



Framing

**REPORT HOLDER:** 

**CLARKDIETRICH®** 

**EVALUATION SUBJECT:** 

**ADDITIONAL LISTEES:** 

**CERTAINTEED GYPSUM** 

**1.0 EVALUATION SCOPE** 

**Properties evaluated:** 

Sound transmission

(IBC)

Structural

2.0 USES

· Fire resistance

CORRIDOR CEILING SYSTEMS

**GEORGIA-PACIFIC GYPSUM LLC** 

NATIONAL GYPSUM COMPANY

UNITED STATES GYPSUM COMPANY

Compliance with the following codes:

2021, 2018, 2015 and 2012 International Building Code®

The ClarkDietrich Shaftwall and Stairwall systems are

nonload-bearing cold-formed steel wall used for framing of

interior nonload-bearing walls. The wall systems may be

used in fire-resistance-rated construction when installed in

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# ICC-ES Evaluation Report **ESR-5050**

Section: 05 40 00—Cold-Formed Metal Framing

Section: 09 22 16.13-Non-Structural Metal Stud

CLARKDIETRICH SHAFTWALL, STAIRWALL AND

DIVISION: 05 00 00-METALS

DIVISION: 09 00 00-FINISHES

A Subsidiary of the International Code Council®

Reissued April 2023

**Revised December 2023** 

This report is subject to renewal April 2025.

The ClarkDietrich Corridor Ceiling system is used for framing interior corridor ceiling applications not designed to carry any loads. The ceiling system may be used in fireresistance-rated construction when installed in accordance with Section 4.4 of this report.

## 3.0 DESCRIPTION

## 3.1 Shaftwall and Stairwall Systems:

The shaftwall and stairwall systemsare constructed from the cold-formed steel C-T studs and J-Tabbed Track (J-runner) tracks which are available in 21/2, 4 and 6- inches (63, 102 and 152 mm) depths and come in 22, 33 and 43 mils thick. See Table 3.1 for additional framing thickness details. See Figures 1 and 2 for typical details of cold-formed steel studs and tracks used in shaftwalls and stairwalls applications.

Mils, Thousandths of an inch	Design Thickness, inch	Minimum base steel thickness, inch					
22	0.0231	0.0219					
33	0.0346	0.0329					
43	0.0451	0.0428					

For SI: 1 inch=25.4 mm.

## 3.2 Corridor Ceiling System:

The corridor celiing system is constructed from the coldformed steel C-T studs and J-Tabbed Track/J-runners tracks which are available in 21/2, 4 and 6-inches (63, 102 and 152 mm) depths and come in 22, 33 and 43 mils thick . See Table 3.1 for additional framing thickness information. See Figures 3 and 4 for typical details of cold-formed steel studs and tracks used in corridor ceiling system.

## 3.3 Material:

3.3.1 Cold-Formed Steel: The studs and tracks are formed from coils of steel complying with ASTM A1003, or other steel complying with AISI Specifications having a minimum yield strength of 33,000 or 50,000 psi (227.5 or 344.7 Mpa). The coating on the steel is a metallic coating conforming to ASTM A653/A653M with a minimum G40 (Z120) coating or shall provide equivalent corrosion protection in accordance with Section A4 of AISI S220.

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accordance with Section 4.3 of this report.

## Table 3.1-Stud and Track Steel Thickness

**3.3.2 Gypsum Wallboard:** Gypsum wallboard must be a minimum of  $\frac{1}{2}$ -inch-thick (12.7 mm) Type C or  $\frac{5}{8}$ -inch-thick (15.9 mm) Type X, complying with ASTM C1396. Gypsum board must be listed for fire rating by an approved accreditation body.

**3.3.3 Gypsum Shaft Liner Panels:** The liner panels must be 1-inch-thick (25.4 mm) by 24 inches (610 mm) wide by 8 foot to 14 foot long (2.44 to 4.27 m). Any butt joints must be factory edge to edge with pieces pushed tight together. Gypsum shaft liner panels must be listed for fire rating by an approved accreditation body.

**3.3.4 Fasteners:** Fasteners attaching the gypsum wallboard to the studs and tracks must be No. 6, Type S, fine thread drywall bugle head screws conforming to ASTM C1002.

