



## STRUCTURAL CALCULATIONS

for the

## PROPOSED RUEPPELL HOME DESIGN

### ADDITION-REMODEL

August 2, 2025

Client: **Puget Sound Construction Partners, Inc.**

Site: 8205 SE 71<sup>st</sup> St.  
Mercer Island, WA 98040  
**Latitude = 47.538922, Longitude = -122.229150, Elevation = 314**

Calculated by: Eric L. Rice, PE  
ELR Engineering  
10508 32<sup>nd</sup> Ave SW Unit B  
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**ELR Engineering**

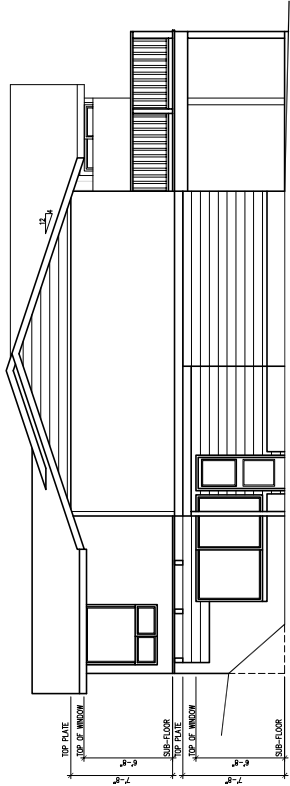
10508 32<sup>nd</sup> Ave SW Unit B  
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Project: PSCP, Inc./Addition-Remodel @ 8205 SE 71<sup>st</sup> St., M.I.  
Job No. \_\_\_\_\_ Figured by: ELR  
Checked by: \_\_\_\_\_ Date: 8/2/2025 Sheet: 2

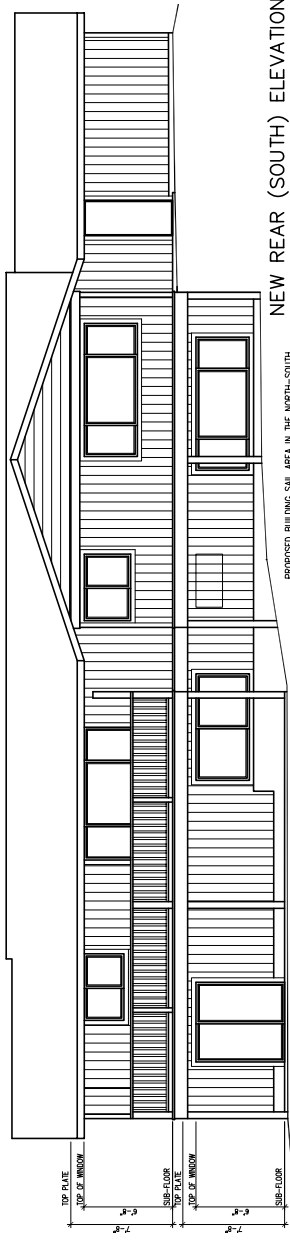
Scope of Work:

ELR Engineering was asked to provide permit submittal structural calculations and the supporting structural sheets for the proposed **Rueppell Home Design Addition-Remodel @ 8205 SE 71<sup>st</sup> St., M.I. for Puget Sound Construction Partners, Inc.** Our structural engineering information is shown in these calculations and on the submitted structural sheets. The information in these calculations conforms to the 2021 International Building & Residential Codes as amended by the local jurisdiction. **These calculations and associated S-sheets are applicable and valid only for the site stated on the cover sheet of these calculations.** Questions should be addressed to the undersigned.

Eric L. Rice, PE  
ELR Engineering

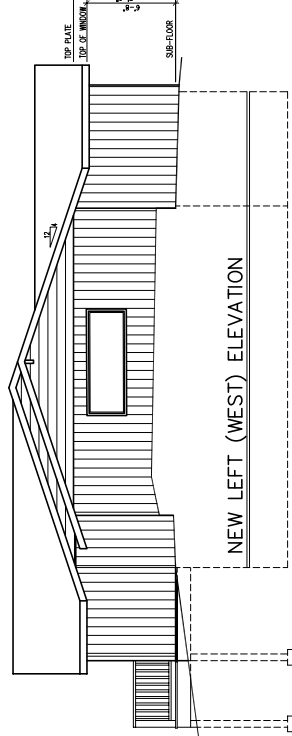


NEW RIGHT (EAST) ELEVATION

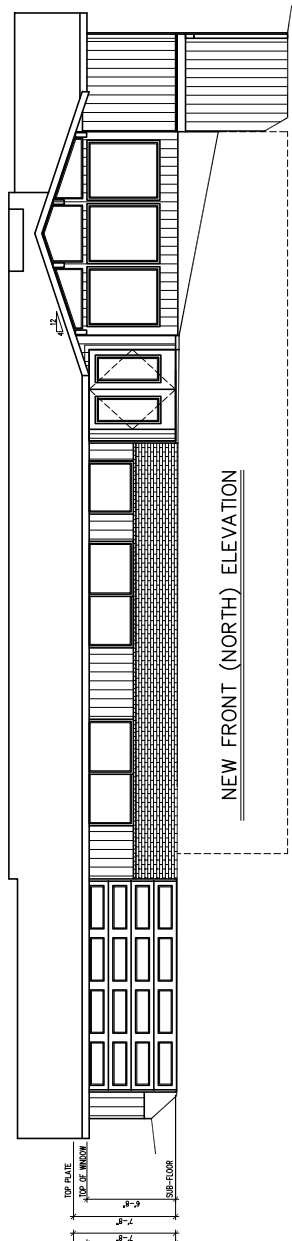


NEW REAR (SOUTH) ELEVATION

PROPOSED BUILDING SAIL AREA IN THE NORTH-SOUTH DIRECTION  
 PROPOSED BUILDING SAIL AREA IN THE NORTH-SOUTH DIRECTION  
 PROPOSED BUILDING SAIL AREA IN THE NORTH-SOUTH DIRECTION



NEW LEFT (WEST) ELEVATION



NEW FRONT (NORTH) ELEVATION

## GENERAL STRUCTURAL NOTES

(Unless noted otherwise on plans and details)

### CODES AND SPECIFICATIONS

1. International Building Code(IBC)/International Residential Code(IRC) – 2021 edition with local jurisdiction amendments as applicable
2. ASCE/SEI 7–16 w/supplement 1 – Minimum Design Loads for Buildings and Other Structures
3. AWC NDS–2018/AWC SPDWS 2021/AWC WFCM 2018 – National Design Specification for Wood Construction with 2018 NDS Supplement/Special Design Provisions for Wind & Seismic/Wood Frame Construction Manual for One– and Two–Family Dwellings
4. ACI 318–19 – Building Code Requirements for Structural Concrete
5. AISC 360–16/341–16 – Specification for Structural Steel Buildings/Seismic Provisions for Structural Steel Buildings
6. AWS D1.4/D1.4M–2018 – Structural Welding Code
7. TMS 402–2016 – Building Code Requirements for Masonry Structures

### DESIGN CRITERIA

1. Wind – Risk category = II, Basic wind speed ( $V$ ) = 100 mph, Wind directionality factor = 0.85, Exposure category = B, Topographic factor  $K_{zt}$  = 1.00, Gust effect factor = 0.85, Enclosure classification = Enclosed, Internal pressure coefficient ( $GC_{pi}$ ) =  $\pm 0.18$
2. Seismic – Risk category = II, Seismic importance factor ( $I_e$ ) = 1.00, Site Class = D (default per 11.4.3),  $S_s$  = 1.466,  $S_1$  = 0.507,  $S_{DS}$  = 1.173,  $S_{D1}$  = 0.606 Seismic Design Category = D, Basic seismic–force–resisting system = A.15 per ASCE 7–16 Table 12.2–1, Seismic response coefficient ( $C_s$ ) = 0.180(orthogonal 1) & 0.180(orthogonal 2), Response modification factor ( $R$ ) = 6.5(orthogonal 1) & 6.5(orthogonal 2), Design procedure used = Equivalent Lateral Force Procedure
3. Roof –  
Dead: 17 psf  
Live: 20 psf  
Snow:  $P_s=25$  psf
4. Floor –  
Dead: 15 psf (non–truss floor), 20 psf (truss floor)  
Live: 40 psf, 60 psf at decks
5. Soils –  
Vertical bearing pressure (capacity): 1500 psf  
Lateral bearing pressure (capacity): 150 psf/ft of depth  
Coefficient of friction (capacity): 0.25 (multiplied by dead load)  
Active design lateral load: 40 psf/ft of depth  
At–rest design lateral load: 60 psf/ft of depth

### STRUCTURAL OBSERVATION

1. Structural observation is required only when specifically designated as being required by the registered design professional or the building official.

### SOIL CONSTRUCTION

1. Extend footings to undisturbed soil or fill compacted to 95% Modified Proctor (ASTM D1557). All construction on fill soils shall be reviewed by a registered geotechnical engineer. All footings shall be 18 inches minimum below adjacent finish grade. It is the contractor's responsibility to verify that the site soils provide the minimum vertical bearing pressure capacity stated above.

### PIPE PILES

1. Pipe shall conform to ASTM A53 Grade B. Unless noted otherwise, pipe is not required to be galvanized.
2. Pipe shall be driven to refusal and tested (as required) per Geotechnical Engineer's requirements.

### REINFORCED CONCRETE

1.  $f'_c$  = 3000 psi(\*) at 28 days. Min 5– $\frac{1}{2}$  sacks of cement per cubic yard of concrete and maximum of 6– $\frac{3}{4}$  gallons of water per 94 lb. sack of cement. (\*) Special inspection is not required – 3000 psi compressive strength is specified for weathering protection only – structural design is based on  $f'_c$  = 2500 psi.
2. Maximum aggregate size is 7/8". Maximum slump = 4 inches.
3. All concrete shall be air entrained – 5% minimum / 7% maximum (percent by volume of concrete).
4. Mixing and placement of all concrete shall be in accordance with the IBC and ACI 318. Proportions of aggregate to cement shall be such as to produce a dense, workable mix which can be placed without segregation or excess free surface water. Provide 3/4 inch chamfer on all exposed concrete edges unless otherwise indicated on architectural drawings.
5. No special inspection is required.
6. Vibrate all concrete walls. Segregation of materials shall be prevented.

### REINFORCING STEEL

1. Concrete reinforcement shall be detailed, fabricated and placed in accordance with ACI 318.
2. Reinforcing steel shall be grade 40 minimum and deformed billet steel conforming to ASTM A615.

3. Welded wire mesh shall conform to ASTM A185.
4. Reinforcing steel shall be accurately placed and adequately secured in position. The following protection for reinforcement shall be provided:

	<u>Min Cover</u>
Cast against and permanently exposed to earth –	3"
Exposed to earth or weather –	1.5" for #5 bar and smaller 2" for #6 bar and larger
Slabs and walls at interior face –	1.5"

5. Lap continuous reinforcing bars 32 bar diameters (1'-6" min) in concrete. Corner bars consisting of 32 bar diameter (1'-6" min) bend shall be provided for all horizontal reinforcement. Lap welded wire mesh edges 1.5 mesh minimum. This criteria applies unless noted otherwise.

#### RETAINING WALLS

1. Concrete floor slabs to be poured and cured and floor framing above shall be complete before backfilling behind retaining walls.

#### TIMBER

1. Unless noted otherwise, all sawn lumber shall be kiln dried and graded/graded in conformance with WCLIB standard grading for west coast lumber. Lumber shall meet the following minimum criteria:

4x and larger:	DF #2 (Fb=875 psi)
3x and smaller:	HF #2 (Fb=850 psi) or SPF #2 (Fb=875 psi)

2. Wall studs shall be:

##### Bearing walls with 10'-0" maximum stud length

2x4 HF stud grade or btr at 24" (max) oc –	carrying only roof and ceiling
2x4 HF stud grade or btr at 16" (max) oc –	carrying only one floor, roof and ceiling
2x6 HF stud grade or btr at 24" (max) oc –	carrying only one floor, roof and ceiling
2x6 HF stud grade or btr at 16" (max) oc –	carrying only two floors, roof and ceiling

##### Non-Bearing walls with maximum stud length noted

2x4 HF stud grade or btr at 24" (max) oc –	10'-0" maximum stud length
2x6 HF stud grade or btr at 24" (max) oc –	15'-0" maximum stud length

3. Provide 4x6 DF2 header over openings not noted otherwise. Provide (1)2x trimmer and (1)2x king header support for clear spans 5'-0" or less. Provide (2)2x trimmer and (1)2x king header support for clear spans exceeding 5'-0".
4. Provide solid blocking in floor space under all posts and wall members connected to holdowns. Orient blocking such that wood grain in blocking is oriented vertically.
5. Provide double floor joists under all partition walls parallel to floor joists and along the perimeter of all diaphragm openings.
6. Provide double blocking between floor joists under all partition walls perpendicular to floor joists.

#### WOOD CONNECTORS, FASTENERS AND PRESSURE TREATED WOOD

1. All wood connectors shall be Simpson or approved equal.
2. All nails shall be common wire nails unless noted otherwise.
3. All nailing shall meet the minimum nailing requirements of Table 2304.10.2 of the International Building Code.
4. All wood in contact with ground or concrete to be pressure-treated with a wood preservative.
5. Wood used above ground shall be pressure treated in accordance with AWPA U1 for the following conditions:
  - a) Joists, girders, and subfloors that are closer than 18" to exposed ground in crawl spaces or unexcavated areas located within the perimeter of the building foundation.
  - b) Wood framing including sheathing that rest on exterior foundation walls and are less than 8 inches from exposed earth.
  - c) Sleepers, sills, ledgers, posts and columns in direct contact with concrete or masonry – except post and columns with code-approved post-base connector with 1 inch standoff.
6. All field-cut ends, notches, and drilled holes of preservative-treated wood shall be treated, for use category UC4A per AWPA U1-07, in the field using a 9.08% Copper Naphthenate (CuN) solution such as "End cut Solution" (Cunapsol-1) in accordance with the directions of the product manufacturer.
7. All wood connectors and associated steel fasteners (except anchor bolts and holdown anchors, 1/2" diameter and larger) in contact with any preservative-treated wood shall conform to one of the following corrosion protection configuration options:
  - a) All wood connectors and associated steel fasteners shall be Type 303, 304, 306 or 316 stainless steel when actual wood preservative retention levels exceed the following levels:

<u>Treatment</u>	<u>Retention level (pcf)</u>
ACQ (Alkaline Copper Quat)	Greater than 0.40
MCQ (Micronized Copper Quat)	Greater than 0.34
CA-B (Copper Azole)	Greater than 0.21
CA-C & MCA (Copper Azole & Azole Biocide)	Greater than 0.15
μCA-C (Azole Biocide)	Greater than 0.14

- b) When actual wood preservative retention levels do not exceed the levels in 7.a) above, all wood connectors and fasteners shall, at a minimum, be hot-dipped galvanized by one of the following methods:
- Continuous hot-dipped galvanizing per ASTM A653, type G185.
  - Batch or Post hot-dipped galvanizing per ASTM 123 for individual connectors and as per ASTM A153 for fasteners. Fasteners, other than nails, timber rivets, wood screws and lag screws, may be hot-dipped galvanized as per ASTM B695, Class 55 minimum.
- c) Plain carbon steel fasteners in SBX/DOT and zinc borate preservative treated wood in an interior, dry environment shall be permitted.
8. Do not mix stainless steel and hot-dipped galvanized wood connectors and fasteners.
9. All anchor bolts shall be as specified in the general notes on the shearwall schedule.
10. Where a connector strap connects two wood members, install one half of the total required nails or bolts in each member.
11. All bolts in wood members shall conform to ASTM A307.
12. Provide standard cut washers under the head of all bolts and lag screws bearing on wood.

#### ANCHORAGE

- All mudsill anchor bolts embedded in concrete or masonry shall be A307 unless noted otherwise. Retro-fit anchor bolts shall be Simpson Strong-Bolt 2 wedge anchors per ICC-ES ESR-3037 or Simpson Titen HD screw anchors per ICC-ES ESR-2713.
- All shear wall holdown bolts embedded in concrete or masonry shall be A307 unless noted otherwise. Retro-fit holdown bolts shall be epoxied using Simpson SET-3G with embedment per plan, installed per manufacturer's requirements.

#### NAILS

- Nailing of wood framed members to be in accordance with IBC table 2304.10.1 unless otherwise noted. Connection designs are based on nails with the following properties:

<u>PENNY WEIGHT</u>	<u>DIAMETER (INCHES)</u>	<u>LENGTH (INCHES)</u>
8d sinker	0.113	2-3/8
8d common	0.131	2-1/2
10d box	0.131	3
16d sinker	0.148	3-1/4
16d common	0.162	3-1/2

#### SHEARWALLS

- All shearwall plywood nailing and anchors shall be as detailed on the drawings and noted in the shearwall schedule. All exterior walls shall be sheathed with 7/16" APA rated sheathing (24/16) - blocked - with minimum nailing 0.131" diameter x 2.5" nails @ 6" OC edges/12" oc field unless noted otherwise.
- All headers shall have strap connectors to the top plate each end when the header interrupts the continuous (2)2x top plate. Use (1)Simpson MSTA24 connector each end unless noted otherwise.
- All shearwall holdowns shall be as noted on the plans and shall be Simpson or approved equal.
- All holdown anchors shall be installed as shown on plans and as per manufacturer's requirements. Holdown anchors may be wet-set or drilled and epoxied (Simpson "SET-3G" epoxy or approved equal) with prior approval from the Engineer of Record. Provide the full embedment into concrete as stated on the plans.

