Townhome Separation Walls with EXACOR™ Sheathing

Construction of townhomes falls under the purview of the *International Residential Code* (IRC). Townhomes have unique fire-resistance requirements compared to single family dwellings and duplexes that are also covered under this model code. The IRC requires walls separating individual townhouse units to meet prescriptive fire-resistance rating requirements and that each townhouse unit is structurally independent. The intent of these requirements is to limit the spread of flame in the structure and should one townhouse unit collapse from fire, to limit the effects on the structural integrity of the neighboring unit. The IRC offers two approaches to meeting the fire-resistance requirements for townhouse separation, by constructing a double wall or by constructing a common wall. This Tech Tip covers the use of EXACOR™ sheathing in the construction of double walls to meet the IRC requirement for townhome separation.

Double Walls for Townhouse Separation

Section R302.2.1 of the 2021 IRC permits the walls that separate each townhouse unit to be constructed of "two 1-hour fire-resistance-rated wall assemblies tested in accordance with ASTM E119, UL 263 or Section 703.2.2 of the *International Building Code*." These fire-resistance rated walls or assemblies must be continuous for the full length of the wall and must extend at least 30 inches above the roof surface (parapet construction). Alternatively, the separating walls may terminate at the underside of the roof deck provided that the roof covering complies with a minimum Class C rating in accordance with ASTM E108/UL 790 and the roof decking is of fire-retardant-treated-wood or a material that meets the requirements of ASTM E136 as noncombustible for 4-feet on each side of the wall or walls.

While the IRC does not prescribe the amount of air space that should separate the double walls, a common approach is to space the double walls by the thickness of the fire blocking that is intended to be used. IRC Section R302.11.1 provides examples of acceptable fireblocking materials that include, but are not limited to:

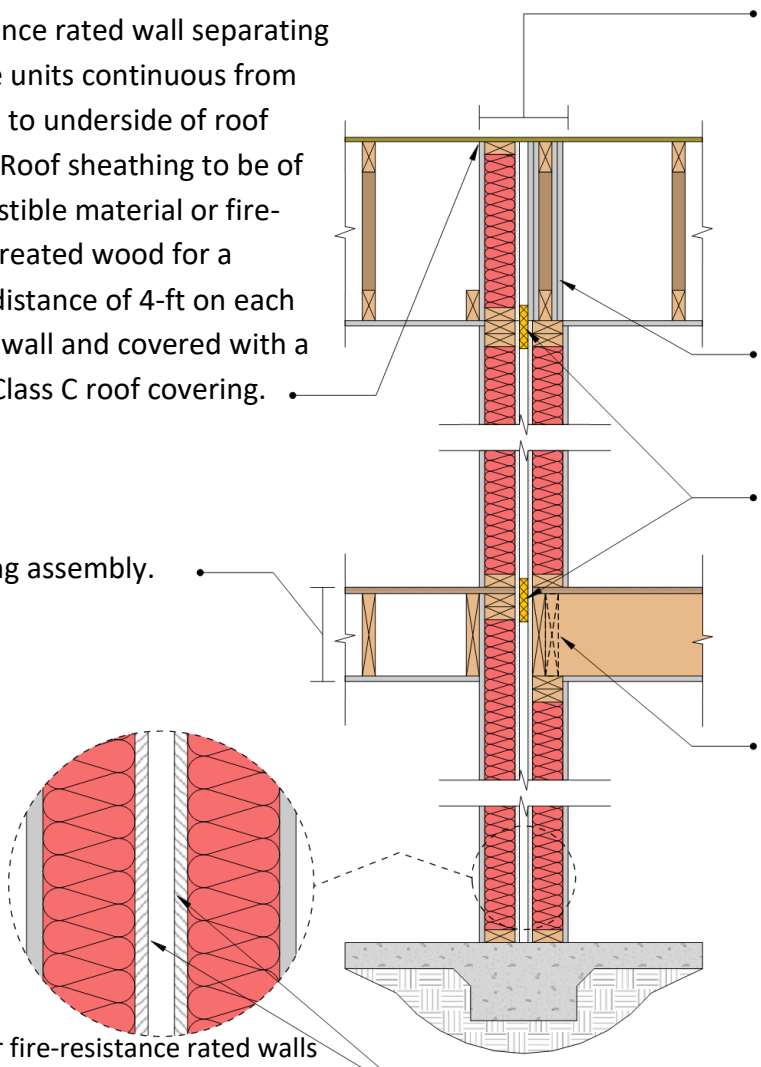
- Two-inch (2") nominal lumber
- One thickness of 23/32" wood structural panels
- Half-inch (0.5") gypsum board
- One-quarter-inch cement-based millboard

EXACOR™ Sheathing in Double Walls

EXACOR™ sheathing can be used as part of an assembly to meet the requirements of the IRC for townhome separation by constructing two 1-hour rated walls as detailed in ICC Design No. MOS-1290-04 (published in ICC-ES ESL-1290). EXACOR sheathing should be installed against the framing in the

interior airspace as it should not be used as an interior finish panel. Always follow local code requirements for fire-resistance rated construction and townhouse separation.
The visual below is for general informational purposes, only. It is the responsibility of the designer of record or other authority having jurisdiction to properly detail roof, floor, and wall fire-rated assemblies.

