I-STUD *Shaftwall System*

Downtown Student Houseing - San Jose State
I-Stud and USG Shaftliner

Steel-Con™

Steel Construction Systems

MILL CERTIFIED
PRIME STEEL
100% GALVANIZED

CLASSIFIED
c UL us

UL Evaluation Report No. ER3660-02

www.SteelConSystems.com

The I-Stud is approved with the following gypsum shaftliner board manufacturers

Intertek

USG™

PABCO® Gypsum

AMERICAN GYPSUM

CONTINENTAL™ BUILDING PRODUCTS

CertainTeed SAINT-GOBAIN Gypsum

National Gypsum®

GP Georgia-Pacific

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Product Application

The I-Stud Shaftwall System has been engineered and designed to friction fit with ease.

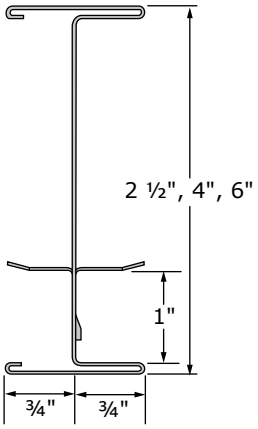
Cut-to-length and ready to install, the I-Stud paired with J-Track or JL-Corner creates an exceptional safety and performance system. The I-Stud is compatible with the gypsum Shaftliner boards of most major companies and is contractor preferred.

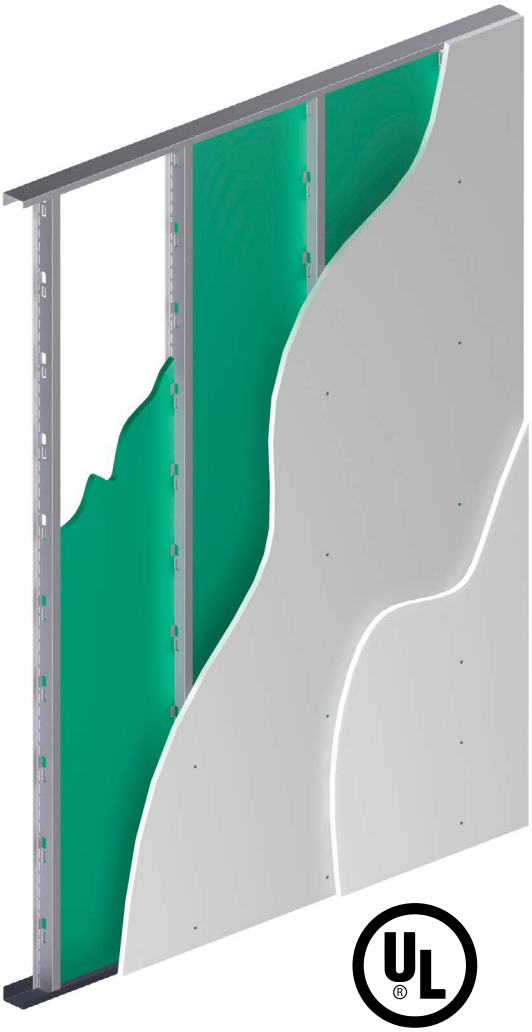
Shaftwall is used to enclose elevator shafts, stairwalls, air-return shafts, mechanical shafts, horizontal membranes and other non-protected floor openings in hotels, office buildings, hospitals and other large buildings.

Material Composition

- Mill certified steel
- ASTM: A653/A653M
- 33H mil
  - 57 ksi yield strength
  - 65 ksi tensile strength
  - G60 galvanized coating
- 43H mil
  - 57 ksi yield strength
  - 65 ksi tensile strength
  - G60 galvanized coating

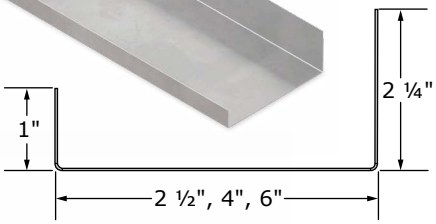
I-Stud

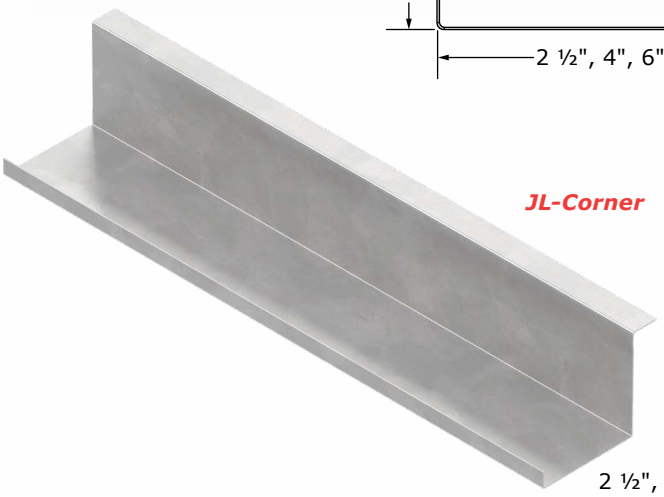




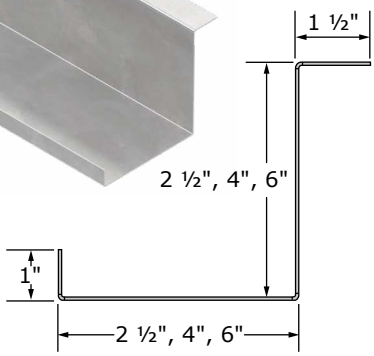
UL Evaluation Report No. ER3660-02

J-Track





JL-Corner



Fire ratings, installation instructions, and CAD detail assemblies available from Technical@SteelConSys.com

Century Towers
I-Stud and GP Shaftliner

Allowable Wall Heights for the I-Stud (One-Hour Wall)

Part No.	Stud Properties			Stud Depth	Design Thickness	Deflection	Design Loads			
	Mil	Gauge	Fy (ksi)				5 psf	7.5 psf	10 psf	15 psf
250IS-33H	33	20	57	2 ½"	0.0346	L/120	16' - 7"	14' - 6"	13' - 2"	10' - 6"
						L/240	13' - 2"	11' - 6"	10' - 4"	9' - 0"
						L/360	11' - 6"	9' - 11"	9' - 0"	7' - 10"
400IS-33H	33	20	57	4"	0.0346	L/120	23' - 8"	20' - 8"	18' - 9"	13' - 6"s
						L/240	18' - 9"	16' - 5"	14' - 11"	13' - 0"
						L/360	16' - 5"	14' - 4"	13' - 0"	11' - 3"
400IS-43H	43	18	57	4"	0.0451	L/120	25' - 2"	22' - 0"	20' - 0"	16' - 1"
						L/240	20' - 0"	17' - 5"	15' - 10"	13' - 10"
						L/360	17' - 5"	15' - 3"	13' - 10"	11' - 11"
600IS-33H	33	20	57	6"	0.0346	L/120	31' - 1"	27' - 2"	24' - 8"	14' - 11"s
						L/240	24' - 8"	21' - 6"	19' - 7"	14' - 11"s
						L/360	21' - 6"	18' - 10"	17' - 1"	14' - 11"s
600IS-43H	43	18	57	6"	0.0451	L/120	33' - 5"	29' - 2"	26' - 6"	20' - 2"s
						L/240	26' - 6"	23' - 2"	21' - 0"	18' - 4"
						L/360	23' - 2"	20' - 3"	18' - 4"	15' - 10"

Table Notes

1. For SI: = 25.4mm, 1' = 305mm, 1psf = 47.9 Pa.
2. Allowable heights are based on the transverse load test complying with ICC-ES AC 86 design criteria.
3. Studs Spaced maximum of 24" o.c.
4. Limiting height is based on the lesser height of deflection or strength.
5. "f" Flexural stress controls allowable height.
6. "s" End reaction controls allowable height.

