City of Puyallup
Development & Permitting Services
ISSUED PERMIT
Building | Planning
Engineering | Public Works
Fire | Traffic

STRUCTURAL ANALYSIS & DESIGN

of

Puyallup Remodel
907 18th St NW
Puyallup, WA 98371

for

Kelli & Tim Thompson
907 18th St NW
Puyallup, WA 98371

by

THE LAND DEVELOPER'S
ENGINEERED SOLUTION
A Division of THE LAND DEVELOPER, LLC

Erik B. Ainsworth, PE
PO Box 4420
Tumwater, WA 98501
(360) 250-3973

Provide structural plans revised for new reduced construction height. Remove all plan sheets that does not include old plan set.
Pg: Structural Analysis & Design report

September 22, 2023

Project Number: 23-044

PRRRSF20231418

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PUYALLUP REMODEL

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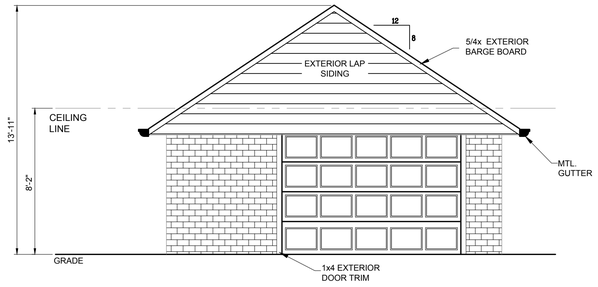
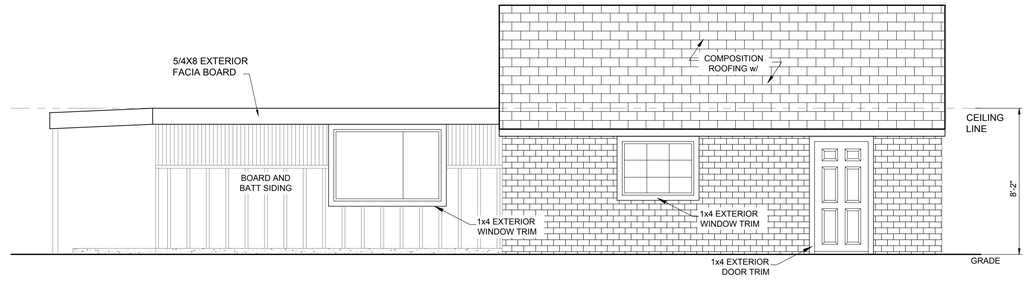


2 EX LEFT ELEVATION PLAN
SCALE: 1/4" = 1' - 0"



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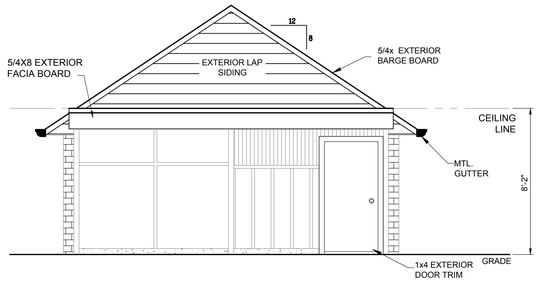

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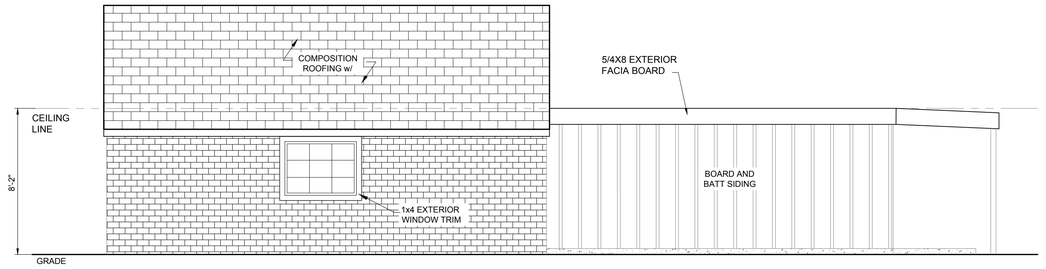

3 EX REAR ELEVATION PLAN
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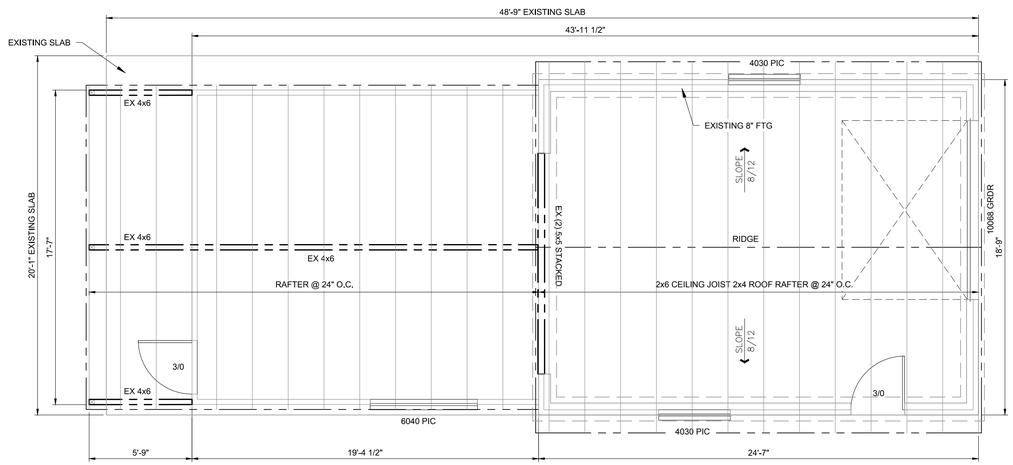

5 EX MAIN FLOOR PLAN
SCALE: 1/4" = 1' - 0"

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REVISIONS: DATE:

PUYALLUP REMODEL

EX ELEVATION AND FLOOR PLAN

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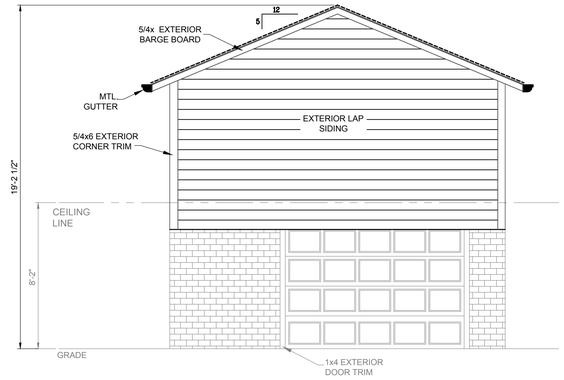
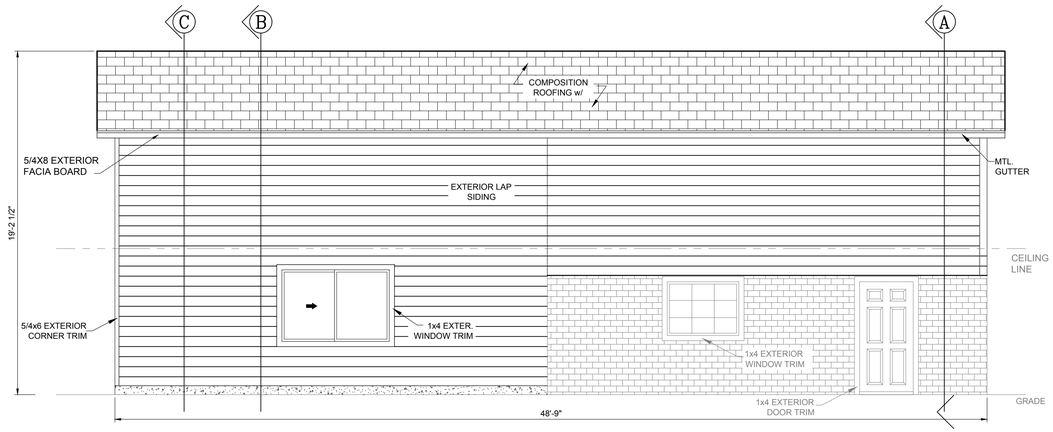


2 PROPOSED LEFT ELEVATION PLAN
SCALE: 1/4" = 1' - 0"



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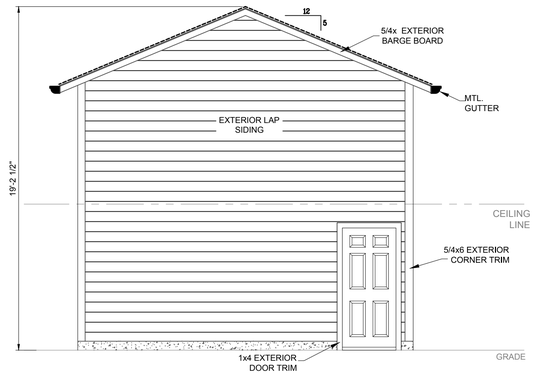

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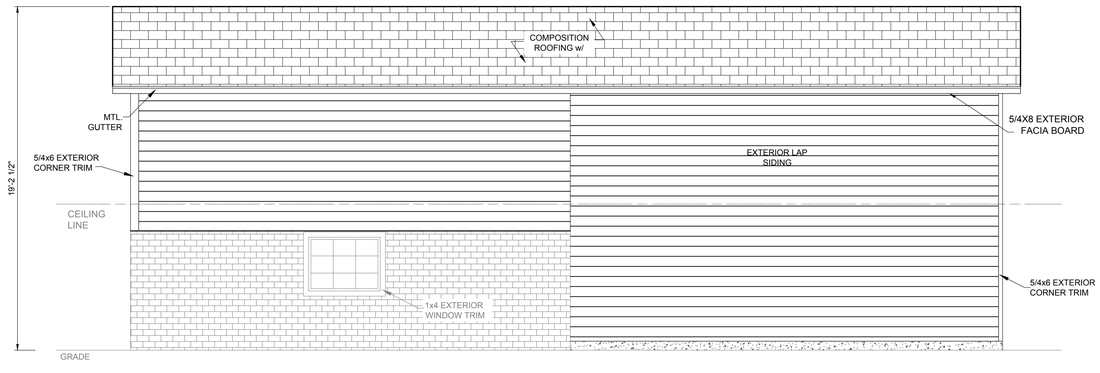

3 PROPOSED REAR ELEVATION PLAN
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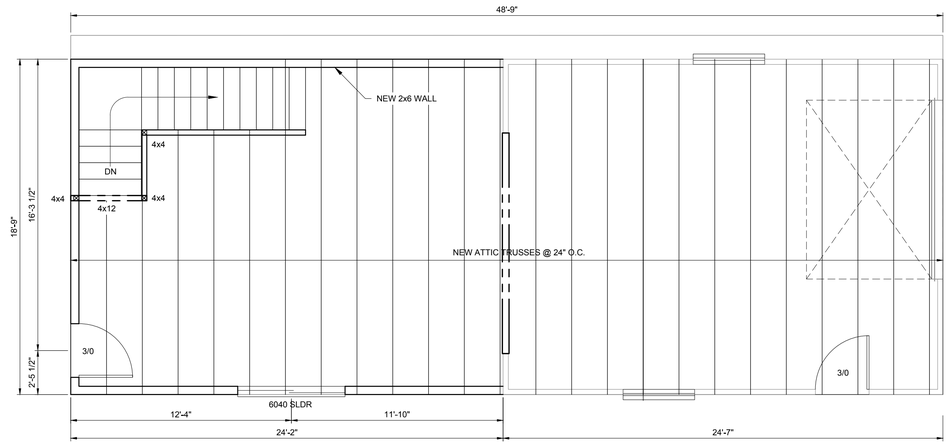

5 PROPOSED LAYOUT PLAN
SCALE: 1/4" = 1' - 0"

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PROPOSED LAYOUT PLAN

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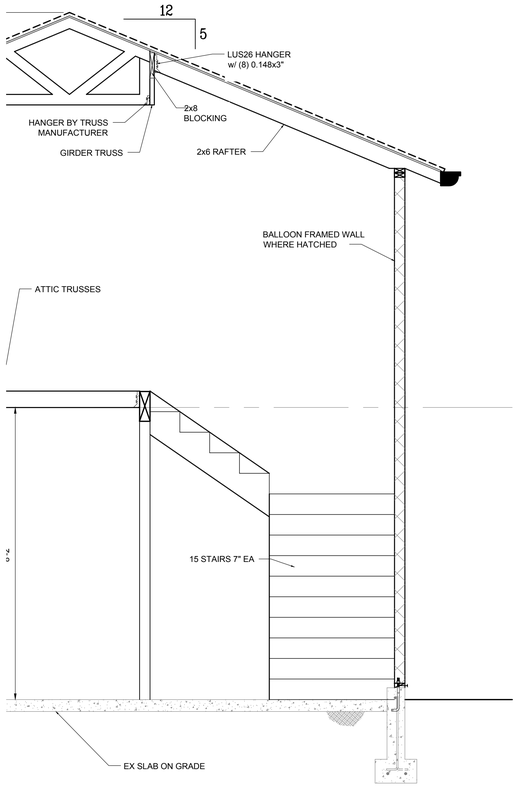
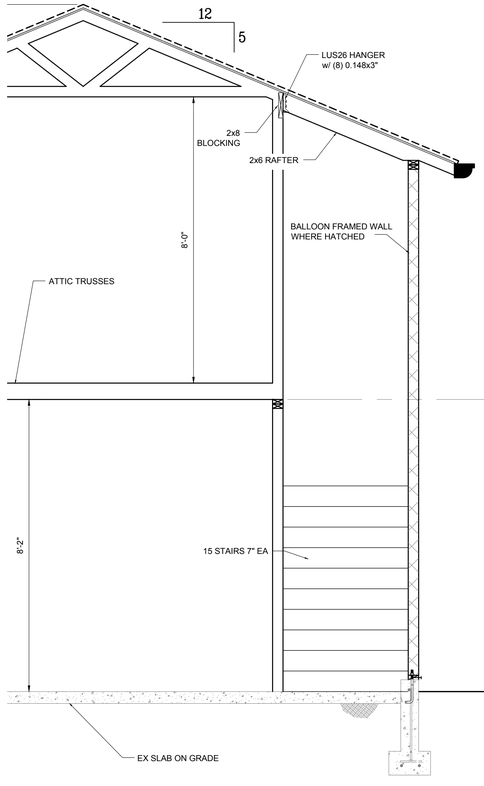


C SECTION PLAN
SCALE: 1/2" = 1' - 0"



