

ICC-ES Evaluation Report

ESR-5071

Reissued September 2024 This report also contains:

- LABC Supplement

Subject to renewal September 2025 - CBC

- CBC Supplement

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DIVISION: 05 00 00—

METALS

Section: 05 40 00—Coldformed Metal Framing

Section: 05 41 00— Structural Metal Stud

Framing

REPORT HOLDER:

CERCA HOMES, LLC

EVALUATION SUBJECT:

COLD-FORMED STEEL FRAMING MEMBERS



1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2021, 2018 and 2015 International Building Code® (IBC)
- 2021, 2018 and 2015 International Residential Code® (IRC)

Property evaluated:

■ Structural

2.0 USES

Cold-formed steel framing members are used as structural members as defined by the North American Standard for Cold-Formed Steel Structural Framing (AISI S240) or North American Standard for Cold-Formed Steel Framing – General Provisions (AISI S200), as applicable, and may also be used as nonstructural members.

3.0 DESCRIPTION

3.1 General:

The framing members are factory-formed with and without web punch-outs from coils of light gage steel. When provided, the punch-outs measure dimensions shown in <u>Tables 1</u> and <u>2</u> of this report and located along the centerline of the webs of the stud sections and have a minimum 610 mm (24 inches) clear distance between punch-outs. The minimum distance between the end of the stud and the near edge of the web punch-out is 10 inches (254 mm). See <u>Tables 1</u>, <u>2</u>, <u>3</u>, <u>4</u> and <u>5</u> and <u>Figure 1</u> for descriptions and properties of the framing members.

3.2 Material:

The framing members are cold-formed from steel coils complying with Australian Standard AS 1397 Grade 350. Grade 350 steel has a minimum yield strength of 350 MPa (50.8 ksi), a minimum tensile strength of 420 MPa (60.9 ksi), and a minimum elongation of 15 percent in a 50 mm (2-inch) gauge length. The members have a minimum AZ150 galvanized coating.

4.0 DESIGN AND INSTALLATION

4.1 Design:

The properties listed in <u>Tables 1</u>, <u>2</u>, <u>3</u>, <u>4</u> and <u>5</u> have been determined in accordance with the North American Specification for Design of Cold-formed Steel Structural Members (AISI S100) based on the allowable strength design (ASD) method.

4.2 Installation:

The 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 during the installation.

5.0 CONDITIONS OF USE:

The cold-formed steel framing members described in this report comply with, or are suitable alternatives 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.
- 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** The cold-formed steel members are manufactured under a quality control program with inspections 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 2019 (editorially revised December 2020).

7.0 IDENTIFICATION

- 7.1 Each member must have a legible label, stamp or embossment, at a maximum of 96 inches (2440 mm) on center, indicating the report holder's name; the evaluation report number (ESR-5071) and member designation as noted in <u>Table 1</u> of this report. The minimum deliverable thickness is determined by the member designation in accordance with <u>Table 1</u>. In addition, all member designation are made from the same steel material specified in Section 3.2.
- **7.2** The report holder's contact information is the following:

CERCA HOMES, LLC 9200 WEST SUNSET BLVD, SUITE 950 LOS ANGELES, CALIFORNIA 90069 (833) 692-3722 www.cercasheds.com

Definitions of structural property symbols:

Yield Strength

Critical Unbraced Length for lateral-torsional buckling. Members are considered fully braced for bending when the unbraced length is less than Lu.

Distortional buckling moment (Mad) is calculated without the beneficial effect of sheathing to rotational stiffness. $K_{\Phi}=0$. K₀:

Gross Properties

Area: 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_{xx}: 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.

Gross section-modulus about the strong axis (X-X). S_{xx}:

I_{yy}: R_y: Moment of inertia of the gross section about the weak axis (Y-Y).

Radius of gyration of the gross section about the Y-Y axis.

Effective Properties

I_{sx}: Effective moment of inertia about the strong axis (X-X). Effective section modulus about the strong axis (X-X). S_{ex}: M_{aL} : Allowable Bending Moment based on local buckling.

Allowable Bending Moment based on Distortional Bucking, assuming $K_{\phi} = 0$. M_{ad} :

Allowable strong axis shear away from punchout. Va:

Va(net): Allowable strong axis shear at punchout.

Torsional Properties

St. Venant Torsional Constant

Cw: Torsional warping constant.

