242
600S200-118	6	2	0.625	0.1242	1400S162-54 ¹	14	1.625	0.5	0.0566
800S137-33 ¹	8	1.375	0.375	0.0346	1400S162-68	14	1.625	0.5	0.0713
800S137-43	8	1.375	0.375	0.0451	1400S162-97	14	1.625	0.5	0.1017
800S137-54	8	1.375	0.375	0.0566	1400S162-118	14	1.625	0.5	0.1242
800S137-68	8	1.375	0.375	0.0713	1400S200-54 ¹	14	2	0.625	0.0566
800S137-97	8	1.375	0.375	0.1017	1400S200-68	14	2	0.625	0.0713
800S137-118	8	1.375	0.375	0.1242	1400S200-97	14	2	0.625	0.1017
800S162-33 ¹	8	1.625	0.5	0.0346	1400S200-118	14	2	0.625	0.1242
800S162-43	8	1.625	0.5	0.0451	1400S250-54 ¹	14	2.5	0.625	0.0566
800S162-54	8	1.625	0.5	0.0566	1400S250-68	14	2.5	0.625	0.0713
800S162-68	8	1.625	0.5	0.0713	1400S250-97	14	2.5	0.625	0.1017
800S162-97	8	1.625	0.5	0.1017	1400S250-118	14	2.5	0.625	0.1242
800S162-118	8	1.625	0.5	0.1242					

For SI: 1 inch = 25.4 mm.

¹Web height-to-thickness ratio, h/t, exceeds 200 but is less than 260. Web must have bearing stiffeners at all support points and concentrated loads in accordance with AISI S100. No holes or punch-outs are permitted in the web at these locations.

²Web height-to-thickness ratio, h/t, exceeds 300. Allowable design values are outside the scope of this evaluation report and may be determined in accordance with Section B4.2 of AISI S100.

³Flange width-to-thickness ratio, b/t, exceeds 90 but is less than 160. Allowable design values are outside the scope of this evaluation report and may be determined by the direct strength method as indicated by AISI S100, Table B4.1-1.

⁴Depth measured from outside face to outside face of flanges.

⁵Members delivered to the jobsite must be a minimum of 95 percent of the design thickness.

⁶The inside corner radius for all members is 0.0787 inches (2 mm).

TABLE 1B—NONSTRUCTURAL C-SHAPE STUD SECTIONS⁶

SECTION	DEPTH ⁴ (in)	FLANGE (in)	LIP (in)	DESIGN THICK. ⁵ (in)	SECTION	DEPTH ⁴ (in)	FLANGE (in)	LIP (in)	DESIGN THICK. ⁵ (in)
162S125-18	1.625	1.25	0.188	0.0188	362S125-43	3.625	1.25	0.188	0.0451
162S125-27	1.625	1.25	0.188	0.0283	362S125-54	3.625	1.25	0.188	0.0566
162S125-30	1.625	1.25	0.188	0.0312	362S125-68	3.625	1.25	0.188	0.0713
162S125-33	1.625	1.25	0.188	0.0346	400S125-18 ¹	4	1.25	0.188	0.0188
250S125-18	2.5	1.25	0.188	0.0188	400S125-27	4	1.25	0.188	0.0283
250S125-27	2.5	1.25	0.188	0.0283	400S125-30	4	1.25	0.188	0.0312
250S125-30	2.5	1.25	0.188	0.0312	400S125-33	4	1.25	0.188	0.0346
250S125-33	2.5	1.25	0.188	0.0346	400S125-43	4	1.25	0.188	0.0451
250S125-43	2.5	1.25	0.188	0.0451	400S125-54	4	1.25	0.188	0.0566
250S125-54	2.5	1.25	0.188	0.0566	400S125-68	4	1.25	0.188	0.0713
250S125-68	2.5	1.25	0.188	0.0713	550S125-18 ²	5.5	1.25	0.188	0.0188
300S125-18	3	1.25	0.188	0.0188	550S125-27	5.5	1.25	0.188	0.0283
300S125-27	3	1.25	0.188	0.0283	550S125-30	5.5	1.25	0.188	0.0312
300S125-30	3	1.25	0.188	0.0312	550S125-33	5.5	1.25	0.188	0.0346
300S125-33	3	1.25	0.188	0.0346	550S125-43	5.5	1.25	0.188	0.0451
300S125-43	3	1.25	0.188	0.0451	550S125-54	5.5	1.25	0.188	0.0566
300S125-54	3	1.25	0.188	0.0566	550S125-68	5.5	1.25	0.188	0.0713
300S125-68	3	1.25	0.188	0.0713	600S125-18 ³	6	1.25	0.188	0.0188
350S125-18	3.5	1.25	0.188	0.0188	600S125-27 ¹	6	1.25	0.188	0.0283
350S125-27	3.5	1.25	0.188	0.0283	600S125-30	6	1.25	0.188	0.0312
350S125-30	3.5	1.25	0.188	0.0312	600S125-33	6	1.25	0.188	0.0346
350S125-33	3.5	1.25	0.188	0.0346	600S125-43	6	1.25	0.188	0.0451
350S125-43	3.5	1.25	0.188	0.0451	600S125-54	6	1.25	0.188	0.0566
350S125-54	3.5	1.25	0.188	0.0566	600S125-68	6	1.25	0.188	0.0713
350S125-68	3.5	1.25	0.188	0.0713	800S125-33 ¹	8	1.25	0.188	0.0346
362S125-18	3.625	1.25	0.188	0.0188	800S125-43	8	1.25	0.188	0.0451
362S125-27	3.625	1.25	0.188	0.0283	800S125-54	8	1.25	0.188	0.0566
362S125-30	3.625	1.25	0.188	0.0312	800S125-68	8	1.25	0.188	0.0713
362S125-33	3.625	1.25	0.188	0.0346					

For SI: 1 inch = 25.4 mm.

¹Web height-to-thickness ratio, h/t, exceeds 200 but is less than 260. Web must have bearing stiffeners at all support points and concentrated loads in accordance with AISI S100. No holes or punch-outs are permitted in the web at these locations.

²Web height-to-thickness ratio, h/t, exceeds 260 but is less than 300. Bearing and intermediate stiffeners must be provided in accordance with AISI S100.

³Web height-to-thickness ratio, h/t, exceeds 300. Allowable design values are outside the scope of this evaluation report and may be determined in accordance with Section B4.2 of AISI S100.

⁴Depth measured from outside face to outside face of flanges.

⁵Members delivered to the jobsite must be a minimum of 95 percent of the design thickness.

⁶The inside corner radius for all members is 0.0787 inches (2 mm).

TABLE 2—U-SHAPE TRACK SECTIONS⁵

SECTION	DEPTH ³ (in)	FLANGE (in)	DESIGN THICK. ⁴ (in)	SECTION	DEPTH ³ (in)	FLANGE (in)	DESIGN THICK. ⁴ (in)	SECTION	DEPTH ³ (in)	FLANGE (in)	DESIGN THICK. ⁴ (in)
162T125-18 ²	1.741	1.25	0.0188	250T200-68	2.721	2	0.0713	350T125-18 ²	3.616	1.25	0.0188
162T125-27	1.760	1.25	0.0283	250T200-97	2.782	2	0.1017	350T125-27	3.635	1.25	0.0283
162T125-30	1.766	1.25	0.0312	300T125-18 ²	3.116	1.25	0.0188	350T125-30	3.641	1.25	0.0312
162T125-33	1.773	1.25	0.0346	300T125-27	3.135	1.25	0.0283	350T125-33	3.648	1.25	0.0346
250T125-18 ²	2.616	1.25	0.0188	300T125-30	3.141	1.25	0.0312	350T125-43	3.669	1.25	0.0451
250T125-27	2.635	1.25	0.0283	300T125-33	3.148	1.25	0.0346	350T125-54	3.692	1.25	0.0566
250T125-30	2.641	1.25	0.0312	300T125-43	3.169	1.25	0.0451	350T125-68	3.721	1.25	0.0713
250T125-33	2.648	1.25	0.0346	300T125-54	3.192	1.25	0.0566	350T125-97	3.782	1.25	0.1017
250T125-43	2.669	1.25	0.0451	300T125-68	3.221	1.25	0.0713	350T150-27	3.635	1.5	0.0283
250T125-54	2.692	1.25	0.0566	300T125-97	3.282	1.25	0.1017	350T150-30	3.641	1.5	0.0312
250T125-68	2.721	1.25	0.0713	300T150-27	3.135	1.5	0.0283	350T150-33	3.648	1.5	0.0346
250T125-97	2.782	1.25	0.1017	300T150-30	3.141	1.5	0.0312	350T150-43	3.669	1.5	0.0451
250T150-27	2.635	1.5	0.0283	300T150-33	3.148	1.5	0.0346	350T150-54	3.692	1.5	0.0566
250T150-30	2.641	1.5	0.0312	300T150-43	3.169	1.5	0.0451	350T150-68	3.721	1.5	0.0713
250T150-33	2.648	1.5	0.0346	300T150-54	3.192	1.5	0.0566	350T150-97	3.782	1.5	0.1017
250T150-43	2.669	1.5	0.0451	300T150-68	3.221	1.5	0.0713	350T162-33	3.648	1.625	0.0346
250T150-54	2.692	1.5	0.0566	300T150-97	3.282	1.5	0.1017	350T162-43	3.669	1.625	0.0451
250T150-68	2.721	1.5	0.0713	300T200-33	3.148	2	0.0346	350T162-54	3.692	1.625	0.0566
250T150-97	2.782	1.5	0.1017	300T200-43	3.169	2	0.0451	350T162-68	3.721	1.625	0.0713
250T200-33	2.648	2	0.0346	300T200-54	3.192	2	0.0566	350T200-33	3.648	2	0.0346
250T200-43	2.669	2	0.0451	300T200-68	3.221	2	0.0713	350T200-43	3.669	2	0.0451
250T200-54	2.692	2	0.0566	300T200-97	3.282	2	0.1017	350T200-54	3.692	2	0.0566

(Continued)

TABLE 2—U-SHAPE TRACK SECTIONS⁵ (CONTINUED)

SECTION	DEPTH ³ (in)	FLANGE (in)	DESIGN THICK. ⁴ (in)	SECTION	DEPTH ³ (in)	FLANGE (in)	DESIGN THICK. ⁴ (in)	SECTION	DEPTH ³ (in)	FLANGE (in)	DESIGN THICK. ⁴ (in)
350T200-68	3.721	2	0.0713	550T125-68	5.721	1.25	0.0713	800T200-68	8.221	2	0.0713
350T200-97	3.782	2	0.1017	550T125-97	5.782	1.25	0.1017	800T200-97	8.282	2	0.1017
362T125-18 ²	3.741	1.25	0.0188	550T150-27	5.635	1.5	0.0283	800T200-118	8.327	2	0.1242
362T125-27	3.760	1.25	0.0283	550T150-30	5.641	1.5	0.0312	1000T125-43 ¹	10.169	1.25	0.0451
362T125-30	3.766	1.25	0.0312	550T150-33	5.648	1.5	0.0346	1000T125-54	10.192	1.25	0.0566
362T125-33	3.773	1.25	0.0346	550T150-43	5.669	1.5	0.0451	1000T125-68	10.221	1.25	0.0713
362T125-43	3.794	1.25	0.0451	550T150-54	5.692	1.5	0.0566	1000T125-97	10.282	1.25	0.1017
362T125-54	3.817	1.25	0.0566	550T150-68	5.721	1.5	0.0713	1000T125-118	10.327	1.25	0.1242
362T125-68	3.846	1.25	0.0713	550T150-97	5.782	1.5	0.1017	1000T150-43 ¹	10.169	1.5	0.0451
362T125-97	3.907	1.25	0.1017	550T200-33	5.648	2	0.0346	1000T150-54	10.192	1.5	0.0566
362T150-18 ²	3.741	1.5	0.0188	550T200-43	5.669	2	0.0451	1000T150-68	10.221	1.5	0.0713
362T150-27	3.760	1.5	0.0283	550T200-54	5.692	2	0.0566	1000T150-97	10.282	1.5	0.1017
362T150-30	3.766	1.5	0.0312	550T200-68	5.721	2	0.0713	1000T150-118	10.327	1.5	0.1242
362T150-33	3.773	1.5	0.0346	550T200-97	5.782	2	0.1017	1000T200-43 ¹	10.169	2	0.0451
362T150-43	3.794	1.5	0.0451	600T125-18 ²	6.116	1.25	0.0188	1000T200-54	10.192	2	0.0566
362T150-54	3.817	1.5	0.0566	600T125-27 ¹	6.135	1.25	0.0283	1000T200-68	10.221	2	0.0713
362T150-68	3.846	1.5	0.0713	600T125-30	6.141	1.25	0.0312	1000T200-97	10.282	2	0.1017
362T150-97	3.907	1.5	0.1017	600T125-33	6.148	1.25	0.0346	1000T200-118	10.327	2	0.1242
362T200-18 ²	3.741	2	0.0188	600T125-43	6.169	1.25	0.0451	1000T250-43 ¹	10.169	2.5	0.0451
362T200-27 ²	3.760	2	0.0283	600T125-54	6.192	1.25	0.0566	1000T250-54	10.192	2.5	0.0566
362T200-30 ²	3.766	2	0.0312	600T125-68	6.221	1.25	0.0713	1000T250-68	10.221	2.5	0.0713
362T200-33	3.773	2	0.0346	600T125-97	6.282	1.25	0.1017	1000T250-97	10.282	2.5	0.1017
362T200-43	3.794	2	0.0451	600T125-118	6.327	1.25	0.1242	1000T250-118	10.327	2.5	0.1242
362T200-54	3.817	2	0.0566	600T150-18 ²	6.116	1.5	0.0188	1200T125-54 ¹	12.192	1.25	0.0566
362T200-68	3.846	2	0.0713	600T150-27 ¹	6.135	1.5	0.0283	1200T125-68	12.221	1.25	0.0713
362T200-97	3.907	2	0.1017	600T150-30	6.141	1.5	0.0312	1200T125-97	12.282	1.25	0.1017
400T125-18 ²	4.116	1.25	0.0188	600T150-33	6.148	1.5	0.0346	1200T125-118	12.327	1.25	0.1242
400T125-27	4.135	1.25	0.0283	600T150-43	6.169	1.5	0.0451	1200T150-54 ¹	12.192	1.5	0.0566
400T125-30	4.141	1.25	0.0312	600T150-54	6.192	1.5	0.0566	1200T150-68	12.221	1.5	0.0713
400T125-33	4.148	1.25	0.0346	600T150-68	6.221	1.5	0.0713	1200T150-97	12.282	1.5	0.1017
400T125-43	4.169	1.25	0.0451	600T150-97	6.282	1.5	0.1017	1200T150-118	12.327	1.5	0.1242
400T125-54	4.192	1.25	0.0566	600T150-118	6.327	1.5	0.1242	1200T200-54 ¹	12.192	2	0.0566
400T125-68	4.221	1.25	0.0713	600T200-18 ²	6.116	2	0.0188	1200T200-68	12.221	2	0.0713
400T125-97	4.282	1.25	0.1017	600T200-27 ²	6.135	2	0.0283	1200T200-97	12.282	2	0.1017
400T150-18 ²	4.116	1.5	0.0188	600T200-30 ²	6.141	2	0.0312	1200T200-118	12.327	2	0.1242
400T150-27	4.135	1.5	0.0283	600T200-33	6.148	2	0.0346	1200T250-54 ¹	12.192	2.5	0.0566
400T150-30	4.141	1.5	0.0312	600T200-43	6.169	2	0.0451	1200T250-68	12.221	2.5	0.0713
400T150-33	4.148	1.5	0.0346	600T200-54	6.192	2	0.0566	1200T250-97	12.282	2.5	0.1017
400T150-43	4.169	1.5	0.0451	600T200-68	6.221	2	0.0713	1200T250-118	12.327	2.5	0.1242
400T150-54	4.192	1.5	0.0566	600T200-97	6.282	2	0.1017	1400T125-54 ¹	14.192	1.25	0.0566
400T150-68	4.221	1.5	0.0713	600T200-118	6.327	2	0.1242	1400T125-68	14.221	1.25	0.0713
400T150-97	4.282	1.5	0.1017	800T125-33 ¹	8.148	1.25	0.0346	1400T125-97	14.282	1.25	0.1017
400T200-18 ²	4.116	2	0.0188	800T125-43	8.169	1.25	0.0451	1400T125-118	14.327	1.25	0.1242
400T200-27 ²	4.135	2	0.0283	800T125-54	8.192	1.25	0.0566	1400T150-54 ¹	14.192	1.5	0.0566
400T200-30 ²	4.141	2	0.0312	800T125-68	8.221	1.25	0.0713	1400T150-68	14.221	1.5	0.0713
400T200-33	4.148	2	0.0346	800T125-97	8.282	1.25	0.1017	1400T150-97	14.282	1.5	0.1017
400T200-43	4.169	2	0.0451	800T125-118	8.327	1.25	0.1242	1400T150-118	14.327	1.5	0.1242
400T200-54	4.192	2	0.0566	800T150-33 ¹	8.148	1.5	0.0346	1400T200-54 ¹	14.192	2	0.0566
400T200-68	4.221	2	0.0713	800T150-43	8.169	1.5	0.0451	1400T200-68	14.221	2	0.0713
400T200-97	4.282	2	0.1017	800T150-54	8.192	1.5	0.0566	1400T200-97	14.282	2	0.1017
550T125-18 ²	5.616	1.25	0.0188	800T150-68	8.221	1.5	0.0713	1400T200-118	14.327	2	0.1242
550T125-27	5.635	1.25	0.0283	800T150-97	8.282	1.5	0.1017	1400T250-54 ¹	14.192	2.5	0.0566
550T125-30	5.641	1.25	0.0312	800T150-118	8.327	1.5	0.1242	1400T250-68	14.221	2.5	0.0713
550T125-33	5.648	1.25	0.0346	800T200-33 ¹	8.148	2	0.0346	1400T250-97	14.282	2.5	0.1017
550T125-43	5.669	1.25	0.0451	800T200-43	8.169	2	0.0451	1400T250-118	14.327	2.5	0.1242
550T125-54	5.692	1.25	0.0566	800T200-54	8.192	2	0.0566				

For S1: 1 inch = 25.4 mm.