B SECTION PLAN
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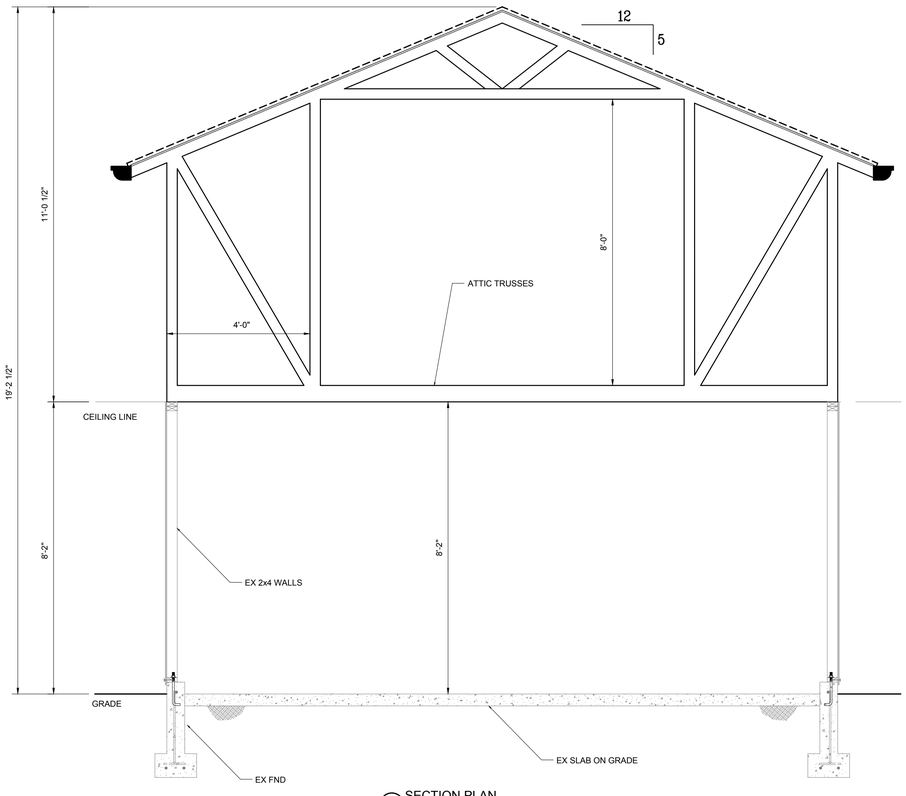

A SECTION PLAN
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SECTION PLAN

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STRUCTURAL SPECIFICATIONS:

GENERAL NOTES

1. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND SITE CONDITIONS BEFORE STARTING WORK. THE ENGINEER SHALL BE NOTIFIED OF ANY DISCREPANCY. CHANGES, OMISSIONS OR SUBSTITUTIONS ARE NOT PERMITTED WITHOUT WRITTEN APPROVAL OF THE ENGINEER.
2. THE DESIGN, ADEQUACY AND SAFETY OF ERECTION BRACING, SHORING, TEMPORARY SUPPORTS, ETC., IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR, AND HAS NOT BEEN CONSIDERED BY THE ENGINEER. THE CONTRACTOR IS RESPONSIBLE FOR THE STABILITY OF THE STRUCTURE PRIOR TO THE COMPLETION OF ALL SHEAR WALLS, ROOF AND FLOOR DIAPHRAGMS AND FINISHED MATERIALS. THE CONTRACTOR SHALL PROVIDE THE NECESSARY BRACING TO PROVIDE STABILITY PRIOR TO THE APPLICATION OF THE ABOVE MENTIONED COMPONENTS.
3. THE WORK DONE ON THIS PROJECT IS TO COMPLY WITH THE 2018 INTERNATIONAL RESIDENTIAL CODE, 2018 INTERNATIONAL BUILDING CODE, 2018 INTERNATIONAL MECHANICAL CODE, 2018 UNIFORM PLUMBING CODE, CURRENT EDITION OF WASHINGTON STATE ENERGY & VENTILATION CODES AND AS AMENDED & ADOPTED BY THE STATE OF WASHINGTON.
4. ALL HOUSE EXTERIOR WALL STUDS ARE 2x6 D.F #2 @ 16" O.C.
   ALL HOUSE INTERIOR WALL STUDS ARE 2x4 D.F.#2 @ 16" O.C.
   UNLESS NOTED OTHERWISE. (UNO).
5. ALL EXTERIOR & INTERIOR BEARING WALL HEADERS AND BEAMS TO BE 4x8 D.F #2 UNO
6. ALL EXTERIOR & INTERIOR BRACED WALL PANEL BOTTOM PLATES TO DBL. JOIST OR DBL. BLOCKING w/ (3) 0.135x3 1/2" NAILS @ 16" O.C.

DESIGN CRITERIA (2018 IRC)

1. VERTICAL LOADS

	ROOF	FLOOR	DECKS/ BALCONIES
GROUND SNOW LOAD:	25 PSF		
LIVE LOAD:	20 PSF	40 PSF	60 PSF
DEAD LOAD:	15 PSF	15 PSF	15 PSF

2. LATERAL WIND LOAD: 110 MPH, EXPOSURE B
3. SEISMIC DESIGN CATEGORY D
4. SITE CLASS: D STIFF SOILS
5. SEISMIC: Ss = 1.284 & S1 = 0.442

FOUNDATION

1. DESIGN ALLOWABLE SOIL BEARING PRESSURE: 1,500 PSF
2. FOOTINGS SHALL BEAR ON NATIVE, INORGANIC, UNDISTURBED SOIL.
3. ALL EXTERIOR FOOTINGS SHALL EXTEND 1'-0" MIN BELOW FINISHED GRADE.
4. ALL INTERIOR CONTINUOUS FOOTINGS TO BE 8" DEEP WITH (2) #4 CONT. BARS, (UNO).
5. COMPACTION OF BACKFILL MATERIAL:
   A. PIPES, PARKING LOTS, SIDEWALKS, SLABS ON GRADE: 95% COMPACTION ASTM D-698 (STANDARD PROCTOR)
   B. FOOTINGS AND FOUNDATIONS: 95% COMPACTION ASTM D-1557 (MODIFIED PROCTOR)
   C. PLANTING BEDS, GRASS AREAS: 90% COMPACTION
6. FOUNDATION WALL AND FOOTING SIZE AND REINFORCING TO SUIT LOCAL CODES AND SOIL CONDITIONS
7. CONTRACTOR TO VERIFY ALL DIMENSIONS AND HOLDOWN LOCATIONS
8. HOLDOWNS SHALL BE TIED IN PLACE PRIOR TO FOUNDATION INSPECTION
9. SILLS SHALL BE BOLTED TO THE FOUNDATION WITH 5/8" DIAMETER X 10" ANCHOR BOLTS AND 0.229"x 3"x 3" STEEL PLATE WASHER AT A MAXIMUM SPACING OF 4'-0" O.C. EACH BRACED OR SHEAR PANEL SHALL HAVE A MINIMUM OF TWO (UNO).
10. PROVIDE CRAWLSPACE VENTILATION AT THE RATE OF 1 SQ.FT. FOR EACH 150 SQ.FT. OF UNDER-FLOOR AREA
11. PROVIDE MINIMUM 12" CLEARANCE UNDER GIRDER BEAMS AND MINIMUM 18" CLEARANCE UNDER FLOOR JOIST
12. PROVIDE A MINIMUM 18"x24" CRAWLSPACE ACCESS

CONCRETE

1. COMPRESSIVE STRENGTH:
   A. CURBS, SIDEWALKS, FOOTINGS, SLABS: F'c= 3,000 PSI @ 28 DAYS - 6 SACK MIX, (PROJECT DESIGN w/ 2000PSI CONC. HOWEVER PROJECT IS SPEC'd w/ 3000 PSI CONC. THEREFORE NO SPECIAL CONCRETE INSPECTION REQUIRED.

STRUCTURAL AND MISCELLANEOUS STEEL:

1. SHAPES, PLATES AND BARS: ASTM A36, Fy = 36 KSI
2. BOLTS: ASTM A307 MACHINE BOLTS (MB), ASTM A325 HIGH STRENGTH BOLTS (HSB)
   A. MIN. EDGE DISTANCE: 1.5xDIA BOLT
   B. MIN. END DISTANCE:
      COMPRESSION: 4xDIA BOLT
      TENSION: 7x DIA BOLT
   C. MIN. BOLT SPACING: 4xDIA BOLT
3. REINFORCEMENT: ASTM A615 GRADE 60 FOR #4 AND LARGER, GRADE 40 FOR #3

WOOD

1. STRUCTURAL LUMBER: NO. 2 & BETTER DOUGLAS FIR-LARCH, WWPA GRADING RULES.
2. NON-STRUCTURAL LUMBER: NO.2 & BETTER HEM FIR, WWPA GRADING RULES.
3. BEAMS AND STRINGERS: NO. 2 & BETTER DOUGLAS FIR-LARCH
4. POSTS AND TIMBERS: STANDARD DOUGLAS FIR-LARCH, Fc = 1300 PSI
5. SHEATHING: APA RATED SHEATHING
6. CONNECTORS: "SIMPSON" OR APPROVED EQUAL AS INDICATED ON THE DRAWINGS
7. NAILING: PER 2018 IBC TABLE R2304.10.1
8. GLU-LAMS: 24F-V4, Fb = 2400 PSI, MOE = 1.8X106 PSI, Fv = 165 PSI
9. PRESSURE TREATED LUMBER (PT): HEM-FIR, NO.2 OR BETTER
10. STRUCTURAL MEMBERS SHALL NOT BE CUT FOR PIPES, ETC., UNLESS SPECIFICALLY NOTED OR DETAILED ON THE DRAWINGS
11. PROVIDE SOLID BLOCKING BETWEEN JOIST OVER ALL SUPPORT BEAMS AND GIRDERS
12. PROVIDE ADDITIONAL JOIST UNDER ALL SHEAR WALL PANELS RUNNING PARALLEL TO JOIST
13. PROVIDE DOUBLE JOIST AT ALL WALLS RUNNING PARALLEL TO FLOOR JOISTS
14. ALL DECK FRAMING TO BE PRESSURE TREATED

PROPRIETARY PRODUCTS

1. ROOF TRUSSES SHALL BE DESIGNED AND FABRICATED TO WITHSTAND THE LOADS LISTED UNDER "DESIGN CRITERIA." TRUSS LENGTH AS SHOWN ON THE PLANS MAY DIFFER SLIGHTLY FROM THE REQUIRED LENGTH. CONTRACTOR SHALL FIELD VERIFY SPACING OF EXISTING FOUNDATION WALL PER MANUFACTURER'S RECOMMENDATION.

GENERAL NOTES

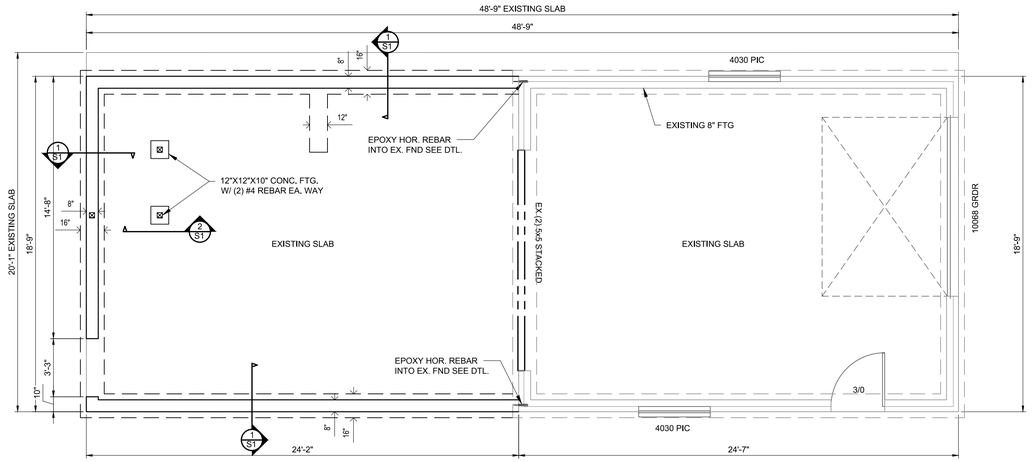
1. BLOCK BETWEEN FLOORS IS REQUIRED FOR ALL COLUMNS (UNO).
2. ALL EXTERIOR WALLS SHALL BE 2X6 FRAMED WALL WITH INSULATION.
3. PROVIDE FIRE PROTECTION PER APPLICABLE CODE.
4. PROVIDE EDGE BLOCKING FOR ALL SHEAR PANELS.

ROOF

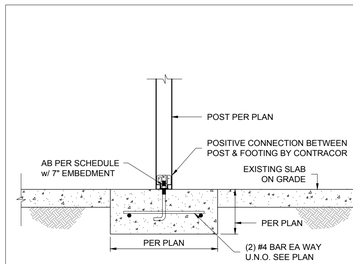
1. ROOF PANELS SHALL BE INSTALLED AS DESCRIBED BELOW:
   A. 1/2" CDX PLYWOOD OR OSB WITH 0.131x2 1/2" GALV. NAILS @ 6" O.C. AT PANEL EDGES AND @ 12" O.C. IN PANEL FIELD.
   B. ALL PANEL EDGES SHALL BE EDGE CLIPPED.
   C. CONNECT ALL TRUSSES TO DOUBLE TOP PLATE OF WALL WITH H2.5A CLIP W/ (5) 0.131x2 1/2" TRUSS & (5) 0.131x2 1/2" PLATES.
2. ALL NAILING PER 2018 IBC TABLE 2304.10.1
3. PROVIDE STC CLIPS @ ALL TRUSS TO INTERIOR WALL CONNECTIONS, SEE DETAILS
4. PROVIDE DBL. STUDS @ ALL GIRDER TRUSSES, UNLESS NOTED OTHERWISE
5. ROOF SHEATHING IS 7/16" OSB SHEATHING w\ PSCL CLIPS, 1/2" CCX @ EXPOSED OVERHANGS

FLOOR SHEATHING

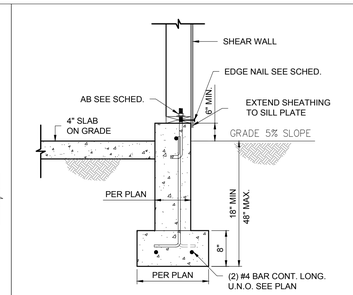
1. FLOOR PANELS SHALL BE INSTALLED AS DESCRIBED BELOW:
   A. 3/4" T&G CDX PLYWOOD GLUED AND NAILED WITH 0.131x2 1/2" GALV. RING SHANK NAILS @ 6" O.C. AT PANEL EDGES AND @ 12" O.C. IN PANEL FIELD. INSTALL PER THE TYPICAL DIAPHRAGM NAILING DETAIL .



