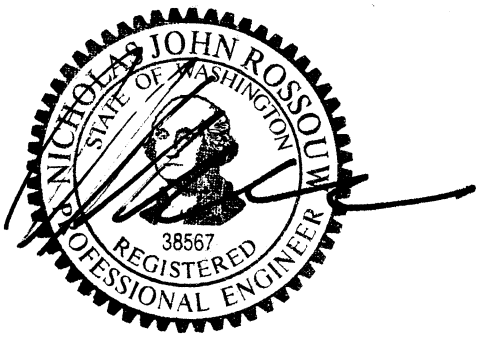
supplemental structural calculations for:

talerman-simon residence

3879 west mercer way
mercer island washington

client: floisand studio

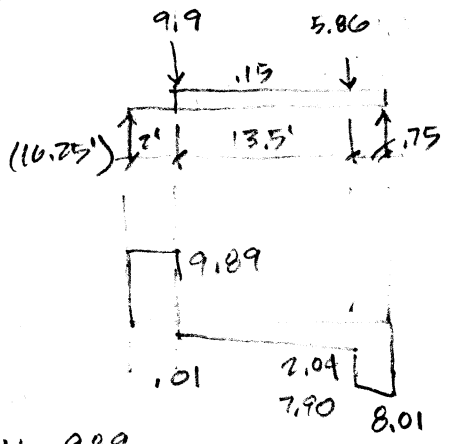
Δ 10 may 2019



index:

giraf design
9220 roosevelt way ne seattle wa 98115-2842
(206) 621-0060 p (206) 621-0061 f
girafdesign@gmail.com http://girafdesign.net

B11



M = 9.89
V = 19.78FTK.

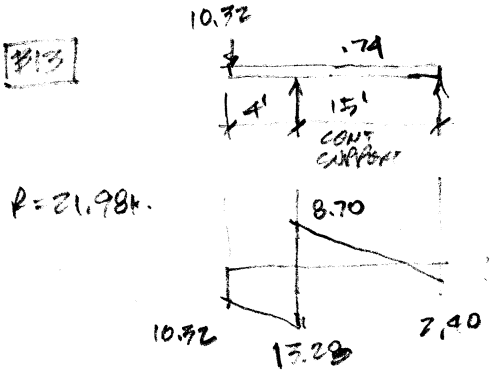
7x11 7/8 PSL Δ TL = L/548

B12 L = 24' M = 61.9FTK.
W = .86KLF V = 10.32K.

(2) 5 1/4 x 16 PSL Δ TL = L/321

(*)

B13

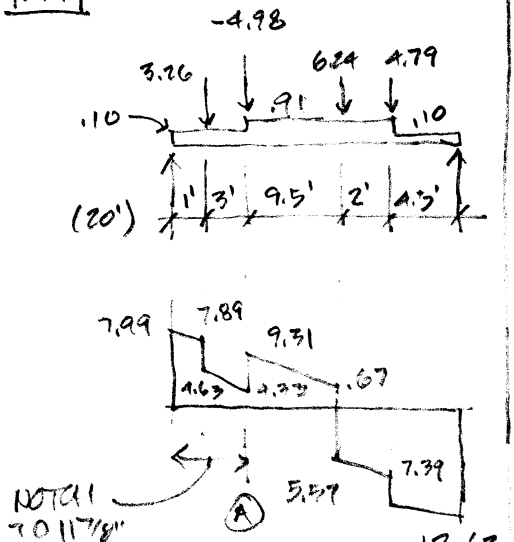


M = 47.2FTK.
V = 13.28K

5 1/4 x 16 PSL Δ CANT TL = .37"
USE (2) 5 1/4 x 16 PSL

(*)

B14



M = 68.78FTK M+ = 21.38FT.K
V = 12.63K. VA = 7.99K.

7x16 PSL + 5 1/4 x 16 PSL

Δ TL = L/468 ← @ 2.0 E LESS @ 2.2E

AT NOTCHED SECTION

MMAX = 21.38FTK.
VMAX = 9.31K.

