Development Services

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APPEAL SUMMARY

Status: Decision Rendered

Appeal ID: 16033	**Project Address:** 1470 NW Overton St
Hearing Date: 10/25/17	**Appellant Name:** Tom Jaleski
Case No.: B-012	**Appellant Phone:** 9712385266
Appeal Type: Building	**Plans Examiner/Inspector:** Preliminary
Project Type: commercial	**Stories:** 7 **Occupancy:** R-2, B, S-1, S-2 **Construction Type:**
Building/Business Name: Overton 15	**Fire Sprinklers:** Yes - Throughout
Appeal Involves: Erection of a new structure	**LUR or Permit Application No.:**
Plan Submitted Option: pdf [File 1] [File 2]	**Proposed use:** Residential and Retail

APPEAL INFORMATION SHEET

Appeal item 1

Code Section	602.3 Type III
Requires	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 complying with Section 2303.2 shall be permitted within exterior wall assemblies of a 2-hour rating or less.
Proposed Design	Vallaster Corl Architects are designing a new apartment building Overton-15 in Portland, OR. This is a 7-story apartment building with 5-stories of type IIIB construction over 2-stories of type IA. The building is primarily residential group R-2 apartments/live-work units with some group B lobby/leasing, group S-1 bike storage and group S-2 parking garage occupancies. The exterior bearing walls in the type IIIB building are allowed to be FRT wood per 602.3. The proposed design consist of exterior walls with untreated wood stud framing with Roxul ComfortBatt mineral wool insulation 2.0 (lbs/ft3) friction fit between studs to fill the entire 6” nominal wall cavity. The attached white paper documents that this will exceed the performance of a traditional FRT wood wall. As additionally safety measures, the proposed design is based on the intent of the ‘Portland Code Guide - OSSC/6/#4’ that allows Non - FRT wood framing within exterior walls of R-2 occupancy buildings of type III construction. This building meets the requirements for the Portland City Guide (OSSC/6/#4) (condition #1- #10 & Condition #12 - #16) except for the conditions #11 and #17. For the condition #17, exterior walls will be protected with non-combustible mineral wool insulation as detailed in the attached white paper.
Reason for alternative	FRT reduces the structural strength of wood and requires more wood than a non-FRT wood wall. The chemical use has long term environmental impact. Hence the request for alternate.

The attached white paper provides a fire analysis that supports the use of mineral wool insulation in the wall cavity of untreated wood stud framing as an alternate to FRT wood stud framing permitted by the OSSC section 602.3. The analysis compares between untreated wood and FRT wood framed wall assemblies. The analysis is based on published temperature data from full scale testing of multiple configurations of fire rated stud walls. The analysis concludes that untreated wood framed walls with comfort batt mineral wool insulation will outperform FRT wood framed walls without such insulation.

This building includes additional protection measures per the Portland Code Guide. This building then far exceeds a comparable building that has FRT wood in exterior walls as permitted by OSSC 602.3.
The exception of item #17 is only for the construction of the exterior wall to be as outlined here.

The proposed building is 74'10" when measured from the grade plane to the average height of the highest roof surface, and meets the requirements of height for type IIIB building per 2012 OSSC table 503.

The addition protection of all exterior facing walls with mineral wool filled stud cavities provides a much safer building. With these modifications, we believe a higher level of safety has clearly been provided for this project. Hence, we urge you to approve this appeal.

APPEAL DECISION

Mineral wool insulation in exterior walls in lieu of fire resistant treated wood stud framing: Granted provided condition #17 from the referenced Code Guide is met with exception of requirement for sacrificial studs.

Appellant may contact John Butler (503 823-7339) with questions.

The Administrative Appeal Board finds with the conditions noted, that the information submitted by the appellant demonstrates that the approved modifications or alternate methods are consistent with the intent of the code; do not lessen health, safety, accessibility, life, fire safety or structural requirements; and that special conditions unique to this project make strict application of those code sections impractical.

Pursuant to City Code Chapter 24.10, you may appeal this decision to the Building Code Board of Appeal within 180 calendar days of the date this decision is published. For information on the appeals process and costs, including forms, appeal fee, payment methods and fee waivers, go to www.portlandoregon.gov/bds/appealsinfo, call (503) 823-7300 or come in to the Development Services Center.

CODE UNLIMITED, LLC

White Paper - Fire Analysis of Fire Retardant Treated Wood Alternate

Project Name: Overton 15

Client: Vallaster Corl Architects

Prepared by: Code Unlimited

Address: 12655 SW Center Street, Suite 350, Beaverton, OR 97005

Date: 10/20/2017

Table of Contents

1. OVERVIEW

1.1 Project Overview

Vallaster Corl Architects are designing a new apartment building at 1470 NW Overton St in Portland. The new seven story apartment building is 5 stories of Type IIIB construction over 2 stories of Type IA construction. The building will be occupied with S-2 (Parking Garage), S-1 (Bike Storage), B (Lobby/Leasing/Mail area), and R-2 (Apartments/Live Work units) occupancies. The building is fully protected throughout by automatic sprinklers and a fire alarm system.

Type IIIB construction requires that exterior walls be of noncombustible or Fire Retardant Treated Wood (FRTW) construction. The project proposes to use Roxul Comfortbatt (2.0 (lbs/ft^3) mineral wool with conventional wood studs (without the Fire Retardant Treatment (FRT)). There are significant fire, structural and environmental benefits for this approach.

1.2 Executive Summary

Fire-retardant treated (FRT) wood framing is permitted by code within exterior Type III wall assemblies with a fire-resistance rating of a 2 hours or less. This is based on the improved fire performance of such wood compared to regular wood of same species. FRT of wood delays ignition and resists “flame spread” once ignited. The proposed design uses tightly packed mineral wool insulation between non-treated wood framing members in lieu of Fire Retardant Treated Wood (FRTW) to achieve equal or better fire performance.

Over the last year Code Unlimited has analyzed this particular issue, namely the use of non-FRT wood in place of FRTW on multiple projects. This has been driven by many stakeholders within the Pacific Northwest region; local and state governments, universities and other research groups, manufacturers, real estate developers, and design and construction industry professionals. This white paper is the most current knowledge on this subject, based on rigorous analysis of published test reports, and input from senior fire protection engineers and code experts within our company.

The white paper is structured to give the reader a detailed understanding of the code regulations that are driving this requirement along with excerpts from the International Building Code (IBC) commentary to clarify intent where necessary. We also provide other code citations where prescriptively the Oregon Structural Specialty Code (OSSC) and the IBC permits the use of rock wool (aka mineral wool) as a means to delay ignition or fire and flame migration. This is provided as documentation of established tradition. Many code provisions have evolved initially out of traditional construction practices and then undergo rigorous analysis and/or testing to substantiate performance in those applications. This white paper follows that time tested path, by including a rigorous performance analysis based on currently available test data in support of non-FRT wood in an exterior wall of a Type IIIB construction building.

Our analysis found that the fire performance of a non-FRTW framed wall with rock wool insulation is superior to a FRTW framed wall. We also found that this approach reduces the potential for chemical exposure to the environment and to the occupants of these buildings compared to the current practice of using FRTW.

