For Evaluation Report Questions
usg4you@usg.com
USG Support: 800.USG4YOU

USG Contact: Manny Hurtado, Building Codes Manager
Phone: 847-970-5179
Email: mhurtado@usg.com

Report Owner
United States Gypsum Company
550 West Adams Street
Chicago, IL 60661

Product
USG Shaft & Stair Wall Systems

Assemblies Evaluated For
1. Non Axial Load Bearing Wall
2. Transverse Load Capacity
3. Fire Resistance
4. Abuse Resistance

Code Compliance

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Section 403.2.3</td>
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<tr>
<td>Section 703.2</td>
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<tr>
<td>Section 703.2.1</td>
</tr>
<tr>
<td>Section 707.3.1</td>
</tr>
</tbody>
</table>

1. USG Shaft & Stair Walls Systems meet the requirements of 1-hour, 2-hour, and 3-hour fire resistive rated assemblies when tested in accordance with ASTM E119 and constructed in accordance with the requirements of the applicable UL Design Number (or equivalent).

2. Meets the requirements for structural integrity of exit enclosures and elevator hoist way enclosures for High-Rise Buildings (Section 403.2.3. of the 2012, 2015 and 2018 IBC) when installed in accordance with the abuse resistant assemblies listed on page two (2) of this Assembly Evaluation Report (AER). Approved abuse resistant assemblies have been tested in accordance with ASTM C1629.

Component Descriptions
USG Shaft & Stair Wall Systems are generally constructed with the following components.

1. J-Runners

The metal framing members used in construction of USG Shaft & Stair Wall Systems are manufactured from cold roll-formed light gauge galvanized steel conforming to ASTM A653 SS Grade 33 for 24ga. minimum thickness and ASTM A653 SS Grade 40 for 20ga minimum thickness. The galvanization coating shall be a G40 minimum. The available sizes are 2-1/2-in, 4-in and 6-in deep and a length of 16-ft in 24 or 20 gauge. Position steel J-runners at floor and ceiling with the 1-in leg towards the finished side of the wall. Securely attach the runners to the structure supports with power actuated fasteners.

For attachment to steel framed construction install floor and ceiling J-runners and End wall J-Runners or E-Studs, on columns and beams before the steel is fireproofed, except where Z-Clips are used as in UL Design HW-D-0609.

2. Steel Studs

USG Steel C-H and E Studs are manufactured from cold roll-formed light gauge steel conforming to ASTM A653 SS Grade 33 for 25ga thickness and ASTM A653 SS Grade 40 for 20ga minimum thickness. The galvanization coating shall be a G40 minimum. The available sizes are 2-1/2-in, 4-in and 6-in deep and a length of 16-ft in 25 or 20 gauge.

Cut the C-H Studs 3/8-in to 5/8-in shorter than the floor-to-ceiling height. Install C-H Studs interlocked between the SHEETROCK® Brand Gypsum Liner Panels with the liner panels securely engaged. The C-H Studs must have current product evaluation report for the USG Shaft &Stair Wall Systems.

Terminations: Install full length steel E-Studs or J-Runners vertically at T-Intersections, corners, door jambs and columns. Openings: Frame with vertical E-Stud or J-Runner at vertical edges, horizontal J-runner at head or sill. Control Joints: Install full length steel E-Stud or J-Runner at edges of control joints, to fully support gypsum panels. C-H Studs: Based on stud size shown in Table 1 and Figure 7 of this AER.
3. Gypsum Liner Panels

**Component Descriptions Continued**

**SHEETROCK® Brand Gypsum Liner Panels** a high performance panel that is composed of a non-combustible gypsum core encased in a water resistant 100% recycled **green** face and back paper. Gypsum Liner Panels are a nominal thickness of 1-in x 24-in wide x 8-ft -- 14-ft long. Must meet the minimum requirements of ASTM C1396.

**Alternatives for UL Fire Resistance:**

**SHEETROCK Brand Mold Tough™ Gypsum Liner Panels** feature a non-combustible, moisture- and mold-resistant gypsum core encased in moisture and mold-resistant, 100% recycled **blue** face and back papers. Available 1-in thick, 24-in wide and in lengths up to 14-ft. Must meet the minimum requirements of ASTM C1396.

**SHEETROCK Brand Glass-Mat Liner Panel** have a noncombustible, moisture- and mold-resistant gypsum core that is encased in moisture- and mold-resistant glass mat. Available 1-in thick, 24-in wide, and lengths up to 14-ft. Must meet the minimum requirements of ASTM C1658.

