MILWAUKIE PLANNING
6101 SE Johnson Creek Blvd
Milwaukie OR 97206
503-786-7630
planning@milwaukieoregon.gov

Application for Land Use Action

Master File #: _____

Review type*: ☐ I ☐ II ☐ III ☐ IV ☐ V

CHECK ALL APPLICATION TYPES THAT APPLY:

- ❑ Amendment to Maps and/or Ordinances:
  - ❑ Comprehensive Plan Text Amendment
  - ❑ Comprehensive Plan Map Amendment
  - ❑ Zoning Text Amendment
  - ❑ Zoning Map Amendment
- ❑ Code Interpretation
- ❑ Community Service Use
- ❑ Conditional Use
- ❑ Development Review
- ❑ Director Determination
- ❑ Downtown Design Review
- ❑ Extension to Expiring Approval
- ❑ Historic Resource:
  - ❑ Alteration
  - ❑ Demolition
  - ❑ Status Designation
  - ❑ Status Deletion
- ❑ Land Division:
  - ❑ Final Plat
  - ❑ Lot Consolidation
  - ❑ Partition
  - ❑ Property Line Adjustment
  - ❑ Replat
  - ❑ Subdivision
- ❑ Miscellaneous:
  - ❑ Barbed Wire Fencing
- ❑ Mixed Use Overlay Review
- ❑ Modification to Existing Approval
- ❑ Natural Resource Review**
- ❑ Nonconforming Use Alteration
- ❑ Parking:
  - ❑ Quantity Determination
  - ❑ Quantity Modification
  - ❑ Shared Parking
  - ❑ Structured Parking
  - ❑ Planned Development
- ❑ Residential Dwelling:
- ❑ Accessory Dwelling Unit
  - ❑ Duplex
  - ❑ Manufactured Dwelling Park
  - ❑ Temporary Dwelling Unit
  - ❑ Sign Review
- ❑ Transportation Facilities Review
- ❑ Variance:
- ❑ Use Exception
  - ❑ Variance
  - ❑ Willamette Greenway Review
- ❑ Other: _____
- ❑ **Use separate application forms for:**

Annexation and/or Boundary Change
- Compensation for Reduction in Property Value (Measure 37)
- Daily Display Sign
- Appeal

RESPONSIBLE PARTIES:

APPLICANT (owner or other eligible applicant—see reverse): Wolf Industries

Mailing address: [redacted] State/Zip: [redacted]

Phone(s): [redacted] Email: [redacted]

Please do not includem y contact information on public notices or on the City website: ☒

APPLICANT'S REPRESENTATIVE (if different than above):

Mailing address: State/Zip:

Phone(s): Email:

SITE INFORMATION:

Address: 2908 SE Olsen St, Milwaukie, OR 97233 Map & Tax Lot(s): 11E25CA00100

Comprehensive Plan Designation: LD Zoning: R-7 Size of property: .26 Acres

PROPOSAL (describe briefly):

Placing a detached ADU, modular home

SIGNATURE:

ATTEST: I am the property owner or I am eligible to initiate this application per Milwaukie Municipal Code (MMC) Subsection 19.1001.6.A. If required, I have attached written authorization to submit this application. To the best of my knowledge, the information provided within this application package is complete and accurate.

Submitted by: [signature] Date: 9/1/2020

IMPORTANT INFORMATION ON REVERSE SIDE

*For multiple applications, this is based on the highest required review type. See MMC Subsection 19.1001.6.B.1.

WHO IS ELIGIBLE TO SUBMIT A LAND USE APPLICATION (excerpted from MMC Subsection 19.1001.6.A):

Type I, II, III, and IV applications may be initiated by the property owner or contract purchaser of the subject property, any person authorized in writing to represent the property owner or contract purchaser, and any agency that has statutory rights of eminent domain for projects they have the authority to construct.

Type V applications may be initiated by any individual.

PREAPPLICATION CONFERENCE:

A preapplication conference may be required or desirable prior to submitting this application. Please discuss with Planning staff.