Distance from shear center to mid-plane of web. m:

Distance from the shear center to the centroid along the principal X-axis. X_o:

Polar radius of gyration about the centroidal principal axis. Ro:

Torsional flexural constant: $1 - (X_o/R_o)^2$ β:

TABLE 1—STUD MEMBER DESIGNATION AND DIMENSIONS

Member Designation ¹	Design Thickness	Minimum Deliverable Thickness	Web	Flang (in)		Lip	Inside Radius	Web Hole Diameter	
-	(in)	(in)	(in)	Left	Right	(in)	(in)	(in)	
C89-1.0	0.0394	0.0374	3.504	1.496	1.614	0.496	0.0787	1.30	
C89-1.2	0.0472	0.0448	3.504	1.496	1.614	0.516	0.0787	1.30	
C89-1.5	0.0591	0.0561	3.504	1.496	1.614	0.547	0.0787	1.30	
C92-1.0	0.0394	0.0374	3.622	1.437	1.555	0.496	0.0787	1.30	
C92-1.2	0.0472	0.0448	3.622	1.437	1.555	0.516	0.0787	1.30	
C92-1.5	0.0591	0.0561	3.622	1.437	1.555	0.547	0.0787	1.30	
C139-1.0	0.0394	0.0374	5.472	1.850	1.969	0.496	0.0787	1.30	
C139-1.2	0.0472	0.0448	5.472	1.850	1.969	0.516	0.0787	1.30	
C139-1.5	0.0591	0.0561	5.472	1.850	1.969	0.547	0.0787	1.30	
C142-1.0	0.0394	0.0374	5.590	1.791	1.909	0.496	0.0787	1.30	
C142-1.2	0.0472	0.0448	5.590	1.791	1.909	0.516	0.0787	1.30	
C142-1.5	0.0591	0.0561	5.590	1.791	1.909	0.547	0.0787	1.30	
C250-1.0	0.0394	0.0374	9.842	2.028	2.028	0.539	0.0787	4.92	
C250-1.2	0.0472	0.0448	9.842	2.028	2.028	0.539	0.0787	4.92	
C250-1.5	0.0591	0.0561	9.842	2.028	2.028	0.539	0.0787	4.92	
C250-2.0	0.0787	0.0748	9.842	2.028	2.028	0.539	0.0787	4.92	
C300-1.0	0.0787	0.0748	11.811	2.559	2.559	0.614	0.0787	4.92	
C300-1.2	0.0787	0.0748	11.811	2.559	2.559	0.614	0.0787	4.92	
C300-1.5	0.0787	0.0748	11.811	2.559	2.559	0.614	0.0787	4.92	
C300-2.0	0.0787	0.0748	11.811	2.559	2.559	0.614	0.0787	4.92	

For **SI**: 1 inch = 25.4 mm

TABLE 2—TRACK MEMBER DESIGNATION AND DIMENSIONS

Member Designation ¹	Design Thickness	Base Metal Thickness	Web (in)	Flange	e (in)	Inside Radius	Web Hole Diameter	
g	(in)	(in)	()	Left	Right	(in)	(in)	
U92-1.0	0.0394	0.0374	3.622	1.795	1.913	0.0787	1.30	
U92-1.2	0.0472	0.0448	3.622	1.795	1.913	0.0787	1.30	
U92-1.5	0.0591	0.0561	3.622	1.795	1.913	0.0787	1.30	
U142-1.0	0.0394	0.0374	5.590	2.150	2.268	0.0787	1.30	
U142-1.2	0.0472	0.0448	5.590	2.150	2.268	0.0787	1.30	
U142-1.5	0.0591	0.0561	5.590	2.150	2.268	0.0787	1.30	
U250-1.0	0.0394	0.0374	10.079	2.5	2.5	0.0787	4.92	
U250-1.2	0.0472	0.0448	10.079	2.5	2.5	0.0787	4.92	
U250-1.5	0.0591	0.0561	10.079	2.5	2.5	0.0787	4.92	
U250-2.0	0.0787	0.0748	10.079	2.5	2.5	0.0787	4.92	
U300-1.2	0.0472	0.0448	12.047	2.795	2.795	0.0787	4.92	
U300-1.5	0.0591	0.0561	12.047	2.795	2.795	0.0787	4.92	
U300-2.0	0.0787	0.0748	12.047	2.795	2.795	0.0787	4.92	

For **SI**: 1 inch = 25.4 mm

¹Member designation CXX-X means C-shaped stud; followed by web depth in mm; followed by design thickness in mm. For example C89-1.0 is a C-shaped stud having 89 mm deep web and 1 mm thick steel.

¹ Member designation UXXX-X means U-shaped track; followed by web depth [in mm for U92 and U142]; followed by design thickness in mm. For example U92-1.0 is a U-shaped track having 92 mm deep web and 1 mm design thickness.



