

SYSTEM No. AER-09038
1 & 2 HOUR SHAFT WALL ASSEMBLY

Assembly Evaluation Report

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This Document Published By: Progressive Engineering Inc. 5940 State Road 15, Gosport, Indiana 46528

Listed Assemblies: USG Shaft & Stair Wall Systems Listed For United States Gypsum Company

Assemblies Listed For: 1. Non Axial Load Bearing Wall 2. Transverse Load Capacity 3. Fire Resistance

Compliance: 1. Meets the requirements for shaft enclosures in accordance with the 2009 International Building Code... 2. Meets the requirements for non-combustible construction in accordance with Section 703.4 of the 2009 International Building Code...

Component Descriptions

1.1 Runners: The metal framing members used in construction of 1HR Shaft & Stair Wall Systems are manufactured from cold rolled formed light gauge galvanized steel conforming to ASTM A 653...

2. Steel C-H Stud: 1/2" deep C-H Studs are manufactured from cold rolled formed light gauge steel conforming to ASTM A 653 with a yield strength of 33,000 psi minimum...

3. Gypsum Liner Panels: The paper faced products listed below comply with ASTM C1396 and Glass-Mat panels in accordance with ASTM C1688...

SHEETROCK® Brand Gypsum Liner Panels: A high performance panel that is composed of a non-combustible gypsum core encased in a 100% recycled non-toxic paper and back paper...

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3. Gypsum Liner Panels cont. SHEETROCK® Brand Mold Tough™ Gypsum Liner Panels feature a non-combustible, moisture- and mold-resistant gypsum core encased in moisture- and mold-resistant paper...

4. Gypsum Wallboard: The products listed below comply with ASTM C1396 and are tested in accordance with ASTM E119, E136 (modified), E84 and are classified as composite non-combustible, Class A building materials...

5. Fiber Reinforced Gypsum Panels: The product listed below complies with ASTM C1279 in accordance with ASTM E119, E84 and are classified as a Class A building material.

FIBEROCK® Brand VHI (Very High Impact) Abuse-Resistant Interior Panels (Type X) are high performance abuse resistant panels. The panels are UL classified for fire-rated construction (Type FRC-G)...

~ Cavity Shaft Wall Systems ~

One-Hour Cavity Shaft Wall (Non-Load Bearing) See Figure 1

1. Minimum 2-1/2" deep 25 gauge floor and ceiling J-runners, attached to structure as described above.

2. One-layer, 5/8" thick SHEETROCK® Brand FIRECODE® Core Gypsum Panels (Type X), installed vertically with 1" long Type 5 screws spaced 12" o.c. in field and at edges for vertical application, and 8" o.c. for horizontal application.

3. Minimum 2-1/2" deep USG C-H Stud 25 gauge 24" o.c., with the H-section of C-H Stud towards the shaft side of the assembly. Screw attachment is not required to affix the stud to the runner, if shaft wall is less than 16 ft. tall. E-Strapped studs may be used for closure panels at end of walls or columns. (If J-runners are used at end walls, the gypsum liner is fastened at the ends with 1-5/8" long Type 5 screws, spaced 12" o.c.)

4. 1" thick SHEETROCK® Brand Gypsum Liner Panel - Friction-fitted in 1/4" portion of C-H studs.

Two-Hour Cavity Shaft Wall (Non-Load Bearing) See Figure 2

1. 2-1/2" deep 25 gauge minimum floor and ceiling J-runners, attached to structure as described above.

2. Two (2) layers, 1/2" thick SHEETROCK® Brand FIRECODE® C Core Gypsum Panels. Apply these layers with 1" long Type 5 screws 24" o.c. in field and at the edges for vertical application and 16" o.c. for horizontal applications. Apply base layer C-H studs and J-runners with 1-5/8" long Type 5 screws. Space the screws 12" o.c. at the edges and in the field when applied horizontally. All joints between the base and face layers must be staggered.

3. A minimum 2-1/2" deep USG C-H Stud 25 gauge 24" o.c., with the H-section of the C-H stud towards the shaft side of the assembly. Screw attachment is not required to affix the stud to the runner, if shaft wall is less than 16 ft. tall. E-Strapped studs may be used for closure panels at the end of walls or columns. (If J-runners are used at end walls, the gypsum liner needs to be fastened at the ends with 1-5/8" long Type 5 screws that are spaced 12" o.c.)

