Development Services

From Concept to Construction

Phone: 503-823-7300 Email: bds@portlandoregon.gov 1900 SW 4th Ave, Portland, OR 97201
More Contact Info (http://www.portlandoregon.gov//bds/article/519984)

APPEAL SUMMARY

Status: Hold for Additional Information

Appeal ID: 31465	**Project Address:** 406 NW Glisan St
Hearing Date: 4/12/23	**Appellant Name:** Jordan Bissett
Case No.: B-005	**Appellant Phone:** 5032339856
Appeal Type: Building	**Plans Examiner/Inspector:** Renay Radtke Butts
Project Type: commercial	**Stories:** 3 **Occupancy:** A, B, R-1 **Construction Type:** V-B
Building/Business Name:	**Fire Sprinklers:** Yes - throughout
Appeal Involves: Alteration of an existing structure	**LUR or Permit Application No.:** 22-199311-CO
Plan Submitted Option: pdf [File 1]	**Proposed use:** Assembly & Business

APPEAL INFORMATION SHEET

Appeal item 1

Code Section	602
Requires	602 Construction Classification Buildings and structures erected or to be erected, altered or extended in height or area shall be classified in one of the five construction types defined in Sections 602.2 through 602.5. The building elements shall have a fire-resistance rating not less than that specified in Table 601 and exterior walls shall have a fire-resistance rating not less than that specified in Table 602. Where required to have a fire-resistance rating by Table 601, building elements shall comply with the applicable provisions of Section 703.2. The protection of openings, ducts and air transfer openings in building elements shall not be required unless required by other provisions of this code.
Code Modification or Alternate Requested	Reclassify construction classification of the building from Type V-B to Type IV.
Proposed Design	The existing condition of the building meets the requirements stated in 602.4 Type IV. Per Table 601: The existing Primary structural frame, Floor construction, and Roof construction meet requirements of Heavy Timber, described in 2304.11. The existing Exterior Bearing walls are of solid masonry (min 10” thick) and solid concrete shear walls (additional 9” thick), meeting 2-hr fire-resistance rating. The as-built drawing indicate that all interior partitions are of 1-hr fire-resistance-rated construction per 2304.11.2.2. If, in the course of demolition and construction, any interior partition is found to be lacking the requirements of a 1-hr fire-resistance-rated construction, they will be upgraded to meet these requirements.
Reason for alternative	The existing condition of the building meets the requirements of Type IV construction.

APPEAL DECISION

Determination of construction as Type IV: Hold for additional information.

Appellant may contact John Butler (503 865-6427) or e-mail at John.Butler@portlandoregon.gov with questions.

PLEASE READ THE NOTE BELOW when providing Board requested Additional Information or when submitting a reconsideration after 1st time appeal Denial.

A reconsideration is submitted online following the same submittal process and using the same appeals form as the original appeal. Indicate at the beginning of the appeal form that you are filing a reconsideration and include the original assigned Appeal ID number. The reconsideration will receive a new appeal number.

Include the original attachments and appeal language. Provide new text with only that information that is specific to the reconsideration in a separate paragraph(s) clearly identified as "Reconsideration Text" with any new attachments also referenced. Once submitted, the appeal cannot be revised.

No additional fee is required when the Board has requested additional information or for the first reconsideration of a denied appeal if submitted within 6 months of the original appeal. In these two specific instances please ignore the auto-generated request for another fee.

GRUMMEL ENGINEERING, L.L.C.

