Type III Alternatives & Engineering Judgments

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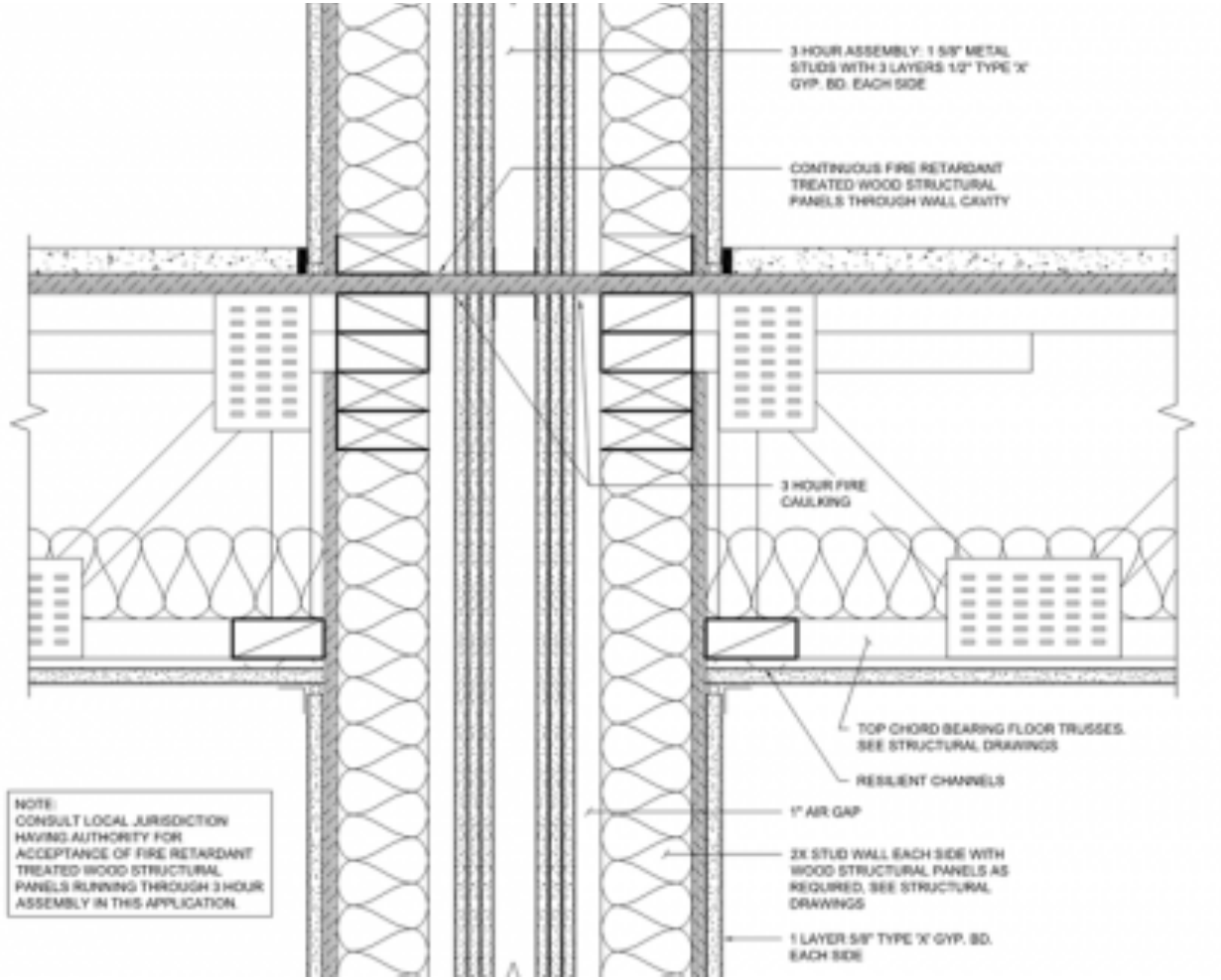
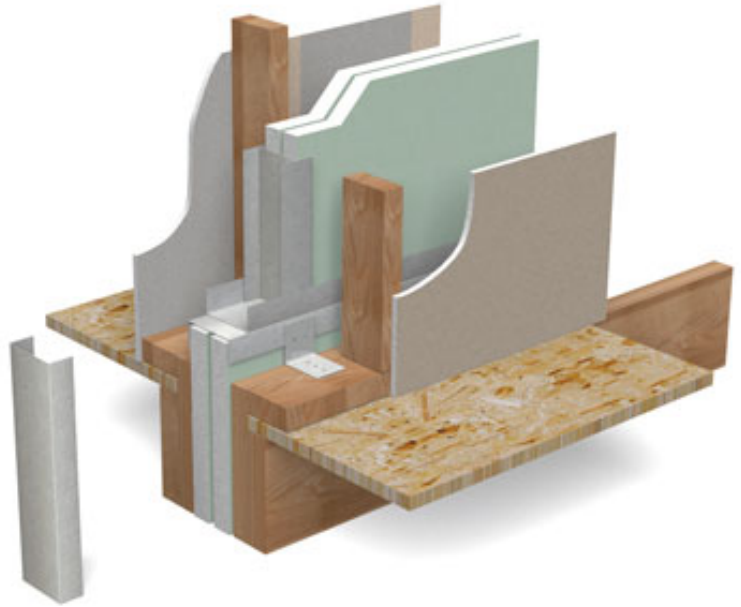
Type III – Exterior Walls