Allowable Wall Heights for the I-Stud (Two-Hour Wall)

Part No.	Stud Properties			Stud Depth	Design Thickness	Deflection	Design Loads			
	Mil	Gauge	Fy (ksi)				5 psf	7.5 psf	10 psf	15 psf
250IS-33H	33	20	57	2 ½"	0.0346	L/120	17' - 3"	15' - 1"	13' - 8"	10' - 2"f
						L/240	13' - 8"	11' - 11"	10' - 10"	9' - 4"
						L/360	11' - 11"	10' - 4"	9' - 4"	8' - 1"
400IS-33H	33	20	57	4"	0.0346	L/120	23' - 8"	20' - 11"	19' - 1"	13' - 6"s
						L/240	19' - 1"	16' - 9"	15' - 4"	13' - 5"
						L/360	16' - 9"	14' - 9"	13' - 5"	11' - 9"
400IS-43H	43	18	57	4"	0.0451	L/120	25' - 8"	22' - 6"	20' - 6"	16' - 2"
						L/240	20' - 6"	17' - 11"	16' - 4"	14' - 3"
						L/360	17' - 11"	15' - 8"	14' - 3"	12' - 6"
600IS-33H	33	20	57	6"	0.0346	L/120	31' - 11"	28' - 0"	25' - 5"s	14' - 11"s
						L/240	25' - 5"	22' - 3"	20' - 3"	14' - 11"s
						L/360	22' - 3"	19' - 6"	17' - 9"	14' - 11"s
600IS-43H	43	18	57	6"	0.0451	L/120	34' - 2"	29' - 10"	27' - 1"	20' - 2"s
						L/240	27' - 1"	23' - 8"	21' - 6"	18' - 9"
						L/360	23' - 8"	20' - 8"	18' - 9"	16' - 4"

Table Notes

1. For SI: = 25.4mm, 1' = 305mm, 1psf = 47.9 Pa.
2. Allowable heights are based on the transverse load test complying with ICC-ES AC 86 design criteria.
3. Studs Spaced maximum of 24" o.c.
4. Limiting height is based on the lesser height of deflection or strength.
5. "f" Flexural stress controls allowable height.
6. "s" End reaction controls allowable height.

UL Classified for US and Canada

UL Evaluation Report No. ER3660-02

This product is Classified by UL as to Fire Resistance.

Contact Steel-Con Engineering Services

For assistance with ordering or questions on your project, utilize Steel-Con Engineering Services:

Call: *1-407-438-1664*

Email: *Technical@SteelConSys.com*

Maximum Horizontal Spans for Corridor and Ceiling Soffits - 1 Hour

Part No.	Mil	Guage	Stud Depth	1 Hour Assembly - 1 Layer 5/8" Type X GWB + 1" Shaftliner			
				L/120	L/180	L/240	L/360
250IS-33H	33	20	2 ½"	15' - 5"	13' - 6"	12' - 3"	10' - 8"
400IS-33H	33	20	4"	22' - 0"	19' - 3"	17' - 6"	15' - 3"
400IS-43H	43	18	4"	23' - 5"	20' - 5"	18' - 7"	16' - 3"
600IS-33H	33	20	6"	28' - 0"f	25' - 3"	22' - 11"	20' - 1"
600IS-43H	43	18	6"	31' - 1"	27' - 2"	24' - 8"	21' - 6"

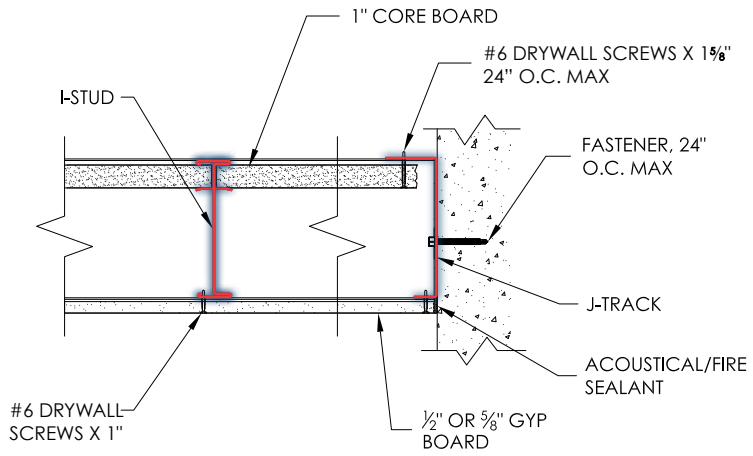
Maximum Horizontal Spans for Corridor and Ceiling Soffits - 2 Hour

Part No.	Mil	Guage	Stud Depth	2 Hour Assembly - 2 Layers 1/2" Type C GWB + 1" Shaftliner			
				L/120	L/180	L/240	L/360
250IS-33H	33	20	2 ½"	14' - 10"	13' - 0"	11' - 9"	10' - 4"
400IS-33H	33	20	4"	20' - 11"f	18' - 5"	16' - 9"	14' - 7"
400IS-43H	43	18	4"	22' - 4"	19' - 6"	17' - 9"	15' - 6"
600IS-33H	33	20	6"	25' - 5"f	24' - 3"	22' - 1"	19' - 3"
600IS-43H	43	18	6"	29' - 5"	25' - 8"	23' - 4"	20' - 5"

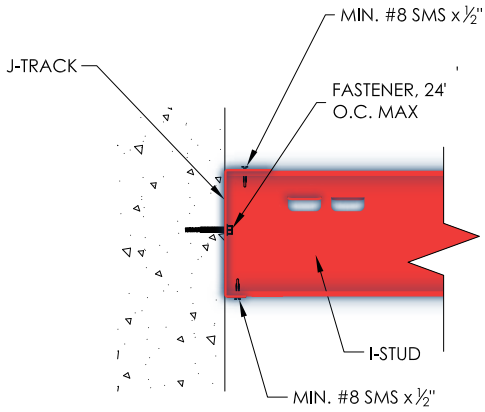
Table Notes

1. Only dead load (i.e. Weight) of assembly is considered.
2. Not designed to carry any live loads, lighting, mechanical equipment, or storage loads.
3. Spans based upon relative strength and stiffness derived from shaftwall limiting height testing.
4. Limiting spans are based on the lesser of deflection or strength.
5. Factor of safety calculated in accordance with AISI S100-12 for flexural members.
6. I-Studs must be full length one piece, with no splicing.
7. Ceilings and corridors shall be constructed in accordance with the details below.