TABLE 3—STUD MEMBER DESIGN PROPERTIES

Area (in²) 0.2866 0.3440 0.4303 0.2866	Weight (lb/ft) 0.98 1.17 1.46 0.98	(in ⁴) 0.5585 0.6658 0.8242	Sxx (in³) 0.3137 0.3740	Rx (in) 1.3959 1.3912	lyy (in ⁴) 0.0995	(in) 0.5893	lxx (in ⁴)	Sxx (in³)	M _{a-L} (in-k)	M _{a-D}	V _{ag}	Valvet	Jx1000	Cw	Xo	m	Ro	β	Lu
0.2866 0.3440 0.4303	0.98 1.17 1.46	0.5585 0.6658	0.3137 0.3740	1.3959				(in³)	(in-k)	C- 1-1									
0.3440 0.4303	1.17 1.46	0.6658	0.3740		0.0995	0.5893			(mi-ny	(in-k)	(lb)	(lb)	(in*)	(in°)	(in)	(in)	(in)		(in)
0.4303	1.46			1.3912			0.5585	0.2562	7.79	7.77	1644	761	0.1481	0.2796	-1.2529	0.7560	1.9661	0.5939	33.3
		0.8242			0.1192	0.5888	0.6658	0.3422	10.16	9.99	2368	906	0.2559	0.3387	-1.2573	0.7589	1.9654	0.5908	33.6
0.2866	0.00		0.4630	1.3839	0.1488	0.5881	0.8242	0.4420	13.44	13.49	3700	1119	0.5002	0.4307	-1.2652	0.7640	1.9652	0.5855	34.0
	0.98	0.5881	0.3196	1.4325	0.0919	0.5661	0.5881	0.2642	8.03	7.98	1604	787	0.1481	0.2734	-1.1857	0.7200	1.9438	0.6279	32.2
0.3440	1.17	0.7013	0.3811	1.4278	0.1100	0.5655	0.7013	0.3531	10.63	10.26	2368	961	0.2559	0.3310	-1.1899	0.7228	1.9428	0.6249	32.4
0.4303	1.46	0.8685	0.4720	1.4207	0.1373	0.5648	0.8685	0.4479	13.62	13.84	3700	1187	0.5002	0.4204	-1.1974	0.7276	1.9419	0.6198	32.8
0.3920	1.33	1.7938	0.6480	2.1392	0.1878	0.6921	1.7321	0.5303	16.12	13.33	1037	960	0.2025	1.1476	-1.3435	0.8289	2.6192	0.7369	38.6
0.4705	1.60	2.1449	0.7748	2.1352	0.2254	0.6921	2.1265	0.6812	20.71	17.43	1798	1381	0.3500	1.3847	-1.3479	0.8317	2.6182	0.7350	38.7
0.5884	2.00	2.6675	0.9636	2.1292	0.2821	0.6924	2.6675	0.9096	27.26	24.11	3527	2155	0.6840	1.7491	-1.3556	0.8366	2.6173	0.7317	39.0
0.3920	1.33	1.8498	0.6540	2.1722	0.1752	0.6685	1.8065	0.5397	16.41	13.56	1014	967	0.2025	1.1173	-1.2831	0.7955	2.6100	0.7583	37.5
0.4705	1.60	2.2119	0.7821	2.1683	0.2102	0.6685	2.2050	0.6960	21.16	17.72	1758	1392	0.3500	1.3479	-1.2873	0.7981	2.6088	0.7565	37.6
0.5884	2.00	2.7513	0.9729	2.1624	0.2631	0.6687	2.7513	0.9355	28.04	24.52	3449	2171	0.6840	1.7019	-1.2947	0.8028	2.6075	0.7535	37.9
0.5768	1.96	7.5738	1.5390	3.6237	0.2626	0.6748	7.0271	0.8591	26.11	25.01	565	565	0.2980	5.0884	-1.1346	0.7352	3.8567	0.9135	39.4
0.6903	2.35	9.0382	1.8366	3.6184	0.3107	0.6709	8.5664	1.0873	33.05	32.58	979	896	0.5136	6.0188	-1.1270	0.7307	3.8488	0.9143	39.3
0.8595	2.92	11.2035	2.2766	3.6104	0.3802	0.6651	10.8705	1.4827	45.07	44.96	1916	1396	0.9992	7.3620	-1.1156	0.7240	3.8369	0.9155	39.0
1.1385	3.87	14.7295	2.9930	3.5969	0.4889	0.6553	14.6498	2.2589	68.67	67.82	4561	2471	2.3529	9.4647	-1.0966	0.7127	3.8170	0.9175	38.7
0.7020	2.39	13.4565	2.2786	4.3782	0.5115	0.8536	11.8542	1.1362	34.54	33.04	469	469	0.3627	14.0740	-1.4422	0.9301	4.6880	0.9054	49.3