920 SW 3rd Ave., Ste. 200
Portland, OR 97204
Phone: (503) 244-7014
www.grummelengineering.com

Jonathan Cohen
Old Town Community Association
Jonathan@equitydevelopmentlab.com
971.404.9671

March 22, 2023

RE: Project: 406 NW Glisan Remodel
Project Number: 222183
Permit Number: 2022-199311-000-00-CO

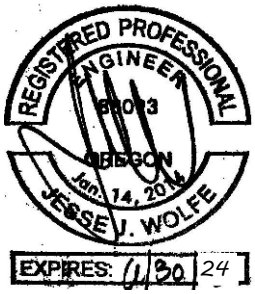
Dear Jonathan,

We have reviewed the requirements of IBC chapter 6. The building at 406 NW Glisan shall be classified as a Type IV-HT per Table 601 of section 601. The framing meets the requirements of a heavy timber construction and the exterior walls are non-combustible. Furthermore we performed a char analysis of the structural members. Members, including decking, were found to have adequate strength with an equivalent char rating of 1-hour.

Please call me at 541-295-5193 if you have any questions regarding the information in this review.

Sincerely,

Jesse Wolfe, P.E..
Grummel Engineering, LLC

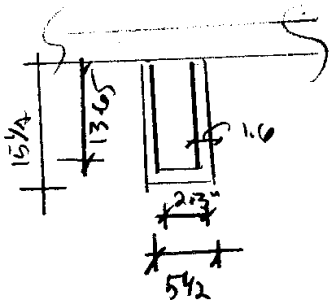


APPENDIX

1-HOUR CHAR RATING DESIGN CHECK
HEAVY TIMBER CLASSIFICATION

CHAR RATING HEAVY TIMBER

1ST FLOOR JOISTS (L=15.5')



DL ≈ 15 psf
LL = 125
TRIB = 3.125

w = 438 PLF

$M = wl^2/8 = 13.2$ K-FT

CAPACITY

$M_{ALL} = f_b S_x K \frac{1}{12}$

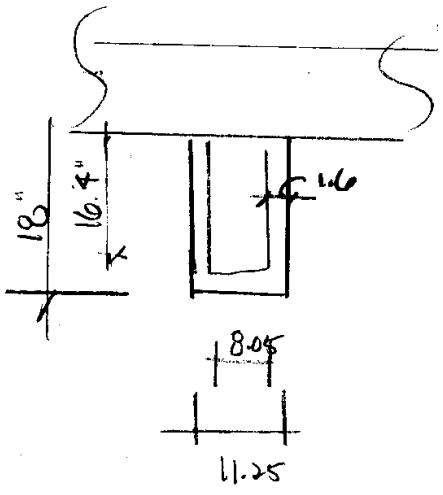
$f_b = 1350$

$S_x = (2.3)(13.65)^2/6 = 71.4$

$K = 2.85$

$M_{ALL} = 22.9$ K-FT ✓

1ST FLOOR BEAMS (L=11.5)



DL = 15
LL = 125
TRIB = 16

w = 2240

M = 37.0 K-FT

V = 12.9 K

CAPACITY

$M_{ALL} = f_b S_x K \frac{1}{12}$

$f_b = 1350$

$S_x = (8.05)(16.4)^2/6 = 360$

$K = 2.85$

$M_{ALL} = 115.4$ K-FT ✓

$V_{ALL} = \frac{2}{3}(8.05)(16.4)(180)(2.85)$

$V_{ALL} = 45.1$ K ✓

1ST FLOOR COLUMN

$P_{TOT} = 68$ · (WITHOUT LIVE LOAD REDUCTION)

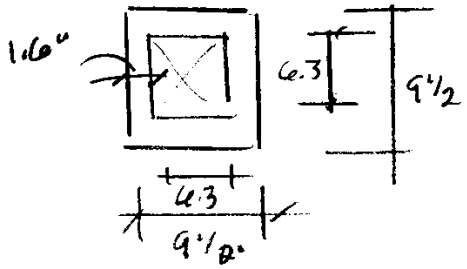
$P_{TCK} = 63^K$ (NO SNOW LOAD)

$$LLR = \left(0.25 + \frac{15}{\sqrt{K_{LL} A_T}}\right)$$

$A_T = 1600$ SF

$K_{LL} = 4$

$LLR = 0.56$



$P_{TOT} = 40.6$ [LIVE LOAD REDUCED NO SNOW]

