



# ICC-ES Evaluation Report ESR-1166P

Reissued August 2020

Revised June 2022

This report is subject to renewal August 2022.

**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:**

CLARKDIETRICH®

**EVALUATION SUBJECT:**

CLARKDIETRICH® C-SECTIONS AND TRACKS

**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)

For evaluation for compliance with codes adopted by the Los Angeles Department of Building and Safety (LADBS), see the [ESR-1166P LABC and LARC Supplement](#).

For evaluation for compliance with codes adopted by the California Office of Statewide Health Planning and Development (OSHPD) and Division of State Architects (DSA), see the [ESR-1166P CBC and CRC Supplement](#).

**Property evaluated:**

Structural

**2.0 USES**

The C-sections and tracks are used for joists, rafters, nonload-bearing interior walls, curtain walls, and load-bearing walls.

**3.0 DESCRIPTION**

**3.1 General:**

The C-sections and tracks recognized in this report are factory-formed from coils of steel at the ClarkDietrich® Metal Framing facilities noted in Table 2.

The C-sections are manufactured with and without web punch-outs. When provided, the punch-outs have a width of 1½ inches (38 mm) and a length of 4 inches (102 mm) in members with a depth of 3½ inches (89 mm) or greater. In C-sections with a depth of 2½ inches (64 mm), punch-outs have a width of ¾ inch (19 mm) and a length of 4 inches (102 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).

The C-sections and tracks are detailed in the ClarkDietrich® catalog entitled "[Cold-Formed Structural Framing Products Technical Design Guide](#)," copyrighted June 2020, which is distributed with this report. The following tables from the catalog are part of this report:

Product Information

How to identify our products .....page 4

Wall Stud & Floor Joist Section

Stud/Track Properties .....pages 6, 8-17

**Note: "GREEN Benefits and Recycled Content" (page 5) is outside the scope of this report.**

Allowable Stud & Track Shear Values.....pages 18

Interior Light-Gauge Limiting Wall

Heights.....pages 19-26

Exterior Light-Gauge Limiting Wall

Heights.....pages 27-39

**Note: Exterior walls must be designed for a transverse load of no less than 10 psf (478 Pa).**

Combined Axial and Lateral Load Tables for Exterior Wall Studs.....pages 40-55

**Note: Exterior walls must be designed for a transverse load of no less than 10 psf (478 Pa).**

Allowable Unbraced Axial Loads.....pages 56-60

Floor Joist Span Tables.....pages 61-88

**Note: Figures on page 67 are outside the scope of this report.**

Allowable Web Crippling Loads .....pages 89-92

All other pages in the “Cold-Formed Structural Framing Products Technical Design Guide” catalog are outside the scope of this report.

The inside bend radius of all members is based on thickness and is as follows:

MILS	DESIGN THICKNESS (in)	INSIDE BEND RADIUS (in)
33	0.0346	0.076
43	0.0451	0.071
54	0.0566	0.085
68	0.0713	0.107
97	0.1017	0.152

### 3.2 Materials:

The ClarkDietrich® metal framing members recognized in this report are cold-formed from galvanized steel coils conforming to ASTM A1003 Structural Grade 50 Type H (ST50H), ASTM A1003 Structural Grade 33 Type H (ST33H), ASTM A653 SS Grade 50 Class I or ASTM A653 SS Grade 33. The steel conforming to ST50H and ST33H has a minimum metallic coating of G60 (ASTM A653), A60 (ASTM A653), AZ50 (ASTM A792), or GF30 (ASTM A875). Steel conforming to ASTM A653 SS Grade 50 Class 1 has a minimum metallic coating designation of G60 or A60. The steel conforming to ASTM A653 SS Grade 33 may have either a minimum metallic coating designation of G60 or A60 for structural members or a minimum metallic coating designation of G40 for nonstructural members.

## 4.0 DESIGN AND INSTALLATION

### 4.1 Design:

The section properties for the cold-formed steel framing members recognized in this report have been determined in accordance with the North American Specification for Design of Cold-Formed Steel Structural Members [AISI S100-16 (2020) w/S2-20]. The allowable moments, as indicated in this report, are for use with Allowable Strength Design (ASD), and are for flexural members with the compression flange continuously braced. For other conditions of compression flange bracing, the allowable moment must be determined in accordance with the AISI. The design of flexural members must address combined bending and web crippling, and combined bending and shear, as applicable in accordance with AISI.

The C-sections listed in Table 1 of this report qualify for use with the prescriptive requirements of the IRC. Track (channel) sections with a flange width of 1.25 inches (31.75 mm) or greater qualify for use with the prescriptive requirements of the IRC. For use of all other sections under the IRC, the cold-formed steel framing members must be limited to engineered structures, in accordance with IRC Section R301.1.3.