ΣMA = 62.90FTK. ✓
ΣVA = 26.65K ✓

(*)

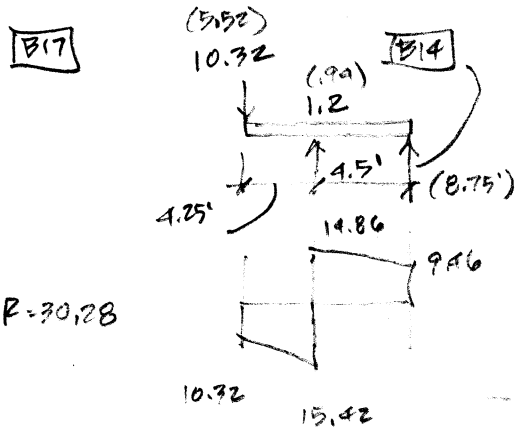
SEE PR-11 FOR SHEAR FLOW FOR LAMINATION.

B15 L = 14.5' M = 11.83FTK
W = .45KLF V = 3.26K.

TRY 3 1/2 x 11 1/4 PSL Δ TL = L/823
5 1/4 x 11 1/4 PSL

B16 L = 11.5' M = 7.44FTK
W = .45KLF V = 2.6K
3 1/2 x 11 1/4 PSL

B17



M = 54.72FTK.
V = 15.42K.
MAX REACTION @ B14 (NO ROOF SNOW) = -4.98

7x16 PSL

Δ CANT TL = L/329.
USE (2) 5 1/4 x 16 PSL (Δ < 1/4")

(*)

B18 L = 3.5' M = 1.5FTK.
W = .98 V = 1.72K.

USE 4x8

B19 L = 5.5' M = 1.26FT.K.
W = .82 V = 1.94K.
(2) 2x8

ΔΔ 5-9-19
date: Δ 8-13-18

giraf design
9220 roosevelt way ne
seattle wa 98115-2842
(206) 621-0060 p
(206) 621-0061 f
girafdesign@gmail.com
http://girafdesign.net

project: TALKMAN - SIMON RESIDENCE

proj #: 2018-024

client: FLOISAND STUDIO

sheet: UF.2

SHEAR FLOW IN LAMINATED PSL BEAMS

BEAMS (B4), B11 & B12 IN BEAM SCHEDULE ON DRAWINGS

UPPER FLOOR CALCULATION BEAMS: B12, B13, B14, B17

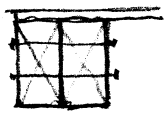
ELIMINATED FROM PROJECT

B12

860 plf THROUGH WALL FROM ABOVE TO OUTER BEAM

TRANSFER 430 plf TO INNER BEAM

UNIFORM LOAD



3/4" ϕ H.B. 780 # SINGLE SHEAR

(2) 3/4" ϕ @ 16" o.c.

OK FOR 1040 plf ✓

ROOF LOAD → 5160 # FROM OUTER LAMINATION TO INNER

CONNECTION @ ENDS FOR CONN TO HANGER

(2) 3/4" ϕ H.B. ADJACENT TO CONN — (2 × 780 × 1.15) = 1794 #

(12) 5/8" ϕ × 8" LAG BOLTS — (12 × 360 × 1.15) = 4,968 #

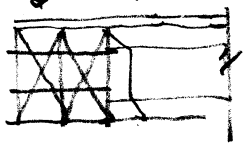
Σ TRANSFER = 6,762 #

B13 POINT LOAD @ END (FROM B12) EVENLY DISTRIBUTED BY HANGER.

100 plf THROUGH WALL FROM ABOVE @ OUTER BEAM

640 plf THROUGH JOISTS HUNG FROM INNER BEAM

UNIFORM LOAD



TRANSFER 270 plf TO OUTER BEAM

(2) 3/4" ϕ @ 16" o.c. OK FOR 1040 plf ✓

B14 SEE PR-12

giraf design
9220 roosevelt way ne
seattle wa 98115-2842
(206) 621-0060 office
(206) 898-4229 cell
girafdesign@gmail.com
http://girafdesign.net

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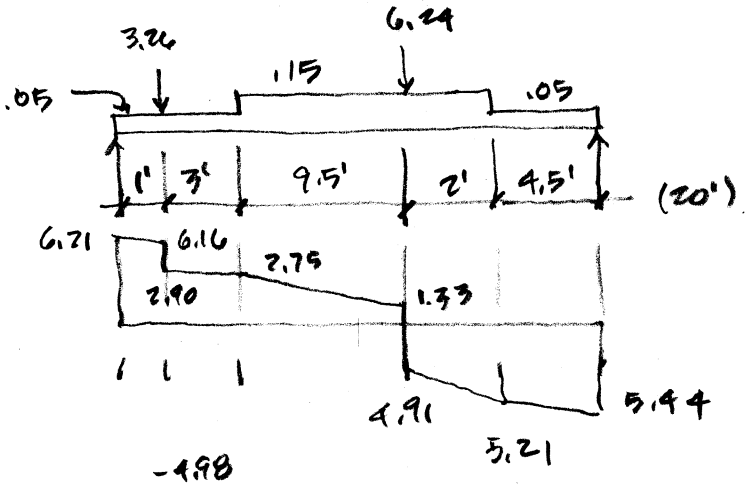
sheet: PR-11

