ICC-ES Evaluation Report

ESR-3054

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DIVISION: 05 00 00—METALS
Section: 05 40 00—Cold-formed Metal Framing
Section: 05 41 00—Structural Metal Stud Framing
Section: 05 42 00—Cold-Formed Metal Joist Framing

DIVISION: 09 00 00—FINISHES
Section: 09 22 16.13—Non-Structural Metal Stud Framing

REPORT HOLDER:

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EVALUATION SUBJECT:

SUPREME FRAMING SYSTEM™ 40-MIL STUDS, JOISTS AND TRACKS

ADDITIONAL LISTEES:

CONSOLIDATED FABRICATORS CORP.
8584 MULBERRY AVENUE
FONTANA, CALIFORNIA 92335
(909) 770-8920
bill@confabbpd.com

QUAIL RUN BUILDING MATERIALS, INC.
2102 WEST LONE CACTUS DRIVE
PHOENIX, ARIZONA 85027
(602) 269-2316
MikeZeeuw@qrbm.com

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ORLANDO, FLORIDA 32837
(800) 548-8499
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234 NORTH SHERMAN AVENUE
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1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2006 *International Building Code®* (IBC)
- 2003 *International Building Code®**

*Codes indicated with an asterisk are addressed in Section 8.0.

Property evaluated:

Structural

2.0 USES

The steel studs, joists and tracks described in this report are used for framing of nonload-bearing interior walls, curtain walls, load-bearing walls, floors or ceilings.

3.0 DESCRIPTION

3.1 General:

The steel studs, joists and tracks described in this report are factory-formed for Supreme Framing System steel at the locations listed in Table 3, from coils of light gage steel. The studs and joists are manufactured with and without web punch-outs; the tracks are manufactured without web punch-outs. When provided, punch-outs measuring up to 0.75 inch by 1.75 inches (19 mm by 44 mm) for the 2.5-inch-deep members and 1.5 inches by 2.5 inches (44 mm by 64 mm) for the other sized members are located along the centerline of the webs. The centerline distance between the punch-outs is 24 inches (610 mm); and the minimum distance between the end of the stud/joist and the near edge of the web punch-out is 10 inches (254 mm). See Table 1 and Figures 1 and 2 for recognized section names, profiles and dimensions. The values in Table 1 are for studs and joists with punch-outs.

3.2 Material:

The studs, joists and tracks are cold-formed from galvanized steel coils conforming to the manufacturer's published specifications, with a minimum yield strength of 57 ksi (393 MPa) and a minimum tensile strength of 65 ksi (448 MPa). The steel has a minimum G60 galvanization coating designation complying with ASTM A 653. Steel framing members are available in a design base-metal thickness of 0.0400 inch (1.016 mm), and in the sizes and configurations shown in Table 1 and Figures 1 and 2.

4.0 DESIGN AND INSTALLATION

4.1 Design:

The section properties indicated in Table 1 have been determined in accordance with the North American Specification for Design of Cold-Formed Steel Structural

Members, including 2004 Supplement (AISI-NAS). The allowable moments, M_a, as indicated in Table 1 are for use with Allowable Stress 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-NAS. Allowable concentrated loads and reactions based on web crippling are shown in Table 2, for related web crippling loading conditions (see Figure 3). The design of flexural members used for framing of nonload-bearing interior walls, curtain walls, load-bearing walls, floors or ceilings must address combined bending and web crippling, and combined bending and shear.

4.2 Installation:

The framing members must be installed in accordance with the applicable code, the manufacturer's published installation instructions, the approved construction documents and this report. If there is a conflict among the manufacturer's published installation instructions, the approved construction documents and this report, this report governs. The manufacturer's published installation instructions and approved construction documents must be available at the jobsite at all times.

5.0 CONDITIONS OF USE

The Supreme Framing System members described in this report comply with, or are suitable alternatives to what is specified in, the code indicated in Section 1.0 of this report, subject to the following conditions:

5.1 The framing members are installed in accordance with the applicable code, Supreme Framing System's published installation instructions, the approved construction documents and this report.

5.2 Minimum uncoated base-metal thickness of the framing members as delivered to the jobsite is at least 0.0380 inch (0.955 mm), which is 95 percent of the design base-metal thickness.

