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Legacy report on the BOCA® National Building Code/1990, the 1988 Standard Building Code® with 1989/1990 Revisions, the 1988 Uniform Building Code™ with 1990 Accumulative Supplement

DIVISION: 09—FINISHES

Section: 09260—Gypsum Board Assemblies

REPORT HOLDER:

USG CORPORATION
550 WEST ADAMS STREET
CHICAGO, ILLINOIS 60661

EVALUATION SUBJECT:

USG Drywall Shaft Partition Systems

1.0 SUBJECT

USG® Drywall Shaft Partition Systems

2.0 PROPERTY FOR WHICH EVALUATION IS SOUGHT

Fire Resistance

3.0 DESCRIPTION

CAVITY SHAFT WALL SYSTEMS

A. One-Hour Cavity Shaft Wall (Nonload-Bearing)

- 1. Two and one-half-inch-wide, minimum No. 25 gauge "J" floor and ceiling runners.
2. One-inch-thick SHEETROCK brand Gypsum Liner panels 24 inches wide - no screw attachment.
3. Minimum No. 25 gauge USG Steel C-H stud. Screws not required to attach stud to runner. E-shaped studs may be used for closure panels at end walls or columns. (If "J" runners are used at end walls, the gypsum liner is fastened at the ends with 1 5/8-inch Type S screws 12 inches on center.) The H-Section of C-H stud normally faces shaft.
4. A single ply 5/8-inch USG SHEETROCK FIRECODE® Type C gypsum panels installed vertically with 1 inch Type S screws 12 inches on center in field and at edges - 6 inches from top, bottom and ends. Joints and screw heads are finished with SHEETROCK Joint Tape and SHEETROCK Joint Compound on this ply, when required for decorative purposes.

B. Two-Hour Cavity Shaft Wall (Nonload-Bearing)

- 1. Two and one-half-inch-wide, minimum No. 25 gauge "J" floor and ceiling runner.
2. One-inch-thick SHEETROCK brand Gypsum Liner Panels 24 inches wide - no screw attachment.
3. Minimum No. 25 gauge USG Steel C-H stud. Screws not required to attach stud to runner. E-shaped studs are used for closure panels at end walls or columns, or in lieu of C-H studs. (If "J" runners are used at end walls, the gypsum liner is fastened at the ends with 1 5/8 inch Type S screws, 12 inches on center.) The H-Section of C-H stud normally faces shaft.
4. Gypsum panels attached as follows:
a. Base layer: 1/2-inch SHEETROCK FIRECODE® TYPE C or 5/8-inch SHEETROCK FIRECODE® Type X gypsum panels applied vertically with 1-inch Type S screws 24 inches on center in field and at edges.
b. Finish layer: 1/2-inch SHEETROCK FIRECODE® Type C or 5/8-inch SHEETROCK FIRECODE® Type X gypsum panels applied vertically or horizontally and attached with 1 5/8 inch Type S screws at 12 inches on center in field and at edges - 6 inches from top, bottom and ends. When applied vertically, the joints must be staggered with the joints in the base layer.
Joints and screw heads on outer layer only are finished with SHEETROCK Joint Tape and SHEETROCK Joint Compound when required for decorative purposes.
5. Fire Damper (optional) (not shown) - 1 1/2 hour curtain-type fire damper encased in a No. 22 gauge galvanized sleeve, installed in a 48 inches wide x 36 inches high opening framed with E-Studs and J-Runners. No. 16 gauge galvanized steel, 1 1/2 inches x 1 1/2 inches mounting angles are attached to the damper sleeve on the face layer side of the wall only around all 4 sides of the sleeve using 2 inch long No. 10 sheet screws 2 inches from each end and 6 inches o.c. The mounting angles must be installed such that

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an overlap of the wall of not less than 1 inch is maintained. The angles are secured to the framed opening with the same type of screws (2 screws on each side angle 3 inches from each end; 3 screws on each head and sill angle with 1 screw in the center and 1 at each end 3 inches from ends).

