STRUCTURAL CALCULATIONS

for the

PROPOSED RUEPPELL HOME DESIGN

PLAN 1620-AB W/OPTIONS

April 16, 2020

Client: Pebble Creek, LLC

Site: **Pebble Creek – Base Plan**
Bremerton, WA

Calculated by: Eric L. Rice, PE
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Established Basic Permit #
20-01726

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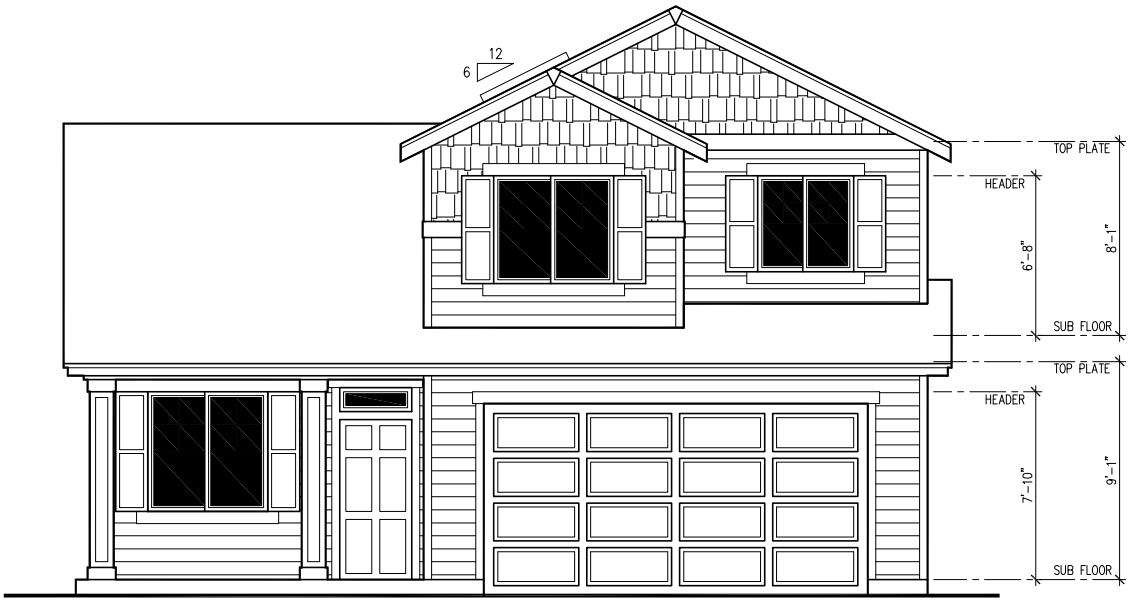
Project: Pebble Creek, LLC/1620-AB
Job No. Figured by: ELR
Checked by: Date: 3/6/2020 Sheet: 2

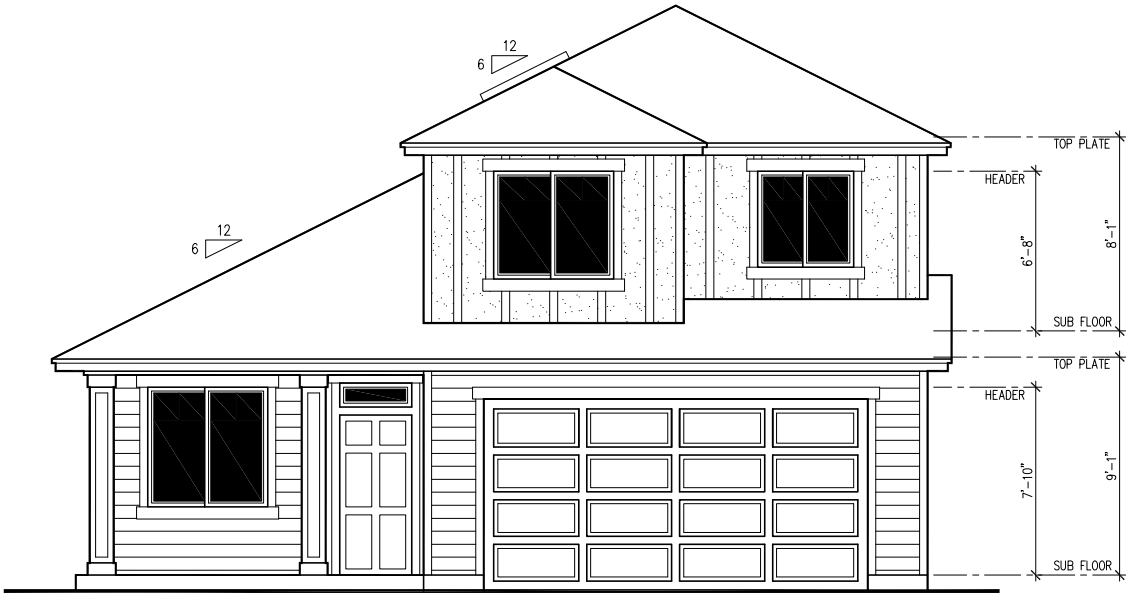
Scope of Work:

ELR Engineering was asked to provide permit submittal structural calculations for the proposed Rueppell Home Design Plan 1620-AB for Pebble Creek, LLC. Our structural engineering information is shown in these calculations and on the project architect's submitted S-sheets. The information in this report conforms to the 2015 International Building Code as amended by the local jurisdiction. **These calculations 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



FRONT ELEVATION (1620-A)



FRONT ELEVATION (1620-B)

Established Basic Permit #

20-01726

Permit Number: 20-04001

GENERAL STRUCTURAL NOTES
(Unless noted otherwise on plans and details)

CODES AND SPECIFICATIONS

1. International Building Code (IBC) – 2015 edition with local jurisdiction amendments as applicable
2. ASCE/SEI 7–10 – Minimum Design Loads for Buildings and Other Structures with Supplement No. 1
3. ANSI AWC NDS–2015/AWC SPDWS 2015/AWC WFCM 2015 – National Design Specification for Wood Construction with 2015 NDS Supplement/Special Design Provisions for Wind & Seismic/Wood Frame Construction Manual for One– and Two–Family Dwellings
4. ACI 318–14 – Building Code Requirements for Structural Concrete
5. AISC 360–10/341–10 – Specification for Structural Steel Buildings/Seismic Provisions for Structural Steel Buildings
6. AWS D1.4/D1.4M–2011/Structural Welding Code
7. TMS 402–2013/ACI 530–13/ASCE 5–13 – Building Code Requirements for Masonry Structures

DESIGN CRITERIA

1. Wind – Risk category = II, Basic wind speed (V) = 110 mph, Wind directionality factor = 0.85, Exposure category = B, Topographic factor Kzt = 1.00, Gust effect factor = 0.85, Enclosure classification = Enclosed, Internal pressure coefficient (GC_{pi}) = ± 0.18
2. Seismic – Risk category = II, Seismic importance factor (Ie) = 1.00, Site Class = D, S_s = 1.579, S_1 = 0.611, S_{DS} = 1.053, S_{D1} = 0.611, Seismic Design Category = D, Basic seismic–force–resisting system = A.15 per ASCE 7–10 Table 12.2–1, Seismic response coefficient (C_S) = 0.162(orthogonal 1) & 0.162(orthogonal 2), Response modification factor (R) = 6.5(orthogonal 1) & 6.5(orthogonal 2), Design procedure used = Equivalent Lateral Force Procedure.
3. Roof – Dead: 15 psf
   Live: 20 psf
   Snow: 25 psf (Ps)
4. Floor – Dead: 12 psf
   Live: 40 psf (uniform), 60 psf (uniform deck)
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 5–½ sacks of cement per cubic yard of concrete and maximum of 6–3/4 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:

	Min Cover
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/marked 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 2304.10.1 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.
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:

Treatment	Retention level (pcf)
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:
   i) Continuous hot–dipped galvanizing per ASTM A653, type G185.
   ii) 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

1. All anchor bolts and holdown bolts embedded in concrete or masonry shall be A307 unless noted otherwise. Expansion bolts into concrete not otherwise specified shall be Simpson STRONG–BOLT 2 Wedge Anchor. Install in accordance with ICC ESR–1771, including minimum embedment depth requirements.

NAILS

1. 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:

PENNY WEIGHT	DIAMETER (INCHES)	LENGTH (INCHES)
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

1. 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.
2. 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.
3. All shearwall holdowns shall be as noted on the plans and shall be Simpson or approved equal.
4. 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" 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

1. 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.
2. 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.
3. Blocking of interior edges is not required unless noted otherwise on the plans.

BUILT–UP WOOD COLUMNS

1. All columns not specified or otherwise noted on the plans shall be (2)2x studs gang fastened per standard detail.
2. 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 A190.1–12.
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.

Established Basic Permit #

20-01726

Permit Number: 20-04001

Shearwall Schedule [(1),(7),(13)]

Mark per plan	Sheathing	No. sides sheathed	Fastener size	Edge fastener spacing (14)	Field fastener spacing	Framing member at adjoining panels (2)	Bottom plate when directly on wood (10)	Bottom plate nail size	Bottom plate nail spacing in each row	Bottom plate when directly on concrete (4),(5),(10)	Anchor bolt dia. (8)	Anchor bolt spacing, (2x sill) (3x sill)	Top plate connector (9),(15)	Top plate connector spacing (11),(15)	ASD Vseismic (12)	ASD Vwind (+40%) (12)
W6A	7/16" PLY/OSB	1	0.131" dia. x 2.5"	6"	12"	2x stud & unblocked horz. joints	2x	0.131" dia. x 3"	1-row 12"	2x or 3x	5/8"	72"(2x) 72"(3x)	A35 or LTP4	50"	**145 plf**	**203 plf**
W6B	7/16" PLY/OSB	1	0.131" dia. x 2.5"	6"	6"	2x stud & unblocked horz. joints	2x	0.131" dia. x 3"	1-row 9"	2x or 3x	5/8"	72"(2x) 72"(3x)	A35 or LTP4	36"	**193 plf**	**271 plf**
W6	7/16" PLY/OSB	1	0.131" dia. x 2.5"	6"	12"**(3)**	2x	2x	0.131" dia. x 3"	1-row 7"	2x or 3x	5/8"	68"(2x) 72"(3x)	A35 or LTP4	30"	**242 plf**	**339 plf**
W4	7/16" PLY/OSB	1	0.131" dia. x 2.5"	4"	12"**(3)**	2x	2x	0.131" dia. x 3"	2-row 10"**(6)**	2x or 3x	5/8"	47"(2x) 58"(3x)	A35 or LTP4	20"	**353 plf**	**495 plf**
W3	7/16" PLY/OSB	1	0.131" dia. x 2.5"	3"	12"**(3)**	3x **(5, 17)**	2x	0.131" dia. x 3"	2-row 8"**(6)**	2x or 3x	5/8"	36"(2x) 45"(3x)	A35 or LTP4	16"	**456 plf**	**638 plf**
W2	7/16" PLY/OSB	1	0.131" dia. x 2.5"	2"	12"**(3)**	3x **(5, 17)**	2x	0.131" dia. x 3"	2-rows 6"**(6)**	2x or 3x	5/8"	28"(2x) 34"(3x)	A35 or LTP4	12"	**595 plf**	**833 plf**
2W3	7/16" PLY/OSB	2	0.131" dia. x 2.5"	3"	12"**(3)**	3x **(5, 16, 17)**	2x	0.131" dia. x 3"	3-rows 6"**(6)**	2x or 3x	5/8"	18"(2x) 22"(3x)	A35 or LTP4	8"	**911 plf**	**1276 plf**
2W2	19/32" PLY/OSB	2	0.131" dia. x 2.5"	2"	12"	3x **(5, 16, 17)**	2x	0.131" dia. x 3"	3-rows 4"**(6)**	2x or 3x	5/8"	12"(2x) 15"(3x)	A35 or LTP4	5"	**1363 plf**	**1908 plf**

General Notes: (unless noted otherwise)

(1) Wall stud framing is assumed to be as per the general structural notes.

(2) All panel edges are to be supported by framing members - studs, plates and blocking (unless noted otherwise in the table above).

(3) Allowable shears in the table above assume **either** 1) wall studs at 16" oc with panel long-axis oriented vertically or horizontally and field fastener spacing as per the table above **or** 2) wall studs at 24" oc with panel long-axis oriented horizontally and 6" oc field fastener spacing.

(4) Where the full thickness of (2)2x or 3x mudsills are directly connected to wall studs, use (2)0.148" dia.x4" end nails (20d box) per stud.

(5) (2)2x material can be used in lieu of 3x material provided the (2)2x is gang nailed as per the associated shearwall bottom plate nailing.

(6) 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.

(7) 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.

(8) 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".

(9) Use 0.131"dia. x 1-1/2" long nails if connector is in contact with framing. Use 0.131"dia. x 2-1/2" long nails if connector is installed over sheathing.

(10) Adjoining horz. panel joints are not permitted to be located on either side of the top plate or the bottom plate. Locate adjoining horz. panel joints on the rim joist above and/or below or at blocking in wall above and/or below.

(11) Spacing shown assumes top plate connectors are installed on one side of wall. If installed on both sides of wall, required spacing can be multiplied by two (2).

(12) Table above shows ASD allowable unit shear capacity. LRFD factored unit shear resistance is calculated by multiplying ASD values above by 1.6.

(13) 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.

(14) Shearwall edge nailing is required along full height of all holdown members. At built-up holdown members, distribute edge nailing into all laminations.

(15) 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 note (10) requirements.

(16) 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.