5.3 Complete construction documents and calculations verifying compliance with this report must be submitted to the code official for each project. The calculations and construction documents 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.

6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Cold-formed Steel Framing Members (AC46), dated February 2011.

7.0 IDENTIFICATION

Bundles of framing members are labeled with the Supreme Framing System name and address; manufacturer's name or initials (see the Additional Listee at the beginning of this report); the evaluation report number (ICC-ES ESR-3054); the date of manufacture; and the section name as provided in Table 1 of this report. At a spacing not exceeding 48 inches (1219 mm) on center, each framing member is stamped with the Supreme Framing System name; the evaluation report number (ICC-ES ESR-3054); the minimum uncoated base-metal thickness in decimal inches (0.0380); the minimum specified yield strength (57 ksi); and the galvanization coating designation (G60).

8.0 OTHER CODES

8.1 Evaluation Scope:

In addition to the 2006 IBC referenced in Section 1.0, the steel studs, joists and tracks described in this report were evaluated for compliance with the 2003 *International Building Code*® (2003 IBC). The products comply with the 2003 IBC as noted below.

8.2 Uses:

The steel studs, joists and tracks described in this report are used for framing of nonload-bearing interior walls, curtain walls, load-bearing walls, floors and ceilings.

8.3 Description:

See Section 3.0.

8.4 Design and Installation:

8.4.1 Design: The section properties indicated in Table 1 have been determined in accordance with the North American Specification for Design of Cold-Formed Steel Structural Members (AISI-NASPEC). The allowable moments, M_a, as indicated in Table 1 are for use with Allowable Stress 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-NASPEC. Allowable concentrated loads and reactions based on web crippling are shown in Table 2, for related web crippling loading conditions. The design of flexural members used for framing of nonload-bearing interior walls, curtain walls, load-bearing walls, floors or ceilings must address combined bending and web crippling, and combined bending and shear.

8.4.2 Installation: See Section 4.2.

8.5 Conditions of Use:

See Section 5.0.

8.6 Evidence Submitted:

See Section 6.0.

8.7 Identification:

See Section 7.0.

TABLE 1—STRUCTURAL PROPERTIES OF STUDS, JOISTS AND TRACKS

Member	Gross Section Properties							57 ksi Effective Properties					Torsional Properties					
	Area	Weight	I_x	S_x	R_x	I_y	R_y	I_x	S_x	M_a	V_{ag}	V_{anet}	Jx1000	C_w	m	X_o	R_o	Beta
	(in^2)	(lb/ft)	(in^4)	(in^3)	(in)	(in^4)	(in)	(in^4)	(in^3)	(ft-lbf)	(lb)	(lb)	(in^4)	(in^6)	(in)	(in)	(in)	
Studs/Joists																		
250SFS-38	0.257	0.88	0.270	0.216	1.025	0.100	0.622	0.270	0.185	527	1798	637	0.137	0.166	0.856	-1.463	1.892	0.402
350SFS-38	0.297	1.01	0.585	0.334	1.402	0.112	0.615	0.585	0.257	731	1738	715	0.159	0.315	0.792	-1.318	2.020	0.574
362SFS-38	0.302	1.03	0.634	0.350	1.448	0.114	0.613	0.634	0.267	760	1674	737	0.161	0.338	0.785	-1.302	2.042	0.593
400SFS-38	0.317	1.08	0.796	0.398	1.584	0.118	0.609	0.796	0.298	847	1508	795	0.169	0.413	0.765	-1.258	2.112	0.645
550SFS-38	0.377	1.28	1.679	0.611	2.110	0.130	0.587	1.679	0.515	1466	1079	944	0.201	0.813	0.694	-1.108	2.454	0.796
600SFS-38	0.397	1.35	2.065	0.688	2.280	0.133	0.579	2.065	0.559	1590	986	976	0.212	0.983	0.673	-1.067	2.583	0.829
800SFS-38	0.477	1.62	4.128	1.032	2.941	0.143	0.548	3.870	0.706	2009	732	732	0.255	1.862	0.603	-0.931	3.133	0.912
Tracks																		
250SFT-38	0.200	0.68	0.222	0.167	1.053	0.031	0.396	0.185	0.114	323	1798	———	0.107	0.038	0.454	-0.758	1.356	0.688
350SFT-38	0.240	0.82	0.467	0.256	1.396	0.034	0.378	0.398	0.184	523	1661	———	0.128	0.080	0.413	-0.666	1.592	0.825
362SFT-38	0.245	0.83	0.506	0.268	1.438	0.035	0.376	0.432	0.194	551	1603	———	0.131	0.087	0.408	-0.656	1.625	0.837
400SFT-38	0.260	0.88	0.634	0.305	1.562	0.036	0.370	0.545	0.224	638	1450	———	0.139	0.109	0.395	-0.628	1.724	0.867
550SFT-38	0.320	1.09	1.339	0.474	2.046	0.038	0.345	1.140	0.284	809	1049	———	0.171	0.224	0.349	-0.539	2.144	0.937
600SFT-38	0.340	1.16	1.650	0.536	2.204	0.039	0.338	1.390	0.313	889	961	———	0.181	0.273	0.336	-0.515	2.288	0.949
800SFT-38	0.420	1.43	3.345	0.821	2.823	0.041	0.312	2.678	0.426	1211	718	———	0.224	0.525	0.293	-0.437	2.874	0.977