C. Two-Hour Cavity shaft Wall - Alternative (Nonload-Bearing)

1. Two and one-half-inch-wide, minimum No. 25 gauge "J" floor and ceiling runners.
2. One-inch-thick SHEETROCK brand Gypsum Liner Panels 24 inches wide - no screw attachment.
3. Minimum No. 25 gauge USG STEEL C-H stud. Screws not required to attach stud to runner. E-shaped studs are used for closure panels at end walls or columns, or in lieu of C-H stud. (If "J" runners are used at end walls, the gypsum liner is fastened at the ends with $1\frac{5}{8}$ inch Type S screws, 12 inches on center.) The H-Section of C-H stud normally faces shaft.
4. One-half-inch USG SHEETROCK FIRECODE® Type C or $\frac{5}{8}$ -inch SHEETROCK FIRECODE® Type X gypsum panels applied vertically and attached with 1-inch type S screws at 12 inches on center in field and at edges - 6 inches from top, bottom and ends. Joints and screw heads are finished with SHEETROCK Joint Tape and SHEETROCK Joint Compound on outer layer only, when required for decorative purposes. Vertical joint must be staggered on opposite sides of the walls.

D. Two-Hour Cavity Shaft Sound Wall (Nonload-Bearing) STC Over 50

1. Two and one-half-inch wide, minimum No. 25 gauge "J" floor and ceiling runners.]
2. One-inch-thick SHEETROCK brand Gypsum Liner Panels 24 inches wide - no screw attachment.
3. Minimum No. 25 gauge USG Steel C-H stud. Screws not required to attach stud to runner. E-shaped studs are used for closure panels at end walls or columns, or in lieu of C-H stud. (If "J" runners are used at end walls, the gypsum is fastened at the ends with $1\frac{5}{8}$ -inch Type S screws, 12 inches on center.) The H-Section of C-H stud normally faces shaft.
4. One and one-half-inch thick USG THERMAFIBER® Sound Attenuation Blanket.
5. One-half-inch SHEETROCK FIRECODE® Type C or $\frac{5}{8}$ -inch SHEETROCK FIRECODE® Type X gypsum panels applied vertically and attached with 1-inch Type S screws at 12 inches on center. Joints and screw heads are finished with SHEETROCK Joint Tape and SHEETROCK Joint Compound on outer layer only, when required for decorative purposes. Vertical joints in the base layer must be staggered with the vertical joints in the finish layer.
6. USG RC-1 resilient channels at 24 inches on center horizontally and attached with $\frac{3}{8}$ -inch panhead screws.

E. Three-Hour Cavity Shaft Wall (Nonload-Bearing)

1. Two and one-half-inch-wide, minimum No. 25 gauge "J" floor and ceiling runners.
2. One-inch-thick SHEETROCK brand Gypsum Liner Panels 24 inches wide - no screw attachment.
3. Minimum No. 25 gauge USG Steel C-H stud. Screws not required to attach stud to runner. E-shaped studs are used for closure panels at end walls or columns, or in lieu of C-H stud. (If "J" runners are used at end walls, the gypsum liner is fastened at the ends with $1\frac{5}{8}$ inch Type S screws, 12 inches on center.) The H-Section of C-H stud normally faces shaft.
4. Gypsum panels attached as follows:
 - a. Base layer: $\frac{5}{8}$ inch SHEETROCK FIRECODE® Type C gypsum panels applied vertically or horizontally with 1 inch Type S screws at 24 inches on center in field and at edges.
 - b. Middle layer: $\frac{5}{8}$ inch SHEETROCK FIRECODE® Type C gypsum panels applied vertically or horizontally with $1\frac{5}{8}$ inch Type S screws at 24 inches on center in field and at edges. When applied vertically the joints must be staggered with the base and finish layer joints.
 - c. Finish layer: $\frac{5}{8}$ inch USG SHEETROCK FIRECODE® Type C gypsum panels applied vertically or horizontally and attached with $2\frac{1}{4}$ inch Type S screws at 16 inches on center in field and at edges - 6 inches from top, bottom and ends.

Joint and screw heads on outer layer only are finished with SHEETROCK Joint Tape and SHEETROCK Joint Compound systems, when required for decorative purposes.

SOLID AND VENT SHAFT SYSTEMS

F. Two-Hour 2-inch Solid Gypsum Partition (Nonload-Bearing)

1. No. 22 gauge metal angles.
2. One-half-inch USG SHEETROCK FIRECODE Type C gypsum panels laminated to core panels with SHEETROCK Setting Type Joint Compound.
3. One-inch USG V-Edge Gypsum Coreboard 2 feet 0 inch wide (attachment - No. 22 gauge angle: 1 inch Type S screws).
4. No. 22 gauge metal angles.