**Note:** All of these panels should be cut 1-in shorter than the floor-to-ceiling height, to allow for the panel to be fitted between the top and bottom J-runners. Where shaft wall height exceeds the length of the liner panel; it must be butted together with meeting factory end cuts. The joints should be staggered and positioned in the upper or lower 1/3 of the wall. Panels must be UL/ULC classified for fire resistance and identified as Type SLX on the UL marking and UL Fire Resistance Directory.

4. Gypsum Wallboard

**Component Descriptions Continued**

**SHEETROCK® Brand FIRECODE C Core Gypsum Panels** have been tested generate the shaft/stairwall limiting heights for wall assemblies shown in Figures 1, 2, 3, 4, and 5. Panels are available in 1/2-in and 5/8-in thicknesses, 48-in wide and lengths up to 14-ft. Product must be UL Classified for fire-rated construction (Type C) and meet the requirements of ASTM C1396.

**SHEETROCK® Brand FIRECODE Core Gypsum Panels (Type X)** have been tested generate the shaft/stairwall limiting heights for the wall assembly described by Figure 6. Panels are available 5/8-thick, 48-in or 54-in wide and lengths up to 14-ft. Product must be UL Classified for fire-rated construction (Type SCX) and meet the requirements of ASTM C1396.

**Alternatives for UL Fire Resistance and/or Abuse Resistance:**

**SHEETROCK Brand Mold Tough Gypsum Panels**, have a non-combustible, moisture- and mold-resistant gypsum core encased in moisture- and mold-resistant, 100 percent recycled **green** face and **brown** back paper. Available in FIRECODE and FIRECODE C core formulations in the same widths, thicknesses and lengths listed above. The panels have been tested for use in abuse resistant assemblies in accordance with ASTM C 1629, Class 2 Impact Rating (Soft Body), Class 1 Impact Rating (Hard Body). Product must be UL Classified for fire-rated construction (Type C or Type SCX) and meet the requirements of ASTM C1396.

**SHEETROCK® Brand Mold Tough VHI (Very High Impact) Abuse Resistant Gypsum Panels** have a non-combustible, moisture-resistant core encased in moisture- and mold-resistant, 100 percent recycled **green** face and **brown** back papers. A fiberglass reinforcing mesh is imbedded in the core adjacent to the back paper. Available in FIRECODE Core formulation in the same widths, thicknesses, and lengths listed above. The panels have been tested for use in abuse resistant assemblies in accordance with ASTM C 1629, Class 3 Impact Rating (Soft Body), Class 3 Impact Rating (Hard Body). Product must be UL Classified for fire-rated construction (Type AR) and meet the requirements of ASTM C1396.

**FIBEROCK® Brand AR (Abuse-Resistant) Interior Panels (Type X)** are high performance abuse resistant panels. Available panels are 5/8-in thick x 48-in wide and available in lengths up to 12-ft. The panels have been tested for use in abuse resistant assemblies in accordance with ASTM C 1629, Class 3 Impact Rating (Soft Body) and Class 2 Impact Rating (Hard Body) . Product must be UL Classified for fire-rated construction (Type FRX-G) and meet the requirements of ASTM C1278 as well as ASTM C473.

**Tested Abuse Resistant Assemblies:**

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

1. A minimum 2-1/2-in wide 24 gauge floor and ceiling J-runners, attached to structure as described above.
2. Apply one (1) layer, 5/8-in thick SHEETROCK Brand FIRECODE C Core Gypsum Panels (Type C), installed vertically with 1-in long Type S screws spaced 12-in o.c. in field and at edges for vertical application, and 8-in o.c. for horizontal application.
3. A minimum 2-1/2-in deep USG C-H studs 25 gauge 24-in 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 then 16-ft tall. E-shaped studs may be used for closure panels at end of the walls or columns. (If J-runners are used at end walls, the gypsum liner is fastened at the ends with 1-5/8-in long Type S Screws 12-in o.c.)

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

1. A minimum 2-1/2-in wide 24 gauge floor and ceiling J-runners, attached to structure as described above.
2. Apply two (2) layers, 1/2-in thick SHEETROCK® Brand FIRECODE® C Core Gypsum Panels. Apply base layer with 1-in long Type S screws 24-in o.c. in field and at the edges for vertical application and 16-in o.c. for horizontal applications. Apply face layer C-H studs and J-runners with 1-5/8-in long Type S screws. Space the screws 12-in 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-in deep USG C-H studs 25 gauge, spaced 24-in 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 then 16-ft tall. E-shaped 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-in long Type S screws that are spaced 12-in o.c.).

