2021/2018/2015
IBC and IRC
Code Compliant
ICC-ESR 4934

Expanding Your Solutions

CT Shaft Wall Stud System

CEMCO's Solution for Fire-Rated Shaft Walls, Stairwells, and Horizontal Ceilings

Effective 07/08/2022

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Introduction

CT Shaft Wall Stud System

CEMCO's new CT Shaft Wall Product is manufactured from hot-dipped galvanized steel in web depths of 2-1/2", 4" and 6" in 20 ga. (33 mil), and in 18 ga. (43 mil) thicknesses with corresponding J-Tracks. The CT Shaft Wall System is the industry's most flexible in that many gypsum board and gypsum Shaftliner manufacturers are approved in several UL fire-rated assemblies for both 1 and 2-hour ratings.

ASTM & Code Standards

- ICC-ESR 4934
- ASTM A653/653M – Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- ASTM A924/924M – Specification for General Requirements for Sheet Steel, Metallic-Coated by the Hot-Dip Process.
- ASTM A1003/1003M – Specification for Steel Sheet, Carbon, Metallic and Nonmetallic-Coated for Cold-Formed Framing Members.
- ASTM C645 – Standard Specification for Nonstructural Steel Framing Members.
- IBC: 2012, 2015, 2018, 2021
- CBC: 2013, 2016, 2019
- AISI: S100

Technical Support and Resources

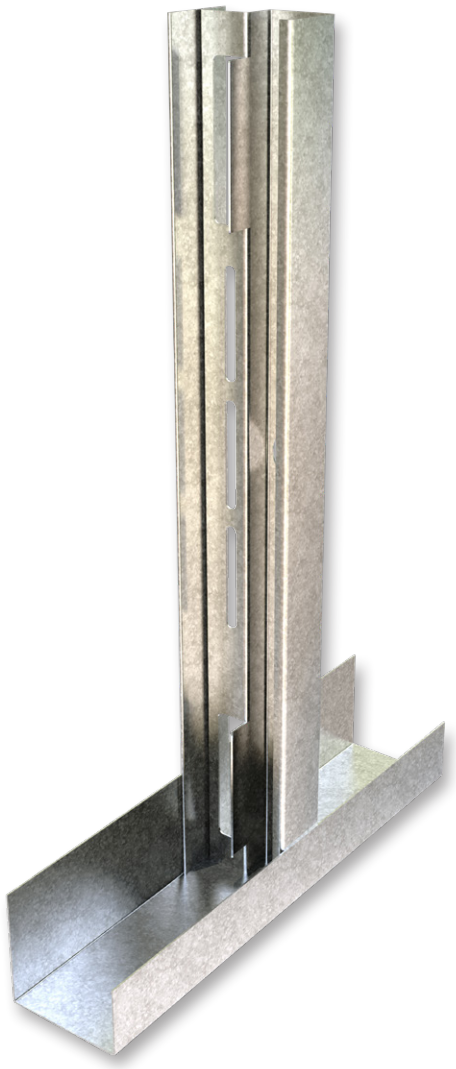
- Contact CEMCO's Technical Services Department at 800-775-2362 or email at technicalservices@cemcosteel.com.
- Visit www.cemcosteel.com for all catalogs, specification sheets, typical details, and acoustical/UL reports.

LEED v4 for Building & Design Construction

- MR Prerequisite: Construction and Demolition Waste Management Planning.
- MR Credit: Construction and Demolition Waste Management.
- MR Credit: Building Product Disclosure and Optimization – Sourcing of Raw Materials, Option 2.
- MR Credit: Building Product Disclosure and Optimization – Material Ingredients, Option 1.
- MR Credit: Building Life-Cycle Impact Reduction, Option 4.