REVIEW TYPES:

This application will be processed per the assigned review type, as described in the following sections of the Milwaukie Municipal Code:

- Type I: Section 19.1004
- Type II: Section 19.1005
- Type III: Section 19.1006
- Type IV: Section 19.1007
- Type V: Section 19.1008

****Note**: Natural Resource Review applications **may require a refundable deposit.** Deposits require completion of a Deposit Authorization Form, found at www.milwaukieoregon.gov/building/deposit-authorization-form.

THIS SECTION FOR OFFICE USE ONLY:

FILE TYPE	FILE NUMBER	AMOUNT (after discount, if any)	PERCENT DISCOUNT	DISCOUNT TYPE	DATE STAMP
Master file		$			
Concurrent application files		$			
		$			
		$			
		$			
Deposit (NR only)				☐ **Deposit Authorization Form received**	
TOTAL AMOUNT RECEIVED: $			**RECEIPT #:**		**RCD BY:**

Associated application file #s (appeals, modifications, previous approvals, etc.):

Neighborhood District Association(s):

Notes:

MILWAUKIE PLANNING
6101 SE Johnson Creek Blvd
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503.786.7630
planning@milwaukieoregon.gov

Accessory Dwelling Units: Detached

This handout summarizes the accessory dwelling unit (ADU) regulations for residential properties in the city of Milwaukie. Please refer to Milwaukie Municipal Code (MMC) Subsection 19.910.1. ADUs are allowed in all residential zones. ADUs must follow all of the zoning requirements of the residential zone they are located in, as well as the additional requirements in MMC Subsection 19.910.1.

Definition of Accessory Dwelling Unit

1. An "accessory dwelling unit" is a second dwelling unit on a lot with a single-family detached dwelling. An ADU is incidental to, and smaller than, the main dwelling unit. An ADU can either be part of the main structure, attached to the main structure, or detached.
2. The City has different regulations based on whether it is attached or not.
3. An ADU includes areas and equipment for sleeping, cooking, and sanitation (bathrooms and toilets). A structure without these areas and equipment is an "accessory structure," not an ADU, and is subject to the provisions of MMC Section 19.502 Accessory Structures.

Standards for All ADUs

1. The primary use on the property must be a single-family detached house, and it must be used as a dwelling.
2. One ADU is allowed per lot.
3. An ADU is limited to the lesser of 800 sq ft or 75% of the floor area of the main structure.
4. A new ADU requires a preapplication conference with City staff.

Review and Approval of Detached ADUs

There are two review processes for ADUs, depending on the size of the unit.

Footprint, Height, and Required Yards for Detached Accessory Dwelling Units		
Level of Review	**Type I**	**Type II**
Maximum Structure Footprint	600 sq ft	800 sq ft
Maximum Structure Height	15 feet, limited to 1 story	25 feet, limited to 2 stories
Required Side and Rear Yard	Base zone requirement for side and rear yard	5 feet
Required Front Yard	10 feet behind front yard as defined in Section 19.201, unless located at least 40 feet from the front lot line.	
Required Street Side Yard	Base zone requirement for street side yard	

Type I review is a staff-level review to ensure that the proposal meets all applicable codes and requirements. This is often called an "as-of-right" or "permitted outright" type of review. The review time and cost are less than what is required for a Type II review.

ADUs greater than the Type I review thresholds will be reviewed through a Type II review process. In addition to a staff-level review, to ensure that the proposal meets all relevant codes and requirements, this type of application requires a public posting on the site and notification to all properties within 300 ft of the subject property and a comment period. The final decision on the application is made by the Planning Director.