Fire-resistance rated wall separating townhouse units continuous from foundation to underside of roof sheathing. Roof sheathing to be of noncombustible material or fire-retardant treated wood for a minimum distance of 4-ft on each side of the wall and covered with a minimum Class C roof covering.



- *Double Wall* consisting of two 1-hr fire-resistance -rated wall assemblies constructed in accordance with 2021 IRC Section R302.2.2.1. Each townhouse unit to be structurally independent.
- 1-hr fire-resistance rated assembly, specified and detailed by others. Consult with local AHJ.
- Fire blocking per local code.

Floor/ceiling assembly.

- If floor framing intersects wall assembly, proper detailing is necessary to ensure continuity of fire-resistance rating. Sacrificial layers, such as 2x blocking, used to protect rim board are typical. Consult with local AHJ.

1-hr fire-resistance rated walls constructed in accordance with ICC Design No. MOS-1290-04. Refer to ESL-1290 for assembly details and requirements.

- EXACOR™ Sheathing to face away from occupant side of wall.

Intersecting Floor Framing

In townhome construction, it is common for floor framing to run perpendicular to the townhome separation wall and interrupt it. In most cases floor/ceiling assemblies in townhomes are not required to be fire-resistance rated, which means that the 1-hr fire-resistance rated walls separating living units will be intersected by an unrated floor/ceiling assembly.

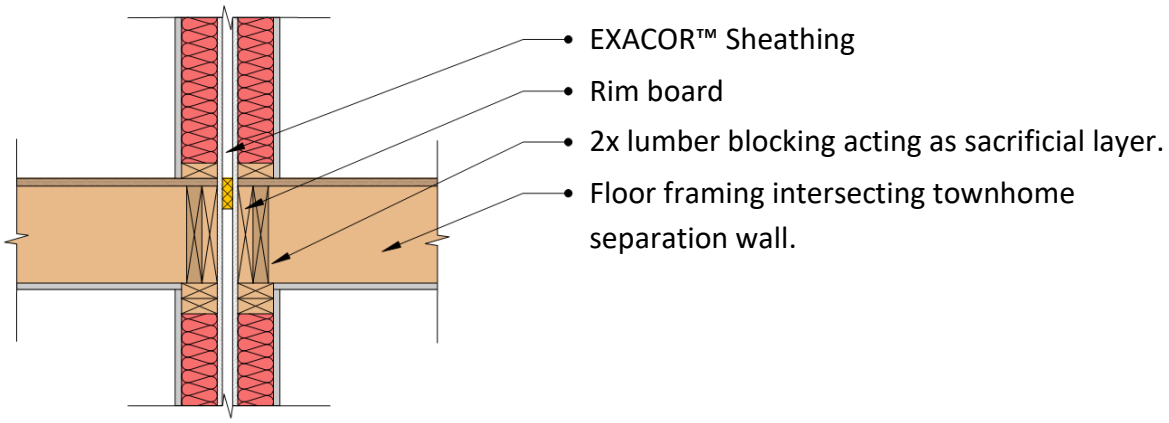
Section R302.2.3 of the IRC provides requirements for continuity of the separation walls. This section states that "The fire-resistance-rated wall or assembly separating townhouse units shall be continuous from the foundation to the underside of the roof sheathing, deck or slab. The fire-resistance rating shall extend the full length of the wall or assembly…"

Based on this language for continuity, code jurisdictions may allow an unrated floor/ceiling assembly to intersect a rated wall assembly when proper detailing and protection of the rim board and/or joist has been provided to maintain the fire-resistance rating and structural support of the separation wall. Section R302.2.1 of the IRC allows the fire-resistance rating of double walls to be derived from analytical methods in accordance with Section 703.2.2 of the International Building Code (IBC). This section allows for the fire-resistance rating of specific materials or combinations of materials to be established through calculations. This methodology is commonly referred to as the Component Additive Method or CAM for short.

Applying the principles of CAM, sacrificial materials maybe incorporated into the assembly to protect the rim board/joists during a fire event, maintaining continuity of the fire-resistance rating for the townhome separation wall. Section 722.6 of the IBC provides information for a variety of building components and the amount of time they contribute to fire-resistance. The sum of the fire-resistance assigned to each material selected is used to calculate the overall fire-resistance of the assembly. Additionally, Section 722.6 allows for the fire-resistance of exposed wood members, such as rim boards and blocking, to be calculated in accordance with Chapter 16 of the ANSI/AWC *National Design Specification for Wood Construction* (NDS). For additional information on the use of the Component Additive Method for wood framing, please refer to the American Wood Council's *Design for Code Acceptance 4* (DCA4) and Section 722.6 of the IBC.