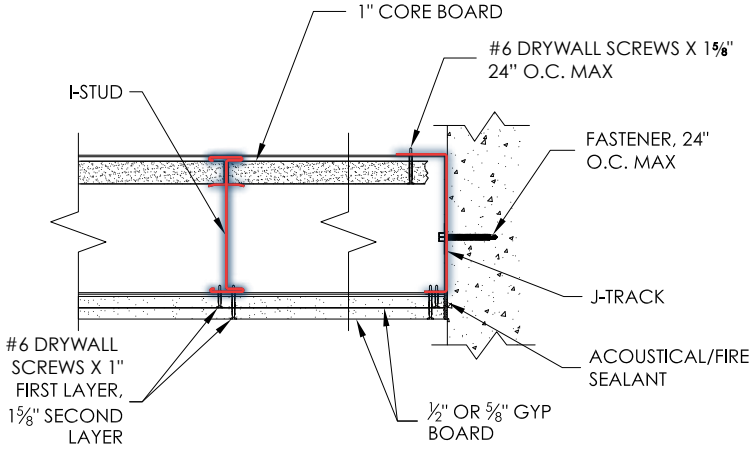
One Hr. Fire Rated Horizontal Assembly

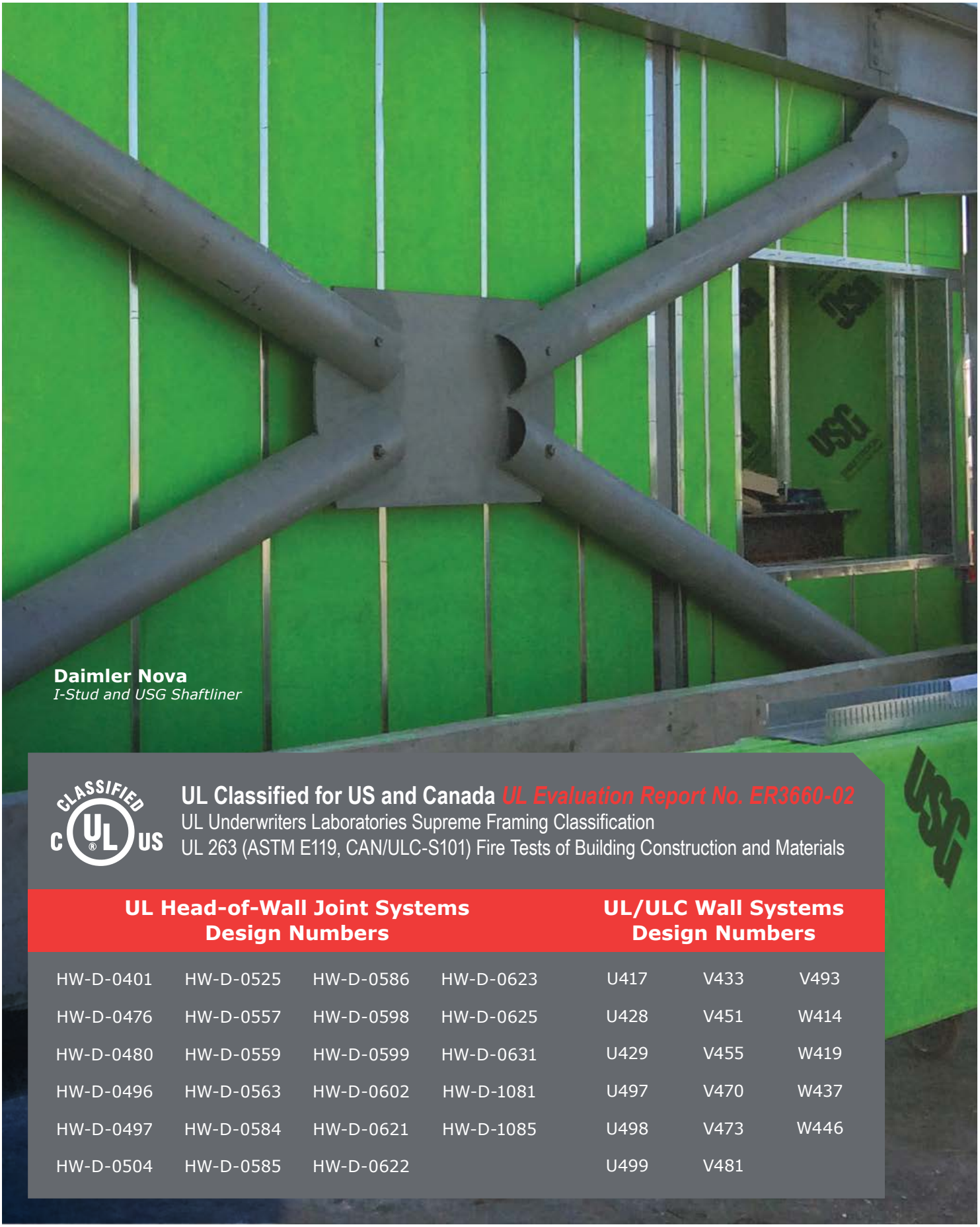


I-Stud to J-Track Horizontal Connection



Two Hr. Fire Rated Horizontal Assembly





Daimler Nova
I-Stud and USG Shaftliner

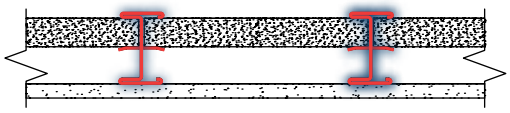
UL Classified for US and Canada *UL Evaluation Report No. ER3660-02*

UL Underwriters Laboratories Supreme Framing Classification
UL 263 (ASTM E119, CAN/ULC-S101) Fire Tests of Building Construction and Materials

UL Head-of-Wall Joint Systems Design Numbers			
HW-D-0401	HW-D-0525	HW-D-0586	HW-D-0623
HW-D-0476	HW-D-0557	HW-D-0598	HW-D-0625
HW-D-0480	HW-D-0559	HW-D-0599	HW-D-0631
HW-D-0496	HW-D-0563	HW-D-0602	HW-D-1081
HW-D-0497	HW-D-0584	HW-D-0621	HW-D-1085
HW-D-0504	HW-D-0585	HW-D-0622	

UL/ULC Wall Systems Design Numbers		
U417	V433	V493
U428	V451	W414
U429	V455	W419
U497	V470	W437
U498	V473	W446
U499	V481	

1 Hour Shaftwall Assembly



Finished on one side

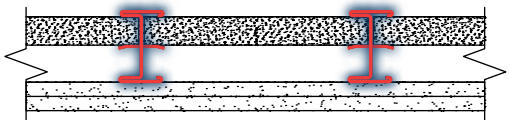
Fire Components

- 1" UL Classified Shaftliner Board
- I-Stud
- J-Track
- 1 layer - 5/8" Type X GWB
- J-Track Runner

Sound Rating with Insulation

- 40-44 STC

2 Hour Shaftwall Assembly



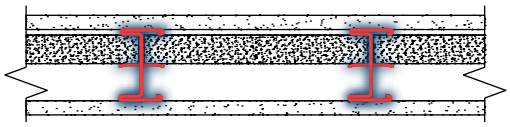
Finished on one side

Fire Components

- 1" UL Classified Shaftliner Board
- I-Stud
- J-Track
- 2 Layers - 5/8" Type X or 1/2" Type C GWB

Sound Rating with Insulation

- 45-49 STC



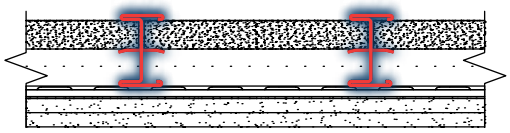
Finished on both sides

Fire Components

- 1" UL Classified Shaftliner Board
- I-Stud
- J-Track
- 1 layer each side - 5/8" Type X or 1/2" Type C GWB

Sound Rating with Insulation

- 45-49 STC



With sound control

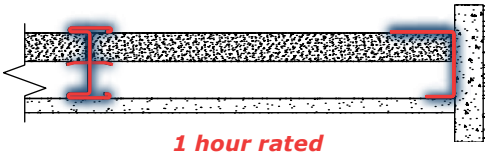
Fire Components

- 1" UL Classified Shaftliner Board
- I-Stud
- J-Track
- 2 Layers - 5/8" Type X or 1/2" Type C GWB
- Resilient Channel Spaced 24" o.c.