### 4.0 DESIGN AND INSTALLATION

### 4.1 Design:

The allowable values and tabulated limiting heights for shaftwall and stairwall framing systems must be inaccodrance with Table 1.

### 4.2 Installation:

Installation of the shaftwall, stairwall and corridor ceiing systems must be in accordance with the applicable code, the approved construction documents and this report. If there is a conflict between this report and the documents submitted for approval, this report governs. The approved plans must be available on the jobsite at all times during installations.

### 4.3 Fire-resistance-rated Construction:

Two-hour Shaftwall and Stairwall Systems 4.3.1 (Nonload Bearing): The shaftwall and stairwall assemblies must be minimum 22 mils thick, 21/2-inches-deep C-T studs spaced 24 inches (610 mm) on center and centered between the top and bottom J-runner track with a minimum <sup>1</sup>/<sub>2</sub>-inch (12.7 mm) clearance from the web of the J-runner track. Two layers of 1/2-inch (12.7 mm) Type C or 5/8-inch (15.9 mm) Type X gypsum wallboard, one layer per side. The face layers should be installed parallel to each face of the framing members with No. 6 x 1-inch (25.4 mm) long Type S drywall screws at 12 inches (305 mm) on center (Note: Use Type S-12 screws for 33 mils thick steel framing), 1 inch (25.4 mm) from gypsum board ends at joints and a minimum of <sup>3</sup>/<sub>8</sub>-inch (9.5 mm) from gypsum board edges. All edge and end joints should be offset from the base layer a minimum of 6 inches (152 mm). One-inch-thick (25.4 mm) Type X fire-rated gypsum liner panels should be cut 1 inch (25.4 mm) less than the opening height. The ends of the liner panel may be retained by bending the J-runner tables 90 degrees. If the J-runners are used at end walls, bend the J-runner tabs 90 degrees, or the 1-inch-thick (25.4 mm) liner panels need to be fastened at the ends with 15/8-inch (41 mm) long Type S screws at 12 inches (305 mm) on center. For more details refer to Figures 1 and 2 or ClarkDietrich published installation instructions.

**4.3.2 Two-hour Corridor Ceiling System (Not Designed to Carry Any Loads):** The corridor celing assembly must be constructed as described above for the shaftwall assembly described in Section 4.3.1 of this report. See Table 3 for stud size, steel thickness and maximum spans. See Figures 3 and 4 for assembly details and specifications. For additional details

and construction methods refer to the ClarkDietrich installation instructions.

### 5.0 CONDITIONS OF USE

The ClarkDietrich shaftwall, stairwall and corridor ceiling systems 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 ClarkDietrich shaftwall, stairwall steel framing systems, and corridor celings are manufactured, identified and installed in accordance with this report, the approved plans, and the manufacturer's published installation instructions.
- **5.2** The shaftwall and stairwall systems are limited to interior nonload-bearing applications where the superimposed vertical load is zero pounds (zero newtons).
- **5.3** The corridor ceiling system is not designed to carry any loads where the superimposed vertical load is zero pounds (zero newtons).
- **5.4** Design of the attachment of the wall to the surrounding structure is outside the scope of this report.
- **5.5** Calculations and drawings demonstrating 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.
- **5.6** Installation of the gypsum wallboard must meet the requirements of ASTM C840 or GA-216.
- 5.7 The wall assemblies must be installed in accordance with AISI S220 specifications, unless more stringent requirements are established by registered design professional.
- **5.8** The assemblies must not be installed in areas which will be adjacent to occupancies of unusually high moisture conditions.
- **5.9** To prevent air movement, the partition perimeters, as well as all penetrations, should be effectively sealed with non-hardening sealant.
- **5.10** Applications that require the use of joint treatment must follow the manufacturer's usage instructions to ensure the finishing of the joint layers is done within the temperature requirements of the products. See IBC Section 715 for additional requirements.
- **5.11** The assemblies described in this report are not recommended for use as unlined HVAC supply shafts or ducts.
- **5.12** Firestopping of the assemblies at each floor must comply with IBC Section 718.
- **5.13** Control joints must be located in a way that limits the maximum continuous partition length to 30 feet (9.14 m). The partition control joints must coincide with the building structure where possible.
- **5.14** Where wall heights exceed the available length of the gypsum panels, the panels may be cut and stacked with horizontal joints occurring within the top and

bottom third of the wall. Horizontal Joints in adjacent panels must be staggered alternating from top and bottom to avoid a continuous horizontal joint along length of wall. The gypsum panels must engage a minimum of two tabs.

