Development Services

From Concept to Construction

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APPEAL SUMMARY				
Status: Hold for additional information				
Appeal ID: 16145	Project Address: 1075 NW 16th Ave			
Hearing Date: 11/22/17	Appellant Name: Joshua Scott			
Case No.: B-002	Appellant Phone: (206) 755-1290			
Appeal Type: Building	Plans Examiner/Inspector: Jerry Engelhardt			
Project Type: commercial	Stories: 6 Occupancy: R-2 Construction Type: III-A over I-A			
Building/Business Name:	Fire Sprinklers: Yes -			
Appeal Involves: Erection of a new structure	LUR or Permit Application No.: 17-116106-CO			
Plan Submitted Option: pdf [File 1] [File 2]	Proposed use: Multifamily Residential			

APPEAL INFORMATION SHEET

Appeal item 1

Code Section	OSSC 602.3
Requires	2014 OSSC Section 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 complying with Section 2303.2 shall be permitted within exterior wall assemblies of a 2-hour rating or less.
Proposed Design	We propose utilizing 5 ¼" PSL Rim Joists, as specified with no additional fire-retardant-treatment within the exterior wall assembly. All other framing in the exterior walls will be fire-retardant-treated-wood.
Reason for alternative	Fire retardant treated wood framing is proposed for the exterior walls, providing the required 2 hour rating. As designed, the rim boards were specified as "5 ¼" PSL rim joists." PSL joists cannot be fire retardant treated. However, as stated by Jim Anderson of Weyeraeuser (see attached blog post) "The IBC (section 722) allows calculated fire resistance of exposed wood members from Chapter 16 of the ANSI/AF&PA National Design Specification for Wood Construction (NDS). Calculating fire resistance per the NDS is valid for Parallam PSL as stated in section 4.3.1 in our ESR 1387 code report. Contained within the NDS is a formula to determine the effective char rate based on time exposure and nominal char rate. Per testing listed in our TJ-1500 specifiers guide (Fire Rated Assemblies and Sprinkler Systems), Parallam PSL has a nominal char rate of 1.5?/hour. When looking at a 5-1/4? section of Parallam PSL, the effective layer of char is 3.2? for a 2 hour time period, assuming only one face exposed to the fire, leaving the remaining section to be checked for load adequacy."

The same provision is allowed in 2014 OSSC Section 722.





A previous product produced by Weyerhauser for this situation, Rim Board with Flak Jacket has apparently been discontinued due to odor from the coating so the product is not available at this time.

The dimensional similarity (same depth as engineered joists,) controlled moisture content, and consistent height tolerances all provide a higher quality assembly utilizing PSL vs. another dimensional lumber product.

APPEAL DECISION

Non-fire retardant treated PSL rim joists in exterior wall of Type IIIA construction: Hold for additional information.