#### FLOOR AND ROOF DIAPHRAGMS

- Apply 23/32" APA rated Sturd-I-Floor(24" oc) nailed to floor framing members with 0.131" diameter x 2.5" nails at 6" OC at all supported edges and at 12" OC at interior supports unless noted otherwise on the plans. Offset panel joints between parallel adjacent runs of sheathing.
- Apply 7/16" APA rated sheathing(24/16) nailed to roof framing members with 0.113" diameter x 2.5" nails at 6" OC at supported edges and at 12" OC at interior supports unless noted otherwise on the plans. Offset panel joints between parallel adjacent runs of sheathing.
- Blocking of interior edges is not required unless noted otherwise on the plans.

#### BUILT-UP WOOD COLUMNS

- All columns not specified or otherwise noted on the plans shall be (2)2x studs gang fastened per standard detail.
- All columns not specified or otherwise noted on the plans supporting girder trusses or beams shall be (3)2x studs gang fastened per standard detail.

### MANUFACTURED WOOD TRUSSES

1. Trusses shall be designed, fabricated, and installed in accordance with the "Design Specifications for Light Metal Plate Connected Wood Trusses" by the Truss Plate Institute.
2. All trusses shall be designed and stamped by a professional engineer licensed in the State of Washington.
3. Roof trusses shall be fabricated of Douglas Fir-Larch or Hem-Fir.
4. All mechanical connectors shall be IBC approved.
5. Submit design calculations, shop drawings and installation drawings stamped by a licensed engineer of all trusses to the owner's representative for review and Building Department approval.
6. Truss members and components shall not be cut, notched, drilled, spliced or otherwise altered in any way without written approval of the registered design professional.
7. Where trusses align with shearwalls, a special truss shall be provided that has been designed to transfer the load between the roof sheathing and the shearwall below. This truss shall be designed to transfer a minimum of 100 plf along the full length of the truss.
8. All temporary and permanent bracing required for the stability of the truss under gravity loads and in-plane wind or seismic loads shall be designed by the truss engineer. Any bracing loads transferred to the main building system shall be identified and submitted to the engineer of record for review.

### PARALLEL STRAND LUMBER (PSL)

1. Parallel strand lumber shall be manufactured as per NER-292 and meet the requirements of ASTM D2559 – Fb=2900 psi, E=2.2E6 psi for beams and Fb=2400 psi, E=1.8E6 psi for columns.

### LAMINATED VENEER LUMBER (LVL)

1. Laminated veneer lumber shall be Doug Fir meeting the requirements of ASTM D2559 – Fb=2600 psi, E=2.0E6 psi.
2. For top loaded multiple member beams only, fasten with two rows of 0.148" diameter x 3" nails at 12" OC. Use three rows of 0.148" diameter x 3" nails for beams with depths of 14" or more.
3. Provide full depth blocking for lateral support at bearing points.

### LAMINATED STRAND LUMBER (LSL)

1. Laminated strand lumber shall be manufactured as per NER-292 and meet the requirements of ASTM D2559 – Fb=2325 psi, E=1.55E6 psi for beams and Fb=1700 psi, E=1.3E6 psi for beams/columns and Fb=1900 psi, E=1.3E6 psi for planks.

### GLUED LAMINATED WOOD MEMBERS (GLB)

1. Glued laminated wood beams shall be Douglas Fir, kiln-dried, stress grade combination 24F-V4 (Fb=2400 psi, E=1.8E6 psi) unless otherwise noted on the plans.
2. Fabrication shall be in conformance with ANSI/APA 190.1-2017 and ASTM D3737-2018E1.
3. AITC stamp and certification required on each and every member.

### WOOD I-JOISTS

1. Joists by Truss Joists/MacMillan or approved equal.
2. Joists to be erected in accordance with the plans and any Manufacturers drawings and installation drawings.
3. Construction loads in excess of the design loads are not permitted.
4. Provide erection bracing until sheathing material has been installed.
5. See manufacturer's references for limitations on the cutting of webs and/or flanges.

### STEEL CONSTRUCTION

1. Structural steel shall be ASTM A992 (wide flange shapes) or A53-Grade B (pipe) or A36 (other shapes and plate) unless noted otherwise.
2. All fabrication and erection shall comply with AISC specifications and codes.
3. All welding shall be as shown on the drawings and in accordance with AWS and AISC standards. Welding shall be performed by WABO certified welders using E70XX electrodes. Only pre-qualified welds (as defined by AWS) shall be used.

### MASONRY

1. Construction shall meet the requirements of IBC Chapter 21.
2. Special inspection is not required.
3. All concrete block masonry shall be laid up in running bond and shall have a minimum compressive strength of  $f'm = 1500$  psi, using Type "S" mortar,  $f'c = 1800$  psi.
4. All cells containing reinforcing bars shall be filled with concrete grout with an  $f'c = 2000$  psi in maximum lifts of 4'-0".
5. Bond beams with two #5 horizontally shall be provided at all floor and roof elevations and at the top of the wall.
6. Provide a lintel beam with two #5 horizontally over all openings and extend these two bars

- 2'-0" past the opening at each side or as far as possible and hook.
7. Provide two #5 vertically for the full story height of the wall at wall ends, intersections, corners and at each side of all openings unless otherwise shown.
  8. Dowels to masonry walls shall be embedded a minimum of 1'-6" or hooked into the supporting structure and of the same size and spacing as the vertical wall reinforcing.
  9. Provide corner bars to match the horizontal walls reinforcing at all wall intersections.
  10. Reinforcing steel shall be specified under "REINFORCING STEEL". Lap all reinforcing bars 40 bar diameters with a minimum of 1'-6".
  11. Masonry walls shall be reinforced as shown on the plans and details and if not shown, shall have (1) #5 @ 48" OC horizontally and (1) #5 @ 48" OC vertically.
  12. Embed anchor bolts a minimum of 5".

#### GENERAL CONSTRUCTION

1. All materials, workmanship, design, and construction shall conform to the project drawings, specifications, and the International Building Code.
2. Structural drawings shall be used in conjunction with architectural drawings for bidding and construction. Contractor shall verify dimensions and conditions for compatibility and shall notify the architect of any discrepancies prior to construction.  
Discrepancies: The contractor shall inform the engineer in writing, during the bidding period, of any and all discrepancies or omissions noted on the drawings and specifications or of any variations needed in order to conform to codes, rules and regulations. Upon receipt of such information, the engineer will send written instructions to all concerned. Any such discrepancy, omission, or variation not reported shall be the responsibility of the contractor.
3. The contractor shall provide temporary bracing as required until all permanent framing and connections have been completed.
4. The contractor shall coordinate with the building department for all permits and building department required inspections.
5. Do not scale drawings. Use only written dimensions.
6. Drawings indicate general and typical details of construction. Where conditions are not specifically indicated but are of similar character to details shown, similar details of construction shall be used, subject to review and approval by the architect and the structural engineer.
7. Contractor initiated changes shall be submitted in writing to the architect and structural engineer for approval prior to fabrication or construction.
8. All structural systems which are to be composed of field erected components shall be supervised by the supplier during manufacturing, delivery, handling, storage, and erection in accordance with instructions prepared by the supplier.
9. Contractor shall be responsible for all safety precautions and the methods, techniques, sequences, or procedures required to perform the work.
10. Shop drawing review: Dimensions and quantities are not reviewed by the engineer of record, therefore, must be reviewed by the contractor. Contractor shall review and stamp all shop drawings prior to submitting for review by the engineer of record. Submissions shall include a reproducible and one copy. Reproducible will be marked and returned. Re-submittals of previously submitted shop drawings shall have all changes clouded and dated with a sequential revision number. Contractor shall review and stamp all revised and resubmitted shop drawings prior to submittal and review by the engineer of record. In the event of conflict between the shop drawings and design drawings/specifications, the design drawings/specifications shall control and be followed.

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## Vertical Calculations

Roof			
Member Name	Results (Max UTIL %)	Current Solution	Comments
1	Passed (66% ΔT)	1 piece(s) 5 1/2" x 9" 24F-V4 DF Glulam	
2	Passed (82% M)	1 piece(s) 4 x 8 DF No.2	
3	Passed (64% M)	1 piece(s) 4 x 8 DF No.2	
4	Passed (89% M+)	1 piece(s) 3 1/2" x 6" 24F-V4 DF Glulam	
a	Passed (38% ΔT)	1 piece(s) 3 1/2" x 9" 24F-V4 DF Glulam	
b	Passed (51% ΔT)	1 piece(s) 3 1/2" x 15" 24F-V4 DF Glulam	
c	Passed (12% R)	1 piece(s) 3 1/2" x 9" 24F-V4 DF Glulam	
5	Passed (86% R)	1 piece(s) 3 1/2" x 15" 24F-V4 DF Glulam	
6	Passed (56% M+)	1 piece(s) 3 1/2" x 6" 24F-V4 DF Glulam	
7	Passed (51% M)	1 piece(s) 2 x 8 HF No.2 @ 16" OC	
8	Passed (71% M+)	1 piece(s) 3 1/2" x 15" 24F-V4 DF Glulam	

Floor			
Member Name	Results (Max UTIL %)	Current Solution	Comments
1	Passed (73% M)	1 piece(s) 6 x 12 DF No.2	
2	Passed (88% M)	1 piece(s) 4 x 10 DF No.2	
3	Passed (87% M)	1 piece(s) 6 x 10 DF No.2	
4	Passed (84% R)	1 piece(s) 5 1/2" x 13 1/2" 24F-V4 DF Glulam	
5	Passed (101% M)	1 piece(s) 4 x 12 DF No.2	
6	Passed (97% R)	1 piece(s) 6 x 12 DF No.2	
7	Passed (84% M+)	1 piece(s) 5 1/2" x 10 1/2" 24F-V4 DF Glulam	
8	Passed (53% R)	1 piece(s) 5 1/2" x 9" 24F-V4 DF Glulam	
9	Passed (66% R)	1 piece(s) 2 x 12 HF No.2 @ 16" OC	
10	Passed (50% ΔL)	1 piece(s) 5 1/2" x 13 1/2" 24F-V4 DF Glulam	
11	Passed (58% ΔT)	1 piece(s) 5 1/2" x 9" 24F-V4 DF Glulam	
12	Passed (75% R)	4 piece(s) 2 x 12 HF No.2	
13	Passed (55% R)	1 piece(s) 4 x 8 DF No.2	

ForteWEB Software Operator	Job Notes
Eric Rice ELR Engineering (206) 200-8764 elreng33@gmail.com	Client: Puget Sound Construction Partners, Inc. Project: Addition-Remodel at 8205



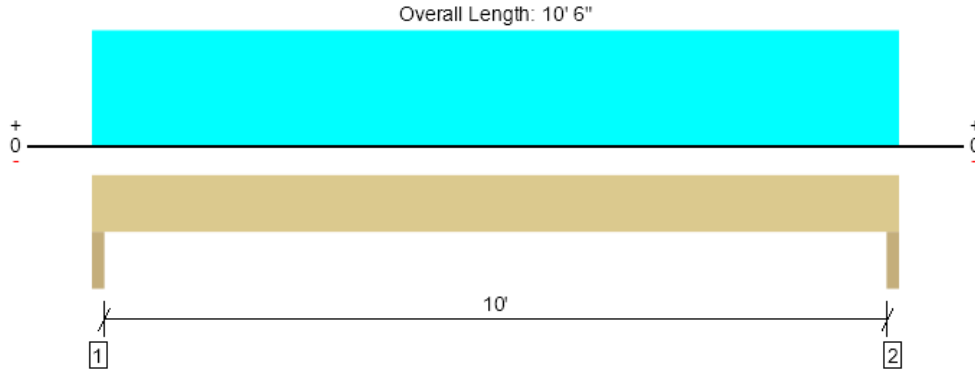
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ForteWEB v3.9

File Name: PSCP, Inc. - Addition-Remodel at 8205

Roof, 1

**1 piece(s) 5 1/2" x 9" 24F-V4 DF Glulam**



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal (typ.).

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	4326 @ 1 1/2"	10725 (3.00")	Passed (40%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	3502 @ 1'	10057	Passed (35%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Pos Moment (Ft-lbs)	10822 @ 5' 3"	17078	Passed (63%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.223 @ 5' 3"	0.342	Passed (L/552)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.340 @ 5' 3"	0.512	Passed (L/361)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

Member Length : 10' 6"  
 System : Wall  
 Member Type : Header  
 Building Use : Residential  
 Building Code : IBC 2021  
 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Volume factor of 1.00 was calculated for positive bending using length L = 10' 3".
- The effects of positive or negative camber have not been accounted for when calculating deflection.
- The specified glulam is assumed to have its strong laminations at the bottom of the beam. Install with proper side up as indicated by the manufacturer.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Factored	
1 - Trimmer - HF	3.00"	3.00"	1.50"	1491	1680	2100	4326	None
2 - Trimmer - HF	3.00"	3.00"	1.50"	1491	1680	2100	4326	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	10' 6" o/c	
Bottom Edge (Lu)	10' 6" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 10' 6"	N/A	12.0	--	--	
1 - Uniform (PSF)	0 to 10' 6"	16'	17.0	20.0	25.0	Default Load

**Weyerhaeuser Notes**

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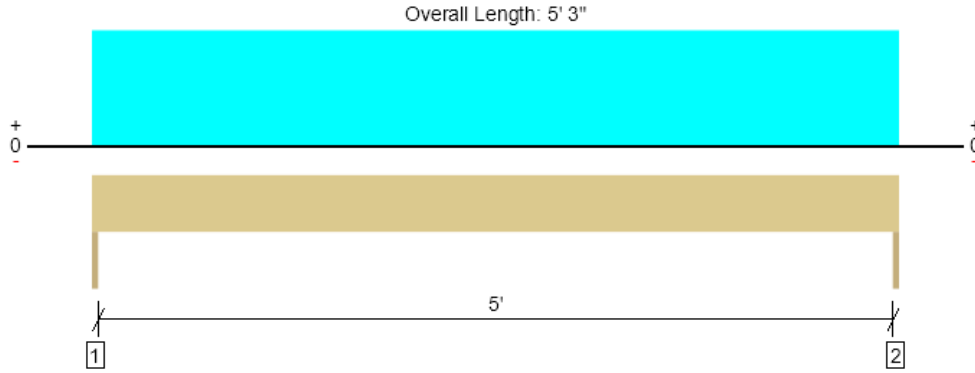
The product application, input design loads, dimensions and support information have been provided by Architect/Designer: RHD

Forteweb Software Operator	Job Notes
Eric Rice ELR Engineering (206) 200-8764 elreng33@gmail.com	Client: Puget Sound Construction Partners, Inc. Project: Addition-Remodel at 8205



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 File Name: PSCP, Inc. - Addition-Remodel at 8205

Roof, 2  
**1 piece(s) 4 x 8 DF No.2**



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal (typ.).

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	2148 @ 0	3281 (1.50")	Passed (65%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	1552 @ 8 3/4"	3502	Passed (44%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	2820 @ 2' 7 1/2"	3438	Passed (82%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.052 @ 2' 7 1/2"	0.175	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.079 @ 2' 7 1/2"	0.262	Passed (L/801)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

Member Length : 5' 3"  
 System : Wall  
 Member Type : Header  
 Building Use : Residential  
 Building Code : IBC 2021  
 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Factored	
1 - Trimmer - HF	1.50"	1.50"	1.50"	731	840	1050	2148	None
2 - Trimmer - HF	1.50"	1.50"	1.50"	731	840	1050	2148	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	5' 3" o/c	
Bottom Edge (Lu)	5' 3" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 5' 3"	N/A	6.4	--	--	
1 - Uniform (PSF)	0 to 5' 3"	16'	17.0	20.0	25.0	Default Load

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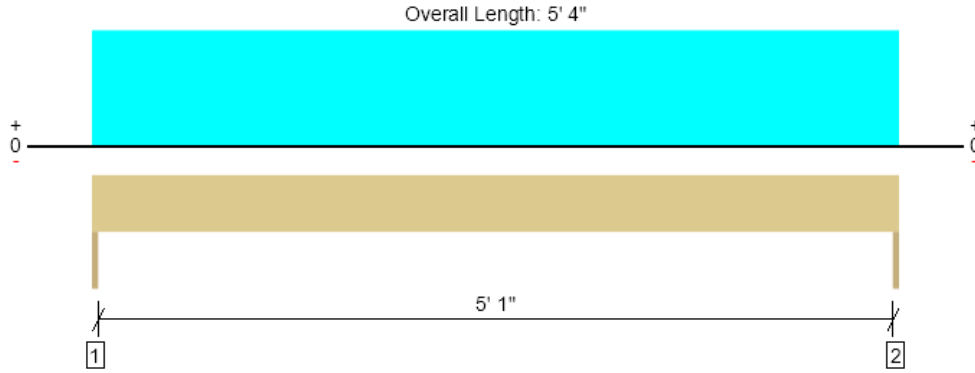
The product application, input design loads, dimensions and support information have been provided by Architect/Designer: RHD

Forteweb Software Operator	Job Notes
Eric Rice ELR Engineering (206) 200-8764 elreng33@gmail.com	Client: Puget Sound Construction Partners, Inc. Project: Addition-Remodel at 8205



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 File Name: PSCP, Inc. - Addition-Remodel at 8205

Roof, 3  
**1 piece(s) 4 x 8 DF No.2**



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal (typ.).