1.3 Applicable Codes and Standards

Applicable Code or Standard
2014 Oregon Structural Specialty Code (OSSC)
2009 ASTM E-84 Test Methods for Surface Burning characteristics of Building Materials – American Society for Testing and Materials
2007 ASTM E-119 standard Test Methods for Fire Tests of Building Construction and Materials – American Society for Testing and Materials

1.4 Additional References

[1] 2007 Analysis of Inter-laboratory Testing of Non-loadbearing Gypsum/Steel-Stud Wall Assemblies, William Grosshandler, Samuel L. Manzello, Alexander Maranghides - Building and Fire Research Laboratory, Tensei Mizukami - Center for Better Living

[2] 1977 Effect of fire-retardant treatments on performance properties of wood. In: Goldstein, I.S., ed. Wood technology: Chemical aspects. Proceedings, ACS symposium Series 43. Washington, DC: American Chemical Society.

[3] 1992 Charring Rate of Wood for ASTM E119 Exposure, Fire Technology Volume 28, Number 1, Robert H. White and Eric V. Nordheim

[4] 1977 National Board of Standards Technical Note 945: An Investigation of the Fire Environment in the ASTM E 84 Tunnel Test

[5] 2007 Performance of a non-load-bearing steel stud gypsum board wall assembly: Experiments and modelling", Samuel L. Manzello, et al, Fire and Materials (Issue 31, pp 297-310)

[6] 2016 Calculating the Fire Resistance of Exposed Wood Members, Technical Report No 10, American Forest & Paper Association, Inc, American Wood Council, 1111 19th St., NW, Suite 800, Washington, DC 20036

[7] 2015 A Model for predicting heat transfer through insulated steel-stud wall assemblies exposed to fire, Sultan, M. A.; Alfawakhiri, F.; Bénichou, N., Fire and Materials - 2001 International Conference, San Francisco, January 22-24, 2001, pp. 495-506

[8] 2010 Wood Handbook, Wood as an Engineering Material, Chapter 17 Fire Safety, Robert H. White and Mark A. Dietenberger, Forest Product Laboratory, United States Department of Agriculture Forest Service, Madison Wisconsin

2. PROPOSED WALL ASSEMBLY

The proposed design is for an exterior wall assembly that is 2-hour rated. The analysis is based on exterior wall with wood framing assembly (See Appendix A). Starting from the interior, wall assembly consist of two layers of 5/8" thick type X gypsum board, ½" resilient channel, 5.5" thick rock wool insulation friction fit between 2" x 6" nominal untreated standard wood stud framing to fill the entire wall cavity, plywood sheathing, one layer of exterior rated gypsum board sheathing, weather resistant barrier, vertical furring strips and pre finished sheet metal exterior cladding on furring. Details of the proposed wall sections are in the attached Appendix A. Where the distance to property line is less than 10ft, an additional layer of type X gypsum board is installed at the exterior face but not analyzed here. A Single layer of 5/8" gypsum board on the exterior side is the worst case design condition for our analysis.

3. ROCK WOOL USE PRESCRIPTIVELY PERMITTED IN CURRENT CODES

The 2014 OSSC section 602.3 for Type III, exterior wall construction, permits the use of fire retardant treated wood (FRTW) in lieu of non-combustible materials.

Rock wool barriers have been allowed in the codes as a means to retard or prevent the ignition of wood in concealed spaces, for some time now:

1. OSSC 803.11.1.1 allows untreated wood to be used for furred walls or ceilings where Non-Combustible construction is required when the cavity is filled with rock wool insulation.
2. OSSC 718.2.1(7) allows rock wool batts to be used as fire blocking to cut off concealed draft openings.
3. OSSC 718.3.1 permits the use of rock wool batts as an approved draft stopping material.
4. ORSC 316.5.3 permits the use of 1.5 inch thick rock wool to satisfy the requirements for an ignition barrier.
5. NFPA 13 section 8.15.1.2.17 allows untreated wood joist to be treated as FRT wood when the cavity is filled with rock wool insulation.
6. OSSC 722.6 contains procedures by which the fire resistance ratings of wood assemblies are established by calculations.

   IBC Section 722.6 Commentary states:

   "Rock wool insulation provides additional protection to wood studs by shielding the studs from exposure to the furnace, thus delaying the time of collapse."

   OSSC table 722.6.2(5) allows glass fiber, or rock wool, or cellulosic fill within stud cavity prescriptively to increase the fire resistance of a wall assembly by 15 minutes.

7. IBC Section 602.2 Commentary:

   "Fire Retardant-treated wood (FRTW), although combustible, is permitted in limited uses in building of Type I and Type II construction… it is not assumed to be fire-resistance rated, and generally does not afford any higher fire-resistance rating than untreated wood material."

4. PERFORMANCE BASED ANALYSIS AND VERIFICATION

The list of prescriptive provisions in section 3 establishes the code history of use of rock wool insulation to improve the fire performance of wood wall and ceiling assemblies. These provisions are an outgrowth of tradition and historical construction practice. The values assigned to these are generic values, based on historical data. These are valuable in establishing precedence and intent of the code requirements. Our analysis is based on the full-scale test data documented in the research papers #5 and #7 listed in section 1.4 in this white paper. The remaining references #1, #2, #3, #4, #6 and #8, provide supporting evidence for the methodology used in this analysis as well as some other key metrics used in the analysis. The full-scale testing was performed with 4 inch metal stud wall assemblies, while the wall assemblies analyzed in this white paper are nominal 6 inch wood assemblies. Wood is a non-conductor of heat and superior performer to metal within the context of this analysis. Our test data includes wall assemblies with both fiberglass and rock wool insulation within the stud cavity. Rock wool out performs fiber glass insulation at higher temperatures. In these two cases as well as in all other cases our analysis takes the conservative value when there are multiple data points available.

Building structural component fire performance is predicated on the type of fire exposure. Most commonly fire from combustible building contents or furnishings expose the components such as walls of structural frame to heat from the fire, causing loss of structural integrity of the wall and its eventual collapse. The point at which the load-bearing components of a Type III wall (in this case, the wall studs) are exposed to heat from the fire, the building would have long since been evacuated and the space become untenable, as the temperature required to breach the gypsum board membrane would be beyond survivability. In this case, the sole concern is for the preservation of structural stability and to protect firefighters and adjacent structures. The studs of the walls provide the necessary structural, load bearing capability to support the exterior wall. Gypsum board or other sheathing is solely relied on to provide resistance to the fire exposure in order to protect the load bearing members, its contribution to the structural strength of the wall is negligible. The Commentaries to section 722.6 of the IBC state “It is assumed that once the structural members fail, the entire assembly fails.”

OSSC section 602.3 defines Type III construction as “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 complying with Section 2303.2 shall be permitted within exterior wall assemblies of a 2-hour rating or less.”

Fire retardant treatment of wood does not prevent the wood from decomposing and charring under fire exposure. The rate of fire penetration through treated wood approximates the rate through untreated wood. [8] Fire-retardant-treated wood used in walls can slightly improve fire endurance of these walls, but, most of this improvement is associated with the reduction in surface flammability rather than any changes in charring rates.

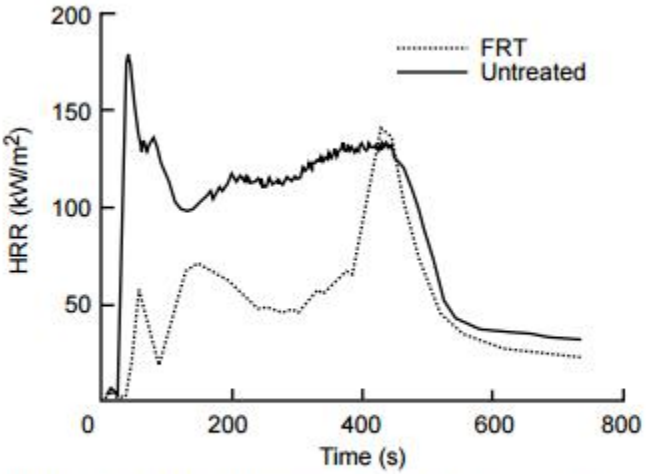


Figure 17–1. Heat release curves for untreated and FRT plywood exposed to 50-kW/m² radiance.