Sound Rating with Insulation

- 50-54 STC

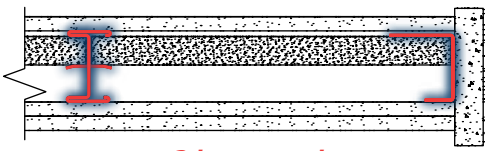
Horizontal



1 hour rated
horizontal ceiling

Fire Components

- 1" UL Classified Shaftliner Board
- I-Stud
- J-Track
- 1 layer - 5/8" Type X GWB



2 hour rated
horizontal membrane and duct protection

Fire Components

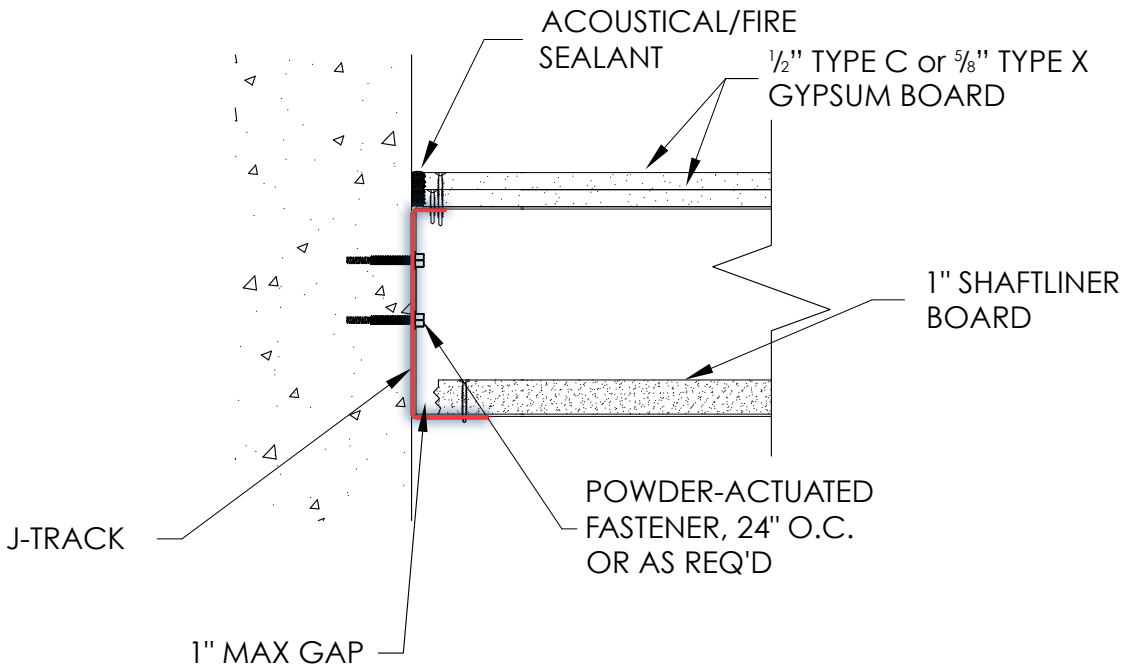
- 1 layer - 5/8" Type X or 1/2" Type C GWB (Top)
- 1" UL Classified Shaftliner Board
- I-Stud
- J-Track
- 2 Layer - 5/8" Type X or 1/2" Type C GWB (Bottom)

*Assemblies to be constructed in accordance with applicable design, based on below references, to achieve fire and sound requirements:
UL Evaluation Report No. ER3660-02 | Gypsum Association: Fire Resistance Design Manual
UL and ULC Rated Assemblies: U417, U428, U429, U497, U498, U499, W433, V451, V455, V470, V473, V481, V493, W414, W419, W437, W446

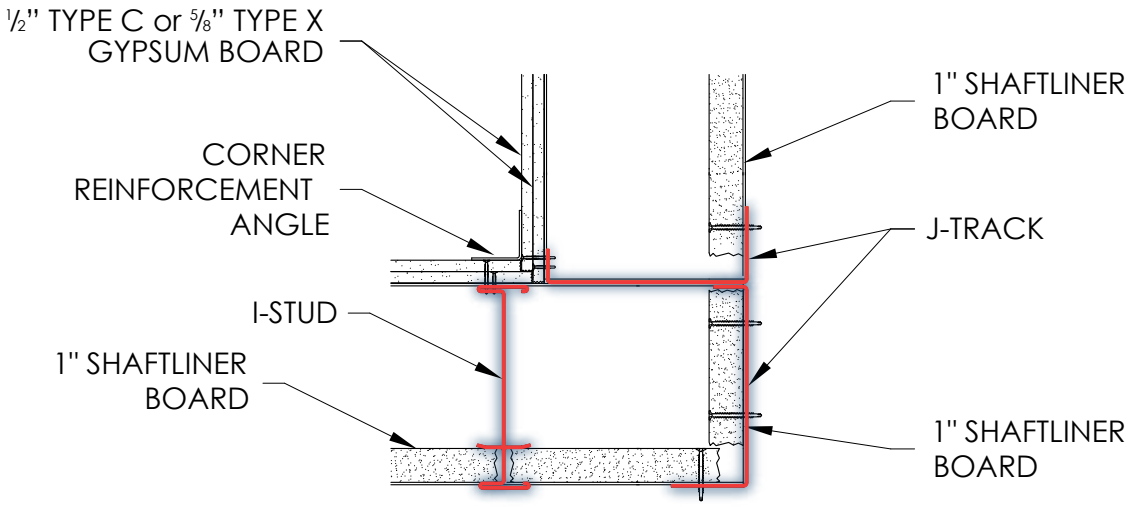
Otis Elevator Training Facility
I-Stud and National Shaftliner