(17) Vertical and horizontal panel joints (where occur) shall be located on a 3x framing member (min.) with panel edge nailing staggered **or** on a (2)2x (min.) framing member as per footnote (5) above.

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rev. 12.04.18

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Vertical Calculations

Established Basic Permit #
20-01726

Permit Number: 20-04001

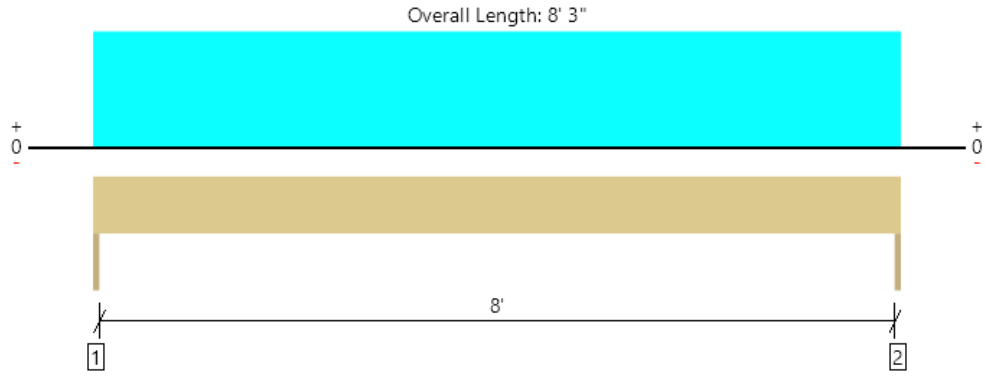
Roof			
Member Name	**Results**	**Current Solution**	**Comments**
1	Passed	1 piece(s) 4 x 8 Douglas Fir-Larch No. 2	
Floor-2			
Member Name	**Results**	**Current Solution**	**Comments**
1	Passed	1 piece(s) 11 7/8" TJI® 110 @ 16" OC	
2	Passed	1 piece(s) 11 7/8" TJI® 110 @ 16" OC	
3	Passed	1 piece(s) 11 7/8" TJI® 110 @ 16" OC	
4	Passed	1 piece(s) 3 1/2" x 9" 24F-V4 DF Glulam	
5	Passed	1 piece(s) 4 x 8 Douglas Fir-Larch No. 2	
6	Passed	1 piece(s) 4 x 8 Douglas Fir-Larch No. 2	
7	Passed	1 piece(s) 4 x 8 Douglas Fir-Larch No. 2	
8	Passed	1 piece(s) 6 x 8 Douglas Fir-Larch No. 2	
9	Passed	1 piece(s) 5 1/2" x 16 1/2" 24F-V4 DF Glulam	
10	Passed	1 piece(s) 3 1/2" x 11 7/8" 2.2E Parallam® PSL	
11	Passed	1 piece(s) 5 1/2" x 16 1/2" 24F-V4 DF Glulam	
Floor-1			
Member Name	**Results**	**Current Solution**	**Comments**
1	Passed	1 piece(s) 4 x 8 Douglas Fir-Larch No. 2	

Established Basic Permit #
20-01726

Permit Number: 20-04001

Roof, 1

1 piece(s) 4 x 8 Douglas Fir-Larch No. 2



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	852 @ 0	3281 (1.50")	Passed (26%)	–	1.0 D + 1.0 S (All Spans)
Shear (lbs)	701 @ 8 3/4"	3502	Passed (20%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	1756 @ 4' 1 1/2"	3438	Passed (51%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.073 @ 4' 1 1/2"	0.275	Passed (L/999+)	–	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.121 @ 4' 1 1/2"	0.313	Passed (L/818)	–	1.0 D + 1.0 S (All Spans)

System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/5/16").
- Top Edge Bracing (Lu): Top compression edge must be braced at 8' 3" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 8' 3" o/c based on loads applied, unless detailed otherwise.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Trimmer - HF	1.50"	1.50"	1.50"	336	516	852	None
2 - Trimmer - HF	1.50"	1.50"	1.50"	336	516	852	None

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 8' 3"	N/A	6.4	--	
1 - Uniform (PSF)	0 to 8' 3"	5'	15.0	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

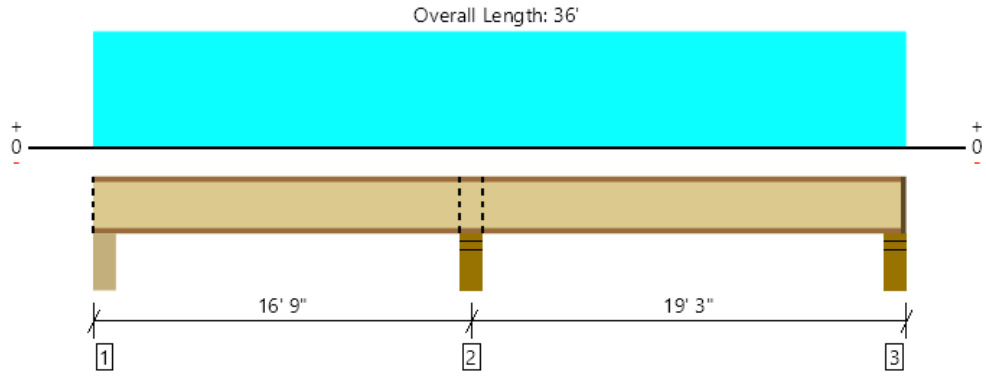
Established Basic Permit # 20-01726

Designer	Job Notes
Eric L Rice ELR Engineering (206) 200-8764 elrengr33@gmail.com	Client: Pebble Creek, LLC Project: Pebble Creek - 1620-AB

Permit Number: 20-04001

Floor-2, 1

1 piece(s) 11 7/8" TJI® 110 @ 16" OC



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1534 @ 16' 9"	2350 (5.25")	Passed (65%)	1.00	1.0 D + 1.0 L (All Spans)
Shear (lbs)	748 @ 16' 11 3/4"	1716	Passed (44%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	-2733 @ 16' 9"	3160	Passed (86%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.352 @ 26' 9"	0.472	Passed (L/644)	–	1.0 D + 1.0 L (Alt Spans)
Total Load Defl. (in)	0.429 @ 26' 10 7/16"	0.944	Passed (L/527)	–	1.0 D + 1.0 L (Alt Spans)
TJ-Pro™ Rating	39	Any	Passed	–	–

System : Floor
Member Type : Joist
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Top Edge Bracing (Lu): Top compression edge must be braced at 3' 9" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 3' 4" o/c based on loads applied, unless detailed otherwise.
- A structural analysis of the deck has not been performed.
- Deflection analysis is based on composite action with a single layer of decking_2332Panels that is gluedAndNailedDown.
- Additional considerations for the TJ-Pro™ Rating include: 5/8" Gypsum ceiling.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Total	
1 - Beam - GLB	5.50"	5.50"	1.75"	98	406/-78	504/-78	Blocking
2 - Stud wall - HF	5.50"	5.50"	3.50"	354	1180	1534	Blocking
3 - Stud wall - HF	5.50"	4.25"	1.75"	124	456/-38	580/-38	1 1/4" Rim Board

- Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.
- Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Floor Live (1.00)	Comments
1 - Uniform (PSF)	0 to 36'	16"	12.0	40.0	Default Load

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

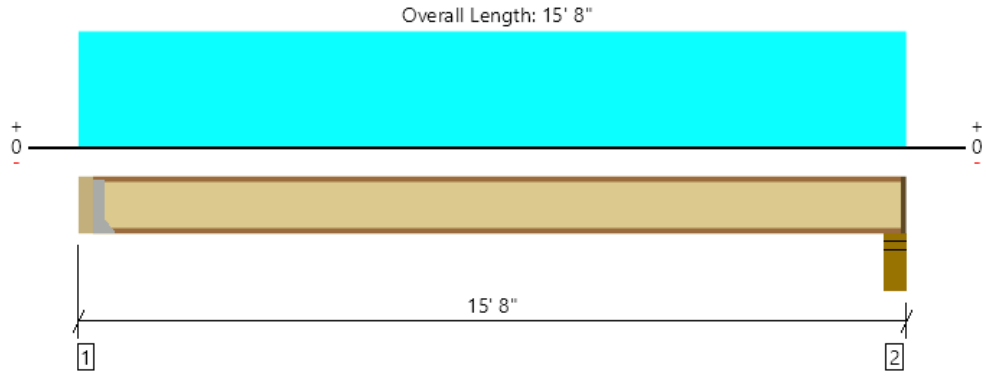
Established Basic Permit # 20-01726

Builder/Purchaser/Dealer	Job Notes
Eric L Rice ELR Engineering (206) 200-8764 elrengr33@gmail.com	Client: Pebble Creek, LLC Project: Pebble Creek - 1620-AB

Permit Number: 20-04001

Floor-2, 2

1 piece(s) 11 7/8" TJI® 110 @ 16" OC



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	520 @ 3 1/2"	910 (1.75")	Passed (57%)	1.00	1.0 D + 1.0 L (All Spans)
Shear (lbs)	520 @ 3 1/2"	1560	Passed (33%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	1950 @ 7' 9 1/2"	3160	Passed (62%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.208 @ 7' 9 1/2"	0.375	Passed (L/866)	–	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.270 @ 7' 9 1/2"	0.750	Passed (L/666)	–	1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	47	Any	Passed	–	–

System : Floor
Member Type : Joist
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Top Edge Bracing (Lu): Top compression edge must be braced at 4' o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 15' 3" o/c based on loads applied, unless detailed otherwise.
- A structural analysis of the deck has not been performed.
- Deflection analysis is based on composite action with a single layer of decking_2332Panels that is gluedAndNailedDown.
- Additional considerations for the TJ-Pro™ Rating include: 5/8" Gypsum ceiling.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Total	
1 - Hanger on 11 7/8" DF beam	3.50"	Hanger[1]	1.75" / 1.75" [2]	125	416	541	See note [1]
2 - Stud wall - HF	5.50"	4.25"	1.75"	126	420	546	1 1/4" 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
- [1] See Connector grid below for additional information and/or requirements.
- [2] Required Bearing Length / Required Bearing Length with Web Stiffeners

Connector: Simpson Strong-Tie						
Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
1 - Face Mount Hanger	IUS1.81/11.88	2.00"	N/A	10-10d	2-Strong-Grip	

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Floor Live (1.00)	Comments
1 - Uniform (PSF)	0 to 15' 8"	16"	12.0	40.0	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

Established Basic Permit # 20-01726

Designer Information	Job Notes
Eric L Rice ELR Engineering (206) 200-8764 elrengr33@gmail.com	Client: Pebble Creek, LLC Project: Pebble Creek - 1620-AB

Permit Number: 20-04001

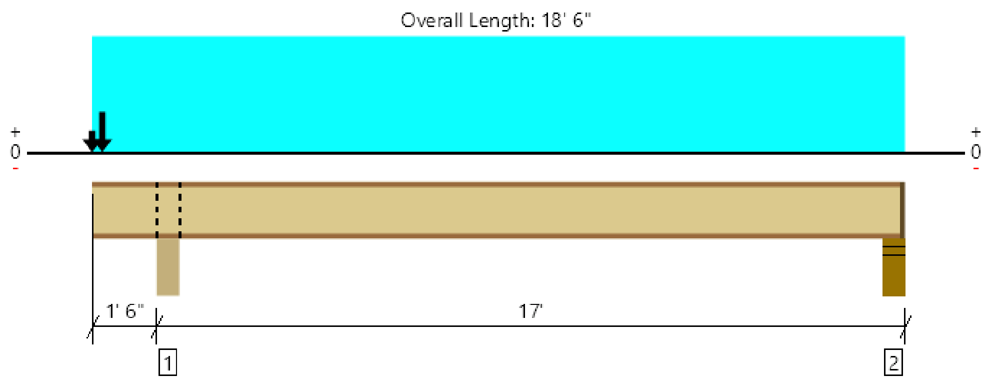
FORTE WEB

MEMBER REPORT

PASSED

Floor-2, 3

1 piece(s) 11 7/8" TJI® 110 @ 16" OC



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	564 @ 18' 1 1/2"	1375 (3.50")	Passed (41%)	1.00	1.0 D + 1.0 L (Alt Spans)
Shear (lbs)	539 @ 18' 1/2"	1560	Passed (35%)	1.00	1.0 D + 1.0 L (Alt Spans)
Moment (Ft-lbs)	2144 @ 10' 3 1/8"	3160	Passed (68%)	1.00	1.0 D + 1.0 L (Alt Spans)
Live Load Defl. (in)	0.290 @ 9' 11 1/8"	0.410	Passed (L/677)	--	1.0 D + 1.0 L (Alt Spans)
Total Load Defl. (in)	0.345 @ 10' 9/16"	0.820	Passed (L/571)	--	1.0 D + 1.0 L (Alt Spans)
TJ-Pro™ Rating	43	Any	Passed	--	--

System : Floor
Member Type : Joist
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Overhang deflection criteria: LL (2L/480) and TL (2L/240).
- Top Edge Bracing (Lu): Top compression edge must be braced at 3' 10" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 6' 11" o/c based on loads applied, unless detailed otherwise.
- A structural analysis of the deck has not been performed.
- Deflection analysis is based on composite action with a single layer of decking_2332Panels that is gluedAndNailedDown.
- Additional considerations for the TJ-Pro™ Rating include: 5/8" Gypsum ceiling.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Beam - GLB	5.50"	5.50"	3.50"	415	534	228	1177	Blocking
2 - Stud wall - HF	5.50"	4.25"	1.75"	114	457	-20	571/-20	1 1/4" Rim Board

- Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.
- Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Vertical Loads	Location (Side)	Spacing	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 18' 6"	16"	12.0	40.0	-	Default Load
2 - Point (PLF)	2 3/4"	16"	81.0	-	-	
3 - Point (PLF)	2 3/4"	16"	75.0	-	125.0	
4 - Point (PLF)	0	16"	19.0	-	31.0	

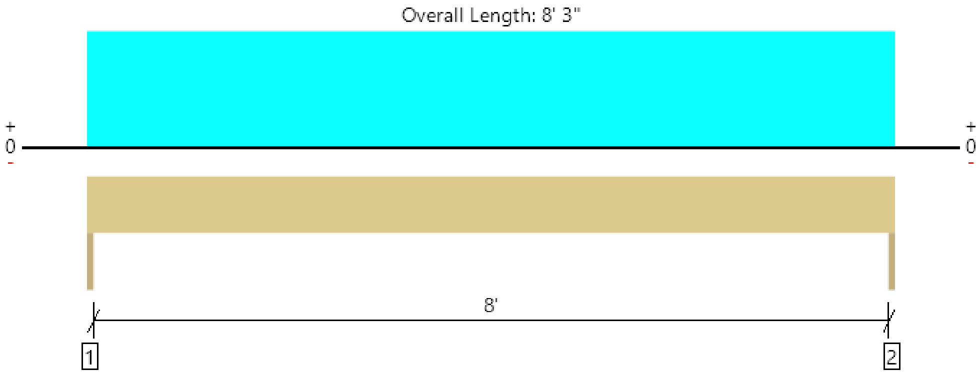
Weyerhaeuser Notes

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

Established Basic Permit #
20-01726

Floor-2, 4

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



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	3497 @ 0	3413 (1.50")	Passed (102%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	2755 @ 10 1/2"	6400	Passed (43%)	1.15	1.0 D + 1.0 S (All Spans)
Pos Moment (Ft-lbs)	7212 @ 4' 1 1/2"	10868	Passed (66%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.143 @ 4' 1 1/2"	0.275	Passed (L/692)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.231 @ 4' 1 1/2"	0.412	Passed (L/429)	--	1.0 D + 1.0 S (All Spans)

System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Top Edge Bracing (Lu): Top compression edge must be braced at 8' 3" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 8' 3" o/c based on loads applied, unless detailed otherwise.
- Critical positive moment adjusted by a volume factor of 1.00 that was calculated 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	Snow	Total	
1 - Trimmer - HF	1.50"	1.50"	1.54"	1331	2166	3497	None
2 - Trimmer - HF	1.50"	1.50"	1.54"	1331	2166	3497	None

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 8' 3"	N/A	7.7	--	
1 - Uniform (PSF)	0 to 8' 3"	21'	15.0	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

Established Basic Permit #
20-01726

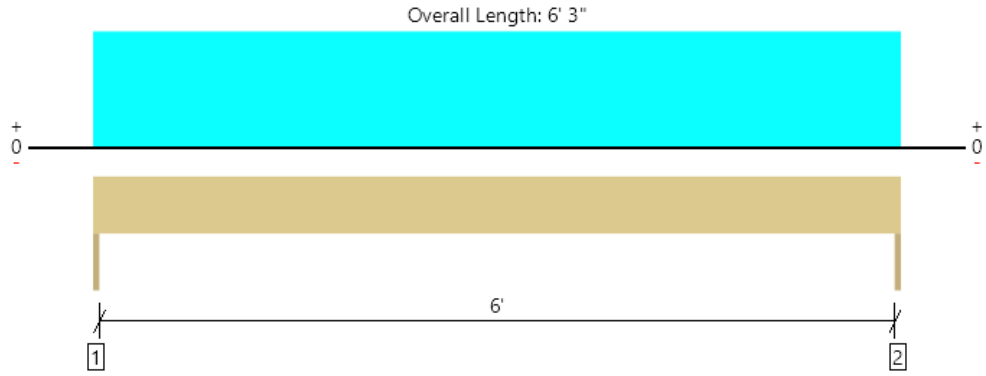
ForteWEB Software Operator	Job Notes
Eric L Rice ELR Engineering (206) 20[illegible]-8764 elreng33@gmail.com	Client: Pebble Creek, LLC Project: Pebble Creek - 1620-AB

Permit Number: 20-04001

Weyerhaeuser

Floor-2, 5

1 piece(s) 4 x 8 Douglas Fir-Larch No. 2



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1834 @ 0	3281 (1.50")	Passed (56%)	–	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	1370 @ 8 3/4"	3045	Passed (45%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	2792 @ 3' 1 1/2"	2989	Passed (93%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.064 @ 3' 1 1/2"	0.208	Passed (L/999+)	–	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.113 @ 3' 1 1/2"	0.313	Passed (L/662)	–	1.0 D + 0.75 L + 0.75 S (All Spans)

System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Top Edge Bracing (Lu): Top compression edge must be braced at 6' 3" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 6' 3" o/c based on loads applied, unless detailed otherwise.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Trimmer - HF	1.50"	1.50"	1.50"	802	984	391	2177	None
2 - Trimmer - HF	1.50"	1.50"	1.50"	802	984	391	2177	None

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	6.4	--	--	
1 - Uniform (PSF)	0 to 6' 3"	5'	15.0	-	25.0	Default Load
2 - Uniform (PSF)	0 to 6' 3"	8' 1"	10.0	-	-	Default Load
3 - Uniform (PLF)	0 to 6' 3"	N/A	94.5	315.0	-	Linked from: 2, Support 2

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

Established Basic Permit # 20-01726

Job Notes
Client: Pebble Creek, LLC Project: Pebble Creek - 1620-AB

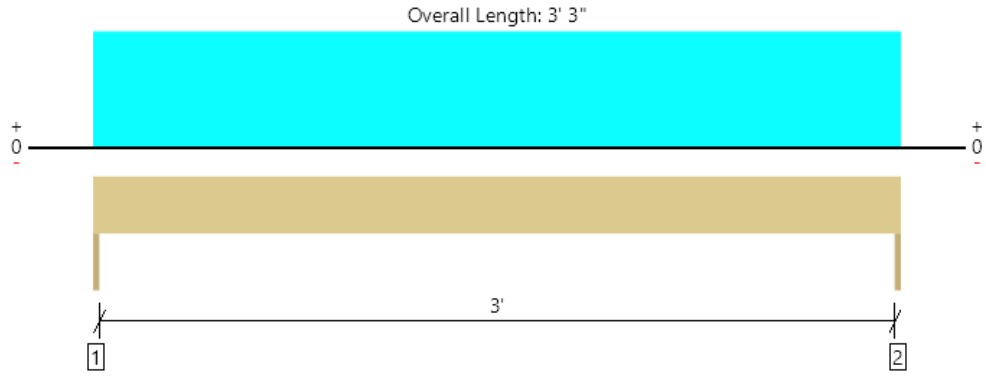
Eric L Rice
ELR Engineering
(206) 200-8764
elrengr33@gmail.com

Weyerhaeuser

Permit Number: 20-04001

Floor-2, 6

1 piece(s) 4 x 8 Douglas Fir-Larch No. 2



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern) [Group]
Member Reaction (lbs)	984 @ 0	3281 (1.50")	Passed (30%)	–	1.0 D + 0.75 L + 0.75 S (All Spans) [1]
Shear (lbs)	535 @ 8 3/4"	3045	Passed (18%)	1.00	1.0 D + 1.0 L (All Spans) [1]
Moment (Ft-lbs)	789 @ 1' 7 1/2"	2989	Passed (26%)	1.00	1.0 D + 1.0 L (All Spans) [1]
Live Load Defl. (in)	0.005 @ 1' 7 1/2"	0.108	Passed (L/999+)	–	1.0 D + 0.75 L + 0.75 S (All Spans) [1]
Total Load Defl. (in)	0.009 @ 1' 7 1/2"	0.162	Passed (L/999+)	–	1.0 D + 0.75 L + 0.75 S (All Spans) [1]

System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Top Edge Bracing (Lu): Top compression edge must be braced at 3' 3" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 3' 3" o/c based on loads applied, unless detailed otherwise.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Trimmer - HF	1.50"	1.50"	1.50"	415	556/-46	203	1174/-46	None
2 - Trimmer - HF	1.50"	1.50"	1.50"	415	556/-46	203	1174/-46	None

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 3' 3"	N/A	6.4	--	--	
1 - Uniform (PSF)	0 to 3' 3"	5'	15.0	-	25.0	Default Load
2 - Uniform (PSF)	0 to 3' 3"	8' 1"	10.0	-	-	Default Load
3 - Uniform (PLF)	0 to 3' 3"	N/A	93.0	342.0/-28.5	-	Linked from: 1, Support 3

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

Established Basic Permit # 20-01726

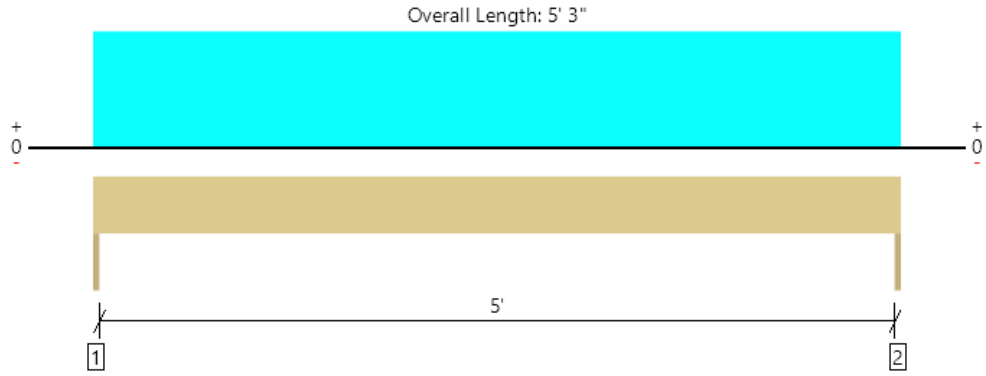
Eric L Rice
ELR Engineering
(206) 200-8764
elrengr33@gmail.com

Job Notes
Client: Pebble Creek, LLC
Project: Pebble Creek - 1620-AB

Permit Number: 20-04001

Floor-2, 7

1 piece(s) 4 x 8 Douglas Fir-Larch No. 2



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	2091 @ 0	3281 (1.50")	Passed (64%)	–	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1510 @ 8 3/4"	3502	Passed (43%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	2744 @ 2' 7 1/2"	3438	Passed (80%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.047 @ 2' 7 1/2"	0.175	Passed (L/999+)	–	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.077 @ 2' 7 1/2"	0.262	Passed (L/823)	–	1.0 D + 1.0 S (All Spans)

System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Top Edge Bracing (Lu): Top compression edge must be braced at 5' 3" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 5' 3" o/c based on loads applied, unless detailed otherwise.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Trimmer - HF	1.50"	1.50"	1.50"	795	1296	2091	None
2 - Trimmer - HF	1.50"	1.50"	1.50"	795	1296	2091	None

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 5' 3"	N/A	6.4	--	
1 - Uniform (PSF)	0 to 5' 3"	19' 9"	15.0	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

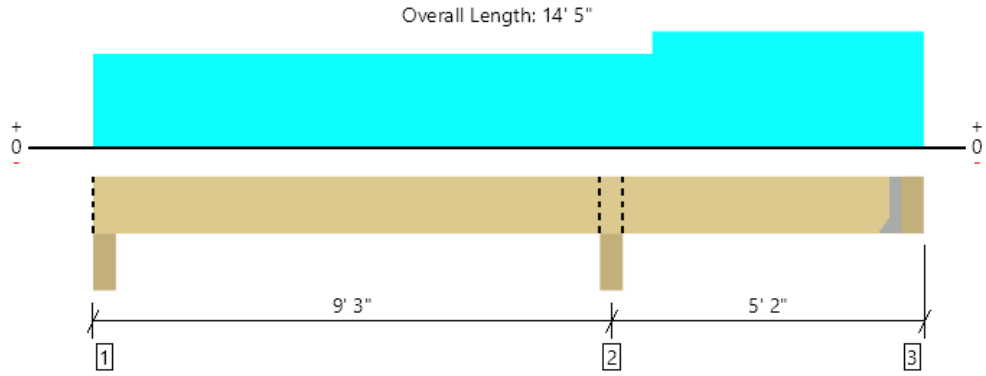
Established Basic Permit # 20-01726

Designer Information	Job Notes
Eric L Rice ELR Engineering (206) 200-8764 elrengr33@gmail.com	Client: Pebble Creek, LLC Project: Pebble Creek - 1620-AB

Permit Number: 20-04001

Floor-2, 8

1 piece(s) 6 x 8 Douglas Fir-Larch No. 2



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1716 @ 9' 3"	18906 (5.50")	Passed (9%)	–	1.0 D + 1.0 S (All Spans)
Shear (lbs)	791 @ 8' 4 3/4"	5376	Passed (15%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	-1357 @ 9' 3"	3705	Passed (37%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.034 @ 4' 5 1/16"	0.297	Passed (L/999+)	–	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.057 @ 4' 4 13/16"	0.446	Passed (L/999+)	–	1.0 D + 1.0 S (Alt Spans)

System : Roof
Member Type : Drop Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD
Member Pitch : 0/12

- Deflection criteria: LL (L/360) and TL (L/240).
- Top Edge Bracing (Lu): Top compression edge must be braced at 14' o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 14' o/c based on loads applied, unless detailed otherwise.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Column - HF	5.50"	5.50"	1.50"	287	416	703	Blocking
2 - Column - HF	5.50"	5.50"	1.50"	704	1012	1716	Blocking
3 - Hanger on 7 1/2" HF beam	5.50"	Hanger[1]	1.50"	123	264	387	See note [1]

- 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
- [1] See Connector grid below for additional information and/or requirements.