Fig.1. E84 Test Comparison between FRT wood and untreated wood (Wood Handbook Chapter 17)

The fire retardant treated wood is achieved by chemical treatment of wood, it slows ignition by interfering with heat transfer to the material and chemically interferes with the process of combustion. It does so by converting combustible gases and tars to carbon char at temperatures below 550°F[2,,8] and releases carbon dioxide and water vapor which dilute the combustible gases. However, above temperatures of 550°F, outgassing and pyrolysis effects exceed the limits whereby ignition is interfered and FRT heat release rate and burning rates are comparable to untreated wood of the same variety. Charts of the ASTM E84 (Standard Test Method for Surface Burning Characteristics of Building Materials) heat release rates (Fig. 1) show that, at about 420 seconds (7 minutes), the heat releases rate (HRR) for FRTW and non-FRTW are virtually identical, indicating that, after the fire retardant treatment has been exhausted, the non-FRT and FRT wood studs will perform similarly. [8]

In a 2-hr fire rated wall, once the gypsum layers are compromised, the fire is free to attack the exposed studs. The charring and consumption of the studs begins before failure of the gypsum membrane, as heat is conducted to the edge face of the studs and to the stud wall cavity by conduction through the gypsum board. In the stud wall cavity, the temperatures are already well over the auto ignition temperature of wood and FRTW (550°F) by the time the two gypsum board layers have been compromised.

Above 550°F, FRTW studs behave similar to a standard wood studs and charring continues until it fails in load. Char rates for softwoods such as used in framing lumber are at an average rate of 1.5 in/hr [6]. By calculating the heated perimeter of the wood studs for an uninsulated, code-accepted FRTW stud and a rock-wool insulated standard stud, and using the average char rate, a time to failure between the two stud types can be determined.

Our analysis shows that filling the stud cavity entirely with (R24) Roxul Comfortbatt 2.0 (lbs/ft^3) insulation will delay the heat transmission to the unexposed sides of the stud. Therefore, slowing the combustion of the wood studs along those sides, see figs 3-6.

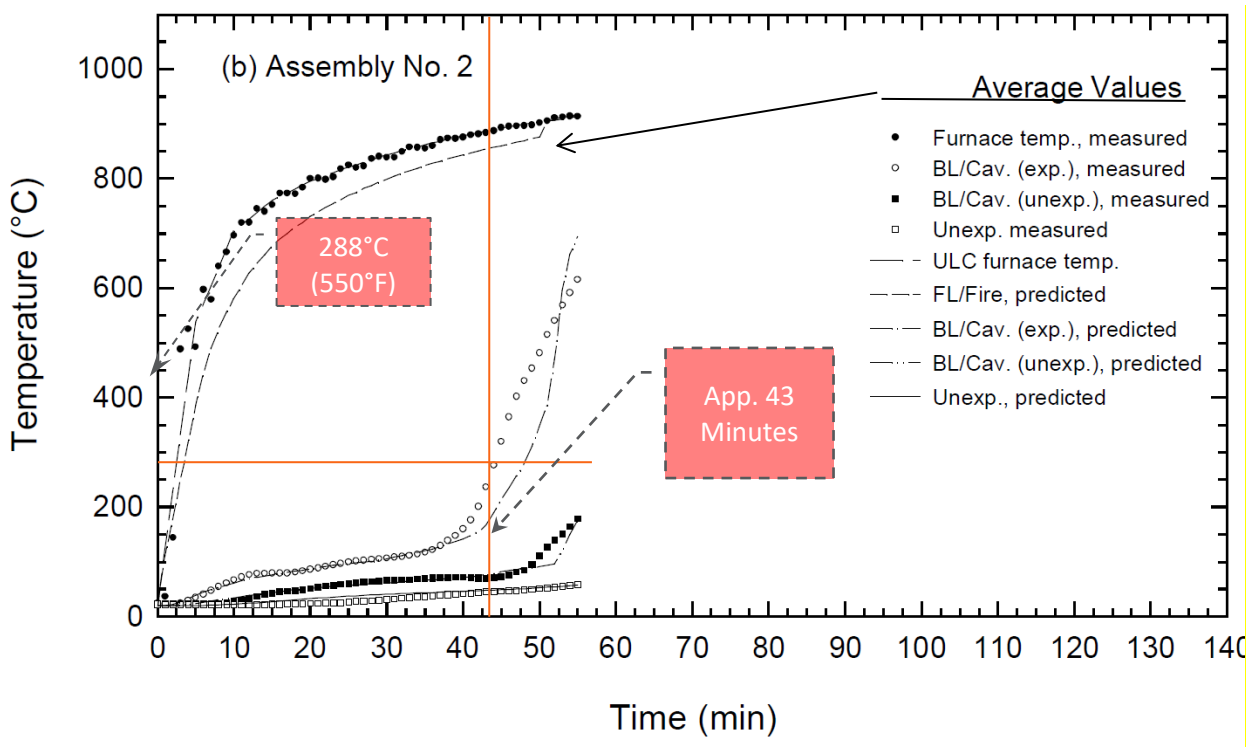
The effective heated perimeter of a 2” x 6” nominal FRTW stud is 12.5 inches at the point of its ignition. The effective heated perimeter of a rock wool insulated stud is only 1.5 inches at the same point, although the point of ignition is approximately 7 minutes earlier due to the effects of FRT and the delay of ignition of the FRTW stud. As the studs are consumed by charring, the 3-sided attack[6] on the FRTW stud results in much more material loss due to charring and more rapid reduction in load-bearing capability. While there is some charring of the sides of the standard stud, especially nearest the exposed edge, the insulative properties of the rock wool significantly slow charring and loss of material.

Based on the full scale tests performed on various gypsum stud wall assemblies with and without insulation, we have the data to determine the heat transfer through the wall cavities. We then determined the effect of mineral wool on the surface temperature of the wood stud of this wall assembly, using equation #10[7] below. This equation allows us to specify the density, type, and thickness of the insulation and get the resultant surface temperature. This is then used to determine the char rate of the stud and the ultimate failure due to loading. The char rate analysis of the wall cavity with wood stud and mineral wool is detailed in the section 5.

Eq. 10[7]

$$T_m^{j+1} = T_m^j + \frac{\Delta t}{(\rho_i c_i)_m^j (\Delta y)^2} \left\{ \left[\frac{(k_i)_{m-1}^j + (k_i)_m^j}{2} \right] (T_{m-1}^j - T_m^j) - \left[\frac{(k_i)_m^j + (k_i)_{m+1}^j}{2} \right] (T_m^j - T_{m+1}^j) \right\}$$

The details of the effect of fire on the wood stud are documented further in this white paper. The table on page 13 shows a side by side comparison between FRTW stud & standard stud with rock wool fill.



Legend

SL - Gypsum Board Single Layer BL - Gypsum Board Base Layer FL - Gypsum Board Face Layer

Std. - Stud Cav. - Cavity Exp. - Exposed Side Unexp. - Unexposed Side Fire - Directly exposed to furnace

Figure 2: Time vs temperature curve – Double Layer 5/8" Gypsum Board, Studs 16" O.C.[7]

Note: Line (open dots) for temperature at inner surface of base layer, exposed side. This is temperature of stud cavity/edge of stud.