MR Credit 4.1/4.2 – Recycled Content

- Total Recycled Content: 36.9%
- Post-Consumer: 19.8%
- Pre-Consumer: 14.4%



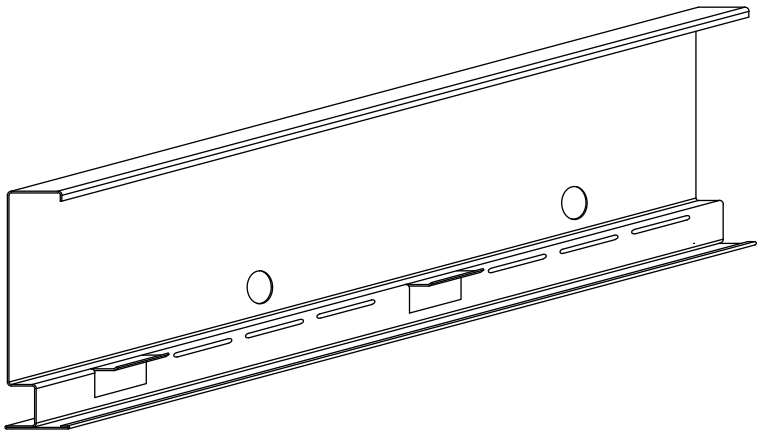
California's Proposition 65 Warning

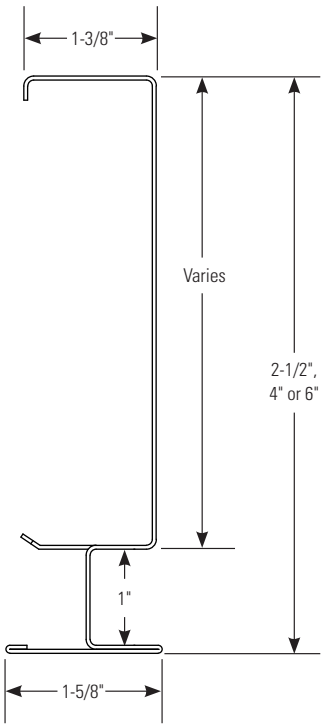
California's Safe Drinking Water and Toxic Enforcement Act of 1986 – commonly referred to as Proposition 65 ("Prop 65") (27 Cal. Code Reg. § 25600, et seq.) – has recently changed, requiring manufacturers to provide a warning based on its knowledge about the presence of one or more of the almost 900 listed chemicals which are known to the State of California to cause cancer and birth defects, or other reproductive harm. With a few exceptions, manufacturers operating in the state of California as well as those entities who distribute, import, package, and/or supply products into the State of California are now required provide a "clear and reasonable" warning to consumers that their products may contain one or more of these listed chemicals or compounds. The complete list is available at **www.P65Warnings.ca.gov.**

In compliance with the new requirements, we are notifying each of our customers that CEMCO products contain Nickel (metallic) and/or other chemicals listed which are known to the State of California to cause cancer and birth defects or other reproductive harm. Safety data sheets from our major suppliers are available from CEMCO on our website at **www.cemcosteel.com.**

Physical Properties							Section Properties			
"CT" Stud Designation	**Web**	**Gauge**	**Mil**	**Yield Strength** (ksi)	**Design Thickness** (in)	**Coating**	**Weight** (lb/ft)	**Area** (in^2)	**Ix** (in^4)	**Sx** (in^3)
20CT212	2-1/2	20	33	40	0.0346	G40	0.840	0.247	0.240	0.167
20CT4	4	20	33	40	0.0346	G40	1.016	0.299	0.708	0.307
20CT6	6	20	33	40	0.0346	G40	1.252	0.368	1.858	0.545
18CT212	2-1/2	18	43	40	0.0451	G60	1.090	0.320	0.307	0.214
18CT4	4	18	43	40	0.0451	G60	1.319	0.388	0.909	0.395
18CT6	6	18	43	40	0.0451	G60	1.625	0.478	2.393	0.703

Notes:
1. Uncoated steel thickness. Thickness is for carbon sheet steel.
2. Ix = Moment of Inertia
3. Sx = Section Modulus





Limiting Heights									
Stud Depth	**Model Number**	**Gauge**	**Design Thickness** (in)	**Yield** (ksi)	**Deflection**	**5 psf**	**7.5 psf**	**10 psf**	**15 psf**
1-Hour Shaft Wall System									
2-1/2"	20CT212	20	0.0346	40	L/120	16' 0"	13' 11"	12' 8"	6' 10"
					L/180	14' 1"	12' 4"	11' 2"	6' 10"
					L/240	12' 10"	11' 2"	10' 2"	6' 10"
					L/360	11' 2"	9' 8"	8' 7"	0' 0"
	18CT212	18	0.0451	40	L/120	16' 2"	14' 2"	12' 11"	6' 7"
					L/180	13' 11"	12' 2"	11' 1"	6' 7"
					L/240	12' 5"	10' 10"	9' 10"	6' 7"
					L/360	10' 5"	9' 1"	8' 4"	0' 0"
4"	20CT4	20	0.0346	40	L/120	20' 10"	18' 2"	16' 6"	7' 2"
					L/180	18' 5"	16' 1"	14' 7"	7' 2"
					L/240	16' 10"	14' 8"	13' 4"	7' 2"
					L/360	14' 8"	12' 10"	11' 8"	7' 2"
	18CT4	18	0.0451	40	L/120	23' 7"	20' 7"	17' 7"	6' 7"
					L/180	20' 10"	18' 1"	16' 6"	6' 7"
					L/240	18' 11"	16' 6"	15' 0"	6' 7"
					L/360	16' 7"	14' 6"	13' 0"	6' 7"
6"	20CT6	20	0.0346	40	L/120	27' 4"	22' 4"	18' 4"	6' 11"
					L/180	24' 6"	21' 5"	18' 4"	6' 11"
					L/240	22' 4"	19' 6"	17' 8"	6' 11"
					L/360	19' 5"	17' 0"	15' 5"	6' 11"
	18CT6	18	0.0451	40	L/120	30' 1"	23' 6"	17' 7"	6' 7"
					L/180	26' 2"	22' 11"	17' 7"	6' 7"
					L/240	23' 7"	20' 7"	17' 7"	6' 7"
					L/360	20' 6"	17' 11"	16' 4"	6' 7"

Notes:
1. Allowable heights are based on the transverse load test complying with ICC-ES AC86 and AISI S916-15.
2. Studs spaced at 24" O.C. maximum.
3. Standard J-Track is used as both top and bottom track.
4. CT-Shaft Stud limiting heights were tested with 5/8" Type-X gypsum board oriented vertically.