¹Web height-to-thickness ratio, h/t, exceeds 200 but is less than 260. Web must have bearing stiffeners at all support points and concentrated loads in accordance with AISI S100.
²Web height-to-thickness ratio, h/t, exceeds 300 or flange width-to-thickness ratio, b/t, exceeds 60. Allowable design values are outside the scope of this evaluation report and may be determined in accordance with Section B4.2 of AISI S100.
³Depth measured from outside face to outside face of flanges.
⁴Delivered members to the jobsite must be a minimum of 95 percent of the design thickness.
⁵The inside corner radius for all members is 0.0787 inches (2 mm).

TABLE 3A—STRUCTURAL C-SHAPE STUD SECTION PROPERTIES⁴

Section	F _y ⁶ (ksi)	Gross Properties							Effective Properties						Torsional Properties					L _u (in)	
		A _r	Wt.	I _x	S _x	R _x	I _y	R _y	I _{ex} ⁵	S _{ex}	M _{al}	M _{ad}	V _{ag}	V _{anet}	x1000	C _w	X _o	m	R _o		β
		(in ²)	(lb/ft)	(in ⁴)	(in ³)	(in)	(in ⁴)	(in)	(in ⁴)	(in ³)	(in-k)	(in-k)	(lb)	(lb)	(in ⁴)	(in ⁶)	(in)	(in)	(in)		(in)
250S137-33	33	0.197	0.67	0.203	0.162	1.015	0.052	0.515	0.200	0.157	3.11	3.09	973	397	0.079	0.076	-1.141	0.677	1.612	0.499	35.6
250S137-43	33	0.255	0.87	0.260	0.208	1.010	0.066	0.510	0.260	0.208	4.10	4.11	1257	388	0.173	0.096	-1.129	0.670	1.598	0.501	35.6
250S137-54	33	0.316	1.08	0.319	0.255	1.004	0.081	0.505	0.319	0.255	5.05	5.05	1562	378	0.338	0.115	-1.115	0.663	1.583	0.504	35.8
250S137-54	50	0.316	1.08	0.319	0.255	1.004	0.081	0.505	0.314	0.248	7.43	7.64	2366	573	0.338	0.115	-1.115	0.663	1.583	0.504	28.8
250S137-68	33	0.393	1.34	0.391	0.313	0.997	0.097	0.497	0.391	0.313	6.19	6.19	1941	366	0.667	0.138	-1.098	0.653	1.565	0.507	36.2
250S137-68	50	0.393	1.34	0.391	0.313	0.997	0.097	0.497	0.391	0.313	9.37	9.37	2941	554	0.667	0.138	-1.098	0.653	1.565	0.507	28.9
250S137-97	33	0.546	1.86	0.527	0.422	0.982	0.127	0.483	0.527	0.422	8.34	8.33	2692	341	1.883	0.176	-1.062	0.633	1.525	0.515	37.7
250S137-97	50	0.546	1.86	0.527	0.422	0.982	0.127	0.483	0.527	0.422	12.63	12.63	4079	516	1.883	0.176	-1.062	0.633	1.525	0.515	29.4
250S162-33	33	0.223	0.76	0.235	0.188	1.027	0.087	0.624	0.229	0.180	3.55	3.56	973	397	0.089	0.146	-1.469	0.859	1.898	0.401	44.1
250S162-43	33	0.288	0.98	0.301	0.241	1.022	0.111	0.619	0.301	0.241	4.76	4.76	1257	388	0.196	0.184	-1.457	0.852	1.884	0.402	44.2
250S162-54	33	0.359	1.22	0.371	0.297	1.017	0.135	0.614	0.371	0.297	5.86	5.86	1562	378	0.383	0.223	-1.443	0.845	1.869	0.404	44.5
250S162-54	50	0.359	1.22	0.371	0.297	1.017	0.135	0.614	0.366	0.289	8.65	8.81	2366	573	0.383	0.223	-1.443	0.845	1.869	0.404	35.7
250S162-68	33	0.447	1.52	0.456	0.365	1.010	0.165	0.607	0.456	0.365	7.20	7.20	1941	366	0.757	0.268	-1.426	0.835	1.850	0.406	45.0
250S162-68	50	0.447	1.52	0.456	0.365	1.010	0.165	0.607	0.456	0.365	10.92	10.92	2941	554	0.757	0.268	-1.426	0.835	1.850	0.406	35.9
250S162-97	33	0.622	2.12	0.617	0.494	0.996	0.219	0.593	0.617	0.494	9.76	9.76	2692	341	2.146	0.346	-1.390	0.815	1.809	0.410	46.8
250S162-97	50	0.622	2.12	0.617	0.494	0.996	0.219	0.593	0.617	0.494	14.79	14.78	4079	516	2.146	0.346	-1.390	0.815	1.809	0.410	36.7
250S200-33	33	0.258	0.88	0.279	0.223	1.040	0.154	0.773	0.259	0.197	3.90	4.09	973	397	0.103	0.302	-1.926	1.108	2.321	0.312	56.0
250S200-43	33	0.334	1.13	0.357	0.286	1.035	0.197	0.769	0.351	0.277	5.47	5.65	1257	388	0.226	0.382	-1.913	1.101	2.307	0.312	56.2
250S200-54	33	0.415	1.41	0.441	0.353	1.030	0.242	0.763	0.441	0.353	6.97	6.97	1562	378	0.444	0.464	-1.900	1.093	2.292	0.313	56.5
250S200-54	50	0.415	1.41	0.441	0.353	1.030	0.242	0.763	0.419	0.321	9.61	10.13	2366	573	0.444	0.464	-1.900	1.093	2.292	0.313	45.5
250S200-68	33	0.518	1.76	0.543	0.434	1.024	0.297	0.757	0.543	0.434	8.58	8.58	1941	366	0.878	0.561	-1.882	1.084	2.272	0.314	57.1
250S200-68	50	0.518	1.76	0.543	0.434	1.024	0.297	0.757	0.539	0.427	12.77	13.01	2941	554	0.878	0.561	-1.882	1.084	2.272	0.314	45.7
250S200-97	33	0.724	2.46	0.739	0.591	1.010	0.400	0.743	0.739	0.591	11.68	11.68	2692	341	2.497	0.735	-1.846	1.063	2.231	0.316	59.3
250S200-97	50	0.724	2.46	0.739	0.591	1.010	0.400	0.743	0.739	0.591	17.70	17.70	4079	516	2.497	0.735	-1.846	1.063	2.231	0.316	46.7
250S250-43	33	0.379	1.29	0.425	0.340	1.060	0.335	0.941	0.393	0.296	5.85	6.23	1257	388	0.257	0.638	-2.403	1.359	2.790	0.258	66.8
250S250-54	33	0.472	1.60	0.525	0.420	1.055	0.413	0.935	0.497	0.380	7.51	8.24	1562	378	0.504	0.778	-2.389	1.351	2.774	0.258	67.2
250S250-54	50	0.472	1.60	0.525	0.420	1.055	0.413	0.935	0.466	0.342	10.24	11.04	2366	573	0.504	0.778	-2.389	1.351	2.774	0.258	54.1
250S250-68	33	0.590	2.00	0.648	0.519	1.049	0.508	0.929	0.640	0.505	9.97	10.25	1941	366	0.999	0.944	-2.372	1.341	2.754	0.259	68.0
250S250-68	50	0.590	2.00	0.648	0.519	1.049	0.508	0.929	0.596	0.446	13.36	14.72	2941	554	0.999	0.944	-2.372	1.341	2.754	0.259	54.4
250S250-97	33	0.826	2.81	0.885	0.708	1.035	0.691	0.914	0.885	0.708	14.00	13.99	2692	341	2.847	1.245	-2.335	1.320	2.713	0.259	70.7
250S250-97	50	0.826	2.81	0.885	0.708	1.035	0.691	0.914	0.870	0.682	20.42	21.20	4079	516	2.847	1.245	-2.335	1.320	2.713	0.259	55.7
300S137-33	33	0.214	0.73	0.309	0.206	1.200	0.056	0.510	0.303	0.199	3.94	3.81	1024	349	0.086	0.111	-1.075	0.648	1.689	0.595	35.1
300S137-43	33	0.277	0.94	0.396	0.264	1.195	0.071	0.505	0.395	0.264	5.21	5.21	1536	395	0.188	0.139	-1.062	0.641	1.676	0.598	35.1
300S137-54	50	0.345	1.17	0.487	0.325	1.189	0.086	0.499	0.479	0.315	9.44	9.54	2897	583	0.368	0.168	-1.049	0.633	1.662	0.602	28.3
300S137-68	50	0.429	1.46	0.599	0.399	1.181	0.104	0.492	0.599	0.399	11.95	11.95	3610	563	0.727	0.201	-1.032	0.624	1.644	0.606	28.3
300S137-97	50	0.597	2.03	0.811	0.541	1.166	0.136	0.477	0.811	0.541	16.19	16.19	5033	522	2.058	0.258	-0.997	0.604	1.606	0.615	28.5
300S162-33	33	0.240	0.82	0.357	0.238	1.218	0.093	0.622	0.347	0.227	4.49	4.38	1024	349	0.096	0.205	-1.392	0.826	1.952	0.491	43.3
300S162-43	33	0.311	1.06	0.458	0.305	1.213	0.118	0.617	0.457	0.305	6.03	6.03	1536	395	0.211	0.259	-1.380	0.819	1.938	0.493	43.3
300S162-54	50	0.387	1.32	0.564	0.376	1.207	0.145	0.611	0.556	0.366	10.95	10.92	2897	583	0.413	0.314	-1.367	0.812	1.923	0.495	35.0
300S162-68	50	0.483	1.64	0.695	0.464	1.200	0.176	0.604	0.695	0.464	13.88	13.88	3610	563	0.818	0.378	-1.349	0.802	1.904	0.498	35.0
300S162-97	50	0.673	2.29	0.947	0.631	1.186	0.234	0.590	0.947	0.631	18.90	18.90	5033	522	2.321	0.492	-1.314	0.782	1.865	0.504	35.4
300S200-33	33	0.275	0.93	0.421	0.281	1.238	0.165	0.774	0.393	0.250	4.95	5.01	1024	349	0.110	0.409	-1.839	1.072	2.348	0.387	54.6
300S200-43	33	0.356	1.21	0.541	0.361	1.233	0.211	0.770	0.531	0.349	6.90	6.99	1536	395	0.241	0.519	-1.826	1.065	2.334	0.388	54.7
300S200-54	50	0.444	1.51	0.669	0.446	1.228	0.259	0.764	0.634	0.405	12.13	12.49	2897	583	0.474	0.633	-1.813	1.058	2.319	0.389	44.2
300S200-68	50	0.554	1.88	0.826	0.551	1.221	0.318	0.758	0.818	0.539	16.15	16.48	3610	563	0.939	0.767	-1.795	1.048	2.299	0.391	44.3
300S200-97	50	0.775	2.64	1.129	0.753	1.207	0.429	0.744	1.129	0.753	22.54	22.54	5033	522	2.672	1.010	-1.759	1.028	2.259	0.394	44.8
350S137-33	33	0.232	0.79	0.441	0.252	1.380	0.059	0.503	0.433	0.244	4.82	4.54	1024	486	0.092	0.153	-1.016	0.621	1.786	0.676	34.8
350S137-43	33	0.300	1.02	0.566	0.323	1.374	0.074	0.498	0.566	0.323	6.39	6.37	1740	626	0.203	0.193	-1.004	0.615	1.774	0.679	34.7
350S137-54	33	0.373	1.27	0.698	0.399	1.368	0.090	0.492	0.698	0.399	7.88	7.88	2262	640	0.398	0.233	-0.991	0.607	1.760	0.683	34.6
350S137-54	50	0.373	1.27	0.698	0.399	1.368	0.090	0.492	0.687	0.388	11.60	11.46	3373	954	0.398	0.233	-0.991	0.607	1.760	0.683	28.0
350S137-68	33	0.465	1.58	0.860	0.491	1.360	0.109	0.485	0.860	0.491	9.71	9.71	2824	623	0.788	0.280	-0.975	0.598	1.742	0.687	34.7
350S137-68	50	0.465	1.58	0.860	0.491	1.360	0.109	0.485	0.860	0.491	14.71	14.71	4278	944	0.788	0.280	-0.975	0.598	1.742	0.687	27.9
350S137-97	33	0.648	2.20	1.170	0.669	1.344	0.143	0.470	1.170	0.668	13.21	13.21	3951	590	2						

TABLE 3A—STRUCTURAL C-SHAPE STUD SECTION PROPERTIES⁴ (CONTINUED)