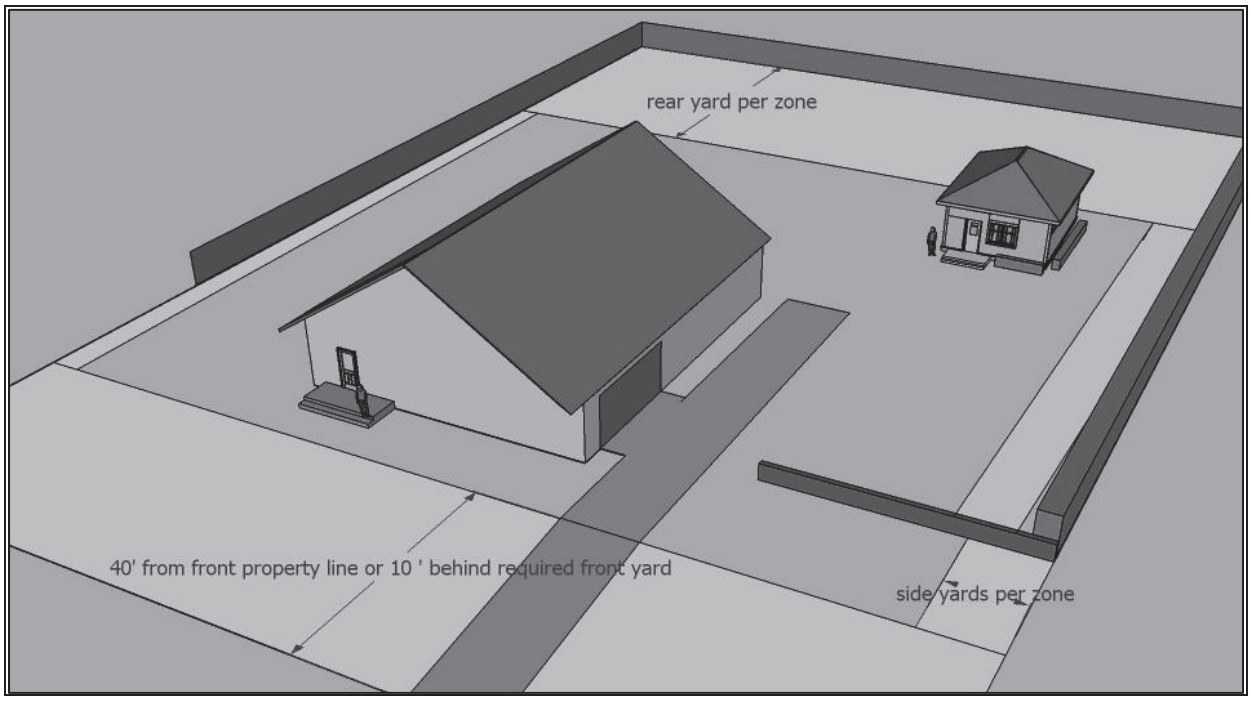
Development Standards for Detached ADUs

ADUs that are detached (a separate structure) from the primary residence must meet the development standards outlined in Table 1, below.

TABLE 1. DEVELOPMENT STANDARDS FOR DETACHED ACCESSORY DWELLING UNITS

Requirement	Allowed by Code Type I	Allowed by Code Type II	Subject Property Requirements	Proposed	Comments Staff Use Only
Maximum Lot Coverage[1] **Minimum Landscaped Area[1]**	**Same as base zone**		30%	20%	
Setbacks: Front Property Line	**10 ft behind required front yard or 40 ft from front lot line**		20	91'	
Setbacks: Street Side Property Line	**Same as base zone**		5 & 10	5	
Setbacks: Rear and Side Property Lines	**Same as base zone**	**5 ft min.**		20' & 5'	
Maximum Allowed Floor Area	**800 sq ft or 75% of main dwelling, whichever is less**		1,448	616 SF	
Building Height of detached ADU[2]	**15 ft 1-story max.**	**25 ft 2-story max.**	15' max	13'	