1 FOUNDATION PLAN
SCALE: 1/4" = 1' - 0"



2 TYPICAL FOUNDATION PIER DETAIL
SCALE: 3/4" = 1' - 0"



1 TYPICAL GARAGE FOUNDATION DETAIL
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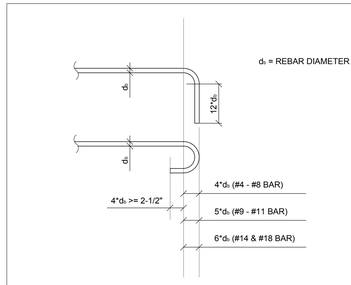
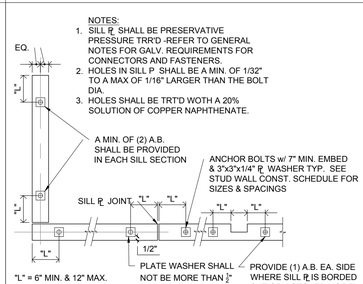


TYPICAL
REBAR HOOK DETAIL
SCALE: 1-1/2" = 1' - 0"



TYPICAL SILL P ANCHORAGE
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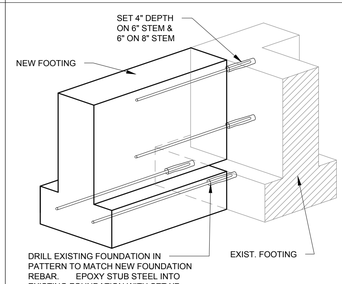

TYPICAL FOUNDATION
DOWEL CONNECTION DETAIL
SCALE: 3/4" = 1' - 0"

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FOUNDATION AND ROOF FRAMING PLAN

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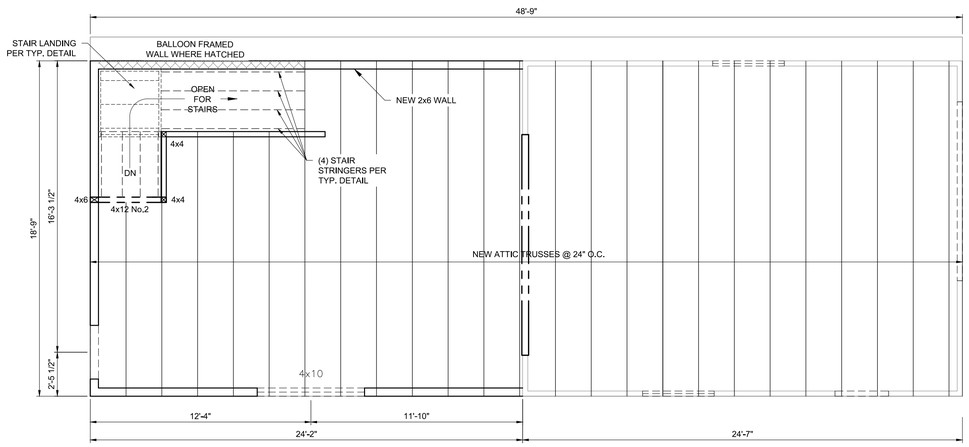

1 ATTIC FRAMING PLAN
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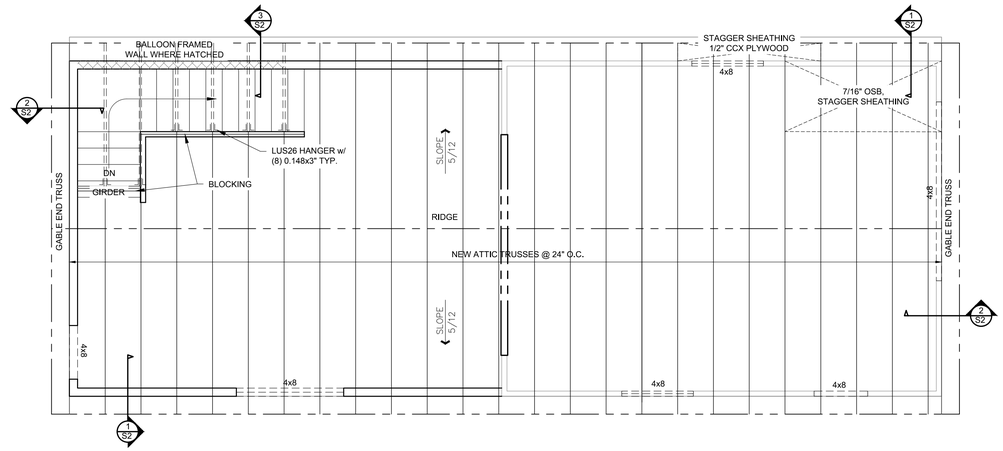

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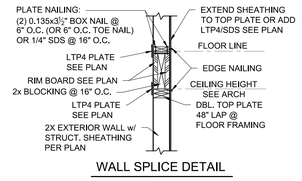
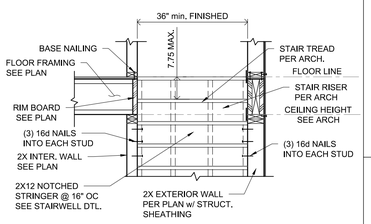
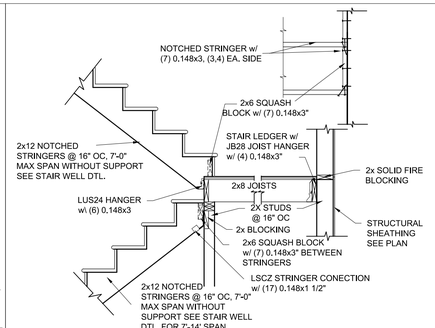


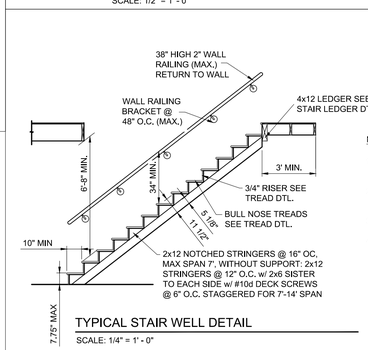
WALL SPLICE DETAIL



TYPICAL STAIR WELL DETAIL



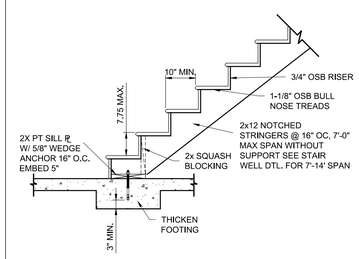
TYPICAL STAIR LEDGER DETAIL
SCALE: 1/2" = 1' - 0"



TYPICAL STAIR WELL DETAIL
SCALE: 1/4" = 1' - 0"

NOTES:

1. STAIR WIDTH TO BE 36" FINISHED OR GREATER
2. HAND RAIL TO HANG 34-38" ABOVE THE STAIR NOSE
3. GRASP DIMENSION TO BE 1 ¼" - 2"
4. PROVIDE CONTINUOUS HANDRAIL OR TERMINATE AT NEWEL POSTS OR SAFETY TERMINAL



TYPICAL STAIR TREAD DETAIL
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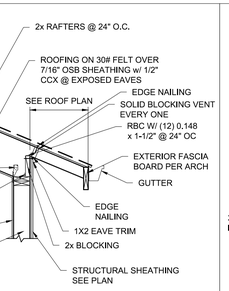
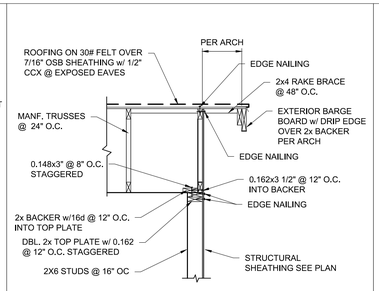
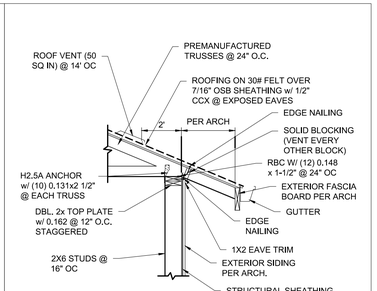


3 RAFTER EAVE ROOF DETAIL
SCALE: 1/2" = 1' - 0"



2 TYPICAL TRUSS GABLE END DETAIL
SCALE: 1/2" = 1' - 0"



1 TYPICAL TRUSS EAVE DETAIL
SCALE: 1/2" = 1' - 0"

RELIANT DESIGN GROUP
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E-MAIL: erik@thelanddeveloper.com

JOHN E. ERICKSON
38284
REGISTERED PROFESSIONAL ENGINEER
09/20/23

REVISIONS: DATE:

PUYALLUP REMODEL

ATTIC & ROOF PLAN

PROJECT: Puyallup Remodel
907 18th St NW
Puyallup, WA 98371

CLIENT: Kelli & Tim Thompson
907 18th St NW
Puyallup, WA 98371

DRAWN BY: SaG
DATE: 07/21/23
AGENCY NO.:
SHEET: S2 OF 3
JOB NO.: 23-044

City of Puyallup
Development & Permitting Services
ISSUED PERMIT
Building | Planning
Engineering | Public Works
Fire | Traffic

SIMPSON STRONGTIE STRAP TIES:

VERTICAL HOLDOWN STRAPS INTO EXISTING FOOTING:

(HD1) TALL=3,075 lb
HDU2-SDS2.5 W/ (6) ¼ x2½" SDS INTO (2) 2X w/ 5/8"Ø ROD EPOXY IN PLACE W/ SET XP, MIN 12" EMBED INTO CONCRETE (FOLLOW MFG. SPEC.)

(HD2) TALL=4,565 lb
HDU4-SDS2.5 W/ (10) ¼ x2½" SDS INTO (2) 2X w/ 5/8"Ø ROD EPOXY IN PLACE W/ SET XP, MIN 15" EMBED INTO CONCRETE (FOLLOW MFG. SPEC.)

(HD4) TALL=6,970 lb
HDU8-SDS2.5 W/ (20) ¼ x2½" SDS INTO 4X w/ 7/8"Ø ROD EPOXY IN PLACE W/ SET XP, MIN 21" EMBED INTO CONCRETE (FOLLOW MFG. SPEC.)

VERTICAL HOLDOWN STRAPS:

(HD1) TALL=3,075 lb
HDU2-SDS2.5 w/ (6) ¼ x2½" SDS INTO (2) 2X w/ SSTB16 A.B. w/ (13" MIN EMBED) OR PAB5 A.B. w/ (7" EMBED) INTO 20"x20"x11" FOOTING w/ (2) #4 REBAR EA WAY, TOP & BTM (NOT JUST STEM WALL)

NOTE: STRAPS MAY BE APPLIED TO THE INSIDE OR OUTSIDE FACE OF STUDS.

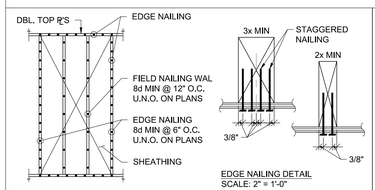
SHEAR WALL SCHEDULE

MARK	SHEATHING	NO. OF SIDES	EDGE NAIL	FIELD NAIL	PLATE NAIL	SHEAR CLIP	MUDSILL ANCHORS		SEISMIC ALLOWABLE SHEAR (plf)	WIND ALLOWABLE SHEAR (plf)	SHEAR WALL NOTES
							2X MUDSILL	3X MUDSILL			
A	7/16" Sheathing, plywood siding except Group 5 Species	Single	0,131x2½" @ 6"	0,131x2½" @ 12"	0,162x3½" NAIL @ 6" O.C. (OR 6" O.C. TOE NAIL) OR 1/4" SDS @ 16" O.C.	LTP4 @ 1'-6"	5/8" x 10" @ 46"	5/8" x 12" @ 72"	255	358	1,2,3,4,8,12

(#) Reference applicable shearwall note below.

SHEAR WALL NOTES

1. THERE SHALL BE A CONTINUOUS FOOTING UNDER ALL BRACED PANELS
2. WALL SHALL BE FRAMED WITH STUDS AT 16" O.C. OR PANELS ARE APPLIED WITH LONG DIMENSION ACROSS STUDS.
3. PLATE NAILING SHALL CONNECT BOTTOM PLATE TO BLOCKING AND BLOCKING TO SHEARWALL PLATES BELOW. SDS SCREW SHALL BE 5" LONG FOR CONNECTING BOTTOM PLATE TO BLOCKING, AND 6" LONG FOR CONNECTING DOUBLE TOP PLATE TO BLOCKING.
4. SHEAR CLIP CAN BE USED TO TRANSFER SHEARWALL SHEAR VALUE IN LIEU OF PLATE NAILING.
5. ALL FRAMING MEMBERS RECEIVING EDGE NAILING FROM ABUTTING PANELS SHALL NOT BE LESS THAN A SINGLE 3-INCH NOMINAL MEMBER OR TWO 2-INCH NOMINAL MEMBERS FASTENED IN ACCORDANCE WITH 2018 IBC SECTION 2306.1 TO TRANSFER THE DESIGN SHEAR VALUE BETWEEN FRAMING MEMBERS. WOOD STRUCTURAL PANEL JOINT AND SILL PLATE NAILING SHALL BE STAGGERED IN ALL CASES.
6. ALL WALL LINES DESIGNATED AS PERFORATED SHEAR WALL SHALL EXTEND SHEAR WALL NAILING INCLUDING EDGE NAILING AROUND PERIMETER OF OPENING. FIELD NAIL ABOVE AND BELOW OPENING AND EDGE NAIL PANEL EDGES PER ADJACENT SHEARWALL TYPE.
7. ALL FRAMING MEMBERS RECEIVING EDGE NAILING FROM ABUTTING PANELS SHALL NOT BE LESS THAN A SINGLE 4-INCH NOMINAL MEMBER FASTENED IN ACCORDANCE WITH 2018 IBC SECTION 2306.1 TO TRANSFER THE DESIGN SHEAR VALUE BETWEEN FRAMING MEMBERS. WOOD STRUCTURAL PANEL JOINT AND SILL PLATE NAILING SHALL BE STAGGERED IN ALL CASES. ALL PANEL EDGES AND SHEATHING EDGES SHALL BE BLOCKED.
8. PLYWOOD SHALL BE OSB OR 3-PLY SHEATHING
9. PLYWOOD SHALL BE RATED STRUCTURAL I, 32 OC AND BE 5-PLY.
10. PLYWOOD SHALL BE RATED STRUCTURAL I, 48 OC AND BE 4-PLY.
11. LTP4 W/ (12) 0.131X1-1/2"
12. PLATE WASHERS SHALL EXTEND TO WITHIN 1/2" OF THE EDGE OF THE BOTTOM PLATE ON THE SIDE(S) WITH SHEATHING OR OTHER MATERIAL WITH UNIT SHEAR CAPACITY OF 400 PLF FOR WIND OR SEISMIC.

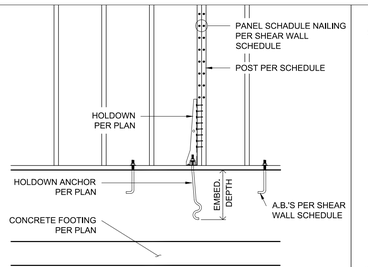


EDGE NAILING DETAIL
SCALE: 2" = 1'-0"

* FOR SPECIFIC WALL TYPE NAILING, SEE SHEAR PANEL NOTES.

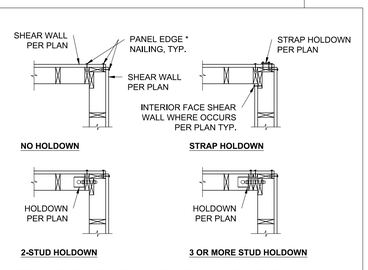
NOTES:
1. PANEL EDGE NAILING AND PLATE NAILING SHALL BE STAGGERED IN ALL CASES.
2. SHEATHING JOINT SHALL OCCUR AT COMMON MEMBER.
3. EDGE NAILING AS CALLED FOR ON PLANS & DETAILS APPLIES TO AREAS INDICATED AND AT HOLDOWN ANCHORED STUDS.
4. PROVIDE 3x MEMBERS AT ALL PANEL EDGES WHERE INDICATED IN SCHEDULE.

TYPICAL SHEARWALL NAILING
SCALE: 1/4" = 1' - 0"



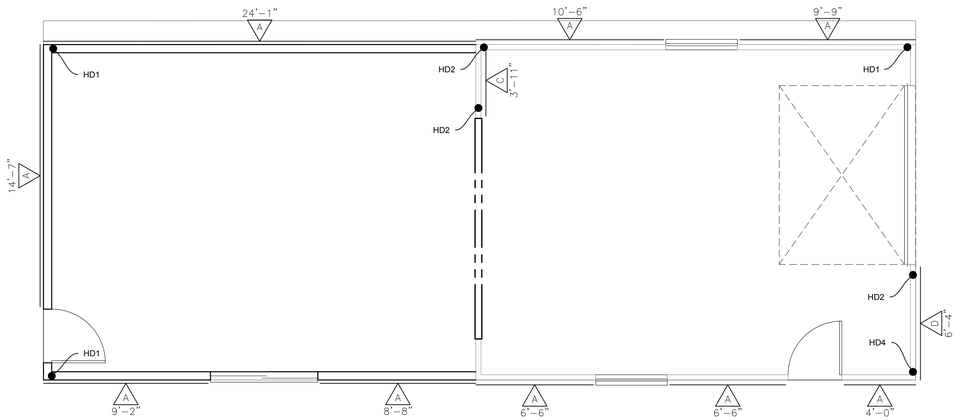
CONTRACTOR NOTE:
COORDINATE HOLDOWN EMBEDMENTS FOR HOLDOWNS WITH THE TYPICAL FOOTING DETAILS.