From the graph (fig 2) we inferred that the wall cavity with mineral wool takes 43 minutes to reach the ignition temperature of the wood stud (550° F).

The calculated time to auto ignition temperature for several depth increments into the mineral wool insulation (long direction of stud) are displayed below. (See Fig. 2A)

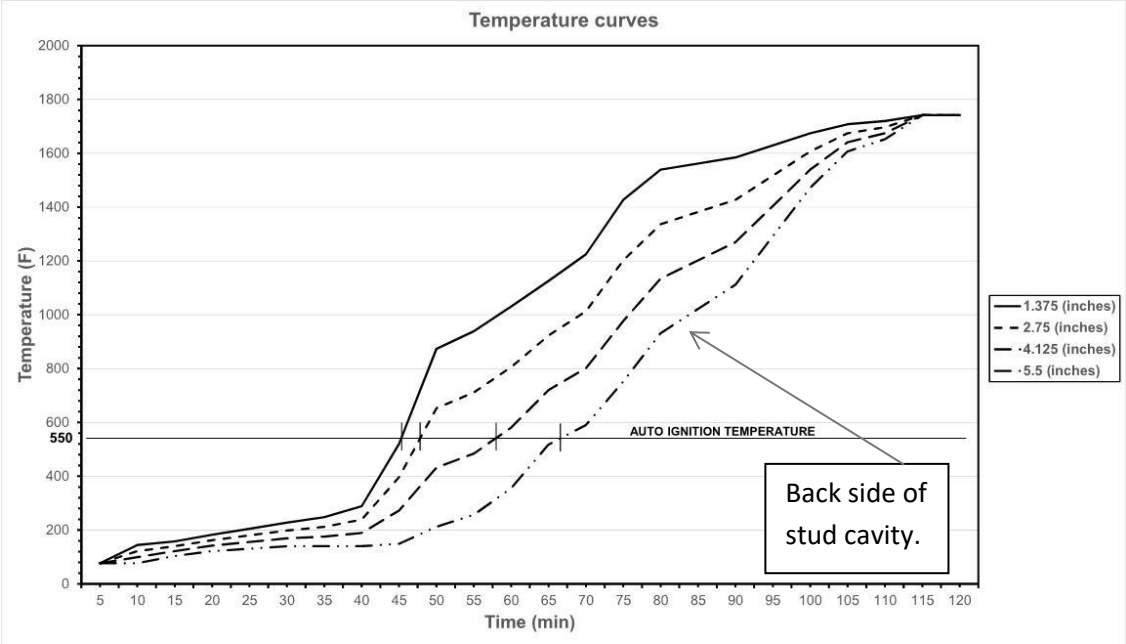


Figure 2A: Time vs Stud Surface Temperature curve – Calculated per Eq. 10.[7]

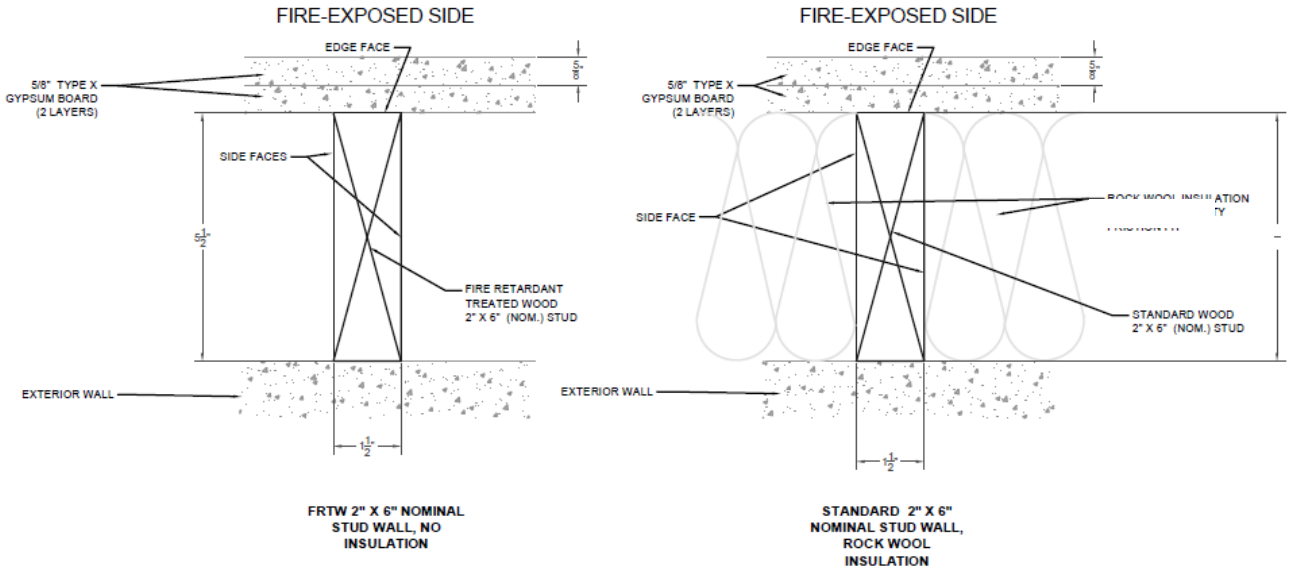


Figure 3: FRTW and Rock Wool Stud Walls

Note: Figures 3-6 do not show composition of the exterior (non-fire exposed) side, as other constructions, allowed by code for non-fire exposed assemblies, may be used. All wall types shall be 2-Hr rated as shown in Appendix A. For the fire separation distance less than 10', an additional layer of 5/8" type X gypsum board is required on the exterior side of the wall.

5. FIRE RESISTANCE COMPARISON

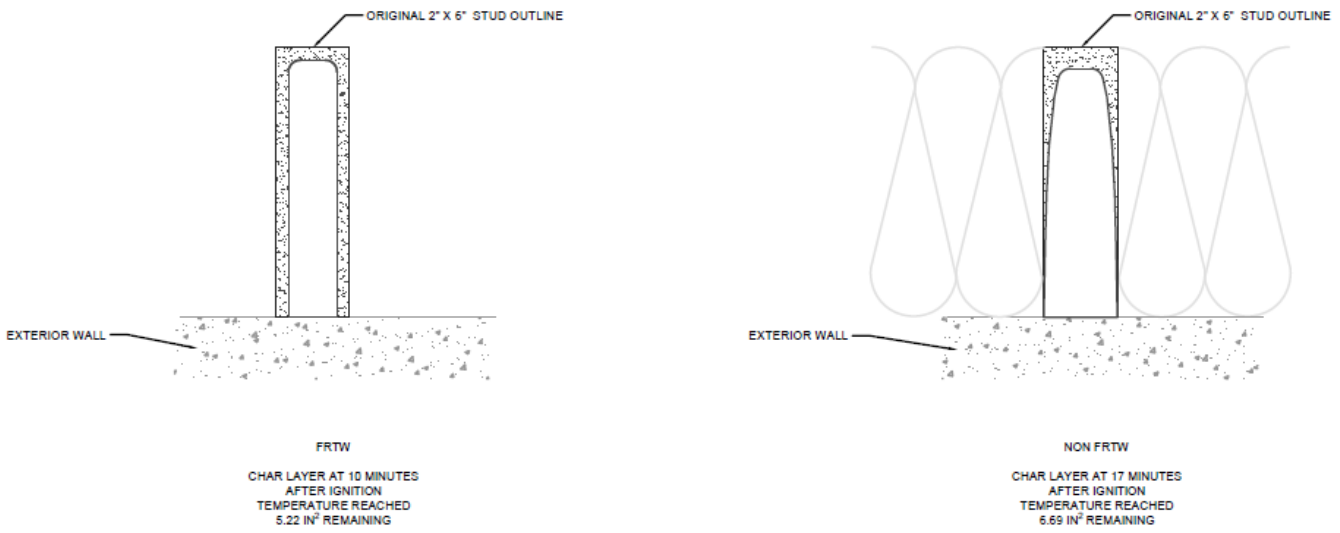


Fig 4: FRTW and non-FRTW Stud Wall at 60 Minutes after Fire Exposure of Gypsum Board Wall