Section	F _y ⁶ (ksi)	Gross Properties							Effective Properties						Torsional Properties						L _u (in)
		A _r	Wt.	I _x	S _x	R _x	I _y	R _y	I _{ex} ⁵	S _{ex}	M _{al}	M _{ad}	V _{ag}	V _{anet}	Jx100	C _w	X _o	m	R _o	β	
		(in ²)	(lb/ft)	(in ⁴)	(in ³)	(in)	(in ⁴)	(in)	(in ⁴)	(in ³)	(in-k)	(in-k)	(lb)	(lb)	(in ⁴)	(in ⁶)	(in)	(in)	(in)	(in)	
350S162-97	33	0.724	2.46	1.361	0.778	1.371	0.248	0.585	1.361	0.777	15.36	15.36	3951	590	2.497	0.672	-1.247	0.752	1.943	0.588	43.3
350S162-97	50	0.724	2.46	1.361	0.778	1.371	0.248	0.585	1.361	0.777	23.28	23.28	5986	893	2.497	0.672	-1.247	0.752	1.943	0.588	34.5
350S200-33	33	0.292	0.99	0.598	0.342	1.431	0.174	0.773	0.560	0.306	6.05	5.95	1024	486	0.117	0.541	-1.760	1.039	2.396	0.461	53.7
350S200-43	33	0.379	1.29	0.770	0.440	1.426	0.223	0.768	0.755	0.426	8.42	8.34	1740	626	0.257	0.687	-1.747	1.032	2.382	0.462	53.7
350S200-54	33	0.472	1.60	0.952	0.544	1.420	0.274	0.762	0.952	0.544	10.75	10.75	2262	640	0.504	0.838	-1.734	1.024	2.367	0.464	53.8
350S200-54	50	0.472	1.60	0.952	0.544	1.420	0.274	0.762	0.901	0.494	14.80	14.90	3373	954	0.504	0.838	-1.734	1.024	2.367	0.464	43.4
350S200-68	33	0.590	2.00	1.178	0.673	1.413	0.337	0.756	1.178	0.673	13.30	13.30	2824	623	0.999	1.018	-1.716	1.014	2.348	0.466	53.9
350S200-68	50	0.590	2.00	1.178	0.673	1.413	0.337	0.756	1.165	0.658	19.71	19.86	4278	944	0.999	1.018	-1.716	1.014	2.348	0.466	43.4
350S200-97	33	0.826	2.81	1.617	0.924	1.399	0.454	0.742	1.617	0.924	18.26	18.26	3951	590	2.847	1.347	-1.680	0.994	2.309	0.470	54.8
350S200-97	50	0.826	2.81	1.617	0.924	1.399	0.454	0.742	1.617	0.924	27.66	27.66	5986	893	2.847	1.347	-1.680	0.994	2.309	0.470	43.7
350S250-43	33	0.424	1.44	0.904	0.517	1.461	0.379	0.946	0.837	0.453	8.95	8.99	1740	626	0.287	1.151	-2.219	1.286	2.820	0.381	64.3
350S250-54	33	0.529	1.80	1.120	0.640	1.456	0.468	0.940	1.058	0.578	11.43	12.01	2262	640	0.565	1.409	-2.205	1.278	2.805	0.382	64.4
350S250-54	50	0.529	1.80	1.120	0.640	1.456	0.468	0.940	0.996	0.524	15.70	15.95	3373	954	0.565	1.409	-2.205	1.278	2.805	0.382	52.1
350S250-68	33	0.661	2.25	1.387	0.793	1.449	0.576	0.934	1.364	0.767	15.16	15.67	2824	623	1.120	1.718	-2.188	1.268	2.785	0.383	64.7
350S250-68	50	0.661	2.25	1.387	0.793	1.449	0.576	0.934	1.273	0.683	20.44	21.48	4278	944	1.120	1.718	-2.188	1.268	2.785	0.383	52.1
350S250-97	33	0.928	3.15	1.910	1.092	1.435	0.784	0.919	1.910	1.092	21.57	21.57	3951	590	3.198	2.291	-2.151	1.248	2.744	0.386	65.8
350S250-97	50	0.928	3.15	1.910	1.092	1.435	0.784	0.919	1.867	1.045	31.28	32.68	5986	893	3.198	2.291	-2.151	1.248	2.744	0.386	52.5
362S137-33	33	0.236	0.80	0.479	0.264	1.424	0.059	0.501	0.470	0.256	5.05	4.73	1024	520	0.094	0.165	-1.003	0.615	1.812	0.694	34.7
362S137-43	33	0.305	1.04	0.614	0.339	1.419	0.075	0.496	0.614	0.339	6.70	6.64	1740	671	0.207	0.208	-0.991	0.608	1.800	0.697	34.6
362S137-54	33	0.380	1.29	0.758	0.418	1.412	0.091	0.490	0.758	0.418	8.26	8.26	2350	713	0.406	0.251	-0.978	0.601	1.787	0.700	34.5
362S137-54	50	0.380	1.29	0.758	0.418	1.412	0.091	0.490	0.745	0.406	12.17	11.94	3373	1023	0.406	0.251	-0.978	0.601	1.787	0.700	27.9
362S137-68	33	0.474	1.61	0.934	0.515	1.404	0.111	0.483	0.934	0.515	10.18	10.18	2934	695	0.803	0.302	-0.962	0.592	1.769	0.705	34.5
362S137-68	50	0.474	1.61	0.934	0.515	1.404	0.111	0.483	0.934	0.515	15.43	15.43	4445	1054	0.803	0.302	-0.962	0.592	1.769	0.705	27.8
362S137-97	33	0.661	2.25	1.272	0.702	1.388	0.145	0.468	1.272	0.702	13.87	13.87	4108	660	2.278	0.390	-0.927	0.573	1.733	0.714	34.8
362S137-97	50	0.661	2.25	1.272	0.702	1.388	0.145	0.468	1.272	0.702	21.01	21.01	6224	1000	2.278	0.390	-0.927	0.573	1.733	0.714	27.7
362S150-18	33	0.134	0.46	0.281	0.155	1.447	0.041	0.555	0.243	0.122	2.41	2.11	172	164	0.016	0.115	-1.128	0.686	1.917	0.654	37.6
362S150-27	33	0.201	0.68	0.418	0.231	1.442	0.061	0.550	0.388	0.205	4.04	3.70	591	370	0.054	0.168	-1.118	0.680	1.906	0.656	37.5
362S150-30	33	0.221	0.75	0.459	0.253	1.441	0.067	0.549	0.430	0.227	4.49	4.21	794	449	0.072	0.184	-1.114	0.678	1.902	0.657	37.4
362S162-18	33	0.144	0.49	0.306	0.169	1.458	0.056	0.623	0.251	0.122	2.41	2.40	172	164	0.017	0.168	-1.326	0.799	2.067	0.588	42.8
362S162-27	33	0.215	0.73	0.454	0.251	1.453	0.082	0.618	0.429	0.229	4.52	4.17	591	370	0.057	0.247	-1.316	0.793	2.055	0.590	42.7
362S162-30	33	0.237	0.80	0.499	0.275	1.452	0.090	0.617	0.480	0.259	5.11	4.74	794	449	0.077	0.270	-1.312	0.791	2.052	0.591	42.6
362S162-33	33	0.262	0.89	0.551	0.304	1.450	0.099	0.615	0.537	0.291	5.76	5.43	1024	520	0.105	0.297	-1.308	0.789	2.048	0.592	42.6
362S162-43	33	0.339	1.15	0.708	0.391	1.445	0.126	0.610	0.708	0.391	7.72	7.60	1740	671	0.230	0.376	-1.296	0.782	2.035	0.594	42.5
362S162-54	33	0.423	1.44	0.875	0.483	1.439	0.155	0.605	0.875	0.483	9.54	9.54	2350	713	0.451	0.457	-1.283	0.774	2.021	0.597	42.5
362S162-54	50	0.423	1.44	0.875	0.483	1.439	0.155	0.605	0.861	0.469	14.03	13.63	3373	1023	0.451	0.457	-1.283	0.774	2.021	0.597	34.3
362S162-68	33	0.527	1.79	1.080	0.596	1.432	0.189	0.598	1.080	0.596	11.78	11.78	2934	695	0.893	0.552	-1.266	0.765	2.002	0.600	42.6
362S162-68	50	0.527	1.79	1.080	0.596	1.432	0.189	0.598	1.080	0.596	17.84	17.85	4445	1054	0.893	0.552	-1.266	0.765	2.002	0.600	34.3
362S162-97	33	0.737	2.51	1.478	0.815	1.416	0.251	0.583	1.478	0.815	16.11	16.11	4108	660	2.541	0.723	-1.231	0.745	1.965	0.608	43.1
362S162-97	50	0.737	2.51	1.478	0.815	1.416	0.251	0.583	1.478	0.815	24.41	24.41	6224	1000	2.541	0.723	-1.231	0.745	1.965	0.608	34.3
362S200-18 ³	33	0.163	0.55	0.359	0.198	1.486	0.099	0.779	-	-	-	-	-	0.019	0.326	-1.760	1.041	2.431	0.476	53.7	
362S200-27	33	0.243	0.83	0.534	0.295	1.481	0.146	0.775	0.476	0.244	4.83	4.74	591	370	0.065	0.479	-1.748	1.035	2.419	0.478	53.6
362S200-30	33	0.268	0.91	0.587	0.324	1.480	0.160	0.773	0.536	0.279	5.51	5.40	794	449	0.087	0.525	-1.745	1.033	2.415	0.478	53.6
362S200-33	33	0.297	1.01	0.648	0.358	1.478	0.177	0.772	0.607	0.321	6.34	6.18	1024	520	0.118	0.577	-1.741	1.031	2.411	0.478	53.5
362S200-43	33	0.384	1.31	0.834	0.460	1.473	0.226	0.767	0.819	0.446	8.81	8.68	1740	671	0.261	0.734	-1.729	1.024	2.397	0.480	53.5
362S200-54	33	0.479	1.63	1.032	0.569	1.468	0.278	0.762	1.032	0.569	11.25	11.25	2350	713	0.512	0.896	-1.715	1.016	2.382	0.482	53.6
362S200-54	50	0.479	1.63	1.032	0.569	1.468	0.278	0.762	0.977	0.518	15.50	15.51	3373	1023	0.512	0.896	-1.715	1.016	2.382	0.482	43.3
362S200-68	33	0.598	2.03	1.277	0.705	1.461	0.341	0.755	1.277	0.705	13.92	13.92	2934	695	1.014	1.089	-1.698	1.006	2.364	0.484	53.7
362S200-68	50	0.598	2.03	1.277	0.705	1.461	0.341	0.755	1.262	0.689	20.63	20.70	4445	1054	1.014	1.089	-1.698	1.006	2.364	0.484	43.3
362S200-97	33	0.839	2.85	1.754	0.968	1.446	0.460	0.741	1.754	0.968	19.13	19.13	4108	660	2.891	1.441	-1.662	0.986	2.324	0.489	54.4
362S200-97	50	0.839	2.85	1.754	0.968	1.446	0.460	0.741	1.754	0.968	28.98	28.98	6224	1000	2.891	1.441	-1.662	0.986	2.324	0.489	43.4
400S150-18 ¹	33	0.141	0.48	0.353	0.177	1.580	0.043	0.549	0.300	0.134	2.66	2.34	155	155	0.017	0.142	-1.088	0.667	1.996	0.703	37.5
400S150-27	33	0.212	0.72	0.525	0.263	1.575	0.063	0.545	0.489	0.234	4.62	4.12	533	398	0.056	0.208	-1.077	0.661	1.984	0.705	37.3
400S150-30	33	0.233	0.79	0.577	0.288	1.574	0.069	0.543	0.541	0.260	5.13	4.70	715	484							

TABLE 3A—STRUCTURAL C-SHAPE STUD SECTION PROPERTIES⁴ (CONTINUED)

Section	F _y ⁶ (ksi)	Gross Properties							Effective Properties						Torsional Properties					L _u (in)	
		A _r	Wt.	I _x	S _x	R _x	I _y	R _y	I _{ex} ⁵	S _{ex}	M _{al}	M _{ad}	V _{ag}	V _{anet}	Jx100	C _w	X _o	m	R _o		β
		(in ²)	(lb/ft)	(in ⁴)	(in ³)	(in)	(in ⁴)	(in)	(in ⁴)	(in ³)	(in-k)	(in-k)	(lb)	(lb)	(in ⁴)	(in ⁶)	(in)	(in)	(in)		(in)
400S162-18 ¹	33	0.151	0.51	0.383	0.192	1.594	0.058	0.618	0.311	0.135	2.67	2.66	155	155	0.018	0.206	-1.281	0.778	2.137	0.640	42.5
400S162-27	33	0.226	0.77	0.570	0.285	1.589	0.085	0.614	0.540	0.261	5.16	4.65	533	398	0.060	0.302	-1.270	0.772	2.125	0.643	42.4
400S162-30	33	0.248	0.84	0.626	0.313	1.588	0.093	0.612	0.604	0.295	5.83	5.29	715	484	0.081	0.330	-1.267	0.770	2.122	0.643	42.3
400S162-33	33	0.275	0.93	0.692	0.346	1.586	0.103	0.611	0.675	0.332	6.56	6.06	977	594	0.110	0.363	-1.263	0.768	2.118	0.644	42.3
400S162-43	33	0.356	1.21	0.890	0.445	1.581	0.131	0.606	0.890	0.445	8.79	8.52	1740	804	0.241	0.460	-1.251	0.761	2.105	0.647	42.2
400S162-54	33	0.444	1.51	1.100	0.550	1.575	0.160	0.600	1.100	0.550	10.87	10.87	2612	953	0.474	0.560	-1.238	0.754	2.091	0.649	42.1
400S162-54	50	0.444	1.51	1.100	0.550	1.575	0.160	0.600	1.082	0.534	15.99	15.29	3373	1230	0.474	0.560	-1.238	0.754	2.091	0.649	34.1
400S162-68	33	0.554	1.88	1.360	0.680	1.567	0.195	0.593	1.360	0.680	13.44	13.44	3265	933	0.939	0.677	-1.222	0.745	2.074	0.653	42.1
400S162-68	50	0.554	1.88	1.360	0.680	1.567	0.195	0.593	1.360	0.680	20.36	20.36	4946	1413	0.939	0.677	-1.222	0.745	2.074	0.653	34.0
400S162-97	33	0.775	2.64	1.865	0.933	1.551	0.259	0.579	1.865	0.932	18.42	18.43	4580	892	2.672	0.889	-1.187	0.725	2.037	0.660	42.4
400S162-97	50	0.775	2.64	1.865	0.933	1.551	0.259	0.579	1.865	0.932	27.92	27.92	6940	1352	2.672	0.889	-1.187	0.725	2.037	0.660	33.9
400S200-18 ³	33	0.170	0.58	0.449	0.224	1.627	0.102	0.776	-	-	-	-	-	-	0.020	0.393	-1.706	1.017	2.482	0.527	53.3
400S200-27	33	0.254	0.86	0.669	0.334	1.622	0.151	0.772	0.597	0.279	5.50	5.28	533	398	0.068	0.578	-1.695	1.011	2.470	0.529	53.2
400S200-30	33	0.280	0.95	0.735	0.367	1.621	0.166	0.770	0.672	0.318	6.28	6.01	715	484	0.091	0.633	-1.692	1.009	2.466	0.530	53.1
400S200-33	33	0.310	1.05	0.812	0.406	1.619	0.183	0.769	0.761	0.365	7.22	6.90	977	594	0.124	0.697	-1.688	1.007	2.462	0.530	53.1
400S200-43	33	0.401	1.36	1.045	0.523	1.614	0.234	0.764	1.027	0.507	10.02	9.72	1740	804	0.272	0.886	-1.676	1.000	2.449	0.532	53.0
400S200-54	33	0.500	1.70	1.295	0.647	1.609	0.288	0.759	1.295	0.647	12.79	12.79	2612	953	0.534	1.083	-1.662	0.993	2.434	0.534	53.0
400S200-54	50	0.500	1.70	1.295	0.647	1.609	0.288	0.759	1.225	0.589	17.63	17.35	3373	1230	0.534	1.083	-1.662	0.993	2.434	0.534	42.9
400S200-68	33	0.625	2.13	1.604	0.802	1.602	0.353	0.752	1.603	0.802	15.84	15.84	3265	933	1.059	1.318	-1.645	0.983	2.416	0.536	53.1
400S200-68	50	0.625	2.13	1.604	0.802	1.602	0.353	0.752	1.584	0.784	23.46	23.24	4946	1413	1.059	1.318	-1.645	0.983	2.416	0.536	42.8
400S200-97	33	0.877	2.98	2.207	1.104	1.587	0.477	0.737	2.207	1.104	21.81	21.81	4580	892	3.023	1.749	-1.610	0.963	2.377	0.542	53.6
400S200-97	50	0.877	2.98	2.207	1.104	1.587	0.477	0.737	2.207	1.104	33.04	33.04	6940	1352	3.023	1.749	-1.610	0.963	2.377	0.542	42.9
550S137-33	33	0.301	1.02	1.282	0.466	2.064	0.067	0.472	1.259	0.453	8.94	7.48	699	699	0.120	0.411	-0.840	0.536	2.278	0.864	33.7
550S137-43	33	0.390	1.33	1.651	0.600	2.058	0.085	0.466	1.651	0.600	11.86	10.73	1554	1197	0.264	0.520	-0.830	0.530	2.267	0.866	33.5
550S137-54	33	0.486	1.65	2.044	0.743	2.050	0.103	0.461	2.043	0.743	14.68	14.46	2740	1672	0.519	0.632	-0.818	0.523	2.255	0.868	33.3
550S137-54	50	0.486	1.65	2.044	0.743	2.050	0.103	0.461	2.010	0.724	21.67	19.36	3085	1882	0.519	0.632	-0.818	0.523	2.255	0.868	27.0
550S137-68	33	0.607	2.07	2.530	0.920	2.041	0.125	0.453	2.530	0.920	18.18	18.18	4348	2089	1.029	0.764	-0.803	0.514	2.240	0.871	33.1
550S137-68	50	0.607	2.07	2.530	0.920	2.041	0.125	0.453	2.530	0.920	27.54	26.39	5352	2572	1.029	0.764	-0.803	0.514	2.240	0.871	26.8
550S137-97	33	0.851	2.89	3.479	1.265	2.021	0.163	0.438	3.478	1.265	24.99	25.00	6468	2143	2.935	0.997	-0.772	0.497	2.208	0.878	32.8
550S137-97	50	0.851	2.89	3.479	1.265	2.021	0.163	0.438	3.478	1.265	37.86	37.87	9800	3247	2.935	0.997	-0.772	0.497	2.208	0.878	26.4
550S162-33	33	0.327	1.11	1.458	0.530	2.112	0.113	0.589	1.424	0.511	10.10	8.62	699	699	0.130	0.713	-1.114	0.697	2.459	0.795	41.4
550S162-43	33	0.424	1.44	1.879	0.683	2.106	0.144	0.584	1.879	0.683	13.50	12.28	1554	1197	0.287	0.905	-1.102	0.691	2.448	0.797	41.2
550S162-54	33	0.529	1.80	2.329	0.847	2.099	0.177	0.578	2.329	0.847	16.73	16.47	2740	1672	0.565	1.105	-1.090	0.684	2.435	0.800	41.0
550S162-54	50	0.529	1.80	2.329	0.847	2.099	0.177	0.578	2.289	0.823	24.64	22.04	3085	1882	0.565	1.105	-1.090	0.684	2.435	0.800	33.2
550S162-68	33	0.661	2.25	2.888	1.050	2.091	0.215	0.571	2.888	1.050	20.75	20.75	4348	2089	1.120	1.342	-1.074	0.675	2.419	0.803	40.8
550S162-68	50	0.661	2.25	2.888	1.050	2.091	0.215	0.571	2.888	1.050	31.44	29.87	5352	2572	1.120	1.342	-1.074	0.675	2.419	0.803	33.0
550S162-97	33	0.928	3.15	3.985	1.449	2.073	0.287	0.556	3.984	1.449	28.63	28.64	6468	2143	3.198	1.775	-1.042	0.656	2.386	0.809	40.6
550S162-97	50	0.928	3.15	3.985	1.449	2.073	0.287	0.556	3.984	1.449	43.38	43.39	9800	3247	3.198	1.775	-1.042	0.656	2.386	0.809	32.7
550S200-33	33	0.361	1.23	1.693	0.616	2.164	0.204	0.750	1.595	0.560	11.06	9.79	699	699	0.144	1.326	-1.508	0.925	2.742	0.698	51.9
550S200-43	33	0.469	1.59	2.185	0.794	2.159	0.261	0.745	2.148	0.772	15.26	13.94	1554	1197	0.318	1.691	-1.496	0.918	2.730	0.700	51.7
550S200-54	33	0.585	1.99	2.712	0.986	2.153	0.320	0.740	2.711	0.986	19.48	18.70	2740	1672	0.625	2.072	-1.483	0.911	2.717	0.702	51.6
550S200-54	50	0.585	1.99	2.712	0.986	2.153	0.320	0.740	2.568	0.901	26.99	24.90	3085	1882	0.625	2.072	-1.483	0.911	2.717	0.702	41.8
550S200-68	33	0.732	2.49	3.368	1.225	2.145	0.393	0.733	3.367	1.224	24.19	24.20	4348	2089	1.241	2.531	-1.467	0.902	2.700	0.705	51.5
550S200-68	50	0.732	2.49	3.368	1.225	2.145	0.393	0.733	3.323	1.196	35.81	33.72	5352	2572	1.241	2.531	-1.467	0.902	2.700	0.705	41.6
550S200-97	33	1.029	3.50	4.663	1.695	2.128	0.531	0.718	4.662	1.695	33.50	33.50	6468	2143	3.549	3.384	-1.433	0.882	2.664	0.711	51.4
550S200-97	50	1.029	3.50	4.663	1.695	2.128	0.531	0.718	4.662	1.695	50.75	50.76	9800	3247	3.549	3.384	-1.433	0.882	2.664	0.711	41.4
600S137-33	33	0.318	1.08	1.581	0.527	2.229	0.068	0.464	1.469	0.456	9.00	8.18	638	638	0.127	0.500	-0.806	0.519	2.416	0.889	33.5
600S137-43	33	0.412	1.40	2.037	0.679	2.222	0.087	0.459	1.987	0.644	12.72	11.80	1419	1239	0.280	0.633	-0.796	0.513	2.405	0.890	33.2
600S137-54	33	0.514	1.75	2.524	0.841	2.215	0.106	0.453	2.513	0.834	16.47	15.99	2740	1896	0.549	0.769	-0.784	0.506	2.393	0.893	33.0
600S137-54	50	0.514	1.75	2.524	0.841	2.215	0.106	0.453	2.422	0.778	23.29	21.30	2816	1949	0.549	0.769	-0.784	0.506	2.393	0.893	26.8
600S137-68	33	0.643	2.19	3.127	1.042	2.205	0.128	0.446	3.126	1.042	20.59	20.59	4348	2371	1.090	0.930	-0.770	0.497	2.378	0.895	32.8
600S137-68	50	0.643	2.19	3.127	1.042	2.205	0.128	0.446	3.120	1.038	31.08	29.20	5352	2919	1.090	0.930	-0.770	0.497	2.378	0.895	26.5
600S137-97	33	0.902	3.07	4.306	1.435	2.185	0.167	0.430	4.30												