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1650 @ 0	3281 (1.50")	Passed (50%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1199 @ 8 3/4"	3502	Passed (34%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	2201 @ 2' 8"	3438	Passed (64%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.037 @ 2' 8"	0.178	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.063 @ 2' 8"	0.267	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)

Member Length : 5' 4"  
 System : Wall  
 Member Type : Header  
 Building Use : Residential  
 Building Code : IBC 2021  
 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Trimmer - HF	1.50"	1.50"	1.50"	678	972	1650	None
2 - Trimmer - HF	1.50"	1.50"	1.50"	678	972	1650	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	5' 4" o/c	
Bottom Edge (Lu)	5' 4" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 5' 4"	N/A	6.4	--	
1 - Uniform (PSF)	0 to 5' 4"	14' 7"	17.0	25.0	Default Load

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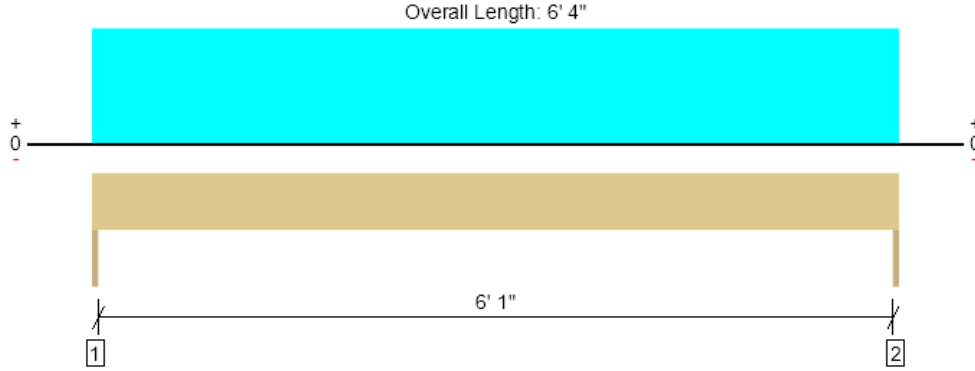
Forteweb Software Operator	Job Notes
Eric Rice ELR Engineering (206) 200-8764 elreng33@gmail.com	Client: Puget Sound Construction Partners, Inc. Project: Addition-Remodel at 8205



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Roof, 4

**1 piece(s) 3 1/2" x 6" 24F-V4 DF Glulam**



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal (typ.).

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	2708 @ 0	3413 (1.50")	Passed (79%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	2174 @ 7 1/2"	4267	Passed (51%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Pos Moment (Ft-lbs)	4288 @ 3' 2"	4830	Passed (89%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.180 @ 3' 2"	0.211	Passed (L/421)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.273 @ 3' 2"	0.313	Passed (L/278)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

Member Length : 6' 4"  
 System : Wall  
 Member Type : Header  
 Building Use : Residential  
 Building Code : IBC 2021  
 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (5/16").
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Volume factor of 1.00 was calculated for positive bending using length L = 6' 4".
- The effects of positive or negative camber have not been accounted for when calculating deflection.
- The specified glulam is assumed to have its strong laminations at the bottom of the beam. Install with proper side up as indicated by the manufacturer.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Factored	
1 - Trimmer - HF	1.50"	1.50"	1.50"	918	1061	1326	2708	None
2 - Trimmer - HF	1.50"	1.50"	1.50"	918	1061	1326	2708	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	6' 4" o/c	
Bottom Edge (Lu)	6' 4" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 6' 4"	N/A	5.1	--	--	
1 - Uniform (PSF)	0 to 6' 4"	16' 9"	17.0	20.0	25.0	Default Load

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The product application, input design loads, dimensions and support information have been provided by Architect/Designer: RHD

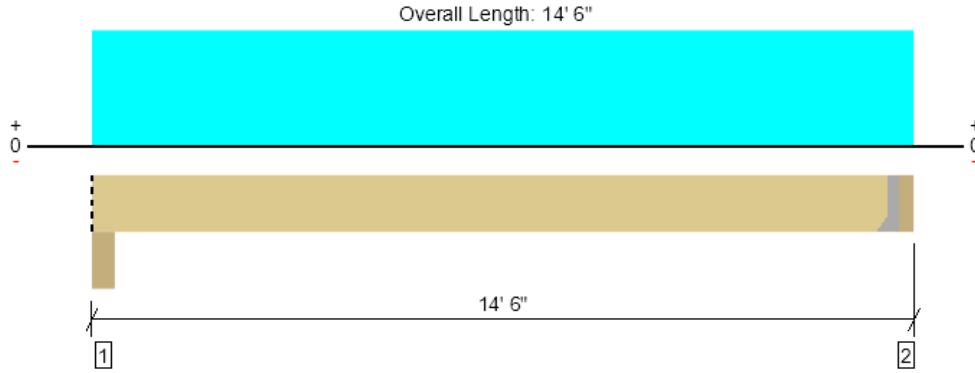
Forteweb Software Operator	Job Notes
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 File Name: PSCP, Inc. - Addition-Remodel at 8205

Roof, a

**1 piece(s) 3 1/2" x 9" 24F-V4 DF Glulam**



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal (typ.).

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1129 @ 14' 2 1/2"	3413 (1.50")	Passed (33%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	1007 @ 13' 5 1/2"	6400	Passed (16%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Pos Moment (Ft-lbs)	3917 @ 7' 3 1/4"	10868	Passed (36%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.208 @ 7' 3 1/4"	0.694	Passed (L/799)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.355 @ 7' 3 1/4"	0.925	Passed (L/469)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

Member Length : 14' 2 1/2"  
 System : Roof  
 Member Type : Drop Beam  
 Building Use : Residential  
 Building Code : IBC 2021  
 Design Methodology : ASD  
 Member Pitch : 0/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Volume factor of 1.00 was calculated for positive bending using length L = 13' 10 1/2".
- The effects of positive or negative camber have not been accounted for when calculating deflection.
- The specified glulam is assumed to have its strong laminations at the bottom of the beam. Install with proper side up as indicated by the manufacturer.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Factored	
1 - Column - DF	5.50"	5.50"	1.50"	488	291	636	1184	Blocking
2 - Hanger on 9" GLB beam	3.50"	Hanger <sup>1</sup>	1.50"	483	289	633	1175	See note <sup>1</sup>

- Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.
- At hanger supports, the Total Bearing dimension is equal to the width of the material that is supporting the hanger
- <sup>1</sup> See Connector grid below for additional information and/or requirements.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	14' 3" o/c	
Bottom Edge (Lu)	14' 3" o/c	

- Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-Tie						
Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
2 - Face Mount Hanger	HUC48	2.50"	N/A	10-10dx1.5	4-10d	

- Refer to manufacturer notes and instructions for proper installation and use of all connectors.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 14' 2 1/2"	N/A	7.7	--	--	
1 - Uniform (PSF)	0 to 14' 6" (Top)	3' 6"	17.0	--	25.0	Default Load
2 - Uniform (PSF)	0 to 14' 6" (Back)	2'	--	20.0	--	Default Load

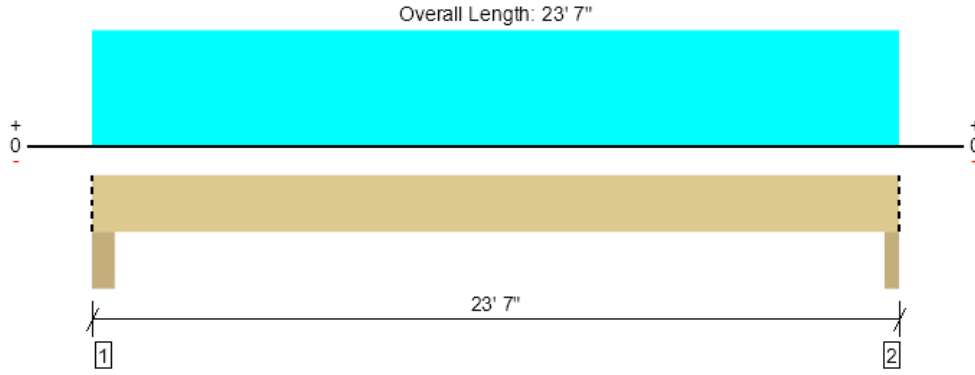
- Side loads are assumed to not induce cross-grain tension.

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Roof, b

**1 piece(s) 3 1/2" x 15" 24F-V4 DF Glulam**



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal (typ.).

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	2567 @ 23' 5"	7963 (3.50")	Passed (32%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	2229 @ 1' 8 1/2"	10666	Passed (21%)	1.15	1.0 D + 1.0 S (All Spans)
Pos Moment (Ft-lbs)	14604 @ 11' 10 1/2"	30188	Passed (48%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.443 @ 11' 10 1/2"	1.154	Passed (L/625)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.791 @ 11' 10 1/2"	1.539	Passed (L/350)	--	1.0 D + 1.0 S (All Spans)

Member Length : 23' 7"  
 System : Roof  
 Member Type : Drop Beam  
 Building Use : Residential  
 Building Code : IBC 2021  
 Design Methodology : ASD  
 Member Pitch : 0/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Volume factor of 1.00 was calculated for positive bending using length L = 23' 1".
- The effects of positive or negative camber have not been accounted for when calculating deflection.
- The specified glulam is assumed to have its strong laminations at the bottom of the beam. Install with proper side up as indicated by the manufacturer.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Column - DF	5.50"	5.50"	1.50"	1144	1460	2604	Blocking
2 - Beam - GLB	3.50"	3.50"	1.50"	1128	1439	2567	Blocking

• Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	23' 7" o/c	
Bottom Edge (Lu)	23' 7" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 23' 7"	N/A	12.8	--	
1 - Uniform (PSF)	0 to 23' 7" (Top)	4' 11"	17.0	25.0	Default Load

• Side loads are assumed to not induce cross-grain tension.

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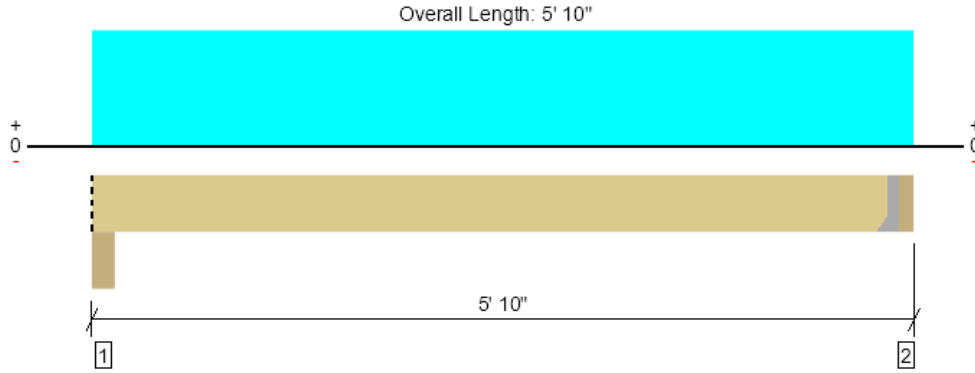
The product application, input design loads, dimensions and support information have been provided by Architect/Designer: RHD

Forteweb Software Operator	Job Notes
Eric Rice ELR Engineering (206) 200-8764 elreng33@gmail.com	Client: Puget Sound Construction Partners, Inc. Project: Addition-Remodel at 8205



Roof, c

**1 piece(s) 3 1/2" x 9" 24F-V4 DF Glulam**



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal (typ.).

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	424 @ 5' 6 1/2"	3413 (1.50")	Passed (12%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	302 @ 4' 9 1/2"	6400	Passed (5%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Pos Moment (Ft-lbs)	552 @ 2' 11 1/4"	10868	Passed (5%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.004 @ 2' 11 1/4"	0.260	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.007 @ 2' 11 1/4"	0.347	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

Member Length : 5' 6 1/2"  
 System : Roof  
 Member Type : Drop Beam  
 Building Use : Residential  
 Building Code : IBC 2021  
 Design Methodology : ASD  
 Member Pitch : 0/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Volume factor of 1.00 was calculated for positive bending using length L = 5' 2 1/2".
- The effects of positive or negative camber have not been accounted for when calculating deflection.
- The specified glulam is assumed to have its strong laminations at the bottom of the beam. Install with proper side up as indicated by the manufacturer.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Factored	
1 - Column - DF	5.50"	5.50"	1.50"	197	118	257	478	Blocking
2 - Hanger on 9" GLB beam	3.50"	Hanger <sup>1</sup>	1.50"	192	116	253	469	See note <sup>1</sup>

- Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.
- At hanger supports, the Total Bearing dimension is equal to the width of the material that is supporting the hanger
- <sup>1</sup> See Connector grid below for additional information and/or requirements.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	5' 7" o/c	
Bottom Edge (Lu)	5' 7" o/c	

•Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-Tie						
Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
2 - Face Mount Hanger	HUC48	2.50"	N/A	10-10dx1.5	4-10d	

- Refer to manufacturer notes and instructions for proper installation and use of all connectors.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 5' 6 1/2"	N/A	7.7	--	--	
1 - Uniform (PSF)	0 to 5' 10" (Top)	3' 6"	17.0	--	25.0	Default Load
2 - Uniform (PSF)	0 to 5' 10" (Front)	2'	--	20.0	--	Default Load

• Side loads are assumed to not induce cross-grain tension.

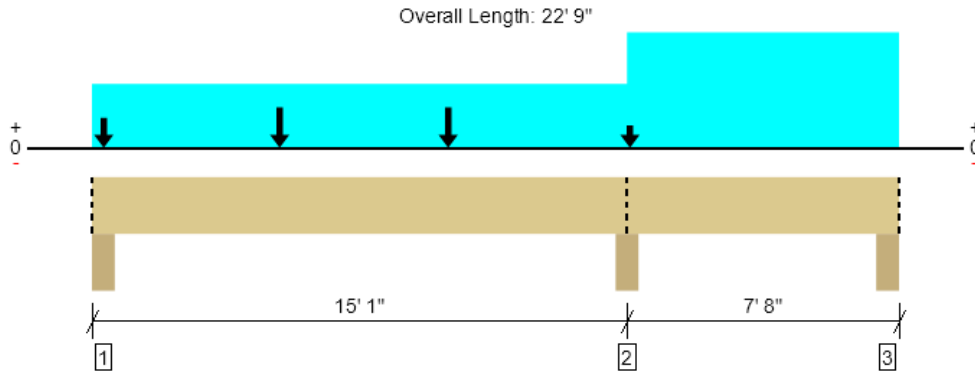
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Roof, 5

**1 piece(s) 3 1/2" x 15" 24F-V4 DF Glulam**



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal (typ.).

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	10698 @ 15' 1"	12513 (5.50")	Passed (86%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	5319 @ 13' 7 1/4"	10666	Passed (50%)	1.15	1.0 D + 1.0 S (All Spans)
Pos Moment (Ft-lbs)	15050 @ 5' 3 1/2"	30188	Passed (50%)	1.15	1.0 D + 1.0 S (Alt Spans)
Neg Moment (Ft-lbs)	-15164 @ 15' 1"	23270	Passed (65%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.156 @ 7' 15/16"	0.738	Passed (L/999+)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.274 @ 7' 3/4"	0.983	Passed (L/645)	--	1.0 D + 1.0 S (Alt Spans)

Member Length : 22' 9"  
 System : Roof  
 Member Type : Drop Beam  
 Building Use : Residential  
 Building Code : IBC 2021  
 Design Methodology : ASD  
 Member Pitch : 0/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Volume factor of 1.00 was calculated for positive bending using length L = 11' 11 7/8".
- Volume factor of 1.00 was calculated for negative bending using length L = 9' 4 9/16".
- -638 lbs uplift at support located at 22' 5". Strapping or other restraint may be required.
- The effects of positive or negative camber have not been accounted for when calculating deflection.
- The specified glulam is assumed to have its strong laminations at the bottom of the beam. Install with proper side up as indicated by the manufacturer.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Factored	
1 - Column - DF	5.50"	5.50"	2.26"	2157	1163/-37	2827	5150	Blocking
2 - Column - DF	5.50"	5.50"	4.70"	4397	2619	5784	10698	Blocking
3 - Column - DF	5.50"	5.50"	1.50"	-10	902/-334	595/-503	1112/-638	Blocking

• Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	22' 9" o/c	
Bottom Edge (Lu)	22' 9" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 22' 9"	N/A	12.8	--	--	
1 - Uniform (PSF)	0 to 15' 1" (Top)	6' 9"	17.0	20.0	25.0	
2 - Point (lb)	5' 3 1/2" (Top)	N/A	1128	--	1439	Linked from: b, Support 2
3 - Point (lb)	10' 1/2" (Top)	N/A	1128	--	1439	Linked from: b, Support 2
4 - Uniform (PSF)	15' 1" to 22' 9" (Top)	12' 2 1/2"	17.0	20.0	25.0	
5 - Point (lb)	4" (Top)	N/A	483	289	633	Linked from: a, Support 2
6 - Point (lb)	15' 2" (Top)	N/A	192	116	253	Linked from: c, Support 2

• Side loads are assumed to not induce cross-grain tension.

