1. SUBJECT:

H-Stud Fire Walls consisting of:

<table>
<thead>
<tr>
<th>UL PRODUCT DESIGNATION</th>
<th>Product Name</th>
<th>Thickness (in.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSW</td>
<td>Gold Bond® Fire-Shield® Shaftliner</td>
<td>1</td>
</tr>
<tr>
<td>FSW</td>
<td>Gold Bond® Fire-Shield® Shaftliner XP</td>
<td>1</td>
</tr>
<tr>
<td>FSW, FSW-7</td>
<td>Gold Bond® Fire-Shield® eXP Shaftliner</td>
<td>1</td>
</tr>
<tr>
<td>FSW</td>
<td>Gold Bond® Fire-Shield®</td>
<td>5/8</td>
</tr>
<tr>
<td>FSW, FSW-3</td>
<td>Gold Bond XP Fire-Shield® Wall Board</td>
<td>5/8</td>
</tr>
<tr>
<td>FSW-C</td>
<td>Gold Bond® Fire-Shield® C Wallboard</td>
<td>1/2</td>
</tr>
</tbody>
</table>
2. SCOPE OF EVALUATION

Compliance with the following codes:


The products were evaluated for the following properties:

- Fire-resistance-rated construction
- Sound Transmission
- Physical properties
- Structural
- Surface Burning Characteristics
- Noncombustibility

3. REFERENCED DOCUMENTS

- ANSI/UL263 14th Ed (ASTM E119), Fire Tests of Building Construction and Materials
- ANSI/UL723, 10th Ed (ASTM E84), Test for Surface Burning Characteristics of Building Materials
- ASTM E72-80, Standard Methods of Conducting Strength Tests of Panels for Building Construction
- ASTM E136-12, Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C.
- ASTM C1396-13, Standard Specification for Gypsum Board
- ASTM C1658-12, Standard Specification for Glass Mat Gypsum Panels
- AC10, Acceptance Criteria for Quality Documentation, dated June 2014

4. USES

H-stud walls are non-load or load bearing fire wall assemblies of gypsum panels and steel studs designed for use as fire walls having a fire resistance rating of 2 hours. Fire walls may also be referred to as party walls and/or area separation walls. H-stud walls have been evaluated as a fire wall, as referenced in 2006 IBC Section 702.1, 2009 IBC Section 702.1, 2012 IBC Section 202, and IBC 2015 Section 202. H-stud walls are also evaluated as a party wall as referenced in IBC 2006 Section 705.1.1, 2009 IBC Section 706.1.1, 2012 IBC Section 706.1.1, and 2015 IBC Section 706.1.1. H-studs are referenced as “common” walls in 2009 IRC Section R302.2, 2012 IRC Section R302.2, and 2015 IRC Section R302.2.

When constructing the H-Stud walls, full sheets, battens, or a 3/4 in. (19 mm) air space shall be installed between the assembly and adjacent solid construction to separate the assembly from any adjacent framing members. See Figures 1 and 2.

In addition, aluminum clips are incorporated into the assembly to act as a fusible link between the assembly and both sides of adjacent framing members. Aluminum angle clips, having a melting point of 1220°F, are used to attach the H-Stud to both sides of adjacent framing members. When the fire wall is subjected to high temperatures, the clips on one side of the assembly will melt and break away, allowing distortion of the framing members on the fire side without jeopardizing the performance of the fire wall itself.

The H-Stud Fire Wall assemblies, with full sheets of Gold Bond® Brand Fire-Shield C gypsum wallboard attached to either side, are acceptable for installation where floor-to-ceiling heights do not exceed 12 ft. 11 in. and will withstand a transverse 5 psf load without exceeding I/240 allowable deflection as indicated in 2006 IBC Section 1607.13 and Table 1604.3, 2009 IBC Section 1607.13 and Table 1604.3, 2012 IBC Section 1607.14 and Table 1604.3, and 2015 IBC Section 1607.14 and Table 1604.3, respectively. When 1/2 in. (12.7 mm) strips of Gold Bond® Fire Shield C gypsum board are utilized as battens, or a minimum 3/4 in. (19 mm) air separation is
maintained, the H-Stud wall is suitable for installation where floor-to-ceiling heights do not exceed 11 ft. 9 in. under a 5 psf transverse load without exceeding I/240 allowable deflection. See Figure 3.

Openings adjacent to the fire wall at floor and ceiling levels and at terminations with the roof deck or exterior walls shall be protected as described in 2006 IBC Section 713, 2009 IBC Section 714, 2012 IBC Section 715, and 2015 IBC Section 715.