TABLE 3A—STRUCTURAL C-SHAPE STUD SECTION PROPERTIES⁴ (CONTINUED)

Section	F _y ⁶ (ksi)	Gross Properties							Effective Properties						Torsional Properties					L _u (in)	
		A _r	Wt.	I _x	S _x	R _x	I _y	R _y	I _{ex} ⁵	S _{ex}	M _{al}	M _{ad}	V _{ag}	V _{anet}	Jx100	C _w	X _o	m	R _o		β
		(in ²)	(lb/ft)	(in ⁴)	(in ³)	(in)	(in ⁴)	(in)	(in ⁴)	(in ³)	(in-k)	(in-k)	(lb)	(lb)	(in ⁴)	(in ⁶)	(in)	(in)	(in)		
600S162-18 ²	33	0.188	0.64	0.989	0.330	2.291	0.065	0.589	-	-	-	-	-	0.022	0.486	-1.089	0.686	2.604	0.825	41.4	
600S162-27 ¹	33	0.282	0.96	1.475	0.492	2.286	0.096	0.584	1.337	0.415	8.20	7.18	349	349	0.075	0.715	-1.079	0.681	2.594	0.827	41.2
600S162-30	33	0.311	1.06	1.622	0.541	2.284	0.105	0.582	1.533	0.492	9.72	8.21	468	468	0.101	0.783	-1.076	0.679	2.591	0.828	41.2
600S162-33	33	0.344	1.17	1.792	0.597	2.282	0.116	0.581	1.752	0.576	11.39	9.46	638	638	0.137	0.861	-1.072	0.677	2.587	0.828	41.1
600S162-43	33	0.446	1.52	2.311	0.770	2.276	0.148	0.576	2.311	0.770	15.22	13.53	1419	1239	0.303	1.095	-1.061	0.670	2.576	0.830	40.9
600S162-54	33	0.557	1.89	2.867	0.956	2.269	0.181	0.570	2.866	0.955	18.88	18.22	2740	1896	0.595	1.337	-1.049	0.663	2.564	0.833	40.7
600S162-54	50	0.557	1.89	2.867	0.956	2.269	0.181	0.570	2.817	0.929	27.80	24.29	2816	1949	0.595	1.337	-1.049	0.663	2.564	0.833	33.0
600S162-68	33	0.696	2.37	3.557	1.186	2.260	0.221	0.563	3.556	1.185	23.42	23.43	4348	2371	1.180	1.626	-1.034	0.655	2.548	0.835	40.5
600S162-68	50	0.696	2.37	3.557	1.186	2.260	0.221	0.563	3.556	1.185	35.49	33.05	5352	2919	1.180	1.626	-1.034	0.655	2.548	0.835	32.8
600S162-97	33	0.978	3.33	4.915	1.638	2.241	0.294	0.548	4.914	1.638	32.37	32.38	7097	2675	3.373	2.153	-1.002	0.636	2.516	0.841	40.2
600S162-97	50	0.978	3.33	4.915	1.638	2.241	0.294	0.548	4.914	1.638	49.04	49.06	10753	4052	3.373	2.153	-1.002	0.636	2.516	0.841	32.4
600S162-118	33	1.181	4.02	5.862	1.954	2.228	0.340	0.537	5.860	1.953	38.60	38.61	8598	2624	6.074	2.487	-0.979	0.623	2.492	0.846	40.1
600S162-118	50	1.181	4.02	5.862	1.954	2.228	0.340	0.537	5.860	1.953	58.48	58.50	13027	3976	6.074	2.487	-0.979	0.623	2.492	0.846	32.2
600S200-18 ²	33	0.207	0.70	1.143	0.381	2.349	0.117	0.751	-	-	-	-	-	-	0.024	0.894	-1.474	0.911	2.873	0.737	51.9
600S200-27 ¹	33	0.311	1.06	1.706	0.569	2.344	0.173	0.746	1.450	0.432	8.54	8.17	349	349	0.083	1.320	-1.464	0.905	2.862	0.738	51.7
600S200-30	33	0.342	1.16	1.876	0.625	2.342	0.190	0.745	1.670	0.515	10.18	9.34	468	468	0.111	1.447	-1.461	0.903	2.859	0.739	51.7
600S200-33	33	0.379	1.29	2.074	0.691	2.340	0.209	0.743	1.957	0.630	12.45	10.76	638	638	0.151	1.593	-1.457	0.901	2.855	0.740	51.6
600S200-43	33	0.491	1.67	2.678	0.893	2.335	0.268	0.738	2.633	0.869	17.16	15.36	1419	1239	0.333	2.033	-1.446	0.894	2.843	0.742	51.4
600S200-54	33	0.614	2.09	3.326	1.109	2.328	0.329	0.733	3.325	1.108	21.90	20.67	2740	1896	0.655	2.493	-1.433	0.887	2.830	0.744	51.3
600S200-54	50	0.614	2.09	3.326	1.109	2.328	0.329	0.733	3.152	1.015	30.40	27.44	2816	1949	0.655	2.493	-1.433	0.887	2.830	0.744	41.6
600S200-68	33	0.768	2.61	4.133	1.378	2.320	0.404	0.725	4.132	1.377	27.22	27.22	4348	2371	1.301	3.047	-1.417	0.878	2.814	0.746	51.1
600S200-68	50	0.768	2.61	4.133	1.378	2.320	0.404	0.725	4.077	1.346	40.29	37.29	5352	2919	1.301	3.047	-1.417	0.878	2.814	0.746	41.4
600S200-97	33	1.080	3.67	5.730	1.910	2.303	0.546	0.711	5.729	1.910	37.73	37.74	7097	2675	3.724	4.080	-1.384	0.859	2.779	0.752	50.9
600S200-97	50	1.080	3.67	5.730	1.910	2.303	0.546	0.711	5.729	1.910	57.17	57.18	10753	4052	3.724	4.080	-1.384	0.859	2.779	0.752	41.0
600S200-118	33	1.306	4.44	6.850	2.283	2.291	0.639	0.700	6.849	2.283	45.11	45.12	8598	2624	6.713	4.753	-1.359	0.845	2.754	0.756	50.9
600S200-118	50	1.306	4.44	6.850	2.283	2.291	0.639	0.700	6.849	2.283	68.35	68.36	13027	3976	6.713	4.753	-1.359	0.845	2.754	0.756	40.9
800S137-33 ¹	33	0.387	1.32	3.197	0.799	2.873	0.073	0.435	2.828	0.629	12.44	10.71	474	474	0.155	0.957	-0.696	0.460	2.988	0.946	32.5
800S137-43	33	0.503	1.71	4.126	1.031	2.865	0.093	0.429	3.854	0.898	17.75	15.75	1053	1053	0.341	1.214	-0.686	0.454	2.977	0.947	32.2
800S137-54	33	0.628	2.13	5.121	1.280	2.856	0.113	0.424	4.921	1.181	23.34	21.79	2088	2088	0.670	1.478	-0.676	0.448	2.966	0.948	31.9
800S137-54	50	0.628	2.13	5.121	1.280	2.856	0.113	0.424	4.704	1.087	32.55	28.54	2088	2088	0.670	1.478	-0.676	0.448	2.966	0.948	25.9
800S137-68	33	0.786	2.67	6.361	1.590	2.845	0.136	0.417	6.281	1.551	30.64	30.03	4189	3373	1.331	1.789	-0.663	0.440	2.951	0.950	31.6
800S137-68	50	0.786	2.67	6.361	1.590	2.845	0.136	0.417	6.133	1.477	44.22	39.94	4189	3373	1.331	1.789	-0.663	0.440	2.951	0.950	25.6
800S137-97	33	1.106	3.76	8.808	2.202	2.823	0.178	0.402	8.804	2.201	43.49	43.51	8846	4944	3.812	2.349	-0.635	0.423	2.921	0.953	31.0
800S137-97	50	1.106	3.76	8.808	2.202	2.823	0.178	0.402	8.804	2.201	65.90	65.49	10888	6086	3.812	2.349	-0.635	0.423	2.921	0.953	25.1
800S137-118	33	1.337	4.54	10.51	2.630	2.805	0.204	0.390	10.51	2.629	51.94	51.97	11672	5303	6.873	2.694	-0.615	0.411	2.898	0.955	30.6
800S137-118	50	1.337	4.54	10.51	2.630	2.805	0.204	0.390	10.51	2.629	78.70	78.73	16239	7378	6.873	2.694	-0.615	0.411	2.898	0.955	24.6
800S162-33 ¹	33	0.413	1.41	3.581	0.895	2.943	0.125	0.550	3.196	0.716	14.15	12.61	474	474	0.165	1.630	-0.936	0.607	3.137	0.911	40.1
800S162-43	33	0.537	1.82	4.626	1.156	2.936	0.159	0.545	4.359	1.021	20.18	18.30	1053	1053	0.364	2.076	-0.926	0.601	3.127	0.912	39.8
800S162-54	33	0.670	2.28	5.747	1.437	2.929	0.195	0.539	5.550	1.336	26.40	25.04	2088	2088	0.716	2.539	-0.915	0.594	3.115	0.914	39.6
800S162-54	50	0.670	2.28	5.747	1.437	2.929	0.195	0.539	5.315	1.233	36.91	32.88	2088	2088	0.716	2.539	-0.915	0.594	3.115	0.914	32.1
800S162-68	33	0.839	2.85	7.147	1.787	2.919	0.238	0.532	7.069	1.746	34.51	34.12	4189	3373	1.422	3.093	-0.900	0.586	3.100	0.916	39.3
800S162-68	50	0.839	2.85	7.147	1.787	2.919	0.238	0.532	6.923	1.672	50.06	45.49	4189	3373	1.422	3.093	-0.900	0.586	3.100	0.916	31.8
800S162-97	33	1.182	4.02	9.923	2.481	2.898	0.316	0.517	9.920	2.480	49.01	49.02	8846	4944	4.075	4.114	-0.871	0.568	3.070	0.919	38.7
800S162-97	50	1.182	4.02	9.923	2.481	2.898	0.316	0.517	9.920	2.480	74.25	73.51	10888	6086	4.075	4.114	-0.871	0.568	3.070	0.919	31.3
800S162-118	33	1.430	4.86	11.87	2.969	2.882	0.366	0.506	11.87	2.968	58.65	58.67	11672	5303	7.352	4.766	-0.850	0.556	3.047	0.922	38.4
800S162-118	50	1.430	4.86	11.87	2.969	2.882	0.366	0.506	11.87	2.968	88.86	88.89	16239	7378	7.352	4.766	-0.850	0.556	3.047	0.922	31.0
800S200-33 ¹	33	0.448	1.52	4.095	1.024	3.023	0.227	0.712	3.600	0.819	16.18	14.52	474	474	0.179	2.971	-1.288	0.817	3.363	0.853	50.5
800S200-43	33	0.582	1.98	5.294	1.324	3.017	0.291	0.707	5.212	1.291	25.52	20.96	1053	1053	0.394	3.797	-1.277	0.811	3.352	0.855	50.3
800S200-54	33	0.727	2.47	6.584	1.646	3.010	0.358	0.702	6.582	1.646	32.52	28.53	2088	2088	0.776	4.663	-1.265	0.804	3.340	0.856	50.1
800S200-54	50	0.727	2.47	6.584	1.646	3.010	0.358	0.702	6.259	1.519	45.48	37.44	2088	2088	0.776	4.663	-1.265	0.804	3.340	0.856	40.6
800S200-68	33	0.910	3.10	8.198	2.050	3.001	0.439	0.694	8.196	2.049	40.49	38.71	4189	3373	1.543	5.712	-1.250	0.796	3.324	0.859	49.8
800S200-68	50	0.910	3.10	8.198	2.050	3.001	0.439	0.694	8.087	2.004	60.01	51.49	4189	3373	1.543	5.712	-1.250	0.796	3.324	0.859	40.4
800S200-97	33	1.284	4.36	11.41	2.85																

TABLE 3A—STRUCTURAL C-SHAPE STUD SECTION PROPERTIES⁴ (CONTINUED)