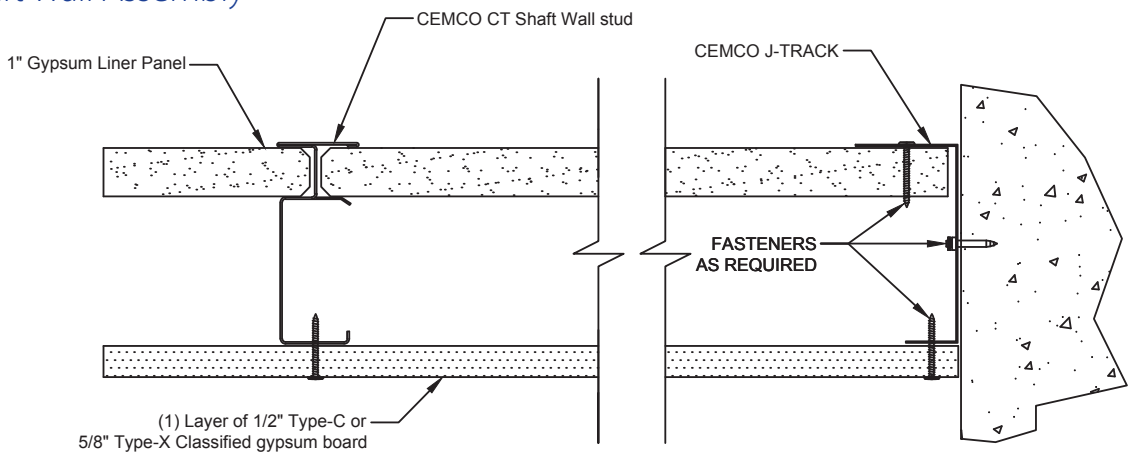
Limiting Heights									
Stud Depth	**Model Number**	**Gauge**	**Design Thickness** (in)	**Yield** (ksi)	**Deflection**	**5 psf**	**7.5 psf**	**10 psf**	**15 psf**
2-Hour Shaft Wall System									
2-1/2"	20CT212	20	0.0346	40	L/120	16' 11"	14' 10"	13' 5"	6' 11"
					L/180	15' 1"	13' 2"	12' 0"	6' 11"
					L/240	13' 11"	12' 2"	11' 1"	6' 11"
					L/360	12' 4"	10' 8"	9' 7"	6' 11"
	18CT212	18	0.0451	40	L/120	17' 0"	14' 11"	13' 6"	6' 7"
					L/120	14' 11"	13' 0"	11' 10"	6' 7"
					L/180	13' 6"	11' 10"	10' 8"	6' 7"
					L/240	11' 6"	10' 10"	9' 1"	0' 0"
4"	20CT4	20	0.0346	40	L/360	21' 8"	19' 0"	17' 2"	6' 11"
					L/180	19' 5"	16' 11"	15' 5"	6' 11"
					L/240	17' 10"	15' 6"	14' 1"	6' 11"
					L/360	15' 8"	13' 8"	12' 5"	6' 11"
	18CT4	18	0.0451	40	L/120	24' 8"	21' 7"	17' 7"	6' 7"
					L/180	21' 10"	19' 1"	17' 4"	6' 7"
					L/240	20' 0"	17' 6"	15' 11"	6' 7"
					L/360	17' 8"	15' 6"	14' 0"	6' 7"
6"	20CT6	20	0.0346	40	L/120	27' 7"	24' 2"	18' 4"	6' 11"
					L/180	25' 4"	22' 1"	18' 4"	6' 11"
					L/240	23' 1"	20' 2"	18' 4"	6' 11"
					L/360	20' 2"	17' 7"	16' 0"	6' 11"
	18CT6	18	0.0451	40	L/120	31' 2"	23' 6"	17' 7"	6' 7"
					L/180	27' 5"	23' 6"	17' 7"	6' 7"
					L/240	24' 11"	21' 10"	17' 7"	6' 7"
					L/360	21' 11"	19' 1"	17' 5"	6' 7"

Notes:
1. Allowable heights are based on the transverse load test complying with ICC-ES AC86 and AISI S916-15.
2. Studs spaced at 24" O.C. maximum.
3. Standard J-Track is used as both top and bottom track.
4. CT-Shaft Stud limiting heights were tested with 5/8" Type-X gypsum board oriented vertically.

