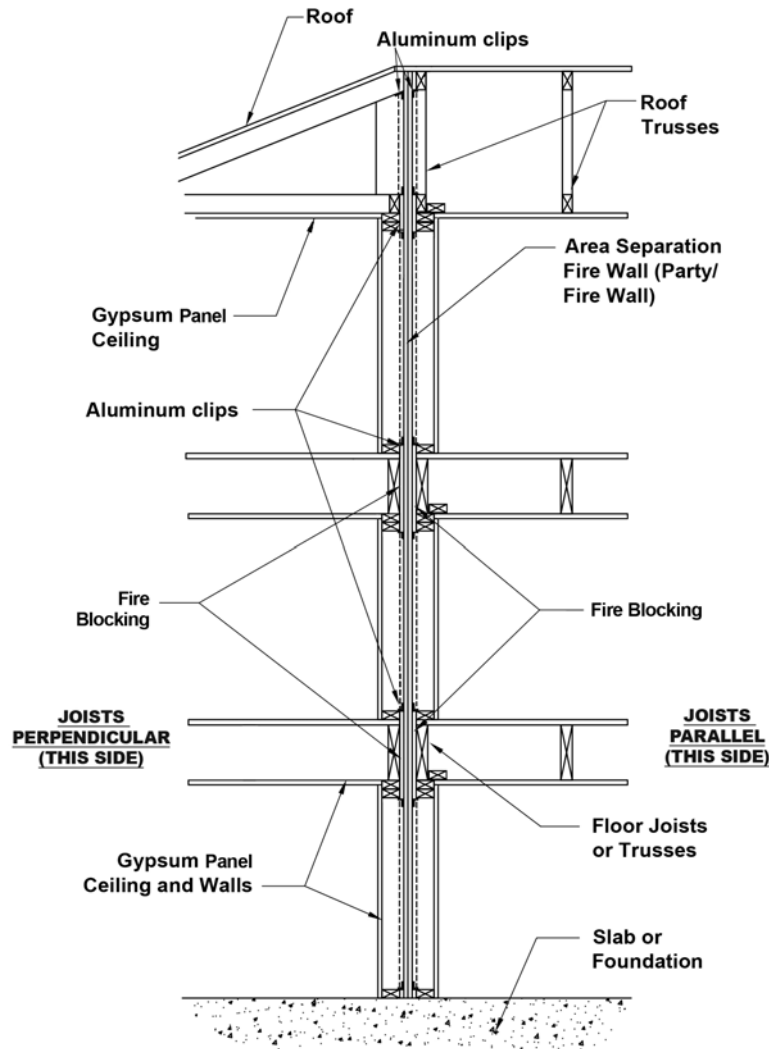


# GA-620-2019 GYPSUM AREA SEPARATION FIREWALLS

## Introduction

Gypsum Area Separation Firewall systems provide the advantages of both fire-resistance and noise reduction between neighboring townhouses and other attached dwelling units. Gypsum Area Separation Firewalls are efficient, nonloadbearing, 2-hour fire resistance rated gypsum panel systems that can provide code compliant STC ratings exceeding 60.



**Fig 1 – Typical Gypsum Area  
Separation Firewall Construction**

Gypsum Area Separation Firewalls are the walls of choice for townhouses up to four stories in height and are compatible with all common floor-to-ceiling heights. Gypsum Area Separation Firewalls offer numerous advantages over other materials historically used in these applications and are rapidly becoming the “standard” method for separating units in multi-family townhouse construction. Their thinner profile allows up to 6 in. (150 mm) more of usable floor space than a typical concrete block wall and reduced footing requirements.

Gypsum Area Separation Firewalls improve construction site safety and efficiency because they are installed one course (or floor) at a time, just like the rest of the building. No scaffolding is required and the risk of a toppling masonry wall is completely eliminated. Gypsum Area Separation Firewalls are designed to be fast and economical to install. Large panels accelerate construction and can be installed by trades already on the job; concerns and scheduling problems related to bringing in another trade are eliminated. These firewalls can be installed year-round without costly cold weather provisions for drying because there is no mortar to freeze.