TYPICAL HOLDOWN AT FOUNDATION
SCALE: 1/2" = 1' - 0"

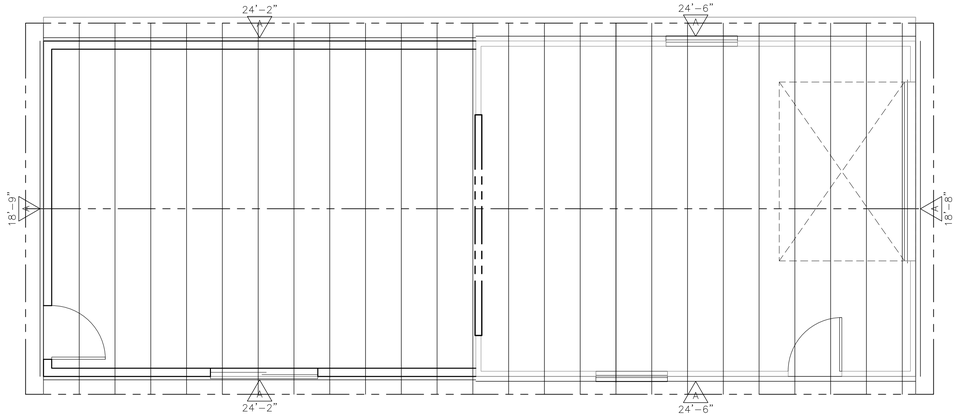


* PANEL EDGE NAILING PER SHEAR WALL SCHEDULE ONE ROW PER FRAMING MEMBER PER FACE. NAIL SPACING OF ALL ROWS TO MEET REQUIRMENTS OF THE HIGHER STRENGTH SHEAR WALL.

TYPICAL CORNER DETAILS
SCALE: 1/2" = 1' - 0"



1 LOWER FLOOR SHEAR AND HOLD DOWN PLAN
SCALE: 1/4" = 1' - 0"



2 UPPER FLOOR SHEAR AND HOLD DOWN PLAN
SCALE: 1/4" = 1' - 0"

RELIANT DESIGN GROUP
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REVISIONS: DATE:

PUYALLUP REMODEL

SHEAR AND HOLD DOWN PLAN

PROJECT: Puyallup Remodel
907 18th St NW
Puyallup, WA 98371

CLIENT: Kelli & Tim Thompson
907 18th St NW
Puyallup, WA 98371

DRAWN BY: SaG
DATE: 07/21/23
AGENCY NO.:
SHEET: S3 OF 3
JOB NO.: 23-044

THE LAND DEVELOPER'S ENGINEERED SOLUTION
a division of THE LAND DEVELOPER, LLC
• *BECAUSE RESULTS MATTER* •

Project: Project No.:	Puyallup Remodel 23-044
Client:	Kelli & Tim Thompson 907 18th St NW Puyallup, WA 98371
Project Location:	907 18th St NW Puyallup, WA 98371
Date:	July 21, 2023
Problem Statement:	Provide structural design for the residential remodel as shown in the attached building plans.
Existing Condition:	There are no known site constraints for this project.
Assumed Design parameters and constraints:	For the purposes of this design, it is assumed that the soil bearing capacity is 1,500 psi. Per Pierce County ASCE 7-16; the basic wind speed is 110 mph. However, since the wind load factors in the (2.4.1) Basic Load Combinations 5, 6, &7 were adjusted (ASCE 7-05 to 7-16) from 1 to 0.6, and 110xSQRT(.6) = 85mph, an analysis with 85mph with wind load factor 1 is exactly equivalent to an analysis with 110mph, wind load factor 0.6. This analysis was done with 85 mph basic wind speed, wind load factor 1, and is consistent with 2018 IBC standards.
Applicable Codes:	2018 IBC and IRC and ASCE 7-16
Jurisdiction:	Pierce County
Design parameters:	WIND SPEED: 110 MPH (3-SEC GUST) I_W=1.0, Kzt=1.00
	SEISMIC PARAMETERS: USE SIMPLIFIED METHOD ASCE 7-16 WOOD STRUCTURAL PANEL, R=6.5 S_S=1.284, S_1=0.442 S_{DS}=1.027
Design Loads:	ROOF: LL = 20 PSF, SL = 25 PSF, DL = 15 PSF FLOOR: LL = 40 PSF, DL = 15 PSF DECK: LL= 60 PSF, DL= 15 PSF

PO Box 4420, Tumwater, WA, 98501 • (360) 250-3973 • email: erik@thelanddeveloper.com

This is a beta release of the new ATC Hazards by Location website. Please contact us with feedback.

The ATC Hazards by Location website will not be updated to support ASCE 7-22. Find out why.

Hazards by Location

Search Information

Address:	907 18th St NW, Puyallup, WA 98371, USA
Coordinates:	47.1993945, -122.3182869
Elevation:	38 ft
Timestamp:	2023-07-13T23:26:43.183Z
Hazard Type:	Seismic
Reference Document:	ASCE7-16
Risk Category:	II
Site Class:	D-default

Basic Parameters

Name	Value	Description
S_S	1.284	MCE_R ground motion (period=0.2s)
S_1	0.442	MCE_R ground motion (period=1.0s)
S_{MS}	1.541	Site-modified spectral acceleration value
S_{M1}	* null	Site-modified spectral acceleration value
S_{DS}	1.027	Numeric seismic design value at 0.2s SA
S_{D1}	* null	Numeric seismic design value at 1.0s SA

* See Section 11.4.8

Additional Information

Name	Value	Description
SDC	* null	Seismic design category
F_a	1.2	Site amplification factor at 0.2s
F_v	* null	Site amplification factor at 1.0s
CR_S	0.914	Coefficient of risk (0.2s)
CR_1	0.899	Coefficient of risk (1.0s)
PGA	0.5	MCE_G peak ground acceleration
F_{PGA}	1.2	Site amplification factor at PGA
PGA_M	0.6	Site modified peak ground acceleration
T_L	6	Long-period transition period (s)
SsRT	1.284	Probabilistic risk-targeted ground motion (0.2s)
SsUH	1.405	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	1.5	Factored deterministic acceleration value (0.2s)
S1RT	0.442	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.492	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	0.6	Factored deterministic acceleration value (1.0s)
PGAd	0.5	Factored deterministic acceleration value (PGA)

* See Section 11.4.8

The results indicated here DO NOT reflect any state or local amendments to the values or any delineation lines made during the building code adoption process. Users should confirm any output obtained from this tool with the local Authority Having Jurisdiction before proceeding with design.

Please note that the ATC Hazards by Location website will not be updated to support ASCE 7-22. Find out why.

Disclaimer

Hazard loads are provided by the U.S. Geological Survey Seismic Design Web Services.

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Company Name		DESIGNED	HsH	JOB NO.	23-044
PROJECT	23-044 Puyallup Remodel	CHECKED	EbA	SHT	OF
SUBJECT	Residential Remodel	DATE	2023-07-13		

Building Information

No. of stories	2
Building height for lateral calculations (ft)	16.38
Building weight (lbs)	58112
Redundancy Factor:	
N-S:	1.3
E-W:	1.3

Floor Information

Floor_ID	1st
Floor net area (sf)	862
Floor opening area (sf)	53
Average height (ft)	8.17

Diaphragms

Floor diaphragms for 1st									
Diaphragm name	Area (sf)	Effective seismic weight (psf)						Type	Remarks
		DL	Walls	Snow	Storage	Partitions	Total		
D1	862	14.00	18.00	0.00	0.00	0.00	32.00	Floor	

Floor_ID	2nd
Floor net area (sf)	1053
Floor opening area (sf)	0
Average height (ft)	6.33

Diaphragms

Floor diaphragms for 2nd									
Diaphragm name	Area (sf)	Effective seismic weight (psf)						Type	Remarks
		DL	Walls	Snow	Storage	Partitions	Total		
D1	1053	20.00	9.00	0.00	0.00	0.00	29.00	Roof	Ignore opening in weight calculations

Company Name		**DESIGNED**	HsH	**JOB NO.**	23-044
PROJECT	23-044 Puyallup Remodel	**CHECKED**	EbA	**SHT**	**OF**
SUBJECT	Residential Remodel	**DATE**	2023-07-13		

Seismic Loads

Design code	2018 IBC (ASCE 7-16) Equivalent
Lateral force calculation method	Lateral Force Procedure

Seismic data:

Building occupancy category	II. Standard	Table 1-1
Importance factor I	1.00	Table 11.5-1
Soil site class	D. Stiff soil profile	Table 20-3-1
Response Spectral Acc. (0.2 sec) (S_S)	1.54	Fig 22-1 through 22-14
Design Response Spectral Acc. (0.2 sec) (S_S)	1.54	Fig 22-1 through 22-14
Response Spectral Acc. (1.0 sec) (S_1)	0.44	Fig 22-1 through 22-14
T_L (sec)	6.00	Fig 22-15 through 22-20
Fa	1.00	Table 11.4-1
Fv	1.56	Table 11.4-2
Max. Considered earthquake acc. S_{MS}	1.54	(11.4-1)
Max. Considered earthquake acc. S_{M1}	0.69	(11.4-2)
Design spectral acc. at short period S_{DS}	1.03	(11.4-3)
Design spectral acc. at 1 s period S_{D1}	0.46	(11.4-4)
Seismic design category based on short period	D	Table 11.6-1
Seismic design category based on 1 S period	D	Table 11.6-2
Is S_1 >0.75	False	Sec 11.6
Project seismic design category	D	
Seismic force resisting system	13. Light-framed walls sheathed with wood structural panels rated for shear resistance or steel sheets	Table 12.2-1
Response modification coefficient R	6.50	Table 12.2-1
System overstrength coefficient Ωo	3.00	
Approximate fundamental period parameters	Ct = 0.02 x = 0.75	Table 12.8-2
Building height (ft)	16.38	
Building period $T=T_a$ (sec)	0.16	(12.8-7)
Regular structure and 5 stories or less?	True	
Maximum S_{ss} =1.50	False	Sec 12.8.1.3
Base Shear Adjustment Factor	1	
Minimum C_s	0.01	12.8.5
Seismic response coefficient C_s	0.16	(12.8-2)
Adjusted C_s	0.16	

Seismic load: **V= Cs W = 0.16 W**

For allowable stress design 0.7 E = 0.7 * 0.16 = 0.1106 W

Company Name		DESIGNED	HsH	JOB NO.	23-044
PROJECT	23-044 Puyallup Remodel	CHECKED	EbA	SHT	OF
SUBJECT	Residential Remodel	DATE	2023-07-13		

Total effective weight (lbs) = 58112

Total seismic force (ASD) (lbs) = 6428

Vertical seismic load distribution:

Fx = Cvx V

$$C_{vx} = \frac{w_x h_x^k}{\sum_{i=1}^{n} w_i h_i^k}$$ (12.8-11)

T = 0.16

K = 1.00 Sec 12.8.3

Floor	Wx (lbs)	hx (ft)	Wx * hx lb.ft	Wx * hx / sum(Wi*Hi)	Fx (lbs)
1st	27573	9.22	254200	0.3370	2166
2nd	30539	16.38	500073	0.6630	4262

Sum(W)= 58112 Sum(W*h)= 754274

Diaphragm design force:

$$F_{px} = \frac{\sum_{i=x}^{n} F_i}{\sum_{i=x}^{n} w_i} w_{px}$$ 12.10.1

Minimum value = 0.2 S_{SD}Wpx

Needn't to exceed = 0.4 S_{SD}Wpx Sec 12.10.1

Diaphragm seismic forces:

Floor	Sum(Fi) (lbs)	Sum(Wi) (lbs)	Wpx (lbs)	Sum(Fi) / Sum(Wi) Wpx	Min. Value	Max. Value	Fpx (lbs)
1st	6428	58112	27573	3050	5665	11329	5665
2nd	4262	30539	30539	4262	6274	12548	6274

Seismic force verification:

Direction	Base Seismic Forces (lbs)							Sum Wall Forces (lbs)	% Difference
	Masses			Forces		Point Seismic	Total Base Shear		
	Sum of diaphragm masses	Sum point mass	Total mass	Seismic factor	Seismic force from mass				
N-S	58112	0	58112	0.1106	6428	0	6428	6429	0.002
E-W	58112	0	58112	0.1106	6428	0	6428	6429	0.003

Company Name		DESIGNED	HsH	JOB NO.	23-044
PROJECT	23-044 Puyallup Remodel	CHECKED	EbA	SHT	OF
SUBJECT	Residential Remodel	DATE	2023-07-13		

Wind Loads

Design Code: International Building Code 2018

Wind Standard: ASCE7-16 (Method 2 - All Heights)

Wind Data

Exposure	B	
Enclosure	Enclosed Building	
Category	II	
Wind Speed	85 MPH	
Mean Roof Height	19.38 ft	
Importance Factor Iw	1	
Hill Shape:	No Topographic Obstructions	
Velocity Coefficient q_z	$0.00256 K_z K_{zt} K_d V^2 I_w$	(6-15)
Velocity Coefficient q_h	$0.00256 K_h K_{zt} K_d V^2 I_w$	(6-15)
Directionality Factor K_d	0.85	Table 6-4
Gust Effect Factor G	0.85	6.5.8.1
Pressures for MWFRS p	qGC_p	(6-17)
K_h	0.62	

North/South C_p :

Windward Wall C_p	0.80
Leeward Wall C_p	-0.50
(L/B)	0.41

East/West C_p :

Windward Wall C_p	0.80
Leeward Wall C_p	-0.28
(L/B)	2.45

Wind Load Distribution (North/South)

Elev. Z (ft)	K_z	K_{zt}	q_z (psf)	p (Wall-Windward) (psf)
0-15	0.57	1.00	9.04	6.14
19.38	0.62	1.00	9.72	6.61

p (Wall-Leeward) (psf)	-4.13
p (Roof Windward) (psf)	1.97
p (Roof Leeward) (psf)	-8.03

Company Name		DESIGNED	HsH	JOB NO.	23-044
PROJECT	23-044 Puyallup Remodel	CHECKED	EbA	SHT	OF
SUBJECT	Residential Remodel	DATE	2023-07-13		

Wind Load Distribution (East/West)

Elev. Z (ft)	K_z	K_{zt}	q_z (psf)	p (Wall-Windward) (psf)
0-15	0.57	1.00	9.04	6.14
19.38	0.62	1.00	9.72	6.61

p (Wall-Leeward) (psf) -2.29

p (Roof Windward) (psf) 3.13

p (Roof Leeward) (psf) -6.87

Company Name	DESIGNED HsH	JOB NO. 23-044
PROJECT 23-044 Puyallup Remodel	CHECKED EbA	SHT ___ OF ___
SUBJECT Residential Remodel	DATE 2023-07-13	