### 4.2 Installation:

The framing members must be installed in accordance with the 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 ClarkDietrich® C-sections and tracks 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 members are installed in accordance with the applicable code, the approved plans and this report.
- 5.2 Minimum uncoated steel 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 Framing members having a minimum metallic coating designation of G40 must be limited to use as nonstructural framing as defined by AISI S220.
- 5.5 Framing members with a height-to-thickness (h/t) ratio of more than 200 must be provided with web stiffeners in accordance with Section B4.1 of AISI S100. Holes or punch-outs in the web for members with a h/t ratio of more than 200 are outside the scope of this report.

## 6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Cold-formed Steel Framing Members (AC46), dated February 2019.

## 7.0 IDENTIFICATION

- 7.1 At a spacing not exceeding 96 inches (2438 mm) on center, each cold-formed steel member is stamped with the ClarkDietrich® name or initials; the section name; the evaluation report number (ESR-1166P); the minimum uncoated base-metal thickness in mils or decimal inches; in addition to the following:
  - For nonstructural members, the designation “NS”, the minimum specified yield strength if other than 33 ksi (230 MPa), and a designation for the coating if other than G40.
  - For structural members, the minimum specified yield strength, and CP 60 designation for the coating (G60, A60, AZ50, GF30 or greater).
- 7.2 The report holder’s contact information is the following:

**CLARKDIETRICH®**  
**9050 CENTRE POINTE DRIVE, SUITE 400**  
**WEST CHESTER, OHIO 45069**  
**(513) 870-1100**  
[www.clarkdietrich.com](http://www.clarkdietrich.com)  
[info@clarkdietrich.com](mailto:info@clarkdietrich.com)

**TABLE 1—C-SECTIONS FOR USE WITH THE IRC**

IRC MEMBER DESIGNATION	EQUIVALENT DIETRICH MEMBER DESIGNATION			
	t = 33	t = 43	t = 54	t = 68
350S162-t	350S162-33	350S162-43	350S162-54	350S162-68
	350S200-33	350S200-43	350S200-54	350S200-68
550S162-t	550S162-33	550S162-43	550S162-54	550S162-68
	550S200-33	550S200-43	550S200-54	550S200-68
800S162-t	800S162-33	800S162-43	800S162-54	800S162-68
	800S200-33	800S200-43	800S200-54	800S200-68
1000S162-t	---	1000S162-43	800S162-54	800S162-68
	---	1000S200-43	1000S200-54	1000S200-68
1200S162-t	---	---	1200S162-54	1200S162-68
	---	---	1200S200-54	1200S200-68

**TABLE 2—MANUFACTURING LOCATIONS**

ClarkDietrich® – Riverside 6510 General Drive Riverside, California 92509 (951) 360-3500	ClarkDietrich® – Woodland 1685 Tide Court Woodland, California 95776 (530) 668-1987
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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:**

CLARKDIETRICH®

**EVALUATION SUBJECT:**

CLARKDIETRICH® C-SECTIONS AND TRACKS

## 1.0 REPORT PURPOSE AND SCOPE

**Purpose:**

The purpose of this evaluation report supplement is to indicate that ClarkDietrich® C-sections and tracks, described in ICC-ES evaluation report [ESR-1166P](#), 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 ClarkDietrich® C-sections and tracks, described in Sections 2.0 through 7.0 of the evaluation report [ESR-1166P](#), 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 ClarkDietrich® C-sections and tracks described in this evaluation report must comply with all of the following conditions:

- All applicable sections in the evaluation report [ESR-1166P](#).
- The design, installation, conditions of use and identification of the ClarkDietrich® C-sections and tracks are in accordance with the 2018 *International Building Code*® (IBC) provisions noted in the evaluation report [ESR-1166P](#).
- The design, installation and inspection are in accordance with additional requirements of LABC Chapters 16, 17 and 22, as applicable.
- Under the LARC, design, installation, conditions of use and identification are to be in accordance with the 2018 *International Residential Code*® (2018 IRC) with the additional requirements of LARC Section R603, as applicable, or an engineered design in accordance with the LARC Section R301.1.3 may be submitted.

This supplement expires concurrently with the evaluation report, reissued August 2020 and revised June 2022.

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**REPORT HOLDER:**

CLARKDIETRICH®

**EVALUATION SUBJECT:**

CLARKDIETRICH® C-SECTIONS AND TRACKS

**1.0 REPORT PURPOSE AND SCOPE****Purpose:**

The purpose of this evaluation report supplement is to indicate that ClarkDietrich® C-Sections and Tracks, recognized in ICC-ES evaluation report ESR-1166P, has also been evaluated for compliance with the codes noted below.