BUILDING CODE SUMMARY

OCCUPANCY						COMPLIANCE NOTE	CODE REFERENCE
LOBBY	A-3		ASSEMBL	LY 15 SF NET / OCC	UPANT	SEE	310.4, TABLE 1004.1.2
COMMERCIAL SPACE	A-3		ASSEMBLY 15 SF NET / OCCUPANT		CUPANT	DIAGRAMS	
BIKE STORAGE	S-2		200 SF G	ROSS / OCCUPANT	r	SHEETS A0.30-A0.32	
APARTMENT UNITS	R-2		200 SF G	ROSS / OCCUPANT	r		
LAUNDRY ROOMS	R-2 (INC	IDENTAL USE}	200 SF G	200 SF GROSS / OCCUPANT			
	,						
OCCUPANCY SEPARATION DWELLING UNIT SEPARATIC HORIZONTAL: VERTICAL:	0N	1 HOUR ASSE 1/2 HOUR PAR	IMBLY RTITION	A		SEE ASSEMBLIES A0.40-A0.41	420, 708 711.3 EXCEPTION
CONSTRUCTION TYPE	5	~~~~~~	~~~~~		(manual)		
TYPE IIA OVER 1 LEVEL TYP	PEIA	FIRE-RETARD BEARING WA	ANT-TREAT	TED WOOD FRAMIN	IG EXTERIOR		
HEIGHT AND AREA	,	24 000 50 / 10		·····	man		TABLE 503
BASE HEIGHT:		4 STORIES / 6	6 FEET (5 S	STORIES / 85 FEET	FROM GRADE PLANE	5 STORIES (ABOVE HORIZONTAL ASSEMBLY)	TABLE 503
AREA MODIFICATIONS: HEIGHT MODIFICATIONS:	EA MODIFICATIONS: NOT NECESSARY					(ABOYE HOMEONY/IE HOMEONY)	504
SPRINKLER INCREASE:		1 STORY + 20	FEET, HIGH	HEST OCCUPIED FI	OOR	80-8" ABOVE GRADE PLANE	504.2
		NO MORE TH	AN 75' FROM	M LOWEST			
		BUILDING					
HORIZONTAL BUILDING SEP ALLOWANCE	ARATION	BUILDING CO BUILDINGS FI	NSIDERED	AS SEPARATE AND RPOSE OF DETERM	DISTINCT INING AREA		510.2
LIMITATIONS, CONTINUITY OF FIRE WALLS, LIMITATIONS OF NUMBER OF STORIES AND TYPE OF CONSTRUCTION:							
1. 3 HOUR HORIZONTAL ASSEMBLY REQUIRED 2. BUILDING BELOW ASSEMBLY IS NOT GREATER THAN 1 STORY 3. BUILDING BELOW ASSEMBLY IS OF TYPE 14 CONSTRUCTION 4. SHAFT, STARWAY, RAMP AND BECALATORS THROUGH					PROVIDED - SEE ASSEMBLIES A0.40 PROVIDED - SEE SECTIONS A4.10-A4.20 PROVIDED - SEE ASSEMBLIES A0.41 PROVIDED		
ASSEMBLY SHALL HAVE NOT LESS THAN 2 HOUR RATING 5. GROUP R OCCUPANCY IS ALLOWED ABOVE HORIZONTAL					OKAY		
ASSEMBLY 6. THE BUILDING BELOW THE HORIZONTAL ASSEMBLY SHALL BE					PROVIDED		
PROTECTED BY AN APPROVED AUTOMATIC SPRINKLER SYSTEM 7. MAXIMUM BUILDING HEIGHT SHALL NOT EXCEED LIMITS FOR					PROVIDED - SEE SECTIONS A4.10-A4.20		
THE BUILDING HAVING THE SMALLER ALLOWABLE HEIGHT AS MEASURED FROM THE GRADE PLANE.							
FIRE RESISTIVE REQUIREMEN	rrs						
STRUCTURAL FRAME: BEARING WALLS (EXTERIOR BEARING WALLS (EXTERIOR FIRE SE WALLS (EXTERIOR FIRE SE USA (STATE) ROOF CONSTRUCTION: ROOF CONSTRUCTION: BLEVATOR MOCHINE ROOM EXIT STARE REVOLOSURES: TRASH CHUTE TERMINATIO	R): PARATION PARATION PARATION PARATION I: I: I: I: I: I: I: I: I: I:	>30') >10', <30') >5', <10'] <5'	1 HOUR 2 HOUR 1 HOUR 1 HOUR 1 HOUR 1 HOUR 1 HOUR 1 HOUR 1 HOUR 2 HOUR N/A 2 HOUR N/A 2 HOUR N/A			SEE ASSEMBLIES A0.40-A0.41	TABLE 601 TABLE 601 TABLE 601 TABLE 602 TABLE 602 TABLE 602 TABLE 602 TABLE 601, 420.2, 420.3 TABLE 601, 420.2, 420.3 N/A
OPENING PROTECTION		WALL BATTERS	DOCH BATING	warnow	AREA OF UNPROTECTED		
EXTERIOR - ABOVE GRADE		1	NR	NR	25% UNPROTECTED.		TABLE 705.8
(FIRE SEPARATION >5', <10'))				SPRINKLERED		
EXTERIOR - ABOVE GRADE (FIRE SEPARATION >10', <15	57)	0	NR	NR	45% UNPROTECTED, SPRINKLERED	GREATER THAN 30'SEPARATION AT NORTH AND EAST FACADES SO NO OPENING LIMITATIONS ON NORTH	5 TABLE 706.8
EXTERIOR - ABOVE GRADE (FIRE SEPARATION >30')		e	NR	NR		AND EAST SIDE	}
FIRE BARRIERS AND PARTIN	TIONS	1	45 MIN.	45 MIN.	25% OF WALL AREA	5 <fire distance<10"<br="" separation="">AT SOUTH AND WEST FACADES, SEE A0.12 FOR MAX, OPENING ANALYSIS</fire>	TABLE 705.8
FIRE BARRIERS AND PARTI	TIONS	2	90 MIN.	NOT PERMITTED	N/A	and the state of t	·
		I			I	1	l

Building Code Summary from Permit Documents A0.11



Exterior wall detail from permit documents S5.2, (note added to clarify no treatment proposed)



What can we help you find?