Connector: Simpson Strong-Tie

Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
3 - Face Mount Hanger	HUC68	2.50"	N/A	10-10d	4-10d	

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 13' 11 1/2"	N/A	10.4	--	
1 - Uniform (PSF)	0 to 9' 11" (Top)	4' 2"	15.0	25.0	Default Load
2 - Uniform (PSF)	9' 11" to 14' 5" (Top)	5' 2"	15.0	25.0	Default Load

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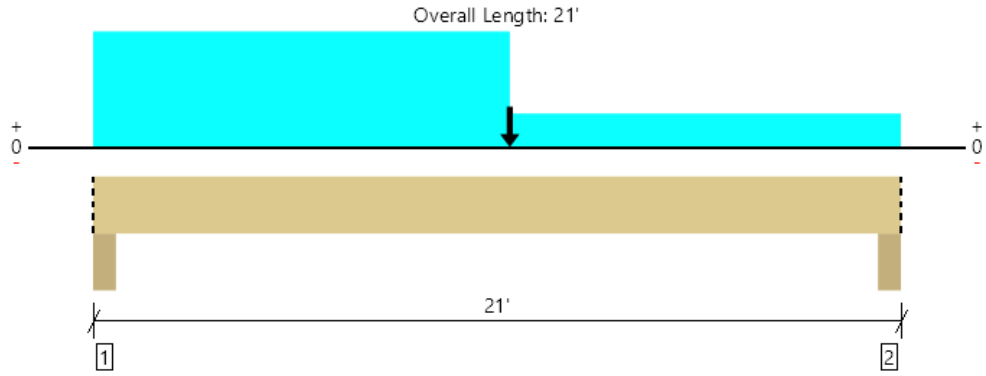
The product application, input design loads, dimensions and support information have been provided by Architect/Designer: RHD

Layout Prepared By:	Job Notes
Eric L Rice ELR Engineering (206) 200-8764 elrengr33@gmail.com	Client: Pebble Creek, LLC Project: Pebble Creek - 1620-AB

Floor-2, 9

1 piece(s) 5 1/2" x 16 1/2" 24F-V4 DF Glulam



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern) [Group]
Member Reaction (lbs)	7796 @ 4"	19663 (5.50")	Passed (40%)	–	1.0 D + 0.75 L + 0.75 S (All Spans) [1]
Shear (lbs)	6077 @ 1' 10"	16033	Passed (38%)	1.00	1.0 D + 1.0 L (All Spans) [1]
Pos Moment (Ft-lbs)	35109 @ 10' 1 3/8"	48163	Passed (73%)	1.00	1.0 D + 1.0 L (All Spans) [1]
Live Load Defl. (in)	0.408 @ 10' 4 1/2"	0.678	Passed (L/598)	–	1.0 D + 0.75 L + 0.75 S (All Spans) [1]
Total Load Defl. (in)	0.736 @ 10' 4 9/16"	1.017	Passed (L/331)	–	1.0 D + 0.75 L + 0.75 S (All Spans) [1]

System : Floor
Member Type : Drop Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Top Edge Bracing (Lu): Top compression edge must be braced at 21' o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 21' o/c based on loads applied, unless detailed otherwise.
- Critical positive moment adjusted by a volume factor of 0.96 that was calculated using length L = 20' 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	Total	
1 - Column - DF	5.50"	5.50"	2.18"	3446	3977	1823	9246	Blocking
2 - Column - DF	5.50"	5.50"	1.85"	2933	3458	1452	7843	Blocking

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 21'	N/A	22.1	--	--	
1 - Uniform (PLF)	0 to 10' 10" (Top)	N/A	311.3	400.5	171.0	Linked from: 3, Support 1
2 - Uniform (PLF)	10' 10" to 21' (Top)	N/A	73.5	304.5/-58.5	-	Linked from: 1, Support 1
3 - Uniform (PSF)	10' 10" to 21' (Top)	8' 1"	10.0	-	-	
4 - Uniform (PSF)	10' 10" to 21' (Top)	4'	15.0	-	25.0	
5 - Point (lb)	10' 10" (Top)	N/A	365	-	406	

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

Established Basic Permit # 20-01726

Permit Number: 20-04001

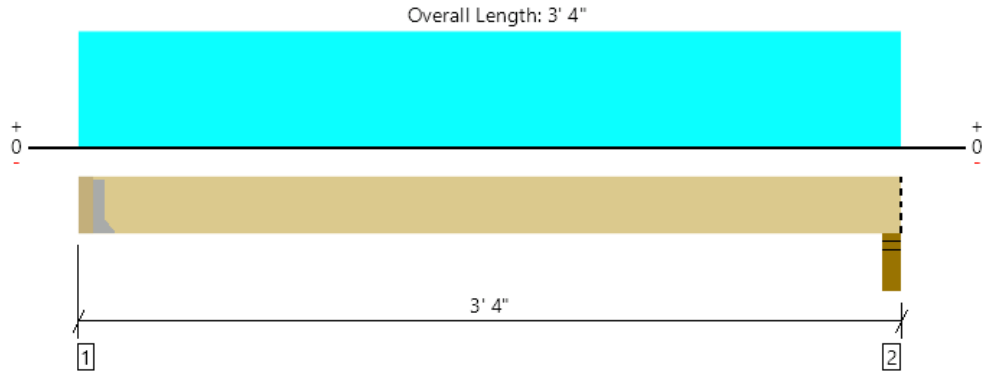
Eric L Rice
ELR Engineering
(206) 200-8764
elrengr33@gmail.com

Job Notes
Client: Pebble Creek, LLC
Project: Pebble Creek - 1620-AB

Weyerhaeuser

Floor-2, 10

1 piece(s) 3 1/2" x 11 7/8" 2.2E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	675 @ 3 1/2"	3281 (1.50")	Passed (21%)	–	1.0 D + 1.0 L (All Spans)
Shear (lbs)	196 @ 1' 3 3/8"	8035	Passed (2%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	471 @ 1' 8 1/4"	19902	Passed (2%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.001 @ 1' 8 1/4"	0.070	Passed (L/999+)	–	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.002 @ 1' 8 1/4"	0.140	Passed (L/999+)	–	1.0 D + 1.0 L (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Top Edge Bracing (Lu): Top compression edge must be braced at 3' 1" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 3' 1" o/c based on loads applied, unless detailed otherwise.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Total	
1 - Hanger on 11 7/8" PSL beam	3.50"	Hanger[1]	1.50"	285	527	812	See note [1]
2 - Stud wall - HF	4.50"	4.50"	1.50"	282	514	796	Blocking

- 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
- [1] See Connector grid below for additional information and/or requirements.

Connector: Simpson Strong-Tie						
Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
1 - Face Mount Hanger	U410	2.00"	N/A	14-10d	6-10d	

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	3 1/2" to 3' 4"	N/A	13.0	--	
1 - Uniform (PLF)	0 to 3' 4" (Back)	N/A	93.8	312.0	Linked from: 2, Support 1
2 - Uniform (PSF)	0 to 3' 4" (Front)	8' 1"	8.0	-	

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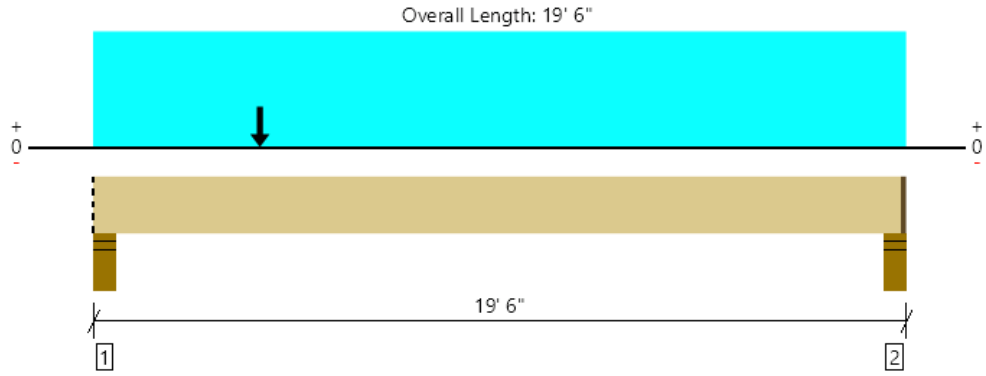
The product application, input design loads, dimensions and support information have been provided by Architect/Designer: RHD

Designer Information	Job Notes
Eric L Rice ELR Engineering (206) 200-8764 elrengr33@gmail.com	Client: Pebble Creek, LLC Project: Pebble Creek - 1620-AB

Floor-2, 11

1 piece(s) 5 1/2" x 16 1/2" 24F-V4 DF Glulam



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	8186 @ 19' 2"	9467 (4.25")	Passed (86%)	–	1.0 D + 1.0 S (All Spans)
Shear (lbs)	6902 @ 1' 10"	18437	Passed (37%)	1.15	1.0 D + 1.0 S (All Spans)
Pos Moment (Ft-lbs)	37895 @ 9' 8 3/16"	55813	Passed (68%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.353 @ 9' 9"	0.628	Passed (L/640)	–	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.654 @ 9' 8 13/16"	0.942	Passed (L/346)	–	1.0 D + 1.0 S (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Top Edge Bracing (Lu): Top compression edge must be braced at 19' 5" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 19' 5" o/c based on loads applied, unless detailed otherwise.
- Critical positive moment adjusted by a volume factor of 0.97 that was calculated using length L = 18' 10".
- 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	Total	
1 - Stud wall - HF	5.50"	5.50"	3.79"	3938	424	4509	8871	Blocking
2 - Stud wall - HF	5.50"	4.25"	3.67"	3762	103	4509	8374	1 1/4" Rim Board

- Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.
- Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 19' 4 3/4"	N/A	22.1	--	--	
1 - Point (lb)	4' (Front)	N/A	285	527	-	Linked from: 10, Support 1
2 - Uniform (PSF)	0 to 19' 6" (Top)	11' 6"	15.0	-	25.0	
3 - Uniform (PSF)	0 to 19' 6" (Top)	8' 1"	10.0	-	-	
4 - Uniform (PSF)	0 to 19' 6" (Top)	7'	15.0	-	25.0	

Weyerhaeuser Notes

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

Established Basic Permit # 20-01726

Designer Information	Job Notes
Eric L Rice ELR Engineering (206) 200-8764 elrengr33@gmail.com	Client: Pebble Creek, LLC Project: Pebble Creek - 1620-AB

Permit Number: 20-04001

FORTE WEB

JOB SUMMARY REPORT

1620-AB

Floor-1			
Member Name	**Results**	**Current Solution**	**Comments**
1	Passed	1 piece(s) 4 x 8 Douglas Fir-Larch No. 2	
2-option	Passed	1 piece(s) 2 x 8 Hem-Fir No. 2 @ 16" OC	
3-option	Passed	1 piece(s) 4 x 10 Douglas Fir-Larch No. 2	

ForteWEB Software Operator	Job Notes
Erick Rice Rice Engineering (206) 200-8764 elrene33@gmail.com	Client: Pebble Creek, LLC Project: Pebble Creek - 1620-AB

Weyerhaeuser

4/16/2020 7:40:31 PM UTC

ForteWEB v2.4

File Name: 1620-AB

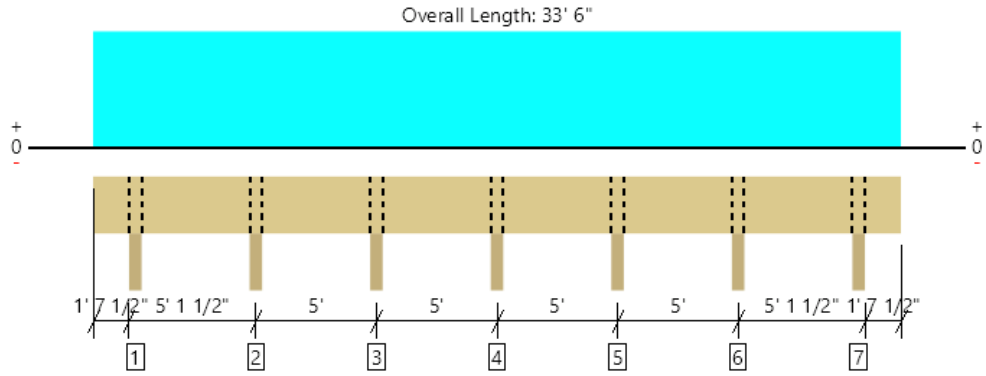
Established Basic Permit #

20-01726

Permit Number: 20-04001

Floor-1, 1

1 piece(s) 4 x 8 Douglas Fir-Larch No. 2



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	3017 @ 6' 9"	6563 (3.00")	Passed (46%)	–	1.0 D + 1.0 L (Adj Spans)
Shear (lbs)	1160 @ 6' 1/4"	3045	Passed (38%)	1.00	1.0 D + 1.0 L (Adj Spans)
Moment (Ft-lbs)	-1444 @ 6' 9"	2989	Passed (48%)	1.00	1.0 D + 1.0 L (Adj Spans)
Live Load Defl. (in)	0.023 @ 29' 4 3/8"	0.167	Passed (L/999+)	–	1.0 D + 1.0 L (Alt Spans)
Total Load Defl. (in)	0.026 @ 33' 6"	0.200	Passed (2L/999+)	–	1.0 D + 1.0 L (Alt Spans)