An alternative assembly sequence for F above: Where construction is limited to application of gypsum panels from one side, "L" runners are anchored to floor and ceiling with suitable attachments at 24 inches on center. If "L" runners frame an opening in concrete, a 2-inch-by-2-inch "L" runner is used to permit fasteners to be driven further from concrete edge. The 1 inch coreboard is fastened to angle runners with two $1\frac{1}{4}$ -inch Type S screws placed 3 inches in from each edge. Two layers of $\frac{1}{2}$ inch USG SHEETROCK FIRECODE® Type C gypsum panels are laminated to one side of 1 inch coreboard with all

vertical joints being offset at least 3 inches. Joints need not be taped or finished on inside.

Alternative Construction: As an alternative for all of the above described constructions. Imperial Gypsum Base of the same thickness and core type shall be substituted for the gypsum panels. Joints on the face layer, other than the inside of shaft or duct partitions, may be covered with tape and the entire surface is covered with a minimum of $\frac{1}{16}$ inch of USG Veneer Plaster (Imperial or Diamond Interior Finish) in accordance with manufacturer's directions.

G. USG Cavity Shaft Wall System

To provide a fire-resistive protection to corridor ceilings or the underside of stairs.

USG "J" runners are attached to all existing horizontal and vertical framing intersected at the boundaries of the area to be protected. The "J" runners are attached to the existing framing members using mechanical fasteners spaced at a maximum of 24 inches on center and having an assigned design load of 200 pounds in either shear or pullout. USG C-H studs of the required gauge are attached to the "J" runners at 24 inches on center by means of two Types S-12, $\frac{1}{2}$ -inch panhead screws to frame the walls and/or soffits of the enclosures. Corners of the enclosure which do not intersect existing framing are built up of two "J" runners fastened together with two Type S-12, $\frac{1}{2}$ -inch panhead screws at 24 inches on center. The USG C-H studs are fastened to the "J" runners as previously described. One-inch-thick SHEETROCK brand Gypsum Liner Panels, 24 inches wide, is installed on the interior face of the enclosure within the slots of the C-H studs. No screw attachments are required. Where the Gypsum Liner Panel intersects the "J" runners against the existing horizontal and/or vertical framing, $\frac{1}{8}$ -inch Type S screws are installed at a maximum of 12 inches on center.

Gypsum panels are attached to the exterior surfaces of the framing in the manner required for the fire-resistive rating as follows:

1. One-hour construction consists of one layer of $\frac{5}{8}$ inch SHEETROCK FIRECODE® Type C gypsum panels applied parallel to the C-H studs, with all vertical joint on studs. The panels are fastened to each C-H stud and end "J" runners with 1-inch Type S screws 12 inches on center in the field and at edges. Joints and screw heads on the outer face panels are finished with SHEETROCK Joint Tape and SHEETROCK Joint Compound.
2. Two-hour construction consists of a base layer of $\frac{1}{2}$ -inch SHEETROCK FIRECODE® Type C panels applied parallel to the C-H studs and attached with 1-inch Type S screws at 24 inches on center in the field and at edges. The finish layer of $\frac{1}{2}$ -inch SHEETROCK FIRECODE® Type C panels are applied either parallel or normal to the C-H studs, with joints staggered 24 inches from the base layer. One and five-eighths-inch Type S screws at 12 inches on center in the field and at edges fasten the finish layer. Joints and screw heads on the outer layer only are finished with SHEETROCK Joint Tape and SHEETROCK Joint Compound.

H. USG Cavity Shaft Wall for Two-Hour Horizontal Membrane or Horizontal Duct Shaft Protection

Basically the same as described in paragraph "G" above, but uses three layers of $\frac{1}{2}$ inch SHEETROCK FIRECODE® Type C gypsum panels. (See Figure III-H at the end of this report.) The base layer is applied identical to the base layer described in item G.2. above. The second layer is applied the same as the base layer, except that joints are offset 24 inches and $\frac{5}{8}$ -inch type S screws are 4 inches on center. The face layer is installed perpendicular to the C-H studs with $2\frac{1}{8}$ -inch screws 12 inches on center. Butt joints in face layer fall between C-H studs and are secured with $1\frac{1}{2}$ -inch Type G screws 8 inches on center. Treatment of wallboard joints and fasteners is not necessary.