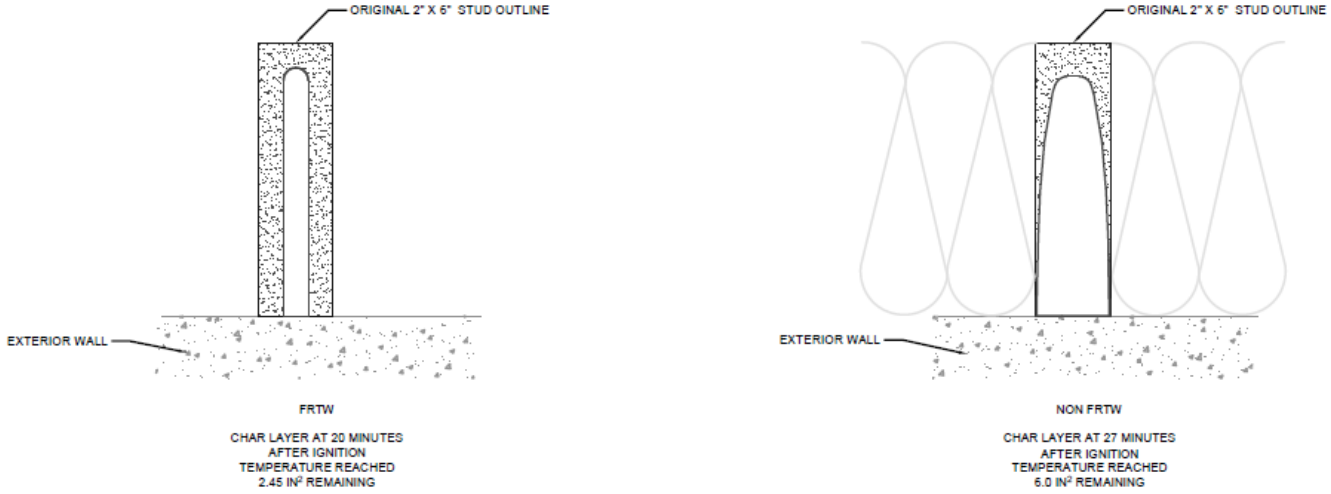


Figure 5: FRTW and Non-FRTW Stud Walls at 70 Minutes after Fire Exposure of Gypsum Board Wall Point of FRTW Wall Failure

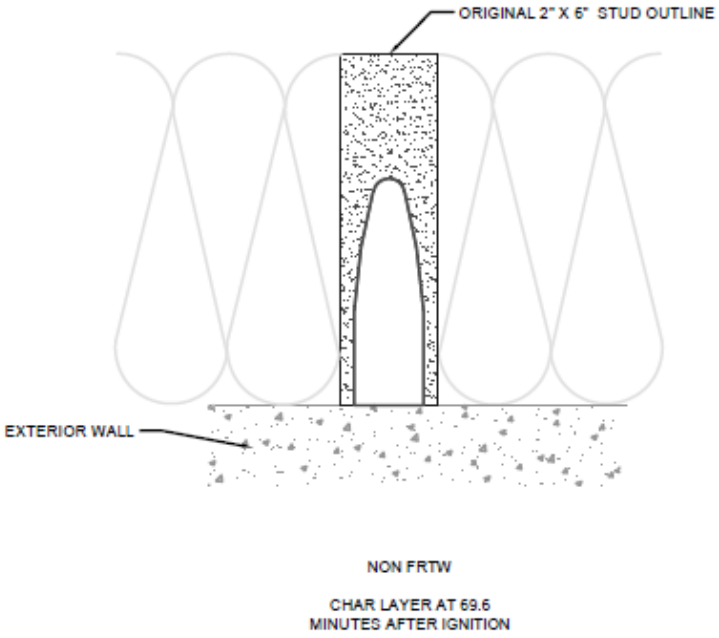


Figure 6: Non-FRTW Stud Wall at Failure at 112 Minutes – Reduced Cross Sectional Area Equivalent to FRTW at Failure

Charring and loss of load-supporting cross- minutes section of the wood studs begins at approximately 43 after exposure of the wall to fire, as heat conducts through the gypsum board and the temperature at the inside face of the gypsum board wall reaches the auto ignition temperature of wood. Ignition of the FRTW is delayed by approximately 7 minutes by the action of the fire retardant treatment. By approximately 50 minutes after exposure, both studs are experiencing charring.

At 60 minutes after exposure, approximately 50% of the allowable cross-section of the FRTW stud has been consumed by charring. Somewhat less (27%) of the insulated non-FRTW stud has been consumed at the same point, due to the effects of rock wool of rock wool in limiting heat transfer to the wood.

At 70 minutes, the FRTW has lost sufficient cross section that it fails in load. At this point, approximately 25% of the original FRTW stud cross-section remains. However, only 39% of the insulated stud has been consumed.

At approximately 112 minutes, charring of the insulated non-FRTW stud reaches the point at which less than 25% of the original cross-section remains and the stud fails.

The table below provides a comparative analysis that clearly shows that standard wood framing with rock wool insulation performs better than FRT wood framing under fire conditions.

Time Interval (minutes)	Description	FRTW Stud Reaction	Standard Stud with Rock 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

6. ADDITIONAL BENEFITS

1. Depending on the species, type of product (stud, joist, plywood, beam), and its application (wall, floor, roof), the strength originally associated with wood is reduced when treated with a fire retardant. Therefore, the FRTW manufacturer is required to provide strength adjustments based on the intended use of the wood. This reduction in strength must be factored in to the structural design of the building. The effective spans and bearing capacity of the lumber is reduced, so beams are over-sized and more lumber is used in the project than required with standard studs. Hence, non-treated wood consumes less natural resources and is structurally stronger than FRTW.
2. The process of pressure-impregnating chemicals into wood to achieve FRT lumber has a negative environmental impact, due to increased use of virgin chemicals and more waste chemicals that need to be treated before it is discharged in to the sewer system. Additionally, there are health impact concerns regarding to the occupants of the building from a long term exposure to the chemicals used in pressure impregnation. Unlike the chemical FRT process, rock wool is made from an inorganic fiber that does not have any known adverse impacts on the environment or individual health of occupants.
3. Due to the potential corrosion of steel, hot-dipped galvanized fasteners are required over standard zinc-plated type, when using FRT wood. Rock wool is made from inorganic fiber, it does not reduce the strength of the wood, and does not require hot dipped galvanized fasteners. Hence, it is a better alternative for the environment and overall structural design.

7. CONCLUSION

Rock wool Comfortbatt mineral wool insulation is optimal for this installation, as friction fitting between the 2x6 studs and expanding to fill the entire depth of the wall cavity will provide better protection than FRT wood framing as permitted by OSSC 2303.2 and 603.2. The architect is proposing to use Comfortbatt insulation by Roxul Company. The batt insulation will be a minimum of 5.5 inches thick and will be friction fit within the stud cavity. This product has been used in our analysis and the proposed wall assembly, it will exceed the performance of an FRT wood framed wall assembly. Code does not prohibit the use of better quality products than what is mandated. As this proposed assembly exceeds the base code criteria, it will satisfy the minimum code requirement. Where the fire separation distance is less than 10ft, 2 layers of 5/8" type X gypsum board are installed on the exterior side.