System : Floor
Member Type : Drop Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Overhang deflection criteria: LL (2L/360) and TL (2L/0.2").
- Top Edge Bracing (Lu): Top compression edge must be braced at 33' 6" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 33' 6" o/c based on loads applied, unless detailed otherwise.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Total	
1 - Column - HF	3.00"	3.00"	1.50"	507	1706	2213	Blocking
2 - Column - HF	3.00"	3.00"	1.50"	639	2378	3017	Blocking
3 - Column - HF	3.00"	3.00"	1.50"	611	2320	2931	Blocking
4 - Column - HF	3.00"	3.00"	1.50"	620	2325	2945	Blocking
5 - Column - HF	3.00"	3.00"	1.50"	611	2320	2931	Blocking
6 - Column - HF	3.00"	3.00"	1.50"	639	2378	3017	Blocking
7 - Column - HF	3.00"	3.00"	1.50"	507	1706	2213	Blocking

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 33' 6"	N/A	6.4	--	
1 - Uniform (PSF)	0 to 33' 6" (Top)	9' 9"	12.0	40.0	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

Established Basic Permit # 20-01726

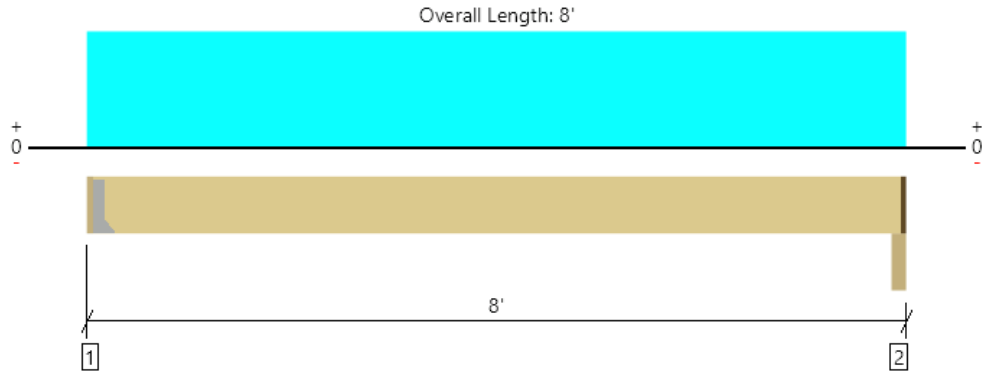
Designer Information	Job Notes
Eric L Rice ELR Engineering (206) 200-8764 elrengr33@gmail.com	Client: Pebble Creek, LLC Project: Pebble Creek - 1620-AB

Permit Number: 20-04001

Weyerhaeuser

Floor-1, 2-option

1 piece(s) 2 x 8 Hem-Fir No. 2 @ 16" OC



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	377 @ 1 1/2"	911 (1.50")	Passed (41%)	–	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	301 @ 8 3/4"	1088	Passed (28%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	686 @ 3' 11 1/2"	1284	Passed (53%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.107 @ 3' 11 1/2"	0.192	Passed (L/862)	–	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.123 @ 3' 11 1/2"	0.383	Passed (L/745)	–	1.0 D + 0.75 L + 0.75 S (All Spans)
TJ-Pro™ Rating	N/A	N/A	N/A	–	N/A

System : Floor
Member Type : Joist
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Top Edge Bracing (Lu): Top compression edge must be braced at 7' 9" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 7' 9" o/c based on loads applied, unless detailed otherwise.
- 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	Total	
1 - Hanger on 7 1/4" HF beam	1.50"	Hanger[1]	1.50"	53	317	132	502	See note [1]
2 - Beam - HF	3.50"	2.25"	1.50"	54	323	135	512	1 1/4" 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
- [1] See Connector grid below for additional information and/or requirements.

Connector: Simpson Strong-Tie						
Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
1 - Face Mount Hanger	Connector not found	N/A	N/A	N/A	N/A	

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 8'	16"	10.0	60.0	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

Established Basic Permit # 20-01726

Builder / Purchaser	Job Notes
Eric L Rice ELR Engineering (206) 200-8764 elrengr33@gmail.com	Client: Pebble Creek, LLC Project: Pebble Creek - 1620-AB

Permit Number: 20-04001

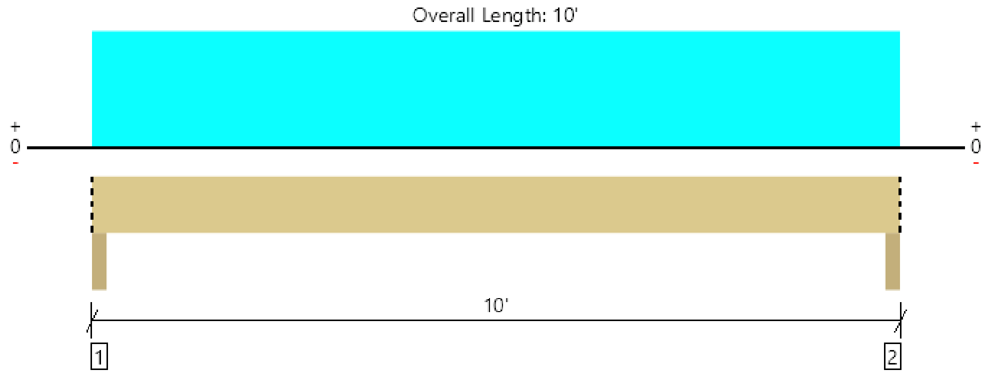
FORTE WEB

MEMBER REPORT

PASSED

Floor-1, 3-option

1 piece(s) 4 x 10 Douglas Fir-Larch No. 2



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1682 @ 2"	7656 (3.50")	Passed (22%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	1264 @ 1' 3/4"	3885	Passed (33%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	3749 @ 5'	4492	Passed (83%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.137 @ 5'	0.322	Passed (L/846)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.179 @ 5'	0.483	Passed (L/648)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

System : Floor
Member Type : Drop Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Top Edge Bracing (Lu): Top compression edge must be braced at 10' o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 10' o/c based on loads applied, unless detailed otherwise.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Column - HF	3.50"	3.50"	1.50"	394	1211	506	2111	Blocking
2 - Column - HF	3.50"	3.50"	1.50"	394	1211	506	2111	Blocking

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 10'	N/A	8.2	--	--	
1 - Uniform (PSF)	0 to 10' (Top)	3'	10.0	-	-	
2 - Uniform (PLF)	0 to 10' (Top)	N/A	40.5	242.3	101.3	Linked from: 2-option, Support 2

Weyerhaeuser Notes

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

Established Basic Permit #

20-01726

ForteWEB Software Operator	Job Notes
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Weyerhaeuser

Permit Number: 20-04001

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Project Title:
Engineer: ELR
Project ID:
Project Descr:

Printed: 16 APR 2020, 12:39PM

Wood Column

Lic. # : KW-06010691 — ELR Engineering

DESCRIPTION: +)> Post for rear deck option

Code References

Calculations per NDS 2015, IBC 2015, CBC 2016, ASCE 7-10
Load Combinations Used : ASCE 7-10

General Information

Analysis Method :	Allowable Stress Design		
End Fixities	Top & Bottom Pinned		
Overall Column Height	10 ft		
(Used for non-slender calculations)			
Wood Species	Hem Fir		
Wood Grade	Stud		
Fb +	675 psi	Fv	150 psi
Fb -	675 psi	Ft	400 psi
Fc - Prll	800 psi	Density	26.84 pcf
Fc - Perp	405 psi		

E : Modulus of Elasticity . . .	x-x Bending	y-y Bending	Axial
Basic	1200	1200	1200 ksi
Minimum	440	440	

Wood Section Name	4x4		
Wood Grading/Manuf.	Graded Lumber		
Wood Member Type	Sawn		
Exact Width	3.50 in	Allow Stress Modification Factors	
Exact Depth	3.50 in	Cf or Cv for Bending	1.10
Area	12.250 in^2	Cf or Cv for Compression	1.050
Ix	12.505 in^4	Cf or Cv for Tension	1.10
Iy	12.505 in^4	Cm : Wet Use Factor	1.0
Incising Factors :		Ct : Temperature Factor	1.0
for Bending	0.80	Cfu : Flat Use Factor	1.0
for Elastic Modulus	0.95	Kf : Built-up columns	1.0 *NDS 15.3.2*
		Use Cr : Repetitive ?	No

Brace condition for deflection (buckling) along columns :
X-X (width) axis : Unbraced Length for buckling ABOUT Y-Y Axis = 10 ft, K = 1.0
Y-Y (depth) axis : Unbraced Length for buckling ABOUT X-X Axis = 10 ft, K = 1.0

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Column self weight included : 22.833 lbs * Dead Load Factor
AXIAL LOADS . . .
Axial Load at 10.0 ft, D = 0.3940, L = 1.211, S = 0.5060 k
BENDING LOADS . . .
Lat. Point Load at 5.0 ft creating Mx-x, W = 0.20 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.9563 : 1**

Load Combination	+D+0.750L+0.750S+0.450W
Governing NDS Forumla	1Comp + Mxx, NDS Eq. 3.9-3
Location of max.above base	5.034 ft
At maximum location values are . . .	
Applied Axial	1.705 k
Applied Mx	0.2235 k-ft
Applied My	0.0 k-ft
Fc : Allowable	286.811 psi

PASS Maximum Shear Stress Ratio = **0.03827 : 1**

Load Combination	+D+0.60W
Location of max.above base	10.0 ft
Applied Design Shear	7.347 psi
Allowable Shear	192.0 psi

Maximum SERVICE Lateral Load Reactions . .

Top along Y-Y	0.10 k	Bottom along Y-Y	0.10 k
Top along X-X	0.0 k	Bottom along X-X	0.0 k

Maximum SERVICE Load Lateral Deflections . . .

Along Y-Y 0.5102 in at 5.034 ft above base
for load combination : W Only
Along X-X 0.0 in at 0.0 ft above base
for load combination : n/a

Other Factors used to calculate allowable stresses . . .

	Bending	Compression	Tension

Load Combination Results

Load Combination	C_D	C_P	Maximum Axial + Bending Stress Ratios: Stress Ratio	Status	Location	Maximum Shear Ratios: Stress Ratio	Status	Location
D Only	0.900	0.440	0.1280	PASS	0.0 ft	0.0	PASS	10.0 ft
+D+L	1.000	0.403	0.4903	PASS	0.0 ft	0.0	PASS	10.0 ft
+D+S	1.150	0.358	0.2722	PASS	0.0 ft	0.0	PASS	10.0 ft
+D+0.750L	1.250	0.333	0.3867	PASS	0.0 ft	0.0	PASS	10.0 ft
+D+0.750L+0.750S	1.150	0.358	0.5027	PASS	0.0 ft	0.0	PASS	10.0 ft
+D+0.60W	1.600	0.267	0.6061	PASS	5.034 ft	0.03827	PASS	10.0 ft
+D+0.750L+0.450W	1.600	0.267	0.7512	PASS	5.034 ft	0.02870	PASS	4.966 ft
+D+0.750L+0.750S+0.450W	1.600	0.267	0.9563	PASS	5.034 ft	0.02870	PASS	4.966 ft
+0.60D+0.60W	1.600	0.267	0.5690	PASS	5.034 ft	0.03827	PASS	10.0 ft

Established Basic Permit #

20-01726

Permit Number: 20-04001

ELR Engineering
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Project Title:
Engineer: ELR
Project ID:
Project Descr:

Printed: 16 APR 2020, 12:39PM

Wood Column

File = C:\Dropbox\1_ELRE~1\1_ELRE~1\2020\1-RHD\MTT\PEBBLE~1\1620-ab\Enercalc\1620.ec6 .