Performance properties of gypsum components are maintained and product quality is assured for every gypsum shaft liner panel by independent third party certification and labeling. The materials come to the job site ready to install without the need for mixing or preparing components onsite. Simply measure, cut, and install.

Gypsum Area Separation Firewalls are designed and recognized in model building codes throughout North America. These systems are specifically engineered to remain in place during a fire, even if the structure on the fire side collapses. The aluminum clips used to attach the steel H-studs to adjacent framing soften on the fire side, allowing the burning unit to collapse, protecting the adjacent structure(s).

### **Handling and Storage**

All materials shall be delivered bearing the brand name, applicable standard designation, and name of manufacturer or supplier for whom the product is manufactured. Any plastic packaging used to wrap gypsum panel products for rail and/or truck shipment is intended to provide temporary protection from moisture exposure during transit only and is not intended to provide protection during storage after delivery. Such plastic packaging shall be removed immediately upon receipt of the shipment.

**Note: Failure to remove protective plastic shipping covers can result in condensation that can lead to damage, including mold.**

All materials shall be kept dry. Gypsum panel products shall be neatly stacked flat and not on end or edge, with care taken to prevent sagging or damage to edges, ends, and surfaces. Gypsum panel products and accessories shall be properly supported on risers on a level platform, and fully protected from weather, direct sunlight exposure, and condensation. Refer to GA-801 *Handling and Storage of Gypsum Panel Products*, for proper storage and handling requirements.

During and after installation, the bottom panels shall not be subjected to contact with standing water. Temporary pumps or drainage shall be provided as needed to protect the gypsum panels from water prior to the completion and startup of a permanent sump and/or drainage system after the building has been properly closed and dried in.

### Components

Gypsum Area Separation Firewalls consist of steel H-studs, steel C-runner, two layers of 1" (25.4 mm) thick gypsum shaft liner panels, and aluminum angle clips. (Figs. 2 and 3).

Fig 2 – Framing Components

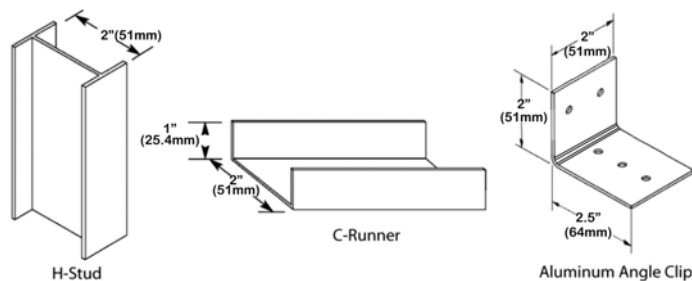
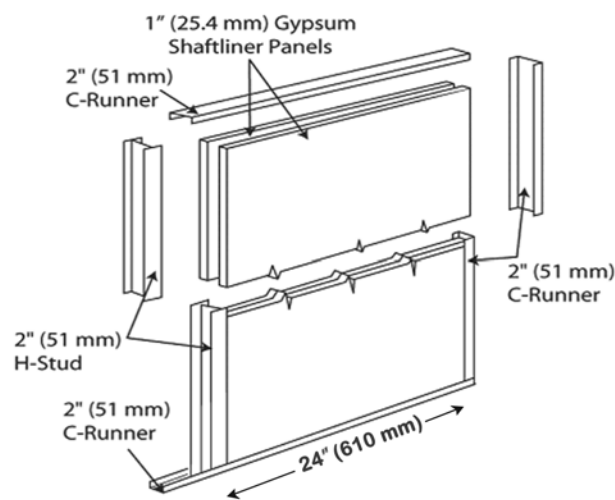


Fig 3 – Primary Components of Gypsum Area Separation Firewall (Aluminum Clips Not Shown)