USING ENGINEERED WOOD IN 2-HOUR FIRE RESISTANCE WALL CONSTRUCTION

Posted on July 25, 2014 by Jim Anderson (http://blog.weyerhaeuser.com/author/janderson/)



With the recent increase in multifamily construction, we are seeing more instances where 2-hour rate walls are required. This leads to questions concerning how to properly frame the intersection of the floor and wall assembly. 2-hour fire rated walls are required in some buildings based on Table 601 an

602 of the International Building Code. The expectation is that fire protection extends through the rir location of the floor assembly. Some typical locations you will see a 2-hour fire rated wall requirements include mechanical shafts, elevator cores, stair ways, and exterior load bearing walls.

The traditional approach of platform framing (using a rim board and floor framing on top of a stud wall) is still the preferred method of construction both for economics and speed. A traditional approach to protect the rim board is to install the same quantity of gypsum protection used on the walls below to protect the rim above. This method creates complications for the project due to the need of the gypsum applicator to install during the framing stage in additional to completion of framing. This involves scheduling multiple trips to the job site and extra fees. Another method is to balloon frame the wall with custom stud heights, apply gypsum and ledger the floor system to the wall. There are also new hangers available to be support floor joists through two layers of gypsum in lieu of a ledger, but this does not solve the problem of having the gypsum installer providing multiple job site visits.

The growing trend at these continuously supported intersections is to install a large section of wood for fire endurance in lieu of a smaller section with multiple layers of gypsum. The rationale behind th is that if you have a large enough section of wood, after two hours of burning, there is still sufficient section remaining to have capacity to transfer loads defined by the designer of record.



(/wp-content/uploads/2014/07/tech-blog-pic-2-.png)

(/wp-content/uploads/2014/07/tech-blog-pic-1-.png)

5 ¼" Parallam[®] PSL may be a suitable material at continuously supported locations to meet the 2-hour fire rated wall requirement based on the following code provision.

Type III and V Construction: The IBC (section 722) allows calculated fire resistance of exposed wood members from Chapter 16 of the ANSI/AF&PA National Design Specification for Wood Construction (NDS). Calculating fire resistance per the NDS is valid for Parallam PSL as stated in section 4.3.1 in ou ESR 1387 code report. Contained within the NDS is a formula to determine the effective char rate based on time exposure and nominal char rate. Per testing listed in our TJ-1500 specifiers guide (Fire Rated Assemblies and Sprinkler Systems), Parallam PSL has a nominal char rate of 1.5"/hour. When looking at a 5-1/4" section of Parallam PSL, the effective layer of char is 3.2" for a 2 hour time period assuming only one face exposed to the fire, leaving the remaining section to be checked for load adequacy.

It is important to note that designers must always verify compliance of this approach with the authority having jurisdiction, especially for applications that require fire retardant treatment in the code. This is because Parallam PSL cannot be treated with fire retardant.

What are the benefits of using Parallam PSL in this application?

There are other unique benefits to using a solid piece of Parallam PSL over other traditional material and methods described above. Most already know the reasons not to use dimension lumber, but they're worth reviewing. First, dimension lumber does not come in depths that are compatible with TJI[®] Joists and Weyerhaeuser structural composite lumber. Even if it did, the material may be "green or at best kiln dried down to 15% moisture content (MC), resulting in significant shrinkage compared to other engineered lumber floor components. This can lead to structural and aesthetic problems.

This same concern exists with glued laminated timbers. They may be manufactured and published with the same depths as engineered wood products, however, Glulam height tolerances for beams allow up to minus 3/16". Besides the variability in manufacturing, one must also consider that the la stock used to make Glulams are permitted to be up to 16% MC at time of manufacture, resulting in typical finished product MC of 12-14%. These two items can lead to potential serviceability and structural issues. Parallam PSL and TJI joists are manufactured under tight quality control targets, allowing the products to be compatible from a MC and product depth standpoint. The MC of Parallar and TJI joists is approximately 4-6%, resulting in a dimensionally stable floor system.

In review, there are alternate methods to achieve 2-hour fire rating at the floor and wall intersection that are code recognized utilizing readily available materials. Review of the structural and fire requirements should be coordinated through the Engineer and Architect on the project to ensure approval by the authority having jurisdiction. For more information on Parallam PSL visit our **websit** (http://http://www.woodbywy.com/trus-joist/parallam-psl).

Jim Anderson



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