Fire blocking shall be provided at floor intersections as described in Figure 4.

H-stud Fire/Party wall projections through roof decks or exterior walls shall be covered by noncombustible flashing that will resist corrosion and galvanic action. The flashing shall be designed to have the ability to slip to allow for expansion or movement due to fire. See Figures 5 and 6. For firewall terminations at exterior roof and wall sheathing, see Figures 7 and 8. The constructions described in Figures 4, 5, 6, 7 and 8 are in accordance with the fireblocking requirements specified in 2006 IBC Section 717.2, 2009 IBC Section 717.2, 2012 IBC Section 718.2, and 2015 IBC Section 718.2.

Penetrations into or through a fire wall shall comply with the specifications of 2006 IBC Section 712, 2009 IBC Section 713, 2012 IBC Section 714, and 2015 IBC Section 714.

5. PRODUCT DESCRIPTION

5.1 General:

Gold Bond® Fire-Shield®, Gold Bond® XP Fire-Shield® Wall Board, and Gold Bond Fire-Shield C Wallboard consist of a gypsum plaster core with either a paper facer or glass mat facer bonded to each face, with the face (finish) side and the back side being various colors.

Gold Bond® Fire-Shield® Shaftliner, Gold Bond® Fire-Shield® Shaftliner XP and Gold Bond® Fire-Shield® Shaftliner eXP consist of a gypsum plaster core with a glass mat facer bonded to each face, with the face (finish) side and the back side being various colors.

The gypsum boards described in this report Board are recognized as a Class A finish material with a flame spread index of 25 or less and smoke-developed index of 450 or less, when tested in accordance with UL723 (ASTM E84) as set forth in Section 803.1.1 of the 2006, 2009, 2012, or 2015 IBC. These boards, having a noncombustible core of gypsum complying with ASTM E136, are considered a noncombustible material, as described in Section 703.5.2 of the 2015 and 2012 IBC or Section 703.4.2 of the 2009 IBC.

For the purpose of this report, the trade name or UL product designation, as shown in Table 1 for any of the products may be used.

Table 1

<table>
<thead>
<tr>
<th>UL PRODUCT DESIGNATION</th>
<th>TRADENAME</th>
<th>THICKNESS, inches</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSW</td>
<td>Gold Bond® Fire-Shield® Shaftliner</td>
<td>1</td>
</tr>
<tr>
<td>FSW</td>
<td>Gold Bond® Fire-Shield® Shaftliner XP</td>
<td>1</td>
</tr>
<tr>
<td>FSW, FSW-7</td>
<td>Gold Bond® Fire-Shield® eXP Shaftliner</td>
<td>1</td>
</tr>
<tr>
<td>FSW</td>
<td>Gold Bond® Fire-Shield®</td>
<td>5/8</td>
</tr>
<tr>
<td>FSW, FSW-3</td>
<td>Gold Bond® XP Fire-Shield® Wall Board</td>
<td>5/8</td>
</tr>
<tr>
<td>FSW-C</td>
<td>Gold Bond Fire-Shield C Wallboard</td>
<td>1/2</td>
</tr>
</tbody>
</table>
6. INSTALLATION

6.1 General:

The manufacturers published installation instructions and this report must be strictly adhered to, and a copy of the instructions must be available at all times on the jobsite during installation.

6.2 UL Fire-Resistance-Rated Assemblies:

The assembly described in this section is also described in UL’s Fire Resistance Online Certification Directory as UL design U347. UL fire resistance ratings are only applicable when the assemblies are constructed in accordance with the published design. Refer to Figures 9 through 9C for basic configuration details. Refer to Online Certification Directory for specific design details.

6.2.1 Two-Hour Fire Wall – UL 263 (ASTM E119) – UL Design U347

The construction providing separation between two compartments consists of No. 25 MSG H-shaped galvanized steel studs with two layers of UL Classified 1 in. Gold Bond® Fire-Shield® Shaftliner, 1 in. Gold Bond® Fire-Shield® Shaftliner XP, or 1 in. Gold Bond® Fire-Shield® eXP Shaftliner installed vertically and friction fit into the H-studs. The nominal 2 in. (51 mm) wide channel-shaped steel track is installed along floor, sidewall or top of wall using suitable fasteners spaced a maximum of 24 in. (610 mm) OC.