1. See Zoning Worksheets for requirements.
2. See page 4 of this handout for how to measure building height.



Required Design Elements for Detached ADUs

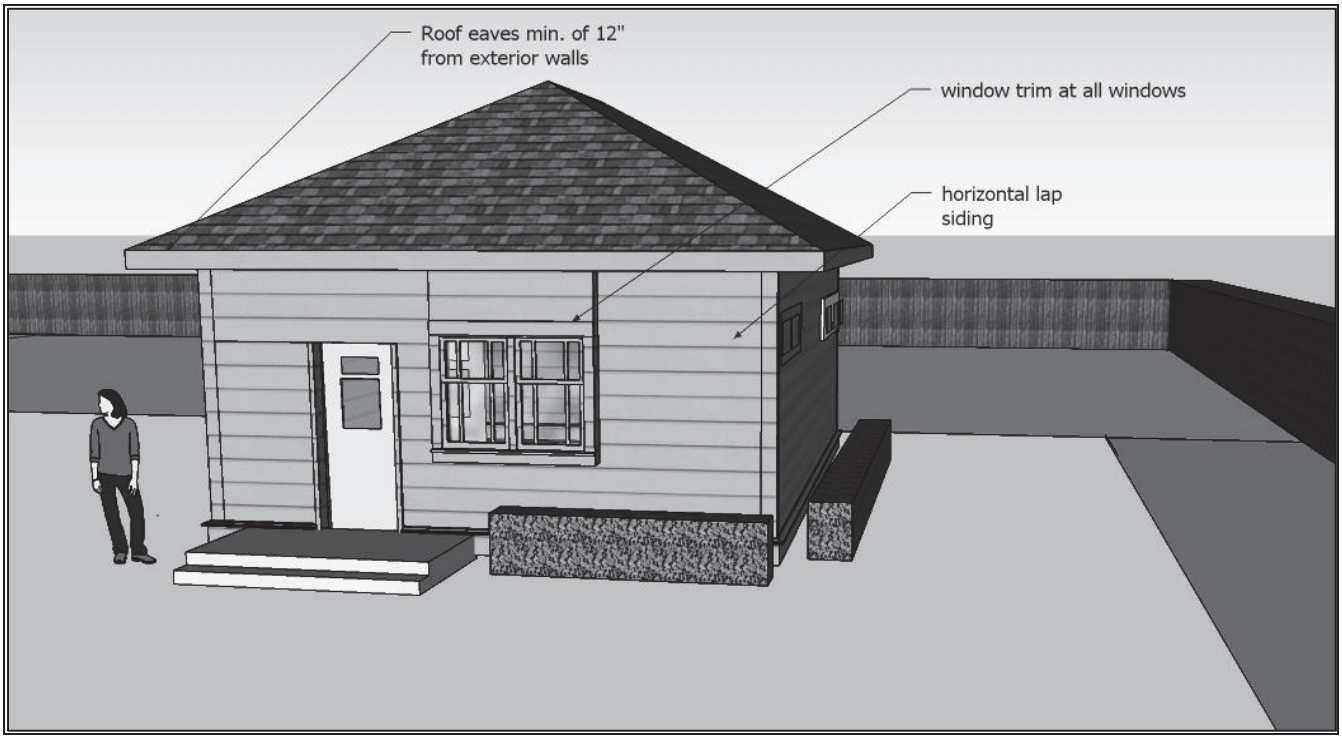
Detached ADUs must include at least 2 of the design details from Table 2, below. Yurts are allowed as detached ADUs and are exempt from this requirement, but they must meet all other ADU regulations and building codes (see MMC Subsection 19.910.4.b).

TABLE 2. DESIGN STANDARDS FOR DETACHED ACCESSORY DWELLING UNITS

Requirement	Required by Code	Existing	Proposed	Comments Staff Use Only
Minimum roof pitch if floor-to-ceiling height is 9 ft or more[1]	**4" rise for every 12" of run (4/12 pitch)**		6/12	
Privacy standard (for walls within 20 ft of adjacent residential property line)	**All windows placed on upper 1/3 of wall, OR 6 ft visual screening**	existing fence	existing fence	
All detached ADUs shall include at least 2 of the following (check at least 2):				
Covered porch	**5 ft min. depth**			
Recessed entry	**2 ft min. from exterior wall to door**			
Roof eaves	**12" min. projection**			
Horizontal lap siding	**Siding between 3-7" wide**	x	x	
Window trim at all windows	**3" wide and 5/8" deep**	x	x	

1. A minimum 4/12 roof pitch is required for an accessory structure greater than 10 ft and for ADUs with a floor-to-ceiling height greater than 9 ft.