For **SI:** 1 inch = 25.4 mm; 1 $inch^2$ = 645 mm^2; 1 $inch^3$ = 1.64x10^4; 1 $inch^6$ = 2.69x10^8 mm^6; 1 ft-lbf = 1.36 Nm; 1 lb = 4.45 N; 1 kip-in = 112.99 N-m; 1 ksi = 6.89 Mpa.

NOTES:

1. Gross properties are based on the full, unreduced cross-section, away from web punch-outs.

2. Use the effective moment of inertia for deflection calculation.

3. Punch-out size for 2.5-inch deep members is 0.75-inch by 1.75-inch, maximum; Punch-out size for other member sizes is 1.5-inch by 2.5-inch, maximum (See Figure 2).

SYMBOLS

I_{xx} = Strong axis moment of inertia

R_x = Strong axis radius of gyration

I_{yy} = Weak axis moment of inertia

R_y = Weak axis radius of gyration

S_{xx} = Strong axis section modulus

V_{ag} = Allowable shear of unpunched web section

V_{anet} = Alloable shear of punched web section

M_a = Stong axis allowable bending moment

J = St. Venant torsion constant

C_w = Torsional warping constant

M = Distance from shear center to mid-plane of web

X_o = Distance from shear center to center-of-gravity

R_o = Torsional radii of gyration

Beta = Torsional flexural constant

TABLE 2—ALLOWABLE CONCENTRATED LOADS AND END REACTIONS BASED ON WEB CRIPPLING (lbs)[6,7]

Member	Bearing Length (in)			
	1	3.5	1	3.5
	Condition 1 (E1F)[1 2 3]	Condition 2 (I1F)[1 2 4]	Condition 3 (E2F)[5]	Condition 4 (I2F)[5]
250SFS-38	396	1063	356	1210
350SFS-38	382	1046	316	1136
362SFS-38	380	1044	311	1128
400SFS-38	376	1039	298	1103
550SFS-38	359	1018	251	1017
600SFS-38	354	1012	236	991
800SFS-38	336	990	185	897

For **SI:** 1 inch = 25.4 mm; 1 lb = 4.45N.

NOTES:

1. Clear distance between punch-outs must be a minimum of 18 inches.

2. Distance between end of member and edge of punch-out must be a minimum of the web height.

3. Values are for unpunched members, and for punched members where the clear distance between the edge of bearing and the edge of the punch-out is at least 2 times the height of the web.

4. Values are for unpunched members, and for punched members where the clear distance between the edge of bearing and the edge of the punch-out is at least 2.5 times the height of the web.