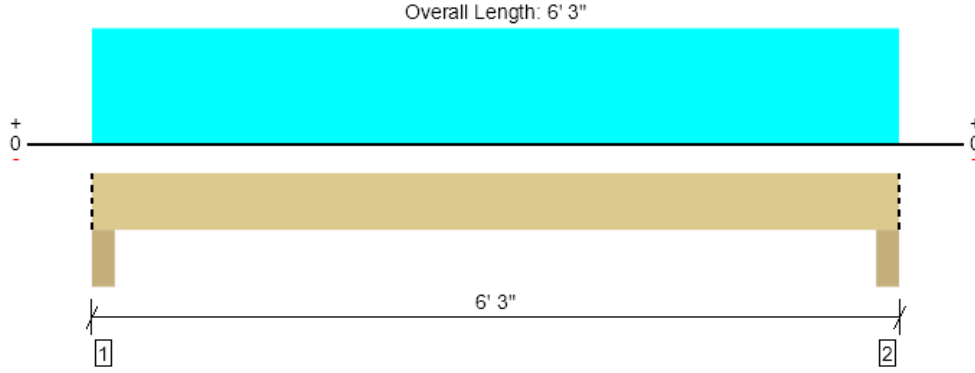
Forteweb Software Operator	Job Notes
Eric Rice ELR Engineering (206) 200-8764 elreng33@gmail.com	Client: Puget Sound Construction Partners, Inc. Project: Addition-Remodel at 8205



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Roof, 6

**1 piece(s) 3 1/2" x 6" 24F-V4 DF Glulam**



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal (typ.).

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	2157 @ 4"	12513 (5.50")	Passed (17%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	1495 @ 11 1/2"	4267	Passed (35%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Pos Moment (Ft-lbs)	2690 @ 3' 1 1/2"	4830	Passed (56%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.088 @ 3' 1 1/2"	0.279	Passed (L/763)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.133 @ 3' 1 1/2"	0.372	Passed (L/503)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

Member Length : 6' 3"  
 System : Roof  
 Member Type : Drop Beam  
 Building Use : Residential  
 Building Code : IBC 2021  
 Design Methodology : ASD  
 Member Pitch : 0/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Volume factor of 1.00 was calculated for positive bending using length L = 5' 7".
- The effects of positive or negative camber have not been accounted for when calculating deflection.
- The specified glulam is assumed to have its strong laminations at the bottom of the beam. Install with proper side up as indicated by the manufacturer.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Factored	
1 - Column - DF	5.50"	5.50"	1.50"	733	844	1055	2157	Blocking
2 - Column - DF	5.50"	5.50"	1.50"	733	844	1055	2157	Blocking

• Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	6' 3" o/c	
Bottom Edge (Lu)	6' 3" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 6' 3"	N/A	5.1	--	--	
1 - Uniform (PSF)	0 to 6' 3" (Top)	13' 6"	17.0	20.0	25.0	

• Side loads are assumed to not induce cross-grain tension.

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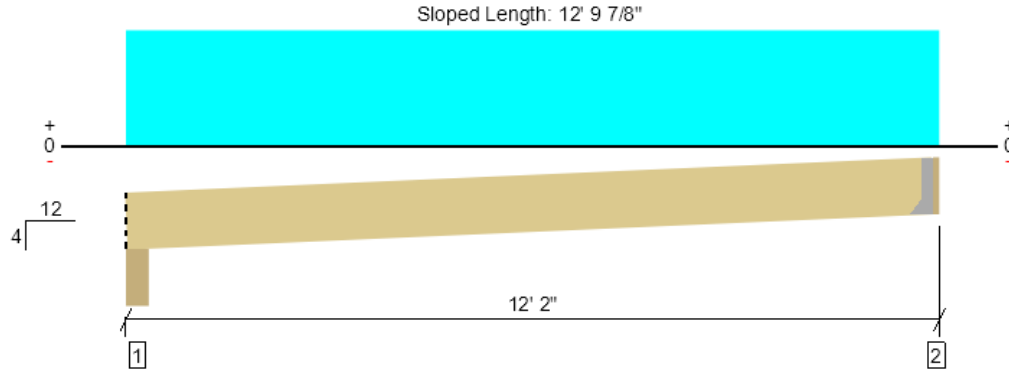
The product application, input design loads, dimensions and support information have been provided by Architect/Designer: RHD

ForteWEB Software Operator	Job Notes
Eric Rice ELR Engineering (206) 200-8764 elreng33@gmail.com	Client: Puget Sound Construction Partners, Inc. Project: Addition-Remodel at 8205



Roof, 7

**1 piece(s) 2 x 8 HF No.2 @ 16" OC**



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal (typ.).

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	260 @ 12' 1/2"	911 (1.50")	Passed (29%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	234 @ 11' 5 5/8"	1251	Passed (19%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	758 @ 6' 2 1/2"	1477	Passed (51%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.249 @ 6' 2 1/2"	0.615	Passed (L/592)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.333 @ 6' 2 1/2"	0.820	Passed (L/443)	--	1.0 D + 1.0 S (All Spans)

Member Length : 12' 10 3/4"  
 System : Roof  
 Member Type : Joist  
 Building Use : Residential  
 Building Code : IBC 2021  
 Design Methodology : ASD  
 Member Pitch : 4/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A 15% increase in the moment capacity has been added to account for repetitive member usage.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Beveled Plate - HF	5.50"	5.50"	1.50"	70	207	277	Blocking
2 - Hanger on 7 1/4" HF beam	1.50"	Hanger <sup>1</sup>	1.50"	67	199	266	See note <sup>1</sup>

- Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.
- At hanger supports, the Total Bearing dimension is equal to the width of the material that is supporting the hanger
- <sup>1</sup> See Connector grid below for additional information and/or requirements.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	10' 10" o/c	
Bottom Edge (Lu)	12' 8" o/c	

- Maximum allowable bracing intervals based on applied load.
- Dimensions for lateral bracing intervals are measured along the length of the member for sloped conditions.

Connector: Simpson Strong-Tie						
Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
2 - Face Mount Hanger	LRU26Z	1.94"	N/A	4-10dx1.5	5-10d	

- Refer to manufacturer notes and instructions for proper installation and use of all connectors.

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 12' 2"	16"	8.0	25.0	Default Load

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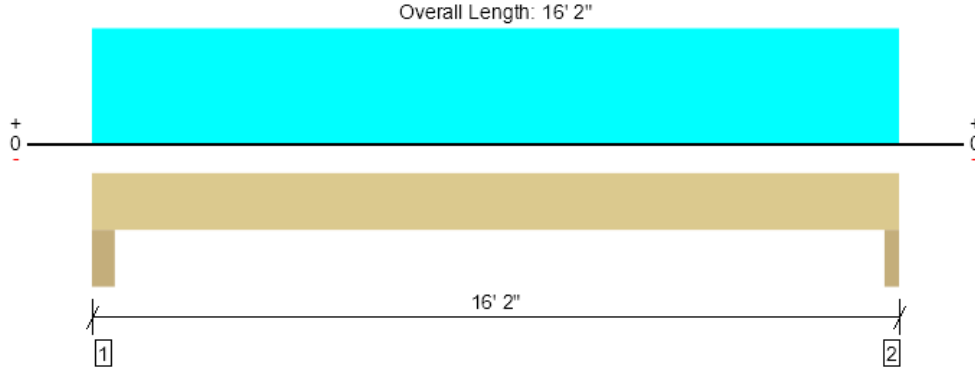
Forteweb Software Operator	Job Notes
Eric Rice ELR Engineering (206) 200-8764 elreng33@gmail.com	Client: Puget Sound Construction Partners, Inc. Project: Addition-Remodel at 8205



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Roof, 8

**1 piece(s) 3 1/2" x 15" 24F-V4 DF Glulam**



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal (typ.).

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	5583 @ 16'	7963 (3.50")	Passed (70%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	4507 @ 1' 8 1/2"	10666	Passed (42%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Pos Moment (Ft-lbs)	21412 @ 8' 2"	30188	Passed (71%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.349 @ 8' 2"	0.522	Passed (L/539)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.534 @ 8' 2"	0.783	Passed (L/352)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

Member Length : 16' 2"  
 System : Floor  
 Member Type : Flush Beam  
 Building Use : Residential  
 Building Code : IBC 2021  
 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Volume factor of 1.00 was calculated for positive bending using length L = 15' 8".
- The effects of positive or negative camber have not been accounted for when calculating deflection.
- The specified glulam is assumed to have its strong laminations at the bottom of the beam. Install with proper side up as indicated by the manufacturer.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Factored	
1 - Column - DF	5.50"	5.50"	2.51"	1978	2205	2756	5699	None
2 - Column - DF	3.50"	3.50"	2.45"	1938	2160	2700	5583	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	16' 2" o/c	
Bottom Edge (Lu)	16' 2" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 16' 2"	N/A	12.8	--	--	
1 - Uniform (PSF)	0 to 16' 2" (Back)	6' 5"	17.0	20.0	25.0	Default Load
2 - Uniform (PSF)	0 to 16' 2" (Front)	7' 1"	17.0	20.0	25.0	Default Load

• Side loads are assumed to not induce cross-grain tension.

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Eric Rice ELR Engineering (206) 200-8764 elreng33@gmail.com	Client: Puget Sound Construction Partners, Inc. Project: Addition-Remodel at 8205

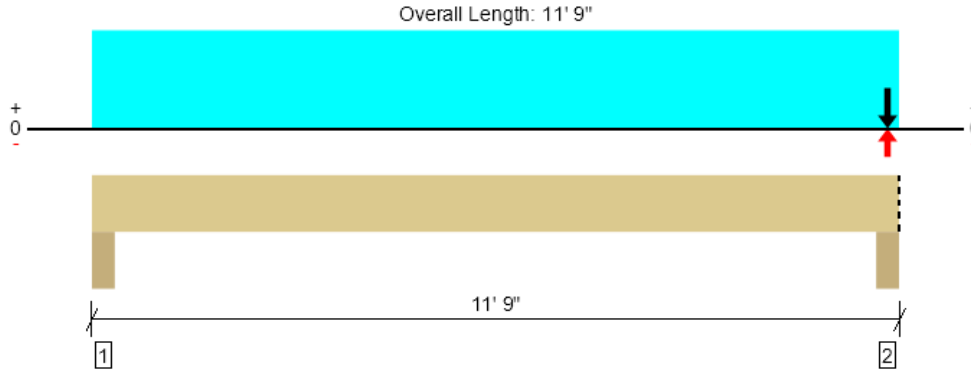


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Floor, 1  
**1 piece(s) 6 x 12 DF No.2**



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal (typ.).

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern) [Group]
Member Reaction (lbs)	3948 @ 11' 5"	18906 (5.50")	Passed (21%)	--	1.0 D + 0.75 L + 0.75 S (All Spans) [1]
Shear (lbs)	2151 @ 1' 5"	8244	Passed (26%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans) [1]
Moment (Ft-lbs)	7409 @ 5' 10 1/2"	10166	Passed (73%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans) [1]
Live Load Defl. (in)	0.107 @ 5' 10 1/2"	0.369	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans) [3]
Total Load Defl. (in)	0.181 @ 5' 10 1/2"	0.554	Passed (L/736)	--	1.0 D + 0.75 L + 0.75 S (All Spans) [1]

Member Length : 11' 9"  
 System : Floor  
 Member Type : Drop Beam  
 Building Use : Residential  
 Building Code : IBC 2021  
 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Lumber grading provisions must be extended over the length of the member per NDS 4.2.5.5.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Factored	
1 - Column - HF	5.50"	5.50"	1.50"	1158	1263	973	2835	None
2 - Column - HF	5.50"	5.50"	1.50"	1148	2165	1568	3948	Blocking

• Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	11' 9" o/c	
Bottom Edge (Lu)	11' 9" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 11' 9"	N/A	16.0	--	--	
1 - Uniform (PSF)	0 to 11' 9" (Top)	7' 8"	10.0	--	--	Default Load
2 - Uniform (PSF)	0 to 11' 9" (Top)	2' 6"	17.0	20.0	25.0	Default Load
3 - Uniform (PSF)	0 to 11' 9" (Top)	4' 1 1/2"	15.0	40.0	25.0	Default Load
4 - Point (lb)	11' 7" (Top)	N/A	-10	902/-334	595/-503	Linked from: 5, Support 3

• Side loads are assumed to not induce cross-grain tension.

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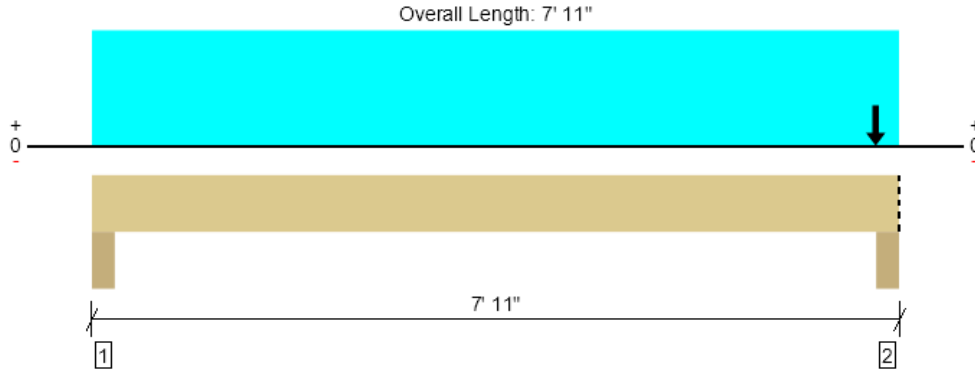
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Forteweb Software Operator	Job Notes
Eric Rice ELR Engineering (206) 200-8764 elreng33@gmail.com	Client: Puget Sound Construction Partners, Inc. Project: Addition-Remodel at 8205



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Floor, 2  
**1 piece(s) 4 x 10 DF No.2**



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal (typ.).

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	5561 @ 7' 7"	12031 (5.50")	Passed (46%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	1880 @ 1' 2 3/4"	4468	Passed (42%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	4525 @ 3' 11 1/2"	5166	Passed (88%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.068 @ 3' 11 1/2"	0.242	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.116 @ 3' 11 1/2"	0.363	Passed (L/751)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

Member Length : 7' 11"  
 System : Floor  
 Member Type : Drop Beam  
 Building Use : Residential  
 Building Code : IBC 2021  
 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Factored	
1 - Beam - DF	5.50"	5.50"	1.50"	1136	1118	1002	2726	None
2 - Beam - DF	5.50"	5.50"	2.54"	2294	2381	1975	5561	Blocking

• Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	7' 11" o/c	
Bottom Edge (Lu)	7' 11" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 7' 11"	N/A	8.2	--	--	
1 - Uniform (PSF)	0 to 7' 11" (Top)	7' 8"	10.0	--	--	Default Load
2 - Uniform (PSF)	0 to 7' 11" (Top)	10' 1 1/2"	17.0	20.0	25.0	Default Load
3 - Uniform (PSF)	0 to 7' 11" (Top)	2'	15.0	40.0	--	
4 - Point (lb)	7' 8 1/4" (Top)	N/A	1158	1263	973	Linked from: 1, Support 1

• Side loads are assumed to not induce cross-grain tension.

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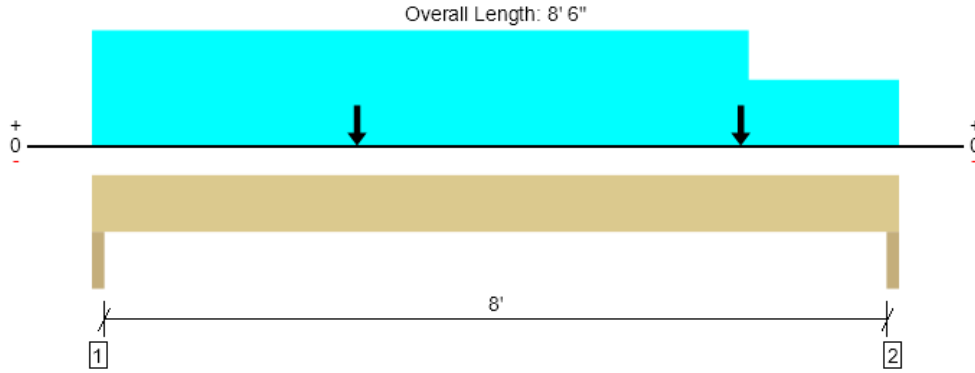
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Eric Rice ELR Engineering (206) 200-8764 elreng33@gmail.com	Client: Puget Sound Construction Partners, Inc. Project: Addition-Remodel at 8205



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Floor, 3  
**1 piece(s) 6 x 10 DF No.2**



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal (typ.).