### Cutting

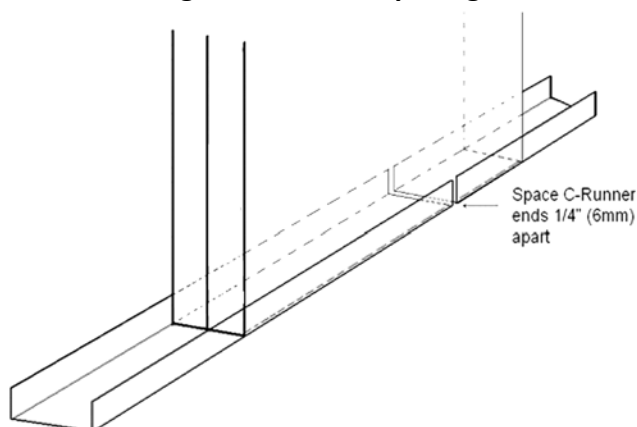
Gypsum panel products shall be cut either by scoring and breaking or by sawing. Always work from the face side. When scoring, a sharp knife shall be used to cut through the facer and into the core. The gypsum panel product shall then be snapped back away from the cut face. The back of the panel shall be cut or shall be broken by snapping the gypsum panel product in the reverse direction.

### Installation

In general, Gypsum Area Separation Firewalls are installed progressively beginning at one end and working toward the other. They are generally installed either a) from the foundation floor (slab) to or through the roof deck or b) from the above grade top of masonry or concrete footings to or through the roof deck. Gypsum Area Separation Firewalls are installed one course (or floor) at a time with succeeding courses stacked on top of the preceding course.

1. Align the 2" (51 mm) C-runner that will serve as the floor track of the Gypsum Area Separation Firewall so that the completed wall will be positioned not less than  $\frac{3}{4}$ " (19 mm) from the adjacent framing. As an alternate to the  $\frac{3}{4}$ " (19 mm) air space the steel components are permitted to be covered with 6" (150 mm) wide batten strips of either (a) gypsum panel screw attached to the framing with 1" (25 mm) Type S screws or (b) 1" (25 mm) mineral fiber insulation.
2. Space ends of adjacent sections of C-runner a minimum of  $\frac{1}{4}$ " (6 mm) apart. Joints between lengths of C-runner shall not occur at an H-stud (Fig 4).

**Fig 4 – C-Runner Spacing**



3. Attach the 2" (51 mm) C-runner to the foundation floor or to the top of the footing with power-driven fasteners spaced 24" (610 mm) o.c. and apply acoustical sealant along edges of C-runner to seal the juncture between the C-runner and foundation or footing.
4. Install a vertical C-runner to the wall at one end of the Gypsum Area Separation Firewall where the wall abuts either a foundation wall or an exterior wall.

5. Begin erecting the Gypsum Area Separation Firewall by inserting two thicknesses of 1" (25.4 mm) gypsum shaft liner panel vertically into the floor and vertical C-runner. Shaft liner panels and studs may be installed either from the basement floor or fed down from the floor above through the space between the wood framing.
6. Make sure the first two shaft liner panels are seated all the way into the floor and vertical C-runners and that their edges are flush, insert an H-stud into the floor runner and engage the H-stud legs over the long edges of the shaft liner panels. Seat the H-stud fully so the panel edges contact the stud web. Attach each leg of the vertical C-runner to the floor C-runner with one 3/8" (10 mm) Type S pan head screw. Install the vertical C-runner, H-studs, and shaft liner panels to not more than 24" (610 mm) above the floor line.
7. Continue in this manner, progressively erecting two thicknesses of full-width shaft liner panels followed by an H-stud until the first course of the wall is completed to within 24" (610 mm) of the end point of the wall. Cut the final two shaft liner panels to the necessary width and install them in the floor runner. Use a vertical 2" (51 mm) C-runner to finish the end of the wall. Make sure all studs, C-runner, and shaft liner panels are tightly seated. Attach each leg of the vertical C-runner to the floor C-runner with one 3/8" (10 mm) Type S pan head screw.