Shear line reactions and shear wall forces

Floor ID: 1st

Shear line ID	Reaction (lbs)		Shear wall ID	Shear wall forces (lbs)		R*	Wall type
	Seismic	Wind		Seismic	Wind		
1	2603	3235	1-1	2603	3235	6.50	Segmented
2	1120	2051	2-1	1120	2051	6.50	Segmented
3	2705	3228	3-1	2705	3228	6.50	Segmented
a	3170	1482	a-1	1721	805	6.50	Segmented
			a-2	748	350	6.50	Segmented
			a-3	700	327	6.50	Segmented
b	3259	1482	b-1	857	390	6.50	Segmented
			b-2	811	369	6.50	Segmented
			b-3	613	279	6.50	Segmented
			b-4	605	275	6.50	Segmented
			b-5	372	169	6.50	Segmented

Floor ID: 2nd

Shear line ID	Reaction (lbs)		Shear wall ID	Shear wall forces (lbs)		R*	Wall type
	Seismic	Wind		Seismic	Wind		
1	2131	2206	1-1	2131	2206	6.50	Segmented
3	2131	2206	3-1	2131	2206	6.50	Segmented
a	2131	834	a-1	1056	413	6.50	Segmented
			a-2	1075	421	6.50	Segmented
b	2131	834	b-1	1056	413	6.50	Segmented
			b-2	1075	421	6.50	Segmented

Company Name		**DESIGNED** HsH	**JOB NO.** 23-044
PROJECT	23-044 Puyallup Remodel	**CHECKED** EbA	**SHT** ____ **OF** ____
SUBJECT	Residential Remodel	**DATE** 2023-07-13	

Shear Wall Schedule

Mark	Sheathing	No. of sides	Edge Nail	Field Nail	Plate Nail	Shear Clip	Mudsill Anchors		Allowable Shear (plf)	Material	Remarks
							2X Mudsill	3X Mudsill			
A	7/16" Sheathing, plywood siding except Group 5 Species	Single	8d @ 6"	8d @ 12"	16d @ 0'-1"	LTP4 @ 0'-4"	5/8" x 10" @ 2'-1"	5/8" x 12" @ 4'-0"	260	DF	1
B	7/16" Sheathing, plywood siding except Group 5 Species	Single	8d @ 4"	8d @ 12"	16d @ 0'-1"	LTP4 @ 0'-4"	5/8" x 10" @ 1'-7"	5/8" x 12" @ 3'-2"	350	DF	1
C	7/16" Sheathing, plywood siding except Group 5 Species	Single	8d @ 3"	8d @ 12"	16d @ 0'-1"	LTP4 @ 0'-4"	5/8" x 10" @ 1'-1"	5/8" x 12" @ 2'-3"	490	DF	1,2
D	7/16" Sheathing, plywood siding except Group 5 Species	Single	8d @ 2"	8d @ 12"	16d @ 0'-1"	LTP4 @ 0'-4"	N/A	5/8" x 12" @ 1'-9"	640	DF	1,2
E	19/32" Sheathing, plywood siding except Group 5 Species	Single	10d @ 2"	10d @ 12"	1/4"x6" SDS @ 0'-5"	LTP4 @ 0'-4"	N/A	5/8" x 12" @ 1'-3"	870	DF	1,2
2C	3/8" Sheathing, plywood siding except Group 5 Species	Double	8d @ 3"	8d @ 12"	1/4"x6" SDS @ 0'-6"	LTP4 @ 0'-4"	N/A	3/4" x 12" @ 2'-0"	980	DF	1,2
2D	7/16" Sheathing, plywood siding except Group 5 Species	Double	8d @ 2"	8d @ 12"	1/4"x6" SDS @ 0'-5"	LTP4 @ 0'-4"	N/A	3/4" x 12" @ 1'-8"	1,280	DF	1,2
E2	19/32" Sheathing, plywood siding except Group 5 Species	Double	10d @ 2"	10d @ 12"	1/4"x6" SDS @ 0'-3"	LTP4 @ 0'-4"	N/A	5/8" x 12" @ 0'-7"	1,740	DF	1,2

1 WALL SHALL BE FRAMED WITH STUDS AT 16" O.C. OR PANELS ARE APPLIED WITH LONG DIMENSION ACROSS STUDS.

2 ALL FRAMING MEMBERS RECEIVING EDGE NAILING FROM ABUTTING PANELS SHALL NOT BE LESS THAN A SINGLE 3-INCH NOMINAL MEMBER OR TWO 2-INCH NOMINAL MEMBERS FASTEND IN ACCORDANCE WITH SECTION 2306.1 TO TRANSFER THE DESIGN SHEAR VALUE BETWEEN FRAMING MEMBERS. WOOD STRUCTURAL PANEL JOINT AND SILL PLATE NAILING SHALL BE STAGGERED IN ALL CASES.

3 ALL HARDWARE SHALL BE USP STRUCTURAL CONNECTORS U.O.N.

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Shear Wall Design

1st walls

Wall ID	Length (ft)	Net Height (ft)	H / W	Shear (plf)		Wall type	Allowable shear (plf)	Adjusted allowable shear (plf)		Wall Drift (in)	Hold-Down		Remarks
				Wind	Seismic			Wind	Seismic		End I	End J	
1-1	14'-7"	8'-2"	0.56	221	231	A	260	364	260	0.82	none	HD1	
2-1	3'-11"	8'-2"	2.04	513	364	C	490	686	480	1.31	HD2	HD2	
3-1	6'-4"	8'-2"	1.29	510	555	D	640	896	640	1.07	HD4	HD2	
a-1	24'-1"	8'-2"	0.34	33	93	A	260	364	260	0.36	HD1		
a-2	10'-6"	8'-2"	0.78	33	93	A	260	364	260	0.51	HD2		
a-3	9'-9"	8'-2"	0.83	33	93	A	260	364	260	0.53		HD1	
b-1	9'-2"	8'-2"	0.89	42	121	A	260	364	260	0.62	HD1		
b-2	8'-8"	8'-2"	0.94	42	121	A	260	364	260	0.64		none	
b-3	6'-6"	8'-2"	1.24	42	121	A	260	364	260	0.74	none		
b-4	6'-6"	8'-2"	1.26	42	121	A	260	364	260	0.35			
b-5	4'-0"	8'-2"	2.04	42	121	A	260	364	255	1.03	none	HD4	

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2nd walls

Wall ID	Length (ft)	Net Height (ft)	H / W	Shear (plf)		Wall type	Allowable shear (plf)	Adjusted allowable shear (plf)		Wall Drift (in)	Hold-Down		Remarks
				Wind	Seismic			Wind	Seismic		End I	End J	
1-1	18'-9"	6'-3"	0.34	118	148	A	260	364	260	0.42	none	none	
3-1	18'-8"	6'-3"	0.34	118	148	A	260	364	260	0.42	none	none	
a-1	24'-2"	6'-3"	0.26	17	57	A	260	364	260	0.20	none		
a-2	24'-6"	6'-3"	0.26	17	57	A	260	364	260	0.20		none	
b-1	24'-2"	6'-3"	0.26	17	57	A	260	364	260	0.20	none		
b-2	24'-6"	6'-3"	0.26	17	57	A	260	364	260	0.20		none	

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HOLD-DOWN SCHEDULE

Mark	Fastener	Minimum Wood Member	Anchor Bolt	Capacity (lbs)	Remarks
none	none	(2) 2 x 4	5/8" A.B.	1000	
HD1	(6) SDS 1/4"x2-1/2"	(2) 2 x 6	SSTB16	3075	
HD2	(10) SDS 1/4"x2-1/2"	(2) 2 x 6	SSTB24	4565	
HD4	20-SDS 1/4"X2.5"	4 x 6	SSTB28	6970	

HOLD-DOWN STRAP SCHEDULE

Mark	Fastener	Minimum Wood Member Thickness	Clear Span	Capacity (lbs)	Remarks
none	12-8d	(2) 2 x 4	LTP4	700	

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Uplift Calculations

Load Cases:

0.6D + W

$(0.6 - 0.14S_{DS})D + 0.7pQ_E$

1st Walls

Post ID	Shear Wall	Reactions (lbs)			Wall Height (ft)	Net Uplift (lbs)	Hold Down
		DL	W	0.7E			
UP2	a-2	2823	-429	-1260	9.22	28	HD2
	2-1	300	-4726	-3357	9.22	-4546	
UP1	a-3	2722	-429	-1260	9.22	-18	HD1
		0	-842	-1057	0	-1057	
UP4	b-3	1708	-513	-1523	9.22	-743	none
UP3	b-5	1044	-513	-1523	9.22	-1047	HD4
	3-1	939	-5541	-6177	9.22	-5749	
UP6	b-1	2251	-513	-1523	9.22	-496	HD1
		0	-842	-1057	0	-1057	
UP5	b-2	2612	-513	-1523	9.22	-331	none
UP7	a-1	5432	-429	-1260	9.22	1218	HD1
	1-1	2341	-2876	-3185	9.22	-2117	
UP8	a-1	6444	-429	-1260	9.22	1679	NR
UP9	b-1	3769	-390	-1116	9.22	603	NR
UP10	b-2	3852	-390	-1116	9.22	641	NR
UP13	b-3	2812	-390	-1116	9.22	167	NR
UP14	b-4	2800	-390	-1116	9.22	161	NR
UP17	a-2	3936	-307	-854	9.22	942	NR
UP18	a-3	3750	-307	-854	9.22	857	NR
UP21	3-1	1848	-4699	-5120	9.22	-4277	HD2
UP25	b-4	2586	-390	-1116	9.22	64	NR
UP26	b-5	1865	-390	-1116	9.22	-265	none
UP30	1-1	2614	-2034	-2127	9.22	-935	none

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1st Walls

UP34	2-1	565	-4726	-3357	9.22	-4388	HD2

2nd Walls

Post ID	Shear Wall	Reactions (lbs)			Wall Height (ft)	Net Uplift (lbs)	Hold Down
		DL	W	0.7E			
UP2	b-1	3182	-122	-407	7.16	1045	none
	1-1	1449	-842	-1057	7.16	-396	
UP1	a-1	3182	-122	-407	7.16	1045	none
	1-1	1449	-842	-1057	7.16	-396	
UP3	a-1	3406	-122	-407	7.16	1147	NR
UP4	b-1	3406	-122	-407	7.16	1147	NR
UP6	b-2	3254	-122	-407	7.16	1078	NR
UP5	b-2	3331	-122	-407	7.16	1113	none
	3-1	1327	-842	-1057	7.16	-452	
UP7	a-2	3336	-122	-407	7.16	1115	none
	3-1	1322	-842	-1057	7.16	-454	
UP8	a-2	3215	-122	-407	7.16	1060	NR

- NR indicates that no hold-down is required because there is no net uplift.
- No Selection indicates that uplift value is larger than available hold-down capacities defined in database.
- PP indicates hold-down attached to a pre-manufactured shear wall panel.

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Diaphragm Design

Floor_ID: **1st**
Diaphragm_ID: **D1**

Code Check
Diaphragm Shear: Passed

Nailing

Load Direction: E-W

Span	Sheathing		Nailing		Min. member thickness (in)	Diaphragm type	Case ID	Effective depth (ft)		Seismic shear (plf)		Wind shear (plf)		Chord force (lbs)		Check
	Grade	Thickness (in)	Boundary	Other edges				For shear	For bending	Applied shear	Allowable shear	Applied shear	Allowable shear	Seismic	Wind	
a-b	Sheathing and Single-Floor	19/32	10d@6	10d@6	2	Unblocked	4	37.25	48.79	69	215	17	300	364	62	P

Load Direction: N-S

Span	Sheathing		Nailing		Min. member thickness (in)	Diaphragm type	Case ID	Effective depth (ft)		Seismic shear (plf)		Wind shear (plf)		Chord force (lbs)		Check
	Grade	Thickness (in)	Boundary	Other edges				For shear	For bending	Applied shear	Allowable shear	Applied shear	Allowable shear	Seismic	Wind	
1-2	Sheathing and Single-Floor	19/32	10d@6	10d@6	2	Unblocked	2	11.59	18.75	102	215	84	300	718	336	P
2-3	Sheathing and Single-Floor	19/32	10d@6	10d@6	2	Unblocked	2	18.75	18.75	80	215	54	300	485	331	P

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Floor_ID: **2nd**
Diaphragm_ID: **D1**

Code Check
Diaphragm Shear: Passed

Nailing

Load Direction: E-W

Span	Sheathing		Nailing		Min. member thickness (in)	Diaphragm type	Case ID	Effective depth (ft)		Seismic shear (plf)		Wind shear (plf)		Chord force (lbs)		Check
	Grade	Thickness (in)	Boundary	Other edges				For shear	For bending	Applied shear	Allowable shear	Applied shear	Allowable shear	Seismic	Wind	
a-b	Sheathing and Single-Floor	15/32	8d@6	8d@6	2	Unblocked	4	50.75	50.75	56	180	15	252.5	259	69	P

Load Direction: N-S

Span	Sheathing		Nailing		Min. member thickness (in)	Diaphragm type	Case ID	Effective depth (ft)		Seismic shear (plf)		Wind shear (plf)		Chord force (lbs)		Check
	Grade	Thickness (in)	Boundary	Other edges				For shear	For bending	Applied shear	Allowable shear	Applied shear	Allowable shear	Seismic	Wind	
1-3	Sheathing and Single-Floor	15/32	8d@6	8d@6	2	Unblocked	2	20.75	20.75	145	180	102	252.5	1767	1243	P

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Project Load Combinations

Design Code: **IBC 2018**

ID	Load Combination Name	Dead	Live	Roof Live	Snow Balanced	Snow Unbalanced	Seismic (0.7 QE)	Wind	LDF
1	D	1.000	0	0	0	0	0	0	0.9
2	D+L	1.000	1.000	0	0	0	0	0	1
3	D+Lr	1.000	0	1.000	0	0	0	0	1.25
4	D+S (Balanced)	1.000	0	0	1.000	0	0	0	1.15
5	D+S (Unbalanced)	1.000	0	0	0	1.000	0	0	1.15
6	D+0.75L+0.75Lr	1.000	0.750	0.750	0	0	0	0	1.25
7	D+0.75L+0.75S (Balanced)	1.000	0.750	0	0.750	0	0	0	1.15
8	D+0.75L+0.75S (Unbalanced)	1.000	0.750	0	0	0.750	0	0	1.15
9	D+0.7E (North)	1.000	0	0	0	0	1.000	0	1.6
10	D+0.7E (South)	1.000	0	0	0	0	1.000	0	1.6
11	D+0.7E (East)	1.000	0	0	0	0	1.000	0	1.6
12	D+0.7E (West)	1.000	0	0	0	0	1.000	0	1.6
13	D+0.7E (North)+0.75L+0.75Lr	1.000	0.750	0.750	0	0	1.000	0	1.6
14	D+0.7E (South)+0.75L+0.75Lr	1.000	0.750	0.750	0	0	1.000	0	1.6
15	D+0.7E (East)+0.75L+0.75Lr	1.000	0.750	0.750	0	0	1.000	0	1.6
16	D+0.7E (West)+0.75L+0.75Lr	1.000	0.750	0.750	0	0	1.000	0	1.6
17	D+0.7E (North)+0.75L+0.75S (Balanced)	1.000	0.750	0	0.750	0	1.000	0	1.6
18	D+0.7E (North)+0.75L+0.75S (Unbalanced)	1.000	0.750	0	0	0.750	1.000	0	1.6
19	D+0.7E (South)+0.75L+0.75S (Balanced)	1.000	0.750	0	0.750	0	1.000	0	1.6
20	D+0.7E (South)+0.75L+0.75S (Unbalanced)	1.000	0.750	0	0	0.750	1.000	0	1.6
21	D+0.7E (East)+0.75L+0.75S (Balanced)	1.000	0.750	0	0.750	0	1.000	0	1.6
22	D+0.7E (East)+0.75L+0.75S (Unbalanced)	1.000	0.750	0	0	0.750	1.000	0	1.6
23	D+0.7E (West)+0.75L+0.75S (Balanced)	1.000	0.750	0	0.750	0	1.000	0	1.6
24	D+0.7E (West)+0.75L+0.75S (Unbalanced)	1.000	0.750	0	0	0.750	1.000	0	1.6
25	06D+0.7E (North)	0.600	0	0	0	0	1.000	0	1.6
26	06D+0.7E (South)	0.600	0	0	0	0	1.000	0	1.6
27	06D+0.7E (East)	0.600	0	0	0	0	1.000	0	1.6
28	06D+0.7E (West)	0.600	0	0	0	0	1.000	0	1.6
29	D+W (North)	1.000	0	0	0	0	0	1.000	1.6