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	2654 @ 8' 4 1/2"	10313 (3.00")	Passed (26%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	2495 @ 7' 5 1/2"	5922	Passed (42%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	5264 @ 2' 11 13/16"	6032	Passed (87%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.071 @ 4' 2 5/8"	0.275	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.133 @ 4' 2 11/16"	0.412	Passed (L/743)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

Member Length : 8' 6"  
 System : Wall  
 Member Type : Header  
 Building Use : Residential  
 Building Code : IBC 2021  
 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Lumber grading provisions must be extended over the length of the member per NDS 4.2.5.5.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Factored	
1 - Trimmer - HF	3.00"	3.00"	1.50"	1188	1059	600	2432	None
2 - Trimmer - HF	3.00"	3.00"	1.50"	1240	1393	493	2654	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	8' 6" o/c	
Bottom Edge (Lu)	8' 6" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 8' 6"	N/A	13.2	--	--	
1 - Uniform (PSF)	0 to 8' 6"	7' 8"	10.0	--	--	
2 - Uniform (PSF)	6' 11" to 8' 6"	2' 6"	17.0	--	25.0	
3 - Uniform (PSF)	0 to 6' 11"	5' 9"	17.0	--	25.0	
4 - Point (lb)	2' 9 1/2"	N/A	460	1226	--	
5 - Point (lb)	6' 10"	N/A	460	1226	--	

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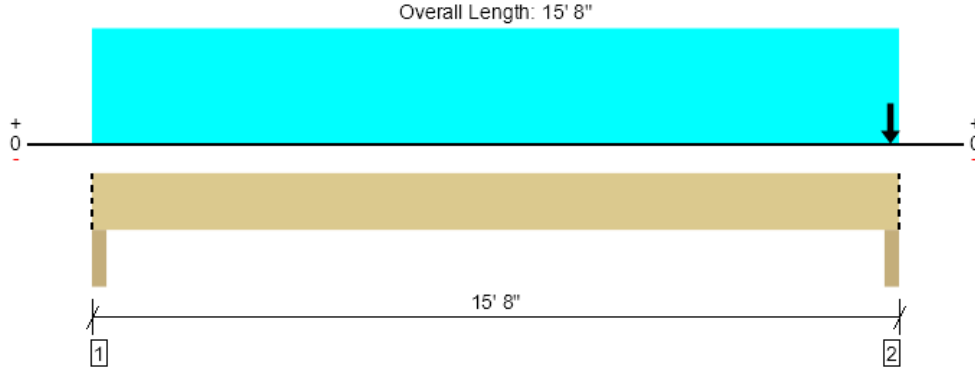
Forteweb Software Operator	Job Notes
Eric Rice ELR Engineering (206) 200-8764 elreng33@gmail.com	Client: Puget Sound Construction Partners, Inc. Project: Addition-Remodel at 8205



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 File Name: PSCP, Inc. - Addition-Remodel at 8205

Floor, 4

**1 piece(s) 5 1/2" x 13 1/2" 24F-V4 DF Glulam**



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal (typ.).

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	10512 @ 15' 6"	12513 (3.50")	Passed (84%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	4910 @ 1' 5"	13118	Passed (37%)	1.00	1.0 D + 1.0 L (All Spans)
Pos Moment (Ft-lbs)	22486 @ 7' 10"	33413	Passed (67%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.333 @ 7' 10"	0.511	Passed (L/553)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.469 @ 7' 10"	0.767	Passed (L/392)	--	1.0 D + 1.0 L (All Spans)

Member Length : 15' 8"  
 System : Floor  
 Member Type : Flush Beam  
 Building Use : Residential  
 Building Code : IBC 2021  
 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Volume factor of 1.00 was calculated for positive bending using length L = 15' 4".
- The effects of positive or negative camber have not been accounted for when calculating deflection.
- The specified glulam is assumed to have its strong laminations at the bottom of the beam. Install with proper side up as indicated by the manufacturer.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Factored	
1 - Column - DF	3.50"	3.50"	1.68"	1737	4256	--	5994	Blocking
2 - Column - DF	3.50"	3.50"	2.94"	3675	6416	2700	10512	Blocking

• Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	15' 8" o/c	
Bottom Edge (Lu)	15' 8" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 15' 8"	N/A	18.0	--	--	
1 - Uniform (PSF)	0 to 15' 8" (Back)	6' 4"	15.0	40.0	--	Default Load
2 - Uniform (PSF)	0 to 15' 8" (Front)	7' 3"	15.0	40.0	--	Default Load
3 - Point (lb)	15' 6" (Top)	N/A	1938	2160	2700	Linked from: 8, Support 2

• Side loads are assumed to not induce cross-grain tension.

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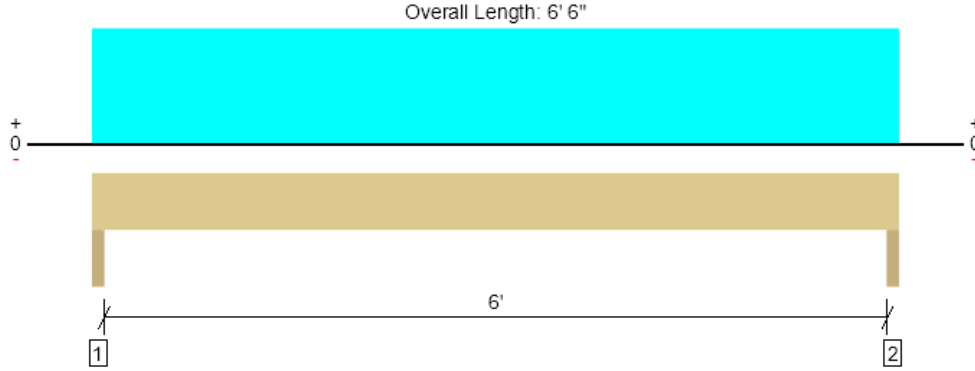
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Floor, 5  
**1 piece(s) 4 x 12 DF No.2**



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal (typ.).

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	4246 @ 1 1/2"	6563 (3.00")	Passed (65%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	2592 @ 1' 2 1/4"	4725	Passed (55%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	6136 @ 3' 3"	6091	Passed (101%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.045 @ 3' 3"	0.208	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.067 @ 3' 3"	0.313	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

Member Length : 6' 6"  
 System : Wall  
 Member Type : Header  
 Building Use : Residential  
 Building Code : IBC 2021  
 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Factored	
1 - Trimmer - HF	3.00"	3.00"	1.94"	1440	2643	1097	4246	None
2 - Trimmer - HF	3.00"	3.00"	1.94"	1440	2643	1097	4246	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	6" o/c	
Bottom Edge (Lu)	6' 6" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 6' 6"	N/A	10.0	--	--	
1 - Uniform (PSF)	0 to 6' 6"	13' 7"	15.0	40.0	--	Default Load
2 - Uniform (PSF)	0 to 6' 6"	13' 6"	17.0	20.0	25.0	Default Load

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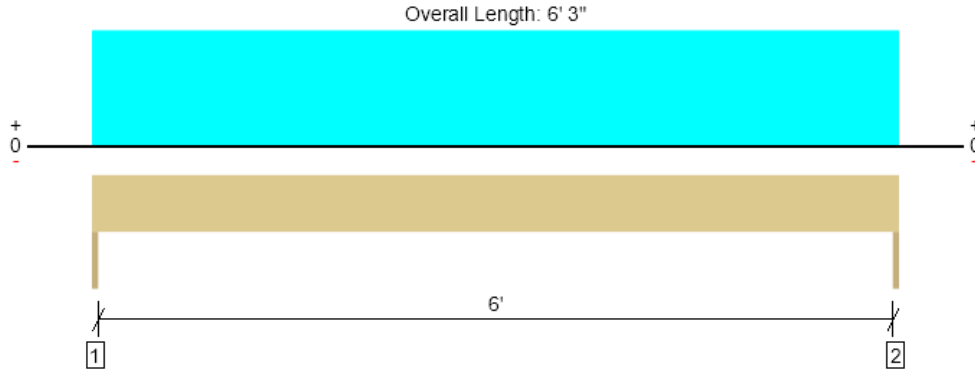
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Floor, 6  
**1 piece(s) 6 x 12 DF No.2**



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal (typ.).

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	5013 @ 0	5156 (1.50")	Passed (97%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	2949 @ 1' 1"	7168	Passed (41%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	7053 @ 3' 1 1/2"	8840	Passed (80%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.041 @ 3' 1 1/2"	0.208	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.061 @ 3' 1 1/2"	0.313	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

Member Length : 6' 3"  
 System : Wall  
 Member Type : Header  
 Building Use : Residential  
 Building Code : IBC 2021  
 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Lumber grading provisions must be extended over the length of the member per NDS 4.2.5.5.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Factored	
1 - Trimmer - HF	1.50"	1.50"	1.50"	1657	2857	1618	5013	None
2 - Trimmer - HF	1.50"	1.50"	1.50"	1657	2857	1618	5013	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	6' 3" o/c	
Bottom Edge (Lu)	6' 3" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 6' 3"	N/A	16.0	--	--	
1 - Uniform (PSF)	0 to 6' 3"	6' 6"	15.0	40.0	--	Default Load
2 - Uniform (PSF)	0 to 6' 3"	7' 8"	10.0	--	--	Default Load
3 - Uniform (PSF)	0 to 6' 3"	14' 8 1/2"	17.0	20.0	25.0	Default Load
4 - Uniform (PSF)	0 to 6' 3"	6'	15.0	60.0	25.0	Default Load

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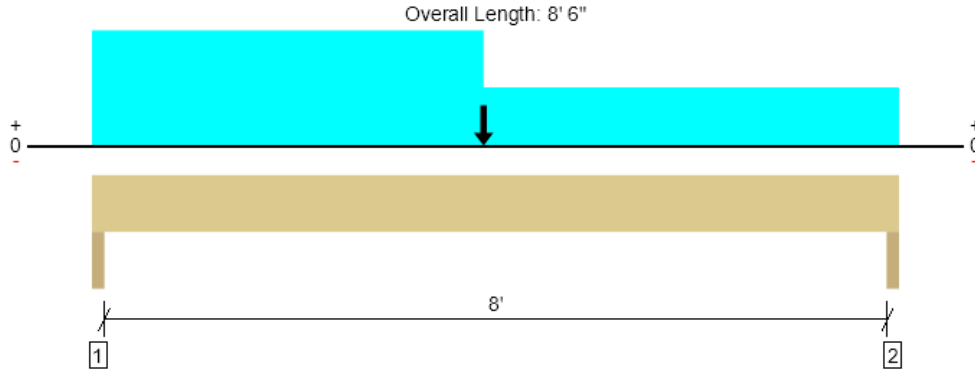
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Floor, 7

**1 piece(s) 5 1/2" x 10 1/2" 24F-V4 DF Glulam**



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal (typ.).

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	8467 @ 1' 1/2"	10725 (3.00")	Passed (79%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	6577 @ 1' 1 1/2"	11733	Passed (56%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Pos Moment (Ft-lbs)	19586 @ 4' 1 1/2"	23244	Passed (84%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.152 @ 4' 2 1/8"	0.275	Passed (L/653)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.228 @ 4' 2 1/8"	0.412	Passed (L/435)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

Member Length : 8' 6"  
 System : Wall  
 Member Type : Header  
 Building Use : Residential  
 Building Code : IBC 2021  
 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Volume factor of 1.00 was calculated for positive bending using length L = 8' 3".
- The effects of positive or negative camber have not been accounted for when calculating deflection.
- The specified glulam is assumed to have its strong laminations at the bottom of the beam. Install with proper side up as indicated by the manufacturer.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Factored	
1 - Trimmer - HF	3.00"	3.00"	2.37"	2822	4526	3001	8467	None
2 - Trimmer - HF	3.00"	3.00"	1.83"	2173	3765	2050	6534	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	8' 6" o/c	
Bottom Edge (Lu)	8' 6" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 8' 6"	N/A	14.0	--	--	
1 - Uniform (PSF)	0 to 4' 1 1/2"	16' 3"	17.0	20.0	25.0	
2 - Uniform (PSF)	0 to 8' 6"	7' 8"	10.0	--	--	
3 - Uniform (PSF)	0 to 8' 6"	6' 6"	15.0	40.0	--	
4 - Uniform (PSF)	0 to 8' 6"	6'	15.0	60.0	25.0	
5 - Point (lb)	4' 1 1/2"	N/A	1491	1680	2100	Linked from: 1, Support 1

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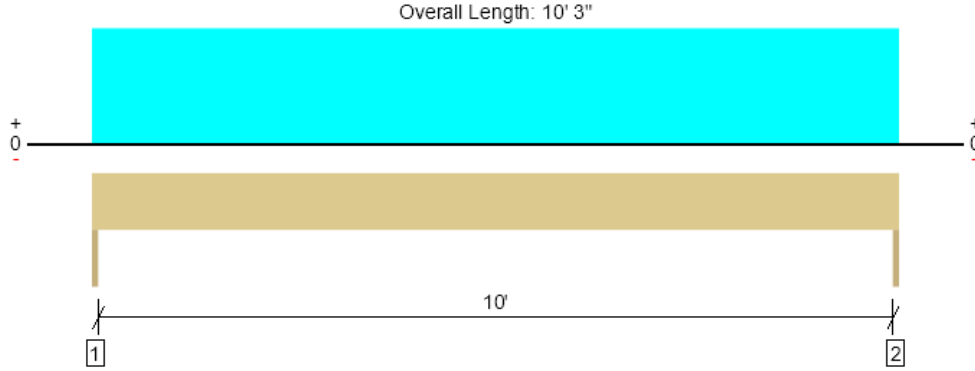
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Floor, 8

**1 piece(s) 5 1/2" x 9" 24F-V4 DF Glulam**



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal (typ.).

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	2833 @ 0	5363 (1.50")	Passed (53%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	2350 @ 10 1/2"	8745	Passed (27%)	1.00	1.0 D + 1.0 L (All Spans)
Pos Moment (Ft-lbs)	7261 @ 5' 1 1/2"	14850	Passed (49%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.162 @ 5' 1 1/2"	0.342	Passed (L/757)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.228 @ 5' 1 1/2"	0.512	Passed (L/539)	--	1.0 D + 1.0 L (All Spans)

Member Length : 10' 3"  
 System : Wall  
 Member Type : Header  
 Building Use : Residential  
 Building Code : IBC 2021  
 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Volume factor of 1.00 was calculated for positive bending using length L = 10' 3".
- The effects of positive or negative camber have not been accounted for when calculating deflection.
- The specified glulam is assumed to have its strong laminations at the bottom of the beam. Install with proper side up as indicated by the manufacturer.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Trimmer - HF	1.50"	1.50"	1.50"	818	2016	2833	None
2 - Trimmer - HF	1.50"	1.50"	1.50"	818	2016	2833	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	10' 3" o/c	
Bottom Edge (Lu)	10' 3" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 10' 3"	N/A	12.0	--	
1 - Uniform (PSF)	0 to 10' 3"	6' 4"	15.0	40.0	
2 - Uniform (PSF)	0 to 10' 3"	3' 6"	15.0	40.0	

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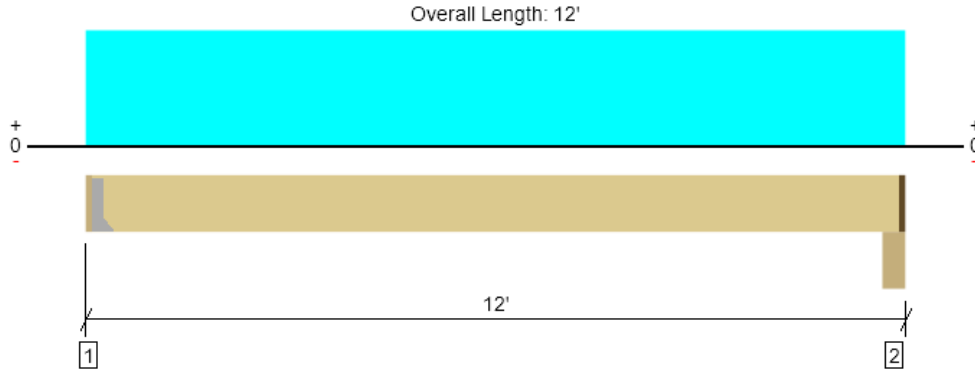
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Floor, 9

1 piece(s) 2 x 12 HF No.2 @ 16" OC



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal (typ.).

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	604 @ 1 1/2"	911 (1.50")	Passed (66%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	481 @ 1' 3/4"	1688	Passed (29%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	1653 @ 5' 10 1/2"	2577	Passed (64%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.145 @ 5' 10 1/2"	0.287	Passed (L/955)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.179 @ 5' 10 1/2"	0.575	Passed (L/773)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
TJ-Pro™ Rating	N/A	N/A	N/A	--	N/A

Member Length : 11' 9"  
 System : Floor  
 Member Type : Joist  
 Building Use : Residential  
 Building Code : IBC 2021  
 Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A 15% increase in the moment capacity has been added to account for repetitive member usage.
- Applicable calculations are based on NDS.
- No composite action between deck and joist was considered in analysis.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Factored	
1 - Hanger on 11 1/4" HF Ledger	1.50"	Hanger <sup>1</sup>	1.50"	118	470	196	617	See note <sup>1</sup>
2 - Beam - HF	5.50"	4.00"	1.50"	123	490	204	643	1 1/2" Rim Board

- Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.
- At hanger supports, the Total Bearing dimension is equal to the width of the material that is supporting the hanger
- <sup>1</sup> See Connector grid below for additional information and/or requirements.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	6' 6" o/c	
Bottom Edge (Lu)	11' 9" o/c	

•Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-Tie						
Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
1 - Face Mount Hanger	U210	2.00"	N/A	10-10dx1.5	6-10dx1.5	

- Refer to manufacturer notes and instructions for proper installation and use of all connectors.