5. Values are for unpunched members.

6. Values are based on members fastened to supports.

7. Allowable loading conditions are as follows (See Figure 3 for illustration):

Condition 1 - End One Flange Loading (E1F)

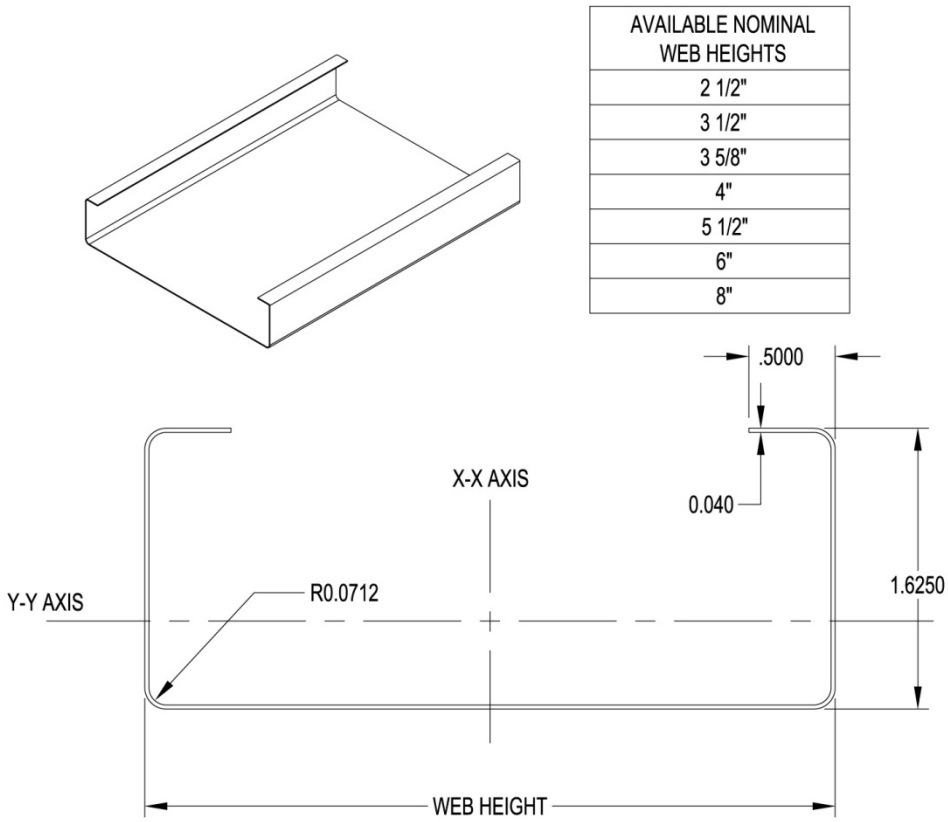
Condition 2 - Interior One Flange Loading (I1F)

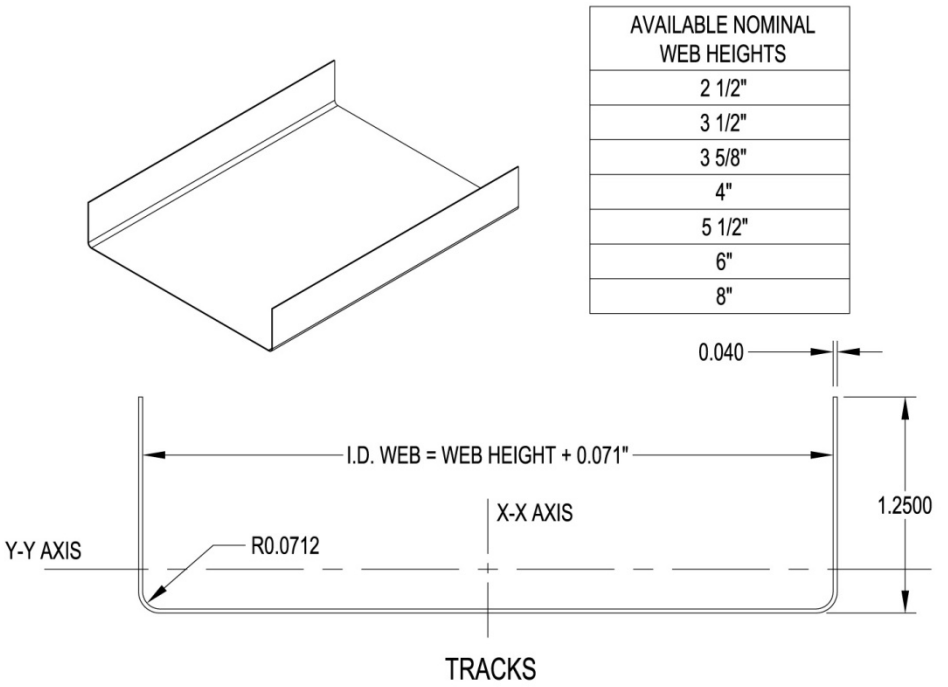
Condition 3 - End Two Flange Loading (E2F)