**Applicable code editions:**

- 2019 *California Building Code (CBC)*

For evaluation of applicable chapters adopted by the California Office of State Wide Health Planning and Development (OSHPD) and Division of the State Architect (DSA), see Sections 2.1.1 and 2.1.2 below.

- 2019 *California Residential Code (CRC)*

**2.0 CONCLUSIONS****2.1 CBC:**

The ClarkDietrich® C-Sections and Tracks, described in Sections 2.0 through 7.0 of the evaluation report ESR-1166P, comply with CBC Chapters 22, provided the design and installation are in accordance with the 2018 and *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 ClarkDietrich® C-Sections and Tracks, described in Sections 2.0 through 7.0 of the evaluation report ESR-1166P, comply with CBC amended Sections in Chapters 16, 17 and 22, and Chapters 16A, 17A and 22A, provided the design and installation are in accordance with the 2018 *International Building Code*® (IBC) provisions, as applicable, noted in the evaluation report, and the additional requirements in Sections 2.1.1.1 to 2.1.1.3 of this supplement:

**2.1.1.1 Conditions of Use:**

1. All loads applied to the cold-formed steel members shall be determined by the registered design professional and shall comply with applicable loads from CBC amended sections in Chapter 16 and Chapter 16A.
2. Cold-formed steel members shall not be part of the lateral resisting elements in light-framed wall with shear panels of all other materials and cold-formed steel-special bolted moment frames, unless allowed by the exceptions, in accordance with Section 1617A1.4 [OSHPD 1 & 4].
3. Prescriptive framing is not permitted in accordance with Section 2211A.1.2 [OSHPD 1 & 4].

4. Cold formed steel structures shall be designed and detailed in accordance with the requirements of AISI S100 and AISI S400 [OSHPD 1R, 2 and 5].
5. The design of cold-formed steel light-frame construction to resist seismic forces in Seismic Design Categories B and C shall be in accordance with the requirements of AISI S400, with the exception of “Steel systems not specifically detailed for seismic resistance, excluding cantilever columns” as designated in ASCE 7, Table 12.2-1, in which design and detailing in accordance with AISI 240 is permitted [OSHPD 1R, 2 & 5].
6. In accordance with Section 2211A.1.1.1, the design of cold-formed steel light-frame construction to resist seismic forces in Seismic Design Categories B and C is not permitted [OSHPD 1 & 4].
7. In accordance with Section 2211.1.1.2 and 2211A.1.1.2, the design of cold-formed steel light-frame construction to resist seismic forces in Seismic Design Categories D through F, shall be designed and detailed in accordance with AISI S400 and comply with the following requirements [OSHPD 1, 1R, 2, 4 and 5]:
  - Cold-formed steel stud foundation plates or sills shall be bolted or fastened to the foundation or foundation wall in accordance with Section 2304.3.4, Item 2.
  - Shear wall assemblies in accordance with Sections E5, E6 and E7 of AISI 400 are not permitted within the seismic force-resisting system of the buildings.
8. In accordance with Section 2211.2 and 2211A.2, for cold-formed steel light-frame construction, the design and installation of nonstructural members and connections shall be in accordance with AISI S220 for noncomposite assembly design. Where nonstructural members do not qualify for design under AISI 220, the design and installation of nonstructural members and connections, shall be in accordance with AISI S240 or S100 [OSHPD 1, 1R, 2, 4 and 5].

**2.1.1.2 Verification Test Requirements:** In accordance with Section 2213A.2 and Section 2213.2, end-welded studs shall be tested in accordance with the requirements of the AWS D1.1, Sections 7.7 and 7.8 [OSHPD 1, 1R, 2, 4 & 5] as applicable.

**2.1.1.3 Special Inspection Requirements:**

1. In accordance with Section 1704.2 Exception 3, special inspection is required for portions of structures designed and constructed in accordance with the cold-formed steel light-frame construction provisions of Section 2211.1.2 [OSHPD 1R, 2 & 5].
2. Periodic special inspections shall be required in accordance with Sections 1705A.12.3 and 1705A.12.5 [OSHPD 1 & 4].