4. 1" thick SHEETROCK® Brand Gypsum Liner Panel - Friction-fitted in 1/4" portion of C-H studs.

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~ Cavity Shaft Wall Systems cont. ~

Two-Hour Stair Cavity Shaft Wall (Non-Load Bearing) See Figure 3

1. Minimum 2-1/2" deep 25 gauge floor and ceiling J-runners, attached to the structure as described.

2. Apply one (1) layer of 1/2" SHEETROCK® Brand FIRECODE® Core Gypsum Panels (Type X) to each side of the C-H stud. Attach the C-H stud with 1" long Type 5 screws 12" o.c. in the field and at the edges for a vertical application and 8" o.c. for horizontal application.

3. A minimum 2-1/2" deep USG C-H Stud 25 gauge 24" o.c., with the H-section of the C-H stud towards the shaft side of the assembly. The shaft wall is less than 16 ft. tall. E-Strapped studs may be used for closure panels at the end of walls or columns. (If J-runners are used at end walls, the gypsum liner needs to be fastened at the ends with 1-5/8" long Type 5 screws that are spaced 12" o.c.)

4. 1" thick SHEETROCK® Brand Gypsum Liner Panel - Friction-fitted in 1/4" portion of C-H studs.

Three-Hour Cavity Shaft Wall (Non-Load Bearing) See Figure 4

1. A minimum 2-1/2" deep 25 gauge floor and ceiling J-runners, attached to the structure as described in the Figure 4

2. Apply (3) layers of 5/8" thick SHEETROCK® Brand FIRECODE® C Core Gypsum Panels (Type C), vertically or horizontally to the room side of the C-H stud. First layer shall be attached with a 1" long Type 5 screw spaced 24" o.c. in the field and at the edges when applied vertically. For horizontal applications the screws shall be spaced 16" o.c. The second layer shall be applied with 1-5/8" long Type 5 screws spaced 24" o.c. when applied vertically or spaced 18" o.c. when applied horizontally. The Face layer shall be applied with 2-1/4" long Type 5 screws that are spaced 16" o.c. when the board is applied vertically and spaced 12" o.c. when the board is applied horizontally. All joints must be staggered a minimum of 24" from the adjacent layer.

3. A minimum 2-1/2" deep USG C-H Stud 25 gauge 24" o.c., with the H-section of the C-H stud towards the shaft side of the assembly. Screw attachment is not required to affix the stud to the runner, if shaft wall is less than 16 ft. tall. E-Strapped studs may be used for closure panels at the end of walls or columns. (If J-runners are used at end walls, the gypsum liner needs to be fastened at the ends with 1-5/8" long Type 5 screws spaced 12" o.c.)

4. 1" thick SHEETROCK® Brand Gypsum Liner Panel - Friction-fitted in 1/4" portion of C-H studs.

Three-Hour Stair Cavity Shaft Wall (Non-Load Bearing) See Figure 5

1. A minimum 2-1/2" deep 25 gauge floor and ceiling J-runners attached to the structure as described above.

2. Apply two (2) layers of 5/8" thick SHEETROCK® Brand FIRECODE® C Core Gypsum Panels (Type C), vertically or horizontally to the room side of the C-H stud. For vertical applications using a 1" long Type 5 screw spaced 24" o.c. in the field and at the edges. For vertical applications the gypsum panels need to be spaced 16" o.c. and for horizontal applications they need to be spaced 12" o.c.

3. A minimum 2-1/2" deep USG C-H Stud 25 gauge 24" o.c., where the H-section of the C-H stud faces the shaft. Screw attachment is not required to affix the stud to the runner, if shaft wall is less than 16 ft. tall. E-Strapped studs may be used for closure panels at the end of walls or columns. (If J-runners are used at end walls, the gypsum liner should be fastened at the ends with 1-5/8" long Type 5 screws, spaced 12" o.c.)

4. 1" thick SHEETROCK® Brand Gypsum Liner Panel - Friction-fitted in 1/4" portion of C-H studs.

Two-Hour Horizontal Shaft Wall Assembly (Non-Load Bearing) See Figure 6

1. A minimum 4" deep 20 gauge J-runner attached horizontally to perimeter or boundary wall, with power actuated fasteners.