Section	F _y ⁶ (ksi)	Gross Properties							Effective Properties						Torsional Properties					L _u (in)	
		A _r	Wt.	I _x	S _x	R _x	I _y	R _y	I _{ex} ⁵	S _{ex}	M _{al}	M _{ad}	V _{ag}	V _{anet}	x1000	C _w	X _o	m	R _o		β
		(in ²)	(lb/ft)	(in ⁴)	(in ³)	(in)	(in ⁴)	(in)	(in ⁴)	(in ³)	(in-k)	(in-k)	(lb)	(lb)	(in ⁴)	(in ⁶)	(in)	(in)	(in)		
1000S162-68	50	0.982	3.34	12.41	2.483	3.556	0.250	0.504	11.61	2.169	64.93	56.78	3325	3325	1.664	5.121	-0.800	0.531	3.680	0.953	31.0
1000S162-97	33	1.385	4.71	17.29	3.459	3.534	0.332	0.490	17.28	3.458	68.33	68.36	8846	6555	4.776	6.827	-0.773	0.514	3.650	0.955	37.5
1000S162-97	50	1.385	4.71	17.29	3.459	3.534	0.332	0.490	16.92	3.311	99.13	94.37	9711	7196	4.776	6.827	-0.773	0.514	3.650	0.955	30.4
1000S162-118	33	1.678	5.71	20.75	4.150	3.517	0.385	0.479	20.74	4.149	81.98	82.01	13193	7961	8.629	7.924	-0.753	0.502	3.628	0.957	37.1
1000S162-118	50	1.678	5.71	20.75	4.150	3.517	0.385	0.479	20.74	4.149	124.2	123.8	16239	9799	8.629	7.924	-0.753	0.502	3.628	0.957	30.0
1000S200-43 ¹	33	0.672	2.28	9.074	1.815	3.675	0.308	0.677	8.183	1.477	29.19	26.12	837	837	0.455	6.236	-1.147	0.743	3.909	0.914	49.3
1000S200-54	33	0.840	2.86	11.29	2.259	3.667	0.379	0.671	10.63	1.991	39.34	35.93	1658	1658	0.897	7.665	-1.136	0.737	3.897	0.915	49.0
1000S200-54	50	0.840	2.86	11.29	2.259	3.667	0.379	0.671	9.752	1.720	51.48	46.70	1658	1658	0.897	7.665	-1.136	0.737	3.897	0.915	39.8
1000S200-68	33	1.053	3.58	14.08	2.817	3.657	0.465	0.664	13.59	2.618	51.73	49.40	3325	3325	1.784	9.401	-1.122	0.729	3.883	0.917	48.7
1000S200-68	50	1.053	3.58	14.08	2.817	3.657	0.465	0.664	13.07	2.431	72.79	64.93	3325	3325	1.784	9.401	-1.122	0.729	3.883	0.917	39.5
1000S200-97	33	1.487	5.06	19.66	3.933	3.637	0.627	0.649	19.65	3.932	77.69	77.72	8846	6555	5.126	12.67	-1.093	0.711	3.852	0.920	48.1
1000S200-97	50	1.487	5.06	19.66	3.933	3.637	0.627	0.649	19.29	3.782	113.2	106.5	9711	7196	5.126	12.67	-1.093	0.711	3.852	0.920	39.0
1000S200-118	33	1.802	6.13	23.63	4.727	3.621	0.734	0.638	23.62	4.725	93.37	93.41	13193	7961	9.267	14.84	-1.071	0.699	3.830	0.922	47.7
1000S200-118	50	1.802	6.13	23.63	4.727	3.621	0.734	0.638	23.62	4.725	141.4	139.2	16239	9799	9.267	14.84	-1.071	0.699	3.830	0.922	38.6
1200S162-54 ¹	33	0.897	3.05	15.75	2.626	4.192	0.212	0.487	14.17	2.131	42.11	36.45	1376	1376	0.957	6.340	-0.732	0.493	4.284	0.971	37.5
1200S162-54 ¹	50	0.897	3.05	15.75	2.626	4.192	0.212	0.487	13.50	1.955	58.52	46.85	1376	1376	0.957	6.340	-0.732	0.493	4.284	0.971	30.5
1200S162-68	33	1.124	3.82	19.65	3.275	4.181	0.259	0.480	18.26	2.835	56.02	51.31	2757	2757	1.905	7.739	-0.720	0.485	4.269	0.972	37.2
1200S162-68	50	1.124	3.82	19.65	3.275	4.181	0.259	0.480	17.73	2.676	80.11	66.60	2757	2757	1.905	7.739	-0.720	0.485	4.269	0.972	30.2
1200S162-97	33	1.589	5.40	27.44	4.574	4.156	0.344	0.465	26.83	4.378	86.50	85.36	8042	7424	5.477	10.33	-0.695	0.470	4.240	0.973	36.4
1200S162-97	50	1.589	5.40	27.44	4.574	4.156	0.344	0.465	26.07	4.137	123.8	113.3	8042	7424	5.477	10.33	-0.695	0.470	4.240	0.973	29.5
1200S162-118	33	1.927	6.55	32.98	5.498	4.138	0.398	0.455	32.97	5.495	108.5	108.6	13193	9928	9.906	12.00	-0.677	0.459	4.217	0.974	35.9
1200S162-118	50	1.927	6.55	32.98	5.498	4.138	0.398	0.455	32.24	5.258	157.4	151.1	14704	11065	9.906	12.00	-0.677	0.459	4.217	0.974	29.1
1200S200-54 ¹	33	0.953	3.24	17.69	2.948	4.308	0.394	0.643	16.13	2.447	48.34	42.54	1376	1376	1.018	11.55	-1.032	0.681	4.476	0.947	48.0
1200S200-54 ¹	50	0.953	3.24	17.69	2.948	4.308	0.394	0.643	14.77	2.112	63.24	54.83	1376	1376	1.018	11.55	-1.032	0.681	4.476	0.947	39.0
1200S200-68	33	1.196	4.07	22.08	3.680	4.297	0.484	0.636	20.71	3.233	63.89	59.19	2757	2757	2.026	14.17	-1.019	0.673	4.462	0.948	47.7
1200S200-68	50	1.196	4.07	22.08	3.680	4.297	0.484	0.636	19.85	2.990	89.51	77.03	2757	2757	2.026	14.17	-1.019	0.673	4.462	0.948	38.7
1200S200-97	33	1.690	5.75	30.89	5.149	4.275	0.653	0.622	30.29	4.949	97.80	96.94	8042	7424	5.828	19.15	-0.991	0.656	4.432	0.950	47.0
1200S200-97	50	1.690	5.75	30.89	5.149	4.275	0.653	0.622	29.54	4.705	140.8	128.8	8042	7424	5.828	19.15	-0.991	0.656	4.432	0.950	38.1
1200S200-118	33	2.051	6.97	37.18	6.198	4.258	0.765	0.611	37.17	6.196	122.4	122.4	13193	9928	10.54	22.45	-0.971	0.644	4.410	0.952	46.5
1200S200-118	50	2.051	6.97	37.18	6.198	4.258	0.765	0.611	36.45	5.954	178.2	170.7	14704	11065	10.54	22.45	-0.971	0.644	4.410	0.952	37.7
1400S162-54 ¹	33	1.010	3.43	23.34	3.334	4.808	0.218	0.465	20.30	2.545	50.29	40.94	1175	1175	1.078	8.980	-0.667	0.454	4.876	0.981	36.6
1400S162-54 ¹	50	1.010	3.43	23.34	3.334	4.808	0.218	0.465	19.34	2.336	69.94	52.23	1175	1175	1.078	8.980	-0.667	0.454	4.876	0.981	29.7
1400S162-68	33	1.267	4.31	29.13	4.162	4.796	0.266	0.458	26.21	3.393	67.05	58.34	2354	2354	2.147	10.96	-0.656	0.447	4.862	0.982	36.2
1400S162-68	50	1.267	4.31	29.13	4.162	4.796	0.266	0.458	25.42	3.197	95.72	75.05	2354	2354	2.147	10.96	-0.656	0.447	4.862	0.982	29.4
1400S162-97	33	1.792	6.09	40.76	5.824	4.770	0.353	0.444	38.83	5.303	104.7	99.30	6863	6863	6.178	14.65	-0.632	0.433	4.832	0.983	35.4
1400S162-97	50	1.792	6.09	40.76	5.824	4.770	0.353	0.444	37.55	4.972	148.8	130.0	6863	6863	6.178	14.65	-0.632	0.433	4.832	0.983	28.7
1400S162-118	33	2.175	7.39	49.07	7.011	4.750	0.409	0.434	48.18	6.769	133.7	132.1	12541	11307	11.18	17.03	-0.615	0.422	4.809	0.984	34.8
1400S162-118	50	2.175	7.39	49.07	7.011	4.750	0.409	0.434	46.71	6.376	190.9	175.7	12541	11307	11.18	17.03	-0.615	0.422	4.809	0.984	28.2
1400S200-54 ¹	33	1.066	3.63	25.99	3.713	4.937	0.407	0.618	23.01	2.913	57.56	48.26	1175	1175	1.139	16.35	-0.947	0.633	5.065	0.965	47.0
1400S200-54 ¹	50	1.066	3.63	25.99	3.713	4.937	0.407	0.618	21.07	2.520	75.43	61.78	1175	1175	1.139	16.35	-0.947	0.633	5.065	0.965	38.2
1400S200-68	33	1.338	4.55	32.46	4.638	4.926	0.499	0.611	29.59	3.859	76.25	67.89	2354	2354	2.268	20.08	-0.934	0.625	5.050	0.966	46.7
1400S200-68	50	1.338	4.55	32.46	4.638	4.926	0.499	0.611	28.32	3.562	106.6	87.61	2354	2354	2.268	20.08	-0.934	0.625	5.050	0.966	37.9
1400S200-97	33	1.894	6.44	45.50	6.500	4.902	0.673	0.596	43.59	5.971	117.9	113.5	6863	6863	6.529	27.15	-0.908	0.609	5.021	0.967	45.9
1400S200-97	50	1.894	6.44	45.50	6.500	4.902	0.673	0.596	42.34	5.637	168.7	149.1	6863	6863	6.529	27.15	-0.908	0.609	5.021	0.967	37.2
1400S200-118	33	2.299	7.82	54.84	7.835	4.884	0.788	0.586	53.96	7.589	149.9	149.8	12541	11307	11.82	31.86	-0.890	0.598	4.999	0.968	45.4
1400S200-118	50	2.299	7.82	54.84	7.835	4.884	0.788	0.586	52.51	7.190	215.2	199.8	12541	11307	11.82	31.86	-0.890	0.598	4.999	0.968	36.8
1400S250-54 ¹	33	1.123	3.82	28.74	4.106	5.059	0.708	0.794	24.18	2.981	58.90	52.17	1175	1175	1.199	27.67	-1.272	0.835	5.277	0.942	58.6
1400S250-54 ¹	50	1.123	3.82	28.74	4.106	5.059	0.708	0.794	22.33	2.616	78.32	66.69	1175	1175	1.199	27.67	-1.272	0.835	5.277	0.942	47.6
1400S250-68	33	1.410	4.79	35.92	5.132	5.049	0.873	0.787	32.30	4.181	82.62	73.21	2354	2354	2.389	34.11	-1.258	0.827	5.262	0.943	58.2
1400S250-68	50	1.410	4.79	35.92	5.132	5.049	0.873	0.787	29.45	3.591	107.5	94.29	2354	2354	2.389	34.11	-1.258	0.827	5.262	0.943	47.3
1400S250-97	33	1.995	6.78	50.41	7.202	5.026	1.189	0.772	48.52	6.664	131.6	122.2	6863	6863	6.880	46.52	-1.231	0.811	5.232	0.945	57.5
1400S250-97	50	1.995	6.78	50.41	7.202	5.026	1.189	0.772	45.90	6.03											

TABLE 3B—NONSTRUCTURAL C-SHAPE STUD SECTION PROPERTIES⁴

Section	F _y ⁶ (ksi)	Gross Properties							Effective Properties						Torsional Properties						L _u (in)
		A _r	Wt.	I _x	S _x	R _x	I _y	R _y	I _{ex} ⁵	S _{ex}	M _{al}	M _{ad}	V _{ag}	V _{anet}	x1000	C _w	X _o	m	R _o	β	
		(in ²)	(lb/ft)	(in ⁴)	(in ³)	(in)	(in ⁴)	(in)	(in ⁴)	(in ³)	(in-k)	(in-k)	(lb)	(lb)	(in ⁴)	(in ⁶)	(in)	(in)	(in)		
162S125-18	33	0.080	0.27	0.038	0.047	0.687	0.016	0.448	0.031	0.033	0.66	0.66	302	101	0.009	0.009	-1.030	0.594	1.316	0.388	29.0
162S125-27	33	0.120	0.41	0.056	0.069	0.682	0.023	0.443	0.049	0.055	1.09	1.14	494	107	0.032	0.013	-1.018	0.587	1.303	0.390	29.1
162S125-30	33	0.131	0.45	0.061	0.075	0.681	0.026	0.441	0.055	0.063	1.24	1.29	543	106	0.043	0.014	-1.014	0.585	1.299	0.390	29.2
162S125-33	33	0.145	0.49	0.067	0.082	0.679	0.028	0.440	0.062	0.072	1.41	1.48	599	104	0.058	0.016	-1.010	0.583	1.294	0.391	29.3
250S125-18	33	0.097	0.33	0.100	0.080	1.015	0.019	0.440	0.083	0.060	1.18	1.03	257	196	0.011	0.023	-0.904	0.543	1.428	0.599	29.0
250S125-27	33	0.144	0.49	0.147	0.118	1.010	0.027	0.435	0.131	0.098	1.93	1.83	685	344	0.039	0.034	-0.893	0.537	1.416	0.602	28.9
250S125-30	33	0.159	0.54	0.161	0.129	1.008	0.030	0.433	0.146	0.110	2.18	2.09	833	378	0.052	0.037	-0.890	0.535	1.413	0.603	28.9
250S125-33	33	0.176	0.60	0.178	0.142	1.006	0.033	0.431	0.165	0.125	2.48	2.41	973	397	0.070	0.040	-0.886	0.532	1.408	0.604	28.9
250S125-43	33	0.226	0.77	0.227	0.181	1.001	0.041	0.426	0.222	0.176	3.47	3.42	1257	388	0.154	0.050	-0.873	0.526	1.395	0.608	28.9
250S125-54	33	0.281	0.96	0.278	0.223	0.995	0.049	0.420	0.275	0.218	4.31	4.40	1562	378	0.300	0.060	-0.860	0.518	1.380	0.612	29.0
250S125-54	50	0.281	0.96	0.278	0.223	0.995	0.049	0.420	0.269	0.211	6.30	6.19	2366	573	0.300	0.060	-0.860	0.518	1.380	0.612	23.3
250S125-68	33	0.349	1.19	0.340	0.272	0.987	0.059	0.412	0.340	0.272	5.37	5.37	1941	366	0.591	0.072	-0.842	0.508	1.361	0.617	29.3
250S125-68	50	0.349	1.19	0.340	0.272	0.987	0.059	0.412	0.337	0.268	8.02	8.14	2941	554	0.591	0.072	-0.842	0.508	1.361	0.617	23.3
300S125-18	33	0.106	0.36	0.151	0.101	1.193	0.020	0.432	0.127	0.077	1.52	1.25	211	135	0.013	0.035	-0.848	0.518	1.526	0.691	28.9
300S125-27	33	0.159	0.54	0.224	0.149	1.188	0.029	0.427	0.200	0.125	2.47	2.24	685	288	0.042	0.051	-0.837	0.512	1.514	0.695	28.8
300S125-30	33	0.174	0.59	0.245	0.164	1.186	0.032	0.425	0.223	0.141	2.78	2.56	833	316	0.057	0.056	-0.833	0.510	1.511	0.696	28.8
300S125-33	33	0.193	0.66	0.270	0.180	1.184	0.035	0.424	0.251	0.160	3.16	2.96	1024	349	0.077	0.061	-0.829	0.508	1.507	0.697	28.7
300S125-43	33	0.249	0.85	0.346	0.231	1.178	0.044	0.418	0.339	0.223	4.41	4.25	1536	395	0.169	0.076	-0.817	0.501	1.494	0.701	28.7
300S125-54	33	0.309	1.05	0.425	0.283	1.172	0.052	0.412	0.420	0.278	5.49	5.60	1912	384	0.330	0.092	-0.804	0.494	1.480	0.705	28.7
300S125-68	50	0.385	1.31	0.521	0.347	1.164	0.063	0.404	0.516	0.342	10.24	10.40	3610	563	0.652	0.109	-0.787	0.484	1.462	0.710	23.0
350S125-18	33	0.116	0.39	0.216	0.123	1.367	0.021	0.424	0.183	0.096	1.89	1.47	179	159	0.014	0.050	-0.798	0.495	1.639	0.763	28.8
350S125-27	33	0.173	0.59	0.320	0.183	1.361	0.030	0.419	0.288	0.155	3.06	2.65	614	359	0.046	0.073	-0.788	0.489	1.628	0.766	28.7
350S125-30	33	0.190	0.65	0.351	0.201	1.360	0.033	0.417	0.321	0.174	3.45	3.05	824	435	0.062	0.079	-0.784	0.488	1.624	0.767	28.6
350S125-33	33	0.210	0.71	0.387	0.221	1.358	0.036	0.415	0.361	0.198	3.91	3.53	1024	486	0.084	0.087	-0.781	0.485	1.620	0.768	28.6
350S125-43	33	0.272	0.92	0.496	0.283	1.351	0.046	0.410	0.487	0.275	5.43	5.10	1740	626	0.184	0.109	-0.769	0.479	1.608	0.771	28.5
350S125-54	33	0.338	1.15	0.610	0.349	1.345	0.055	0.404	0.603	0.342	6.76	6.89	2262	640	0.361	0.131	-0.756	0.472	1.594	0.775	28.4
350S125-54	50	0.338	1.15	0.610	0.349	1.345	0.055	0.404	0.592	0.332	9.94	9.29	3373	954	0.361	0.131	-0.756	0.472	1.594	0.775	22.9
350S125-68	33	0.420	1.43	0.750	0.429	1.336	0.066	0.396	0.750	0.428	8.47	8.47	2824	623	0.712	0.156	-0.739	0.462	1.577	0.780	28.3
350S125-68	50	0.420	1.43	0.750	0.429	1.336	0.066	0.396	0.743	0.422	12.64	12.74	4278	944	0.712	0.156	-0.739	0.462	1.577	0.780	22.8
362S125-18	33	0.118	0.40	0.234	0.129	1.410	0.021	0.422	0.188	0.090	1.78	1.53	172	164	0.014	0.054	-0.787	0.490	1.669	0.778	28.8
362S125-27	33	0.176	0.60	0.347	0.192	1.404	0.031	0.417	0.313	0.163	3.22	2.76	591	370	0.047	0.079	-0.776	0.484	1.658	0.781	28.6
362S125-30	33	0.194	0.66	0.381	0.210	1.402	0.033	0.415	0.349	0.183	3.62	3.17	794	449	0.063	0.086	-0.773	0.482	1.654	0.782	28.6
362S125-33	33	0.214	0.73	0.420	0.232	1.400	0.037	0.413	0.392	0.208	4.11	3.67	1024	520	0.086	0.094	-0.769	0.480	1.650	0.783	28.5
362S125-43	33	0.277	0.94	0.539	0.297	1.394	0.046	0.408	0.529	0.288	5.70	5.32	1740	671	0.188	0.118	-0.758	0.474	1.638	0.786	28.4
362S125-54	33	0.345	1.17	0.663	0.366	1.387	0.056	0.401	0.656	0.359	7.10	7.22	2350	713	0.368	0.142	-0.745	0.466	1.625	0.790	28.3
362S125-54	50	0.345	1.17	0.663	0.366	1.387	0.056	0.401	0.643	0.348	10.43	9.69	3373	1023	0.368	0.142	-0.745	0.466	1.625	0.790	22.8
362S125-68	33	0.429	1.46	0.815	0.450	1.378	0.066	0.393	0.815	0.450	8.89	8.89	2934	695	0.727	0.170	-0.729	0.457	1.608	0.795	28.2
362S125-68	50	0.429	1.46	0.815	0.450	1.378	0.066	0.393	0.808	0.443	13.27	13.31	4445	1054	0.727	0.170	-0.729	0.457	1.608	0.795	22.7
400S125-18 ¹	33	0.125	0.43	0.295	0.148	1.537	0.022	0.415	0.232	0.099	1.97	1.69	155	155	0.015	0.068	-0.755	0.475	1.762	0.816	28.7
400S125-27	33	0.187	0.64	0.438	0.219	1.531	0.031	0.410	0.396	0.187	3.70	3.07	533	398	0.050	0.098	-0.745	0.469	1.751	0.819	28.5
400S125-30	33	0.206	0.70	0.481	0.240	1.529	0.034	0.409	0.441	0.211	4.16	3.53	715	484	0.067	0.108	-0.742	0.467	1.748	0.820	28.5
400S125-33	33	0.227	0.77	0.530	0.265	1.527	0.038	0.407	0.496	0.239	4.71	4.10	977	594	0.091	0.118	-0.738	0.465	1.744	0.821	28.4
400S125-43	33	0.294	1.00	0.680	0.340	1.521	0.047	0.401	0.668	0.330	6.53	5.97	1740	804	0.199	0.148	-0.726	0.459	1.732	0.824	28.2
400S125-54	33	0.366	1.24	0.838	0.419	1.513	0.057	0.395	0.829	0.412	8.13	8.15	2612	953	0.391	0.178	-0.714	0.452	1.719	0.828	28.1
400S125-54	50	0.366	1.24	0.838	0.419	1.513	0.057	0.395	0.814	0.400	11.97	10.91	3373	1230	0.391	0.178	-0.714	0.452	1.719	0.828	22.7
400S125-68	33	0.456	1.55	1.032	0.516	1.504	0.068	0.387	1.031	0.516	10.19	10.19	3265	933	0.773	0.213	-0.698	0.443	1.703	0.832	28.0
400S125-68	50	0.456	1.55	1.032	0.516	1.504	0.068	0.387	1.022	0.509	15.23	15.06	4946	1413	0.773	0.213	-0.698	0.443	1.703	0.832	22.5
550S125-18 ²	33	0.153	0.52	0.632	0.230	2.030	0.023	0.391	0.466	0.136	2.69	2.30	111	111	0.018	0.141	-0.651	0.423	2.168	0.910	28.2
550S125-27	33	0.229	0.78	0.939	0.342	2.024	0.034	0.385	0.781	0.248	4.90	4.27	382	382	0.061	0.205	-0.642	0.417	2.158	0.912	27.9
550S125-30	33	0.252	0.86	1.032	0.375	2.022	0.037	0.384	0.885	0.287	5.68	4.95	512	512	0.082	0.224	-0.639	0.416	2.155	0.912	27.9
550S125-33	33	0.279	0.95	1.139	0.414	2.019	0.041	0.382	1.011	0.336	6.64	5.79	699	699	0.111	0.246	-0.636	0.414	2.151	0.913	27.8
550S125-43	33	0.362	1.23	1.464	0.532	2.012	0.051	0.377	1.413	0.499	9.85	8.60	1554	1197	0.245	0.309	-0.625	0.408	2.140	0.915	27.6
550S125-54	33	0.451	1.53	1.810	0.658	2.004	0.062	0.370	1.791	0.648	12.80	11.97	2740	1672	0.481	0.374	-0.614	0.40			