Shaftwall

Wall Intersection Detail

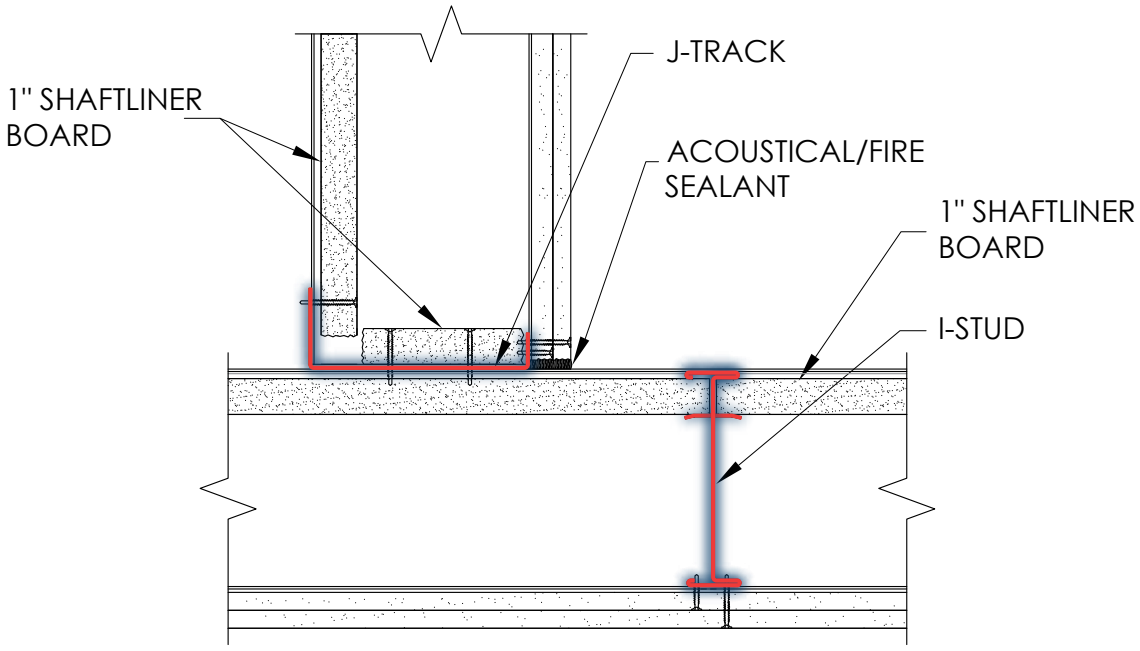


Inside Corner Detail

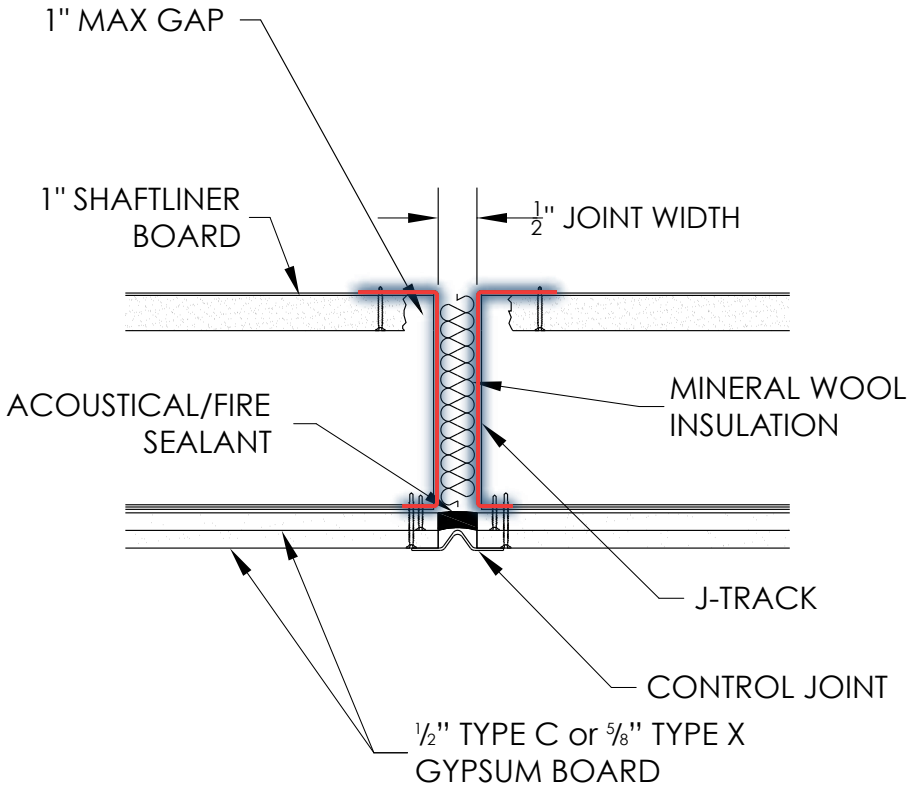


Shaftwall

Wall Junction Detail

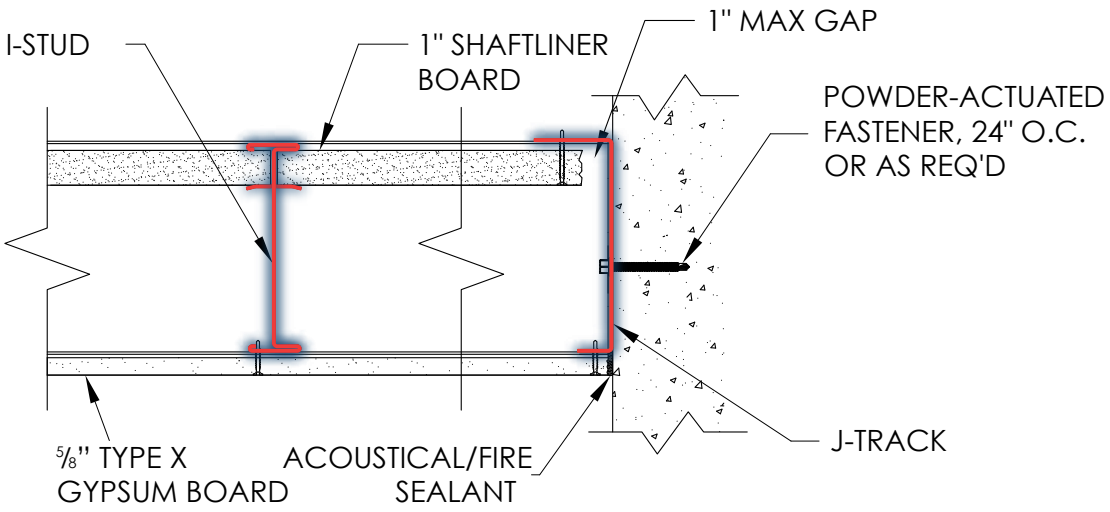


Control Joint Detail

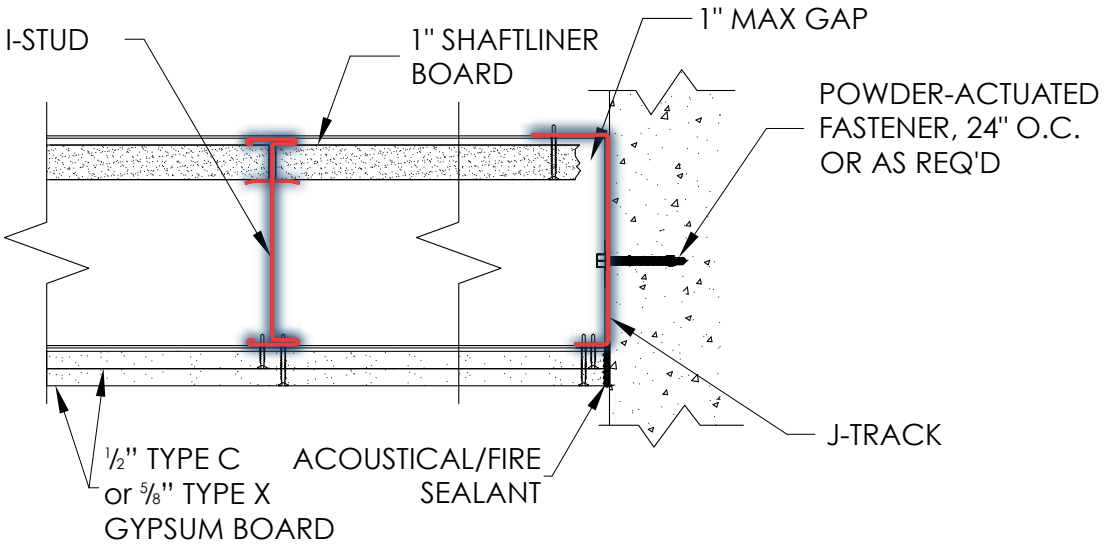


Horizontal

One Hr. Fire Rated Assembly



Two Hr. Fire Rated Assembly



JL-Corner

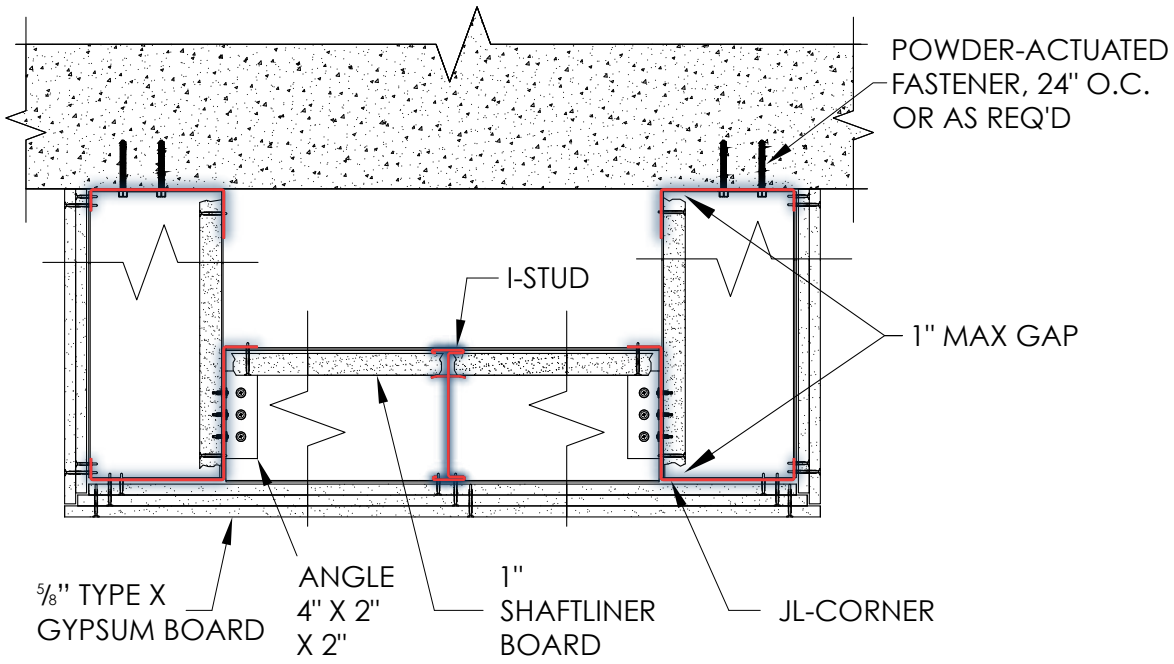
Benefits of JL-Corner

JL-Corner

Benefits of JL-Corner vs. double J-Track assembly:

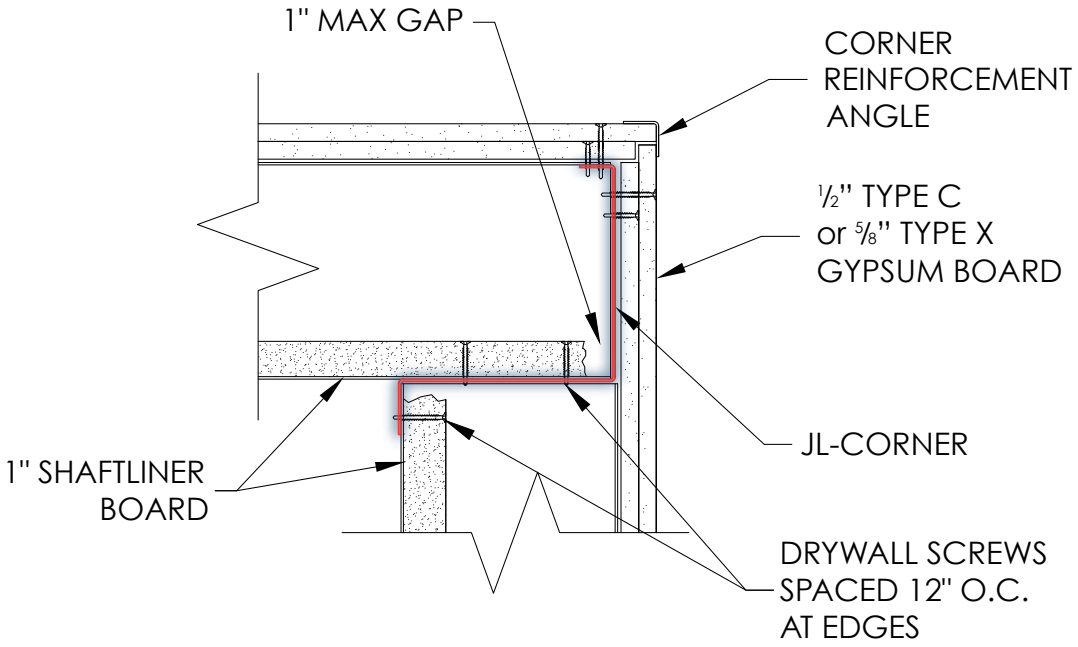
- Handling - 1 pc vs. 2 pcs
- Cost – reduced labor cost
- Delivery – lower delivery charge
- Construction – less complicated
- Finish – cleaner, less build-up