The interior facing wall is constructed with one layer of minimum 1/2 in. gypsum board attached to either No. 20 MSG steel studs with 1 in. long type S steel screws spaced 12 in. OC, or to nominal 2 in. by 4 in. wood studs with 1-1/4 in. long steel drywall screws spaced 12 in. OC. Steel studs are attached to floor and ceiling tracks with 1/2 in. long type S-12 screws on both sides of the studs or by welded or bolted connections in accordance with AISI specifications with maximum spacing 24 in. OC. Floor and ceiling tracks are min. No. 20 MSG or No. 20 GSG galvanized or primed steel. Steel or wood studs are braced at mid-height where necessary for clip attachment.

As an alternate to the minimum 1/2 in. (12.7 mm) thick gypsum board, a minimum 1/2 in. thick plywood or OSB facing may be applied either horizontally or vertically to wood or steel studs with nails or screws spaced 12 in. OC. Alternately, UL Classified (BZJZ) glass fiber or mineral wool insulation, min. 3-1/2 in. thick, may be used in place of minimum 1/2 in. (12.7 mm) thick gypsum board, and placed to completely fill the wood or steel stud cavities. When using this option, the maximum wall height is 54 ft., and the aluminum clips shall be spaced a maximum 5 ft. OC vertically.

In lieu of minimum 1/2 in. Type Gold Bond® gypsum board, minimum 5/8 in. thick, minimum 6 in. wide batten strips formed from type FSW or FSW-3 gypsum board may be applied on both sides of steel studs and horizontal back to back steel track. Minimum 5/8 in. thick, minimum 3 in. wide batten strips formed from type FSW or FSW-3 gypsum board may be applied on both sides of single steel track at perimeter of assembly. Batten strips secured to studs with 1-1/4 in. long Type S steel screws spaced 12 in. OC. Batten joints shall be butted tight to form a closed joint. As an option, entire sheet of gypsum board may be used in lieu of the battens.

Aluminum clips (angles) are secured through holes provided in the clips to H-studs with 3/8 in. long type S screws, and to wood framing or steel framing with 1-1/4 in. long screws. Clip placement for walls up to 23 ft. high is 10 ft. OC. For walls up to 54 ft. high, clips are placed 5 ft. OC up to 24 ft. from top of wall. Clips then spaced 10 ft. OC for upper 24 ft of wall. For walls up to 66 Ft. high, clips are placed 10 ft. OC 24 ft. down from top of wall, middle 30 ft of wall, clips are placed 5 ft. OC. Below 54 ft. from top of wall, clips are placed 39 in. OC vertically between wood or steel framing and H-studs.

Minimum 3/4 in. air space separation between steel framing area and wood or steel studs used to support interior facing wall.
6.2.1.1 Sound Transmission Class (STC)

The construction described in 6.2.1 has an STC rating of 61 when constructed as described above except:

- a) Wood studs are spaced 16 in. OC.
- b) Gypsum board is applied vertically and attached to studs with 1-1/4 in. long steel drywall screws spaced 16 in. OC. Joints and screw heads are covered with paper tape and joint compound.
- c) Aluminum clips are spaced a max. of 10 ft OC vertically.
- d) Wall cavities are friction fit with 3-1/2 in. thick fiberglass insulation batts, min. 0.80 pcf. See UL Fire Resistance Directory category Batts and Blankets (BZJZ) for names of UL Classified companies.
- e) Max. height of separation wall is 23 ft.
- f) The STC rating applies to Configuration B only (Figure 9A).
- g) Steel studs, plywood sheathing, OSB, or other specifications for Batts and Blankets are not evaluated as alternatives for obtaining STC rating.

7. CONDITIONS OF USE

7.1 General:

The gypsum boards described in this report, comply with, or are suitable alternatives to what is specified in, those codes listed in section 2.0 of this report, subject to the following conditions:

7.2 The products must be manufactured, identified, and installed in accordance with this report, the manufacturer's published installation instructions, and the applicable code. If there is a conflict between the manufacturers published installation instructions and this report, this report governs.

7.3 All UL fire resistive assemblies shall be built in accordance with the applicable published UL design(s). See UL Online Certifications Directory under File R3501 for products evaluated as a part of fire-resistance-rated assemblies in accordance with UL263, Gypsum Board (CKNX).

7.4 A minimum 3/4 in. (19 mm) air space shall be established between the 2 hour rated H-Stud assembly and adjacent solid construction.

7.5 Penetrations through the H-Stud Fire/Party Wall shall be protected in accordance with the appropriate provisions of 2006 IBC Section 705.2, 2009 IBC Section 706.2, 2012 IBC Section 706.2, and 2015 IBC Section 706.2 which requires the H-Stud Fire/Party Wall to have sufficient structural stability under fire conditions to allow collapse of construction on either side without collapse of the fire/party wall.