2. Apply two (2) layers of 5/8" thick SHEETROCK® Brand FIRECODE® Core Gypsum Panels (Type X) vertically or horizontally to the room side of the C-H stud, with 1" long Type 5 screws spaced 12" o.c. in the field and at the edges for the BASE layer. The Face layer shall be installed with 1-5/8" long Type 5 screws spaced 8" o.c. All joints must be staggered a minimum of 24" from the adjacent layer.

3. A minimum 4" deep USG C-H Stud or E-Strap 10 gauge, are to be installed horizontally between the J-runners. The H-section of the C-H stud faces the shaft. C-H Stud(s) shall be attached to vertical J-runners with Type 5 fasteners.

4. 1" thick SHEETROCK® Brand Gypsum Liner Panel - Friction-fitted in 1/4" portion of C-H studs. The wall width is limited to the length of the Gypsum Liner Panel.

One & Two-Hour Horizontal Cavity Ceiling Membrane (Non-Load Bearing) See Figure 7

1. A minimum 2-1/2" deep 24 gauge J-runner attached horizontally to perimeter or boundary wall, with power actuated fasteners.

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~ Cavity Shaft Wall Systems cont. ~

One & Two-Hour Horizontal Cavity Ceiling Membrane (Non-Load Bearing) See Figure 7

2. Gypsum Wall: a. For a one (1) hour assembly, attach one (1) layer of 5/8" thick SHEETROCK® Brand FIRECODE® C Core Gypsum Panels (Type C), to the underside of the "Corridor Ceiling" of the C-H Stud and the perimeter J-runners. Use 1" long Type 5 screws that are spaced 12" o.c. in the field and at the edges.

b. For a two (2) hour assembly, attach two (2) layers of minimum 1/2" thick SHEETROCK® Brand FIRECODE® C Core Gypsum Panels (Type C), to the underside of the "Corridor Ceiling" of the C-H stud and the perimeter J for the BASE layer. Use a 1" long Type 5 screw that is spaced 24" o.c. along the perimeter and the edges. The FACE layer shall be applied with 1-5/8" long Type 5 screws that are spaced 12" o.c. in the field and perimeter. All joints must be staggered a minimum of 24" o.c. from the adjacent layer.

3. Install the C-H studs perpendicular to the J-runners spaced 24" o.c., with the C-section of the C-H stud facing downward towards the corridor side of the assembly with two (2) screws a minimum 1/2" long Type 5 screws, one on each side.

4. 1" thick SHEETROCK® Brand Gypsum Liner Panel - Friction-fitted in 1/4" portion of C-H studs.

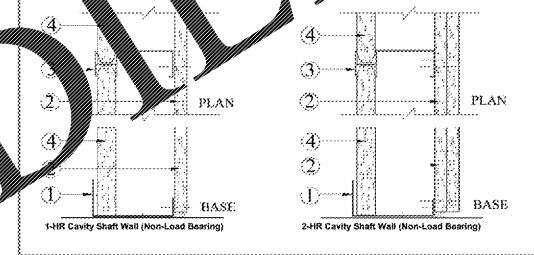
Two-Hour Horizontal Gypsum Duct Enclosure, See Figure 8

1. A minimum 2-1/2" deep 24 gauge J-runners attached horizontally to the perimeter or boundary wall, with power actuated fasteners.

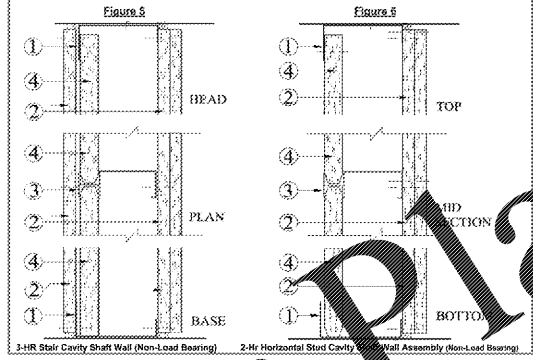
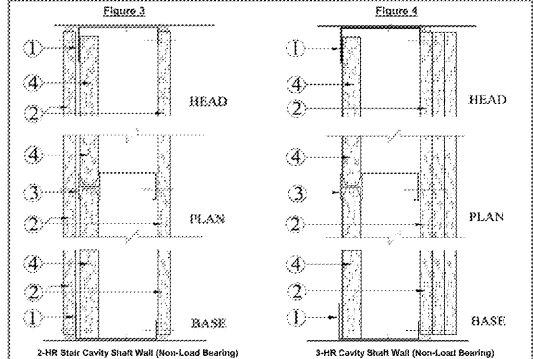
2. Attach three (3) layers of 1/2" (minimum) SHEETROCK® Brand FIRECODE® C Core Gypsum Panels to the underside (room side) of the assembly. The Base layer is attached with 1" long Type 5 screws that are spaced 24" o.c. in the field and at the edges. The middle layer is attached with 1-5/8" long Type 5 screws spaced 24" o.c. when applied vertically or spaced 18" o.c. when applied horizontally. The Face layer is attached perpendicular to the C-H Stud(s) with 2" long Type 5 screws spaced 8" o.c. and the joints are staggered 24" o.c. from the base layer.