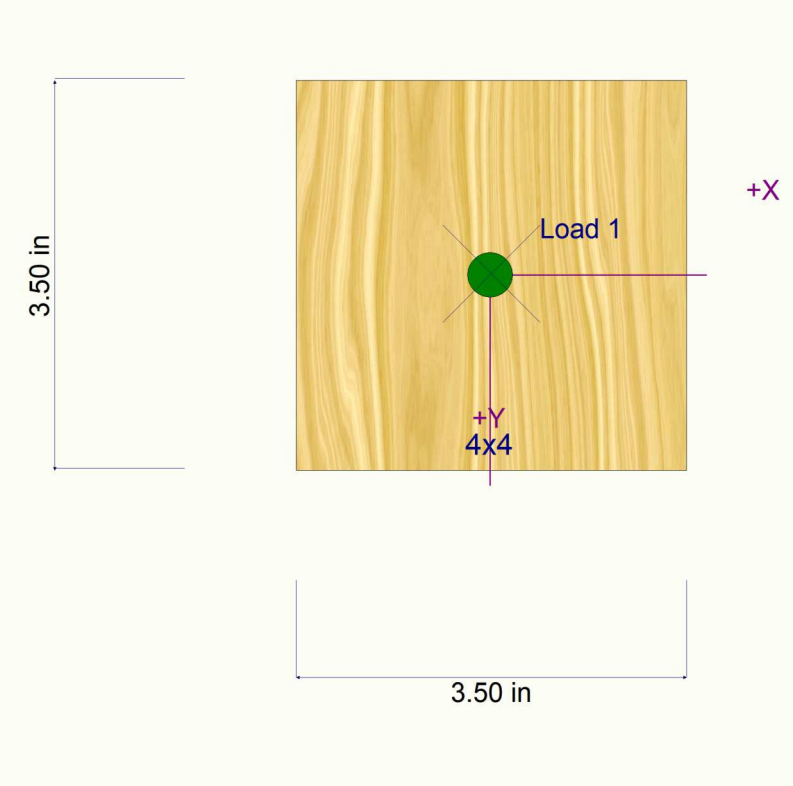
Lic. # : KW-06010691 ELR Engineering

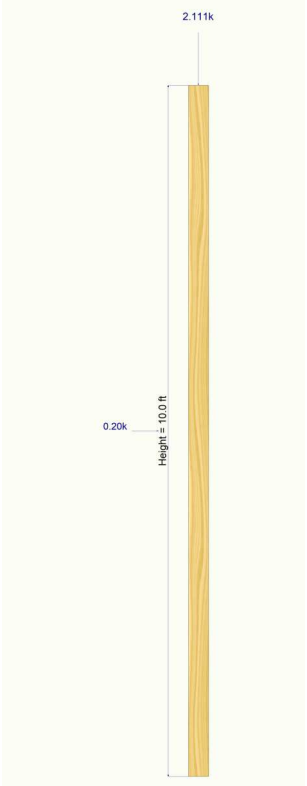
DESCRIPTION: +)> Post for rear deck option

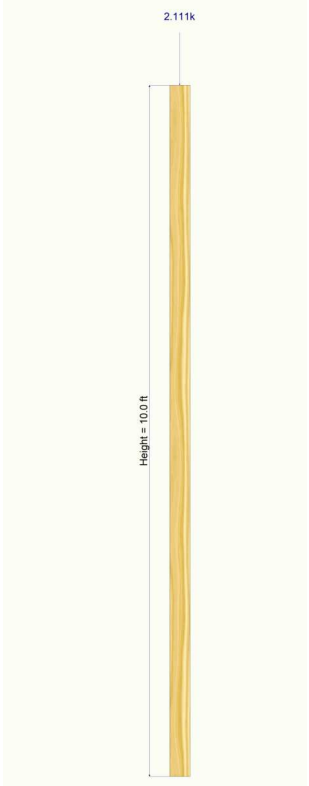
Load Combination Results

Load Combination	C_D	C_P	Maximum Axial + Bending Stress Ratios			Maximum Shear Ratios		
			Stress Ratio	Status	Location	Stress Ratio	Status	Location
+0.60D	1.600	0.267	0.07118	PASS	0.0 ft	0.0	PASS	10.0 ft

Sketches







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Permit Number: 20-04001

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Lateral Calculations

Established Basic Permit #
20-01726

Permit Number: 20-04001

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Project Title:
Engineer: ELR
Project ID:
Project Descr:

Printed: 4 MAR 2020, 11:37AM

ASCE Seismic Base Shear

Lic. # : KW-06010691 — ELR Engineering

> Seismic load design values

Risk Category

Calculations per ASCE 7-10

Risk Category of Building or Other Structure : "II" : All Buildings and other structures except those listed as Category I, III, and IV — *ASCE 7-10, Page 2, Table 1.5-1*

Seismic Importance Factor = 1 — *ASCE 7-10, Page 5, Table 1.5-2*

Gridded Ss & S1values ASCE-7-10 Standard

ASCE 7-10 11.4.1

Max. Ground Motions, 5% Damping :

S_S = 1.579 g, 0.2 sec response
S_1 = 0.6105 g, 1.0 sec response

Latitude = 47.528 deg North
Longitude = 122.627 deg West

Site Class, Site Coeff. and Design Category

Site Classification "D" : Shear Wave Velocity 600 to 1,200 ft/sec		=	D	*ASCE 7-10 Table 20.3-1*
Site Coefficients Fa & Fv	Fa	=	1.00	*ASCE 7-10 Table 11.4-1 & 11.4-2*
(using straight-line interpolation from table values)	Fv	=	1.50	
Maximum Considered Earthquake Acceleration	S_{MS} = Fa * Ss	=	1.579	*ASCE 7-10 Eq. 11.4-1*
	S_{M1} = Fv * S1	=	0.916	*ASCE 7-10 Eq. 11.4-2*
Design Spectral Acceleration	$S_{DS} = S_{MS} * 2/3$	=	1.053	*ASCE 7-10 Eq. 11.4-3*
	$S_{D1} = S_{M1} * 2/3$	=	0.611	*ASCE 7-10 Eq. 11.4-4*
Seismic Design Category		=	D	*ASCE 7-10 Table 11.6-1 & -2*

Resisting System

ASCE 7-10 Table 12.2-1

Basic Seismic Force Resisting System . . . **Bearing Wall Systems**
13.Light-frame (wood) walls sheathed w/wood structural panels rated for shear resistance.

Response Modification Coefficient " R "	=	6.50
System Overstrength Factor " Wo "	=	3.00
Deflection Amplification Factor " Cd "	=	4.00

NOTE! See ASCE 7-10 for all applicable footnotes.

Building height Limits :

Category "A & B" Limit:	No Limit
Category "C" Limit:	No Limit
Category "D" Limit:	Limit = 65
Category "E" Limit:	Limit = 65
Category "F" Limit:	Limit = 65

Lateral Force Procedure

ASCE 7-10 Section 12.8.2

Equivalent Lateral Force Procedure

The "Equivalent Lateral Force Procedure" is being used according to the provisions of ASCE 7-10 12.8

Determine Building Period

Use ASCE 12.8-7

Structure Type for Building Period Calculation : All Other Structural Systems

" Ct " value = 0.020
" x " value = 0.75
" hn " : Height from base to highest level = 21.670 ft

" Ta " Approximate fundemental period using Eq. 12.8-7 : Ta = Ct * (hn ^ x) = 0.201 sec
"TL" : Long-period transition period per ASCE 7-10 Maps 22-12 -> 22-16 = 6.000 sec

Building Period " Ta " Calculated from Approximate Method selected = 0.201 sec

" Cs " Response Coefficient

ASCE 7-10 Section 12.8.1.1

S_{DS}: Short Period Design Spectral Response	=	1.053	From Eq. 12.8-2, Preliminary Cs	=	0.162
" R " : Response Modification Factor	=	6.50	From Eq. 12.8-3 & 12.8-4 , Cs need not exceed	=	0.468
" I " : Seismic Importance Factor	=	1	From Eq. 12.8-5 & 12.8-6, Cs not be less than	=	0.047
			Cs : Seismic Response Coefficient =	=	**0.1619**

Seismic Base Shear

ASCE 7-10 Section 12.8.1

Cs = 0.1619 from 12.8.1.1

W (see Sum Wi below) = 56.66 k
Seismic Base Shear V = Cs * W = 9.18 k

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Project Title:
Engineer: ELR
Project ID:
Project Descr:

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ASCE Seismic Base Shear

Lic. # : KW-06010691 ELR Engineering

Vertical Distribution of Seismic Forces

ASCE 7-10 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	20.29	18.92	383.89	0.5198	4.77	4.77	0.00
1	36.37	9.75	354.61	0.4802	4.41	9.18	43.74
Sum Wi =	56.66 k	Sum Wi * Hi =	738.49 k-ft		Total Base Shear =	9.18 k	
					Base Moment =	133.2 k-ft	

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

ASCE 7-10 12.10.1.1

Level #	Wi	Fi	Sum Fi	Sum Wi	Fpx : Calcd	Fpx : Min	Fpx : Max	Fpx	Dsgn. Force
2	20.29	4.77	4.77	20.29	4.77	4.27	8.54	4.77	4.77
1	36.37	4.41	9.18	56.66	5.89	7.66	15.31	7.66	7.66

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 * SUM(x->n) Fi / SUM(x->n) wi, x = Current level, n = Top Level

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Engineer: ELR
Project ID:
Project Descr:

Printed: 4 MAR 2020, 11:46AM

ASCE 7-10 Wind Forces, Chapter 27, Part I

DESCRIPTION: > ASCE 7-10 Wind Load Determination

> ASCE 7-10 wind forces

Basic Values

Risk Category	2 per ASCE 7-10 Table 1.5.1	Horizontal Dim. in North-South Direction (B or L) =	40.0 ft
V : Basic Wind Speed	110.0	Horizontal Dim. in East-West Direction (B or L) =	35.0 ft
Kd : Directionality Factor	0.850 per ASCE 7-10 Table 26.6-1	h : Mean Roof height =	21.670 ft

Exposure Category per ASCE 7-10 Section 26.7

North : Exposure B East : Exposure B
South : Exposure B West : Exposure B

Topographic Factor per ASCE 7-10 Sec 26.8 & Figure 26.8-1

North :	K1 =	K2 =	K3 =	Kzt = 1.000
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	18.92	9.17	0.000	0.000
Lower	9.75	9.75	0.000	0.000

Gust Factor

For wind coming from direction indicated

North	=	**0.850**	South	=	**0.850**
East	=	**0.850**	West	=	**0.850**

Enclosure

Check if Building Qualifies as "Open"

	North Wall	South Wall	East Wall	West Wall	Roof	Total
Agross	662.0 ft^2	662.0 ft^2	757.0 ft^2	757.0 ft^2	893.0 ft^2	3,731.0 ft^2
Aopenings	ft^2	ft^2	ft^2	ft^2	ft^2	0.0 ft^2
Aopenings >= 0.8 * Agross ?	No	No	No	No		

All four Agross values must be non-zero **Building does NOT qualify as "Open"**

User has specified the Building is to be considered Enclosed when NORTH elevation receives positive external pressure

User has specified the Building is to be considered Enclosed when SOUTH elevation receives positive external pressure

User has specified the Building is to be considered Enclosed when EAST elevation receives positive external pressure

User has specified the Building is to be considered Enclosed when WEST elevation receives positive external pressure

Velocity Pressures

When the following walls experience leeward or sidewall pressures, the value of Kh shall be (per Table 27.3-1) :

North Wall = 0.6384 psf South Wall = 0.6384 psf East Wall = 0.6384 psf West Wall = 0.6384 psf

When the following walls experience leeward or sidewall pressures, the value of qh shall be (per Table 27.3-1) :

North Wall = 16.809 psf South Wall = 16.809 psf East Wall = 16.809 psf West Wall = 16.809 psf

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

Height Above Base (ft)	North Elevation Kz	qz	South Elevation Kz	qz	East Elevation Kz	qz	West Elevation Kz	qz
0.00	0.575	15.13	0.575	15.13	0.575	15.13	0.575	15.13
4.00	0.575	15.13	0.575	15.13	0.575	15.13	0.575	15.13
8.00	0.575	15.13	0.575	15.13	0.575	15.13	0.575	15.13
12.00	0.575	15.13	0.575	15.13	0.575	15.13	0.575	15.13

Established Basic Permit #

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Project Descr:

ASCE 7-10 Wind Forces, Chapter 27, Part I

DESCRIPTION: > ASCE 7-10 Wind Load Determination

16.00	0.585	15.41	0.585	15.41	0.585	15.41	0.585	15.41
20.00	0.624	16.43	0.624	16.43	0.624	16.43	0.624	16.43

Pressure Coefficients

GCpi Values when elevation receives positive external pressure

GCpi : Internal pressure coefficient, per sec. 26.11 and Table 26.11-1

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

Specify Cp Values from Figure 27.4-1 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	-0.470	-0.470	-0.50	-0.50
Side Walls	-0.70	-0.70	-0.70	-0.70

User Defined Roof locations and Net Directional Pressure Coefficients : Cp or Cn

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

Description	North	South	East	West
Perp: windward			-0.330	-0.330
Perp: leeward			-0.60	-0.60
Perp: windward	-0.250	-0.250		
Perp: leeward	-0.60	-0.60		
Perp: windward	0.20	0.20		
Perp: windward			0.150	0.150

Wind Pressures

Wind Pressures when NORTH Elevation receives positive external wind pressure

	Positive Internal	Negative Internal
Leeward Wall Pressures	-9.741 psf	-3.690 psf
Side Wall Pressures	-13.027 psf	-6.976 psf

Windward Wall Pressures . . . Height Above Base (ft)	Positive Internal Pressure (psf)	Negative Internal Pressure (psf)
0.00	7.26	13.32
4.00	7.26	13.32
8.00	7.26	13.32
12.00	7.26	13.32
16.00	7.46	13.51
20.00	8.15	14.20

Roof Pressures . . . Description	Positive Internal Pressure (psf)	Negative Internal Pressure (psf)
Perp: windward	-6.60	-0.55
Perp: leeward	-11.60	-5.55
Perp: windward	-0.17	5.88

Wind Pressures when SOUTH Elevation receives positive external wind pressure

	Positive Internal	Negative Internal
Leeward Wall Pressures	-9.741 psf	-3.690 psf
Side Wall Pressures	-13.027 psf	-6.976 psf

Windward Wall Pressures . . . Height Above Base (ft)	Positive Internal Pressure (psf)	Negative Internal Pressure (psf)

Established Basic Permit #

20-01726

Permit Number: 20-04001

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Project Title:
Engineer: ELR
Project ID:
Project Descr:

DESCRIPTION: > ASCE 7-10 Wind Load Determination

0.00	7.26	13.32
4.00	7.26	13.32
8.00	7.26	13.32
12.00	7.26	13.32
16.00	7.46	13.51
20.00	8.15	14.20

Roof Pressures . . . Description	Positive Internal Pressure (psf)	Negative Internal Pressure (psf)
Perp: windward	-6.60	-0.55
Perp: leeward	-11.60	-5.55
Perp: windward	-0.17	5.88