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**Figure 1 - 1-HR Cavity Shaft Wall (Non-Load Bearing)**

**Figure 2 - 2-HR Cavity Shaft Wall (Non-Load Bearing)**
**Two-Hour Cavity Stair Wall (Non-Load Bearing), See Figure 3**
1. A minimum 2-1/2-in deep, 24 gauge floor and ceiling J-runners, attached to the structure as described.
2. Apply one (1) layer of 1/2-in SHEETROCK® Brand FIRECODE® Gypsum Panels (Type C) to each side of the C-H stud. Attach the C-H stud with 1-in long Type S screws 12-in o.c. in the field and at the edges for a vertical application and 8-in o.c. center for a horizontal application.
3. A minimum of 2-1/2-in deep USG C-H studs 25 gauge, spaced 24-in o.c., with the H-section of the C-H stud towards the shaft side of the assembly, if the Shaft Wall is less than 16-ft tall. Screw attachment is not required to affix the stud to the runner, if Shaft Wall is less then 16-ft tall. E-shaped 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-in long Type S screws that are 12-in o.c.).

**Three-Hour Cavity Shaft Wall (Non-Load Bearing), See Figure 4**
1. A minimum 2-1/2-in deep 24 gauge floor and ceiling J-runners, attached to the structure as described in the Figure 4.
2. Apply three (3) layers of 5/8-in 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-in long Type S screw placed 24-in o.c. in the field and at the edges when applied vertically, for horizontal applications the screws shall be spaced 16-in o.c. The second layer shall be applied with 1-5/8-in long Type S screws spaced 24-in o.c. when applied vertically or spaced 16-in o.c. when the applied horizontally. The Face layer shall be applied with 2-1/4-in long Type S screws that are spaced 16-in o.c. when the board is applied vertically, and spaced 12-in o.c. when the board is applied horizontally. All joints must be staggered a minimum of 24-in o.c. from the adjacent layers, where screws are offset a minimum of 6-in from the layer below.
3. A minimum 2-1/2-in USG C-H studs 25 gauge that are spaced 24-in 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 then 16-ft tall. E-shaped studs may be used for closure panels at the end of walls or columns. (If J-runners are used at the end walls, the gypsum liner needs to be fastened at the ends with 1-5/8-in Type S screws spaced 12-in o.c.)
Three-Hour Cavity Stair Wall (Non-Load Bearing), See Figure 5
1. A minimum 2-1/2-in deep 24 gauge floor and ceiling J-runners attached to the structure as described above.
2. Apply two (2) layers of 5/8-in 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-in long Type S screw spaced 24-in o.c. in the field and at the edges. For vertical applications the gypsum panels need to be spaced 16-in o.c. and for horizontal applications they need to be spaced at 16-in o.c.
3. A minimum 2-1/2-in deep USG C-H Stud 25 gauge spaced 24-in 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 then 16-ft tall. E-shaped studs may be used for closure panels at the end of the walls or columns. (If J-runners are used at end walls, the gypsum liner should be fastened at the ends with a 1-5/8-in long Type S screw, spaced 12-in o.c.)

Two-Hour Horizontal Stud Shaft Wall Assembly (Non-Load Bearing), See Figure 6
1. A minimum 4-in deep 20 gauge J-runner to be installed vertically, on the ends of the wall.
2. Apply two (2) layers of 5/8-in thick SHEETROCK® Brand FIRECODE® Core Gypsum Panels (Type X) vertically or horizontally to the room side of the C-H stud, with 1-in long Type S screws spaced 12-in o.c. in the field and at the edges for the BASE layer. The FACE layer shall be installed with 1-5/8-in long Type S screws spaced 8-in o.c. All joints must be staggered a minimum of 24-in from the adjacent layers.
3. A minimum 4-in deep USG C-H stud or E Studs 20 gauge, are to be installed horizontally between the J-runners. The H-section of the C-H stud faces the shaft. C-H Studs should be attached to vertical J-runners with Type S fasteners.
5. Horizontal Stud Wall Assembly - The wall width is limited to the length of the Gypsum Liner Panel.
### Table 1 - Nominal C-H Stud Dimensions (inches)