602.3 Type III. Type III construction is that type of construction in which the exterior walls are of noncombustible materials and the interior building elements are of any material permitted by this code.

Fire-retardant-treated wood framing and sheathing complying with Section 2303.2 shall be permitted within exterior wall assemblies of a 2-hour rating or less.

Type III/V 3hr & 2hr Fire Wall Assembly





- Metal H stud with 1” liner panel
- Aluminum burn clips at beams and floors

Reimagining Wood Construction

Code Modification

Strict letter of the code is impractical and the modification is in compliance with the intent and purpose of this code.

Alternate Materials, Design, and Methods of Construction and Equipment (AM&Ms)

The proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, at least the equivalent of.

Engineering Judgment (EJ) Wood Construction

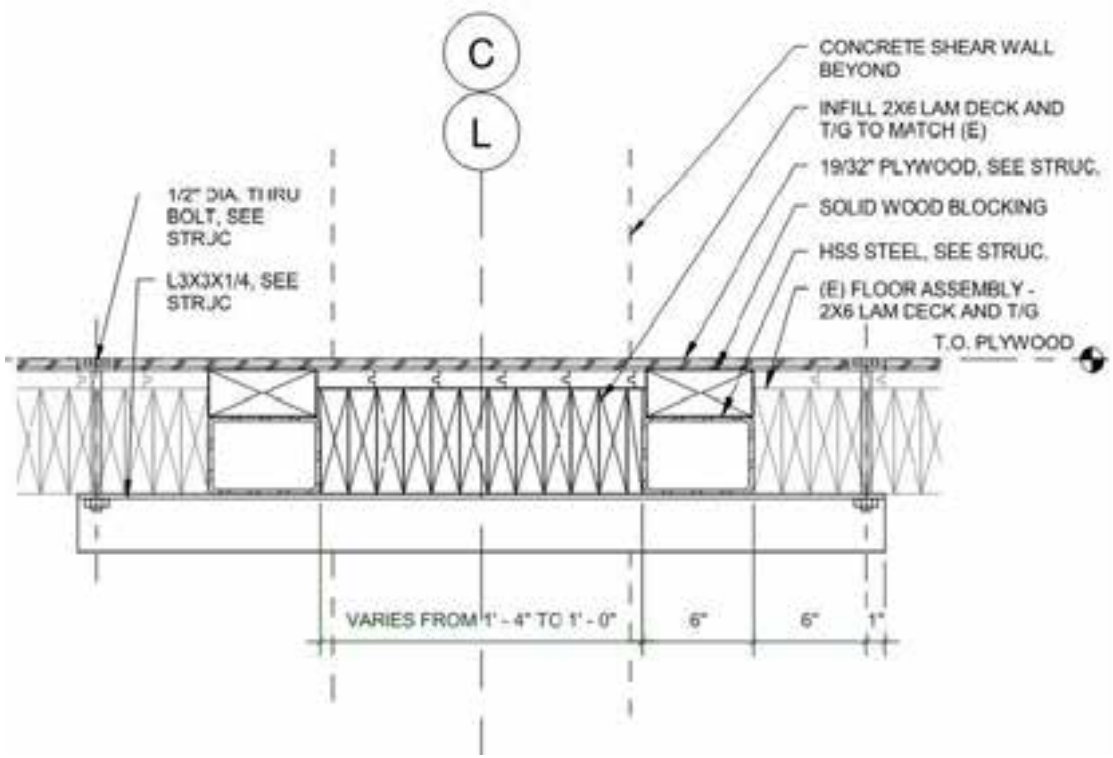


TABLE 722.2.1.4(2)
TIME ASSIGNED TO FINISH MATERIALS ON FIRE-EXPOSED SIDE OF WALL

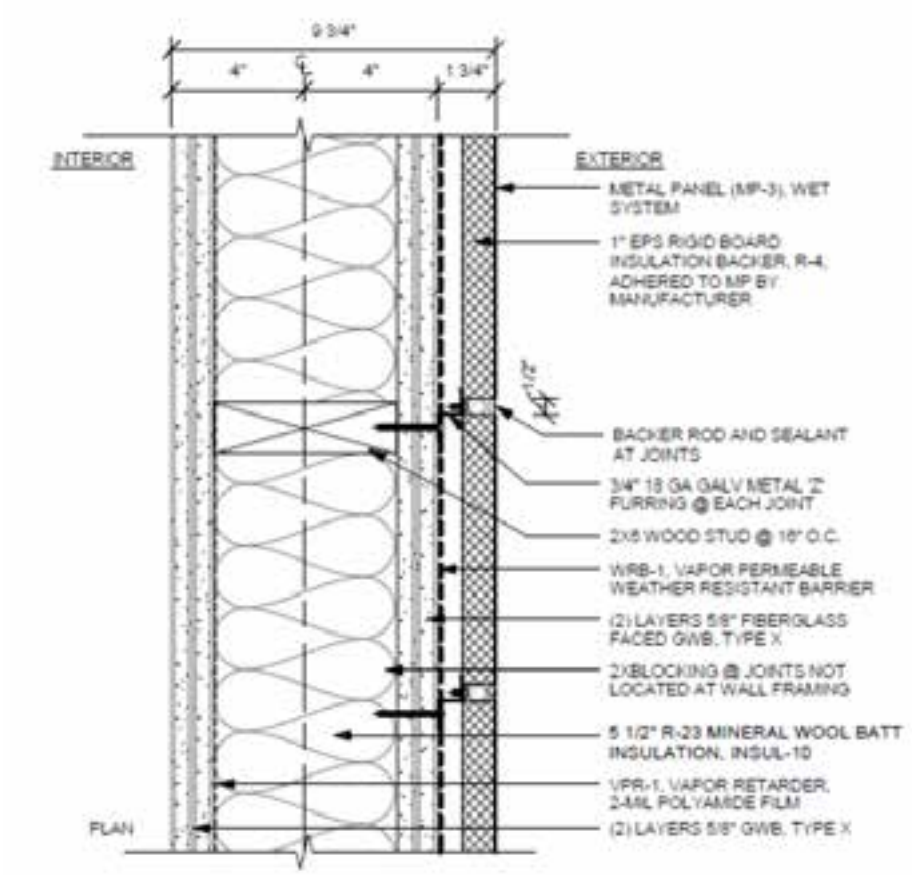
FINISH DESCRIPTION	TIME (minutes)
Gypsum wallboard	
$^3/_8$ inch	10
$^1/_2$ inch	15
$^5/_8$ inch	20
2 layers of $^3/_8$ inch	25
1 layer of $^3/_8$ inch, 1 layer of $^1/_2$ inch	35
2 layers of $^1/_2$ inch	40
Type X gypsum wallboard	
$^1/_2$ inch	25
$^5/_8$ inch	40
Portland cement-sand plaster applied directly to concrete masonry	See Note a
Portland cement-sand plaster on metal lath	
$^3/_4$ inch	20
$^7/_8$ inch	25
1 inch	30
Gypsum sand plaster on $^3/_8$-inch gypsum lath	
$^1/_2$ inch	35
$^5/_8$ inch	40
$^3/_4$ inch	50
Gypsum sand plaster on metal lath	
$^3/_4$ inch	50
$^7/_8$ inch	60
1 inch	80

For SI: 1 inch = 25.4 mm.