TABLE 3B—NONSTRUCTURAL C-SHAPE STUD SECTION PROPERTIES⁴ (CONTINUED)

Section	F _y ⁶ (ksi)	Gross Properties							Effective Properties						Torsional Properties					L _u (in)	
		A _r	Wt.	I _x	S _x	R _x	I _y	R _y	I _{ex} ⁵	S _{ex}	M _{al}	M _{ad}	V _{ag}	V _{anet}	C _w	X _o	m	R _o	β		
		(in ²)	(lb/ft)	(in ⁴)	(in ³)	(in)	(in ⁴)	(in)	(in ⁴)	(in ³)	(in-k)	(in-k)	(lb)	(lb)	(in ⁴)	(in ⁶)	(in)	(in)	(in)		(in)
600S125-43	33	0.384	1.31	1.813	0.604	2.172	0.052	0.369	1.729	0.553	10.93	9.45	1419	1239	0.261	0.379	-0.598	0.393	2.282	0.931	27.3
600S125-54	33	0.479	1.63	2.242	0.747	2.163	0.063	0.363	2.207	0.728	14.38	13.23	2740	1896	0.512	0.457	-0.587	0.386	2.271	0.933	27.1
600S125-54	50	0.479	1.63	2.242	0.747	2.163	0.063	0.363	2.121	0.677	20.26	17.41	2816	1949	0.512	0.457	-0.587	0.386	2.271	0.933	21.9
600S125-68	33	0.599	2.04	2.773	0.924	2.152	0.075	0.355	2.772	0.924	18.26	18.26	4348	2371	1.014	0.549	-0.573	0.378	2.255	0.936	26.8
600S125-68	50	0.599	2.04	2.773	0.924	2.152	0.075	0.355	2.744	0.909	27.20	24.65	5352	2919	1.014	0.549	-0.573	0.378	2.255	0.936	21.6
800S125-33 ¹	33	0.366	1.24	2.881	0.720	2.806	0.044	0.347	2.392	0.516	10.19	8.22	474	474	0.146	0.583	-0.519	0.350	2.875	0.967	26.6
800S125-43	33	0.475	1.61	3.714	0.929	2.798	0.055	0.342	3.374	0.774	15.30	12.55	1053	1053	0.322	0.735	-0.510	0.344	2.864	0.968	26.3
800S125-54	33	0.592	2.01	4.605	1.151	2.788	0.067	0.336	4.355	1.036	20.47	17.93	2088	2088	0.633	0.890	-0.500	0.338	2.853	0.969	26.0
800S125-54	50	0.592	2.01	4.605	1.151	2.788	0.067	0.336	4.150	0.950	28.45	23.26	2088	2088	0.633	0.890	-0.500	0.338	2.853	0.969	21.1
800S125-68	33	0.741	2.52	5.712	1.428	2.776	0.080	0.328	5.632	1.389	27.45	25.49	4189	3373	1.256	1.069	-0.487	0.330	2.838	0.971	25.7
800S125-68	50	0.741	2.52	5.712	1.428	2.776	0.080	0.328	5.436	1.300	38.92	33.59	4189	3373	1.256	1.069	-0.487	0.330	2.838	0.971	20.8

For SI: 1 inch = 25.4mm, 1 pound = 4.4482 N.

¹Web height-to-thickness ratio, h/t, exceeds 200 but is less than 260. Web must have bearing stiffeners at all support points and concentrated loads in accordance with AISI S100. No holes or punch-outs are permitted in the web at these locations.

²Web height-to-thickness ratio, h/t, exceeds 260 but is less than 300. Bearing and intermediate stiffeners must be provided in accordance with AISI S100.

³Web height-to-thickness ratio, h/t, exceeds 300. Allowable design values are outside the scope of this evaluation report and may be determined in accordance with Section B4.2 of AISI S100.

⁴All properties are based on the full-unreduced cross section of the studs, away from web punch-outs, except for V_{anet}.

⁵Use the effective moment of inertia for deflection calculations. The calculated deflection will be for studs without punch-outs.

⁶Values for members with F_y=33ksi apply to members made from Q235 steel. Values for members with F_y=50ksi apply to members made from Q345 and S350GD steels.

TABLE 4—U-SHAPE TRACK SECTION PROPERTIES

Section	Gross Properties							33 ksi Effective Properties ⁴				50 ksi Effective Properties ⁵				Torsional Properties					
	A _r	W _t	I _x (in ⁴)	S _x (in ³)	R _x (in)	I _y (in ⁴)	R _y (in)	I _{ex} ³ (in ⁴)	S _{ex} (in ³)	M _{al} (in-k)	V _{ag} (lb)	I _{ex} ³ (in ⁴)	S _{ex} (in ³)	M _{al} (in-k)	V _{ag} (lb)	J _{x1000} (in ⁴)	C _w (in ⁶)	X _o (in)	m (in)	R _o (in)	β
162T125-18 ²	0.078	0.26	0.042	0.048	0.731	0.013	0.411	-	-	-	-	-	-	-	0.009	0.007	-0.877	0.504	1.214	0.478	
162T125-27	0.117	0.40	0.063	0.072	0.735	0.020	0.410	0.046	0.044	0.87	542	-	-	-	0.031	0.010	-0.872	0.501	1.211	0.482	
162T125-30	0.129	0.44	0.070	0.079	0.735	0.022	0.409	0.052	0.050	1.00	597	-	-	-	0.042	0.012	-0.870	0.500	1.210	0.483	
162T125-33	0.143	0.48	0.077	0.087	0.737	0.024	0.408	0.060	0.058	1.15	662	-	-	-	0.057	0.013	-0.868	0.499	1.210	0.485	
250T125-18 ²	0.094	0.32	0.104	0.079	1.050	0.015	0.400	-	-	-	-	-	-	-	0.011	0.018	-0.768	0.460	1.361	0.682	
250T125-27	0.141	0.48	0.157	0.119	1.053	0.022	0.398	0.120	0.079	1.56	685	-	-	-	0.038	0.027	-0.763	0.457	1.360	0.685	
250T125-30	0.156	0.53	0.173	0.131	1.053	0.025	0.397	0.135	0.090	1.77	833	-	-	-	0.051	0.030	-0.762	0.456	1.359	0.686	
250T125-33	0.173	0.59	0.192	0.145	1.054	0.027	0.397	0.154	0.103	2.04	1024	-	-	-	0.069	0.033	-0.760	0.455	1.359	0.687	
250T125-43	0.225	0.77	0.252	0.189	1.057	0.035	0.395	0.216	0.148	2.93	1351	-	-	-	0.153	0.043	-0.755	0.453	1.357	0.691	
250T125-54	0.282	0.96	0.317	0.236	1.060	0.043	0.392	0.288	0.202	4.00	1696	0.274	0.188	5.62	2570	0.301	0.054	-0.749	0.449	1.356	0.695
250T125-68	0.355	1.21	0.402	0.295	1.064	0.054	0.390	0.386	0.277	5.47	2136	0.369	0.257	7.71	3237	0.602	0.067	-0.742	0.445	1.354	0.700
250T125-97	0.505	1.72	0.580	0.417	1.072	0.074	0.384	0.581	0.417	8.25	3047	0.577	0.414	12.38	4617	1.742	0.095	-0.727	0.437	1.351	0.710
250T150-27	0.156	0.53	0.181	0.137	1.078	0.037	0.486	0.128	0.081	1.61	685	0.122	0.076	2.28	833	0.042	0.044	-0.977	0.575	1.534	0.594
250T150-30	0.172	0.58	0.200	0.151	1.079	0.040	0.486	0.145	0.093	1.84	833	-	-	-	0.056	0.049	-0.975	0.574	1.533	0.595	
250T150-33	0.190	0.65	0.222	0.167	1.080	0.045	0.485	0.166	0.107	2.11	1024	-	-	-	0.076	0.054	-0.973	0.573	1.532	0.597	
250T150-43	0.248	0.84	0.290	0.218	1.083	0.058	0.483	0.233	0.154	3.05	1351	-	-	-	0.168	0.070	-0.968	0.570	1.530	0.600	
250T150-54	0.311	1.06	0.366	0.272	1.086	0.072	0.481	0.314	0.213	4.20	1696	0.297	0.196	5.86	2570	0.332	0.088	-0.962	0.567	1.528	0.604
250T150-68	0.391	1.33	0.465	0.341	1.090	0.089	0.478	0.424	0.294	5.81	2136	0.402	0.271	8.11	3237	0.662	0.111	-0.954	0.563	1.526	0.609
250T150-97	0.556	1.89	0.672	0.483	1.099	0.124	0.472	0.668	0.478	9.45	3047	0.639	0.445	13.33	4617	1.917	0.158	-0.938	0.554	1.521	0.619
250T200-33	0.225	0.76	0.281	0.212	1.118	0.097	0.658	0.166	0.113	2.23	1024	-	-	-	0.090	0.118	-1.418	0.813	1.922	0.456	
250T200-43	0.293	1.00	0.368	0.276	1.121	0.126	0.657	0.263	0.164	3.23	1351	-	-	-	0.199	0.154	-1.412	0.810	1.919	0.458	
250T200-54	0.367	1.25	0.465	0.345	1.125	0.157	0.654	0.356	0.227	4.49	1696	0.335	0.208	6.22	2570	0.392	0.194	-1.406	0.806	1.916	0.462
250T200-68	0.462	1.57	0.590	0.433	1.130	0.196	0.652	0.487	0.318	6.29	2136	0.457	0.290	8.69	3237	0.783	0.245	-1.398	0.802	1.912	0.466
250T200-97	0.658	2.24	0.854	0.614	1.140	0.275	0.646	0.785	0.534	10.56	3047	0.741	0.488	14.60	4617	2.268	0.352	-1.381	0.793	1.903	0.474
300T125-18 ²	0.103	0.35	0.155	0.099	1.224	0.016	0.391	-	-	-	-	-	-	-	0.012	0.027	-0.718	0.438	1.472	0.762	
300T125-27	0.156	0.53	0.234	0.149	1.226	0.024	0.389	0.182	0.102	2.02	685	-	-	-	0.042	0.041	-0.713	0.435	1.471	0.765	
300T125-30	0.172	0.58	0.258	0.164	1.227	0.026	0.389	0.205	0.116	2.29	833	-	-	-	0.056	0.045	-0.712	0.435	1.471	0.766	
300T125-33	0.190	0.65	0.287	0.182	1.228	0.029	0.388	0.233	0.133	2.62	1024	-	-	-	0.076	0.049	-0.710	0.434	1.471	0.767	
300T125-43	0.248	0.84	0.375	0.237	1.230	0.037	0.386	0.324	0.189	3.74	1630	-	-	-	0.168	0.064	-0.706	0.431	1.470	0.770	
300T125-54	0.311	1.06	0.472	0.296	1.233	0.046	0.384	0.431	0.257	5.07	2046	0.412	0.239	7.17	3100	0.332	0.080	-0.700	0.428	1.469	0.773
300T125-68	0.391	1.33	0.598	0.371	1.237	0.057	0.381	0.575	0.349	6.90	2578	0.551	0.326	9.77	3905	0.662	0.101	-0.693	0.424	1.468	0.777
300T125-97	0.556	1.89	0.860	0.524	1.244	0.078	0.375	0.860	0.524	10.36	3677	0.856	0.520	15.56	5571	1.917	0.142	-0.679	0.416	1.466	0.785
300T150-27	0.170	0.58	0.268	0.171	1.257	0.039	0.479	0.195	0.106	2.09	685	-	-	-	0.045	0.066	-0.919	0.551	1.629	0.682	
300T150-30	0.187	0.64	0.296	0.188	1.258	0.043	0.478	0.220	0.120	2.37	833	-	-	-	0.061	0.073	-0.918	0.550	1.629	0.682	
300T150-33	0.207	0.71	0.329	0.209	1.259	0.047	0.477	0.250	0.138	2.72	1024	-	-	-	0.083	0.081	-0.916	0.549	1.628	0.683	
300T150-43	0.270	0.92	0.430	0.271	1.261	0.061	0.475	0.350	0.197	3.90	1630	-	-	-	0.183	0.105	-0.911	0.546	1.627	0.687	
300T150-54	0.339	1.15	0.542	0.340	1.265	0.076	0.473	0.468	0.269	5.32	2046	0.444	0.250	7.48	3100	0.362	0.132	-0.905	0.543	1.625	0.690
300T150-68	0.426	1.45	0.686	0.426	1.268	0.094	0.470	0.628	0.370	7.32	2578	0.598	0.343	10.27	3905	0.723	0.166	-0.898	0.539	1.624	0.694
300T150-97	0.607	2.06	0.989	0.603	1.276	0.131	0.465	0.983	0.597	11.79	3677	0.942	0.558	16.71	5571	2.092	0.235	-0.883	0.531	1.620	0.703
300T200-33	0.242	0.82	0.412	0.262	1.305	0.103	0.653	0.280	0.145	2.87	1024	-	-	-	0.097	0.177	-1.348	0.786	1.987	0.540	
300T200-43	0.315	1.07	0.540	0.341	1.309	0.134	0.651	0.393	0.209	4.13	1630	-	-	-	0.214	0.230	-1.342	0.783	1.985	0.543	
300T200-54	0.395	1.34	0.681	0.427	1.312	0.167	0.649	0.530	0.288	5.69	2046	0.500	0.265	7.94	3100	0.422	0.289	-1.336	0.779	1.982	0.546
300T200-68	0.498	1.69	0.863	0.536	1.317	0.208	0.647	0.718	0.400	7.91	2578	0.678	0.367	10.99	3905	0.843	0.365	-1.328	0.775	1.979	0.550
300T200-97	0.709	2.41	1.246	0.759	1.326	0.291	0.641	1.149	0.665	13.14	3677	1.088	0.610	18.27	5571	2.443	0.521	-1.312	0.766	1.972	0.558
350T125-18 ²	0.113	0.38	0.219	0.121	1.394	0.017	0.382	-	-	-	-	-	-	-	0.013	0.038	-0.675	0.418	1.595	0.821	
350T125-27	0.170	0.58	0.331	0.182	1.396	0.025	0.381	0.261	0.128	2.53	590	0.252	0.121	3.63	590	0.045	0.057	-0.671	0.416	1.595	0.823
350T125-30	0.187	0.64	0.365	0.200	1.397	0.027	0.380	0.294	0.145	2.86	790	-	-	-	0.061	0.063	-0.669	0.415	1.595	0.824	
350T125-33	0.207	0.71	0.405	0.222	1.397	0.030	0.379	0.334	0.166	3.27	1024	-	-	-	0.083	0.070	-0.668	0.414	1.594	0.825	
350T125-43	0.270	0.92	0.529	0.289	1.400	0.038	0.377	0.462	0.234	4.63	1740	-	-	-	0.183	0.091	-0.663	0.411	1.594	0.827	
350T125-54	0.339	1.15	0.666	0.361	1.402	0.048	0.375	0.611	0.316	6.24	2396	0.585	0.296	8.86	3373	0.362	0.113	-0.658	0.408	1.594	0.830
350T125-68	0.426	1.45	0.842	0.453	1.405	0.059	0.372	0.812	0.427	8.45	3019	0.779	0.401	12.01	4574	0.723	0.142	-0.651	0.405	1.593	0.833
350T125-97	0.607	2.06	1.210	0.640	1.412	0.082	0.367	1.209	0.640	12.64	4306	1.203	0.635	19.00	6524	2.092	0.199	-0.638	0.397	1.592	0.839
350T150-27	0.184	0.63	0.377	0.207	1.431	0.041	0.470	0.279	0.132	2.62	590	-	-	-	0.049	0.094	-0.869	0.529	1.739	0.750	
350T150-30	0.203	0.69	0.416	0.228	1.432	0.045	0.470	0.315	0.150	2.97	790	-	-	-	0.066	0.103	-0.867	0.528	1.739	0.751	
350T150-33	0.225	0.76	0.462	0.253	1.433	0.049	0.469	0.357	0.172	3.39	1024	-	-	-	0.090	0.115	-0.866	0.527	1.739	0.752	
350T150-43	0.293	1.00	0.603	0.329	1.436	0.064	0.467	0.497	0.244	4.82</											

TABLE 4—U-SHAPE TRACK SECTION PROPERTIES (CONTINUED)