**2.1.2 DSA:** The ClarkDietrich® C-Sections and Tracks, described in Sections 2.0 through 7.0 of the evaluation report ESR-4510, comply with CBC amended Sections in Chapters 16 and 22, and Chapters 16A, 17A and 22A, 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 in Sections 2.1.2.1 to 2.1.2.3 of this supplement:

**2.1.2.1 Conditions of Use:**

1. All loads applied to the cold-formed steel members shall be determined by the registered design professional and shall comply with applicable loads from CBC amended sections in Chapters 16, and Chapter 16A.
2. Cold-formed steel members shall not be part of the lateral resisting elements in light-framed wall with shear panels of all other materials and cold-formed steel-special bolted moment frames, unless allowed by the exceptions, in accordance with Section 1617.11.3 [DSA-SS/CC] and 1617A.1.4 [DSA-SS].
3. In accordance with Sections 2212.5.2 [DSA-SS/CC], cold-formed steel stud foundation plates or sills shall be bolted or fastened to the foundation or foundation wall in accordance with CBC Section 2304.3.2, Item 2.
4. In accordance with Section 2212.5.3, cold-formed steel stud shear wall assemblies in accordance with Sections E5, E6 and E7 of AISI-400 are not permitted within the seismic force resisting system of buildings or structures assigned to Occupancy Category II, III, IV, or buildings designed to be relocatable [DSA-SS/CC].
5. In accordance with Section 2211A.1.1.1, the design of cold-formed steel light-frame construction to resist seismic forces in Seismic Design Categories B and C is not permitted [DSA-SS].
6. In accordance with Section 2211A.1.1.2, the design of cold-formed steel light-frame construction to resist seismic forces in Seismic Design Categories D through F, shall be designed and detailed in accordance with AISI S400 and comply with the following requirements [DSA-SS]:
  - Cold-formed steel stud foundation plates or sills shall be bolted or fastened to the foundation or foundation wall in accordance with Section 2304.3.4, Item 2.
  - Shear wall assemblies in accordance with Sections E5, E6 and E7 of AISI 400 are not permitted within the seismic force-resisting system of the buildings.
7. Prescriptive framing is not permitted in accordance with Section 2211A.1.2 [DSA-SS].
8. In accordance with Section 2211A.2, for cold-formed steel light-frame construction, the design and installation of nonstructural members and connections shall be in accordance with AISI S220 for noncomposite assembly design. Where nonstructural members do not qualify for design under AISI 220, the design and installation of nonstructural members and connections, shall be in accordance with AISI S240 or S100 [DSA-SS].

**2.1.2.2 Verification Test Requirements:** In accordance with Sections 2212.6.2 [DSA-SS/CC] or 2213A.2 [DSA-SS], end-welded studs shall be tested in accordance with the requirements of the AWS D1.1, (Sections 7.7 and 7.8 [DSA-SS]).

**2.1.2.3 Special Inspection Requirements:** Periodic special inspections shall be required in accordance with Sections 1705A.12.3 and 1705A.12.5 [DSA-SS/CC].



**2.2 CRC:**

The ClarkDietrich® C-Sections and Tracks, described in Sections 2.0 through 7.0 of the evaluation report ESR-1166P, comply with CRC Chapters 5, 6 and 8, provided the design and installation are in accordance with the 2018 *International Residential Code*® (IRC) provisions, as applicable.

This supplement expires concurrently with the evaluation report, reissued August 2020 and revised June 2022.

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CLARKDIETRICH® C-SECTIONS AND TRACKS

**1.0 REPORT PURPOSE AND SCOPE**

**Purpose:**

The purpose of this evaluation report supplement is to indicate that ClarkDietrich® C-sections and tracks, recognized in ICC-ES report ESR-1166P, have also been evaluated for compliance with the codes noted below.

**Applicable code editions:**

- 2020 Florida Building Code—Building
- 2020 Florida Building Code—Residential

**2.0 CONCLUSIONS**

The ClarkDietrich® C-sections and tracks, described in Sections 2.0 through 7.0 of ICC-ES evaluation report ESR-1166P, comply with the *Florida Building Code—Building* and the *Florida Building Code—Residential*. The design requirements must be determined in accordance with the *Florida Building Code—Building* or the *Florida Building Code—Residential*, as applicable. The installation requirements noted in ICC-ES evaluation report ESR-1166P for the 2018 *International Building Code*® meet the requirements of the *Florida Building Code—Building* or the *Florida Building Code—Residential*, as applicable.

Use of the ClarkDietrich® C-sections and tracks has also been found to be in compliance with the High-Velocity Hurricane Zone provisions of the *Florida Building Code—Building* and the *Florida Building Code—Residential* with the following exception:

1. Members in the Stud/Track Properties Tables noted with an astrick (\*) in the  $M_a$  column include increase in strength for the effect of cold work of forming. These members are outside the scope of this supplemental report for High-Velocity Hurricane Zones in accordance with the *Florida Building Code—Building* Section 2222.3.
2. Protection of metal must be in accordance with the *Florida Building Code—Building* Section 2222.6.

For products falling under Florida Rule 61G20-3, verification that the report holder's quality assurance program is audited by a quality assurance entity approved by the Florida Building Commission for the type of inspections being conducted is the responsibility of an approved validation entity (or the code official, when the report holder does not possess an approval by the Commission).

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