7.6 H-Stud firewalls have not been evaluated for in-plane and lateral loads caused by wind or seismic conditions, or for use as an exterior wall.

7.7 The maximum height of the wall shall be 66 feet (20.1 m).
8. MANUFACTURING LOCATIONS

The gypsum boards described in this report are manufactured by National Gypsum Company, located at the manufacturing locations named below, under the UL LLC Classification and Follow-Up Service Program, which includes inspections in accordance with the quality elements of ICC-ES Acceptance Criteria for Quality Documentation, AC10.

Manufacturing locations:
Gibsonston, FL
Burlington, NJ
Baltimore, MD
Ft. Dodge, IA
Medicine Lodge, KS
Long Beach, CA
Mt. Holly, NC
National City, MI
Phoenix, AZ
Portsmouth, NH
Richmond, CA
Rotan, TX
Garden City, GA
Shippingport, PA
Shoals, IN
Waukegan, IL
Westwego, LA

9. SUPPORTING EVIDENCE

9.1 Manufacturer’s product literature and quality documentation.

9.2 UL Classification reports in accordance with UL263 (ASTM E119). See UL Product Certification Category for Gypsum Board (CKNX).

9.3 UL Classification reports in accordance with UL723 (ASTM E84). See Product Certification Category for Gypsum Board (BWFR).

9.4 UL adjunct Classification reports in accordance with ASTM E90.

9.5 Reports in accordance with ASTM C1396 and C1658.

9.6 Reports in accordance with ASTM E136.

9.7 Reports in accordance with ASTM E72.

10. IDENTIFICATION

The gypsum board products described in this report are identified by a marking bearing the report holder’s name (National Gypsum Company), the plant identification, the product designation, and the UL Classification Mark. Gold Bond Shaftliner products are also identified with the evaluation report number UL ER3501-01. The validity of the evaluation report is contingent upon this identification appearing on the product or UL Classification Mark certificate.
11. USE OF UL EVALUATION REPORT

11.1 The approval of building products, materials or systems is under the responsibility of the applicable authorities having jurisdiction.

11.2 UL Evaluation Reports shall not be used in any manner that implies an endorsement of the product, material or system by UL.

10.3 The current status of this report, as well as a complete directory of UL Evaluation Reports may be found at UL.com via our Online Certifications Directory: [www.ul.com/erdirectory](http://www.ul.com/erdirectory).
FIGURE 1 – TYPICAL WALL CROSS SECTION

FIGURE 2 – TYPICAL FOUNDATION DETAIL
FIGURE 3 –
COMPONENTS OF 2-HR FIRE-RESISTANCE RATED
H-STUD FIRE WALL/PARTY WALL
(ALUMINUM CLIPS NOT SHOWN)
FIGURE 4 – FIRE BLOCKING AT FLOOR INTERSECTIONS
FIGURE 5 – PROJECTION AT ROOF
FIGURE 6 – PROJECTION AT EXTERIOR WALL
FIGURE 7 – TYPICAL ROOF JUNCTION DETAIL
FIGURE 8 – EXTERIOR WALL INTERSECTION

- 5/8" FIRE-SHIELD GYPSUM SHEATHING (OR AS REQUIRED BY LOCAL CODES)
- EXTERIOR FACING
- 2" H-STUD TRACK
- CAULK (SMOKETIGHT JOINT)
- 2" H-STUD FRAMING
- INTERIOR WALL FRAMING
- INTERIOR GYPSUM FACINGS AS SPECIFIED
- 1" FIRE-SHIELD SHAFTLINER
- 3/4" AIR SPACE
- 18" MINIMUM (OR AS REQUIRED BY LOCAL CODES)
- EXTERIOR WALL FRAMING
1. Steel track – 25 MSG galv. Steel

2. Steel Studs – H-shaped, No. 25 MSG galv. Steel

3. Gypsum Board – Two layers of 1 in. thick Shaftliner

4. Woods Studs – 2 in. by 4 in. studs spaced 24 in. OC

   4A. Steel Studs – Not shown - As an alternate to Item 4. No. 20 MSG steel

5. Gypsum Board – Min. 1/2 in. thick applied vertically or horizontally

   5A. Plywood Sheathing or OSB – Not shown – Min. 1/2 in. thick plywood or OSB applied vertically or horizontally to wood or steel studs.

   5B. Batts and Blankets – Not shown – As an alternate to item 5. Min. 3-1/2 in. thick glass fiber or mineral wool insulation placed to completely fill wall cavity.