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Project Load Combinations

Design Code: **IBC 2018**

ID	Load Combination Name	Dead	Live	Roof Live	Snow Balanced	Snow Unbalanced	Seismic (0.7 QE)	Wind	LDF
30	D+W (South)	1.000	0	0	0	0	0	1.000	1.6
31	D+W (East)	1.000	0	0	0	0	0	1.000	1.6
32	D+W (West)	1.000	0	0	0	0	0	1.000	1.6
33	D+0.75W (North)+0.75L+0.75Lr	1.000	0.750	0.750	0	0	0	0.750	1.6
34	D+0.75W (South)+0.75L+0.75Lr	1.000	0.750	0.750	0	0	0	0.750	1.6
35	D+0.75W (East)+0.75L+0.75Lr	1.000	0.750	0.750	0	0	0	0.750	1.6
36	D+0.75W (West)+0.75L+0.75Lr	1.000	0.750	0.750	0	0	0	0.750	1.6
37	D+0.75W (North)+0.75L+0.75S (Balanced)	1.000	0.750	0	0.750	0	0	0.750	1.6
38	D+0.75W (North)+0.75L+0.75S (Unbalanced)	1.000	0.750	0	0	0.750	0	0.750	1.6
39	D+0.75W (South)+0.75L+0.75S (Balanced)	1.000	0.750	0	0.750	0	0	0.750	1.6
40	D+0.75W (South)+0.75L+0.75S (Unbalanced)	1.000	0.750	0	0	0.750	0	0.750	1.6
41	D+0.75W (East)+0.75L+0.75S (Balanced)	1.000	0.750	0	0.750	0	0	0.750	1.6
42	D+0.75W (East)+0.75L+0.75S (Unbalanced)	1.000	0.750	0	0	0.750	0	0.750	1.6
43	D+0.75W (West)+0.75L+0.75S (Balanced)	1.000	0.750	0	0.750	0	0	0.750	1.6
44	D+0.75W (West)+0.75L+0.75S (Unbalanced)	1.000	0.750	0	0	0.750	0	0.750	1.6
45	06D+W (North)	0.600	0	0	0	0	0	1.000	1.6
46	06D+W (South)	0.600	0	0	0	0	0	1.000	1.6
47	06D+W (East)	0.600	0	0	0	0	0	1.000	1.6
48	06D+W (West)	0.600	0	0	0	0	0	1.000	1.6
49	(1.0+0.145SDS)D+0.7ΩoQE (North) ASCE 12.4.3.2 #5	1.149	0	0	0	0	3.000	0	1.92
50	(1.0+0.145SDS)D+0.7ΩoQE (South) ASCE 12.4.3.2 #5	1.149	0	0	0	0	3.000	0	1.92
51	(1.0+0.145SDS)D+0.7ΩoQE (East) ASCE 12.4.3.2 #5	1.149	0	0	0	0	3.000	0	1.92
52	(1.0+0.145SDS)D+0.7ΩoQE (West) ASCE 12.4.3.2 #5	1.149	0	0	0	0	3.000	0	1.92
53	(1.0+0.105SDS)D+0.525ΩoQE(North)+0.75L+0.75Lr ASCE 12.4.3.2 #6	1.108	0.750	0.750	0	0	2.250	0	1.92
54	(1.0+0.105SDS)D+0.525ΩoQE(South)+0.75L+0.75Lr ASCE 12.4.3.2 #6	1.108	0.750	0.750	0	0	2.250	0	1.92
55	(1.0+0.105SDS)D+0.525ΩoQE(East)+0.75L+0.75Lr ASCE 12.4.3.2 #6	1.108	0.750	0.750	0	0	2.250	0	1.92
56	(1.0+0.105SDS)D+0.525ΩoQE(West)+0.75L+0.75Lr ASCE 12.4.3.2 #6	1.108	0.750	0.750	0	0	2.250	0	1.92
57	(1.0+0.105SDS)D+0.525ΩoQE(North)+0.75L+0.75S ASCE 12.4.3.2 #6	1.108	0.750	0	0.750	0	2.250	0	1.92
58	(1.0+0.105SDS)D+0.525ΩoQE(North)+0.75L+0.75S(U) ASCE 12.4.3.2 #6	1.108	0.750	0	0	0.750	2.250	0	1.92
59	(1.0+0.105SDS)D+0.525ΩoQE(South)+0.75L+0.75S ASCE 12.4.3.2 #6	1.108	0.750	0	0.750	0	2.250	0	1.92

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Project Load Combinations

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ID	Load Combination Name	Dead	Live	Roof Live	Snow Balanced	Snow Unbalanced	Seismic (0.7 QE)	Wind	LDF
60	(1.0+0.105SDS)D+0.525ΩoQE(South)+0.75L+0.75S(U) ASCE 12.4.3.2 #6	1.108	0.750	0	0	0.750	2.250	0	1.92
61	(1.0+0.105SDS)D+0.525ΩoQE(East)+0.75L+0.75S ASCE 12.4.3.2 #6	1.108	0.750	0	0.750	0	2.250	0	1.92
62	(1.0+0.105SDS)D+0.525ΩoQE(East)+0.75L+0.75S(U) ASCE 12.4.3.2 #6	1.108	0.750	0	0	0.750	2.250	0	1.92
63	(1.0+0.105SDS)D+0.525ΩoQE(West)+0.75L+0.75S ASCE 12.4.3.2 #6	1.108	0.750	0	0.750	0	2.250	0	1.92
64	(1.0+0.105SDS)D+0.525ΩoQE(West)+0.75L+0.75S(U) ASCE 12.4.3.2 #6	1.108	0.750	0	0	0.750	2.250	0	1.92
65	(0.6-0.145SDS)D+0.7ΩoQE (North) ASCE 12.4.3.2 #8	0.451	0	0	0	0	3.000	0	1.92
66	(0.6-0.145SDS)D+0.7ΩoQE (South) ASCE 12.4.3.2 #8	0.451	0	0	0	0	3.000	0	1.92
67	(0.6-0.145SDS)D+0.7ΩoQE (East) ASCE 12.4.3.2 #8	0.451	0	0	0	0	3.000	0	1.92
68	(0.6-0.145SDS)D+0.7ΩoQE (West) ASCE 12.4.3.2 #8	0.451	0	0	0	0	3.000	0	1.92

	Company Name		**DESIGNED**	HsH	**JOB NO.**
	PROJECT	23-044 Puyallup Remodel	**CHECKED**	EbA	**SHT**
	SUBJECT	Residential Remodel	**DATE**	2023-07-13	

Design Code: IBC 2018 / NDS 2018

Beam_ID: B1 **Location:** 1st **Passed**

Beam length (ft):	3.79	Section Type:	Douglas Fir - Larch No.2	
Number of spans:	1	Section Name:	4x12	
Maximum span (ft):	3.79	Beam Thickness:	3.50	in.
Left cantilever Lc (ft):	0.00	Beam Depth:	11.25	in.
Right cantilever Lr (ft):	0.00	A:	39.38	in^2
Ignore shear within (d)?	False	Sxx:	73.83	in^3
Repetitive member?	False	Syy:	22.97	in^3
Include own weight?	True	Fb Base Allowable:	900	psi
Lu top (ft):	0.00	Fb Adjust Allowable (CD = 1):	990	psi
Lu bottom (ft):	0.00	Fv Allowable (CD = 1):	180	psi
Slenderness Ratio:	1	Fc Allowable (CD = 1):	1350	psi
Adjustment factors:	CF=1.100	E:	1600	ksi

Reactions:

Support ID	Distance from Start (ft)	Reactions (lbs)					Requird Bearing Area	
		Dead (lbs)	Live (lbs)	Roof Live (lbs)	Balanced Snow (lbs)	Unbalanced Snow (lbs)	Max Value (in^2)	Load combination ID
P40	0.00	164	393	0	0	0	1.22	2
P37	3.79	167	400	0	0	0	1.24	2

Analysis Summary:

Load Combination	Max. Bending			Max. Shear	
	Max Moment (k.lf.)	Shear (lbs)	Location (ft)	Max Shear (lbs)	Location (lbs)
D	0.17	-38	1.76	-167	3.79
D+L	0.59	-144	1.76	-567	3.79

Code Check:

Load Combination	LDF	Max. Bending			Max. Shear		
		Critical fb (psi)	Fb (psi)	% Code Check	Max fv (psi)	Fv (psi)	% Code Check
D	0.90	28	891	3.2	6	162	3.9
D+L	1.00	96	990	9.7	22	180	12.0

Total Load Deflection:

Span ID	Applied (in)	Allowable (in)	Location (ft)	Deflection Check	Load Combination
P40-P37	0.002	0.19	1.90	Passed L/999+	D+L

Total Live Load Deflection:

SpanID	Applied (in)	Allowable (in)	Location (ft)	Deflection Check
P40-P37	0.002	0.13	1.90	Passed L/999+

Company Name		DESIGNED	HsH	JOB NO.
PROJECT	23-044 Puyallup Remodel	CHECKED	EbA	SHT
SUBJECT	Residential Remodel	DATE	2023-07-13	

Design Code: IBC 2018 / NDS 2018
Opening_ID: O1 **Location:** 1st **Passed**

Center span Ls (ft):	6.00	Section Type:	Douglas Fir - Larch No.2	
Left Cantilever Lc (ft):	0	Section Name:	4x10	
Right Cantilever Lr (ft):	0	Opening Thickness:	3.50	in.
Ignore shear within (d)?	False	Opening Depth:	9.25	in.
Include own weight?	True	A:	32.38	in^2
Lu top (ft):	6.25	Sxx:	49.91	in^3
Lu bottom (ft):	6.25	Syy:	18.89	in^3
Slenderness Ratio:	11	Fb Base Allowable:	900	psi
Adjustment factors:	CF=1.200	Fb Adjust Allowable (CD = 1):	1070	psi
		Fv Allowable (CD = 1):	180	psi
		Fc Allowable (CD = 1):	1350	psi
		E:	1600	ksi

Analysis Summary:

Load Combination	Max. Bending			Max. Shear		Reaction (lbs)	
	Max Moment (k.lf.)	Shear (lbs)	Location (ft)	Max Shear (lbs)	Location (ft)	Left	Right
D	1.95	-11	3.18	1260	0.00	1260	1279
D+L	3.35	-13	3.43	2126	0.00	2126	2103
D+Lr	2.92	-36	3.18	1895	0.00	1895	1941
D+S	3.17	-43	3.18	2054	0.00	2054	2106
D+0.75L+0.75Lr	3.73	24	3.18	2386	0.00	2386	2394
D+0.75L+0.75S	3.91	20	3.18	2505	0.00	2505	2518

Code Check:

Load Combination	LDF	Max. Bending			Max. Shear			Required bearing area (in^2)	
		Critical fb (psi)	Fb (psi)	% Code Check	Max fv (psi)	Fv (psi)	% Code Check	Left	Right
D	0.90	469	963	48.7	58	162	36.0	2.76	2.80
D+L	1.00	807	1069	75.5	98	180	54.7	4.66	4.61
D+Lr	1.25	703	1332	52.8	88	225	39.0	4.15	4.25
D+S	1.15	761	1227	62.0	95	207	46.0	4.50	4.62
D+0.75L+0.75Lr	1.25	896	1332	67.3	111	225	49.1	5.23	5.25
D+0.75L+0.75S	1.15	940	1227	76.6	116	207	56.1	5.49	5.52

Total Load Deflection:

Span ID	Applied (in)	Allowable (in)	Location (ft)	Deflection Check	Load Combination
UP9-UP10	0.073	0.30	2.94	Passed L/999+	D+0.75L+0.75S (Balanced)

Total Live Load Deflection:

SpanID	Applied (in)	Allowable (in)	Location (ft)	Deflection Check
UP9-UP10	0.044	0.20	2.94	Passed L/999+

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Company Name		**DESIGNED**	HsH	**JOB NO.**	
PROJECT	23-044 Puyallup Remodel	**CHECKED**	EbA	**SHT**	
SUBJECT	Residential Remodel	**DATE**	2023-07-13		

Design Code: **IBC 2018 / NDS 2018**
Opening_ID: **O2** **Location:** **1st** **Passed**

Center span Ls (ft):	4.00	Section Type:	Douglas Fir - Larch No.2	
Left Cantilever Lc (ft):	0	Section Name:	4x8	
Right Cantilever Lr (ft):	0	Opening Thickness:	3.50	in.
Ignore shear within (d)?	False	Opening Depth:	7.25	in.
Include own weight?	True	A:	25.38	in^2
Lu top (ft):	4.25	Sxx:	30.66	in^3
Lu bottom (ft):	4.25	Syy:	14.80	in^3
Slenderness Ratio:	8	Fb Base Allowable:	900	psi
Adjustment factors:	CF=1.300	Fb Adjust Allowable (CD = 1):	1164	psi
		Fv Allowable (CD = 1):	180	psi
		Fc Allowable (CD = 1):	1350	psi
		E:	1600	ksi

Analysis Summary:

Load Combination	Max. Bending			Max. Shear		Reaction (lbs)	
	Max Moment (k.lf.)	Shear (lbs)	Location (ft)	Max Shear (lbs)	Location (ft)	Left	Right
D	0.95	-43	1.93	917	0.00	917	933
D+L	1.78	-266	1.93	1694	0.00	1694	1656
D+Lr	1.39	-15	1.93	1345	0.00	1345	1387
D+S	1.50	-8	1.93	1452	0.00	1452	1501
D+0.75L+0.75Lr	1.90	-190	1.93	1820	0.00	1820	1816
D+0.75L+0.75S	1.99	-185	1.93	1901	0.00	1901	1901

Code Check:

Load Combination	LDF	Max. Bending			Max. Shear			Required bearing area (in^2)	
		Critical fb (psi)	Fb (psi)	% Code Check	Max fv (psi)	Fv (psi)	% Code Check	Left	Right
D	0.90	373	1048	35.6	54	162	33.5	2.01	2.04
D+L	1.00	698	1163	60.0	100	180	55.6	3.71	3.63
D+Lr	1.25	545	1452	37.5	79	225	35.3	2.95	3.04
D+S	1.15	588	1336	44.0	86	207	41.5	3.18	3.29
D+0.75L+0.75Lr	1.25	745	1452	51.4	108	225	47.8	3.99	3.98
D+0.75L+0.75S	1.15	778	1336	58.2	112	207	54.3	4.17	4.17