Section	Gross Properties							33 ksi Effective Properties ⁴				50 ksi Effective Properties ⁵				Torsional Properties					
	A _r	W _t	I _x (in ⁴)	S _x (in ³)	R _x (in)	I _y (in ⁴)	R _y (in)	I _{ex} ³ (in ⁴)	S _{ex} (in ³)	M _{al} (in-k)	V _{ag} (lb)	I _{ex} ³ (in ⁴)	S _{ex} (in ³)	M _{al} (in-k)	V _{ag} (lb)	Jx1000 (in ⁴)	C _w (in ⁶)	X _o (in)	m (in)	R _o (in)	β
362T125-27	0.173	0.59	0.358	0.191	1.438	0.025	0.378	0.284	0.135	2.66	569	-	-	-	-	0.046	0.062	-0.661	0.411	1.627	0.835
362T125-30	0.191	0.65	0.395	0.210	1.438	0.027	0.378	0.320	0.153	3.01	762	-	-	-	-	0.062	0.068	-0.659	0.410	1.627	0.836
362T125-33	0.212	0.72	0.439	0.233	1.439	0.030	0.377	0.362	0.174	3.44	1024	-	-	-	-	0.085	0.076	-0.658	0.409	1.627	0.836
362T125-43	0.276	0.94	0.573	0.302	1.441	0.039	0.375	0.501	0.246	4.86	1740	-	-	-	-	0.187	0.098	-0.653	0.407	1.626	0.839
362T125-54	0.346	1.18	0.721	0.378	1.444	0.048	0.373	0.662	0.331	6.55	2484	0.635	0.311	9.31	3373	0.369	0.123	-0.648	0.404	1.626	0.841
362T125-68	0.435	1.48	0.911	0.474	1.447	0.060	0.370	0.879	0.448	8.85	3129	0.844	0.421	12.60	4741	0.738	0.153	-0.642	0.400	1.626	0.844
362T125-97	0.620	2.11	1.309	0.670	1.453	0.082	0.364	1.308	0.670	13.23	4463	1.302	0.665	19.90	6762	2.136	0.216	-0.629	0.392	1.625	0.850
362T150-18 ²	0.125	0.42	0.270	0.144	1.472	0.027	0.470	-	-	-	-	-	-	-	-	0.015	0.068	-0.862	0.526	1.769	0.763
362T150-27	0.187	0.64	0.408	0.217	1.474	0.041	0.468	0.304	0.139	2.76	569	-	-	-	-	0.050	0.102	-0.857	0.524	1.769	0.765
362T150-30	0.207	0.70	0.450	0.239	1.475	0.045	0.467	0.342	0.158	3.12	762	-	-	-	-	0.067	0.112	-0.856	0.523	1.768	0.766
362T150-33	0.229	0.78	0.499	0.265	1.476	0.050	0.467	0.388	0.181	3.57	1024	-	-	-	-	0.091	0.124	-0.854	0.522	1.768	0.767
362T150-43	0.298	1.01	0.652	0.344	1.479	0.064	0.465	0.538	0.256	5.06	1740	-	-	-	-	0.202	0.161	-0.849	0.519	1.767	0.769
362T150-54	0.374	1.27	0.821	0.430	1.481	0.080	0.463	0.715	0.347	6.87	2484	0.683	0.324	9.71	3373	0.400	0.202	-0.844	0.516	1.766	0.772
362T150-68	0.471	1.60	1.038	0.540	1.485	0.100	0.460	0.956	0.474	9.37	3129	0.913	0.442	13.23	4741	0.798	0.253	-0.837	0.512	1.765	0.775
362T150-97	0.670	2.28	1.493	0.764	1.492	0.138	0.454	1.484	0.757	14.96	4463	1.426	0.711	21.29	6762	2.312	0.357	-0.823	0.504	1.763	0.782
362T200-18 ²	0.143	0.49	0.335	0.179	1.529	0.060	0.648	-	-	-	-	-	-	-	-	0.017	0.147	-1.278	0.759	2.095	0.628
362T200-27 ²	0.216	0.73	0.506	0.269	1.532	0.090	0.646	-	-	-	-	-	-	-	-	0.058	0.221	-1.274	0.756	2.094	0.630
362T200-30 ²	0.238	0.81	0.558	0.297	1.532	0.099	0.645	-	-	-	-	-	-	-	-	0.077	0.243	-1.272	0.755	2.093	0.631
362T200-33	0.264	0.90	0.620	0.329	1.533	0.110	0.645	0.432	0.191	3.77	1024	-	-	-	-	0.105	0.270	-1.270	0.754	2.093	0.632
362T200-43	0.344	1.17	0.811	0.427	1.536	0.142	0.643	0.603	0.272	5.37	1740	-	-	-	-	0.233	0.351	-1.265	0.751	2.091	0.634
362T200-54	0.431	1.46	1.021	0.535	1.540	0.177	0.641	0.806	0.371	7.33	2484	0.765	0.344	10.30	3373	0.460	0.441	-1.259	0.748	2.089	0.637
362T200-68	0.542	1.84	1.292	0.672	1.544	0.221	0.638	1.087	0.512	10.11	3129	1.030	0.473	14.15	4741	0.919	0.554	-1.252	0.744	2.087	0.640
362T200-97	0.772	2.63	1.861	0.953	1.552	0.309	0.632	1.722	0.841	16.62	4463	1.635	0.776	23.24	6762	2.662	0.789	-1.236	0.735	2.083	0.648
400T125-18 ²	0.122	0.42	0.298	0.145	1.560	0.017	0.374	-	-	-	-	-	-	-	-	0.014	0.052	-0.637	0.400	1.726	0.864
400T125-27	0.184	0.63	0.449	0.217	1.562	0.025	0.372	0.360	0.156	3.09	514	-	-	-	-	0.049	0.078	-0.633	0.398	1.726	0.866
400T125-30	0.203	0.69	0.495	0.239	1.563	0.028	0.371	0.404	0.177	3.49	689	-	-	-	-	0.066	0.086	-0.632	0.397	1.726	0.866
400T125-33	0.225	0.76	0.549	0.265	1.563	0.031	0.371	0.457	0.201	3.98	940	-	-	-	-	0.090	0.095	-0.630	0.396	1.726	0.867
400T125-43	0.293	1.00	0.718	0.344	1.566	0.040	0.369	0.630	0.283	5.59	1740	-	-	-	-	0.199	0.123	-0.626	0.393	1.726	0.869
400T125-54	0.367	1.25	0.902	0.431	1.568	0.049	0.367	0.832	0.380	7.51	2740	0.798	0.358	10.71	3373	0.392	0.153	-0.621	0.391	1.726	0.871
400T125-68	0.462	1.57	1.140	0.540	1.571	0.061	0.364	1.101	0.512	10.11	3460	1.059	0.482	14.44	5242	0.783	0.191	-0.615	0.387	1.725	0.873
400T125-97	0.658	2.24	1.635	0.764	1.577	0.084	0.358	1.635	0.763	15.09	4935	1.627	0.758	22.69	7477	2.268	0.268	-0.602	0.379	1.725	0.878
400T150-18 ²	0.132	0.45	0.337	0.164	1.600	0.028	0.463	-	-	-	-	-	-	-	-	0.016	0.085	-0.829	0.511	1.860	0.802
400T150-27	0.198	0.67	0.508	0.246	1.602	0.042	0.461	0.384	0.162	3.19	514	-	-	-	-	0.053	0.127	-0.824	0.509	1.860	0.804
400T150-30	0.218	0.74	0.561	0.271	1.603	0.046	0.461	0.431	0.183	3.61	689	-	-	-	-	0.071	0.140	-0.823	0.508	1.860	0.804
400T150-33	0.242	0.82	0.623	0.300	1.604	0.051	0.460	0.489	0.209	4.12	940	-	-	-	-	0.097	0.155	-0.821	0.507	1.860	0.805
400T150-43	0.315	1.07	0.813	0.390	1.606	0.066	0.458	0.676	0.295	5.82	1740	-	-	-	-	0.214	0.201	-0.817	0.504	1.859	0.807
400T150-54	0.395	1.34	1.023	0.488	1.609	0.082	0.456	0.896	0.398	7.86	2740	0.857	0.373	11.16	3373	0.422	0.252	-0.811	0.501	1.859	0.809
400T150-68	0.498	1.69	1.293	0.613	1.612	0.102	0.453	1.194	0.541	10.69	3460	1.142	0.506	15.15	5242	0.843	0.315	-0.805	0.497	1.858	0.812
400T150-97	0.709	2.41	1.857	0.867	1.619	0.142	0.447	1.846	0.860	16.99	4935	1.777	0.810	24.24	7477	2.443	0.445	-0.791	0.489	1.857	0.818
400T200-18 ²	0.150	0.51	0.416	0.202	1.663	0.062	0.642	-	-	-	-	-	-	-	-	0.018	0.183	-1.236	0.741	2.169	0.675
400T200-27 ²	0.226	0.77	0.628	0.304	1.665	0.093	0.640	-	-	-	-	-	-	-	-	0.060	0.276	-1.232	0.738	2.168	0.677
400T200-30 ²	0.250	0.85	0.693	0.335	1.666	0.102	0.639	-	-	-	-	-	-	-	-	0.081	0.304	-1.230	0.738	2.168	0.678
400T200-33	0.277	0.94	0.769	0.371	1.667	0.113	0.639	0.544	0.220	4.35	940	-	-	-	-	0.110	0.337	-1.228	0.737	2.167	0.679
400T200-43	0.360	1.23	1.005	0.482	1.670	0.146	0.637	0.756	0.312	6.17	1740	-	-	-	-	0.244	0.438	-1.223	0.734	2.166	0.681
400T200-54	0.452	1.54	1.265	0.604	1.673	0.182	0.635	1.007	0.425	8.39	2740	0.958	0.395	11.84	3373	0.483	0.549	-1.218	0.731	2.164	0.684
400T200-68	0.569	1.93	1.600	0.758	1.677	0.227	0.632	1.353	0.583	11.53	3460	1.285	0.541	16.19	5242	0.964	0.691	-1.210	0.726	2.162	0.687
400T200-97	0.810	2.76	2.301	1.075	1.685	0.318	0.626	2.134	0.953	18.83	4935	2.030	0.882	26.42	7477	2.794	0.982	-1.195	0.718	2.159	0.694
550T125-18 ²	0.150	0.51	0.629	0.224	2.045	0.018	0.349	-	-	-	-	-	-	-	-	0.018	0.107	-0.547	0.354	2.145	0.935
550T125-27	0.226	0.77	0.948	0.336	2.046	0.027	0.348	0.673	0.194	3.84	372	-	-	-	-	0.060	0.160	-0.543	0.352	2.145	0.936
550T125-30	0.250	0.85	1.045	0.371	2.047	0.030	0.347	0.774	0.229	4.52	499	-	-	-	-	0.081	0.176	-0.542	0.351	2.146	0.936
550T125-33	0.277	0.94	1.160	0.411	2.047	0.033	0.346	0.896	0.272	5.37	680	-	-	-	-	0.110	0.195	-0.541	0.350	2.146	0.937
550T125-43	0.360	1.23	1.513	0.534	2.049	0.043	0.344	1.299	0.419	8.27	1506	-	-	-	-	0.244	0.253	-0.537	0.348	2.146	0.937
550T125-54	0.452	1.54	1.901	0.668	2.051	0.053	0.342	1.770	0.600	11.87	2740	1.649	0.533	15.95	2976	0.483	0.315	-0.532	0.345	2.146	0.938
550T125-68	0.569	1.93	2.398	0.838	2.053	0.066	0.340	2.325	0.800	15.82	4348	2.248	0.761	22.79	5352	0.964	0.392	-0.527	0.342	2.146	0.940
550T125-97	0.810	2.76	3.429	1.186	2.057	0.090	0.334	3.428	1.186	23.43	6823	3.414	1.178	35.28	10338	2.794	0.548	-0.516	0.335	2.147	0.942
550T150-27	0.241	0.82	1.0																		

TABLE 4—U-SHAPE TRACK SECTION PROPERTIES (CONTINUED)

