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ICC-ES Evaluation Report

ESR-5236

Issued August 2024

This report is subject to renewal August 2025.

DIVISION: 05 00 00—METALS
Section: 05 40 00—Cold-Formed Metal Framing

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

REPORT HOLDER:

DRYCONT, LLC

EVALUATION SUBJECT:

COLD-FORMED STEEL FRAMING

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

The framing members with a minimum G40 coating are used only as nonstructural members as defined by the North American Standard for Cold-Formed Steel Nonstructural Framing (AISI S220).

3.0 DESCRIPTION

The designations and dimensions of studs and tracks are provided in Table 1. Figure 1 includes profiles of the studs and tracks.

The studs are manufactured with and without web punch-outs. When provided on 162S125 or 250S125 studs, the punch-outs have a rectangular profile with rounded corners width of ¾ inches (19 mm) and a length of 2 3/8 inches (60 mm) in members. When provided on 362S152 studs, the punch-outs have a bowtie profile with widths of 3/4 inch (19 mm) and 1½ inch (38 mm) and lengths of 1 ½ inches (38 mm) and 2 ¾ inches (69 mm). The punch-outs are spaced a minimum of 24 inches (610 mm) on center and have a minimum distance between the end of the member and the near edge of the punch-out of 10 inches (254 mm). See Figure 2 for punch-out profiles.

The stud and track sections are cold-formed from steel coils conforming to ASTM A653 SS Grade 33 Class 1 with a minimum G40 galvanized coating or ASTM A1003 Grade 33 (NS33) with a minimum G40 galvanized coating.

4.0 DESIGN AND INSTALLATION

4.1 Design:

The gross, effective and torsional properties are provided in Tables 2 and 3 for the studs and tracks, respectively. These values have been determined in accordance with the North American Specification for the Design of Cold-Formed Steel Structural Members (AISI S100).

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 installation.

5.0 CONDITIONS OF USE

The framing members described in this report comply with, or are 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 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 cold formed steel 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 framing members are manufactured under a 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 2019 (Editorially revised December 2020).

7.0 IDENTIFICATION

7.1 The ICC-ES mark of conformity, electronic labeling, or the evaluation report number (ICC-ES ESR-5236) along with the name, registered trademark, or registered logo of the report holder must be included in the product label.

7.2 In addition, at a spacing not exceeding 96 inches (2440 mm) on center, each cold-formed steel member is stamped, stenciled or embossed with the company name or initials; the acronym "ICC-ES"; the evaluation report number (ESR-5236); the minimum uncoated base-metal thickness in mils or decimal inches; the minimum specified yield strength; in addition to the following:

- For nonstructural members, each member must have the designation "NS".

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

DRYCONT, LLC
2530 SW 82 AVENUE
CUTLER BAY, FLORIDA 33189
(786) 312-3167
www.drycont.com

Definition of Symbols

F_y: Yield strength (ksi)
L_u: Critical unbraced length for lateral-torsional buckling. Members are considered fully braced when the unbraced length (maximum of unbraced length for bending about the weak axis, L_y and the unbraced length for twisting, L_t) 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 (away from punch-outs):
A: The cross-sectional area of the full unreduced cross-section of the member.
Wt: The weight per foot of the full unreduced cross-section of the member.
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 strong axis (X-X).
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 weak axis (Y-Y).
t: Design base metal thickness without coating.

Effective Properties:
I_{ex}: Effective moment of inertia about the strong axis (X-X) based on serviceability limit state.
S_{ex}: Effective section modulus about the strong axis (X-X) based on strength limit state.
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-outs.
V_{anet}: Allowable strong axis shear at punch-outs.

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 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 1 – STUD AND TRACK PHYSICAL PROPERITES[1]

Section	Mils	Depth (in.)	Flange (in.)	Lip (in.)	Inside Corner Rad. (in.)	Design Thick. (in.)	Min. Thick. (in.)
STUDS							
162S125-18	18	1.625	1.25	0.1875	0.0938	0.0188	0.0179
162S125-33	33	1.625	1.25	0.1875	0.0938	0.0346	0.0329
250S125-18	18	2.5	1.25	0.1875	0.0938	0.0188	0.0179
250S125-33	33	2.5	1.25	0.1875	0.0938	0.0346	0.0329
362S125-18	18	3.625	1.25	0.1875	0.0938	0.0188	0.0179
362S125-33	33	3.625	1.25	0.1875	0.0938	0.0346	0.0329
TRACKS							
162T125-18	18	1.75	1.25	---	0.0938	0.0188	0.0179
162T125-33	33	1.75	1.25	---	0.0938	0.0346	0.0329
250T125-18	18	2.625	1.25	---	0.0938	0.0188	0.0179
250T125-33	33	2.625	1.25	---	0.0938	0.0346	0.0329
362T125-18	18	3.75	1.25	---	0.0938	0.0188	0.0179
362T125-33	33	3.75	1.25	---	0.0938	0.0346	0.0329

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

[1]XXX = Overall depth in 100's of an inch. For example: 162 = 1.625 inches; 250 = 2.50 inches; 362 = 3.625 inches.