Metal Duct Enclosure Detail

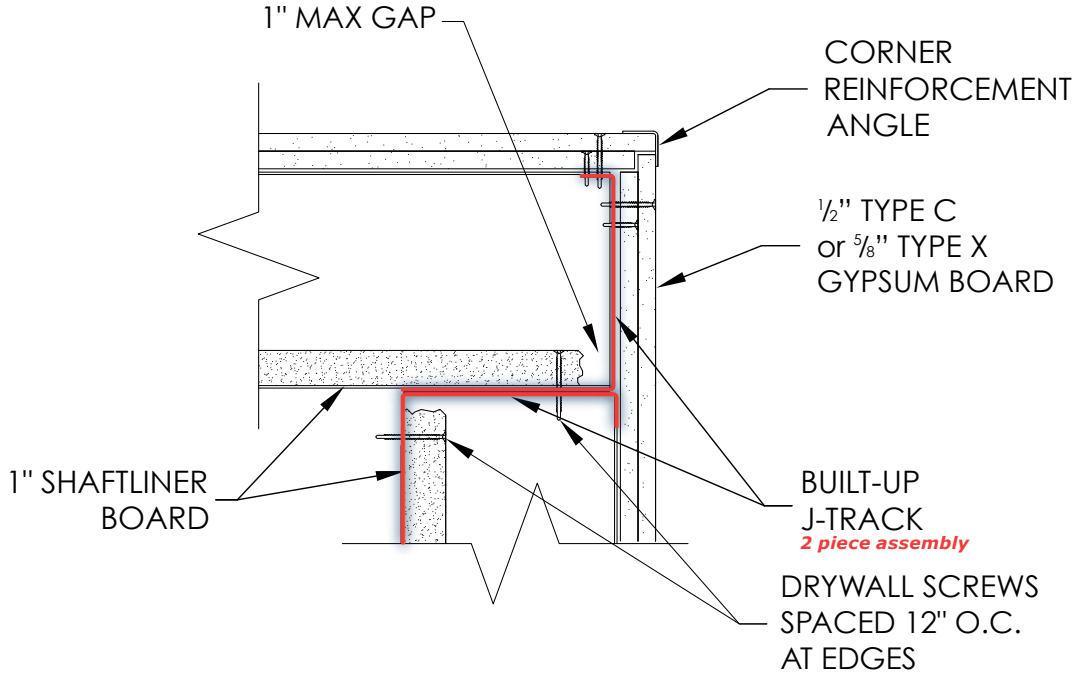


JL-Corner vs. Traditional

JL Outside Corner Detail

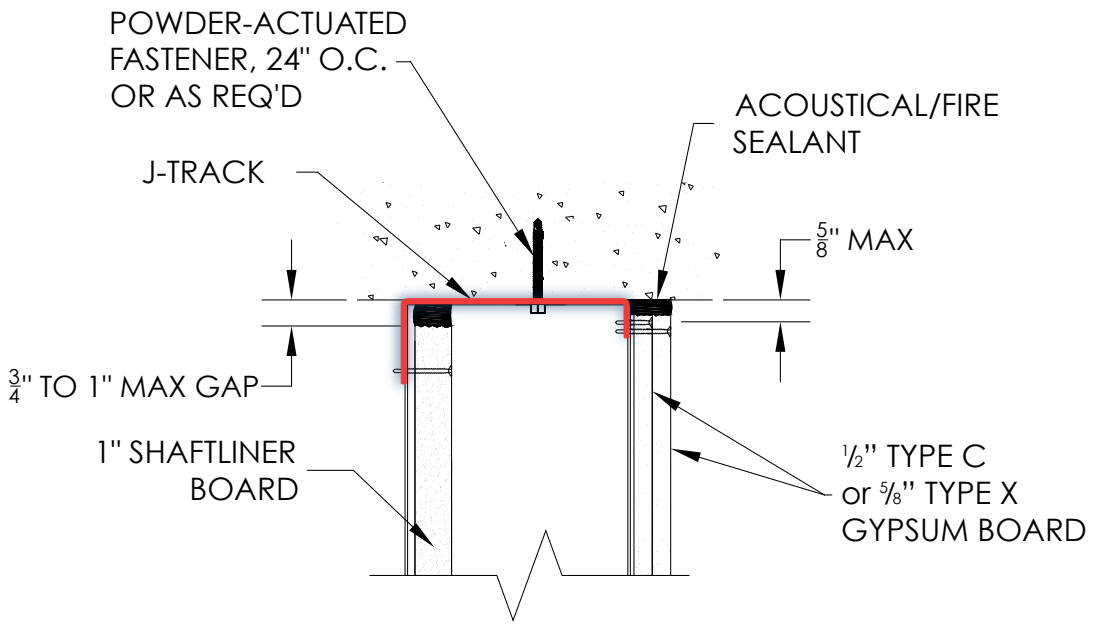


Standard Outside Corner Detail

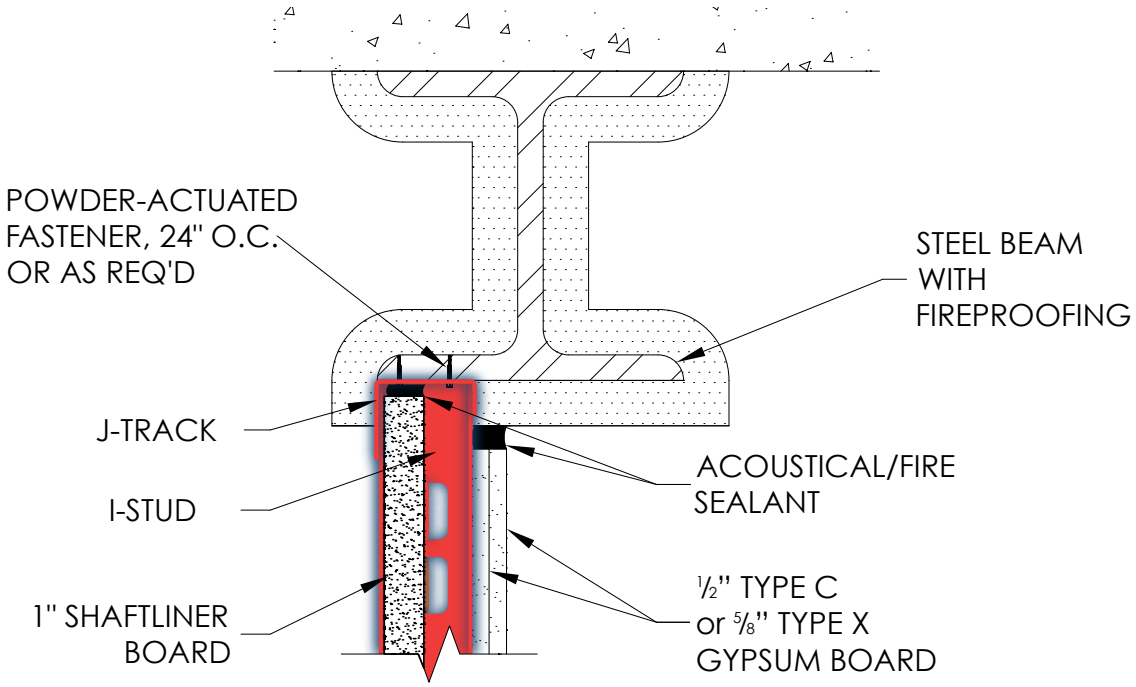


Head of Wall

Head Section Detail

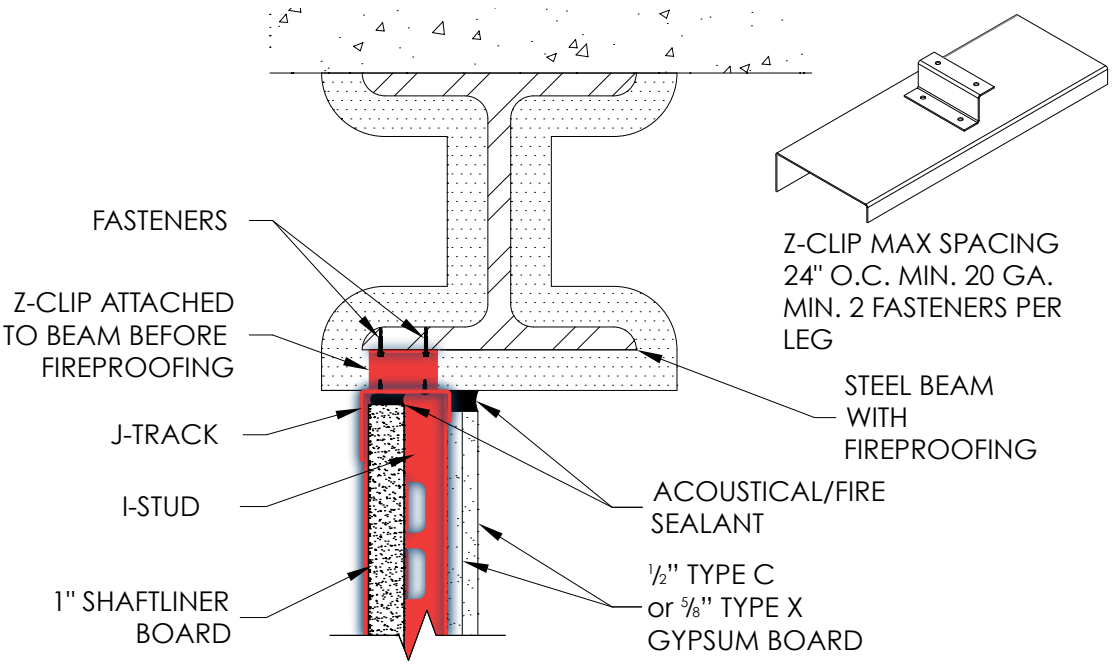


Under Steel Beam Connection Detail

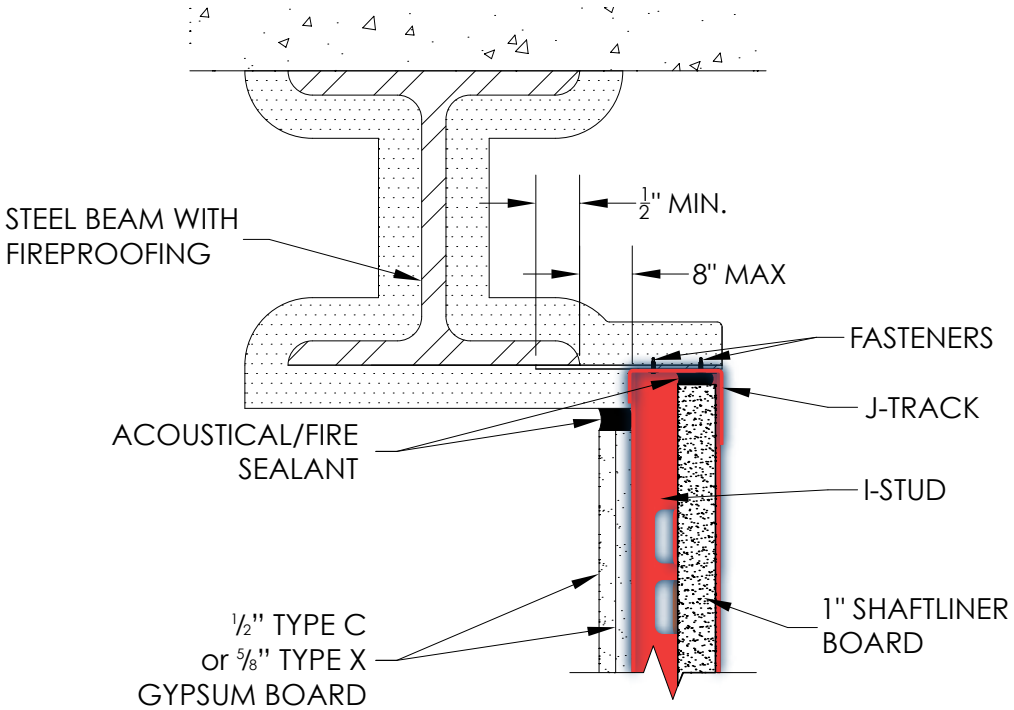


Head of Wall

Under Steel Beam with Z-Clip Connection Detail



Under Steel Beam Offset Connection Detail



Part 1 – General

1.0 Description of Work

Types of Work: The types of work herein specified include, but are not limited to, "I" Stud Shaftwall and Stairwall installations.