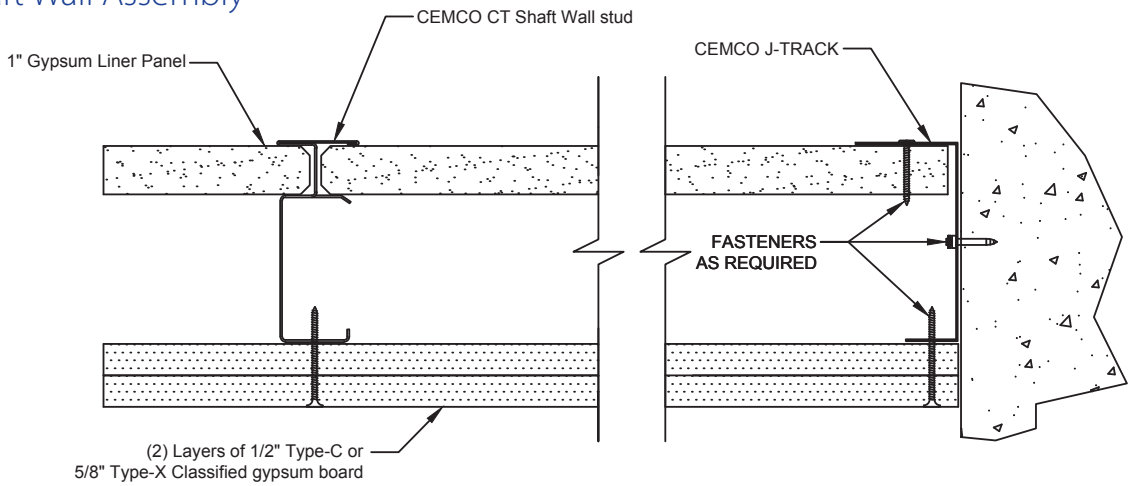
Limiting Heights									
Stud Depth	**Model Number**	**Gauge**	**Design Thickness** (in)	**Yield** (ksi)	**Deflection**	**5 psf**	**7.5 psf**	**10 psf**	**15 psf**
1-Hour Stairwell System									
4"	20CT4	20	0.0346	40	L/120	21' 10"	18' 8"	16' 2"	9' 11"
					L/180	19' 4"	16' 11"	15' 4"	9' 11"
					L/240	17' 8"	15' 6"	14' 1"	9' 11"
					L/360	15' 8"	13' 8"	12' 6"	9' 11"
	18CT4	18	0.0451	40	L/120	24' 2"	21' 1"	19' 2"	10' 5"
					L/180	21' 6"	18' 8"	17' 0"	10' 5"
					L/240	19' 8"	17' 2"	15' 7"	10' 5"
					L/360	17' 4"	15' 2"	13' 8"	10' 5"
6"	20CT6	20	0.0346	40	L/120	28' 11"	23' 7"	18' 4"	10' 10"
					L/180	25' 10"	22' 6"	18' 4"	10' 10"
					L/240	23' 8"	20' 8"	18' 4"	10' 10"
					L/360	20' 11"	18' 2"	16' 7"	10' 10"
	18CT6	18	0.0451	40	L/120	30' 7"	25' 0"	21' 8"	10' 5"
					L/180	27' 5"	23' 11"	21' 8"	10' 5"
					L/240	25' 2"	22' 0"	20' 0"	10' 5"
					L/360	22' 2"	19' 5"	17' 7"	10' 5"

Notes:
1. Allowable heights are based on the transverse load test complying with ICC-ES AC86 and AISI S916-15.
2. Studs spaced at 24" O.C. maximum.
3. Standard J-Track is used as both top and bottom track.
4. CT-Shaft Stud limiting heights were tested with 5/8" Type-X gypsum board oriented vertically.