**Note: If the Gypsum Area Separation Firewall terminates at an existing or previously constructed foundation wall or exterior wall, the last two shaft liner panels will need to be inserted from the floor above into the channel formed by the final H-stud and the vertical C-runner before attaching the vertical C-runner to the floor runner.**

8. Install a 2" (51 mm) C-runner (legs down) over the top of the studs and shaft liner panels to cap off the wall. Attach each leg of the C-runner to the legs of the vertical C-runners at the ends of the wall.
9. Secure one aluminum clip to each side of every H-stud (two per stud) with one 3/8" (10 mm) Type S pan head screw through the short leg of the clip. Secure the long leg of the clip to wood framing with one 1- 1/4" (32 mm) Type W screw.
10. The recommended point of attachment of the aluminum clips to the wood framing varies. Refer to the gypsum shaft liner manufacturer for specific attachment requirements.
11. When the total height of the Gypsum Area Separation Firewall exceeds 23' (7000 mm) but not more than 44' (13 400 mm), the vertical spacing between rows of aluminum clips shall not exceed 5' (1500 mm) o.c. for the lower 23' (7000 mm) and 10' (3000 mm) o.c. for the portion above 23' (7000 mm).

**Note: Refer to manufacturer's installation instructions for specific limiting heights and clip spacing requirements for walls exceeding 44' (13 400 mm) in total height.**

12. Begin the next course of the Gypsum Area Separation Firewall by attaching a 2" (51 mm) C-runner (with legs up) to the previously installed top C-runner of the lower course. This back-to-back C-runner installation allows for the progressive erection of the Gypsum Area Separation Firewall one floor at a time. Secure the two C-runners together with two 3/8" (10 mm) Type S pan head screws 24" (610 mm) o.c. Stagger back-to-back C-runner joints a minimum of 12" (300 mm).

**Note: Always use back-to-back C-runners between courses in Gypsum Area Separation Firewalls. Do not substitute a single H-stud for the specified back-to-back C-runners.**

Erect shaft liner panels and H-studs in the same manner as for the first section of wall, except that starting and ending procedures may vary depending on the exterior wall intersection detail.

13. Install code approved fire blocking on both sides of the Gypsum Area Separation Firewall at each floor and the roof line. Fire blocking should fit tightly between the truss and framing area to the shaft liner panel.

14. At top floor, the Gypsum Area Separation Firewall may either extend to the top of a parapet wall or terminate at the underside of the roof deck. When terminating at the underside of the roof deck, the roof decking material for 4 ft (1220 mm) on either side of the wall shall be either Fire Retardant Treated plywood or gypsum panels.

15. At roof intersection the walls are capped-off with C-runners.

### **Limitations and Special Conditions**

- Gypsum Area Separation Firewalls are specifically designed to be 2-hour walls separating townhouses and areas in various occupancies. They are not intended for use as shear walls.
- Gypsum Area Separation Firewalls are designed to be laterally supported with aluminum clips spaced at specified intervals. Consult the manufacturer for specific clip placement and maximum allowable wall heights.
- Penetrations and openings in Gypsum Area Separation Firewalls are not addressed in this document.
- Do not install insulation in the wall system until the building has been properly closed or dried in.
- The exterior side of Gypsum Area Separation Firewalls, including offsets, parapets, and wall extensions (wing walls), must be protected by appropriate weather resistant materials.
- Gypsum panel products shall not be used where there will be direct exposure to water or continuous high humidity conditions. Gypsum panel products shall not be installed in direct contact with concrete, masonry, or other materials that have high moisture content.
- Gypsum panel products shall not be used where they will be exposed to sustained temperatures of more than 125°F (52°C ) for extended periods of time.

### Air Sealing Area Separation Walls

Air sealing area separation walls to reduce leakage between units and between the unit and any outside areas where the wall is off-set to meet energy code requirements is becoming a standard practice. Air leakage is measured via a blower door test, which pressurizes the unit, and measurements are taken to calculate the loss per unit area of wall. When a unit fails (i.e. leaks more than allowed by the code), the most common means of reducing air leakage is to seal all cracks, gaps and voids in all walls along the perimeter of a unit to reduce leakage paths. Such gaps, cracks and voids are at the foot and the head of the wall along the C-channels, at seams in the wall along the H-studs, and at intersections with other walls and the ceiling.