- **5.15** Openings and penetrations in fire-resistance-rated construction are outside the scope of this report and must comply with the applicable provisions in IBC Chapter 7.
- **5.16** Openings and penetrations require structural support by other structural elements designed by registered design professional.
- **5.17** Studs and tracks are manufactured at the facilities listed in Table 1.

## 6.0 EVIDENCE SUBMITTED

- **6.1** Data in accordance with ASTM E72.
- **6.2** Data in accordance with ASTM E119 and supportive engineering analysis.
- 6.3 Structural calculations in accordance with AISI S220
- 6.4 Data in accordance with ASTM C1396.

## 7.0 IDENTIFICATION

**7.1** Each ClarkDietrich stud and track described in this report must have a legible label or stamp, at a maximum spacing of 96 inches (2413 mm) on center, indicating the product code; manufacturer's name or initials; the minimum base steel thickness; the minimum yield strength; and the evaluation report number (ESR-5050).

**7.2** The report holder's contact information is:

CLARKDIETRICH<sup>®</sup> 9050 CENTRE POINTE DRIVE, SUITE 400 WEST CHESTER, OHIO 45069 (513) 870-1100 www.clarkdietrich.com

**7.3** The Additional Listees' contact information is the following:

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#### TABLE 1—MANUFACTURING LOCATIONS

Framing Depth (inches)	Steel Design	Limiting Height(feet - inches)												
	YieldStrength	Design	Design Allowable Design Pressure (psf)								f)			
		Deflection	5			7.5			10			15		
		L/120	16	-	10	13	-	8	11	-	10 *	8	-	6 *
	0.0231"	L/180	13	-	8	11	-	3	9	-	10	8	-	3
	33,000psi	L/240	11	-	10	9	-	10	8	-	8	7	-	3
		L/360	9	-	10	8	-	3	7	-	3	6	-	2
<b>2</b> <sup>1</sup> / <sub>2</sub>		L/120	16	-	10	14	-	4	12	-	11	11	-	1
	0.0346"	L/180	14	-	4	12	-	4	11	-	1	9	-	6
	33,000psi	L/240	12	-	11	11	-	1	9	-	11	8	-	7
		L/360	11	-	1	9	-	6	8	-	7	7	-	5
		L/120	17	-	11	15	-	10	14	-	6	12	-	10
	0.0451"	L/180	15	-	10	14	-	0	12	-	10			
	50,000psi	L/240	14	-	6	12	-	10						
		L/360	12	-	10									
	0.0231" 33,000psi	L/120	21	-	8	16	-	6 *	12	-	5 *	8	-	3 *
		L/180	18	-	1	15	-	3	12	-	5 *	8	-	3 *
		L/240	16	-	0	13	-	7	12	-	1	8	-	3 *
		L/360	13	-	7	11	-	6	10	-	4	8	-	3 *
4	0.0346" 33,000psi	L/120	23	-	0	21	-	0	18	-	7	15	-	5 **
		L/180	21	-	0	17	-	9	15	-	10	13	-	6
		L/240	18	-	7	15	-	10	14	-	1	12	-	1
		L/360	15	-	10	13	-	6	12	-	1	10	-	4
	0.0451"	L/120	25	-	7	22	-	2	20	-	0	17	-	4
		L/180	22	-	2	19	-	2	17	-	4	15	-	1
	50,000psi	L/240	20	-	0	17	-	4	15	-	8	13	-	7
			17	-	4	15	-	1	13	-	7	11	-	10
		L/120	30	-	3 **	24	-	9 **	20	-	6 *	13	-	8 *
	0.0346"	L/180	30	-	3	24	-	9 **	20	-	6 *	13	-	8 *
6	33,000psi	L/240	26	-	6	22	-	2	19	-	7	13	-	8 *
5		L/360	22	-	2	18	-	8	16	-	7	13	-	8 *
		L/120	36	-	5	30	-	8	27	-	3	23	-	2
	0.0451"	L/180	30	-	8	26	-	0	23	-	2	19	-	9
	50,000psi	L/240	27	-	3	23	-	2	20	-	8	17	-	8
		L/360	23	-	2	19	-	9	17	-	8			

Table 2– Shaftwall and Stairwall C-T Stud Limiting Height<sup>1,2,3,4,5</sup>

For SI: 1 inch= 25.4 mm, 1 psi= 6.89 kPa, 1 foot = 305 mm, 1 psf= 47.88 Pa.