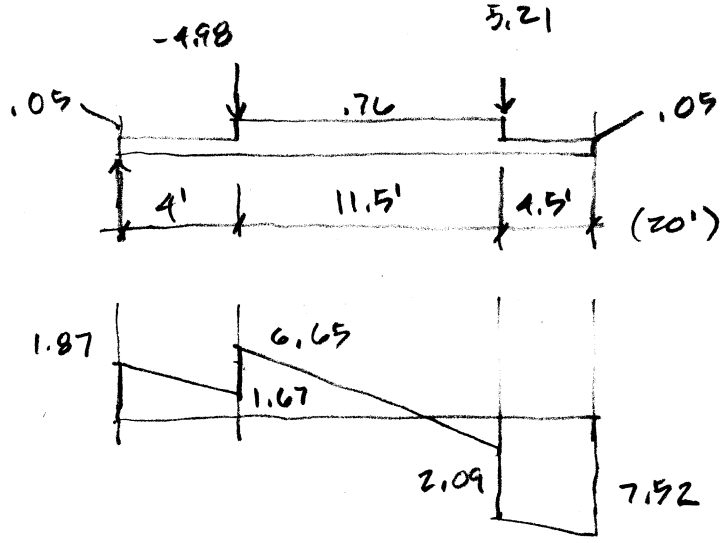
B14 CONSIDER LOAD TO LAMINATIONS SEPARTELY

OUTER (5¼") LAMINATION



M = 34.08 FT K.
V = 6.21 K.

INNER (7") LAMINATION



M = 36.2 FT K.
V = 7.52 K.

EACH LAMINATION ADEQUATE FOR LOADING SEPARATELY

NO SHEAR TRANSFER REQUIRED FOR STRENGTH

(2) 3/4" ϕ H.B. @ 16" o.c. (OK FOR 1040 plf TRANSFER) WILL ENSURE BEAMS DO NOT DEFLECT DIFFERENTIALLY.

B17 CONNECTION @ ENDS LOAD EQUALLY TRANSFERRED THROUGH HANGERS

LOAD TO OUTER LAM. THROUGH WALL ABOVE 960 plf
LOAD TO INNER LAM. THROUGH HANGERS. 640 plf
(2) 3/4" ϕ @ 16" o.c. ✓ OK BY INSPECTION

giraf design
9220 roosevelt way ne
seattle wa 98115-2842
(206) 621-0060 office
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girafdesign@gmail.com
http://girafdesign.net

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date: 5-9-19

proj #: 2018-024

sheet: PR-12

Holes and notches in the rim board shall comply with applicable codes and the manufacturer's published literature. Penetrations into and through fire-resistance-rated wall assemblies must also be detailed and constructed in accordance with Section 714 of the IBC.

4.4 Rim Board:

Each rim board product described in this evaluation report is used as a structural rim board element located at the joist elevation in an end bearing wall or parallel to the joist framing that is the full depth of the joist space and manufactured in minimum continuous 8-foot-long (2.44 m) segments for the length of the wall. Design values for rim board applications are provided in Table 4. Rim board products in this report are not required to be continuously supported provided they are designed as flexural members using the reference design values shown in Table 1. The rim boards may be used for any combination of the following:

1. To transfer, from above to below, all vertical loads at the rim board location. Allowable vertical loads are given in Table 4.
2. To provide diaphragm attachment (sheathing to top edge of rim board).
3. To transfer in-plane lateral loads from the diaphragm to the wall plate below. Allowable lateral loads are given in Table 4.
4. To provide lateral support to the joist or rafter (resistance against rotation) through attachment to the joist or rafter.
5. To provide closure for ends of joists or rafters.
6. To provide an attachment base for siding or an exterior deck ledger.