<table>
<thead>
<tr>
<th>Stud Designation</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
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<tbody>
<tr>
<td>212CH25-18</td>
<td>2 1/2</td>
<td>1</td>
<td>3/8</td>
<td>1 29/64</td>
<td>31/32</td>
<td>7/32 25ga</td>
</tr>
<tr>
<td>212CH20-34</td>
<td>2 1/2</td>
<td>1</td>
<td>3/8</td>
<td>1 29/64</td>
<td>31/32</td>
<td>7/32 20ga</td>
</tr>
<tr>
<td>400CH25-18</td>
<td>4</td>
<td>1</td>
<td>3/8</td>
<td>1 29/64</td>
<td>31/32</td>
<td>7/32 25ga</td>
</tr>
<tr>
<td>400CH20-34</td>
<td>4</td>
<td>1</td>
<td>3/8</td>
<td>1 29/64</td>
<td>31/32</td>
<td>7/32 20ga</td>
</tr>
<tr>
<td>600CH20-34</td>
<td>6</td>
<td>1</td>
<td>3/8</td>
<td>1 29/64</td>
<td>31/32</td>
<td>7/32 20ga</td>
</tr>
</tbody>
</table>

**Notes:**
1. Refer to Figure 7 for location of tabulated dimensions.
2. Dimension "F" refers to the minimum steel thickness and is shown as the minimum nominal gauge thickness of the material allowable.

### Table 2 - Limiting Heights Vertical Shaft Walls

<table>
<thead>
<tr>
<th>Stud Designation</th>
<th>Allowable Deflection</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5psf design (ft - in)</td>
</tr>
<tr>
<td>212CH25-18</td>
<td>L/120 13 10 9 4 7 0 4 8</td>
</tr>
<tr>
<td>212CH20-34</td>
<td>L/120 16 0 14 0 12 9 11 1</td>
</tr>
<tr>
<td>400CH25-18</td>
<td>L/120 10 6 7 0 5 3 3 6</td>
</tr>
<tr>
<td>400CH20-34</td>
<td>L/120 22 3 19 5 17 8 14 3</td>
</tr>
<tr>
<td>600CH20-34</td>
<td>L/120 30 11 21 5 16 1 10 8</td>
</tr>
</tbody>
</table>

**Notes:**
1. See Figure 1 for vertical stud installation details within shaft/stair wall.
2. Tabulated limiting heights are based upon the tested composite behavior of the 1 hour wall assemblies described in this AER only. Alternative designs are outside the scope of this AER.
Table 3 - Limiting Heights - Shaft Walls with Vertical & Horizontal Stud Orientation

<table>
<thead>
<tr>
<th>Stud Description</th>
<th>Allowable Deflection</th>
<th>2-hr Stair Wall</th>
<th>2-hr Shaft Wall</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5psf design (ft - in)</td>
<td>7.5psf design (ft - in)</td>
<td>10psf design (ft - in)</td>
</tr>
<tr>
<td>L/120</td>
<td>14 4 12 6 10 5 6 11</td>
<td>14 6 12 8 10 5 6 11</td>
<td>12 3 10 4 9 3 7 10</td>
</tr>
<tr>
<td>L/240</td>
<td>11 4 9 11 9 0 6 11</td>
<td>11 6 10 0 9 1 6 11</td>
<td>13 6 11 10 10 9 9 4</td>
</tr>
<tr>
<td>L/360</td>
<td>12 3 10 4 9 3 7 10</td>
<td>11 6 10 0 9 1 6 11</td>
<td>13 6 11 10 10 9 9 4</td>
</tr>
</tbody>
</table>

Notes:
1. See Figure 2 and 3 for vertical stud installation details within shaft/stair wall.
2. See Figure 6 for horizontal stud installation details within shaft/stair wall. The horizontal wall width is limited to the length of the Gypsum Liner Panel and only 400CH20-34 and 600CH20-34 steel studs are permitted for horizontal stud installations.
3. Tabulated limiting heights are based upon the tested composite behavior of the 2 hour wall assemblies described in this AER only. Alternative designs are outside the scope of this AER.