0.8406	2.86	16 0745	2 7219	4 3729	0.6069	0.8497	14.8809	1.4451	43.93	43.14	812	812	0.6254	16 6938	-1 4344	0.9255	4.6800	0.9061	49.2
					0.7457		19.0604							20.5054					48.9
	4.73	26.3042	4.4542											26.5500		0.9074	4.6480		48.6
	0.4303 0.3920 0.4705 0.5884 0.3920 0.4705 0.5884 0.5768 0.6903 0.8595 1.1385	0.4303 1.46 0.3920 1.33 0.4705 1.60 0.5884 2.00 0.3920 1.33 0.4705 1.60 0.5884 2.00 0.5768 1.96 0.6903 2.35 0.8905 2.92 1.1385 3.87 0.7020 2.39 0.8406 2.86 1.0474 3.56	0.4303 1.46 0.8685 0.3920 1.33 1.7938 0.4705 1.60 2.1449 0.5884 2.00 2.6675 0.3920 1.33 1.8498 0.4705 1.60 2.2119 0.5884 2.00 2.7513 0.5768 1.96 7.5738 0.6903 2.35 9.0382 0.6903 2.35 9.0382 0.8995 2.92 11.2035 1.1385 3.87 14.7295 0.7020 2.39 13.4565 0.8406 2.86 16.0745 1.0474 3.56 19.9559	0.4303 1.46 0.8685 0.4720 0.3920 1.33 1.7938 0.6480 0.4705 1.60 2.1449 0.7748 0.5884 2.00 2.6675 0.9636 0.3920 1.33 1.8498 0.6540 0.4705 1.60 2.2119 0.7821 0.5884 2.00 2.7513 0.9729 0.5768 1.96 7.5738 1.5390 0.6903 2.35 9.0382 1.8366 0.8995 2.92 11.2035 2.2766 1.1385 3.87 14.7295 2.9930 0.7020 2.39 13.4565 2.2786 0.8406 2.86 16.0745 2.7219 1.0474 3.56 19.9559 3.3792	0.4303 1.46 0.8685 0.4720 1.4207 0.3920 1.33 1.7938 0.6480 2.1392 0.4705 1.60 2.1449 0.7748 2.1352 0.5884 2.00 2.6675 0.9636 2.1292 0.3920 1.33 1.8498 0.6540 2.1772 0.4705 1.60 2.2199 0.7821 2.1683 0.5884 2.00 2.7513 0.9729 2.1624 0.5768 1.96 7.5738 1.5390 3.6237 0.6903 2.35 9.0382 1.8366 3.6184 0.8595 2.92 11.2035 2.2766 3.6104 1.1385 3.87 14.7295 2.9930 3.5969 0.7020 2.39 13.4565 2.2786 4.3782 0.8406 2.86 16.0745 2.7219 4.3729 1.0474 3.56 19.9559 3.3792 4.3650	0.4303 1.46 0.8685 0.4720 1.4207 0.1373 0.3920 1.33 1.7938 0.6480 2.1392 0.1878 0.4705 1.60 2.1449 0.7748 2.1352 0.2254 0.5884 2.00 2.6675 0.9636 2.1292 0.2821 0.3920 1.33 1.8498 0.6540 2.1722 0.1752 0.4705 1.60 2.2119 0.7821 2.1682 0.2102 0.5884 2.00 2.7513 0.9729 2.1624 0.2631 0.5768 1.96 7.5738 1.5390 3.6237 0.2626 0.6903 2.35 9.0382 1.8366 3.6184 0.3107 0.8995 2.92 11.2035 2.2766 3.6104 0.3802 1.1385 3.87 14.7295 2.9990 3.5969 0.4889 0.7020 2.39 13.4565 2.2786 4.3782 0.5116 0.8406 2.86 16.0745 2.7219	0.4303 1.46 0.8685 0.4720 1.4207 0.1373 0.5648 0.3920 1.33 1.7938 0.6480 2.1392 0.1878 0.6921 0.4705 1.60 2.1449 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2.2050 0.6960 24.16 1.77.72 1758 <td>0.4303 1.46 0.8685 0.4720 1.4207 0.1373 0.5648 0.8685 0.4479 13.62 13.84 3700 1187 0.5002 0.4204 0.3920 1.33 1.7938 0.6480 2.1392 0.1878 0.6921 1.1721 0.5303 16.12 13.33 1037 960 0.2025 1.1476 0.4705 1.60 2.1449 0.7748 2.1352 0.2524 0.6921 2.1256 0.6812 2.1256 0.6812 2.1752 0.671 1.743 1798 1381 0.3500 1.3847 0.5884 