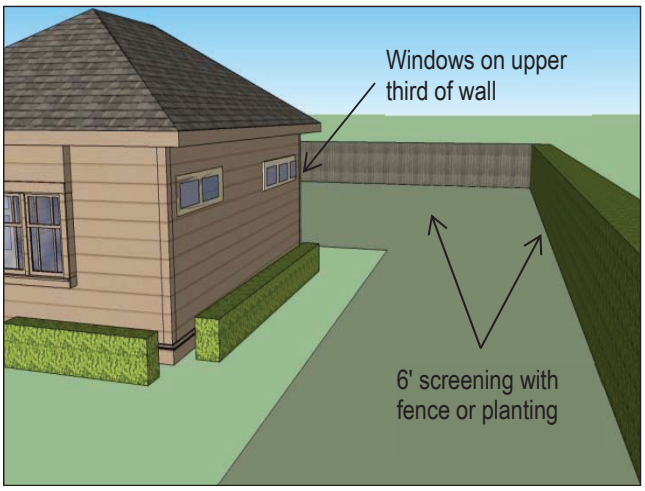
ILLUSTRATION OF DESIGN STANDARDS FOR DETACHED ACCESSORY DWELLING UNITS



Privacy Standards for Detached ADUs

If a detached ADU has a wall within 20 ft of a side or rear lot line of an adjacent residential property and is a 45-degree angle or less to the property line, at least one of the following privacy standards are required.

1. All windows on the wall shall be placed in the upper third of the distance between floor and ceiling.
2. Opaque visual screening with a minimum height of 6 ft is required along the property line next to the wall of the ADU. Screening may consist of a fence, wall, or evergreen shrubs. If newly planted shrubs are used, they must be at least 5 ft above grade at time of planting, and they must reach 6 ft high within one year. Existing features of the site may be used to meet this requirement.



Converting an Existing Accessory Structure into a Detached ADU

An existing structure can be converted to a detached ADU subject to the following standards.

1. If the existing accessory structure was created on or after December 1, 2012, it must meet all applicable standards for a new detached ADU.
2. If the existing accessory structure was created before December 1, 2012, it must meet all applicable standards for a new detached ADU except for the design standards listed in Table 2 above. However, the conversion must not bring the accessory structure out of conformance, or further out of conformance, with any of the design standards listed in Table 2.