The examples provided on the following pages are for general information purposes only. It is the responsibility of the designer of record to appropriately detail assemblies to conform to local building code requirements.

Example 1



Chapter 16 of the NDS provides a nominal char rate of 1.5-inch/hour for solid sawn lumber. Therefore, installing a layer of nominal 2x lumber blocking to the rim board between the floor joists would provide 1-hr of protection to the rim board and continuity of the rated wall assembly.

Example 2

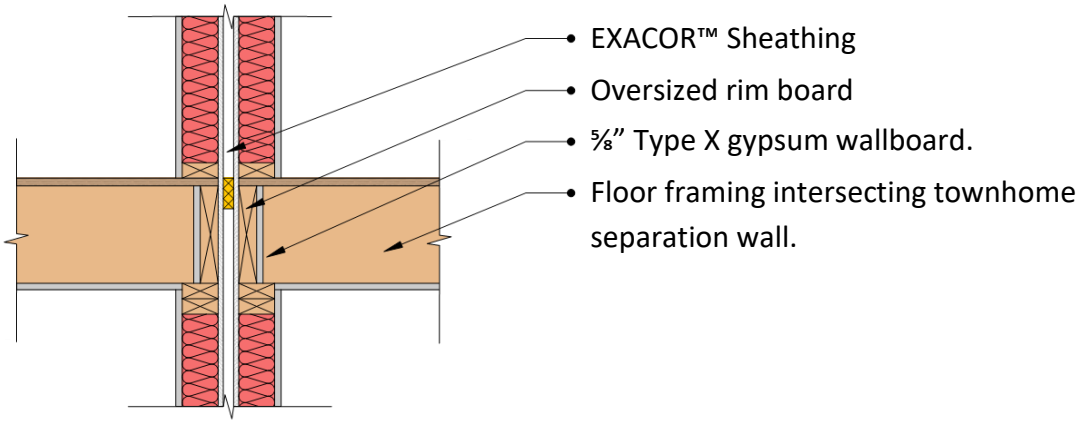
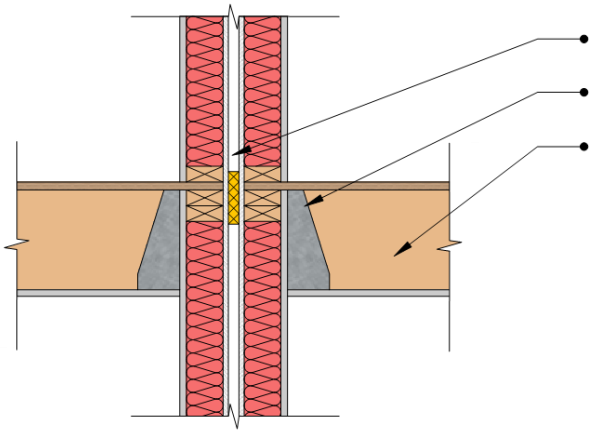


Table 722.6.2(1) of the IBC assigns a time of 40 minutes to 5/8-inch Type X gypsum wallboard. Using the same linear char rate of 1.5-inch/hour from Chapter 16 of the NDS, we can assume charring to occur to a depth of 0.5-inch into the wood rim board over the remaining 20-minute period after the Type X gypsum has burned away. To compensate, a wood rim board that is 0.5-inch thicker than the minimum required dimension to carry the load can be specified. For example, if a minimum 1 1/8-inch rim joist is required to support the wall loads above, a minimum 1 5/8-inch rim board should be specified to account for the additional fire-resistance needed.

Example 3



- EXACOR™ Sheathing
- Hanger designed to be installed over 1 layer of gypsum.
- Floor framing perpendicular to townhome separation wall.

In this example, the wall framing is not interrupting the separation wall as the wall is continuous to the underside of the floor sheathing. The floor framing is supported by a joist hanger that is designed to be installed over 1 layer of 5/8” gypsum wallboard.

Summary

EXACOR sheathing maybe used in townhome separation walls when constructed as double walls in accordance with IRC R302.2.1 and as detailed in ICC Design No. MOS-1290-04 for fire-resistance. The ability of floor framing to interrupt the fire-resistance rated townhome separation wall is at the discretion of the local authority having jurisdiction (AHJ). Many AHJ’s may allow the intersection of unrated floor/ceiling assemblies provided that special considerations and detailing is made to maintain continuity of the assembly or assemblies that serve as townhome separation. Consult with your local AHJ for requirements in your area.

Limitations

1. EXACOR sheathing is not a direct replacement for gypsum shaft liner products. The use of EXACOR sheathing in townhome separation walls is limited to double walls as described in IRC R302.2.1.
2. EXACOR sheathing is NOT permitted to be used in fire walls (area separation walls) where required by the International Building Code for Construction Types I-IV. Fire walls in Construction Type V are outside the scope of this document.

Please visit Huberwood.com or contact our Technical Services department at 800-933-9220 Ext 2716 or at techquestions@huber.com with any questions or comments.