Section	Gross Properties							33 ksi Effective Properties ⁴				50 ksi Effective Properties ⁵				Torsional Properties					
	A _r	W _t	I _x (in ⁴)	S _x (in ³)	R _x (in)	I _y (in ⁴)	R _y (in)	I _{ex} ³ (in ⁴)	S _{ex} (in ³)	M _{al} (in-k)	V _{ag} (lb)	I _{ex} ³ (in ⁴)	S _{ex} (in ³)	M _{al} (in-k)	V _{ag} (lb)	Jx1000 (in ⁴)	C _w (in ⁶)	X _o (in)	m (in)	R _o (in)	β
600T125-30	0.265	0.90	1.289	0.420	2.205	0.031	0.340	0.941	0.253	4.99	456	-	-	-	-	0.086	0.215	-0.518	0.338	2.290	0.949
600T125-33	0.294	1.00	1.429	0.465	2.205	0.034	0.339	1.090	0.300	5.93	622	-	-	-	-	0.117	0.238	-0.516	0.337	2.290	0.949
600T125-43	0.383	1.30	1.865	0.605	2.207	0.044	0.337	1.583	0.464	9.17	1379	-	-	-	-	0.260	0.308	-0.513	0.335	2.290	0.950
600T125-54	0.480	1.63	2.342	0.756	2.208	0.054	0.335	2.155	0.664	13.12	2725	2.009	0.591	17.69	2725	0.513	0.383	-0.509	0.333	2.291	0.951
600T125-68	0.605	2.06	2.954	0.949	2.210	0.067	0.332	2.867	0.908	17.95	4348	2.745	0.847	25.37	5352	1.025	0.478	-0.503	0.329	2.291	0.952
600T125-97	0.861	2.93	4.222	1.344	2.214	0.092	0.327	4.220	1.344	26.55	7452	4.204	1.336	39.99	10888	2.969	0.666	-0.493	0.323	2.292	0.954
600T125-118	1.051	3.57	5.164	1.632	2.217	0.109	0.323	5.162	1.632	32.24	9101	5.162	1.632	48.85	13789	5.401	0.800	-0.485	0.318	2.292	0.955
600T150-18 ²	0.169	0.58	0.863	0.282	2.258	0.031	0.429	-	-	-	-	-	-	-	-	0.020	0.214	-0.690	0.443	2.400	0.917
600T150-27 ¹	0.255	0.87	1.300	0.424	2.260	0.047	0.428	0.857	0.219	4.32	341	-	-	-	-	0.068	0.320	-0.686	0.441	2.400	0.918
600T150-30	0.281	0.95	1.434	0.467	2.260	0.051	0.427	0.986	0.258	5.09	456	-	-	-	-	0.091	0.352	-0.685	0.440	2.400	0.918
600T150-33	0.311	1.06	1.591	0.518	2.261	0.057	0.426	1.145	0.306	6.06	622	-	-	-	-	0.124	0.390	-0.684	0.439	2.400	0.919
600T150-43	0.406	1.38	2.076	0.673	2.263	0.073	0.424	1.671	0.477	9.42	1379	-	-	-	-	0.275	0.506	-0.680	0.437	2.400	0.920
600T150-54	0.509	1.73	2.608	0.843	2.265	0.091	0.422	2.289	0.687	13.58	2725	2.122	0.607	18.19	2725	0.543	0.631	-0.675	0.434	2.401	0.921
600T150-68	0.640	2.18	3.291	1.058	2.267	0.113	0.420	3.074	0.955	18.86	4348	2.920	0.879	26.32	5352	1.085	0.789	-0.670	0.431	2.401	0.922
600T150-97	0.912	3.10	4.707	1.499	2.272	0.156	0.414	4.684	1.487	29.39	7452	4.533	1.415	42.38	10888	3.144	1.107	-0.658	0.424	2.401	0.925
600T150-118	1.113	3.78	5.761	1.821	2.276	0.187	0.410	5.759	1.821	35.98	9101	5.740	1.811	54.23	13789	5.721	1.335	-0.649	0.418	2.402	0.927
600T200-18 ²	0.188	0.64	1.038	0.339	2.349	0.069	0.607	-	-	-	-	-	-	-	-	0.022	0.463	-1.055	0.659	2.646	0.841
600T200-27 ²	0.283	0.96	1.564	0.510	2.351	0.104	0.605	-	-	-	-	-	-	-	-	0.076	0.695	-1.051	0.656	2.646	0.842
600T200-30 ²	0.312	1.06	1.725	0.562	2.352	0.114	0.605	-	-	-	-	-	-	-	-	0.101	0.765	-1.050	0.656	2.646	0.843
600T200-33	0.346	1.18	1.914	0.623	2.353	0.126	0.604	1.435	0.407	8.04	622	-	-	-	-	0.138	0.848	-1.048	0.655	2.645	0.843
600T200-43	0.451	1.53	2.499	0.810	2.355	0.163	0.602	1.966	0.566	11.19	1379	-	-	-	-	0.306	1.101	-1.044	0.652	2.645	0.844
600T200-54	0.565	1.92	3.141	1.015	2.357	0.204	0.600	2.587	0.757	14.97	2725	2.486	0.716	21.43	2725	0.604	1.378	-1.039	0.649	2.645	0.846
600T200-68	0.712	2.42	3.965	1.275	2.360	0.254	0.597	3.432	1.023	20.22	4348	3.290	0.962	28.81	5352	1.206	1.728	-1.032	0.645	2.645	0.848
600T200-97	1.014	3.45	5.679	1.808	2.367	0.355	0.591	5.316	1.633	32.26	7452	5.094	1.531	45.84	10888	3.495	2.442	-1.019	0.638	2.644	0.851
600T200-118	1.237	4.21	6.956	2.199	2.372	0.426	0.587	6.787	2.116	41.82	9101	6.522	1.991	59.60	13789	6.359	2.961	-1.009	0.632	2.643	0.854
800T125-33 ¹	0.363	1.23	2.898	0.711	2.825	0.036	0.313	2.101	0.419	8.28	465	-	-	-	-	0.145	0.457	-0.439	0.294	2.876	0.977
800T125-43	0.473	1.61	3.778	0.925	2.826	0.046	0.311	3.053	0.649	12.83	1031	-	-	-	-	0.321	0.590	-0.436	0.292	2.876	0.977
800T125-54	0.594	2.02	4.743	1.158	2.827	0.057	0.309	4.186	0.939	18.56	2037	3.874	0.827	24.76	2037	0.634	0.734	-0.432	0.290	2.876	0.977
800T125-68	0.747	2.54	5.977	1.454	2.828	0.070	0.307	5.703	1.344	26.56	4072	5.336	1.202	35.98	4072	1.266	0.913	-0.427	0.287	2.877	0.978
800T125-97	1.065	3.62	8.532	2.060	2.831	0.097	0.301	8.529	2.060	40.70	8846	8.497	2.048	61.32	10888	3.670	1.269	-0.418	0.281	2.878	0.979
800T125-118	1.299	4.42	10.425	2.504	2.833	0.115	0.298	10.421	2.503	49.46	12175	10.421	2.503	74.94	16239	6.679	1.521	-0.411	0.276	2.878	0.980
800T150-33 ¹	0.380	1.29	3.182	0.781	2.892	0.060	0.397	2.193	0.427	8.45	465	-	-	-	-	0.152	0.752	-0.588	0.388	2.978	0.961
800T150-43	0.496	1.69	4.150	1.016	2.893	0.077	0.395	3.199	0.665	13.14	1031	-	-	-	-	0.336	0.974	-0.584	0.385	2.978	0.962
800T150-54	0.622	2.11	5.211	1.272	2.895	0.096	0.393	4.407	0.968	19.13	2037	4.062	0.848	25.38	2037	0.664	1.213	-0.580	0.383	2.979	0.962
800T150-68	0.783	2.66	6.569	1.598	2.897	0.119	0.390	6.044	1.398	27.63	4072	5.623	1.240	37.13	4072	1.327	1.514	-0.575	0.380	2.979	0.963
800T150-97	1.115	3.79	9.383	2.266	2.900	0.165	0.385	9.340	2.251	44.48	8846	9.059	2.149	64.34	10888	3.846	2.118	-0.565	0.373	2.980	0.964
800T150-118	1.361	4.63	11.470	2.755	2.903	0.198	0.381	11.466	2.754	54.42	12175	11.432	2.742	82.08	16239	6.998	2.549	-0.557	0.369	2.981	0.965
800T200-33 ¹	0.415	1.41	3.752	0.921	3.006	0.135	0.571	2.350	0.440	8.69	465	-	-	-	-	0.166	1.639	-0.917	0.589	3.195	0.918
800T200-43	0.541	1.84	4.894	1.198	3.008	0.175	0.569	3.449	0.687	13.58	1031	-	-	-	-	0.367	2.128	-0.913	0.587	3.195	0.918
800T200-54	0.678	2.31	6.148	1.501	3.010	0.218	0.567	4.785	1.008	19.92	2037	4.383	0.877	26.25	2037	0.724	2.659	-0.909	0.584	3.195	0.919
800T200-68	0.854	2.90	7.753	1.886	3.013	0.272	0.564	6.623	1.473	29.11	4072	6.114	1.294	38.73	4072	1.448	3.330	-0.903	0.581	3.195	0.920
800T200-97	1.217	4.14	11.084	2.677	3.018	0.379	0.558	10.452	2.449	48.40	8846	10.007	2.290	68.57	10888	4.196	4.693	-0.891	0.573	3.196	0.922
800T200-118	1.485	5.05	13.559	3.257	3.022	0.456	0.554	13.263	3.149	62.23	12175	12.803	2.987	89.42	16239	7.637	5.679	-0.882	0.568	3.196	0.924
1000T125-43 ¹	0.563	1.92	6.638	1.306	3.433	0.047	0.290	5.119	0.843	16.66	823	-	-	-	-	0.382	0.975	-0.379	0.258	3.466	0.988
1000T125-54	0.707	2.40	8.332	1.635	3.433	0.059	0.288	7.028	1.222	24.15	1626	6.493	1.074	32.15	1626	0.755	1.211	-0.376	0.256	3.466	0.988
1000T125-68	0.890	3.03	10.496	2.054	3.434	0.073	0.286	9.634	1.766	34.90	3251	8.959	1.565	46.85	3251	1.508	1.505	-0.372	0.254	3.466	0.988
1000T125-97	1.268	4.31	14.973	2.912	3.436	0.100	0.281	14.926	2.896	57.23	8846	14.439	2.722	81.51	9434	4.371	2.088	-0.364	0.248	3.467	0.989
1000T125-118	1.547	5.26	18.286	3.541	3.438	0.119	0.277	18.278	3.540	69.95	13193	18.216	3.517	105.30	16239	7.956	2.498	-0.358	0.244	3.467	0.989
1000T150-43 ¹	0.586	1.99	7.216	1.419	3.509	0.080	0.370	5.335	0.862	17.04	823	-	-	-	-	0.397	1.615	-0.513	0.345	3.566	0.979
1000T150-54	0.735	2.50	9.058	1.778	3.511	0.100	0.368	7.355	1.256	24.82	1626	6.772	1.099	32.90	1626	0.785	2.010	-0.510	0.343	3.566	0.980
1000T150-68	0.926	3.15	11.414	2.233	3.512	0.124	0.366	10.140	1.830	36.15	3251	9.385	1.610	48.21	3251	1.568	2.507	-0.505	0.340	3.567	0.980
1000T150-97	1.319	4.48	16.290	3.169	3.515	0.172	0.361	16.179	3.134	61.92	8846	15.280	2.842	85.09	9434	4.547	3.499	-0.496	0.334	3.568	0.981
1000T150-118	1.609	5.47	19.902	3.854	3.517	0.205	0.357	19.894	3.853	76.13	13193	19.776	3.813	114.17	16239	8.275	4.205	-0.489	0.329	3.568	0.981
1000T200-43 ¹	0.631	2.15																			

TABLE 4—U-SHAPE TRACK SECTION PROPERTIES (CONTINUED)

Section	Gross Properties						33ksi Effective Properties ⁴				50ksi Effective Properties ⁵				Torsional Properties						
	A _r	Wt.	I _x (in ⁴)	S _x (in ³)	R _x (in)	I _y (in ⁴)	R _y (in)	I _{ex} ³ (in ⁴)	S _{ex} (in ³)	M _{al} (in-k)	V _{aq} (lb)	I _{ex} ³ (in ⁴)	S _{ex} (in ³)	M _{al} (in-k)	V _{aq} (lb)	Jx1000 (in ⁴)	C _w (in ⁶)	X _o (in)	m (in)	R _o (in)	β
1200T150-97	1.522	5.18	25.837	4.207	4.120	0.176	0.340	24.985	3.954	78.14	7852	23.426	3.545	106.12	7852	5.248	5.262	-0.442	0.302	4.158	0.989
1200T150-118	1.858	6.32	31.555	5.120	4.121	0.211	0.337	31.517	5.110	100.98	13193	30.521	4.811	144.06	14301	9.552	6.317	-0.436	0.298	4.158	0.989
1200T200-54 ¹	0.905	3.08	16.460	2.700	4.265	0.236	0.510	12.002	1.612	31.85	1354	11.028	1.409	42.18	1354	0.966	6.706	-0.730	0.487	4.357	0.972
1200T200-68	1.139	3.87	20.743	3.395	4.267	0.294	0.508	16.684	2.372	46.87	2706	15.322	2.068	61.92	2706	1.931	8.386	-0.725	0.484	4.358	0.972
1200T200-97	1.624	5.52	29.609	4.822	4.270	0.410	0.503	27.301	4.219	83.38	7852	25.364	3.733	111.77	7852	5.599	11.781	-0.715	0.477	4.359	0.973
1200T200-118	1.982	6.74	36.179	5.870	4.273	0.493	0.499	35.454	5.693	112.49	13193	33.371	5.138	153.84	14301	10.191	14.224	-0.708	0.473	4.359	0.974
1200T250-54 ¹	0.961	3.27	18.544	3.042	4.392	0.445	0.681	12.663	1.651	32.62	1354	11.604	1.440	43.11	1354	1.027	12.325	-1.039	0.680	4.564	0.948
1200T250-68	1.211	4.12	23.374	3.825	4.394	0.556	0.678	17.683	2.441	48.24	2706	16.176	2.120	63.46	2706	2.052	15.445	-1.034	0.676	4.565	0.949
1200T250-97	1.726	5.87	33.381	5.436	4.398	0.780	0.672	29.227	4.398	86.90	7852	26.993	3.861	115.59	7852	5.949	21.794	-1.023	0.670	4.566	0.950
1200T250-118	2.106	7.16	40.803	6.620	4.402	0.941	0.668	38.255	6.001	118.59	13193	35.734	5.357	160.38	14301	10.830	26.401	-1.015	0.665	4.566	0.951
1400T125-54 ¹	0.933	3.17	19.979	2.816	4.627	0.061	0.256	15.528	1.824	36.04	1159	14.416	1.615	48.36	1159	0.996	2.557	-0.299	0.209	4.644	0.996
1400T125-68	1.175	4.00	25.162	3.539	4.628	0.076	0.254	21.321	2.641	52.20	2317	19.782	2.335	69.90	2317	1.991	3.175	-0.296	0.206	4.644	0.996
1400T125-97	1.675	5.69	35.874	5.024	4.628	0.104	0.249	33.622	4.460	88.14	6724	32.100	4.105	122.90	6724	5.774	4.394	-0.289	0.202	4.644	0.996
1400T125-118	2.044	6.95	43.794	6.114	4.629	0.124	0.246	42.647	5.823	115.07	12246	40.991	5.416	162.15	12246	10.510	5.245	-0.284	0.198	4.644	0.996
1400T150-54 ¹	0.961	3.27	21.392	3.015	4.717	0.105	0.330	16.130	1.870	36.94	1159	14.933	1.650	49.41	1159	1.027	4.276	-0.411	0.283	4.746	0.993
1400T150-68	1.211	4.12	26.947	3.790	4.718	0.130	0.328	22.252	2.725	53.84	2317	20.562	2.396	71.72	2317	2.052	5.325	-0.407	0.280	4.747	0.993
1400T150-97	1.726	5.87	38.430	5.382	4.719	0.180	0.323	36.056	4.785	94.55	6724	33.657	4.262	127.59	6724	5.949	7.416	-0.399	0.275	4.747	0.993
1400T150-118	2.106	7.16	46.926	6.551	4.720	0.215	0.319	45.786	6.257	123.64	12246	44.024	5.822	174.30	12246	10.830	8.896	-0.394	0.272	4.747	0.993
1400T200-54 ¹	1.018	3.46	24.220	3.413	4.878	0.242	0.487	17.155	1.935	38.23	1159	15.828	1.701	50.94	1159	1.087	9.511	-0.665	0.449	4.947	0.982
1400T200-68	1.282	4.36	30.516	4.292	4.879	0.301	0.485	23.805	2.840	56.12	2317	21.888	2.481	74.29	2317	2.173	11.888	-0.661	0.446	4.947	0.982
1400T200-97	1.827	6.21	43.543	6.098	4.882	0.420	0.480	39.114	5.083	100.44	6724	36.208	4.474	133.96	6724	6.300	16.684	-0.652	0.440	4.948	0.983
1400T200-118	2.230	7.58	53.190	7.425	4.883	0.505	0.476	51.087	6.927	136.88	12246	47.787	6.189	185.30	12246	11.468	20.129	-0.645	0.436	4.949	0.983
1400T250-54 ¹	1.075	3.65	27.047	3.812	5.017	0.458	0.653	18.034	1.981	39.14	1159	16.603	1.739	52.06	1159	1.148	17.533	-0.955	0.633	5.148	0.966
1400T250-68	1.353	4.60	34.085	4.794	5.019	0.573	0.651	25.119	2.919	57.68	2317	23.020	2.542	76.10	2317	2.293	21.962	-0.950	0.630	5.149	0.966
1400T250-97	1.929	6.56	48.655	6.814	5.022	0.803	0.645	41.644	5.283	104.39	6724	38.342	4.618	138.27	6724	6.651	30.960	-0.940	0.623	5.150	0.967
1400T250-118	2.355	8.01	59.453	8.299	5.025	0.968	0.641	54.781	7.272	143.71	12246	50.891	6.435	192.66	12246	12.107	37.480	-0.932	0.618	5.151	0.967

For SI: 1 inch = 25.4mm, 1 pound = 4.4482 N.

¹Web height-to-thickness ratio, h/t, exceeds 200 but is less than 260. Web must have bearing stiffeners at all support points and concentrated loads in accordance with AISI S100.
²Web height-to-thickness ratio, h/t, exceeds 300 or flange width-to-thickness ratio, b/t, exceeds 60. Allowable design values are outside the scope of this evaluation report and may be determined in accordance with Section B4.2 of AISI S100.
³Use the effective moment of inertia for deflection calculations.
⁴Values for members with F_y=33ksi apply to members made from Q235 steel.
⁵Values for members with F_y=50ksi apply to members made from Q345 and S350GD steels.

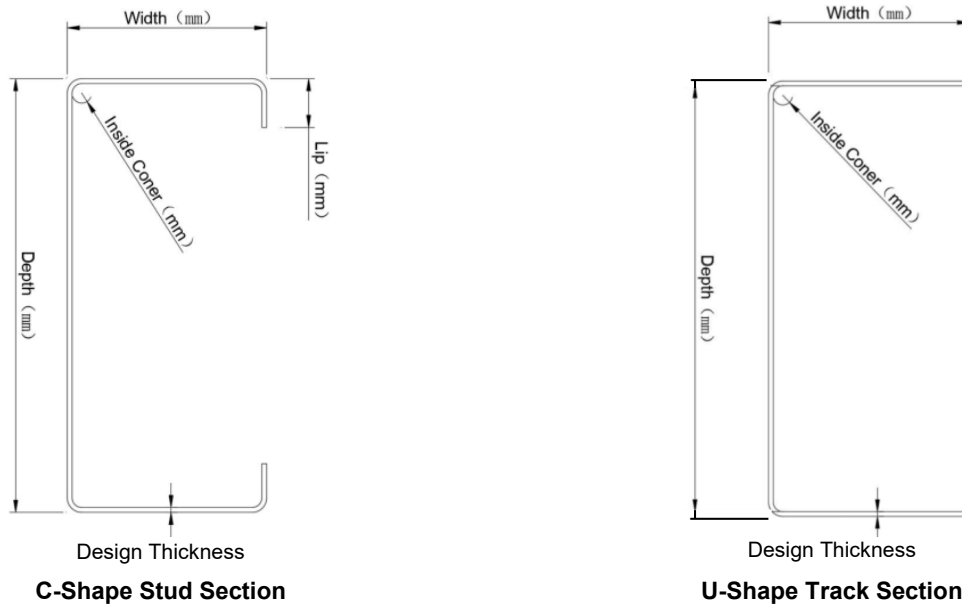


FIGURE 1—STUD AND TRACK PROFILES

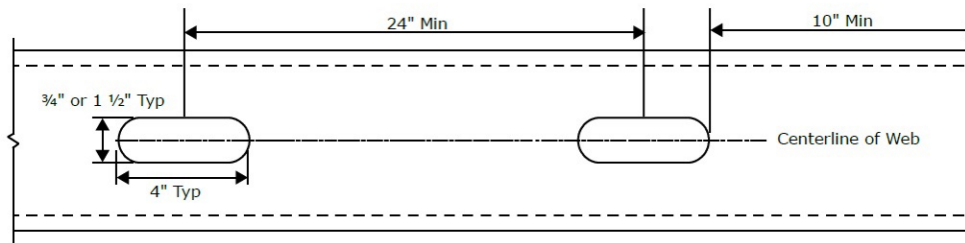


FIGURE 2—PUNCH-OUTS (STUDS ONLY)

DIVISION: 05 00 00—METALS

Section: 05 40 00— Cold-Formed Metal Framing

Section: 05 41 00—Structural Metal Stud Framing

DIVISION: 09 00 00—FINISHES

Section: 09 22 16.13—Non-Structural Metal Stud Framing

REPORT HOLDER:

HI-TECH BUILDING SOLUTION INC.

EVALUATION SUBJECT:

COLD-FORMED STEEL FRAMING MEMBERS

1.0 REPORT PURPOSE AND SCOPE**Purpose:**

The purpose of this evaluation report supplement is to indicate that the Cold-Formed Steel Framing Members, described in ICC-ES evaluation report [ESR-4540](#), have also been evaluated for compliance with the code noted below.

Applicable code edition:

- 2019 *California Building Code* (CBC)

For evaluation of applicable chapters adopted by the California Office of Statewide Health Planning and Development (OSHPD) and Division of State Architect (DSA), see Sections 2.1 and 2.2 below.

2.0 CONCLUSIONS

The Cold-Formed Steel Framing Members, described in Sections 2.0 through 7.0 of the evaluation report [ESR-4540](#), comply with CBC Chapter 22, provided the design and installation are in accordance with the 2018 *International Building Code*® (IBC) provisions noted in the evaluation report and the additional requirements of the CBC Chapters 16, 17 and 22, as applicable.

2.1 OSHPD: The applicable OSHPD Sections and Chapters of the CBC are beyond the scope of this supplement.

2.2 DSA: The applicable DSA Sections and Chapters of the CBC are beyond the scope of this supplement.

This supplement expires concurrently with the evaluation report, reissued September 2025.