I. Materials

USG Steel C-H studs are roll formed from ASTM A 526 steel having a minimum yield strength of 33,000 psi.

Cement for laminating - SHEETROCK Setting Type Joint Compound.

For taping and sealing joints - SHEETROCK Joint Tape and SHEETROCK Joint Compound.

SHEETROCK FIRECODE® is a USG registered trademark for a Type X core gypsum panel. Type C is a USG trademark for an improved Type X core. USG Type C panels may be substituted for any Type X gypsum panel permitted by the code, provided the panel thickness is the same.

4.0 INSTALLATION

USG Drywall Shaft Partition Systems shall be installed in accordance with the fire rated assembly details and other information contained in this report.

5.0 IDENTIFICATION

Face panels are bundled in two panel groups and bound with a red, white and blue tape with panel designation printed on the tape.

SHEETROCK brand Gypsum Liner Panels are shipped unbundled in units with end banding. The face and back paper is green. The long edges are paper wrapped and have a $\frac{3}{8}$ -inch bevel on top and bottom edge. The back of each liner panel has an Underwriters Laboratories, Inc. Label that denotes UL design U438, lists USG File No. R 1319 and identifies the panel as USG Type SLX (shaft liners fire-rated).

6.0 EVIDENCE SUBMITTED

Results of fire-endurance tests conducted in accordance with ASTM E 119.

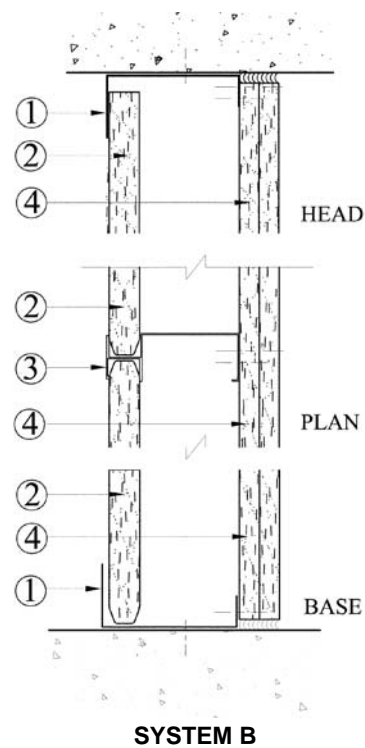
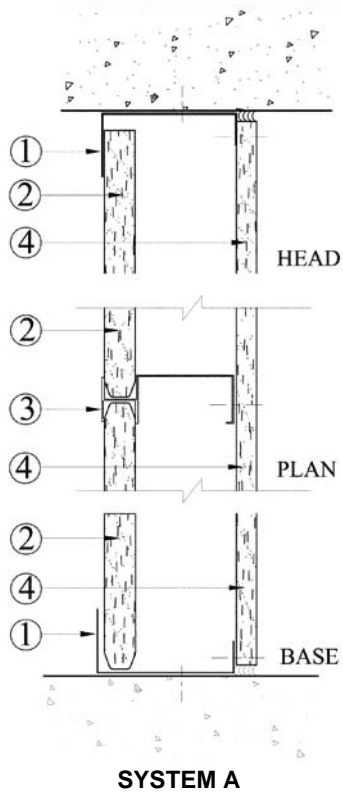
7.0 CONDITIONS OF USE

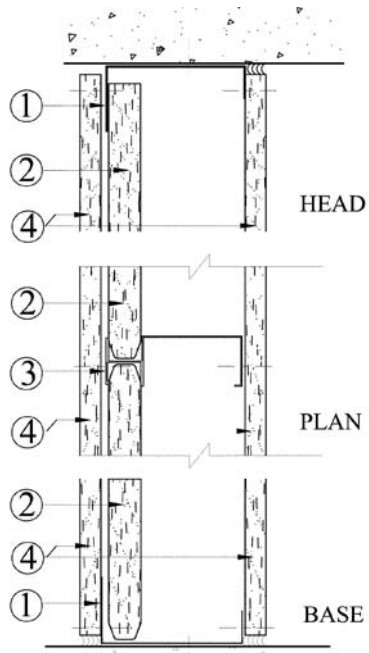
The National Evaluation Service Committee finds that, in their opinion, the USG® Drywall Shaft Partition Systems described in this report are alternates to types of fire-resistive construction specified in the 1990 BOCA National Building Code, the 1988 Standard Building Code with 1989/1990 Revisions, and the 1988 Uniform Building Code with 1990 Accumulative Supplement, subject to the following conditions:

1. The report does not include structural evaluation of the products listed.
2. All cut openings and horizontal joints in metal-framed shaft partitions with coreboard must be cased with system metal framing.