Table 4 - Limiting Heights Vertical Shaft Walls - Applicable to Fig. 4 & 5

<table>
<thead>
<tr>
<th>Stud Description</th>
<th>Allowable Deflection</th>
<th>3-hr Stair Wall</th>
<th>3-hr Shaft Wall</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5psf design (ft - in)</td>
<td>7.5psf design (ft - in)</td>
<td>10psf design (ft - in)</td>
</tr>
<tr>
<td>L/120</td>
<td>14 4 12 6 10 5 6 11</td>
<td>14 6 12 8 10 5 6 11</td>
<td>12 3 10 4 9 3 7 10</td>
</tr>
<tr>
<td>L/240</td>
<td>11 4 9 11 9 0 6 11</td>
<td>11 6 10 0 9 1 6 11</td>
<td>13 6 11 10 10 9 9 4</td>
</tr>
<tr>
<td>L/360</td>
<td>12 3 10 4 9 3 7 10</td>
<td>11 6 10 0 9 1 6 11</td>
<td>13 6 11 10 10 9 9 4</td>
</tr>
</tbody>
</table>

Notes:
1. See Figure 4 and 5 for vertical stud installation details within shaft/stair wall.
2. Tabulated limiting heights are based upon the tested composite behavior of the 3 hour wall assemblies described in this AER only. Alternative designs are outside the scope of this AER.
One Hour Corridor Ceiling or Underside Stair Applications, See Figure 8

1. A minimum 2-1/2-in deep 24 gauge J-runner attached horizontally to perimeter or boundary walls with a power actuated fasteners.

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

3. Install the C-H studs perpendicular to the J-runner spaced 24-in 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-in long Type S-12 screws, one on each side.


5. Ripper Board:
   a. Where the liner panel (item 4) is cut short to be installed, gaps must be filled by using a strip of 1-in thick SHEETROCK Brand Gypsum Liner Panel.
   b. As an alternative you can use mineral fiber insulation to prevent exposure to the top leg of the J-runner that forms the ceiling.
   c. Where the wall section extends above the corridor ceiling, above corridor height a rip of board must be used to cap the opening between studs and a strip of mineral fiber insulation as described in item 6 must be used.

6. In order to prevent the passage of heat and gases, a 12-in long strip of mineral fiber insulation must be used to fill in the stud cavity of the walls.

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**1-Hour Exit Corridor Ceiling and Stair Soffits**

<table>
<thead>
<tr>
<th>Single layer 5/8-in gypsum panels</th>
<th>Maximum Span</th>
</tr>
</thead>
<tbody>
<tr>
<td>212CH25-18&lt;sup&gt;-2x&lt;/sup&gt;</td>
<td>8-ft - 6-in</td>
</tr>
<tr>
<td>212CH20-34&lt;sup&gt;-3x&lt;/sup&gt;</td>
<td>10-ft - 4-in</td>
</tr>
<tr>
<td>400CH25-18&lt;sup&gt;-2x&lt;/sup&gt;</td>
<td>9-ft - 3-in</td>
</tr>
<tr>
<td>400CH20-34&lt;sup&gt;-3x&lt;/sup&gt;</td>
<td>14-ft - 11-in</td>
</tr>
<tr>
<td>600CH20-34&lt;sup&gt;-3x&lt;/sup&gt;</td>
<td>20-ft - 10-in</td>
</tr>
</tbody>
</table>

**Notes:**
1. Based on L/240 allowable deflection with studs at 24-in o.c. and JR24 runner.
2. J-Runner connection to wall/building must meet or exceed 189-lbs capacity at every stud location (24-in o.c.).
3. J-Runner connection to wall/building must meet or exceed 386-lbs capacity at every stud location (24-in o.c.).
Two Hour Corridor Ceiling or Underside Stair Applications, See Figure 9

1. A minimum 2-1/2-in deep 24 gauge J-runner attached horizontally to perimeter or boundary walls with a power actuated fasteners.
2. Gypsum Wall Board:
   a. For a two (2) hour assembly: Attached two (2) layers of minimum 1/2-in 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-in long Type S screw that is spaced 24-in o.c. along the perimeter and the edges. The FACE layer should be applied with a 1-5/8-in long Type S screw that is spaced 12-in o.c. in the field and perimeter. All joints must be staggered a minimum of 24-in o.c. from the adjacent layer.
3. Install the C-H studs perpendicular to the J-runner spaced 24-in 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-in long Type S-12 screws, one on each side.
5. Ripper Board:
   a. Where the liner panel (item 4) is cut short to be installed, gaps must be filled by using a strip of 1-in thick SHEETROCK Brand Gypsum Liner Panel.
   b. As an alternative you can use mineral fiber insulation to prevent exposure to the top leg of the J-runner that forms the ceiling.
   c. Where the wall section extends above the corridor ceiling, above corridor height a rip of board must be used to cap the opening between studs and a strip of mineral fiber insulation as described in item 6 must be used.
6. In order to prevent the passage of heat and gases, a 12-in long strip of mineral fiber insulation must be used to fill in the stud cavity of the walls.