2.00 2.6675 0.9636 2.1292 0.2821 0.6924 2.6675 0.9096 27.26 24.11 3527 2155 0.6840 1.7491 0.3920 1.33 1.8498 0.6540 2.1722 0.1752 0.6685 2.2050 0.6960 1.216 1.7272 1758 1904 967 0.2025 1.1173 0.4705 1.60 2.2119 0.782</td> <td>0.4303 1.46 0.8685 0.4720 1.4207 0.1373 0.5648 0.8685 0.4479 13.62 13.84 3700 1187 0.5002 0.4204 -1.1974 0.3920 1.33 1.7938 0.6480 2.1392 0.1878 0.6921 1.7321 0.5303 16.12 13.33 1037 960 0.2025 1.1476 -1.4345 0.4705 1.60 2.1449 0.7748 2.1352 0.2254 0.6924 2.6675 0.6812 2.171 1743 1798 1381 0.3500 1.3487 -1.3479 0.5844 2.00 2.6675 0.9636 2.1292 0.2821 0.6924 2.6675 0.9096 27.26 24.11 3527 2155 0.6840 1.7491 -1.3556 0.3920 1.33 1.8498 0.6540 2.1722 0.1752 0.6685 1.8065 0.5997 16.41 13.56 1014 967 0.025 1.1173 -1.2831 0.4705 1.60 2</td> <td>0.4303 1.46 0.8685 0.4720 1.4207 0.1373 0.5648 0.8685 0.4479 13.62 13.84 3700 1187 0.5002 0.4204 -1.1974 0.7726 0.3920 1.33 1.7938 0.6480 2.1392 0.1878 0.6921 1.7321 0.5303 16.12 13.33 1037 960 0.2025 1.1476 -1.3435 0.8218 0.4705 1.60 2.1449 0.7748 2.1352 0.2254 0.6924 2.6675 0.6906 2.7.26 24.11 3527 2155 0.6840 1.7491 -1.3556 0.8317 0.5884 2.00 2.6675 0.9636 2.1292 0.2821 0.6685 1.8065 0.5397 1.641 13.56 1014 967 0.2025 1.1173 -1.2831 0.7952 0.4705 1.60 2.2119 0.7821 2.1624 0.2631 0.6687 2.7513 0.9352 2.804 2.4.52 3449 2171 0.6840 1.7019</td> <td>0.4303 1.46 0.8685 0.4720 1.4207 0.1373 0.5648 0.8685 0.4479 13.62 13.84 3700 1187 0.5002 0.4204 -1.1974 0.7276 1.9419 0.3920 1.33 1.7938 0.6480 2.1392 0.1878 0.6921 2.1256 0.6812 0.5021 0.7276 0.7271 17.43 1978 1381 0.3500 1.3847 -1.3435 0.2829 2.6192 0.5884 2.00 2.6675 0.9636 2.1292 0.2821 0.6924 2.6675 0.9096 27.26 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2.1392 0.1878 0.6921 2.1256 0.6812 0.5021 0.7276 0.7271 17.43 1978 1381 0.3500 1.3847 -1.3435 0.2829 2.6192 0.5884 2.00 2.6675 0.9636 2.1292 0.2821 0.6924 2.6675 0.9096 27.26 24.11 3527 2155 0.6840 1.7491 -1.3556 0.8366 2.6173 0.3920 1.33 1.8498 0.6540 2.1722 0.1752 0.6685 1.8065 0.5397 1.641 13.56 1014 967 0.2025 1.1173 -1.2831 0.7955 2.6100 0.4705 1.60 2.2119 0.7821 2.1683 0.6687 2.2505 0.6969 1.116	0.4303 1.46 0.8685 0.4720 1.4207 0.1373 0.5648 0.8685 0.4479 13.62 13.84 3700 1187 0.5002 0.4204 -1.1974 0.7276 1.9419 0.6198 0.3920 1.33 1.7938 0.6480 2.1392 0.1878 0.6921 1.27321 0.5303 16.12 13.33 1037 960 0.2025 1.1466 -1.3435 0.8289 2.6192 0.7369 0.4705 1.60 2.1449 0.7748 2.1352 0.2254 0.6924 2.6675 0.6902 2.2675 0.9906 27.26 24.11 3527 2155 0.6840 1.7491 -1.3556 0.8366 2.6173 0.7317 0.3920 1.33 1.8498 0.6540 2.1722 0.1752 0.6685 1.8065 0.5397 16.41 1.356 1014 967 0.2025 1.1173 -1.2831 0.7583 0.4705 1.60 2.2119 0.7821 0.8937 0.6687 2.7513