Franklin Callfas
Fire Protection Engineer
Principal/Code Unlimited

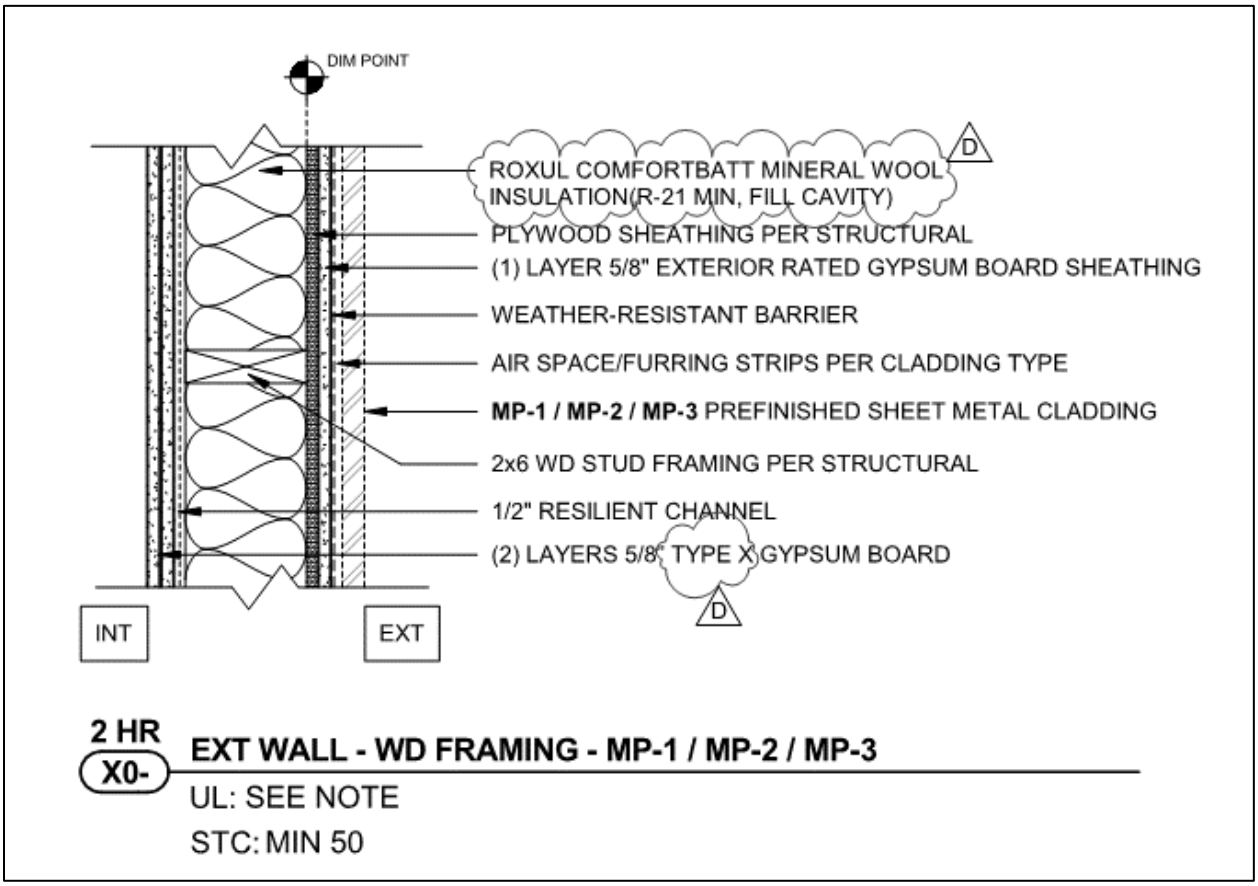
Appendix A

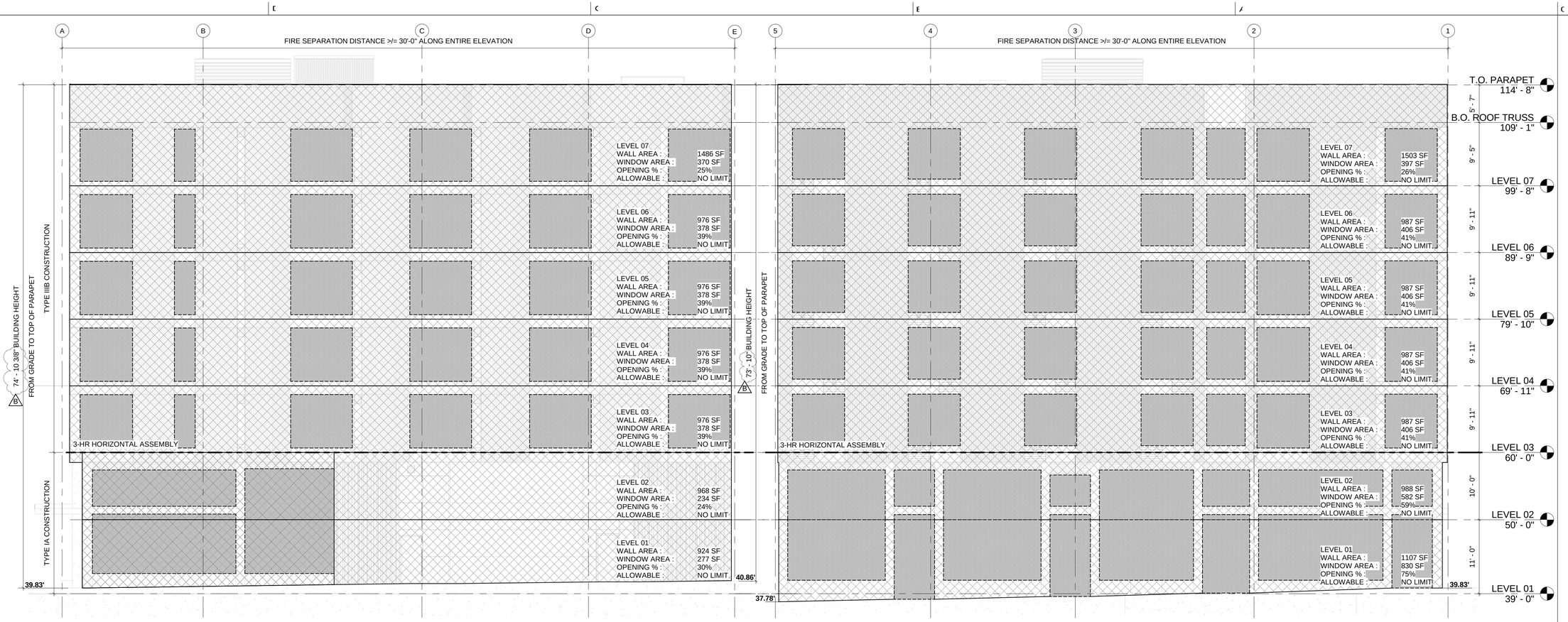
Proposed Wall Section

PROPOSED WALL ASSEMBLY:

- 2” x 6” nominal stud size,
- (2) layers of type ‘x’ 5/8” gypsum sheathing,
- Roxul comfortbatt mineral wool (R24) with min 5.5 inch thick.