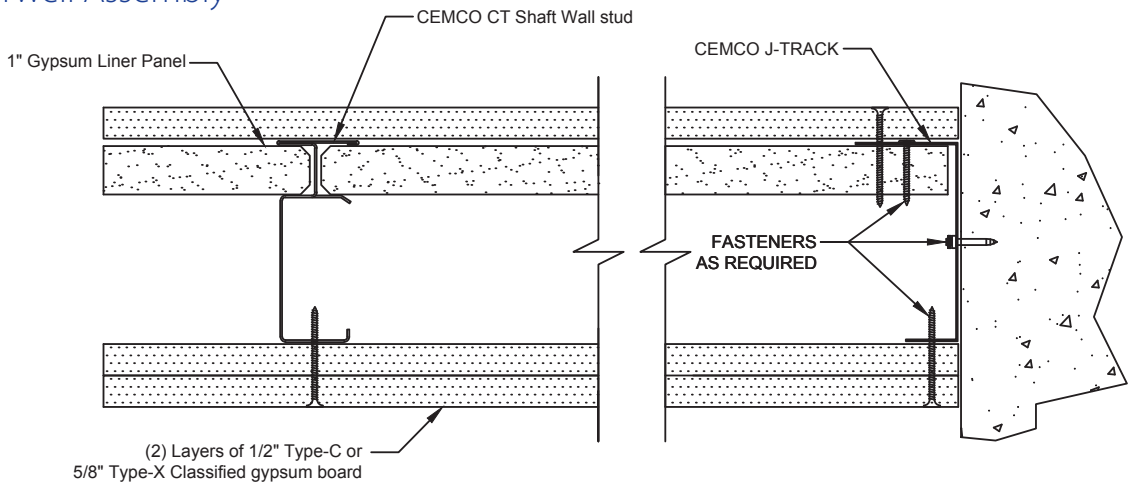
1 Hour Shaft Wall Assembly



2 Hour Shaft Wall Assembly



2 Hour Stairwell Assembly



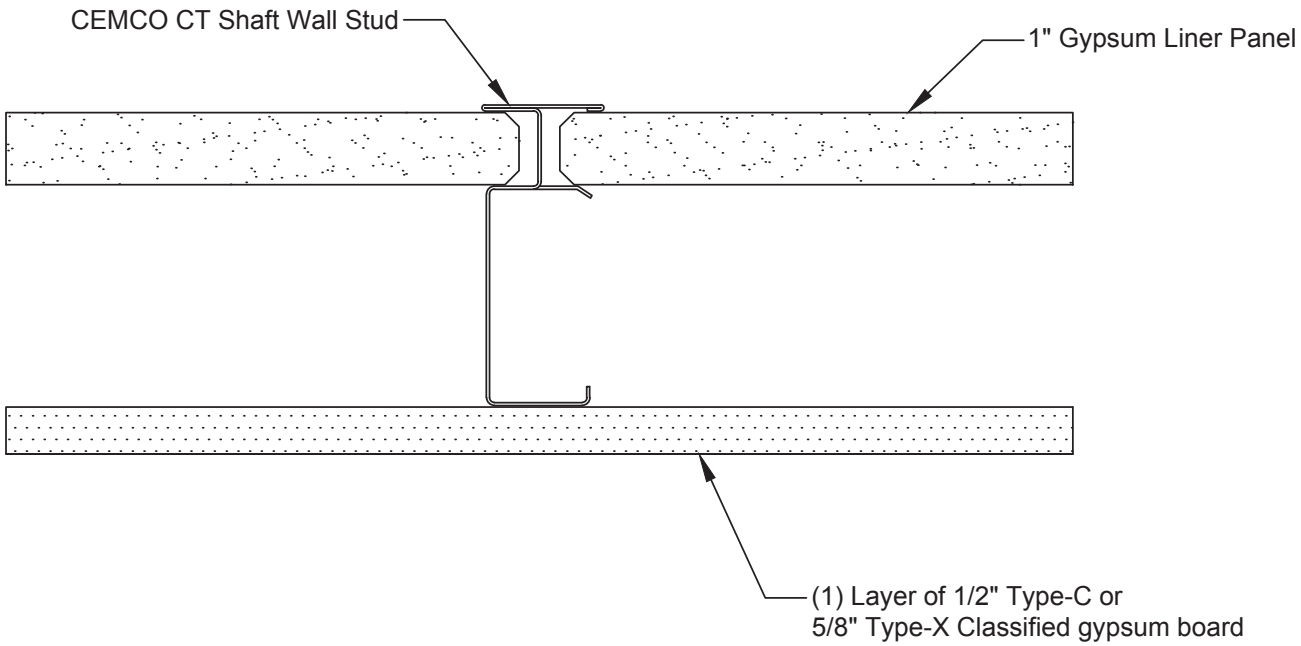
Web Depth	Gauge	Design Thickness (in)	Mil	1 Layer Type "X" 1" Shaft Liner			2 Layer Type "X" 1" Shaft Liner			2 Layers of Type "C" 1" Shaft Liner		
				L/120	L/240	L/360	L/120	L/240	L/360	L/120	L/240	L/360
2-1/2"	20	0.0346	33	13'-3"	10'-6"	9'-2"	12'-0"	9'-6"	8'-4"	12'-2"	9'-8"	8'-5"
4"	20	0.0346	33	18'-11"	15'-0"	13'-1"	17'-2"	13'-8"	11'-11"	17'-6"	13'-10"	12'-1"
6"	20	0.0346	33	25'-11"	20'-7"	18'-0"	23'-8"	18'-9"	16'-4"	24'-0"	19'-0"	16'-7"
4"	18	0.0451	43	20'-5"	16'-2"	14'-2"	18'-7"	14'-9"	12'-11"	18'-10"	15'-0"	13'-1"
6"	18	0.0451	43	28'-0"	22'-2"	19'-5"	25'-6"	20'-3"	17'-8"	25'-11"	20'-7"	18'-0"

Notes:

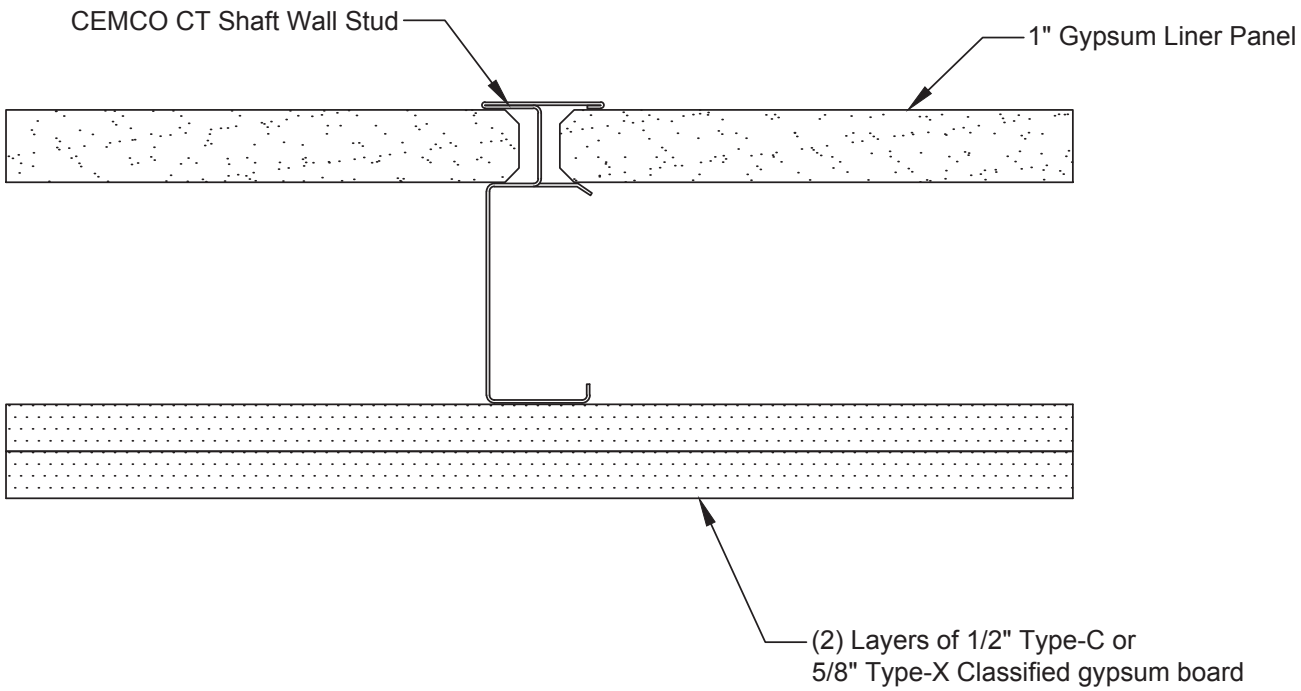
1. Not designed to carry live loads, mechanical loads or for material storage area use.