Total Load Deflection:

Span ID	Applied (in)	Allowable (in)	Location (ft)	Deflection Check	Load Combination
UP13-UP14	0.034	0.20	1.94	Passed L/999+	D+0.75L+0.75S (Balanced)

Total Live Load Deflection:

SpanID	Applied (in)	Allowable (in)	Location (ft)	Deflection Check
UP13-UP14	0.022	0.13	1.94	Passed L/999+

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Company Name		**DESIGNED**	HsH	**JOB NO.**
PROJECT	23-044 Puyallup Remodel	**CHECKED**	EbA	**SHT**
SUBJECT	Residential Remodel	**DATE**	2023-07-13	

Design Code: **IBC 2018 / NDS 2018**
Opening_ID: **O3** **Location:** **1st** **Passed**

Center span Ls (ft):	4.00	Section Type:	Douglas Fir - Larch No.2	
Left Cantilever Lc (ft):	0	Section Name:	4x8	
Right Cantilever Lr (ft):	0	Opening Thickness:	3.50	in.
Ignore shear within (d)?	False	Opening Depth:	7.25	in.
Include own weight?	True	A:	25.38	in^2
Lu top (ft):	4.25	Sxx:	30.66	in^3
Lu bottom (ft):	4.25	Syy:	14.80	in^3
Slenderness Ratio:	8	Fb Base Allowable:	900	psi
Adjustment factors:	CF=1.300	Fb Adjust Allowable (CD = 1):	1164	psi
		Fv Allowable (CD = 1):	180	psi
		Fc Allowable (CD = 1):	1350	psi
		E:	1600	ksi

Analysis Summary:

Load Combination	Max. Bending			Max. Shear		Reaction (lbs)	
	Max Moment (k.lf.)	Shear (lbs)	Location (ft)	Max Shear (lbs)	Location (ft)	Left	Right
D	0.96	-80	2.01	-910	4.12	906	944
D+L	1.79	-333	2.01	-1663	4.12	1652	1698
D+Lr	1.40	-69	2.01	-1338	4.12	1334	1399
D+S	1.51	-67	2.01	-1445	4.12	1440	1512
D+0.75L+0.75Lr	1.91	-262	2.01	-1796	4.12	1786	1850
D+0.75L+0.75S	2.00	-260	2.01	-1877	4.12	1867	1935

Code Check:

Load Combination	LDF	Max. Bending			Max. Shear			Required bearing area (in^2)	
		Critical fb (psi)	Fb (psi)	% Code Check	Max fv (psi)	Fv (psi)	% Code Check	Left	Right
D	0.90	375	1048	35.8	54	162	33.2	1.99	2.07
D+L	1.00	701	1163	60.2	98	180	54.6	3.62	3.72
D+Lr	1.25	547	1452	37.7	79	225	35.2	2.92	3.07
D+S	1.15	590	1336	44.2	85	207	41.3	3.16	3.31
D+0.75L+0.75Lr	1.25	749	1452	51.6	106	225	47.2	3.92	4.06
D+0.75L+0.75S	1.15	781	1336	58.4	111	207	53.6	4.09	4.24

Total Load Deflection:

Span ID	Applied (in)	Allowable (in)	Location (ft)	Deflection Check	Load Combination
UP17-UP18	0.034	0.20	2.01	Passed L/999+	D+0.75L+0.75S (Balanced)

Total Live Load Deflection:

SpanID	Applied (in)	Allowable (in)	Location (ft)	Deflection Check
UP17-UP18	0.022	0.13	2.01	Passed L/999+

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Company Name		**DESIGNED**	HsH	**JOB NO.**	
PROJECT	23-044 Puyallup Remodel	**CHECKED**	EbA	**SHT**	
SUBJECT	Residential Remodel	**DATE**	2023-07-13		

Design Code: **IBC 2018 / NDS 2018**
Opening_ID: **O4** **Location:** **1st** **Passed**

Center span Ls (ft):	10.00	Section Type:	Douglas Fir - Larch No.2	
Left Cantilever Lc (ft):	0	Section Name:	4x8	
Right Cantilever Lr (ft):	0	Opening Thickness:	3.50	in.
Ignore shear within (d)?	False	Opening Depth:	7.25	in.
Include own weight?	True	A:	25.38	in^2
Lu top (ft):	10.25	Sxx:	30.66	in^3
Lu bottom (ft):	10.25	Syy:	14.80	in^3
Slenderness Ratio:	12	Fb Base Allowable:	900	psi
Adjustment factors:	CF=1.300	Fb Adjust Allowable (CD = 1):	1156	psi
		Fv Allowable (CD = 1):	180	psi
		Fc Allowable (CD = 1):	1350	psi
		E:	1600	ksi

Analysis Summary:

Load Combination	Max. Bending			Max. Shear		Reaction (lbs)	
	Max Moment (k.lf.)	Shear (lbs)	Location (ft)	Max Shear (lbs)	Location (ft)	Left	Right
D	2.33	22	4.94	-920	10.12	920	938
D+L	2.55	24	4.94	-1010	10.12	1009	1030
D+Lr	2.68	26	4.94	-1059	10.12	1059	1081
D+S	2.77	27	4.94	-1094	10.12	1094	1117
D+0.75L+0.75Lr	2.76	26	4.94	-1092	10.12	1091	1114
D+0.75L+0.75S	2.83	27	4.94	-1118	10.12	1118	1141

Code Check:

Load Combination	LDF	Max. Bending			Max. Shear			Required bearing area (in^2)	
		Critical fb (psi)	Fb (psi)	% Code Check	Max fv (psi)	Fv (psi)	% Code Check	Left	Right
D	0.90	911	1040	87.6	54	162	33.6	2.02	2.06
D+L	1.00	999	1154	86.6	60	180	33.2	2.21	2.26
D+Lr	1.25	1048	1435	73.1	63	225	27.8	2.32	2.37
D+S	1.15	1083	1323	81.9	65	207	31.2	2.40	2.45
D+0.75L+0.75Lr	1.25	1080	1435	75.3	65	225	28.7	2.39	2.44
D+0.75L+0.75S	1.15	1106	1323	83.6	66	207	31.9	2.45	2.50

Total Load Deflection:

Span ID	Applied (in)	Allowable (in)	Location (ft)	Deflection Check	Load Combination
UP21-P22	0.293	0.50	4.94	Passed L/419	D+0.75L+0.75S (Balanced)

Total Live Load Deflection:

SpanID	Applied (in)	Allowable (in)	Location (ft)	Deflection Check
UP21-P22	0.060	0.33	4.94	Passed L/999+

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Company Name		**DESIGNED**	HsH	**JOB NO.**	
PROJECT	23-044 Puyallup Remodel	**CHECKED**	EbA	**SHT**	
SUBJECT	Residential Remodel	**DATE**	2023-07-13		

Design Code: **IBC 2018 / NDS 2018**
Opening_ID: **O5** **Location:** **1st** **Passed**

Center span Ls (ft):	3.00	Section Type:	Douglas Fir - Larch No.2	
Left Cantilever Lc (ft):	0	Section Name:	4x8	
Right Cantilever Lr (ft):	0	Opening Thickness:	3.50	in.
Ignore shear within (d)?	False	Opening Depth:	7.25	in.
Include own weight?	True	A:	25.38	in^2
Lu top (ft):	3.25	Sxx:	30.66	in^3
Lu bottom (ft):	3.25	Syy:	14.80	in^3
Slenderness Ratio:	7	Fb Base Allowable:	900	psi
Adjustment factors:	CF=1.300	Fb Adjust Allowable (CD = 1):	1166	psi
		Fv Allowable (CD = 1):	180	psi
		Fc Allowable (CD = 1):	1350	psi
		E:	1600	ksi

Analysis Summary:

Load Combination	Max. Bending			Max. Shear		Reaction (lbs)	
	Max Moment (k.lf.)	Shear (lbs)	Location (ft)	Max Shear (lbs)	Location (ft)	Left	Right
D	0.54	1	1.68	710	0.00	710	668
D+L	0.98	-633	1.84	1313	0.00	1313	1065
D+Lr	0.79	-25	1.68	1034	0.00	1034	1019
D+S	0.85	-31	1.68	1115	0.00	1115	1107
D+0.75L+0.75Lr	1.05	-15	1.84	1405	0.00	1405	1229
D+0.75L+0.75S	1.10	-26	1.84	1466	0.00	1466	1295

Code Check:

Load Combination	LDF	Max. Bending			Max. Shear			Required bearing area (in^2)	
		Critical fb (psi)	Fb (psi)	% Code Check	Max fv (psi)	Fv (psi)	% Code Check	Left	Right
D	0.90	210	1049	20.0	42	162	25.9	1.56	1.46
D+L	1.00	383	1165	32.9	78	180	43.1	2.88	2.33
D+Lr	1.25	308	1454	21.2	61	225	27.2	2.27	2.23
D+S	1.15	333	1339	24.8	66	207	31.8	2.44	2.43
D+0.75L+0.75Lr	1.25	411	1454	28.2	83	225	36.9	3.08	2.69
D+0.75L+0.75S	1.15	429	1339	32.0	87	207	41.9	3.21	2.84

Total Load Deflection:

Span ID	Applied (in)	Allowable (in)	Location (ft)	Deflection Check	Load Combination
UP25-UP26	0.011	0.15	1.44	Passed L/999+	D+0.75L+0.75S (Balanced)

Total Live Load Deflection:

SpanID	Applied (in)	Allowable (in)	Location (ft)	Deflection Check
UP25-UP26	0.007	0.10	1.44	Passed L/999+

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	Company Name		**DESIGNED**	HsH	**JOB NO.**
	PROJECT	23-044 Puyallup Remodel	**CHECKED**	EbA	**SHT**
	SUBJECT	Residential Remodel	**DATE**	2023-07-13	

Design Code: **IBC 2018 / NDS 2018**
Opening_ID: **O6** **Location:** **1st** **Passed**

Center span Ls (ft):	3.00	Section Type:	Douglas Fir - Larch No.2	
Left Cantilever Lc (ft):	0	Section Name:	4x8	
Right Cantilever Lr (ft):	0	Opening Thickness:	3.50	in.
Ignore shear within (d)?	False	Opening Depth:	7.25	in.
Include own weight?	True	A:	25.38	in^2
Lu top (ft):	3.25	Sxx:	30.66	in^3
Lu bottom (ft):	3.25	Syy:	14.80	in^3
Slenderness Ratio:	7	Fb Base Allowable:	900	psi
Adjustment factors:	CF=1.300	Fb Adjust Allowable (CD = 1):	1166	psi
		Fv Allowable (CD = 1):	180	psi
		Fc Allowable (CD = 1):	1350	psi
		E:	1600	ksi

Analysis Summary:

Load Combination	Max. Bending			Max. Shear		Reaction (lbs)	
	Max Moment (k.lf.)	Shear (lbs)	Location (ft)	Max Shear (lbs)	Location (ft)	Left	Right
D	0.24	-22	1.68	306	0.00	306	321
D+L	0.26	-24	1.68	336	0.00	336	354
D+Lr	0.29	-24	1.68	376	0.00	376	391
D+S	0.30	-25	1.68	394	0.00	394	409
D+0.75L+0.75Lr	0.29	-26	1.68	381	0.00	381	398
D+0.75L+0.75S	0.30	-26	1.68	395	0.00	395	411

Code Check:

Load Combination	LDF	Max. Bending			Max. Shear			Required bearing area (in^2)	
		Critical fb (psi)	Fb (psi)	% Code Check	Max fv (psi)	Fv (psi)	% Code Check	Left	Right
D	0.90	92	1049	8.8	18	162	11.1	0.67	0.70
D+L	1.00	102	1165	8.7	20	180	11.0	0.74	0.78
D+Lr	1.25	114	1454	7.8	22	225	9.9	0.82	0.86
D+S	1.15	119	1339	8.9	23	207	11.3	0.86	0.90
D+0.75L+0.75Lr	1.25	115	1454	7.9	23	225	10.0	0.84	0.87
D+0.75L+0.75S	1.15	119	1339	8.9	23	207	11.3	0.86	0.90

Total Load Deflection:

Span ID	Applied (in)	Allowable (in)	Location (ft)	Deflection Check	Load Combination
P29-UP30	0.003	0.15	1.44	Passed L/999+	D+0.75L+0.75S (Balanced)

Total Live Load Deflection:

SpanID	Applied (in)	Allowable (in)	Location (ft)	Deflection Check
P29-UP30	0.001	0.10	1.44	Passed L/999+

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	Company Name		**DESIGNED**	HsH	**JOB NO.**
	PROJECT	23-044 Puyallup Remodel	**CHECKED**	EbA	**SHT**
	SUBJECT	Residential Remodel	**DATE**	2023-07-13	

Design Code: **IBC 2018 / NDS 2018**
Opening_ID: **O7** **Location:** **1st** **Passed**

Center span Ls (ft):	12.33	Section Type:	Douglas Fir - Larch No.2	
Left Cantilever Lc (ft):	0	Section Name:	6x6	
Right Cantilever Lr (ft):	0	Opening Thickness:	5.50	in.
Ignore shear within (d)?	False	Opening Depth:	5.50	in.
Include own weight?	True	A:	30.25	in^2
Lu top (ft):	12.58	Sxx:	27.73	in^3
Lu bottom (ft):	12.58	Syy:	27.73	in^3
Slenderness Ratio:	7	Fb Base Allowable:	875	psi
Adjustment factors:		Fb Adjust Allowable (CD = 1):	872	psi
		Fv Allowable (CD = 1):	170	psi
		Fc Allowable (CD = 1):	600	psi
		E:	1300	ksi

Analysis Summary:

Load Combination	Max. Bending			Max. Shear		Reaction (lbs)	
	Max Moment (k.lf.)	Shear (lbs)	Location (ft)	Max Shear (lbs)	Location (ft)	Left	Right
D	0.82	0	6.23	-262	12.46	262	263
D+L	1.17	0	6.23	-375	12.46	375	378

Code Check:

Load Combination	LDF	Max. Bending			Max. Shear			Required bearing area (in^2)	
		Critical fb (psi)	Fb (psi)	% Code Check	Max fv (psi)	Fv (psi)	% Code Check	Left	Right
D	0.90	353	785	45.0	13	153	8.5	0.57	0.58
D+L	1.00	505	871	58.0	19	170	10.9	0.82	0.83

Total Load Deflection:

Span ID	Applied (in)	Allowable (in)	Location (ft)	Deflection Check	Load Combination
P33-UP34	0.329	0.62	6.23	Passed L/459	D+L

Total Live Load Deflection:

SpanID	Applied (in)	Allowable (in)	Location (ft)	Deflection Check
P33-UP34	0.099	0.41	6.23	Passed L/999+

PRRRSF20231418

Project: 23-044 StruCalc

The Vitruvius Project, Inc.