## Notes:

\* Reduced for End Reaction capacity

\*\* Reduced for Flexural Strength Capacity

- 1. The values in this table are based on testing ASTM E72 and represent the limiting height capacity for strength using a 1.5 Safety Factor.
- 2. See Table 3.1 for steel mil thickness and base steel thickness information.
- 3. Limiting Height values shown, were assessed from the lowest Flexural Strength value of Gypsum tested.
- 4. Limiting height values shown, are based on nonload-bearing wall assemblies installed in accordance with Section 4.3 of this report.
- 5. C-T studs must be full length and must not be spliced. J-runners when not attached to the structure must not be spliced. Do not attach J-runners to C-T studs unless noted otherwise by the manufacturer's installation instructions.





FIGURE 2- CONSTRUCTION DETAIL FRAMING

Stud Depth	Steel Mil Thickness, thousandths of	Minimum Yield Strength	Design Thickness	(2) 1/2	2 Hour (2) 1/2-inch Type C + (1) 1-in Shaft Liner				2 Hour (2) 5/8-inch Type X + (1) 1-in Shaft Liner					
(inches)	inch	(psi)	(IN)	L / 120	L / 180	L/240	L/360	L/120	L / 180	L/240	L/360			
	22	33,000	0.0231	8' -8"	8' -8"	8' -6"	7' -5"	8' -2"	8' -2"	8' -2"	7' -2"			
21⁄2	33	33,000	0.0346	10' -6"	10' -6"	9' -10"	8' -7"	9' -11"	9' -11"	9' -6"	8' -3"			
	22	33,000	0.0231	11' -8"	11' -8"	11' -8"	10' -8"	11' -0"	11' -0"	11' -0"	10' -3"			
4	33	33,000	0.0346	14' -3"	14' -3"	14' -1"	12' -4"	13' -6"	13' -6"	13' -6"	11' -10"			
-	43	50,000	0.0451	19' -1"	16' -8"	15' -2"	13' -3"	18' -5"	16' -1"	14' -7"	12' -9"			
	33	33,000	0.0346	18' -9"	18' -9"	18' -9"	16' -10"	17' -9"	17' -9"	17' -9"	16' -3"			
6	43	50,000	0.0451	22' -9"	22' -9"	20' -9"	18' -2"	20' -5"	20' -5"	20' -0"	17' -6"			

Table 3 - Maximum Horizontal Spans for Fire-resistance-rated Corridor Ceilings<sup>1,2,3,4,5,6</sup>

For SI: 1 inch= 25.4 mm, 1 psi= 6.89 kPa, 1 foot = 305 mm, 1 psf= 47.88 Pa.

#### Notes:

- 1. Dead Load of assembly ONLY is considered.
- 2. Not designed to carry any Live Loads, Mechanical equipment, Storage Loads or Lighting.
- 3. Studs must be one piece, full span.
- 4. See Table 3.1 for steel mil thickness and base steel thickness
- 5. Verify details of construction for specific assembly to achieve required fire resistance rating and code requirements.
- 6. Horizontal corridor use permitted per IBC section 708.4 Continuity, Exception 3.



FIGURE 3- TWO-HOUR CORRIDOR CEILING ASSEMBLY

#### Figure 3 and 4 descriptions

- 1. J-Track
- 2. Corridor Side Gypsum
- 3. C-T Stud (full span length)- See Table 2 above.
- 4. Liner Panel on top side. One seam only per stud bay allowed.
- 5. Fastener thru J-Track into wall at 24"o.c. maximum spacing.
- 6. Fastener must provide a minimum of 200 Lbs. of shear value per C-T Stud
- 7. Framing fastener thru J-Track top & bottom legs into C-T Stud.
- 8. Gypsum fasteners thru gypsum into framing.
- 9. Fire-resistant rated or listed joint sealant system.
- 10. See ClarkDietrich Horizontal Shaftwall Assembly Instructions for more details.



FIGURE 4- C-T STUD TO J-RUNNER CONNECTION