3. Install the C-H studs perpendicular to the J-runners, spacing them 24" o.c., with the C-section of the C-H stud facing downward towards the corridor side of the assembly with two (2) screws a minimum 1/2" long Type 5 screws, one on each side.

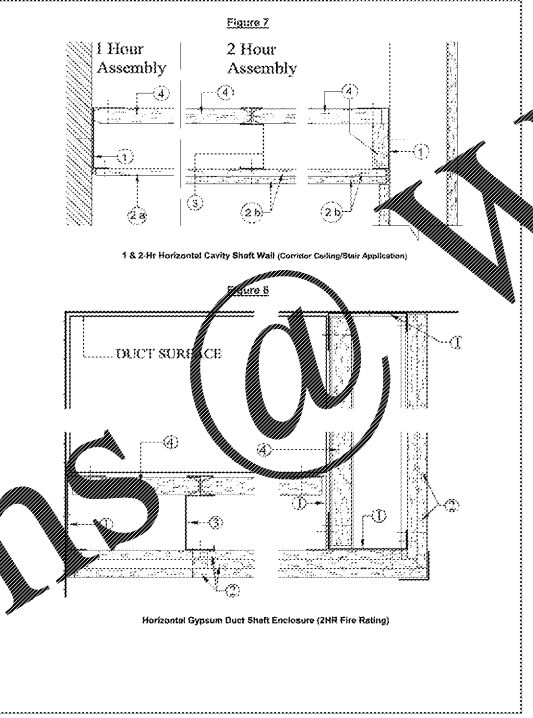
4. 1" thick SHEETROCK® Brand Gypsum Liner Panel - Friction-fitted in 1/4" portion of C-H studs.



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Table 1. Limiting Heights - Horizontal Shaft Wall (Ceiling Application), Applicable to Fig. 7 & 8

Table with 4 columns: Shaft Description, Allowable Deflection, 7.5psf design (ft.-in), 10psf design (ft.-in), 15psf design (ft.-in). Rows include 212CH25-18, 212CH20-34, 400CH25-18, 400CH20-34, 600CH20-34.

Table 2. Limiting Heights Vertical Shaft Walls, Applicable to Fig. 1

Table with 4 columns: Shaft Description, Allowable Deflection, 7.5psf design (ft.-in), 10psf design (ft.-in), 15psf design (ft.-in). Rows include 212CH25-18, 212CH20-34, 400CH25-18, 400CH20-34, 600CH20-34.

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Table 3. Limiting Heights - Vertical & Horizontal Shaft Walls, Applicable to Fig. 2, 3, 4 & 6

Table with 6 columns: Shaft Description, Allowable Deflection, 7.5psf design, 10psf design, 15psf design. Rows include 212CH25-18, 212CH20-34, 400CH25-18, 400CH20-34, 600CH20-34.

Table 4. Limiting Heights - Vertical Shaft Walls, Applicable to Fig. 1

Table with 6 columns: Shaft Description, Allowable Deflection, 7.5psf design, 10psf design, 15psf design. Rows include 212CH20-34, 400CH25-18, 400CH20-34, 600CH20-34.

General Product Usage and Limitations: 1. These products shall be installed in accordance with ASTM C 840 Standard Specification for Application and Finishing of Gypsum Board... 2. The USG Sheetrock® Brand Cavity Shaft Wall system is designed to enclose stairwells, elevator shafts, mechanical components and other vertical shafts.

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Product Documentation: Drywall Shaft Partition System Product Installation Guidelines SA928 (Rev 10/07) Assembly Evaluation Service Agreement between Progressive Engineering Inc. and USG Company... Test report No. R1319, Project 04N0267 - Shaft Wall Assembly With Horizontal Placement of Studs and Gypsum Liner Panels - Dated 3/02/2004.

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