1.1 Quality Assurance

A. Fire Resistance Ratings: Where shaftwall/stairwall systems with fire resistance ratings are indicated, provide UL Classified gypsum shaftliner board.

B. Provide fire resistance rated assemblies identical to those reference in Gypsum Association's Fire Resistance Design Manual or listings by other acceptable testing agencies.

1.2 Qualifications

All shaftwall/stairwall framing materials shall be manufactured by Steel-Con. All materials shall be installed in accordance with printed installation instructions as required by the testing agency.

1.3 Submittals

Product Data: Submit Steel-Con's technical data sheets for each shaftwall/stairwall component indicating materials, dimensions, and other data required to show compliance with the specifications.

1.4 Delivery, Storage and Handling

A. Deliver materials in original packages, containers or bundles bearing Steel-Con's brand name and identification.

B. Keep materials protected from weather and damage from construction operations and other causes.

C. Handle system components carefully to prevent damage to edges, ends or surfaces. Protect metal accessories, framing and trim from damage.

Part 2 – Products

2.0 Materials

A. Metal framing:

1. "I" Studs:
   a. Galvanized steel, conforming to ASTM A653/A653M manufactured by Steel-Con.
   b. Width: 2½", 4" and 6"
   c. Mil: 33H mil, 43H mil
2. "J" Track and "JL" Corner:
   a. Galvanized steel, conforming to ASTM A653/A653M manufactured by Steel-Con.
   b. Width: 2½", 4" and 6"
   c. Mil: 33H mil, 43H mil

Part 3 – Execution

3.0 Installation

A. General: Follow Steel-Con recommendations for installation of metal framing.

3.1 Installation of Framing (Shaftwall/ Stairwall)

A. Installation of "J" Track, "I" Studs and 1" gypsum shaftliner board panels.

1. Layout shaftwall in locations indicated on construction drawings.
2. Anchor "J" Track perimeter framing at abutting horizontal and vertical construction.
3. Anchor with approved fasteners spaced maximum 24" o.c.
4. Apply non-hardening, flexible sealant in a continuous application at the perimeter.
5. Space "I" Studs at 24" o.c. Adjust the spacing at ends of shaftwall construction so end studs are minimum 8" from the ends.
6. Install the first gypsum shaftliner board panel. The panel length shall be ¾" less than the total height of the framed section. Plumb the panel against the web of the "J" Track and secure the panel in place.
7. Insert an "I" Stud into the top and bottom "J" Track and fit tightly over the previously installed 1" panel. Allow equal clearance between track and stud at top and bottom "J" Track. The stud length shall be ¾" less than the total height of the framed section.
8. Install the second 1" gypsum shaftliner board panel inside the "J" Track and within the tabs of the "I" Studs.
9. Install succeeding studs and panels in the same manner as described for the first and second panels until the wall section is complete.
10. Anchor the final panel section at 12" o.c.
11. Where wall heights exceed the standard or available length of the gypsum shaftliner board panels, the panels shall be cut and stacked with joints occurring within the top or bottom third of the wall height. The shorter panels shall be minimum 24" long and of sufficient width to engage 2 stud tabs on each panel edge.
12. For doors, ducts or other large penetrations or openings, install "J" Track as perimeter framing. Install 12" wide gypsum filler strips for doors exceeding 7'0" height.

3.2 Installation of Gypsum Board

A. 1 Hour Shaftwall/Stairwall system finished one side:

1. Install gypsum board in a single layer on one side.
2. Single layer of gypsum board is installed vertically with approved 24" o.c. and 3" from all edges.
3. Offset the horizontal joints a minimum 12" from any splice joints in the gypsum shaftliner board panels.

B. 2 Hour Shaftwall/Stairwall system finished one side:

1. Install gypsum board in a double layer on one side.
2. Install the first layer of gypsum board horizontally with approved fasteners spaced 24" o.c. and 3 " from each end.
3. Offset the horizontal joints a minimum 12" from any splice joints in the gypsum shaftliner board panels.
4. Install the face layer of gypsum board parallel to the framing with approved fasteners spaced 12" minimum o.c. and 6" from all edges.
5. Offset edge and end joints from the base layer 24".

C. 2 Hour Shaftwall/Stairwall system finished both sides.

1. Install gypsum board on both sides either horizontally or vertically.
2. Attach gypsum board with approved fasteners spaced 12" o.c. and 6" from all edges.
3. Offset edges and gypsum board on opposite sides minimum 24".

3.3 Finishing

A. Apply a non-hardening, flexible sealant continuous at all perimeter edges, abutments with dissimilar materials and penetrations in the facing layer.

B. Tape and finish all joints at face layers with tape and joint compound and finish fastener heads with joint compound.

3.4 Protection of Work

A. Protect shaftwall work from damage and deterioration until date of substantial completion.

B. Repair damaged work to be indistinguishable from adjacent work. Replace work that cannot be repaired as required.

Limitations:

- Non-load-bearing; not to be used as an unlined air supply duct.
- Not designed for exposure to constant high-moisture conditions or direct water.
- Elevator door assemblies require support independent of shaftwall partitions.
- Good construction practice calls for partition control joints to coincide with that of the building structure.
- Limiting loads and heights not to exceed design specifications or data provided herein or by metal component supplier.
- Provide flexible sealant/caulk at partition perimeters and penetrations to avoid air leakage/ whistling and dust collection.

Allen Institute for Brain Science
I-Stud and CertainTeed Shaftliner

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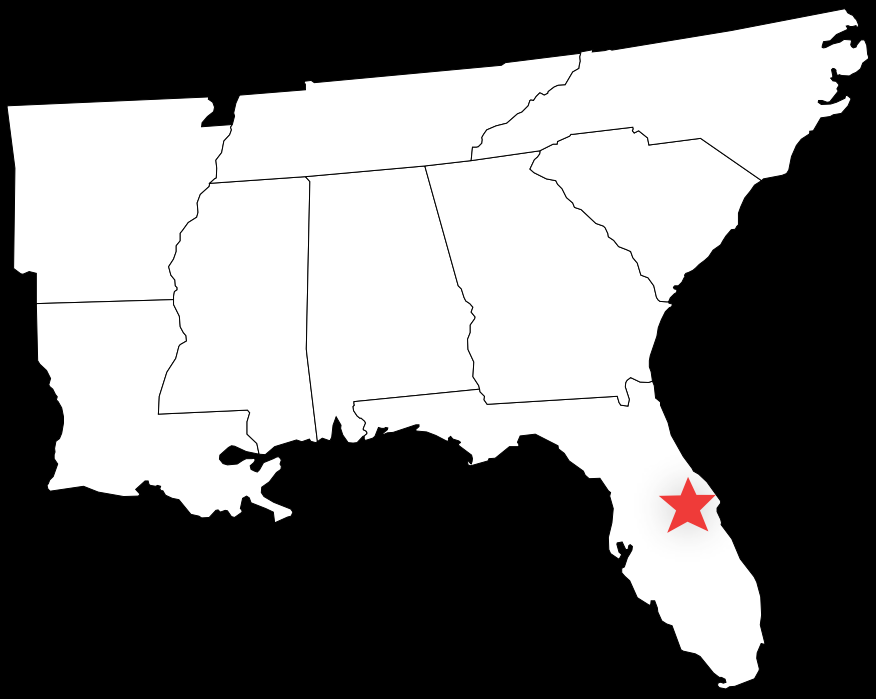

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