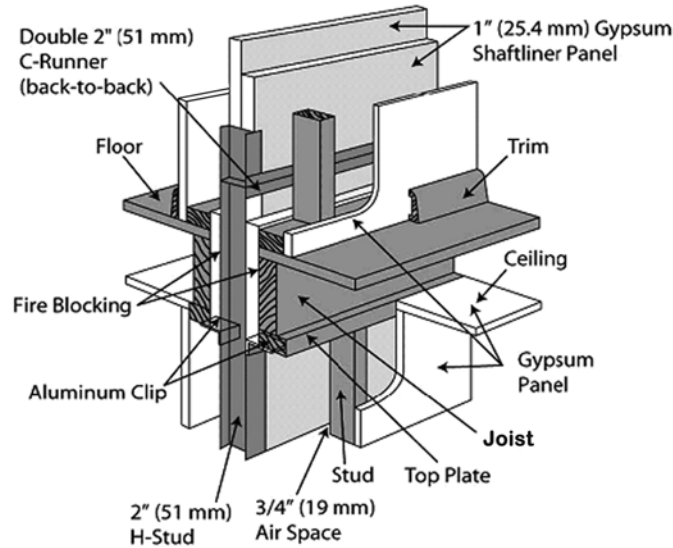
**NOTE: For a complete discussion on air leakage and energy code requirements, refer to *Field Testing of Compartmentalization Methods for Multifamily Construction* authored by Kohta Ueno and Joseph Lsitburek, March 2015, as part of the United States Department of Energy's Build America Program.**

Many material technologies are available on the market that will effectively seal gaps, cracks and voids. Traditional sealants/caulking materials, spray-applied sealants and membranes, mastics, self-adhered membranes, tapes and spray foams are among just a handful of the technologies available that may prove the best choice in any one application.

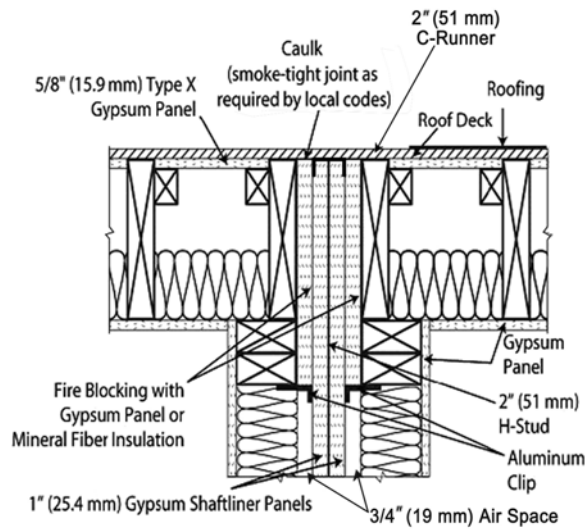
Care should be taken when selecting materials for air sealing area separation firewalls. These walls often serve multiple functions, but their intended first purpose is as a fire-resistive barrier. Air sealing materials must therefore be third-party listed and meet the criteria of the pertinent ASTM, UL, or other international standard, or be code compliant as a fire-resistive/fire blocking material. The material must not compromise the fire-rating of the wall.

When applying air sealing materials, it is always recommended to follow the guidance of the material manufacturer, bearing in mind the cautions provided here. The manufacturer will be able to provide specific application instructions and details beyond what is provided in this document for specific systems and conditions. The details shown in this guide are generic, not specific to any one job, condition or separation wall system and should not be used for specifying the application or installation of air sealing materials on the area separation firewall.