Wind Pressures when EAST Elevation receives positive external wind pressure

	Positive Internal	Negative Internal
Leeward Wall Pressures	-10.170 psf	-4.118 psf
Side Wall Pressures	-13.027 psf	-6.976 psf

Windward Wall Pressures . . . Height Above Base (ft)	Positive Internal Pressure (psf)	Negative Internal Pressure (psf)
0.00	7.26	13.32
4.00	7.26	13.32
8.00	7.26	13.32
12.00	7.26	13.32
16.00	7.46	13.51
20.00	8.15	14.20

Roof Pressures . . . Description	Positive Internal Pressure (psf)	Negative Internal Pressure (psf)
Perp: windward	-7.74	-1.69
Perp: leeward	-11.60	-5.55
Perp: windward	-0.88	5.17

Wind Pressures when WEST Elevation receives positive external wind pressure

	Positive Internal	Negative Internal
Leeward Wall Pressures	-10.170 psf	-4.118 psf
Side Wall Pressures	-13.027 psf	-6.976 psf

Windward Wall Pressures . . . Height Above Base (ft)	Positive Internal Pressure (psf)	Negative Internal Pressure (psf)
0.00	7.26	13.32
4.00	7.26	13.32
8.00	7.26	13.32
12.00	7.26	13.32
16.00	7.46	13.51
20.00	8.15	14.20

Roof Pressures . . . Description	Positive Internal Pressure (psf)	Negative Internal Pressure (psf)
Perp: windward	-7.74	-1.69
Perp: leeward	-11.60	-5.55
Perp: windward	-0.88	5.17

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Printed: 4 MAR 2020, 11:46AM

ASCE 7-10 Wind Forces, Chapter 27, Part I

Lic. # : KW-06010691 ELR Engineering

DESCRIPTION: > ASCE 7-10 Wind Load Determination

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) In "Y" Direction	In "X" Direction	Eccentricity for (ft) "Y" Shear	"X" Shear	Mt, (ft-k)
CASE 1	North	Level 2	14.34' -> 18.92'	4.59	-2.78	---	---	---	---
CASE 1	North	Level 1	4.88' -> 14.34'	9.46	-5.63	---	---	---	---
CASE 1	South	Level 2	14.34' -> 18.92'	4.59	2.78	---	---	---	---
CASE 1	South	Level 1	4.88' -> 14.34'	9.46	5.63	---	---	---	---
CASE 1	East	Level 2	14.34' -> 18.92'	4.59	---	-3.25	---	---	---
CASE 1	East	Level 1	4.88' -> 14.34'	9.46	---	-6.60	---	---	---
CASE 1	West	Level 2	14.34' -> 18.92'	4.59	---	3.25	---	---	---
CASE 1	West	Level 1	4.88' -> 14.34'	9.46	---	6.60	---	---	---
CASE 2	North	Level 2	14.34' -> 18.92'	4.59	-2.08	---	---	5.25 +/-	10.9
CASE 2	North	Level 1	4.88' -> 14.34'	9.46	-4.22	---	---	5.25 +/-	22.2
CASE 2	South	Level 2	14.34' -> 18.92'	4.59	2.08	---	---	5.25 +/-	10.9
CASE 2	South	Level 1	4.88' -> 14.34'	9.46	4.22	---	---	5.25 +/-	22.2
CASE 2	East	Level 2	14.34' -> 18.92'	4.59	---	-2.44	5.99	--- +/-	14.6
CASE 2	East	Level 1	4.88' -> 14.34'	9.46	---	-4.95	5.99	--- +/-	29.7
CASE 2	West	Level 2	14.34' -> 18.92'	4.59	---	2.44	5.99	--- +/-	14.6
CASE 2	West	Level 1	4.88' -> 14.34'	9.46	---	4.95	5.99	--- +/-	29.7
CASE 3	North & East	Level 2	14.34' -> 18.92'	4.59	-2.08	-2.44	---	---	---
CASE 3	North & East	Level 1	4.88' -> 14.34'	9.46	-4.22	-4.95	---	---	---
CASE 3	North & West	Level 2	14.34' -> 18.92'	4.59	-2.08	2.44	---	---	---
CASE 3	North & West	Level 1	4.88' -> 14.34'	9.46	-4.22	4.95	---	---	---
CASE 3	South & West	Level 2	14.34' -> 18.92'	4.59	2.08	2.44	---	---	---
CASE 3	South & West	Level 1	4.88' -> 14.34'	9.46	4.22	4.95	---	---	---
CASE 3	South & East	Level 2	14.34' -> 18.92'	4.59	2.08	-2.44	---	---	---
CASE 3	South & East	Level 1	4.88' -> 14.34'	9.46	4.22	-4.95	---	---	---
CASE 4	North & East	Level 2	14.34' -> 18.92'	4.59	-1.56	-1.83	5.99	5.25 +/-	19.2
CASE 4	North & East	Level 1	4.88' -> 14.34'	9.46	-3.17	-3.71	5.99	5.25 +/-	38.9
CASE 4	North & West	Level 2	14.34' -> 18.92'	4.59	-1.56	1.83	5.99	5.25 +/-	19.2
CASE 4	North & West	Level 1	4.88' -> 14.34'	9.46	-3.17	3.71	5.99	5.25 +/-	38.9
CASE 4	South & West	Level 2	14.34' -> 18.92'	4.59	1.56	1.83	5.99	5.25 +/-	19.2
CASE 4	South & West	Level 1	4.88' -> 14.34'	9.46	3.17	3.71	5.99	5.25 +/-	38.9
CASE 4	South & East	Level 2	14.34' -> 18.92'	4.59	1.56	-1.83	5.99	5.25 +/-	19.2
CASE 4	South & East	Level 1	4.88' -> 14.34'	9.46	3.17	-3.71	5.99	5.25 +/-	38.9
Min per ASCE 27.4.7	North	Level 2	14.34' -> 18.92'	4.59	-2.57	---	---	---	---
Min per ASCE 27.4.7	North	Level 1	4.88' -> 14.34'	9.46	-5.30	---	---	---	---
Min per ASCE 27.4.7	South	Level 2	14.34' -> 18.92'	4.59	2.57	---	---	---	---
Min per ASCE 27.4.7	South	Level 1	4.88' -> 14.34'	9.46	5.30	---	---	---	---
Min per ASCE 27.4.7	East	Level 2	14.34' -> 18.92'	4.59	---	-2.93	---	---	---
Min per ASCE 27.4.7	East	Level 1	4.88' -> 14.34'	9.46	---	-6.05	---	---	---
Min per ASCE 27.4.7	West	Level 2	14.34' -> 18.92'	4.59	---	2.93	---	---	---

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ASCE 7-10 Wind Forces, Chapter 27, Part I

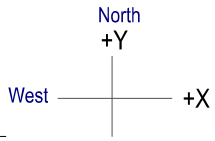
Lic. # : KW-06010691 ELR Engineering

DESCRIPTION: > ASCE 7-10 Wind Load Determination

Min per ASCE 27.4.7	West	Level 1	4.88' ->	14.34'	9.46	---	6.05	---	---	---

Base Shear for Design Wind Load Cases

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) In "Y" Direction	In "X" Direction		Mt, (ft-k)
Case 1	North	South	-8.41	---		---
Case 1	South	North	8.41	---		---
Case 1	East	West	---	-9.85		---
Case 1	West	East	---	9.85		---
Case 2	North	South	-6.31	---	+/-	33.1
Case 2	South	North	6.31	---	+/-	33.1
Case 2	East	West	---	-7.39	+/-	44.3
Case 2	West	East	---	7.39	+/-	44.3
Case 3	North & East	South & West	-6.31	-7.39		---
Case 3	North & West	South & East	-6.31	7.39		---
Case 3	South & West	North & East	6.31	7.39		---
Case 3	South & East	North & West	6.31	-7.39		---
Case 4	North & East	South & West	-4.73	-5.55	+/-	58.1
Case 4	North & West	South & East	-4.73	5.55	+/-	58.1
Case 4	South & West	North & East	4.73	5.55	+/-	58.1
Case 4	South & East	North & West	4.73	-5.55	+/-	58.1
Min per ASCE 27.4.7	North	South	-7.87	---		---
Min per ASCE 27.4.7	South	North	7.87	---		---
Min per ASCE 27.4.7	East	West	---	-8.99		---
Min per ASCE 27.4.7	West	East	---	8.99		---

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Permit Number: 20-04001

LATERAL LOADING

	Hstory	Wind (E-W loads) B (< N-S >)	Wind (N-S loads) L (< E-W >)	Seismic Alevel
Roof	8.08	37.5	21	893
Roof-1	9.08	40	35	1497
Roof-2	0.00	0	0	0

Story/base shear and diaphragm forces

	WIND N-S loads	WIND E-W loads	Fpy (N-S)	Fpx (E-W)
Pw x B x L =	1.67	3.05	1.67	3.05
Pw x B x L =	5.63	6.60	5.63	6.60
Pw x B x L =	0.00	0.00	0.00	0.00
Base shear > Pw x B x L =	7.30	9.65		
Design base shear (ASD) > x 0.6	4.38	5.79	kips	

rho (ρ)

Sds 1.053	SEISMIC N-S loads	0.7 E-W loads	1.3 Fpxy (both)
Cs x W =	4.77	4.77	4.77
Cs x W =	4.41	4.41	7.66
Cs x W =	0.00	0.00	0.00
Cs x W =	9.18	9.18	
x p x 0.7	8.35	8.35	kips

Client: **MTT/PC, LLC**
Project: **1620-AB**
Date: 3/4/2020
Revised:
Description: Wind/EQ Design
Code: AWC-SDPWS-2015

Summary check: **OK**

SHEARWALLS

Roof

N-S loads	Grid	WIND trib. width	SEISMIC trib. area	ASD Flexible Fwind	ASD Flexible Fseismic	Full height wall segments with A.R. <= 3.5:1 (except portal frames - PFXX) L1	L2	L3	L4	L5	L6	Demand Flexible Vwind(plf)	Demand Rigid Vwind(plf)	Flexible Vseismic(plf)	Rigid Vseismic(plf)
< H'(if applies)	8														
< H'(if applies)	7														
< H'(if applies)	6														
< H'(if applies)	5														
< H'(if applies)	4														
< H'(if applies)	3	10.50	446.5	0.50	2.17	17.92	10.33					18		77	
< H'(if applies)	2	10.50	446.5	0.50	2.17	37.50						13		58	
< H'(if applies)	1														
min Li = 2.309	OK	21	893												
			OK	1.00	4.34										

E-W loads	Grid	trib. width	trib. area	Fwind	Fseismic	L1	L2	L3	L4	L5	L6	Vwind(plf)	Vwind(plf)	Vseismic(plf)	Vseismic(plf)
< H'(if applies)	H														
< H'(if applies)	G														
< H'(if applies)	F														
< H'(if applies)	E	18.00	437	0.88	2.12	9.17						96		232	
< H'(if applies)	D														
< H'(if applies)	C														
< H'(if applies)	B	19.50	456	0.95	2.22	10.17						93		218	
< H'(if applies)	A														
min Li = 2.309	OK	37.5	893												
			OK	1.83	4.34										

Roof-1

N-S loads	Grid	trib. width	trib. area	Fwind	Fseismic	L1	L2	L3	L4	L5	L6	Vwind(plf)	Vwind(plf)	Vseismic(plf)	Vseismic(plf)
< H'(if applies)	8														
< H'(if applies)	7														
< H'(if applies)	6														
< H'(if applies)	5														
< H'(if applies)	4														
< H'(if applies)	3	10.50	436	1.51	3.34	40.00						38		83	
< H'(if applies)	2	17.50	725	2.19	4.11	20.00						109		206	
< H'(if applies)	1	7.00	336	0.68	0.90	13.67	18.33					21		28	
min Li = 2.595	OK	35	1497												
			OK	4.38	8.35										

E-W loads	Grid	trib. width	trib. area	Fwind	Fseismic	L1	L2	L3	L4	L5	L6	Vwind(plf)	Vwind(plf)	Vseismic(plf)	Vseismic(plf)
< H'(if applies)	H														
< H'(if applies)	G														
< H'(if applies)	F														
< H'(if applies)	E	9.67	362	1.83	3.09	17.00	12.00					63		107	
< H'(if applies)	D	16.83	607	1.67	1.63	10.67	6.58					97		94	
< H'(if applies)	C	10.33	375	1.63	2.42	10.00						163		242	
< H'(if applies)	B														
< H'(if applies)	A	3.17	153	0.66	1.21	2.33	2.33					141		259	
min Li = 2.595	OK	40	1497												
			OK	5.79	8.35										

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"E-W" grids ^ Y +					
	E				
	D	Assumed orientation			
	C				
	B				
	A				
	0,0	1	2	3	4
		X + >	"N-S" grids		

Total seismic capacity of shear line with individual segment capacities within the shearline with A.R.i > 2:1 reduced by **2 Li/H** per 2015 SDPWS 4.3.3.4.1 for shear lines with more than one shear wall and **1.25-H/8Li** per 2015 SDPWS 4.3.4.2 for shear lines with one wall only

W6	W4	W3	W2	2W3	2W2	Flexible	Rigid	Governs W or EQ
6.831	**9.984**	**12.874**	**16.814**	**25.747**	**38.496**	**W6**		**EQ**
9.068	**13.253**	**17.089**	**22.320**	**34.178**	**51.101**	**W6**		**EQ**

W6	W4	W3	W2	2W3	2W2	Flexible	Rigid	W or EQ
2.217	**3.241**	**4.179**	**5.458**	**8.358**	**12.496**	**W6**		**EQ**
2.459	**3.594**	**4.634**	**6.053**	**9.269**	**13.859**	**W6**		**EQ**