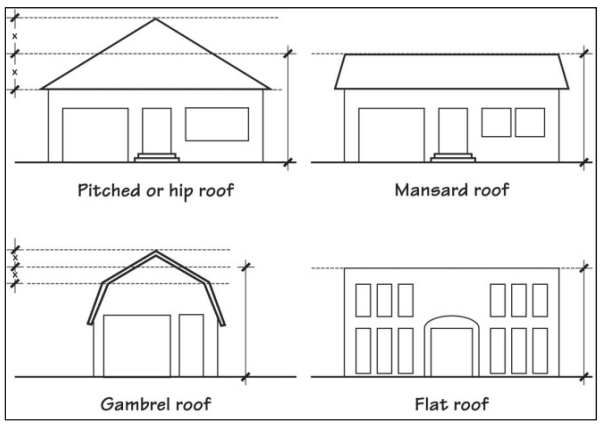
Other Requirements

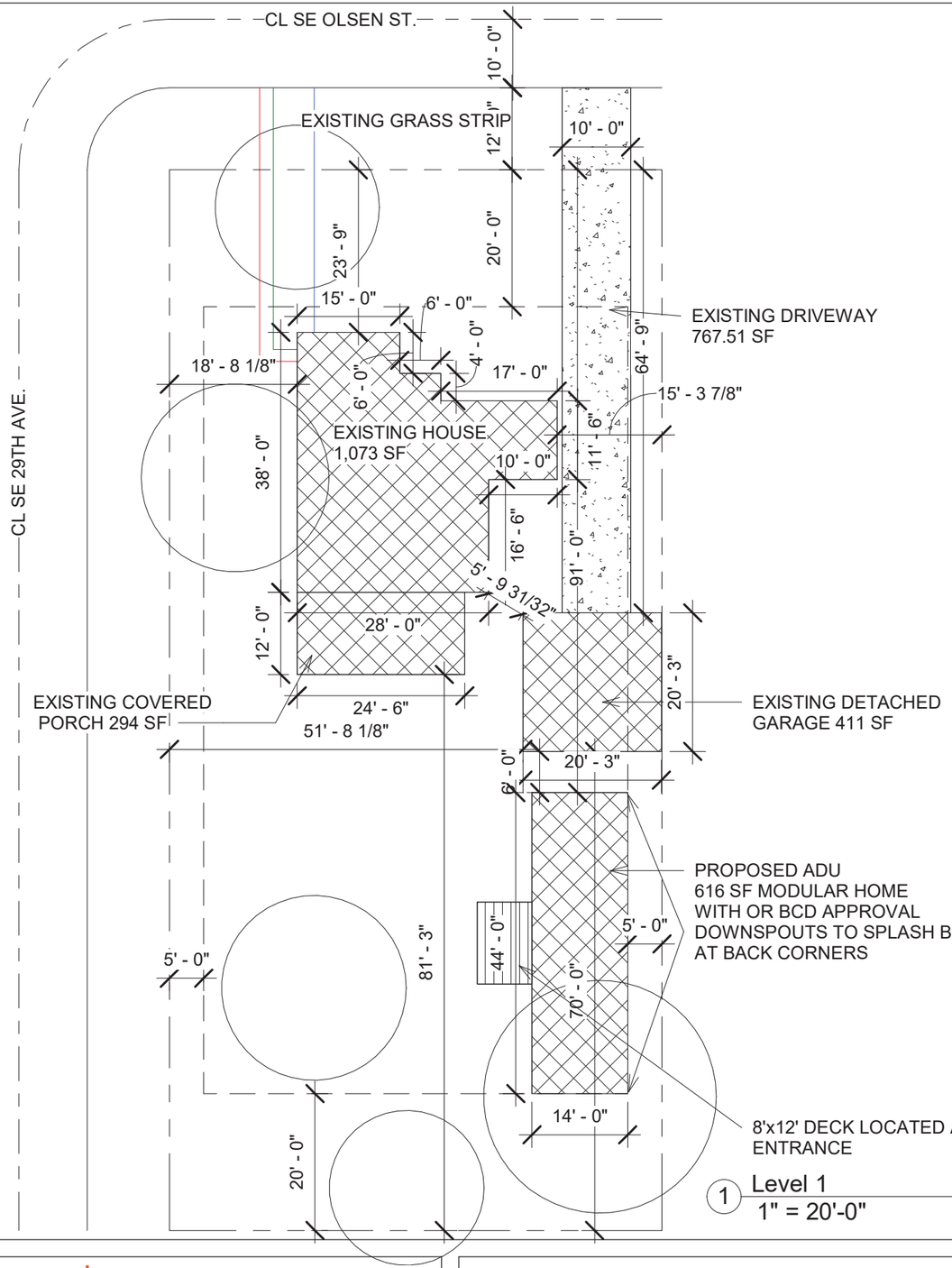
A new dwelling unit within the city must also meet all applicable building codes and engineering requirements, which may include system development charges (SDCs) and street frontage improvements. Please be sure to contact these departments for applicable requirements. The Building Division can be contacted at 503-786-7623 or building@milwaukieoregon.gov, and the Engineering Department can be contacted at 503-786-7609 or engineering@milwaukieoregon.gov.

How to Measure Building Height

The top of building shall be determined based on the specific roof types listed below.

1. Flat roof: Measure to the top of the parapet or, if there is no parapet, to the highest point of the roof. If a roof includes multiple flat roofs at different elevations, measure to the top of the highest parapet or highest point of the highest roof.
2. Mansard roof: Measure to the deck line.
3. Pitched, hipped, or gambrel roof where roof pitch is 12/12 or less: Measure to the average height of the highest gable.
4. Pitched or hipped roof with a pitch steeper than 12/12: Measure to the highest point.
5. Gambrel roof where both pitches are steeper than 12/12: Measure to the highest point.
6. Other roof shape, such as domed, vaulted, or pyramidal: Measure to the highest point.
7. Stepped or terraced building: Measure to the highest point of any segment of the building.