Condition 4 - Interior Two Flange Loading (I2F)

TABLE 3—MANUFACTURING FACILITIES

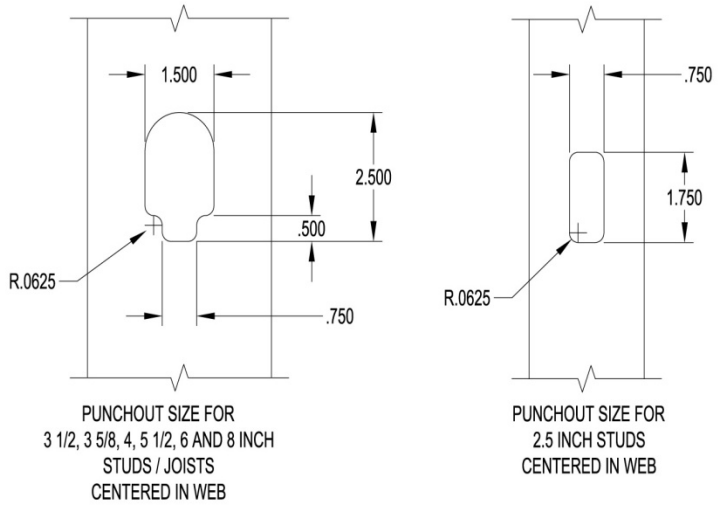
Consolidated Fabricators Corp. 8584 Mulberry Avenue Fontana, California 92335 (909) 770-8920
Consolidated Fabricators Corp. 650 Live Oak Avenue, Galt, California 95632 (209) 744-2704
Quail Run Building Materials, Inc. 2102 West Lone Cactus Drive Phoenix, Arizona 85027 (602) 269-2316
SCAFCO Steel Stud Manufacturing Company (SCAFCO) 6200 East Main Avenue Spokane, Washington 99211-1215 (509) 343-9000
Steel Construction Systems 11250 Astronaut Boulevard Orlando, Florida 32837 (800) 548-8499
Steel Construction Systems 5301 Hamilton, Theodore, Alabama 36582 (800) 548-8499
United Metal Products, Inc. 234 North Sherman Avenue Corona, California 92882 (951) 739-9535





FOR SI: 1 INCH = 25.4mm

FIGURE 1—MEMBER DESCRIPTION



FOR SI: 1 INCH = 25.4mm

FIGURE 2—PUNCH-OUT DESCRIPTIONS

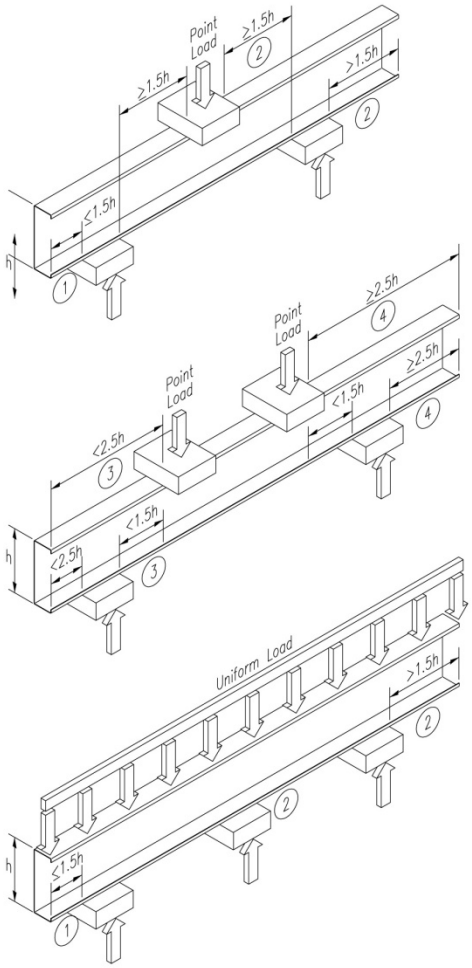


FIGURE 3—WEB CRIPPLING CONDITION