   5C. Gypsum Board Battens – As an alternate to item 5. Min. 5/8 in. thick 6 in. wide batten strips applied on both sides of steel studs (item 2) and horizontal back to back steel track (item 1).

6. Aluminum Clips

7. STC Rating – Refer to Section 6.2.1.1 of this Report. Non-Bearing Wall Partition Intersection – (option, not shown).

8. Plywood Sheathing or OSB – Optional – Min. 1/2 in. thick applied vertically or horizontally to H-studs on area separation wall side of Figure 1 or Figure 3.
FIGURE 9A

1. Steel track – 25 MSG galv. Steel
2. Steel Studs – H-shaped, No. 25 MSG galv. Steel
3. Gypsum Board – Two layers of 1 in. thick Shaftliner
4. Woods Studs – 2 in. by 4 in. studs spaced 24 in. OC
   4A. Steel Studs – Not shown - As an alternate to Item 4. No. 20 MSG steel
5. Gypsum Board – Min. 1/2 in. thick applied vertically or horizontally
   5A. Plywood Sheathing or OSB – Not shown – Min. 1/2 in. thick plywood or OSB applied vertically or horizontally to wood or steel studs.
   5B. Batts and Blankets – Not shown – As an alternate to item 5. Min. 3-1/2 in. thick glass fiber or mineral wool insulation placed to completely fill wall cavity.
   5C. Gypsum Board Battens – As an alternate to item 5. Min. 5/8 in. thick 6 in. wide batten strips applied on both sides of steel studs (item 2) and horizontal back to back steel track (item 1).
6. Aluminum Clips
7. STC Rating – Refer to Section 6.2.1.1 of this Report.
8. Non-Bearing Wall Partition Intersection – (option, not shown).

FIGURE 9B
1. Steel track – 25 MSG galv. Steel

2. Steel Studs – H-shaped, No. 25 MSG galv. Steel

3. Gypsum Board – Two layers of 1 in. thick Shaftliner

4. Woods Studs – 2 in. by 4 in. studs spaced 24 in. OC
   4A. Steel Studs – Not shown - As an alternate to Item 4. No. 20 MSG steel

5. Gypsum Board – Min. 1/2 in. thick applied vertically or horizontally
   5A. Plywood Sheathing or OSB – Not shown – Min. 1/2 in. thick plywood or OSB applied vertically or horizontally to wood or steel studs.
   5B. Batts and Blankets – Not shown – As an alternate to item 5. Min. 3-1/2 in. thick glass fiber or mineral wool insulation placed to completely fill wall cavity.
   5C. Gypsum Board Battens – As an alternate to item 5. Min. 5/8 in. thick 6 in. wide batten strips applied on both sides of steel studs (item 2) and horizontal back to back steel track (item 1).

6. Aluminum Clips

7. STC Rating - Refer to Section 6.2.1.1 of this Report.

8. Non-Bearing Wall Partition Intersection – Optional – Maximum one non-bearing wall partition intersection per stud cavity. Non-bearing wall partition stud depth shall be at least equal to the depth of the wall.

9. Plywood Sheathing or OSB – Optional – Not shown - Min. 1/2 in. thick applied vertically or horizontally to H-studs on area separation wall side of Figure 1 or Figure 3.
1. Steel track – 25 MSG galv. Steel
2. Steel Studs – H-shaped, No. 25 MSG galv. Steel
3. Gypsum Board – Two layers of 1 in. thick Shaftliner
4. Woods Studs – 2 in. by 4 in. studs spaced 24 in. OC
   4A. Steel Studs – Not shown - As an alternate to Item 4. No. 20 MSG steel
5. Gypsum Board – Min. 1/2 in. thick applied vertically or horizontally
   5A. Plywood Sheathing or OSB – Not shown – Min. 1/2 in. thick plywood or OSB applied vertically or horizontally to wood or steel studs.
   5B. Batts and Blankets – Not shown – As an alternate to item 5. Min. 3-1/2 in. thick glass fiber or mineral wool insulation placed to completely fill wall cavity.
   5C. Gypsum Board Battens – As an alternate to item 5. Min. 5/8 in. thick 6 in. wide batten strips applied on both sides of steel studs (item 2) and horizontal back to back steel track (item 1).
6. Aluminum Clips.

STC Rating - Refer to Section 6.2.1.1 of this Report.

Non-Bearing Wall Partition Intersection – Optional – Maximum one non-bearing wall partition intersection per stud cavity. Non-bearing wall partition stud depth shall be at least equal to the depth of the wall.
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