Location: Stair Header
Uniformly Loaded Floor Beam
Uniformly Loaded Floor Beam [2021 International Building Code(2018 NDS)]
3.5 IN x 11.25 IN x 4.0 FT
#2 - Douglas-Fir-Larch - Dry Use
Section Adequate By: 488.0%
Controlling Factor: Shear

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DEFLECTIONS Center

Live Load	0.00	IN L/MAX
Dead Load	0.00	in
Total Load	0.00	IN L/MAX

Live Load Deflection Criteria: L/360 Total Load Deflection Criteria: L/240

REACTIONS

	A		B	
Live Load	572	lb	572	lb
Dead Load	232	lb	232	lb
Total Load	804	lb	804	lb
Bearing Length	0.37	in	0.37	in

BEAM DATA Center

Span Length	4	ft
Unbraced Length-Top	0	ft
Floor Duration Factor	1.00	
Notch Depth	0.00	

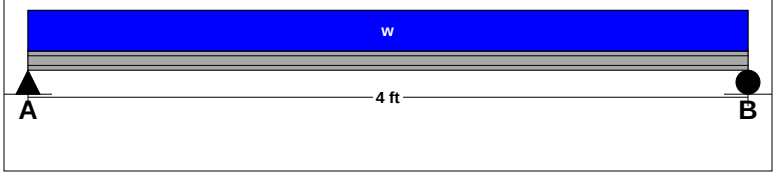
MATERIAL PROPERTIES
#2 - Douglas-Fir-Larch

	Base Values		Adjusted	
Bending Stress:	Fb = 900	psi	Fb' = 990	psi
Cd=1.00 CF=1.10				
Shear Stress:	Fv = 180	psi	Fv' = 180	psi
Cd=1.00				
Modulus of Elasticity:	E = 1600	ksi	E' = 1600	ksi
Comp. ⊥ to Grain:	Fc - ⊥ = 625	psi	Fc - ⊥' = 625	psi

Controlling Moment: 804 ft-lb
2.0 ft from left support
Created by combining all dead and live loads.
Controlling Shear: 804 lb
At support.
Created by combining all dead and live loads.

Comparisons with required sections:	Req'd		Provided	
Section Modulus:	9.74	in3	73.83	in3
Area (Shear):	6.7	in2	39.38	in2
Moment of Inertia (deflection):	7.72	in4	415.28	in4
Moment:	804	ft-lb	6091	ft-lb
Shear:	804	lb	4725	lb

LOADING DIAGRAM



FLOOR LOADING

		Side 1		Side 2	
Floor Live Load	FLL =	40	psf	40	psf
Floor Dead Load	FDL =	15	psf	15	psf
Floor Tributary Width	FTW =	5.3	ft	1.9	ft
Wall Load	WALL =	0	plf		

BEAM LOADING

Beam Total Live Load:	wL =	286	plf
Beam Total Dead Load:	wD =	107	plf
Beam Self Weight:	BSW =	9	plf
Total Maximum Load:	wT =	402	plf

PRRRSF20231418

Project: 23-044 StruCalc

The Vitruvius Project, Inc.

Location: Rafters over stairs
Roof Rafter
Roof Rafter [2021 International Building Code(2018 NDS)]
1.5 IN x 5.5 IN x 9.0 FT Pressure Treated (7 + 2) @ 24 O.C.
#2 - Douglas-Fir-Larch - Dry Use
Section Adequate By: 64.8%
Controlling Factor: Moment

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DEFLECTIONS	Center		Right	
Live Load	0.10	IN L/908	0.04	IN 2L/1430
Dead Load	0.05	in	0.00	in
Total Load	0.15	IN L/596	0.00	IN 2L/MAX

Live Load Deflection Criteria: L/360 Total Load Deflection Criteria: L/180

REACTIONS	A		B	
Live Load	175	lb	289	lb
Dead Load	104	lb	188	lb
Total Load	279	lb	477	lb
Bearing Length	0.30	in	0.51	in

SUPPORT LOADS	A		B	
Live Load	88	plf	145	plf
Dead Load	52	plf	94	plf
Total Load	140	plf	239	plf

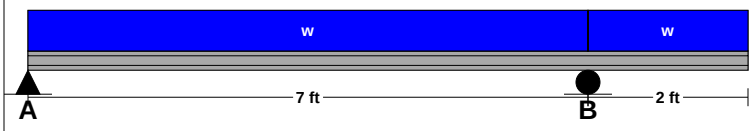
MATERIAL PROPERTIES
#2 - Douglas-Fir-Larch

	Base Values		Adjusted	
Bending Stress:	Fb = 900	psi	Fb' = 1238	psi
	Cd=1.15 CF=1.30 Cr=1.15 Ci=0.80			
Shear Stress:	Fv = 180	psi	Fv' = 166	psi
	Cd=1.15 Ci=0.80			
Modulus of Elasticity:	E = 1600	ksi	E' = 1520	ksi
	Ci=0.95			
Comp. ⊥ to Grain:	Fc - ⊥ = 625	psi	Fc - ⊥' = 625	psi

Controlling Moment: 473 ft-lb
3.36 Ft from left support of span 2 (Center Span)
Created by combining all dead loads and live loads on span(s) 2
Controlling Shear: -288 lb
7.385 Ft from left support of span 2 (Center Span)
Created by combining all dead loads and live loads on span(s) 2, 3

Comparisons with required sections:	Req'd	Provided
Section Modulus:	4.59 in3	7.56 in3
Area (Shear):	2.61 in2	8.25 in2
Moment of Inertia (deflection):	8.25 in4	20.8 in4
Moment:	473 ft-lb	780 ft-lb
Shear:	-288 lb	911 lb

LOADING DIAGRAM



RAFTER DATA	Interior	Eave
Span Length	7 ft	2 ft
Rafter Pitch	5 :12	

Roof sheathing applied to top of joists-top of rafters fully braced.
Roof Duration Factor 1.15
Peak Notch Depth 0.00
Base Notch Depth 0.00

RAFTER LOADING
Uniform Roof Loading

Roof Live Load:	LL =	25	psf
Roof Dead Load:	DL =	15	psf

Slope Adjusted Spans And Loads

Interior Span:	L-adj =	7.58	ft
Eave Span:	L-Eave-adj =	2.17	ft
Interior Live Load:	wL-adj =	43	plf
Eave Live Load:	wL-Eave-adj =	43	plf
Interior Dead Load:	wD-adj =	28	plf
Eave Dead Load:	wD-Eave-adj =	28	plf
Interior Total Load:	wT-adj =	70	plf
Eave Total Load:	wT-Eave-adj =	70	plf

Project: 23-044 StruCalc
Location: Mid stairway footing
Footing
Footing [2021 International Building Code(2018 NDS)]
Footing Size: 1.0 FT x 1.0 FT x 10.00 IN
Reinforcement: #4 Bars @ 5.50 IN. O.C. E/W / (2) min.
Section Footing Design Adequate

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FOOTING PROPERTIES

Allowable Soil Bearing Pressure:	Qs =	1500	psf
Concrete Compressive Strength:	F'c =	2500	psi
Reinforcing Steel Yield Strength:	Fy =	40000	psi
Concrete Reinforcement Cover:	c =	3	in

FOOTING SIZE

Width:	W =	1	ft
Length:	L =	1	ft
Depth:	Depth =	10	in
Effective Depth to Top Layer of Steel:	d =	6.25	in

COLUMN AND BASEPLATE SIZE

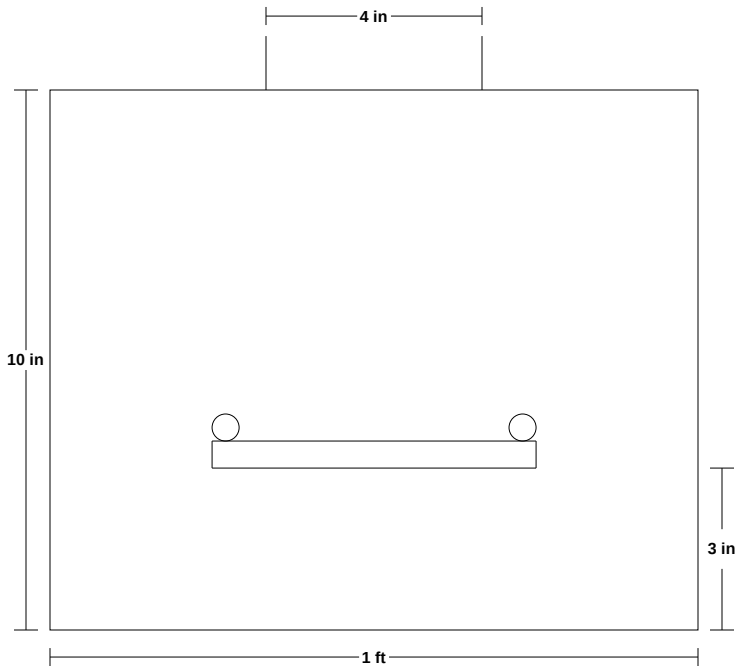
Column Type:	Wood		
Column Width:	m =	4	in
Column Depth:	n =	4	in

FOOTING CALCULATIONS

Bearing Calculations:			
Ultimate Bearing Pressure:	Qu =	857	psf
Effective Allowable Soil Bearing Pressure:	Qe =	1375	psf
Required Footing Area:	Areq =	0.62	sf
Area Provided:	A =	1.00	sf
Baseplate Bearing:			
Bearing Required:	Bear =	1278	lb
Allowable Bearing:	Bear-A =	44200	lb
Beam Shear Calculations (One Way Shear):			
Beam Shear:	Vu1 =	0	lb
Allowable Beam Shear:	Vc1 =	5625	lb
Punching Shear Calculations (Two Way Shear):			
Critical Perimeter:	Bo =	41	in
Punching Shear:	Vu2 =	345	lb
Allowable Punching Shear (ACI 11-35):	vc2-a =	57656	lb
Allowable Punching Shear (ACI 11-36):	vc2-b =	77813	lb
Allowable Punching Shear (ACI 11-37):	vc2-c =	38438	lb
Controlling Allowable Punching Shear:	vc2 =	38438	lb
Bending Calculations:			
Factored Moment:	Mu =	1916	in-lb
Nominal Moment Strength:	Mn =	84003	in-lb
Reinforcement Calculations:			
Concrete Compressive Block Depth:	a =	0.62	in
Steel Required Based on Moment:	As(1) =	0.01	in2
Min. Code Req'd Reinf. Flex. Members (ACI-150.1):	As(2) =	0.24	in2
Controlling Reinforcing Steel:	As-reqd =	0.24	in2
Selected Reinforcement:	#4's @ 5.5 in. o.c. e/w (2) Min.		
Reinforcement Area Provided:	As =	0.39	in2
Development Length Calculations:			
Development Length Required:	Ld =	15	in
Development Length Supplied:	Ld-sup =	3	in

Note: Plain concrete adequate for bending, therefore adequate development length not required.

LOADING DIAGRAM



FOOTING LOADING

Live Load:	PL =	623	lb
Dead Load:	PD =	234	lb
Total Load:	PT =	857	lb
Ultimate Factored Load:	Pu =	1278	lb
Footing plus soil above footing weight:	Wt =	81	lb

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Project: 23-044 StruCalc

Location: Footing 1
Footing
Footing [2021 International Building Code(2018 NDS)]
Footing Size: 1.0 FT x 1.0 FT x 10.00 IN
Reinforcement: #4 Bars @ 5.50 IN. O.C. E/W / (2) min.
Section Footing Design Adequate

The Vitruvius Project, Inc.

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FOOTING PROPERTIES

Allowable Soil Bearing Pressure:	Qs =	1500	psf
Concrete Compressive Strength:	F'c =	2500	psi
Reinforcing Steel Yield Strength:	Fy =	40000	psi
Concrete Reinforcement Cover:	c =	3	in

FOOTING SIZE

Width:	W =	1	ft
Length:	L =	1	ft
Depth:	Depth =	10	in
Effective Depth to Top Layer of Steel:	d =	6.25	in

COLUMN AND BASEPLATE SIZE

Column Type:	Wood		
Column Width:	m =	4	in
Column Depth:	n =	4	in

FOOTING CALCULATIONS

Bearing Calculations:			
Ultimate Bearing Pressure:	Qu =	804	psf
Effective Allowable Soil Bearing Pressure:	Qe =	1375	psf
Required Footing Area:	Areq =	0.58	sf
Area Provided:	A =	1.00	sf
Baseplate Bearing:			
Bearing Required:	Bear =	1194	lb
Allowable Bearing:	Bear-A =	44200	lb
Beam Shear Calculations (One Way Shear):			
Beam Shear:	Vu1 =	0	lb
Allowable Beam Shear:	Vc1 =	5625	lb
Punching Shear Calculations (Two Way Shear):			
Critical Perimeter:	Bo =	41	in
Punching Shear:	Vu2 =	323	lb
Allowable Punching Shear (ACI 11-35):	vc2-a =	57656	lb
Allowable Punching Shear (ACI 11-36):	vc2-b =	77813	lb
Allowable Punching Shear (ACI 11-37):	vc2-c =	38438	lb
Controlling Allowable Punching Shear:	vc2 =	38438	lb
Bending Calculations:			
Factored Moment:	Mu =	1790	in-lb
Nominal Moment Strength:	Mn =	84003	in-lb
Reinforcement Calculations:			
Concrete Compressive Block Depth:	a =	0.62	in
Steel Required Based on Moment:	As(1) =	0.01	in2
Min. Code Req'd Reinf. Flex. Members (ACI-150.1):	As(2) =	0.24	in2
Controlling Reinforcing Steel:	As-reqd =	0.24	in2
Selected Reinforcement:	#4's @ 5.5 in. o.c. e/w (2) Min.		
Reinforcement Area Provided:	As =	0.39	in2
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Development Length Required:	Ld =	15	in
Development Length Supplied:	Ld-sup =	3	in

Note: Plain concrete adequate for bending, therefore adequate development length not required.

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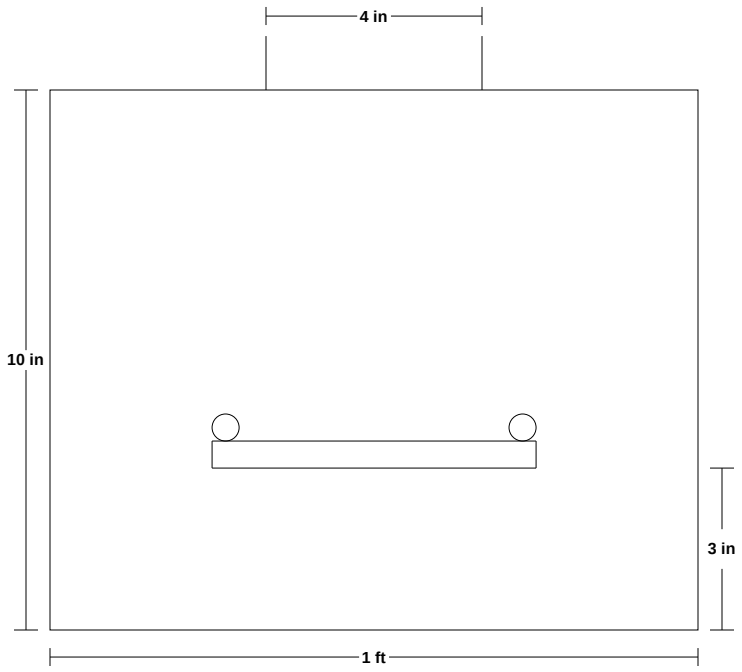

FOOTING LOADING

Live Load:	PL =	572	lb *
Dead Load:	PD =	232	lb *
Total Load:	PT =	804	lb *
Ultimate Factored Load:	Pu =	1194	lb
Footing plus soil above footing weight:	Wt =	81	lb

* Load obtained from Load Tracker. See Summary Report for details.

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