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 12'	16"	15.0	60.0	25.0	Default Load

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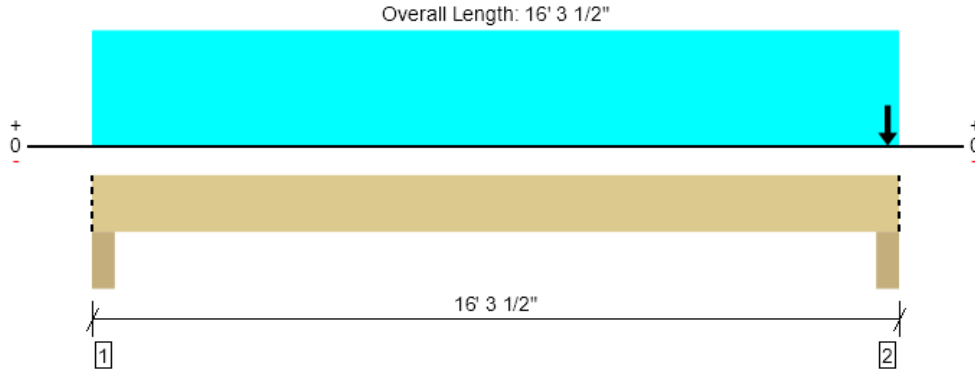
ForteWEB Software Operator	Job Notes
Eric Rice ELR Engineering (206) 200-8764 elreng33@gmail.com	Client: Puget Sound Construction Partners, Inc. Project: Addition-Remodel at 8205



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Floor, 10

**1 piece(s) 5 1/2" x 13 1/2" 24F-V4 DF Glulam**



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal (typ.).

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	8646 @ 15' 11 1/2"	19663 (5.50")	Passed (44%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	3332 @ 1' 7"	13118	Passed (25%)	1.00	1.0 D + 1.0 L (All Spans)
Pos Moment (Ft-lbs)	15497 @ 8' 1 3/4"	33413	Passed (46%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.258 @ 8' 1 3/4"	0.521	Passed (L/727)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.351 @ 8' 1 3/4"	0.781	Passed (L/535)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

Member Length : 16' 3 1/2"  
 System : Floor  
 Member Type : Drop Beam  
 Building Use : Residential  
 Building Code : IBC 2021  
 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Volume factor of 1.00 was calculated for positive bending using length L = 15' 7 1/2".
- The effects of positive or negative camber have not been accounted for when calculating deflection.
- The specified glulam is assumed to have its strong laminations at the bottom of the beam. Install with proper side up as indicated by the manufacturer.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Factored	
1 - Column - HF	5.50"	5.50"	1.50"	1143	2994	1246	4323	Blocking
2 - Column - HF	5.50"	5.50"	2.42"	2286	5988	2492	8646	Blocking

• Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	16' 4" o/c	
Bottom Edge (Lu)	16' 4" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 16' 3 1/2"	N/A	18.0	--	--	
1 - Uniform (PLF)	0 to 16' 3 1/2" (Top)	N/A	92.3	367.5	153.0	Linked from: 9, Support 2
2 - Uniform (PSF)	0 to 16' 3 1/2" (Top)	3'	10.0	--	--	
3 - Point (lb)	16' 3/4" (Top)	N/A	1143	2994	1246	

• Side loads are assumed to not induce cross-grain tension.

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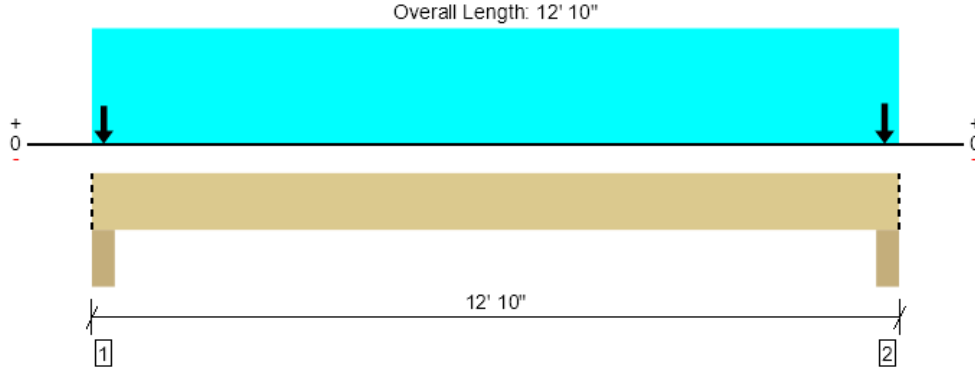
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Floor, 11

**1 piece(s) 5 1/2" x 9" 24F-V4 DF Glulam**



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal (typ.).

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	5542 @ 12' 6"	19663 (5.50")	Passed (28%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	1985 @ 1' 2 1/2"	8745	Passed (23%)	1.00	1.0 D + 1.0 L (All Spans)
Pos Moment (Ft-lbs)	7053 @ 6' 5"	14850	Passed (47%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.214 @ 6' 5"	0.406	Passed (L/683)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.354 @ 6' 5"	0.608	Passed (L/412)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

Member Length : 12' 10"  
 System : Floor  
 Member Type : Drop Beam  
 Building Use : Residential  
 Building Code : IBC 2021  
 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Volume factor of 1.00 was calculated for positive bending using length L = 12' 2".
- The effects of positive or negative camber have not been accounted for when calculating deflection.
- The specified glulam is assumed to have its strong laminations at the bottom of the beam. Install with proper side up as indicated by the manufacturer.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Factored	
1 - Column - HF	5.50"	5.50"	1.53"	2443	1610	2449	5487	Blocking
2 - Column - HF	5.50"	5.50"	1.55"	2198	2696	1764	5542	Blocking

• Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	12' 10" o/c	
Bottom Edge (Lu)	12' 10" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 12' 10"	N/A	12.0	--	--	
1 - Uniform (PSF)	0 to 12' 10" (Top)	7' 8"	10.0	--	--	
2 - Uniform (PSF)	0 to 12' 10" (Top)	2'	15.0	--	25.0	
3 - Uniform (PSF)	0 to 12' 10" (Top)	3' 6"	15.0	60.0	25.0	
4 - Point (lb)	12' 7 1/4" (Top)	N/A	1099	1348	882	
5 - Point (lb)	2 1/4" (Front)	N/A	1344	262	1567	Linked from: 12, Support 2

• Side loads are assumed to not induce cross-grain tension.

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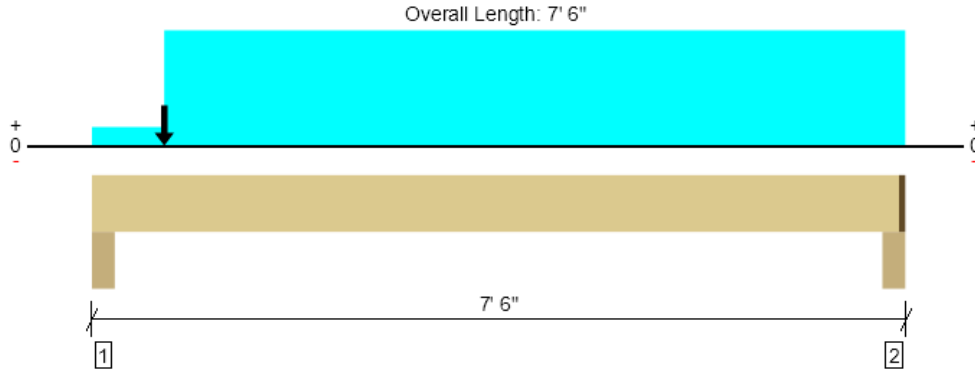
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Floor, 12  
**4 piece(s) 2 x 12 HF No.2**



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal (typ.).

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	10021 @ 4"	13365 (5.50")	Passed (75%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	3240 @ 1' 4 3/4"	7763	Passed (42%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	5242 @ 3' 3 1/8"	10310	Passed (51%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.027 @ 3' 7 3/8"	0.228	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.049 @ 3' 7 1/2"	0.342	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)

Member Length : 7' 4 1/2"  
 System : Floor  
 Member Type : Flush Beam  
 Building Use : Residential  
 Building Code : IBC 2021  
 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Factored	
1 - Column - DF	5.50"	5.50"	4.12"	3757	3267	5085	10021	None
2 - Beam - GLB	5.50"	4.00"	1.50"	1344	262	1567	2911	1 1/2" Rim Board

- Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	7' 5" o/c	
Bottom Edge (Lu)	7' 5" o/c	

- Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 7' 4 1/2"	N/A	17.1	--	--	
1 - Uniform (PSF)	0 to 7' 6" (Top)	8"	15.0	40.0	--	Default Load
2 - Uniform (PSF)	0 to 7' 6" (Top)	7' 8"	10.0	--	--	Default Load
3 - Uniform (PSF)	8" to 7' 6" (Top)	14' 7"	15.0	--	25.0	Default Load
4 - Point (lb)	8" (Top)	N/A	2830	3329	4161	

- Side loads are assumed to not induce cross-grain tension.

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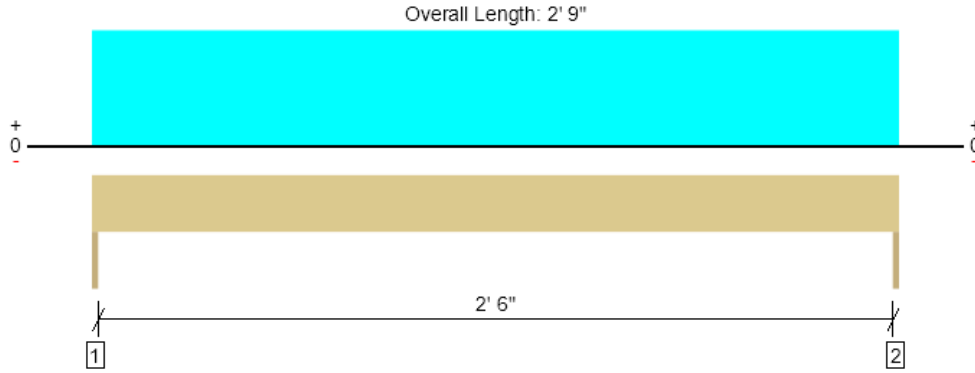
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Floor, 13

**1 piece(s) 4 x 8 DF No.2**



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal (typ.).

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1791 @ 0	3281 (1.50")	Passed (55%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	809 @ 8 3/4"	3045	Passed (27%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	1184 @ 1' 4 1/2"	2989	Passed (40%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.006 @ 1' 4 1/2"	0.092	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.009 @ 1' 4 1/2"	0.138	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

Member Length : 2' 9"  
 System : Wall  
 Member Type : Header  
 Building Use : Residential  
 Building Code : IBC 2021  
 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Factored	
1 - Trimmer - HF	1.50"	1.50"	1.50"	605	1118	464	1791	None
2 - Trimmer - HF	1.50"	1.50"	1.50"	605	1118	464	1791	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	2' 9" o/c	
Bottom Edge (Lu)	2' 9" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 2' 9"	N/A	6.4	--	--	
1 - Uniform (PSF)	0 to 2' 9"	13' 7"	15.0	40.0	--	Default Load
2 - Uniform (PSF)	0 to 2' 9"	13' 6"	17.0	20.0	25.0	Default Load

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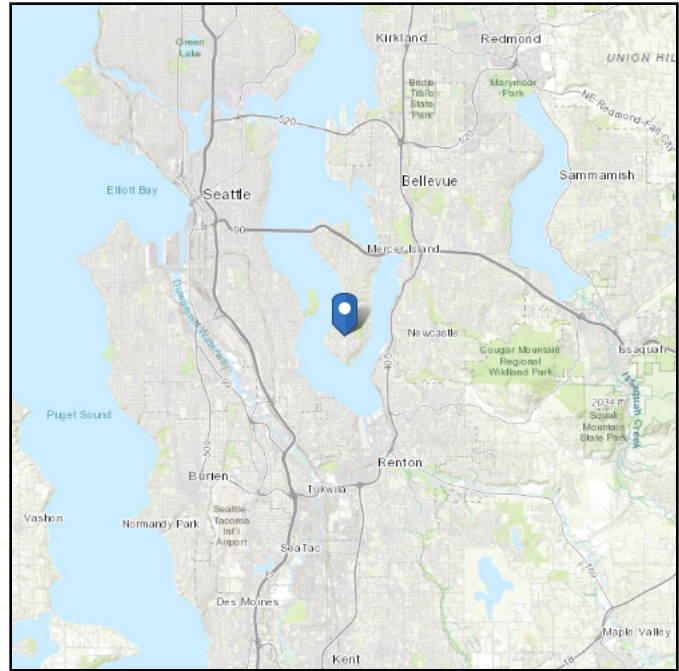
## Lateral Calculations

# ASCE Hazards Report

**Address:**  
No Address at This Location

**Standard:** ASCE/SEI 7-16  
**Risk Category:** II  
**Soil Class:** D - Default (see Section 11.4.3)

**Latitude:** 47.538922  
**Longitude:** -122.22915  
**Elevation:** 313.7964814653716 ft (NAVD 88)



## Wind

### Results:

Wind Speed	98 Vmph
10-year MRI	67 Vmph
25-year MRI	74 Vmph
50-year MRI	78 Vmph
100-year MRI	83 Vmph

Data Source: ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2  
Date Accessed: Tue Jul 29 2025

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-16 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is not in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2.

**Site Soil Class:** D - Default (see Section 11.4.3)

**Results:**

$S_s$ :	1.466	$S_{D1}$ :	N/A
$S_1$ :	0.507	$T_L$ :	6
$F_a$ :	1.2	PGA :	0.627
$F_v$ :	N/A	PGA <sub>M</sub> :	0.753
$S_{MS}$ :	1.759	$F_{PGA}$ :	1.2
$S_{M1}$ :	N/A	$I_e$ :	1
$S_{DS}$ :	1.173	$C_v$ :	1.393

Ground motion hazard analysis may be required. See ASCE/SEI 7-16 Section 11.4.8.

**Data Accessed:** Tue Jul 29 2025

**Date Source:** [USGS Seismic Design Maps](#)

## ASCE 7-16 Seismic Base Shear

Project File: addition-remodel\_8205.ec6

LIC#: KW-06019101, Build:20.25.07.31

ELR Engineering

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### DESCRIPTION: Seismic Base Shear Analysis

Specific Description: 8205 SE 71st St., Mercer Island, WA 98040

### Risk Category

Calculations per ASCE 7-16

Risk Category of Building or Other Structure: "II": All Buildings and other structures except those listed as Category I, III, and IV *SCE 7-16, Page 4, Table 1.5-1*

Seismic Importance Factor = 1 *ASCE 7-16, Page 5, Table 1.5-2*

### USER DEFINED Ground Motion

*ASCE 7-16 11.4.2*

Max. Ground Motions, 5% Damping

$$S_S = 1.466 \text{ g, 0.2 sec response}$$

$$S_1 = 0.5070 \text{ g, 1.0 sec response}$$

For the closest datapoint grid location . . .

$$\text{Latitude} = 0.000 \text{ deg North}$$

$$\text{Longitude} = 0.000 \text{ deg West}$$

### Site Class, Site Coeff. and Design Category

Classification: "D": Shear Wave Velocity 600 to 1,200 ft/sec = **D** (By Default per 11.4.3) *ASCE 7-16 Table 20.3-1*

Site Coefficients  $F_a$  &  $F_v$   $F_a = 1.20$  *ASCE 7-16 Table 11.4-1 & 11.4-2*  
*(using straight-line interpolation from table val)*  $F_v = 1.79$

Maximum Considered Earthquake Accelerat  $S_{MS} = F_a * S_s = 1.759$  *ASCE 7-16 Eq. 11.4-1*  
 $S_{M1} = F_v * S_1 = 0.909$  *ASCE 7-16 Eq. 11.4-2*

Design Spectral Acceleration  $S_{DS} = S_{MS}^{2/3} = 1.173$  *ASCE 7-16 Eq. 11.4-3*  
 $S_{D1} = S_{M1}^{2/3} = 0.606$  *ASCE 7-16 Eq. 11.4-4*

Seismic Design Category = **D** *ISCE 7-16 Table 11.6-1 & -2*

### Resisting System

*ASCE 7-16 Table 12.2-1*

Basic Seismic Force Resisting System . . .

#### Bearing Wall Systems

**15.Light-frame (wood) walls sheathed w/wood structural panels rated for shear resistance.**

Response Modification Coefficient "R" = 6.50 *Building height Limits :*  
 System Overstrength Factor "Wo" = 2.50 *Category "A & B" Limit: No Limit*  
 Deflection Amplification Factor "Cd" = 4.00 *Category "C" Limit: No Limit*  
*Category "D" Limit: Limit = 65*  
*Category "E" Limit: Limit = 65*  
*Category "F" Limit: Limit = 65*

*NOTE! See ASCE 7-16 for all applicable footnc*

### Lateral Force Procedure

*ASCE 7-16 Section 12.8.2*

Equivalent Lateral Force Procedure

The "Equivalent Lateral Force Procedure" is being used according to the provisions of ASCE 7-16 12.8

### Determine Building Period

*Use ASCE 12.8-7*

Structure Type for Building Period CalcuzAll Other Structural Systems

$$\text{" Ct " value} = 0.020 \quad \text{" hn " : Height from base to highest level} = 18.50 \text{ ft}$$

$$\text{" x " value} = 0.75$$

$$\text{" Ta " Approximate fundamental period using Eq. 12.8-7 : } Ta = Ct * (hn \wedge x) = 0.178 \text{ sec}$$

$$\text{"TL" : Long-period transition period per ASCE 7-16 Maps 22-14 -> 22-17} = 6.000 \text{ sec}$$

$$\text{Building Period " Ta " Calculated from Approximate Method sel=} = 0.178$$

**ASCE 7-16 Seismic Base Shear**

Project File: addition-remodel\_8205.ec6

LIC# : KW-06019101, Build:20.25.07.31

ELR Engineering

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**DESCRIPTION: Seismic Base Shear Analysis**

**" Cs " Response Coefficient**

ASCE 7-16 Section 12.8.1.1

$S_{DS}$ : Short Period Design Spectral Response	=	1.173	" R " : Response Modification Factor	=	6.500
Upper limit on SDS	=	0.000	" I " : Seismic Importance Factor	=	1
SDS used for CS calc	=	1.173	From Eq. 12.8-2, Preliminary Cs	=	0.180
			From Eq. 12.8-3 & 12.8-4 , Cs need not exceed	=	0.523
			From Eq. 12.8-5 & 12.8-6, Cs not be less than	=	0.052
			<b>Cs : Seismic Response Coefficient</b>	=	<b>0.1804</b>

**Seismic Base Shear**

ASCE 7-16 Section 12.8.1

<b>Cs = 0.1804 from 12.8.1.1</b>	W ( see Sum Wi below ) =	62.10 k
	Seismic Base Shear $V = Cs * W =$	11.20 k

**Vertical Distribution of Seismic Forces**

ASCE 7-16 Section 12.8.3

" k " : hx exponent based on Ta = 1.00

Table of building Weights by Floor Level...