W6	W4	W3	W2	2W3	2W2	Flexible	Rigid	W or EQ
9.672	**14.136**	**18.228**	**23.808**	**36.456**	**54.508**	**W6**		**EQ**
4.836	**7.068**	**9.114**	**11.904**	**18.228**	**27.254**	**W6**		**EQ**
7.738	**11.309**	**14.582**	**19.046**	**29.165**	**43.606**	**W6**		**EQ**

W6	W4	W3	W2	2W3	2W2	Flexible	Rigid	W or EQ
7.012	**10.249**	**13.215**	**17.261**	**26.431**	**39.518**	**W6**		**EQ**
4.171	**6.096**	**7.861**	**10.267**	**15.722**	**23.506**	**W6**		**EQ**
2.418	**3.534**	**4.557**	**5.952**	**9.114**	**13.627**	**W4**		**EQ**
0.578	**0.845**	**1.089**	**1.423**	**2.179**	**3.258**	**PF24**		**EQ**

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Permit Number: 20-04001

HOLDOWNS																				0.6D + 0.6W	0.6D + 0.7pE	
Roof	N-S loads	Grid	L1	L2	L3	L4	L5	L6	Flexible Vwind(plf)	Rigid Vwind(plf)	Flexible Vseismic(plf)	Rigid Vseismic(plf)	MAX v (plf)	Controlling hd shear W/E?	Available resisting D uni. (plf)	conc. (lbs)	WIND o/t T (lbs)	SEISMIC o/t T (lbs)	0.6 resist C (lbs)	WIND net o/t (lbs)	SEISMIC net o/t (lbs)	
8.08	< Hw	8																				
8.08	< Hw	7																				
8.08	< Hw	6																				
8.08	< Hw	5																				
8.08	< Hw	4																				
8.08	< Hw	3	17.92	10.33					18		77		77	E	253		143	621	1362	-1219	-741	
8.08	< Hw	2	37.50						13		58		58	E	253		108	468	2850	-2742	-2382	
8.08	< Hw	1																				
	E-W loads	Grid	L1	L2	L3	L4	L5	L6														
8.08	< Hw	H																				
8.08	< Hw	G																				
8.08	< Hw	F																				
8.08	< Hw	E	9.17						96		232		232	E	141		773	1872	387	386	1485	holdown
8.08	< Hw	D																				
8.08	< Hw	C																				
8.08	< Hw	B	10.17						93		218		218	E	141		756	1762	430	326	1332	holdown
8.08	< Hw	A																				
Roof-1	N-S loads	Grid	L1	L2	L3	L4	L5	L6														
9.08	< Hw	8																				
9.08	< Hw	7																				
9.08	< Hw	6																				
9.08	< Hw	5																				
9.08	< Hw	4																				
9.08	< Hw	3	40.00						38		83		83	E	392		344	758	4706	-4362	-3948	
9.08	< Hw	2	20.00						109		206		206	E	392		994	1868	2353	-1359	-485	
9.08	< Hw	1	13.67	18.33					21		28		28	E	151		192	256	829	-638	-574	
	E-W loads	Grid	L1	L2	L3	L4	L5	L6														
9.08	< Hw	H																				
9.08	< Hw	G																				
9.08	< Hw	F																				
9.08	< Hw	E	17.00	12.00					63		107		107	E	349		575	969	1778	-1203	-809	
9.08	< Hw	D	10.67	6.58					97		94		97	W	307		877	857	982	-105	-125	
9.08	< Hw	C	10.00						163		242		242	E	211		1482	2202	632	849	1569	holdown
9.08	< Hw	B																				
9.08	< Hw	A	2.33	2.33					141		259		259	E	136		1279	2355	95	1184	2260	holdown

Force Transfer Around Openings Calculator

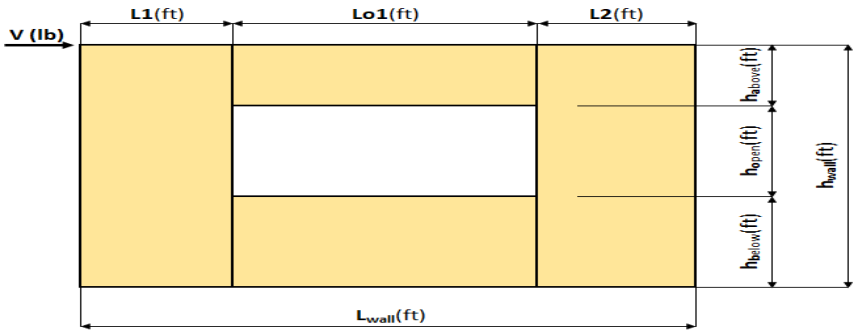
ONE OPENING

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-2015	**Date:** 3/4/2020
Designer:	ELR	
Client:	MTT/PC, LLC	
Project:	1620-AB	
Wall Line:	Upper story - Grid B - 10'-2"	

	> 0.6W	> 0.7pE
- V (lb) =	951	2217
- Apply Ωo per 12.3.3.3?		Y
- Overstrength factor (Ωo) =		2.5
- ASCE 7-10 12.4.3.3 ASD stress increase w/Ωo =		1.2
- Sds =		1.053
- ρ =		1.3



Input Variables

V	2217 lbf	Seismic controls	Opening 1
h_{wall}	8.08 ft	ha1	1.42 ft
L1	3.08 ft	ho1	4.00 ft
L2	3.08 ft	hb1	2.67 ft
L_{wall}	10.17 ft	Lo1	4.00 ft

Wall Pier Aspect Ratio		Adj. Factor
P1=ho1/L1=	1.30	N/A
P2=ho1/L2=	1.30	N/A

1. Hold-down forces: $H = Vh_{wall}/L_{wall}$ 1762 lbf

2. Unit shear above + below opening

First opening: va1 = vb1 = H/(ha1+hb1) = 431 plf

3. Total boundary force above + below openings

First opening: O1 = va1 x (Lo1) = 1728 lbf

4. Corner forces

F1 = O1(L1)/(L1+L2) = 864 lbf
F2 = O1(L2)/(L1+L2) = 864 lbf

5. Tributary length of openings

T1 = (L1*Lo1)/(L1+L2) = 2.00 ft
T2 = (L2*Lo1)/(L1+L2) = 2.00 ft

6. Unit shear beside opening

V1 = (V/L)(L1+T1)/L1 = 359 plf
V2 = (V/L)(T2+L2)/L2 = 359 plf
Check V1*L1+V2*L2=V? 2217 lbf **OK**

7. Resistance to corner forces

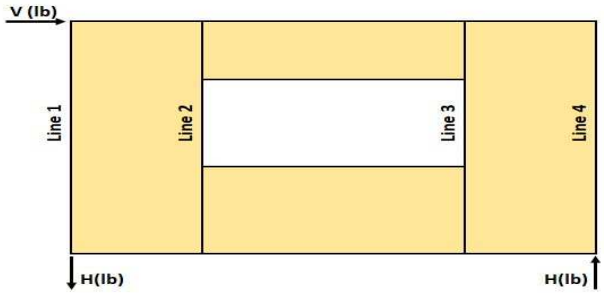
R1 = V1*L1 = 1108 lbf
R2 = V2*L2 = 1108 lbf

8. Difference corner force + resistance

R1-F1 = 244 lbf
R2-F2 = 244 lbf

9. Unit shear in corner zones

vc1 = (R1-F1)/L1 = 79 plf
vc2 = (R2-F2)/L2 = 79 plf



Holdowns (overturning)

Twind =	756 lbf	
Tseismic =	2823 lbf	
Holdowns (Dead resisting)		
Uniform =	141 plf	
Conc. =	0 lbf	
Twind (net) =	326 lbf	< (0.6D+0.6W)
Tseismic (net) =	1848 lbf	< (0.6-0.14Sds)D+0.7ΩoE/ρ

Check Summary of Shear Values for One Opening

Line 1: vc1(ha1+hb1)+V1(ho1)=H?		324	1438	1762 lbf
Line 2: va1(ha1+hb1)-vc1(ha1+hb1)-V1(ho1)=0?	1762	324	1438	0
Line 3: vc2(ha1+hb1)+V2(ho1)=H?		324	1438	1762 lbf

Design Summary

Req. Sheathing Capacity	359 plf	< Seismic controls	**W3**			
Req. Strap Force	864 lbf	< Seismic controls	**CS20**	**applied to one side of wall above and below window x**	**122.04**	inches long
Req. HD Force (net)	1848 lbf	< Seismic controls	**MSTC48B3**	**< Input holdown here**		

Established Basic Permit #

20-01726

Permit Number: 20-04001

Force Transfer Around Openings Calculator

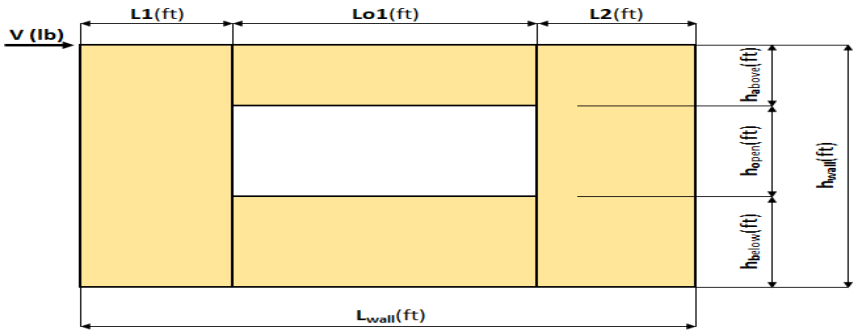
ONE OPENING

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-2015	**Date:** 3/4/2020
Designer:	ELR	
Client:	MTT/PC, LLC	
Project:	1620-AB	
Wall Line:	Lower story - Grid B - 10'-0"	

	> 0.6W	> 0.7pE
- V (lb) =	1631	2424
- Apply Ωo per 12.3.3.3?		N
- Overstrength factor (Ωo) =		N.A.
- ASCE 7-10 12.4.3.3 ASD stress increase w/Ωo =		N.A.
- Sds =		1.053
- ρ =		1.3



Input Variables

V	2424 lbf	Seismic controls	Opening 1
h_{wall}	9.08 ft	ha1	1.25 ft
L1	2.50 ft	ho1	5.00 ft
L2	2.50 ft	hb1	2.83 ft
L_{wall}	10.00 ft	Lo1	5.00 ft

Wall Pier Aspect Ratio		Adj. Factor
P1=ho1/L1=	2.00	N/A
P2=ho1/L2=	2.00	N/A

1. Hold-down forces: H = Vh_{wall}/L_{wall} 2202 lbf

2. Unit shear above + below opening

First opening: va1 = vb1 = H/(ha1+hb1) = 539 plf

3. Total boundary force above + below openings

First opening: O1 = va1 x (Lo1) = 2696 lbf

4. Corner forces

F1 = O1(L1)/(L1+L2) = 1348 lbf
F2 = O1(L2)/(L1+L2) = 1348 lbf

5. Tributary length of openings

T1 = (L1*Lo1)/(L1+L2) = 2.50 ft
T2 = (L2*Lo1)/(L1+L2) = 2.50 ft

6. Unit shear beside opening

V1 = (V/L)(L1+T1)/L1 = 485 plf
V2 = (V/L)(T2+L2)/L2 = 485 plf
Check V1*L1+V2*L2=V? 2424 lbf **OK**

7. Resistance to corner forces

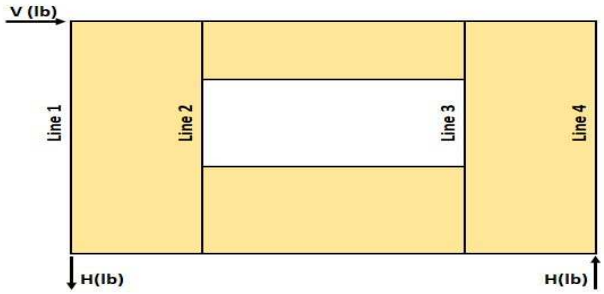
R1 = V1*L1 = 1212 lbf
R2 = V2*L2 = 1212 lbf

8. Difference corner force + resistance

R1-F1 = -136 lbf
R2-F2 = -136 lbf

9. Unit shear in corner zones

vc1 = (R1-F1)/L1 = -54 plf
vc2 = (R2-F2)/L2 = -54 plf



Holdowns (overturning)

Twind =	1482 lbf
Tseismic =	2202 lbf

Holdowns (Dead resisting)

Uniform =	211 plf
Conc. =	0 lbf

Twind (net) =	849 lbf	< (0.6D+0.6W)
Tseismic (net) =	1725 lbf	< (0.6-0.14Sds)D+0.7pE

Check Summary of Shear Values for One Opening

Line 1: vc1(ha1+hb1)+V1(ho1)=H?		-222	2424	2202 lbf
Line 2: va1(ha1+hb1)-vc1(ha1+hb1)-V1(ho1)=0?	2202	-222	2424	0
Line 3: vc2(ha1+hb1)+V2(ho1)=H?		-222	2424	2202 lbf

Design Summary

Req. Sheathing Capacity	485 plf	< Seismic controls	**W2**			
Req. Strap Force	1348 lbf	< Seismic controls	**CS18**	**applied to one side of wall above and below window x**	**120**	inches long
Req. HD Force (net)	1725 lbf	< Seismic controls	**STHD14RJ**	**< Input holdown here**		

Established Basic Permit #

20-01726

Permit Number: 20-04001