General Notes - Stud Properties

- Calculations are based on AISI Standard, North American Specification for the Design of Cold-Formed Steel Structural Members, 2016 edition with Supplement 2 (2020) (AISI S100-16w/S2-20) adopted in the International Building Code (IBC), 2021 edition. All calculations are based on allowable strength design (ASD).
- 2 Distortional buckling calculations are based on $k\phi$ = 0
- 3 When provided, factory punchouts will be located along the centerline of the webs of the members and will have a minimum center-to-center spacing of 24 inches.
- 3 For deflection determination, use the effective moment of inertia. Effective moment of inertia is based on Serviceability Determination provisions of AISI S100.
- 4 The effective moment of inertia for deflection is calculated at a stress which results in a section modulus such that the stress times the section modulus at that stress is equal to the allowable local buckling moment.
- 5 Tabulated gross properties are based on the full, unreduced section away from punchouts.
- 6 Web height-to-thickness ratio exceeds 200. Web stiffeners are required at all reactions and concentrated loads.

TABLE 4—TRACK MEMBER DESIGN PROPERTIES

			Gross Properties								Effe	ctive Prope	rties		Torsional Properties						
	Thickness	Fy	Area	Weight	lxx	Sxx	Rx	lyy	Ry	lxx	Sxx	M _{a-L}	Vag	Valvet	Jx1000	Cw	Xo	m	Ro	β	
Section	(in)	(ksi)	(in²)	(lb/ft)	(in⁴)	(in³)	(in)	(in⁴)	(in)	(in⁴)	(in³)	(in-k)	(lb)	(lb)	(in ⁴)	(in ⁶)	(in)	(in)	(in)		
U92-1.0	0.03937	50.76	0.281	0.96	0.599	0.324	1.460	0.098	0.590	0.426	0.150	4.55	1604	787	0.145	0.220	-1.147	0.684	1.949	0.653	
U92-1.2	0.04724	50.76	0.336	1.14	0.713	0.385	1.457	0.117	0.589	0.543	0.203	6.16	2784	1130	0.250	0.261	-1.145	0.682	1.944	0.653	
U92-1.5	0.05906	50.76	0.418	1.42	0.882	0.477	1.452	0.144	0.587	0.725	0.291	8.85	3700	1187	0.486	0.321	-1.142	0.680	1.938	0.653	
U142-1.0	0.03937	50.76	0.388	1.32	1.863	0.659	2.192	0.184	0.689	1.406	0.318	9.65	1014	967	0.200	1.003	-1.257	0.769	2.619	0.770	
U142-1.2	0.04724	50.76	0.464	1.58	2.224	0.786	2.189	0.219	0.688	1.719	0.455	13.82	1758	1391	0.345	1.193	-1.254	0.768	2.615	0.770	
U142-1.5	0.05906	50.76	0.579	1.97	2.759	0.975	2.184	0.272	0.686	2.225	0.653	19.86	3450	2171	0.673	1.474	-1.251	0.766	2.608	0.770	
U250-1.2 ⁶	0.04724	50.76	0.704	2.39	9.755	1.936	3.723	0.359	0.714	5.965	0.651	19.78	955	918	0.523	6.645	-1.151	0.739	3.962	0.916	
U250-1.5	0.05906	50.76	0.878	2.99	12.136	2.408	3.718	0.446	0.712	8.289	0.967	29.39	1870	1432	1.021	8.232	-1.148	0.737	3.955	0.916	
U250-2.0	0.07874	50.76	1.167	3.97	16.048	3.185	3.708	0.587	0.709	12.404	1.599	48.60	4450	2535	2.412	10.809	-1.142	0.733	3.945	0.916	
U300-1.2 ⁶	0.04724	50.76	0.836	2.84	16.481	2.736	4.441	0.574	0.829	9.195	0.799	24.30	795	795	0.622	15.233	-1.326	0.854	4.708	0.921	
U300-1.5	0.05906	50.76	1.043	3.55	20.520	3.407	4.435	0.713	0.827	12.950	1.191	36.20	1558	1558	1.213	18.897	-1.323	0.852	4.701	0.921	
U300-2.0	0.07874	50.76	1.387	4.72	27.170	4.511	4.426	0.941	0.824	19.733	1.983	60.26	3704	2967	2.866	24.869	-1.317	0.848	4.691	0.921	