TABLE 2 – STUD SECTION PROPERTIES[1,2,3,4,5,6]

SECTION	GROSS PROPERTIES							EFFECTIVE PROPERTIES (Based on F_y = 33 ksi)						TORSIONAL PROPERTIES						
	Area	Weight	I_{xx}	S_{xx}	R_x	I_{yy}	R_y	I_{xx}	S_{xx}	M_{al}	M_{ad}	V_{ag}	V_{anet}	Jx1000	C_w	X_o	m	R_o	β	L_u
	(in^2)	(lb/ft)	(in^4)	(in^3)	(in)	(in^4)	(in)	(in^4)	(in^3)	(ft-lb)	(ft-lb)	(lb)	(lb)	(in^4)	(in^6)	(in)	(in)	(in)		(in)
162S125-18	0.080	0.272	0.038	0.046	0.686	0.016	0.446	0.032	0.031	0.609	0.611	302	97	0.009	0.009	-1.028	0.594	1.314	0.388	29.0
162S125-33	0.144	0.491	0.066	0.082	0.678	0.028	0.438	0.065	0.069	1.355	1.369	586	97	0.058	0.016	-1.008	0.583	1.292	0.391	29.3
250S125-18	0.096	0.327	0.099	0.079	1.013	0.018	0.438	0.087	0.057	1.129	0.969	260	195	0.011	0.023	-0.903	0.543	1.426	0.599	29.0
250S125-33	0.175	0.594	0.176	0.141	1.005	0.032	0.429	0.174	0.123	2.426	2.238	960	384	0.070	0.040	-0.884	0.532	1.405	0.604	28.9
362S125-18	0.117	0.399	0.233	0.128	1.407	0.021	0.420	0.187	0.075	1.481	1.433	174	163	0.014	0.054	-0.785	0.490	1.665	0.778	28.8
362S125-33	0.214	0.726	0.417	0.230	1.398	0.036	0.411	0.396	0.181	3.568	3.402	1024	512	0.085	0.094	-0.768	0.480	1.647	0.783	28.5

For **SI:** 1 lbf = 4.448 N, 1 kip = 4448 N, 1 inch = 25.4 mm, 1 lb/lin ft = 14.5939 N/m, 1 inch-kip = 12.8 N-m

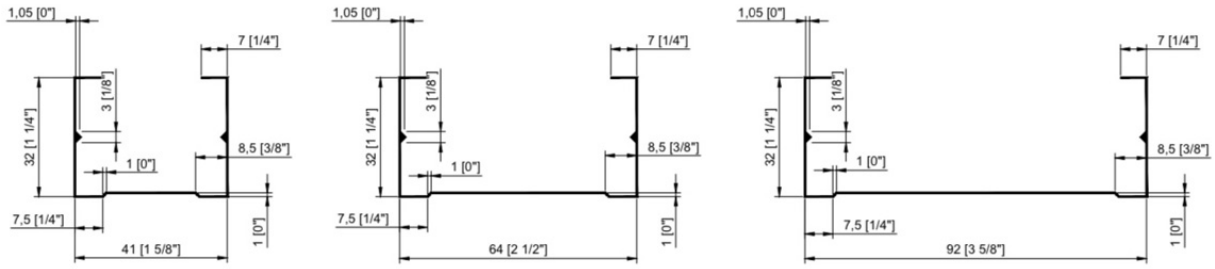
[1] Gross and torsional properties are based on the full-unreduced cross section of the studs, away from web punch-outs.
[2] Effective properties are based on studs with punchouts. Cold work of forming has not been considered.
[3] Use the effective moment of inertia for deflection calculations.
[4] M_{al} and M_{ad} are based on the compression flange fully braced. For other conditions of compression flange bracing, the allowable moment must be determined in accordance with AISI S100 [-16 (2020) w/ S2-20 for 2021 IBC and IRC; -16 for 2018 IBC and IRC; and -12 for the 2015 IBC and IRC].
[5] M_{ad} is calculated without the beneficial effect of sheathing to rotational stiffness. K_ϕ =0.
[6] For definition of symbols, see page 2.