a. The actual thickness of Portland cement-sand plaster, provided it is $^3/_8$ inch or less in thickness, shall be permitted to be included in determining the equivalent thickness of the masonry for use in Table 722.3.2.

FRT Wood Alternate Wall Construction

Figure 5: FRTW and Non-FRTW Stud Walls at 70 Minutes After Fire Exposure of Gypsum Board Wall Point of FRTW Wall Failure



2-HR EXT. WALL @ MP-3 @ WD FRAMING

3" = 1'-0"

FIRE RATING: 2 HR, UL U301
STC RATING: N/A

FRT Wood Alternate Wall Construction

Time Interval (minutes)	Description	FRTW Stud Reaction	Standard Stud with Mineral Wool Insulation Reaction
t = 0	Gypsum board face of wall is first exposed to flames/heat, interior of stud wall at ambient temperature	None	None
t = 43	Temperature at edge face of stud attached to gypsum board exceeds autoignition point of wood (500°F), stud cavity of FRTW exceeds autoignition point of wood (500°F) (See Fig. 2)	FRT of wood stud inhibits ignition of FRT studs	Charring begins on narrow edge of stud (1.5" wide)
t=50	Chemical and mechanical inhibition of ignition of FRT wood exhausted	Charring begins on narrow edge of stud (1.5" wide) and along both exposed long faces (5.5" wide each)	Charring along wide faces nearest to the gypsum board
t=60		Charring has consumed 50% of allowable	Charring has consumed approximately 27% of allowable
t =70		Char layer exceeds allowable, insufficient cross-section of stud available to support load, stud fails	Charring has consumed approximately 39% of allowable
t = 112.6			Char layer exceeds allowable, insufficient cross-section of stud available to support load, stud fails

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