General Notes - Channel Properties

- 1 Calculations are based on AISI Standard, North American Specification for the Design of Cold-Formed Steel Structural Members, 2016 edition with Supplement 2 (2020) (AISI S100-16w/S2-20) adopted in the International Building Code (IBC), 2021 edition. All calculations are based on allowable strength design (ASD).
- 2 When provided, factory punchouts will be located along the centerline of the webs of the members and will have a minimum center-to-center spacing of 24 inches.
- 3 For deflection determination, use the effective moment of inertia. Effective moment of inertia is based on Serviceability Determination provisions of AISI S100.
- 4 The effective moment of inertia for deflection is calculated at a stress which results in a section modulus such that the stress times the section modulus at that stress is equal to the allowable local buckling moment.
- 5 Tabulated gross properties are based on the full, unreduced section away from punchouts.
- 6 Web height-to-thickness ratio exceeds 200. Web stiffeners are required at all reactions and concentrated loads.

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TABLE 5-ALLOWABLE WEB CRIPPLING LOAD (Ibs) -SINGLE STUD MEMBERS^{1, 2, 3, 4}

Member Designation	Condition 1					Cond	ition 2			Cond	lition 3		Condition 4					
	1 in	3.5 in	4 in	6 in	1 in	3.5 in	4 in	6 in	1 in	3.5 in	4 in	6 in	1 in	3.5 in	4 in	6 in		
C89-1.0	326	507	534	628	648	882	917	103 7	270	359	372	418	777	972	100 1	110 1		
C89-1.2	462	710	747	875	946	126 9	131 7	148 3	407	533	551	616	114 6	141 4	145 4	159 3		
C89-1.5	705	1068	1122	1309	1495	197 1	204 2	228 8	664	855	883	982	183 4	222 9	228 8	249 2		
C92-1.0	325	505	532	625	647	880	915	103 5	266	354	367	412	772	965	994	109 3		
C92-1.2	460	707	744	872	945	126 7	131 5	148 1	402	526	545	609	113 9	140 5	144 5	158 3		
C92-1.5	703	1065	1118	1305	1493	196 8	203 9	228 4	657	846	874	972	182 4	221 7	227 6	247 9		
C139-1.0	307	477	502	590	631	858	892	101 0	214	285	295	331	696	870	896	986		
C139-1.2	437	672	707	828	923	123 8	128 5	144 7	335	438	454	507	104 0	128 3	132 0	144 5		
C139-1.5	673	1018	1070	1248	1463	192 9	199 8	223 8	566	728	753	837	168 7	205 1	210 5	229 3		
C142-1.0	306	476	501	588	630	857	891	100 8	211	281	291	327	692	865	890	980		
C142-1.2	436	670	705	826	922	123 7	128 3	144 6	331	433	449	502	103 4	127 6	131 2	143 7		
C142-1.5	671	1016	1067	1245	1462	192 7	199 6	223 6	560	722	746	829	167 9	204 2	209 5	228 2		
C250-1.5	617	934	981	1145	1409	185 8	192 4	215 6	400	516	533	592	144 0	175 1	179 7	195 7		
C250-2.0	1084	1609	1686	1957	2547	328 6	339 5	377 6	836	105 4	108 7	119 9	274 1	327 1	335 0	362 3		
C300-1.5	597	903	949	1107	1389	183 1	189 7	212 5	339	436	451	501	134 8	163 9	168 2	183 2		
C300-2.0	1054	1564	1639	1902	2516	324 5	335 3	373 0	744	938	967	106 7	260 2	310 4	317 9	343 8		

For **SI**: 1 inch = 25.4 mm; 1 lb = 4.448 N; 1 ksi = 6.89 Mpa

- Condition 1 End Reaction One Flange Loading
- Condition 2 Interior Reaction One Flange Loading
- Condition 3 End Reaction Two Flange Loading
- Condition 4 Interior Reaction Two Flange Loading

- One-flange loading or reaction is defined as the condition where the clear distance between the bearing edges of adjacent opposite concentrated loads or reactions is equal to or greater than 1.5h.
- Two-flange loading or reaction is defined as the condition where the clear distance between the bearing edges of adjacent opposite concentrated loads or reactions is less than 1.5h.
- End loading or reaction is defined as the condition where the distance from the edge of the bearing to the end of the member is equal to or less than 1.5h.
- Interior loading or reaction is defined as the condition where the distance from the edge of the bearing to the end of the member is greater than 1.5h, except as noted in AISI S100 Chapter C.