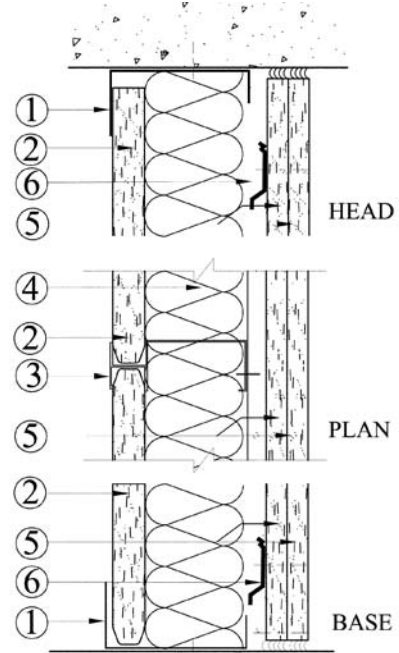
3. System G shaft walls are limited to use as corridor ceilings or as the horizontal enclosure on the underside of stairs (i.e. "Stair Soffits").
4. Assembly described in paragraph H may be used to protect two-hour horizontal ducts (horizontal duct shafts) or where a two-hour horizontal membrane is required and is not part of a floor/ceiling or roof/ceiling assembly. This system is designed to support its own dead weight only and should not be used where there is an attic or loft above, or any probability of storage.

This report is subject to periodic re-examination. For information on the current status of this report, contact the ICC-ES.