1 Level 1
1" = 20'-0"

Notes

Property Owner:
[redacted]

Site Address:
2908 SE Olsen St.
Milwaukie, OR 97233

Tax Lot ID: 11E25CA00100

Applicant:
Wolf Industries
[redacted]

Impervious Area
House: 1.240 SF
Garage: 416 SF
Driveway: 722.51 SF
ADU: 616 SF
Total: 2,994.51 SF
New: 616 SF

Total Lot Area: .26 Acres, 11,325 SF
Building Coverage: 2,272 SF
Lot Coverage: 20%

WATER LINE
SEWER LINE
GAS LINE
POWER LINE

Site Plan Legend
3/16" = 1'-0"

N

WOLF | INDUSTRIES
www.wolfind.com

David DuFauw

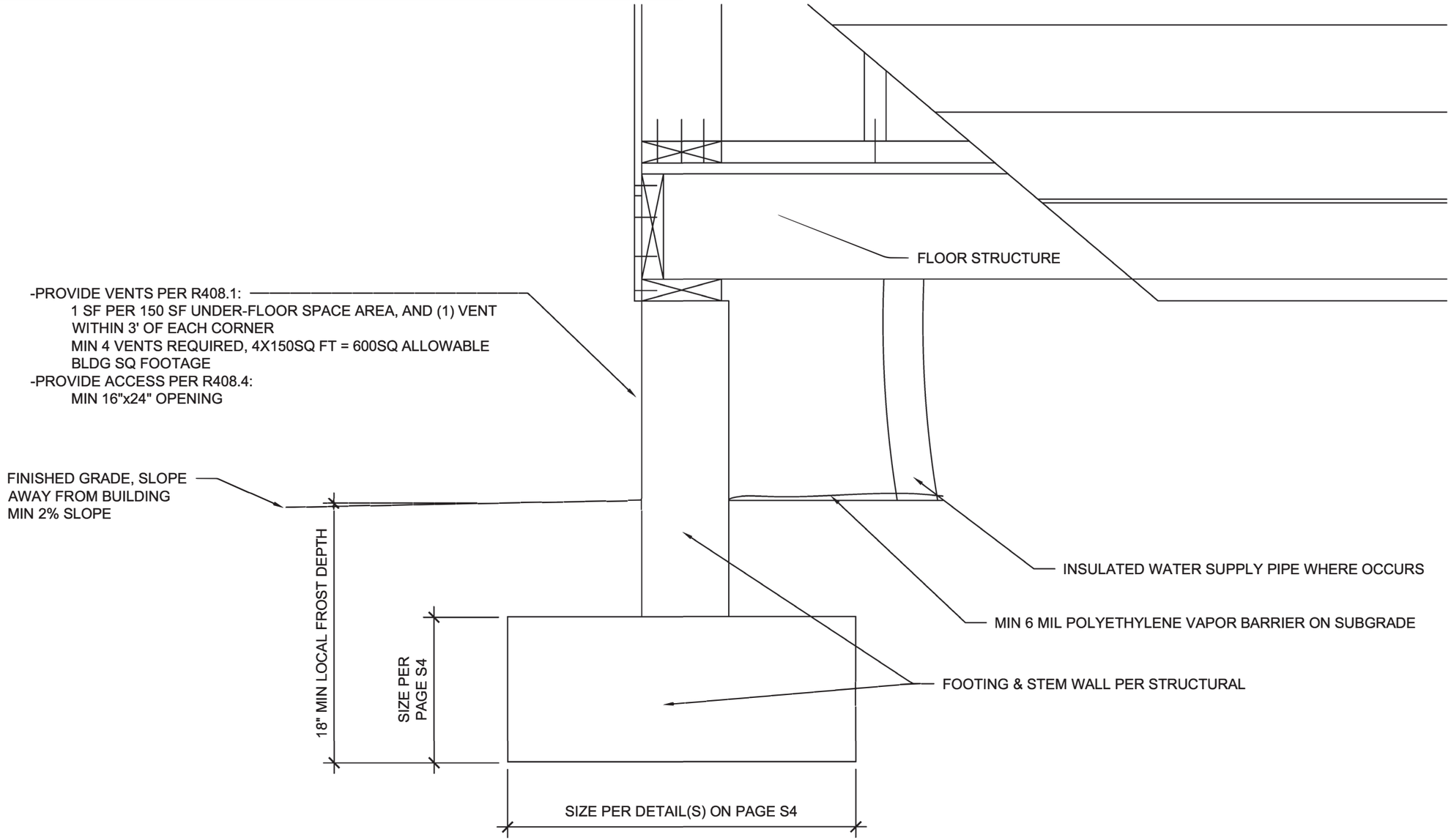
DuFauw ADU

No.	Description	Date

Site Plan

Project number	20214	A101
Date	8/21/2020	
Drawn by	Kirsten	
Checked by	David DuFauw	Scale As indicated

8/24/2020 11:39:41 AM



TYPICAL PERIMETER DETAIL AT FOUNDATION
Scale: N.A.