2. Dead Loads include: Type-X: 2.2 PSF
Type-C: 2.0 PSF
1" Shaft Liner: 4.0 PSF
CT-Stud Weight

1 Hour Horizontal Assembly



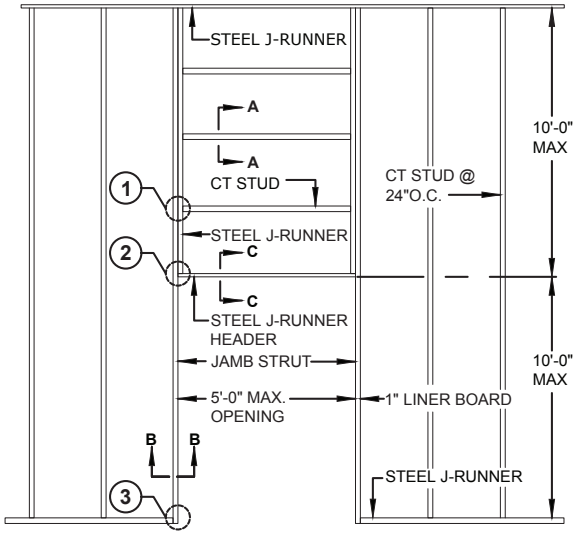
2 Hour Horizontal Assembly



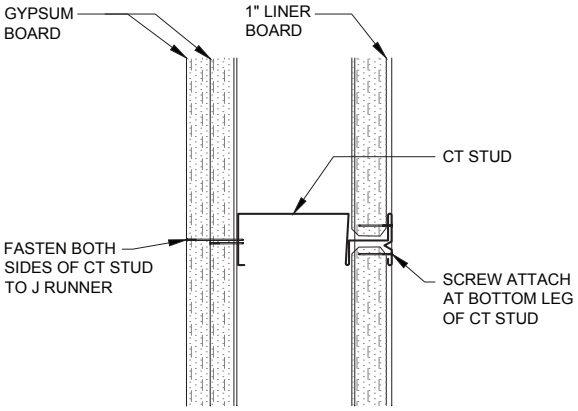
1 Hour	2 Hour	3 Hour	4 Hour
GA WP 6800	GA WP 7040	GA WP 7422	GA WP 7640
GA WP 6801	GA WP 7051	GA WP 7424	
GA WP 6802	GA WP 7052		
GA WP 6850	GA WP 7054		
GA WP 6851	GA WP 7054.4		
GA WP 6904	GA WP 7056		
GA WP 6905	GA WP 7057		
GA WP 7024.3	GA WP 7058		
	GA WP 7059		
	GA WP 7060		
	GA WP 7061		
	GA WP 7062		
	GA WP 7064		
	GA WP 7065.2		
	GA WP 7065.5		
	GA WP 7066		
	GA WP 7067		
	GA WP 7073		
	GA WP 7076		
	GA WP 7077		
	GA WP 7078		
	GA WP 7079		
	GA WP 7080		
	GA WP 7084		
	GA WP 7096		
	GA WP 7097		

Shaft Wall Installation Instructions

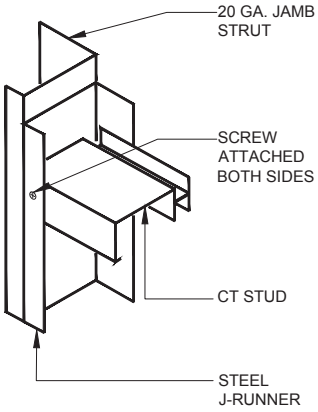
1. Layout per construction drawings. Secure J-Track as perimeter framing on floor and plumb to ceiling, floor and sides. Attach using suitable fasteners not to exceed 24" on-center. Sealant may be required per the specific assembly.
2. Plan the stud layout at 24" on-center and adjust accordingly at either end to avoid the last CT stud installed is no closer than 8" from the end.
3. Cut the first 1" Shaftliner panel 3/4" to 1" less than the total height of the framed section. Plumb the flush against the J-Track and secure with 1-5/8" long #6 Type S screws 24" on-center.
4. Insert a CT Stud (cut 3/4" less than the overall height of the section) into the tracks (top and bottom) and fit tightly over the installed Shaftliner panel. Install top and bottom of the CT stud into both legs of the J-Track.
5. Install the next 1" Shaftliner board (cut 3/4" to 1" shorter than the overall height of the section) into the T-section of the CT Stud.
6. Continue to install successive CT studs and Shaftliner panels as described above until the wall section is closed. The final panel section may be secured using 1-5/8" long #6 Type S screws into the J-Track.
7. For doors, rough openings, and other large penetrations/openings, install J-Track with a 3" back leg as perimeter framing for elevator doors and block cavity using a 12" wide gypsum board filler strips per the door frame manufacturer's instructions.
8. 1" Shaftliner boards may be abutted, spliced, or stacked within the cavity with panels no shorter than 2' in length. Joints of adjacent Shaftliner panels should be alternately stacked or staggered to prevent a continuous joint (horizontal).
9. For a one sided finished vertical system: A 1-hour rating is achieved by installing a layer of 1/2" Type-C or 5/8" Type-X Classified gypsum board horizontally using 1" Type-S or S-12 screws spaced at 24" on-center ensuring the horizontal joints are offset from any splice joints in the shaftliner panels by no less than 12". For a 2-hour system, a face layer of 1/2" Type-C or 5/8" Type-X Classified gypsum board may be installed either horizontally or vertically over the 1-hour system using 1-5/8" Type S or S-12 screws spaced at 8" on-center.
10. For a two-sided finished vertical system: Each side may be installed either horizontally or vertically with 1" Type S or S-12 screws spaced at 8" on-center. Offset edges and ends on opposite sides by at least 24" on-center.
11. For a one-sided finished horizontal system: A 1-hour rating is achieved by installing one layer of 1/2" Type-C or 5/8" Type-X Classified gypsum board perpendicular to framing using 1" Type-S or S-12 screws spaced at 24" on-center ensuring long-edged joints are offset from any splice joints in the shaftliner panels by no less than 12". For a 2-hour system, a face layer of 1/2" Type-C or 5/8" Type-X Classified gypsum board may be installed either perpendicular or parallel to framing over the 1-hour system using 1-5/8" Type-S or S-12 screws spaced at 8" on-center.
12. If installing for HVAC ducts, consult with the HVAC engineer regarding the level of caulking and sealant required. All joints on the face layers must be taped and finished with joint compound meeting ASTM C 475. All penetration openings must be filled with approved fire-stopping sealants.