$P_{ALL} = F_c' A C_p K$

$A = (6.3)^2 = 39.7 \text{ in}^2$

$F'_c = 1200$

$K = 2.58$

$$C_p = \frac{1 + F_{CE}/F_c}{2c} - \sqrt{\left(\frac{1+F_{CE}/F_c}{2c}\right)^2 - \frac{F_{CE}/F_c}{c}}$$

$$F_{CE} = \frac{0.822 E_{min}}{(l_e/d)^2}$$

$l_e = 84"$

$d = 6.3$ in

$E_{min} = 586,000$

$F_{CE} = 2681$

$c = 0.80$

$$C_p = 2.02 - \sqrt{(2.02)^2 - 2.79}$$

$C_p = 0.88$

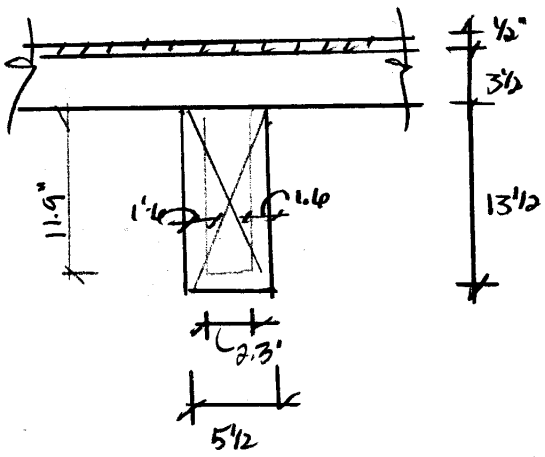
$P_{ALL} = 108.8^K$ ✓

2ND FLOOR JOISTS (L = 15.5')

DL = 15 PSF
LL = 185 PSF (OFFICE + PART.)
TRIB = 3.125'

W = 250 PLF

M = $wl^2/8$ = 7,508 IB-FT



CAPACITY

$M_{ALL} = f_b S_x K \frac{1}{12}$

f_b = 1350

$S_x = (2.3)(11.9)^2/6 = 54.3 in^3$

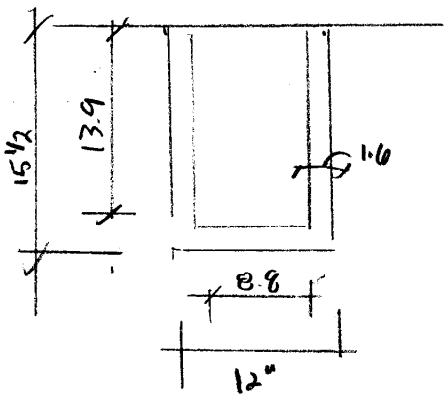
K = 2.85

M_{ALL} = 17.4 K-FT ✓

2ND FLOOR BEAMS (L = 11.5')

DL = 15
LL = 185
TRIB = 16 FT

W = 1280 IB-FT, M = 21.2 K-FT



CAPACITY

$M_{ALL} = f_b S_x K \frac{1}{12}$

f_b = 1350

$S_x = (8.8)(13.9)^2/6 = 283$

K = 2.85

M_{ALL} = 90.8 K-FT ✓

DECKING

SPAN = 3.125'
W = 80 PLF
M = $wl^2/10$ = 78 IB-FT

CAPACITY

$M_{ALL} = f_b S_x K \frac{1}{12}$

f_b = 1350

$S_x = 12"(3.5-1.6)^2/6 = 7.22 in^3$

K = 2.85

M_{ALL} = 2314 IB-FT ✓

Char Rates

Char rates are used to compare the rate of combustion between wood products. Although no ASTM or CAN/ULC test standards for char rate currently exist, most wood product testing laboratories burn the test specimen for a measured time period using a single radiant energy source, then extinguish the burn and measure the remaining section. The depth of char divided by the measured time period is the char rate. A lower char rate indicates a slower rate of burn.