TABLE 3 – TRACK SECTION PROPERTIES[1,2,3,4]

SECTION	GROSS PROPERTIES							EFFECTIVE PROPERTIES (Based on F_y = 33 ksi)				TORSIONAL PROPERTIES					
	Area	Weight	I_{xx}	S_{xx}	R_x	I_{yy}	R_y	I_{xx}	S_{xx}	M_{al}	V_a	Jx1000	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)	(lb)	(in^4)	(in^6)	(in)	(in)	(in)	
162T125-18	0.078	0.264	0.042	0.048	0.734	0.013	0.411	0.029	0.024	0.470	302	0.009	0.007	-0.877	0.503	1.215	0.479
162T125-33	0.141	0.481	0.075	0.085	0.727	0.024	0.409	0.062	0.056	1.108	639	0.056	0.012	-0.873	0.500	1.207	0.478
250T125-18	0.094	0.320	0.104	0.079	1.052	0.015	0.400	0.074	0.042	0.836	246	0.011	0.018	-0.768	0.459	1.362	0.683
250T125-33	0.172	0.584	0.188	0.143	1.045	0.027	0.397	0.159	0.099	1.953	1014	0.068	0.032	-0.763	0.456	1.354	0.682
362T125-18	0.115	0.391	0.238	0.127	1.437	0.017	0.380	0.175	0.065	1.284	168	0.014	0.042	-0.665	0.413	1.629	0.833
362T125-33	0.211	0.716	0.431	0.230	1.430	0.030	0.378	0.372	0.166	3.285	1024	0.084	0.075	-0.660	0.410	1.620	0.834

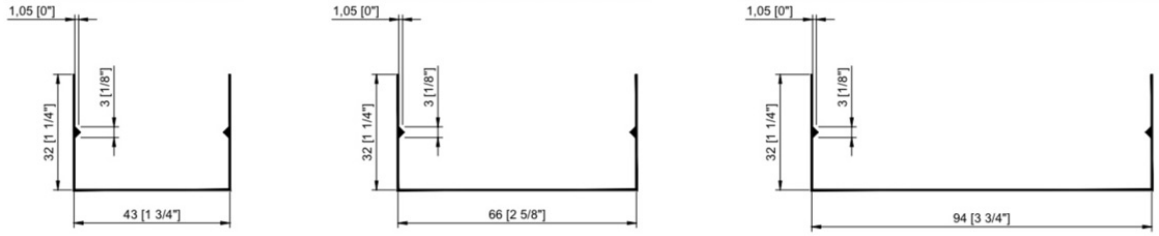
For **SI:** 1 lbf = 4.448 N, 1 kip = 4448 N, 1 inch = 25.4 mm, 1 lb/lin ft = 14.5939 N/m, 1 inch-kip = 12.8 N-m

[1] Use the effective moment of inertia for deflection calculations.
[2] Cold-work of forming has not been considered.
[3] M_{al} is based on the compression flange fully braced. For other conditions of compression flange bracing, the allowable moment must be determined in accordance with AISI S100 [-16 (2020) w/ S2-20 for 2021 IBC and IRC; -16 for 2018 IBC and IRC; and -12 for the 2015 IBC and IRC].
[4] For definition of symbols, see page 2.



162S125 250S125 362S125

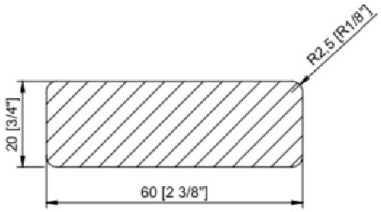
Studs



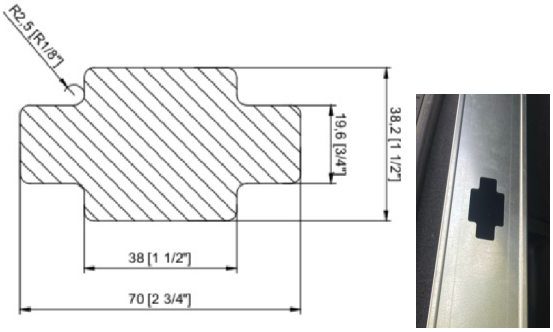
162T125 250T125 362T125

Tracks

FIGURE 1 – STUD AND TRACK SECTION PROFILES



Punch-out for the 162S125 and 250S125 studs



Punch-outs for the 362S125 studs

FIGURE 2 – PUNCH-OUTS FOR STUDS