Appendix A Figure 1: Exterior Wall Assembly at FSD > 30 feet





2 CODE ELEVATION - WEST

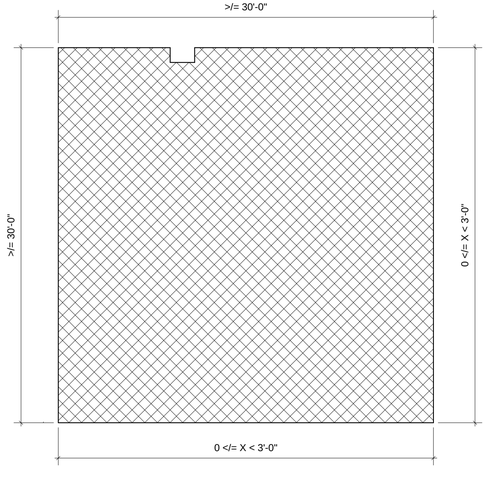
SCALE: 1/8" = 1'-0"

NOTE: NW 15TH AVENUE WILL BE DESIGNATED FRONTAGE FOR AERIAL FIRE ACCESS PER FIRE CODE APPEAL#

1 CODE ELEVATION - NORTH

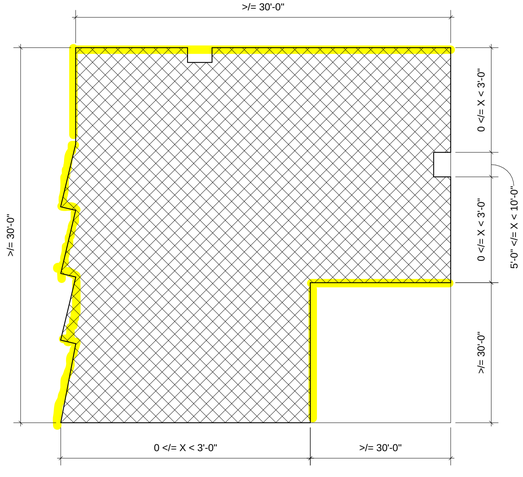
SCALE: 1/8" = 1'-0"

NOTE: NW OVERTON STREET NOT QUALIFIED FOR AERIAL FIRE ACCESS PER FIRE CODE APPEAL#



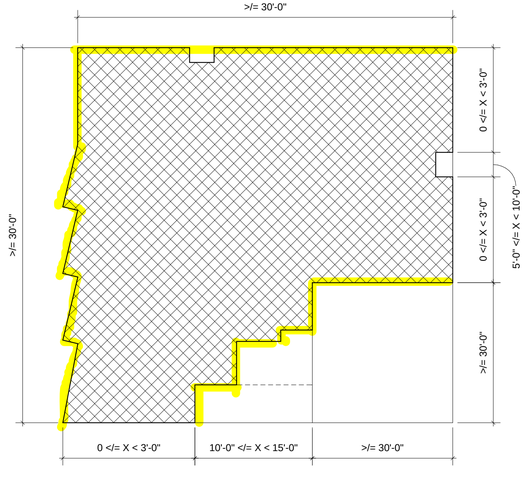
FIRE SEPARATION DISTANCE - TYPE IA LVL01-02

SCALE: 1" = 20'-0"



FIRE SEPARATION DISTANCE - TYPE IIIB LVL03-06

SCALE: 1" = 20'-0"



FIRE SEPARATION DISTANCE - TYPE IIIB LVL07

SCALE: 1" = 20'-0"

GENERAL NOTES - CODE ELEVATIONS

1. ALL EXTERIOR WALLS TO BE 1-HOUR FIRE RATED MINIMUM PER CITY OF PORTLAND CODE GUIDE 'NON-FIRE-RETARDENT TREATED WOOD FRAMING WITHIN EXTERIOR WALLS OF R-2 OCCUPANCY BUILDINGS OF TYPE III CONSTRUCTION'.

2. BUILDING SHALL HAVE APPROVED ADDRESS NUMBERS, BUILDING NUMBERS OR APPROVED BUILDING IDENTIFICATION PLACED IN A POSITION THAT IS PLAINLY LEGIBLE & VISIBLE FROM THE STREET OR ROAD FRONTING THE PROPERTY. THESE NUMBERS SHALL CONTRAST WITH THEIR BACKGROUND & BE A MINIMUM OF 4 INCHES HIGH WITH A MINIMUM STROKE WIDTH OF 0.5 INCHES.

NOTE: At FSD >10', protected on inside with at least two layers of 5/8" type X gyp and outside with a layer of 5/8" fire rated gyp sheathing

At FSD <10', protected on inside and outside with at least two layers of 5/8" type X gyp

VALLASTER CORL ARCHITECTS, PC
711 SW ALDER
PENTHOUSE SUITE
PORTLAND, OR 97205
PHONE : 503.228.0311
FAX : 503.228.0314
www.vcarch.com

REGISTERED ARCHITECT
JAMES M. VALLASTER
PORTLAND, OREGON
STATE OF OREGON

OWNER :

PEARL DISTRICT APARTMENTS, LLC

PROJECT NAME :

OVERTON 15

1470 NW OVERTON ST
PORTLAND, OR 97209

REVISIONS :

B FLS CHECKSH : 09-29-2017

ISSUE DATES :
11-01-2016: DD MEP
11-14-2016: DD 75%
11-23-2016: DD 100%
05-22-2017: PERMIT SET

JOB NO. :	1612
DRAWN :	Author
CHECKED :	Checker
STATUS :	PERMIT

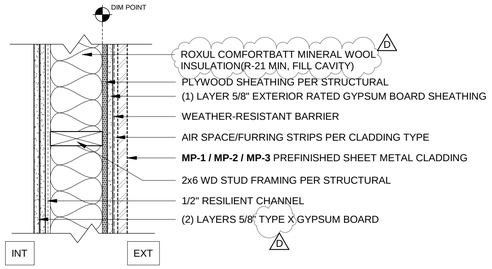
CODE ELEVATIONS - WEST & NORTH

G011

ORIGINAL SHEET SIZE : 22"x34"

9/29/2017 11:16:37 AM

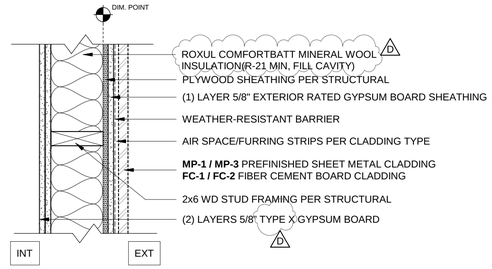
C:\Users\Author\ VCAPDX\Desktop\Overton15 - LOCAL\OVERTON 15_NEW CENTRAL_Author.rvt