4.5 Wall Studs:

TimberStrand LSL may be used as wall stud material in accordance with the prescriptive requirements of the applicable code. Cutting, notching and boring of nominally 2-by-4 and 2-by-6 TimberStrand LSL studs is permitted in accordance with Sections 2308.5.9 and 2308.5.10 of the 2018 and 2015 IBC, 2308.9.10 and 2308.9.11 of the IBC, and Section R602.6 of the IRC.

The allowable shear values for nailed wood structural panel shear walls utilizing TimberStrand LSL framing must be determined using Table 4.3A of the ANSI/AWC Special Design Provisions for Wind and Seismic (SDPWS) or Table 2306.3 of the 2009 IBC, subject to the following:

1. TimberStrand LSL having a grade of 1.55E or lower is considered to be equivalent to sawn lumber studs with a specific gravity of 0.42, with the exception that the minimum boundary nail spacing permitted for grades lower than 1.5E must be 6 inches (152 mm) on center. TimberStrand LSL of grades 1.5E or higher, may be used with boundary nail spacings from 2 inches (51 mm) to 6 inches (152 mm) on center.
2. TimberStrand LSL having a grade of 1.6E or higher is considered to be equivalent to sawn lumber studs with a specific gravity of 0.50.

5.0 CONDITIONS OF USE

The structural composite lumber and oriented strand board [TimberStrand® Laminated Strand Lumber (LSL), Parallam® Parallel Strand Lumber (PSL), and Microllam® Laminated Veneer Lumber (LVL)]; TimberStrand® LSL Rim Board; RedBuilt LSL Rim Board; TJ® Rim Board; and Weyerhaeuser Rim Board products described in this report comply with, or are suitable alternatives to what is specified, in those codes listed in Section 1.0, subject to the following conditions:

5.1 Installation, fabrication, identification, and connection details must be in accordance with this report, the manufacturer's published installation instructions and the applicable code.

5.2 Design calculations and details must be furnished to the code official, verifying that the material is used in compliance with this report. The calculations must be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.

5.3 The products described in this report must be limited to covered end-use installations with dry conditions of use in which the in-service equilibrium moisture content is less than 16 percent.

5.4 Length and depth dimensions of TimberStrand LSL, Parallam PSL and Microllam LVL may be cut to size for required application. Depth must not be cut to less than 3.50 inches (89 mm). Thickness dimension of Parallam PSL and TimberStrand LSL may be cut to a minimum of 1.75 inches (45 mm). Microllam LVL must not be cut in thickness. For all material used in structural applications, the product identification described in Section 7.0 must be maintained on all material, or the material must be re-stamped with the appropriate identification only under the approval and direction of PFS Corporation, Intertek Testing Services, or APA—The Engineered Wood Association. Additionally, TimberStrand LSL, Parallam PSL, Microllam LVL, TJ Rim Board, and Weyerhaeuser Rim Board may be notched, drilled, or tapered end cut provided design is by a design professional.

5.5 TimberStrand LSL that has been treated with zinc borate (ZB) may be used within the building envelope, such as for sill plates supported by masonry or concrete footings, foundations or slabs (including where preservative-treated lumber is required within the building envelope) in accordance with the American Wood Protection Association (AWPA) "Use Category UC2". When used under these conditions, the corrosion rate of carbon steel and/or galvanized steel in contact with ZB-treated TimberStrand LSL is not increased by the ZB treatment. TimberStrand LSL treated with ZB must not be used in exposed exterior or ground-contact applications.

5.6 TimberStrand LSL, TimberStrand LSL Rim Board and RedBuilt LSL Rim Board are produced at the Weyerhaeuser manufacturing plant located in Kenora, Ontario, Canada; with quality-control inspections by ICC-ES and PFS Corporation (AA-652). For TimberStrand® LSL with Flak Jacket® FRT protection, the Flak Jacket® FRT protection is applied in accordance with approved manufacturing standard and quality-control program with inspections by ICC-ES and PFS Corporation (AA-652).

5.7 Parallam PSL is produced at the Weyerhaeuser manufacturing plants located in Annacis Island, British Columbia, Canada; and Buckhannon, West Virginia; with quality-control inspections by ICC-ES and PFS Corporation (AA-652).

5.8 Parallam PSL is secondary laminated for Weyerhaeuser at Structurlam Products, Ltd., Okanagan Falls, British Columbia, Canada, with quality-control inspections by ICC-ES and PFS