**Fig 5 – Typical Floor/Ceiling Juncture**

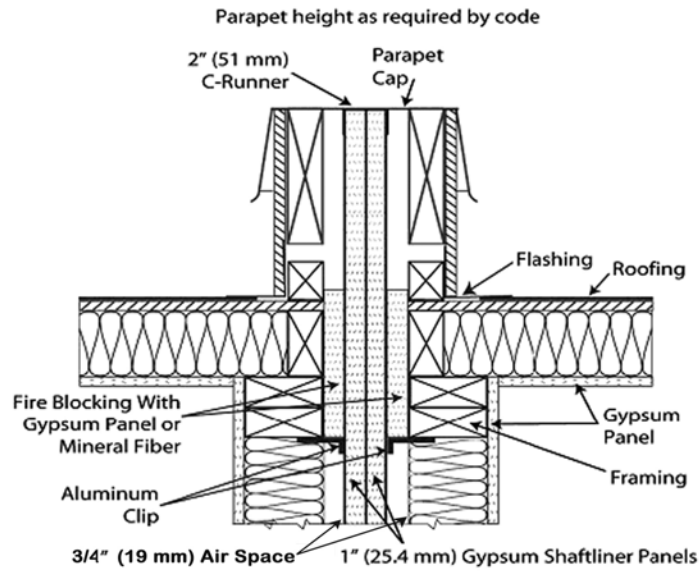


**Fig 6 – Typical Roof Junction Detail**

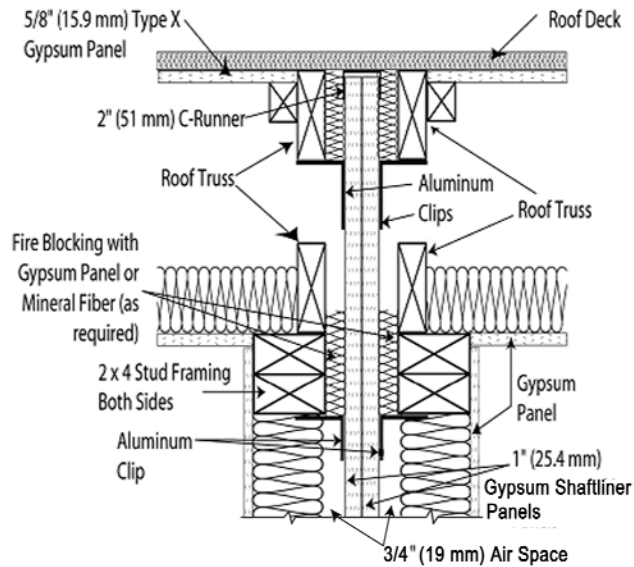




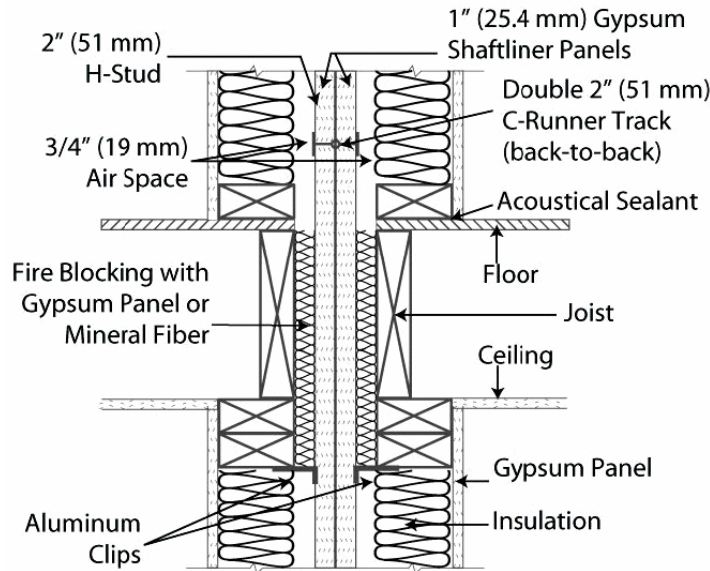
**Fig 7 – Typical Roof Parapet Detail**



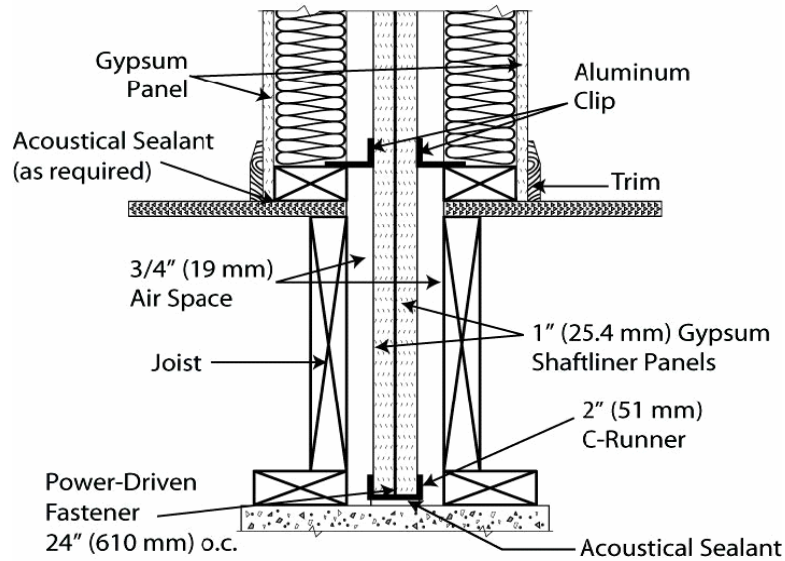
**Fig 8 – Roof Intersection with Parallel Roof Trusses**