Level #	Wi : Weight	Hi : Height	(Wi * Hi^k)	Cvx	Fx=Cvx * V	Sum Story Shear	Sum Story Moment
2	28.04	16.32	457.61	0.6297	7.06	7.06	0.00
1	34.06	7.90	269.07	0.3703	4.15	11.20	59.41
Sum Wi =	62.10 k	Sum Wi * Hi =	726.69 k-ft	Total Base Shear =	11.20 k	Base Moment =	147.9 k-ft

**Diaphragm Forces : Seismic Design Category "B" to "F"**

ASCE 7-16 12.10.1.1

Level #	Wi	Fi	Sum Fi	Sum Wi	Fpx : Calcd	Fpx : Min	Fpx : Max	Fpx	Dsgn. Force
2	28.04	7.06	7.06	28.04	7.06	6.58	13.15	7.06	7.06
1	34.06	4.15	11.20	62.10	6.15	7.99	15.98	7.99	7.99

Wpx . . . . . Weight at level of diaphragm and other structure elements attached to it.  
 Fi . . . . . Design Lateral Force applied at the level.  
 Sum Fi . . . . . Sum of "Lat. Force" of current level plus all levels above  
 MIN Req'd Force @ Level . . .  $0.20 * S_{DS} * I * Wpx$   
 MAX Req'd Force @ Level . . .  $0.40 * S_{DS} * I * Wpx$   
 Fpx : Design Force @ Level . .  $Wpx * \text{SUM}(x->n) Fi / \text{SUM}(x->n) wi$ , x = Current level, n = Top Level

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Project Title: **Addition-Remeodel at 8205**  
 Engineer: **ELR**  
 Project ID:  
 Project Descr:

Printed: 2 AUG 2025, 10:49AM

**ASCE 7-16 Wind Forces, Chapter 27, Part 1**

Project File: addition-remodel\_8205.ec6

LIC# : KW-06019101, Build:20.25.07.31

ELR Engineering

(c) ENERCALC, LLC 1982-2025

**DESCRIPTION: ASCE 7-16 wind loads**

**8205 SE 71st St., MI**

**Basic Values**

Risk Category	2 per ASCE 7-16 Table 1.5-1	Horizontal Dim. in North-South Direction (B or L)	21.50 ft
V : Basic Wind Speed	100.0 per ASCE 7-16 Fig. 26.5-1 & 26.5-2	Horizontal Dim. in East-West Direction (B or L)	71.670 ft
Kd : Directionality Factor	0.850 per ASCE 7-16 Table 26.6-1	h : Mean Roof height	= 18.50 ft
Exposure Category	per ASCE 7-16 Section 26.7	Topographic Factor per ASCE 7-16 Sec 26.8 & Figure 26.8-1	
North : Exposure B	East : Exposure B	North : K1 =	K2 = K3 = Kzt = 1.000
South : Exposure B	West : Exposure B	South : K1 =	K2 = K3 = Kzt = 1.000
		East : K1 =	K2 = K3 = Kzt = 1.000
		West : K1 =	K2 = K3 = Kzt = 1.000

**Building Period & Flexibility Category**

User has specified the building frequency is >= 1 Hz, therefore considered RIGID for both North-South and East-West directions.

**Building Story Data**

Level Description	hi ft	Story Ht ft	$E_R : X$ ft	$E_R : X$ ft
Upper	16.32	8.42	0.000	0.000
Lower	7.90	7.90	0.000	0.000

**Gust Factor**

For wind coming from direction indicated

North =	<b>0.850</b>	South =	<b>0.850</b>
East =	<b>0.850</b>	West =	<b>0.850</b>

**ASCE 7-16 Wind Forces, Chapter 27, Part 1**

Project File: addition-remodel\_8205.ec6

LIC# : KW-06019101, Build:20.25.07.31

ELR Engineering

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**DESCRIPTION:** ASCE 7-16 wind loads

**Enclosure**

Check that Building Qualifies as "OPEN"

	North Wall	South Wall	East Wall	West Wall	Roof	Total
Agross	1,170.0ft <sup>2</sup>	1,170.0ft <sup>2</sup>	351.0ft <sup>2</sup>	351.0ft <sup>2</sup>	1,301.0ft <sup>2</sup>	4,343.0ft <sup>2</sup>
Aopenings	0.0ft <sup>2</sup>	0.0ft <sup>2</sup>	0.0ft <sup>2</sup>	0.0ft <sup>2</sup>	0.0ft <sup>2</sup>	0.0ft <sup>2</sup>
Aopenings >= 0.8 * Agross	No	No	No	No		

**Building does NOT qualify as OPEN**

North Wall . . . .

**Continue to check this direction for ENCLOSED**

Reference Area = Smaller of 4 sq. ft. or 1% of Agross 4.0 ft<sup>2</sup>  
 Is Ao < Reference Area ? Yes

**Building qualifies as "ENCLOSED" when the North wall receives positive external pressure.**

South Wall . . . .

**Continue to check this direction for ENCLOSED**

Reference Area = Smaller of 4 sq. ft. or 1% of Agross 4.0 ft<sup>2</sup>  
 Is Ao < Reference Area ? Yes

**Building qualifies as "ENCLOSED" when the South wall receives positive external pressure.**

East Wall . . . .

**Continue to check this direction for ENCLOSED**

Reference Area = Smaller of 4 sq. ft. or 1% of Agross 3.510 ft<sup>2</sup>  
 Is Ao < Reference Area ? Yes

**Building qualifies as "ENCLOSED" when the East wall receives positive external pressure.**

West Wall . . . .

**Continue to check this direction for ENCLOSED**

Reference Area = Smaller of 4 sq. ft. or 1% of Agross 3.510 ft<sup>2</sup>  
 Is Ao < Reference Area ? Yes

**Building qualifies as "ENCLOSED" when the West wall receives positive external pressure.**

**Velocity Pressures**

**When the following walls experience leeward or sidewall pressures, the value of Kh shall be (per Table 26.10-1) :**

North Wall = 0.6102 psf South Wall = 0.6102 psf East Wall = 0.6102psf West Wall = 0.6102 psf

**When the following walls experience leeward or sidewall pressures, the value of qh shall be (per Eq 26.10-1) :**

North Wall = 13.278 psf South Wall = 13.278 psf East Wall = 13.278psf West Wall = 13.278 psf

**qz : Windward Wall Velocity Pressures at various heights per Eq. 27.3-1**

Height Above Base (ft)	North Elevation		South Elevation		East Elevation		West Elevation	
	Kz	qz	Kz	qz	Kz	qz	Kz	qz
0.00	0.575	12.51	0.575	12.51	0.575	12.51	0.575	12.51
5.00	0.575	12.51	0.575	12.51	0.575	12.51	0.575	12.51
10.00	0.575	12.51	0.575	12.51	0.575	12.51	0.575	12.51
15.00	0.575	12.51	0.575	12.51	0.575	12.51	0.575	12.51
18.50	0.610	13.28	0.610	13.28	0.610	13.28	0.610	13.28

**ASCE 7-16 Wind Forces, Chapter 27, Part 1**

Project File: addition-remodel\_8205.ec6

LIC# : KW-06019101, Build:20.25.07.31

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**DESCRIPTION: ASCE 7-16 wind loads**

**Pressure Coefficients**

**GCpi Values when elevation receives positive external pressure**

**GCpi : Internal pressure coefficient, per sec. 26.13 and Table 26.13-1**

	North	South	East	West
+/-	0.180	+/- 0.180	+/- 0.180	+/- 0.180

**Specify Cp Values from Figure 27.3-1 for Windward, Leeward & Side Walls**

Cp Values when elevation receives positive external pressure

	North	South	East	West
Windward Wall	0.80	0.80	0.80	0.80
Leeward Wall	-0.50	-0.50	-0.260	-0.260
Side Walls	-0.70	-0.70	-0.70	-0.70

**User Defined Roof locations and Net Directional Pressure Coefficients : Cp**

Cp or Cn Values when the indicated building elevation receives positive external pressure

Description	North	South	East	West
Perp: windward	-0.70	-0.70		
Perp: leeward	-0.550	-0.550		
Perp: windward	-0.140	-0.140		
Parallel: 0 to h/2			-0.90	-0.90
Parallel: h/2 to h			-0.90	-0.90
Parallel: h to 2h			-0.50	-0.50
Parallel: > 2h			-0.30	-0.30
Parallel: 0 to > 2h			-0.180	-0.180

**Wind Pressures**

**Wind Pressures when NORTH Elevation receives positive external wind pressure**

	Positive Internal	Negative Internal
<b>Leeward Wall Pressures</b>	-8.033 psf	-3.253 psf
<b>Side Wall Pressures</b>	-10.291 psf	-5.510 psf
<b>Windward Wall Pressures . .</b>	Positive Internal	Negative Internal
Height Above Base (ft)	Pressure (psf)	Pressure (psf)
0.00	6.11	10.89
5.00	6.11	10.89
10.00	6.11	10.89
15.00	6.11	10.89
18.50	6.64	11.42
<b>Roof Pressures . . .</b>	Positive Internal	Negative Internal
Description	Pressure (psf)	Pressure (psf)
Perp: windward	-10.29	-5.51
Perp: leeward	-8.60	-3.82
Perp: windward	-3.97	0.81

**Wind Pressures when SOUTH Elevation receives positive external wind pressure**

	Positive Internal	Negative Internal
<b>Leeward Wall Pressures</b>	-8.033 psf	-3.253 psf
<b>Side Wall Pressures</b>	-10.291 psf	-5.510 psf
<b>Windward Wall Pressures . .</b>	Positive Internal	Negative Internal
Height Above Base (ft)	Pressure (psf)	Pressure (psf)
0.00	6.11	10.89

**ASCE 7-16 Wind Forces, Chapter 27, Part 1**

Project File: addition-remodel\_8205.ec6

LIC# : KW-06019101, Build:20.25.07.31

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**DESCRIPTION: ASCE 7-16 wind loads**

5.00	6.11	10.89
10.00	6.11	10.89
15.00	6.11	10.89
18.50	6.64	11.42

Roof Pressures . . .	Positive Internal Pressure (psf)	Negative Internal Pressure (psf)
Description		
Perp: windward	-10.29	-5.51
Perp: leeward	-8.60	-3.82
Perp: windward	-3.97	0.81

**Wind Pressures when EAST Elevation receives positive external wind pressure**

	Positive Internal	Negative Internal
Leeward Wall Pressures	-5.325 psf	-0.5444 psf
Side Wall Pressures	-10.291 psf	-5.510 psf

Windward Wall Pressures . .	Positive Internal Pressure (psf)	Negative Internal Pressure (psf)
Height Above Base (ft)		
0.00	6.11	10.89
5.00	6.11	10.89
10.00	6.11	10.89
15.00	6.11	10.89
18.50	6.64	11.42

Roof Pressures . . .	Positive Internal Pressure (psf)	Negative Internal Pressure (psf)
Description		
Parallel: 0 to h/2	-12.55	-7.77
Parallel: h/2 to h	-12.55	-7.77
Parallel: h to 2h	-8.03	-3.25
Parallel: > 2h	-5.78	-1.00
Parallel: 0 to > 2h	-4.42	0.36

**Wind Pressures when WEST Elevation receives positive external wind pressure**

	Positive Internal	Negative Internal
Leeward Wall Pressures	-5.325 psf	-0.5444 psf
Side Wall Pressures	-10.291 psf	-5.510 psf

Windward Wall Pressures . .	Positive Internal Pressure (psf)	Negative Internal Pressure (psf)
Height Above Base (ft)		
0.00	6.11	10.89
5.00	6.11	10.89
10.00	6.11	10.89
15.00	6.11	10.89
18.50	6.64	11.42

Roof Pressures . . .	Positive Internal Pressure (psf)	Negative Internal Pressure (psf)
Description		
Parallel: 0 to h/2	-12.55	-7.77
Parallel: h/2 to h	-12.55	-7.77
Parallel: h to 2h	-8.03	-3.25
Parallel: > 2h	-5.78	-1.00
Parallel: 0 to > 2h	-4.42	0.36

**ASCE 7-16 Wind Forces, Chapter 27, Part 1**

Project File: addition-remodel\_8205.ec6

LIC# : KW-06019101, Build:20.25.07.31

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**DESCRIPTION: ASCE 7-16 wind loads**

**Story Forces for Design Wind Load Cases**

Values below are calculated based on a building with dimensions B x L x h as defined on the "Basic Values" tab.

Load Case	Windward Wall	Building level	Ht. Range	Trib. Height	Wind Shear Components (k)		Eccentricity for (ft)		Mt, (ft-k)
					In "Y" Direction	In "X" Direction	"Y" Shear	"X" Shear	
CASE 1	North	Level 2	12.11' -> 16.3	4.21	-4.28	---	---	---	---
CASE 1	North	Level 1	3.95' -> 12.1'	8.16	-8.27	---	---	---	---
CASE 1	South	Level 2	12.11' -> 16.3	4.21	4.28	---	---	---	---
CASE 1	South	Level 1	3.95' -> 12.1'	8.16	8.27	---	---	---	---
CASE 1	East	Level 2	12.11' -> 16.3	4.21	---	-1.04	---	---	---
CASE 1	East	Level 1	3.95' -> 12.1'	8.16	---	-2.01	---	---	---
CASE 1	West	Level 2	12.11' -> 16.3	4.21	---	1.04	---	---	---
CASE 1	West	Level 1	3.95' -> 12.1'	8.16	---	2.01	---	---	---
CASE 2	North	Level 2	12.11' -> 16.3	4.21	-3.21	---	---	10.75 -	34.5
CASE 2	North	Level 1	3.95' -> 12.1'	8.16	-6.21	---	---	10.75 -	66.7
CASE 2	South	Level 2	12.11' -> 16.3	4.21	3.21	---	---	10.75 -	34.5
CASE 2	South	Level 1	3.95' -> 12.1'	8.16	6.21	---	---	10.75 -	66.7
CASE 2	East	Level 2	12.11' -> 16.3	4.21	---	-0.78	3.23	--- /-	2.5
CASE 2	East	Level 1	3.95' -> 12.1'	8.16	---	-1.51	3.23	--- /-	4.9
CASE 2	West	Level 2	12.11' -> 16.3	4.21	---	0.78	3.23	--- /-	2.5
CASE 2	West	Level 1	3.95' -> 12.1'	8.16	---	1.51	3.23	--- /-	4.9
CASE 3	North & East	Level 2	12.11' -> 16.3	4.21	-3.21	-0.78	---	---	---
CASE 3	North & East	Level 1	3.95' -> 12.1'	8.16	-6.21	-1.51	---	---	---
CASE 3	North & West	Level 2	12.11' -> 16.3	4.21	-3.21	0.78	---	---	---
CASE 3	North & West	Level 1	3.95' -> 12.1'	8.16	-6.21	1.51	---	---	---
CASE 3	South & West	Level 2	12.11' -> 16.3	4.21	3.21	0.78	---	---	---
CASE 3	South & West	Level 1	3.95' -> 12.1'	8.16	6.21	1.51	---	---	---
CASE 3	South & East	Level 2	12.11' -> 16.3	4.21	3.21	-0.78	---	---	---
CASE 3	South & East	Level 1	3.95' -> 12.1'	8.16	6.21	-1.51	---	---	---
CASE 4	North & East	Level 2	12.11' -> 16.3	4.21	-2.41	-0.58	3.23	10.75 -	27.8
CASE 4	North & East	Level 1	3.95' -> 12.1'	8.16	-4.66	-1.13	3.23	10.75 -	53.7
CASE 4	North & West	Level 2	12.11' -> 16.3	4.21	-2.41	0.58	3.23	10.75 -	27.8
CASE 4	North & West	Level 1	3.95' -> 12.1'	8.16	-4.66	1.13	3.23	10.75 -	53.7
CASE 4	South & West	Level 2	12.11' -> 16.3	4.21	2.41	0.58	3.23	10.75 -	27.8
CASE 4	South & West	Level 1	3.95' -> 12.1'	8.16	4.66	1.13	3.23	10.75 -	53.7
CASE 4	South & East	Level 2	12.11' -> 16.3	4.21	2.41	-0.58	3.23	10.75 -	27.8
CASE 4	South & East	Level 1	3.95' -> 12.1'	8.16	4.66	-1.13	3.23	10.75 -	53.7
Min per ASCE 27.1.	North	Level 2	12.11' -> 16.3	4.21	-4.83	---	---	---	---
Min per ASCE 27.1.	North	Level 1	3.95' -> 12.1'	8.16	-9.36	---	---	---	---
Min per ASCE 27.1.	South	Level 2	12.11' -> 16.3	4.21	4.83	---	---	---	---
Min per ASCE 27.1.	South	Level 1	3.95' -> 12.1'	8.16	9.36	---	---	---	---
Min per ASCE 27.1.	East	Level 2	12.11' -> 16.3	4.21	---	-1.45	---	---	---
Min per ASCE 27.1.	East	Level 1	3.95' -> 12.1'	8.16	---	-2.81	---	---	---
Min per ASCE 27.1.	West	Level 2	12.11' -> 16.3	4.21	---	1.45	---	---	---

**ASCE 7-16 Wind Forces, Chapter 27, Part 1**

Project File: addition-remodel\_8205.ec6

LIC# : KW-06019101, Build:20.25.07.31

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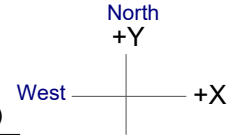
**DESCRIPTION: ASCE 7-16 wind loads**

Min per ASCE 27.1. West Level 1 3.95' -> 12.1' 8.16 --- 2.81 --- --- ---

**Base Shear for Design Wind Load Cas**

Values below are calculated based on a building with dimensions B x L x h as defined on the "General" tab.