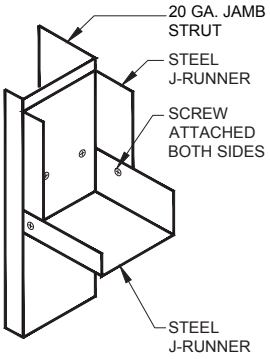
ELEVATOR DOOR ROUGH OPENING



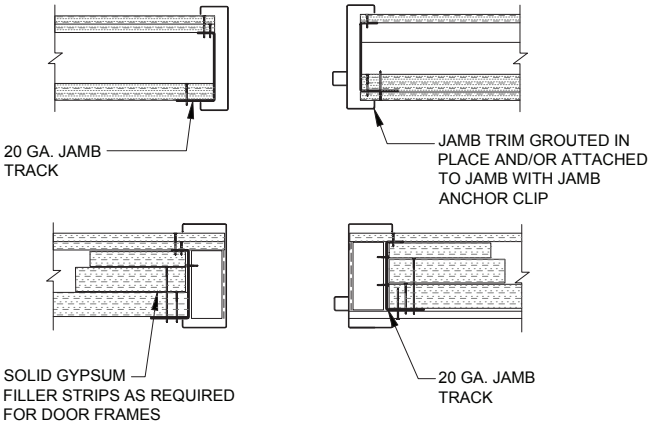
4 SECTION A-A



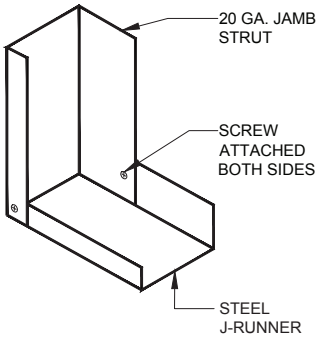
1 HORIZONTAL ATTACHMENT CT STUD TO J-RUNNER



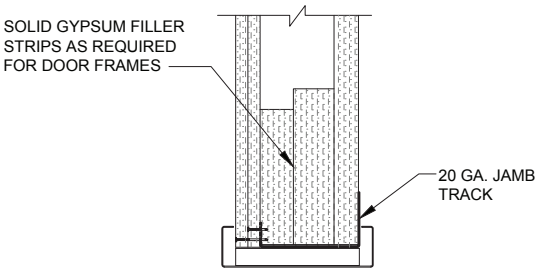
2 HEADER DETAIL



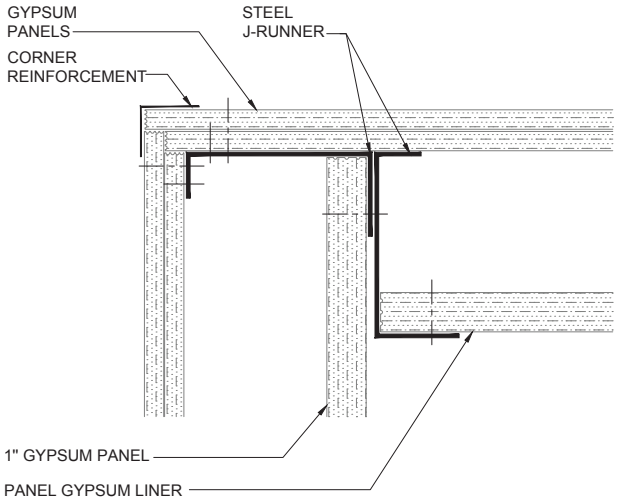
5 JAMB DETAIL SECTION B-B



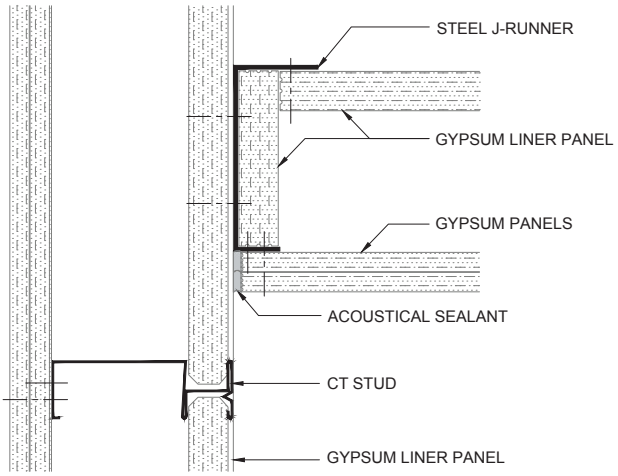
3 JAMB DETAIL



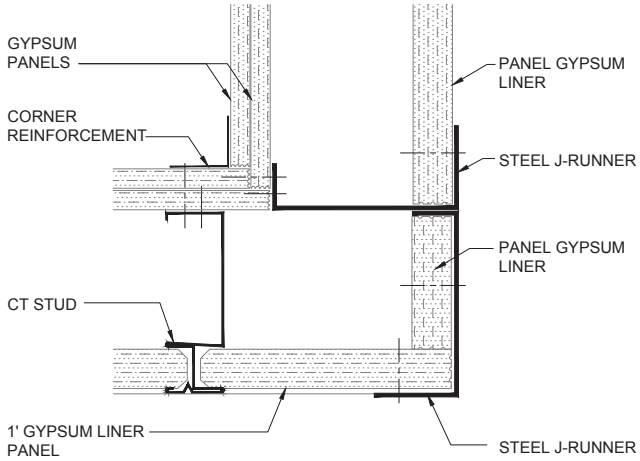