¹ For multiple members, multiply the listed capacity of a single member by the number of members in the assembly.

² Values shown are for unpunched and punched members. For punched members, the clear distance between the edge of bearing and the edge of punch-out must be at least two times the depth of the web.

³ Conditions for Bearing Length based on minimum bearing widths of 1 inch; 3.5 inches, 4 inches and 6 inches:

⁴ As defined by AISI S100:

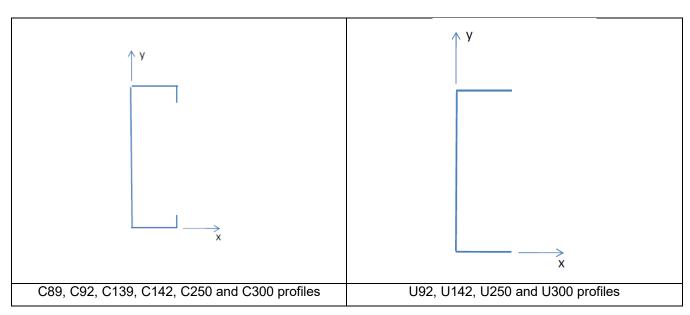


FIGURE 1—COLD-FORMED STEEL MEMBER PROFILES



ICC-ES Evaluation Report

ESR-5071 LABC and LARC Supplement

Reissued September 2024

This report is subject to renewal September 2025.

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A Subsidiary of the International Code Council®

DIVISION: 05 00 00—METALS

Section: 05 40 00—Cold-formed Metal Framing Section: 05 41 00—Structural Metal Stud Framing

REPORT HOLDER:

CERCA HOMES, LLC

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 <u>ESR-5071</u>, have also been evaluated for compliance with the codes noted below as adopted by the Los Angeles Department of Building and Safety (LADBS).

Applicable code editions:

- 2020 City of Los Angeles Building Code (LABC)
- 2020 City of Los Angeles Residential Code (LARC)

2.0 CONCLUSIONS

The cold-formed steel framing members, described in Sections 2.0 through 7.0 of the evaluation report <u>ESR-5071</u>, comply with the LABC Chapter 22, and the LARC, and are subject to the conditions of use described in this supplement.

3.0 CONDITIONS OF USE

The cold-formed steel framing members described in this evaluation report supplement must comply with all of the following conditions:

- All applicable sections in the evaluation report <u>ESR-5071</u>.
- The design, installation, conditions of use and identification of the cold-formed steel framing members are in accordance
 with the 2018 International Building Code® (IBC) provisions noted in the evaluation report <u>ESR-5071</u>.
- The design, installation and inspection are in accordance with additional requirements of LABC Chapters 16, 17 and 22, as applicable.
- Under the LARC, an engineered design in accordance with LARC Section R301.1.3 must be submitted.

This supplement expires concurrently with the evaluation report, reissued September 2024.





ICC-ES Evaluation Report

ESR-5071 CBC and CRC Supplement

Reissued September 2024

This report is subject to renewal September 2025.

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1.0 REPORT PURPOSE AND SCOPE

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The purpose of this evaluation report supplement is to indicate that cold-formed steel framing members, described in ICC-ES evaluation report ESR-5071, have also been evaluated for compliance with the codes noted below.

Applicable code editions:

■ 2022 and 2019 California Building Code (CBC)

For evaluation of applicable chapters adopted by the California Office of Statewide Health Planning and Development (OSHPD) AKA: California Department of Health Care Access and Information (HCAI) and the Division of State Architect (DSA), see Sections 2.1.1 and 2.1.2 below.

■ 2022 and 2019 California Residential Code (CRC)

2.0 CONCLUSIONS

2.1 CBC:

The cold-formed steel framing members, described in Sections 2.0 through 7.0 of the evaluation report ESR-5071, comply with CBC Chapter 22, provided the design and installation are in accordance with the 2021 and 2018 *International Building Code*® (IBC) provisions, as applicable, noted in the evaluation report and the additional requirements of CBC Chapters 16, 17 and 22, as applicable.

- 2.1.1 OSHPD: The applicable OSHPD Sections and Chapters of the CBC are beyond the scope of this supplement.
- 2.1.2 DSA: The applicable DSA Sections and Chapters of the CBC are beyond the scope of this supplement.

2.2 CRC:

The cold-formed steel framing members, described in Sections 2.0 through 7.0 of the evaluation report ESR-5071, provided the design and installation are in accordance with the 2021 and 2018 *International Residential Code*[®] (IRC) provisions, as applicable, noted in the evaluation report.

This supplement expires concurrently with the evaluation report, reissued September 2024.