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<table>
<thead>
<tr>
<th>2-Hour Exit Corridor Ceiling and Stair Soffits&lt;sup&gt;1&lt;/sup&gt;</th>
<th>Double layer 1/2-in gypsum panels</th>
<th>Maximum Span</th>
</tr>
</thead>
<tbody>
<tr>
<td>212CH25-18&lt;sup&gt;2&lt;/sup&gt;</td>
<td>7-ft - 10-in</td>
<td></td>
</tr>
<tr>
<td>212CH20-34&lt;sup&gt;3&lt;/sup&gt;</td>
<td>9-ft - 8-in</td>
<td></td>
</tr>
<tr>
<td>400CH25-18&lt;sup&gt;2&lt;/sup&gt;</td>
<td>7-ft - 7-in</td>
<td></td>
</tr>
<tr>
<td>400CH20-34&lt;sup&gt;3&lt;/sup&gt;</td>
<td>14-ft - 0-in</td>
<td></td>
</tr>
<tr>
<td>600CH20-34&lt;sup&gt;3&lt;/sup&gt;</td>
<td>19-ft - 7-in</td>
<td></td>
</tr>
</tbody>
</table>

Notes:
1. Based on L/240 allowable deflection with studs at 24-in o.c. and JR24 runner.
2. J-Runner connection to wall/building must meet or exceed 189-lbs capacity at every stud location (24-in o.c.).
3. J-Runner connection to wall/building must meet or exceed 386-lbs capacity at every stud location (24-in o.c.).
Two-Hour Horizontal Gypsum Duct Enclosure, See Figure 10

1. A minimum 2-1/2-in deep 24 gauge J-runners attached horizontally to the perimeter or boundary wall, with power actuated fasteners. Connection of the vertical C-H stud to the top J-runner and connection of the top J-runner to the structure shall be capable of carrying the weight of the duct enclosure and verified by a registered design professional.

2. Apply three (3) layers of 1/2-in (minimum) SHEETROCK® Brand FIRECODE® C Core Gypsum Panels to the underside "ceiling" side of the assembly. The base layer is attached with 1-in long Type S Screws that are spaced 24-in o.c. The second layer is attached with 1-5/8-in long Type S screws that are spaced 12-in o.c., with all the joints staggered 24in o.c. from the base layer. The face layer is attached perpendicular to the C-H Studs with 2-in long Type S screws that are spaced 12-in o.c. and the joints are staggered 24-in o.c. from the base layer.

3. Install the C-H studs perpendicular to the J-runners, spacing them 24-in 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 of 1/2-in long Type S-12 screws, one on each end.


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**Figure 10 - Two Hour Horizontal Duct Enclosure Assembly and Limiting Spans**
**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*, and in accordance with USG Product Literature.
2. The USG SHEETROCK® Brand Cavity Shaftwall system is designed to enclose stairwalls, elevator shafts, mechanical components and other vertical shafts.
3. For horizontal ceiling and ductwork applications, please see manufacturer’s product brochure *SA926 Shaft Wall Systems*.
4. Non-load bearing and limited to fire-resistance only. Structural and other requirements shall be in accordance with pertinent building code and manufacturer's requirements.

**Product Labeling**
Each assembled USG Drywall Shaft Partition System that is covered by this AER, must be marked with the following information:

**Gypsum Board & Liner Panels:**
1. USG Name
2. Product Name
3. Plant Identifier & Date Code
4. UL Classification (or equivalent) label for Firecode Resistance, surface burning characteristics and non-combustibility.

**Steel C-H Studs:**
1. Each bundle of steel studs contains a label with the steel gauge and yield strength.
2. Each stud is identified at a maximum spacing of 96-in with the manufacturer name, product code, minimum thickness, and yield strength.

**Tested to**
ASTM E330-97 - Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Differences, following procedure A. (Test Reports 2004-0329 B-L were based on this test method)

**Product Documentation**
An Assembly Evaluation Service Agreement between *Pei Evaluation Service*® and United States Gypsum Company
USG Drywall Shaft Partition System Product Installation Guidelines - SA926-USA-ENG - Revised: 2/2017
Various Test Reports, Opinion Letters, & Third Party Product Listings Used as Verification of Fire Resistance, Abuse Resistance, and Transverse Load Capacity.
Various Engineering Calculations for Limiting Heights and Horizontal Spans.