Research conducted at the Forest Products Laboratory demonstrates that these char-rate calculation procedures are applicable to TimberStrand® laminated strand lumber (LSL), Parallam® parallel strand lumber (PSL), and Microllam® laminated veneer lumber (LVL). In a report dated February 2000, researcher Robert H. White concluded, "One-dimensional charring tests of structural composite lumber products, including LVLs, PSLs, and LSLs, confirmed that charring of these products in the standard fire-endurance test may be considered comparable with solid wood. Such results support the use of the fire-resistance calculation procedures for solid wood to estimate the ratings of composite lumber products." (*Charring Rate of Composite Timber Products,* Proceedings of the 4th International Wood and Fire Safety Conference, 2000.)

Char Rate Comparison

Product or Wood Species	Char Rates(6)	
	Inches/Hour	mm/Min.
TimberStrand® LSL(1)	1.7	0.72
Parallam® PSL(1)	1.5	0.64
Microllam® LVL(2)	1.4	0.59
TJI® Joist Performance Plus® Web(3)	1.5	0.62
OSB(4)	1.5	0.64
Douglas Fir(5)	1.6	0.68
Southern Pine(5)	2.2	0.93
Hemlock (Eastern)(5)	1.6	0.68
Sitka Spruce(5)	1.7	0.72
Ponderosa Pine(5)	2.1	0.89

(1) Southwest Research Institute, *Project No. 01-1046-001.*

(2) TRADA International, *Project No. RRESF91013.*

(3) Weyerhaeuser Research & Development Report No. 991-1763.

(4) Forest Products Laboratory *Report FPL-RP-610. Fire Resistance of Engineered Wood Rim Board Products,* May 2003.

(5) *Fire Protection Handbook, 19th Edition,* Volume II, Table 8.3.6, National Fire Protection Association.

(6) Nominal char rates, B_n.

are not open, as with tongue-and-groove timber decking, tests have shown that charring of the sides of members is negligible and can be ignored [21][22].

1.4.2 Approximation of Member Strength

Generally, average unheated member strength can be approximated from tests or by using design stresses derived from actual member strength data. To approximate average member strength using allowable design stress values, the allowable design stress value can be multiplied by an adjustment factor, K, to adjust from a 5% exclusion value allowable design value to an average ultimate value [15]. The adjustment factor, K, has two components, the inverse of the applicable design value adjustment factor, $1/k$, and the inverse of the variability adjustment factor, c. To develop general design procedures for glulam and solid-sawn lumber, the following design value adjustment factors and estimates of COV were used to conservatively develop an allowable design stress to average ultimate strength adjustment factor, K:

Table 1.4.2 Allowable Design Stress to Average Ultimate Strength Adjustment Factors

	F	*1/k*	*c*	*Assumed COV*	*K*
Bending Strength	F_b	2.1 [1]	1-1.645 COV_b	0.16 [2]	2.85
Tensile Strength	F_t	2.1 [1]	1-1.645 COV_t	0.16 [2]	2.85
Compression Strength	F_c	1.9 [1]	1-1.645 COV_c	0.16 [2]	2.58
Buckling Strength	E_{05}	1.66 [3]	1-1.645 COV_E	0.11 [4]	2.03

[1] taken from Table 10 of ASTM D 245 *Standard Practice for Establishing Structural Grades and Related Allowable Properties for Visually Graded Lumber.*
[2] taken from Table 4-6 of *1999 Wood Handbook.*
[3] taken from Appendices D and H of *1997 National Design Specification for Wood Construction.*
[4] taken from Sections 3.3.3.8 and 3.7.1.5 of *1997 National Design Specification for Wood Construction.*

1.4.3 Approximation of Member Capacity

As noted, average member capacity of a wood member exposed to fire for a given time, t, can be estimated using cross-sectional properties reduced for fire exposure time and average ultimate strength properties derived from allowable stress values.