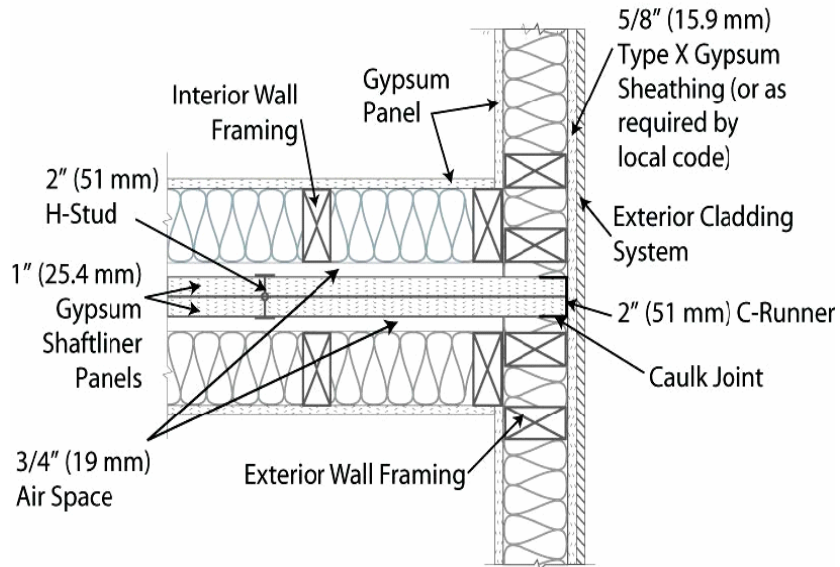
**Fig 9 – Intermediate Floor Intersection**



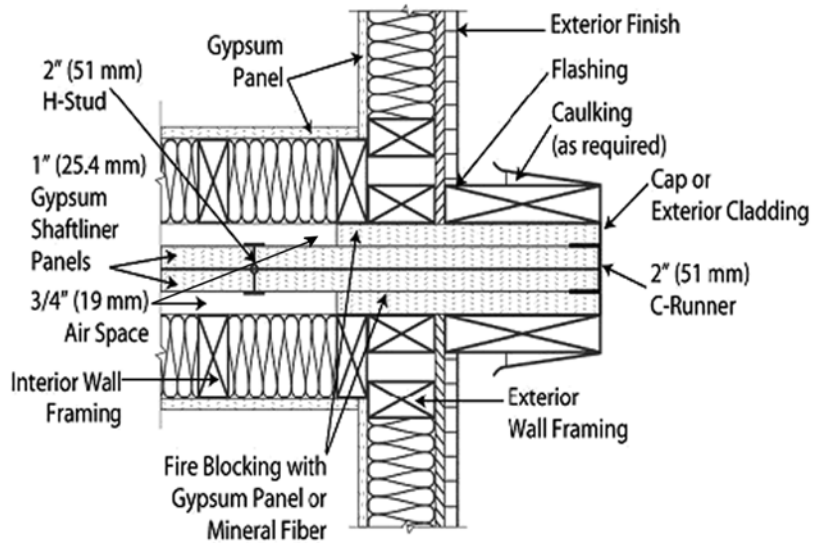
**Fig 10 - Foundation**



**Fig 11 – Exterior Wall Intersection**



**Fig 12 – Protruding Exterior Wall**



NOTES:

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