Load Case	Windward Wall	Leeward Wall	Wind Base Shear Components (k)		Mt, (ft-k)
			In "Y" Direction	In "X" Direction	
Case 1	North	South	-12.55	---	---
Case 1	South	North	12.55	---	---
Case 1	East	West	---	-3.05	---
Case 1	West	East	---	3.05	---
Case 2	North	South	-9.41	---	/- 101.2
Case 2	South	North	9.41	---	/- 101.2
Case 2	East	West	---	-2.28	+/- 7.4
Case 2	West	East	---	2.28	+/- 7.4
Case 3	North & East	South & West	-9.41	-2.28	---
Case 3	North & West	South & East	-9.41	2.28	---
Case 3	South & West	North & East	9.41	2.28	---
Case 3	South & East	North & West	9.41	-2.28	---
Case 4	North & East	South & West	-7.07	-1.71	/- 81.5
Case 4	North & West	South & East	-7.07	1.71	/- 81.5
Case 4	South & West	North & East	7.07	1.71	/- 81.5
Case 4	South & East	North & West	7.07	-1.71	/- 81.5
Min per ASCE 27.1.5	North	South	-14.18	---	---
Min per ASCE 27.1.5	South	North	14.18	---	---
Min per ASCE 27.1.5	East	West	---	-4.26	---
Min per ASCE 27.1.5	West	East	---	4.26	---



# Shearwall Schedule

Mark per plan	Sheathing	No. sides sheathed	Sheathing nail size (Length x Shank x Head) (17)	Edge fastener spacing (14)	Field fastener spacing	Framing member at adjoining panels (2)	Bottom plate when directly on wood (4),(5)	Bottom plate nail size (Length x Shank x Head) (4),(5)	Bottom plate nail spacing in each row	Bottom plate when directly on concrete (4),(5)	Anchor bolt dia. (7),(8)	Anchor bolt spacing, (2x sill) (3x sill)	Top plate connector (9),(15)	Top plate connector spacing (11),(15)	ASD Vwind (+40%) (12)	ASD Vseismic (12)
<b>W6A</b>	7/16" PLY/OSB	1	2.5"L x 0.131"D x 0.281"H	6"	12"	2x stud & unblocked horz. joints	2x or 3x	3.25"L x 0.148"D x 0.344"H	1-ROW 12"	2x or 3x	5/8"	48"(2x) 72"(3x)	A35 or LTP4	50"	203 pif	145 pif
<b>W6B</b>	7/16" PLY/OSB	1	2.5"L x 0.131"D x 0.281"H	6"	6"	2x stud & unblocked horz. joints	2x or 3x	3.25"L x 0.148"D x 0.344"H	1-ROW 9"	2x or 3x	5/8"	48"(2x) 72"(3x)	A35 or LTP4	36"	271 pif	194 pif
<b>W6</b>	7/16" PLY/OSB	1	2.5"L x 0.131"D x 0.281"H	6"	12"(3)	2x	2x or 3x	3.25"L x 0.148"D x 0.344"H	1-ROW 7"	2x or 3x	5/8"	48"(2x) 72"(3x)	A35 or LTP4	30"	339 pif	242 pif
<b>W4</b>	7/16" PLY/OSB	1	2.5"L x 0.131"D x 0.281"H	4"	12"(3)	3x (5)	2x or 3x	3.25"L x 0.148"D x 0.344"H	2-ROW 10"(6)	2x or 3x	5/8"	42"(2x) 58"(3x)	A35 or LTP4	20"	495 pif	354 pif
<b>W3</b>	7/16" PLY/OSB	1	2.5"L x 0.131"D x 0.281"H	3"	12"(3)	3x (5)	2x or 3x	3.25"L x 0.148"D x 0.344"H	2-ROW 8"(6)	2x or 3x	5/8"	36"(2x) 45"(3x)	A35 or LTP4	16"	637 pif	455 pif
<b>W2</b>	7/16" PLY/OSB	1	2.5"L x 0.131"D x 0.281"H	2"	12"(3)	3x (5)	2x or 3x	3.25"L x 0.148"D x 0.344"H	2-ROWS 6"(6)	2x or 3x	5/8"	28"(2x) 34"(3x)	A35 or LTP4	12"	832 pif	595 pif
<b>2W3</b>	7/16" PLY/OSB	2	2.5"L x 0.131"D x 0.281"H	3"	12"(3)	3x (5, 16)	2x or 3x	3.25"L x 0.148"D x 0.344"H	3-ROWS 6"(6)	2x or 3x	5/8"	18"(2x) 22"(3x)	A35 or LTP4	8"	1274 pif	910 pif
<b>2W2</b>	19/32" PLY/OSB	2	2.5"L x 0.131"D x 0.281"H	2"	12"(3)	3x (5, 16)	2x or 3x	3.25"L x 0.148"D x 0.344"H	3-ROWS 4"(6)	2x or 3x	5/8"	12"(2x) 15"(3x)	A35 or LTP4	5"	1907 pif	1362 pif

**GENERAL NOTES: (UNLESS NOTED OTHERWISE)**

- Wall stud framing is assumed to be as per the general structural notes.
- All panel edges are to be supported by framing members - studs, plates and blocking (unless noted otherwise in the table above).
- Allowable shears in the table above assume either 1) wall studs at 16" oc(max.) with panel long-axis oriented vertically or horizontally or 2) wall studs at 24" oc(max.) with panel long-axis oriented horizontally.
- Where the full thickness of (2)2x or 3x mudsills are directly connected to wall studs, use (2)0.148" dia.x4.5" end nails(30d box) per stud.
- (2)2x material can be used in lieu of 3x material provided the (2)2x is ganged as per the associated shearwall bottom plate nailing.
- Where bottom plate attachment specifies 2 or more rows of nails into the wood floor below, provide rim joist(s), joist(s), or blocking that has a minimum total width of 2.5 inches.
- Unless noted otherwise, provide (1)2x treated mudsill with 5/8" diameter anchor bolts at 72" oc and located within 4" to 12" from the cut ends of the sill plate, provide a minimum of two anchor bolts per mudsill section.
- Provide .229"x3"x3" plate washers at all anchor bolts in 2x4/3x4 mudsills and .229"x3"x4-1/2" plate washers at all anchor bolts in 2x6/3x6 mudsills. the distance from the inside face of any structural sheathing to the nearest edge of the nearest plate washer shall not exceed 1/2". embed anchor bolts 7 inches min. into concrete. min. anchor bolt concrete edge dist. (perp. to mudsill) is 1-3/4". min. anchor bolt concrete end dist. (parallel to mudsill) is 8".
- Use 0.131"dia.x1-1/2" long nails if connector is in contact with framing. use 0.131"dia.x2-1/2" long nails if connector is installed over sheathing.
- For two and three story construction, at floor joist/floor truss elevation, adjoining horz. panel joints may be located as per detail 10/10A/10B.
- Spacing shown assumes top plate connectors are installed on one side of wall. if installed on both sides of wall, required spacing may be multiplied by two (2).
- Table above shows ASD allowable unit shear capacity. LRFD factored unit shear resistance is calculated by multiplying ASD values above by 1.4 for seismic and by 1.6 for wind.
- Shearwalls designated as FTAO (force transfer around openings) or perforated require sheathing and shear nailing above and below all openings for the full extent of the shearwall.
- Shearwall edge nailing is required along full height of all holdown members. At built-up holdown members, distribute edge nailing into all laminations.
- For two and three story construction, at floor joist/floor truss elevation, LTP4's and/or A35's are not required at the top of the shear wall when/where the shear wall is sheathed on one side only and when/where the location of adjoining horz. panel joints meets footnote (10) requirements.
- Vertical and horizontal panel joints (where occur) on opposite sides of the wall shall not occur on the same framing member (stud, plate, or blocking) unless that framing member is a 3x member (min.) with panel edge nailing staggered or that framing member is a (2)2x (min.) as per footnote (5) above.
- Hot-dipped or mechanically deposited galvanized box nails (2.5" long x 0.113" shank dia. x 0.297" head dia.) may be substituted for the sheathing nails in the table above.







# Force Transfer Around Openings Calculator

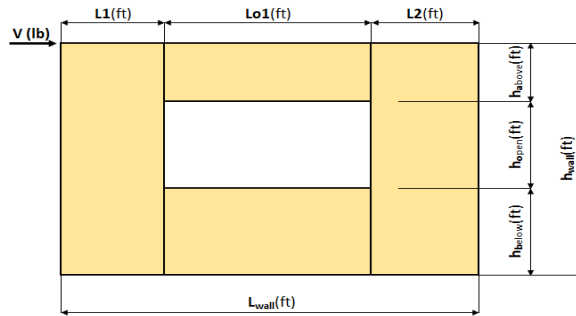
## ONE OPENING

The force transfer around openings (FTAO) method of shear wall analysis is an approach that aims to reinforce the wall such that it performs as if there was no opening. This approach lends certain advantages over segmented shear walls: more versatility, because it allows for narrower wall segments while still meeting the height-to-width ratios and, often, fewer required hold-downs.

### Project Information

Code:	AWC-SDPWS-2021	Date:	7/29/2025
Designer:	ELR		
Client:	PSCP, Inc.		
Project:	Addition-remodel @ 8205		
Wall ID:	Upper Grid C - 19'-5"		

	$\geq 0.6W$	$\geq 0.7pE$
- V (lb) =	496	4168
- Apply $\Omega$ per 12.3.3.3?		N
- Overstrength factor ( $\Omega_o$ ) =		N.A.
- ASCE 7-10 12.4.3.3 ASD stress increase $w/\Omega_o$ =		N.A.
- Sds =		1.173
- $\rho$ =		1.3

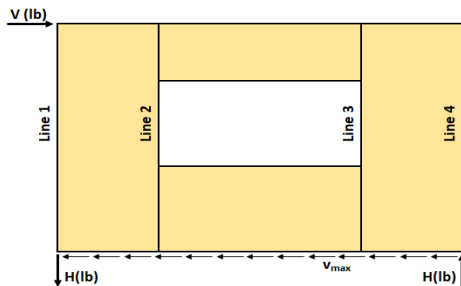


### Shear Wall Calculation Variables

V	4168 lbf	Seismic controls	Opening 1	Adj. Factor Method =	2bs/h
L1	7.04 ft	ha1	1.00 ft	Wall Pier Aspect Ratio	Adj. Factor
L2	7.38 ft	ho1	3.00 ft	P1=ho1/L1=	0.43
h_wall	7.67 ft	hb1	3.67 ft	P2=ho2/L2=	0.41
L_wall	19.42 ft	Lo1	5.00 ft		N/A

- Hold-down forces:**  $H = Vh_{wall}/L_{wall}$  = 1646 lbf
- Unit shear above + below opening**  
First opening:  $va1 = vb1 = H/(ha1+hb1)$  = 353 plf
- Total boundary force above + below openings**  
First opening:  $O1 = va1 \times (Lo1)$  = 1763 lbf
- Corner forces**  
 $F1 = O1(L1)/(L1+L2)$  = 861 lbf  
 $F2 = O1(L2)/(L1+L2)$  = 902 lbf
- Tributary length of openings**  
 $T1 = (L1*Lo1)/(L1+L2)$  = 2.44 ft  
 $T2 = (L2*Lo1)/(L1+L2)$  = 2.56 ft

- Unit shear beside opening**  
 $V1 = (V/L)(L1+T1)/L1$  = 289 plf  
 $V2 = (V/L)(T2+L2)/L2$  = 289 plf  
Check  $V1*L1+V2*L2=V?$  = 4168 lbf **OK**
- Resistance to corner forces**  
 $R1 = V1*L1$  = 2036 lbf  
 $R2 = V2*L2$  = 2132 lbf
- Difference corner force + resistance**  
 $R1-F1$  = 1175 lbf  
 $R2-F2$  = 1230 lbf
- Unit shear in corner zones**  
 $vc1 = (R1-F1)/L1$  = 167 plf  
 $vc2 = (R2-F2)/L2$  = 167 plf



### 10. Net hold-down forces

<b>Holdowns (overturning)</b>	
Hwind =	196 lbf < (0.6W)
Hseismic =	1646 lbf < (0.7pE)
<b>Holdowns (Dead resisting)</b>	
Uniform =	215 plf
Conc. =	0 lbf
<b>Net Forces</b>	
Hwind (net) =	-1054 lbf < (0.6D+0.6W)
Hseismic (net) =	-170 lbf < (0.6-0.14Sds)D+(0.7pE)

### Check Summary of Shear Values for One Opening

Line 1: $vc1(ha1+hb1)+V1(ho1)=H?$	779	867	1646 lbf
Line 2: $va1(ha1+hb1)-vc1(ha1+hb1)-V1(ho1)=0?$	1646	779	0
Line 3: $va1(ha1+hb1)-vc2(ha1+hb1)-V1(ho1)=0?$	1646	779	0
Line 4: $vc2(ha1+hb1)+V2(ho1)=H?$	779	867	1646 lbf

### Design Summary\*

Req. Sheathing Capacity	353 plf	Seismic controls	W4	4-Term Deflection		3-Term Deflection	
Req. Strap Force	902 lbf	One side >	CS16	4-Term Story Drift %		3-Term Story Drift %	
Req. HD Force - H(net)	-170 lbf		NONE				
Req. Shear Wall Anchorage Force ( $v_{max}$ )	215 plf						

\*The Design Summary assumes that the shear wall is designed as blocked.

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## Foundation Calculations

This spreadsheet calculates soil pressures and  $V_u/\phi V_n$  &  $M_u/\phi M_n$  for a continuous plain concrete footing under a concrete stem wall

Project: PSCP, Inc-8205 Date: 7/30/2025  
 Code: ACI 318R-19 Chapter 14 - "Plain Concrete"

Footing ID: Typical perimeter at worst case

$f_tg. (w, in.) = 14$      $f_tg. (t, in.) = 7$      $stem (w, in.) = 8$      $4 \text{ foot unbalanced maximum}$      $\phi = 0.6$   
 $Allow. soil press. (psf) = 1500$      $P = 3$     inches < OK    stem (h, in.) = 18     $f_c (psi) = 2500$

**1) Determine and input unfactored design loads applied to footing**

	D (psf)	trib-1 (ft)	trib-2 (ft)	D (plf)	L (psf)	L (plf)	S (psf)	S (plf)
Roof	17	14.58		248		0	25	365
Wall	10	7.67		77		0		0
Floor (Roof-1)	15	6.5		98	40	260		0
Wall	10	7.67		77		0		0
Floor (Roof-2)	15	6		90	60	360	25	150
Wall	10	0		0		0		0
Floor (Roof-3)	12	0		0	40	0		0
Stem wall	150	8	18	150		0		0
Footing	150	14	7	102		0		0
				<b>841</b>		<b>620</b>		<b>515</b>

**Factored design soil pressures**

1.2D + 1.6L + 0.50S    1009    992    257    1936 psf  
 1.2D + 1.0L + 1.60S    1009    620    823    2102 psf

**Unfactored soil pressures**

D + L    841    620    0    1252 psf    OK >  
 D + 0.75(L + S)    841    465    386    1450 psf    OK >  
 D + S    841    0    515    1162 psf    OK >

Sum total for L.C.

**2) Shear (in footing)**

Capacity - Table 14.5.5.1 (a)

$\phi V_n = 2400$  lbs per ft    Demand  $V_u = 525$  lbs per ft     $V_u/\phi V_n = 0.219$  < OK  
 $\phi = 0.6$   
 $f_c = 2500$   
 $h = 7$   
 $h (14.5.1.7) = 5$

**3) Bending (in footing)**

Capacity - 14.5.2.1a-b

$\phi M_n = 625$  ft lbs per ft    Demand  $M_u = 66$  ft lbs per ft     $M_u/\phi M_n = 0.105$  < OK  
 $\phi = 0.6$   
 $f_c = 2500$   
 $h = 7$   
 $h (14.5.1.7) = 5$