6 HEADER DETAIL SECTION C-C



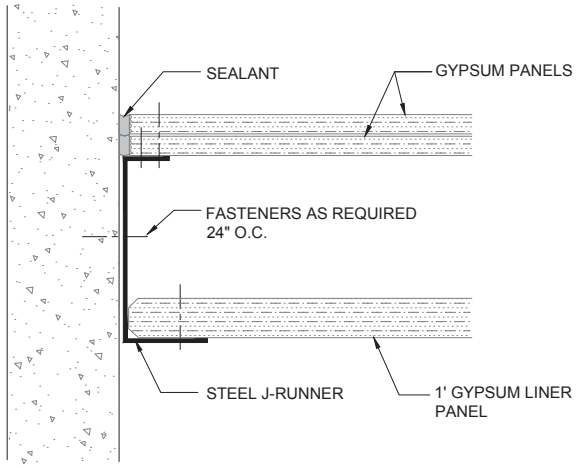
7 OUTSIDE CORNER



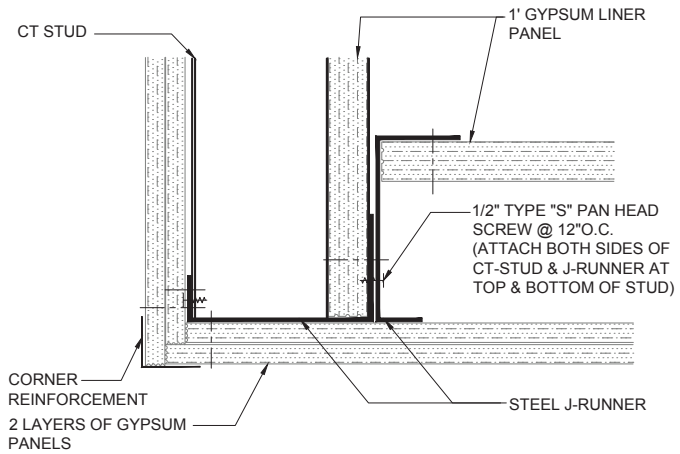
10 WALL JUNCTION



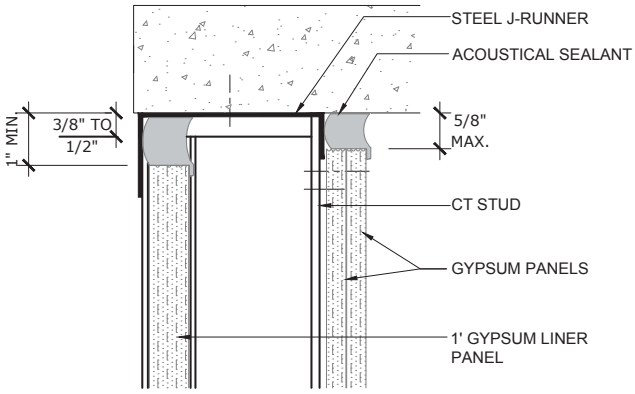
8 INSIDE CORNER



11 WALL INTERSECTION



9 INSIDE CORNER



12 HEAD SECTION (UL TBD)

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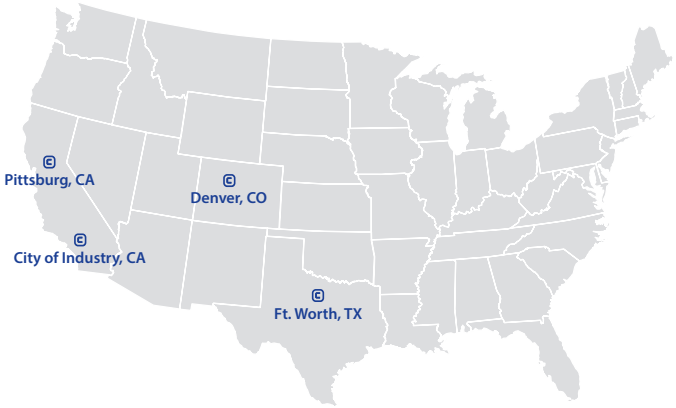

STEEL FRAMING INDUSTRY ASSOCIATION

Effective 07/08/2022