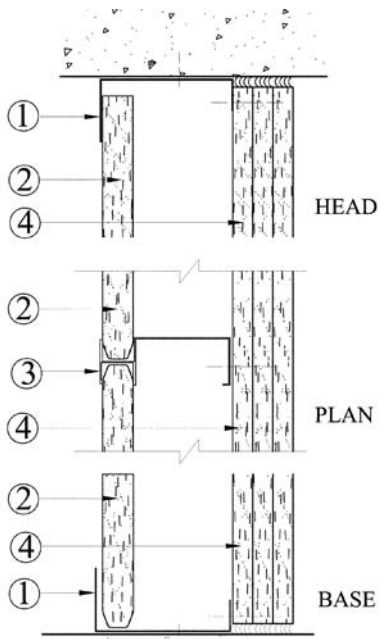




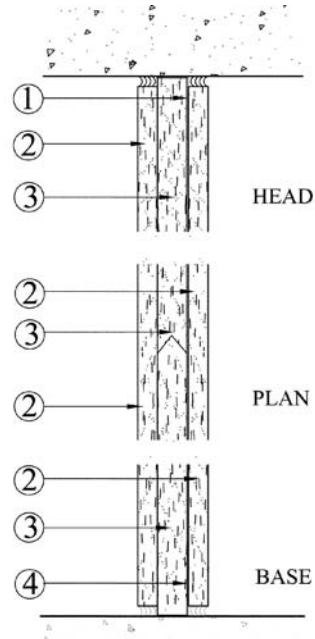
SYSTEM C



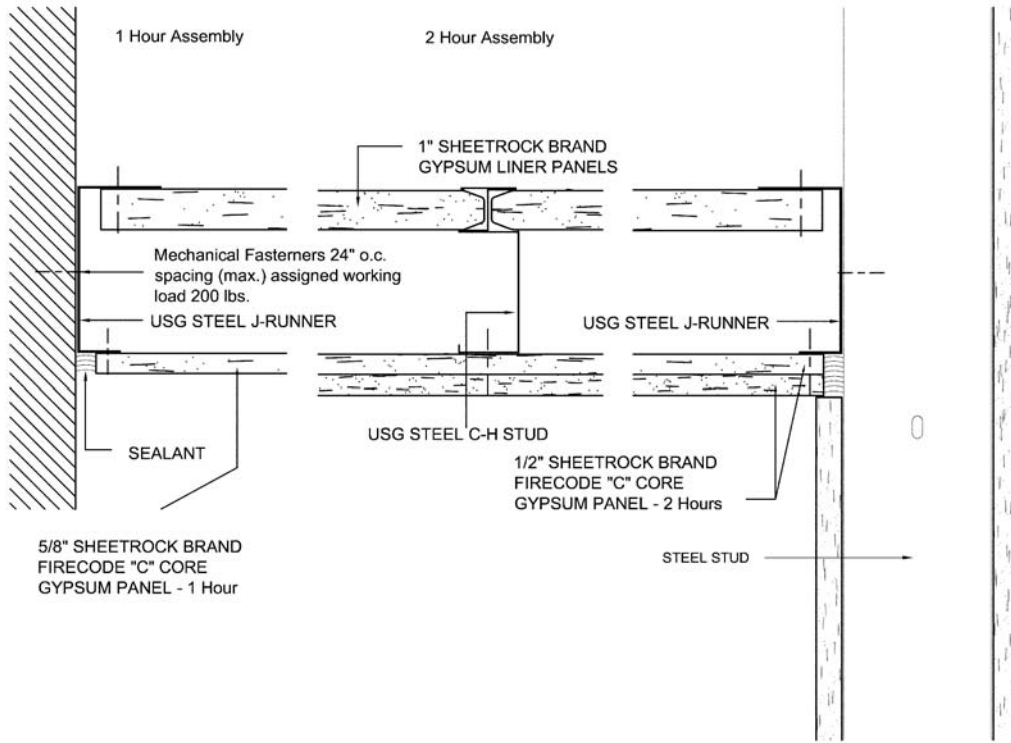
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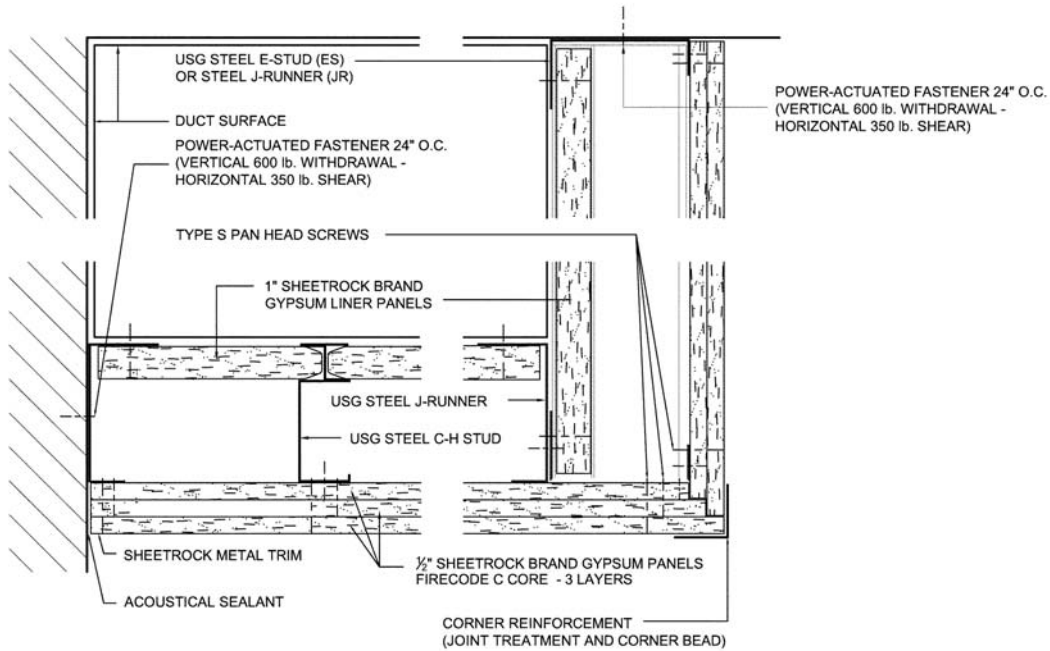
SYSTEM E



SYSTEM F



SYSTEM G



SYSTEM H