2 HR **X0-** **EXT WALL - WD FRAMING - MP-1 / MP-2 / MP-3**

UL: SEE NOTE

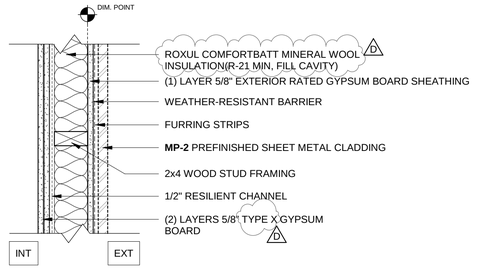
STC: MIN 50



2 HR **X1-** **EXT WALL - WD FRAMING - MP-1 / MP-3 / FC-1 / FC-2**

UL: SEE NOTE

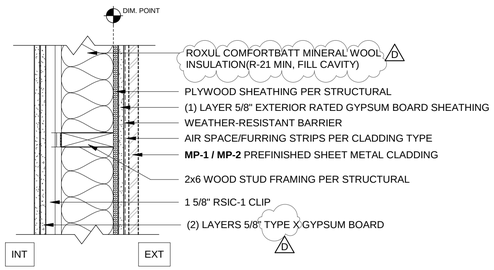
STC: MIN 50



2HR **X2-** **EXT WALL - WD FRAMING - MP-2 @ BALCONETS**

UL: SEE NOTE

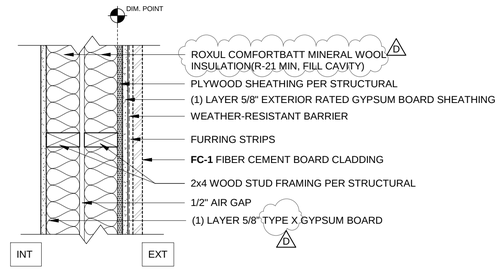
STC: MIN 50



2 HR **X3-** **EXT WALL - WD FRAMING - MP-1 / MP-2**

UL: SEE NOTE

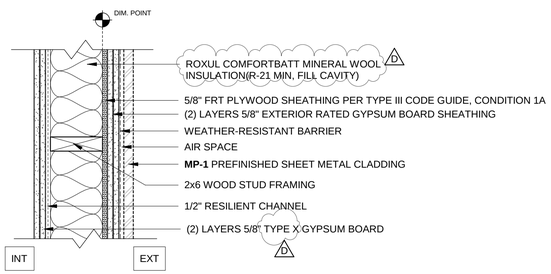
STC: MIN 50



2 HR **X4-** **EXT WALL - WD FRAMING - FC-1**

UL: SEE NOTE

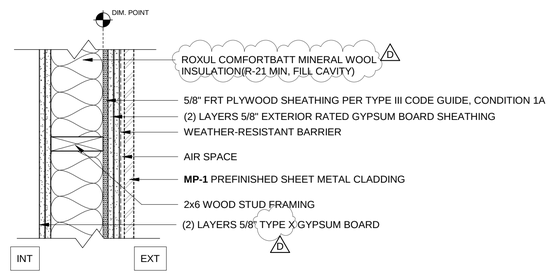
STC: MIN 50



2HR **X5-** **EXT WALL - WD FRAMING - MP-1 @ SOUTH PROP. LINE**

UL: SEE NOTE

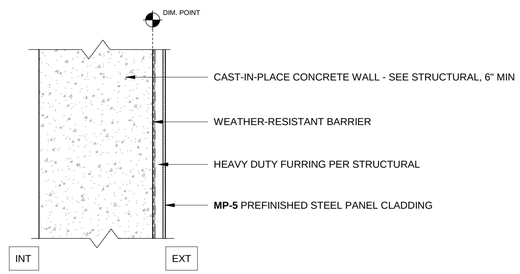
STC: MIN 50



2HR **X6-** **EXT WALL - WD FRAMING - MP-1 @ EAST PROP. LINE**

UL: SEE NOTE

STC: MIN 50



3HR **X7-** **EXT WALL - CONCRETE - MP-5**

UL: OSSC 2014 TABLE 721.1(2) ITEM# 4-1.1

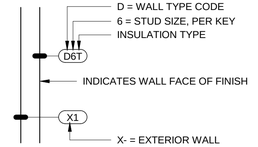
STC: N/A

GENERAL NOTES - WALL TYPES

1. REFER TO CODE PLANS FOR REQUIRED FIRE RATINGS
2. CONTRACTOR TO COORDINATE STUD MATERIAL THICKNESS OF INDIVIDUAL WALLS TO MEET ALLOWABLE LIMITING WALL HEIGHT CRITERIA.
3. ALL FIRE PARTITIONS & FLOORS SHALL BE CAULKED AROUND PERIMETER WITH A UL APPROVED NON-HARDENING SEALANT.
4. WALL ASSEMBLIES TO EXTEND TO UNDERSIDE OF STRUCTURE ABOVE, UNLESS DETAILED OTHERWISE - SEE CEILING PLANS FOR PARTIAL HEIGHT WALLS.
5. COORDINATE WITH CODE COMPLIANCE SUMMARY DRAWINGS FOR RATED WALL LOCATIONS - CONTRACTOR TO REFER TO APPLICABLE DOCUMENTATION PERTAINING TO FIRE RATING & ACOUSTIC REQUIREMENTS NOTED PER ASSEMBLY.
6. NON-BEARING WALLS ATTACHED TO STRUCTURE ABOVE TO HAVE DEFLECTION HEAD:
   WALLS < 10'-5" = 3/4"
   WALLS = 10'-5", < 20'-0" = 1"
   WALLS >20'-0" = 1-1/4"
7. INSTALLATION SHALL COMPLY WITH 2014 OREGON STRUCTURAL SPECIALTY CODE, CHAPTER 25.
8. WET WALLS ARE DEFINED AS ANY WALLS WITHIN 4'-0" OF A PLUMBING FIXTURE. ALL WET WALLS TO RECEIVE MOLD-RESISTANT GYPSUM BOARD.
9. SEE DEFLECTION HEAD DETAIL FOR TYPICAL CONDITION.
10. AT WALLS OF DIFFERING THICKNESS INTENDED TO ALIGN, PROVIDE ADDITIONAL GYPUSM BOARD MATERIAL TO CREATE A FLUSH FINISH SURFACE.
11. COORDINATE W/ STRUCTURAL FOR BEARING WALL & SHEARWALL LOCATIONS, REQUIREMENTS.
12. USE PUDDY PADS FOR OUTLETS IN ALL WALLS STC-50 OR GREATER.
13. USE PUDDY PADS FOR ALL RECESSED OUTLETS IN CEILINGS.
14. AVOID PLACING OUTLETS SERVING OPPOSITE SIDES OF A WALL THAT ARE <24" APART.
15. CONTINUOUS CEMENTITIOUS UNDERLAYMENT UNDER ALL BATHTUBS.
17. ALL EXTERIOR CLADDING SYSTEMS (INCLUDING MP-1, MP-2, MP-3 & MP-5) TO BE NON-COMBUSTIBLE. ALL EXTERIOR CLADDING SYSTEMS NOT TO CONTAIN COMBUSTIBLE MATERIALS AS PART OF THE SYSTEM, INCLUDING BUT NOT LIMITED TO FOAM INSULATION.
18. CONSTRUCTION OF FIRE RATED ASSEMBLIES MUST COMPLY WITH ALL REQUIREMENTS OF THE REFERENCED LISTED ASSEMBLIES.

ASSEMBLY LEGEND

WALL TYPES SYMBOL:



FLOOR SYMBOL : FLX

ROOF SYMBOL : RFX

CEILING SYMBOL : CLX

METAL STUD SIZE KEY:

0	= 7/8"
1	= 1 5/8"
2	= 2 1/2"
3	= 3 5/8"
4	= 4"
6	= 6"
8	= 8"
10	= 10"

WOOD STUD SIZE KEY:

2	= 2 x 4 (FLAT FRAMED)
4	= 2 x 4
6	= 2 x 6, 3x6 REF STRUCT
8	= 2 x 8

CMU SIZE KEY:

4	= 4 x 8 x 16
6	= 6 x 8 x 16
8	= 8 x 8 x 16

CONCRETE WALL KEY:

8	= 8"
10	= 10"
12	= 12"

INSULATION KEY:

T	= THERMAL
A	= ACOUSTIC

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EXTERIOR WALL ASSEMBLIES

A001

ORIGINAL SHEET SIZE : 22"x34"

10/20/2017 2:40:59 PM

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