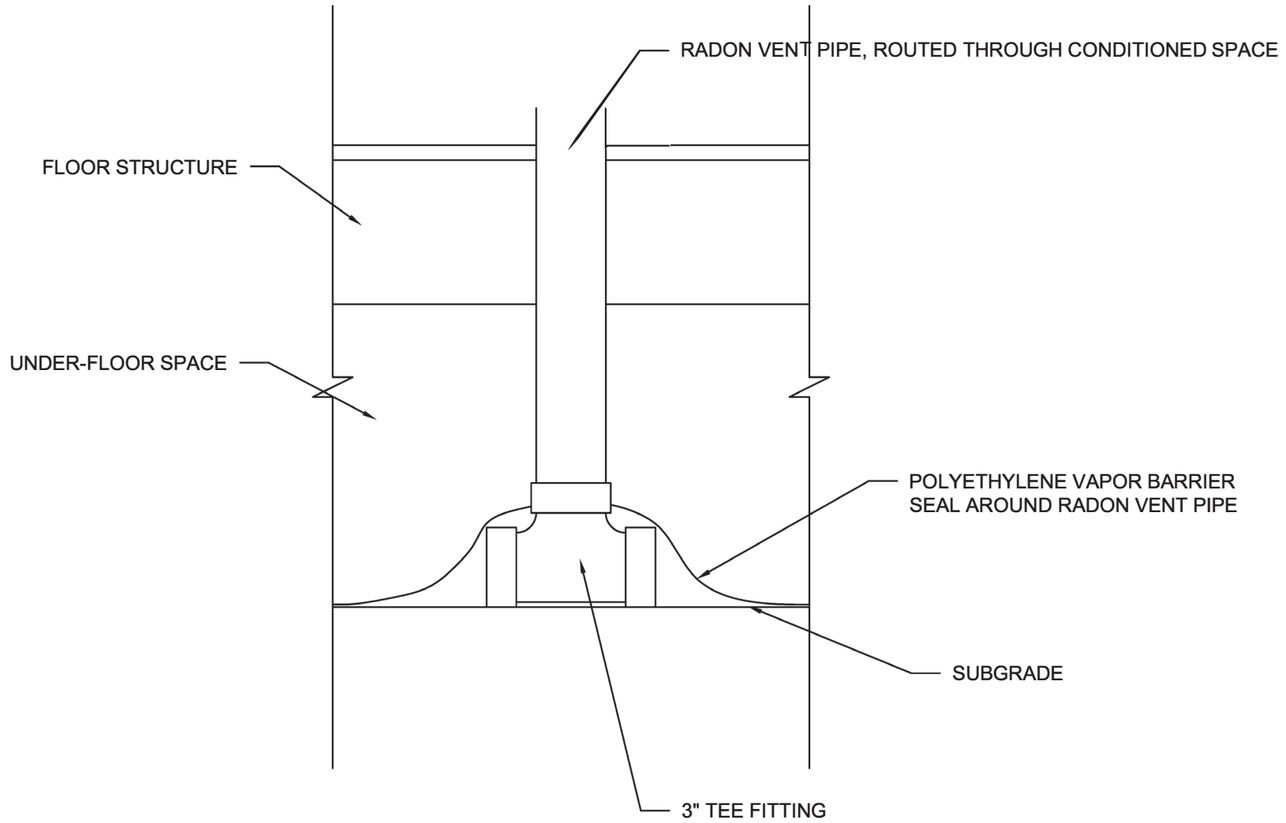
General Notes

See file for architectural plans approved by the State of Oregon.

Firm Name and Address
Wolf Industries
1511 SE 4th Ave
Battle Ground, WA 98604

Project Name and Address

Project	Sheet
----	D1C
Date	
Scale N.A.	



TYPICAL RADON VENT DETAIL
Scale: N.A.

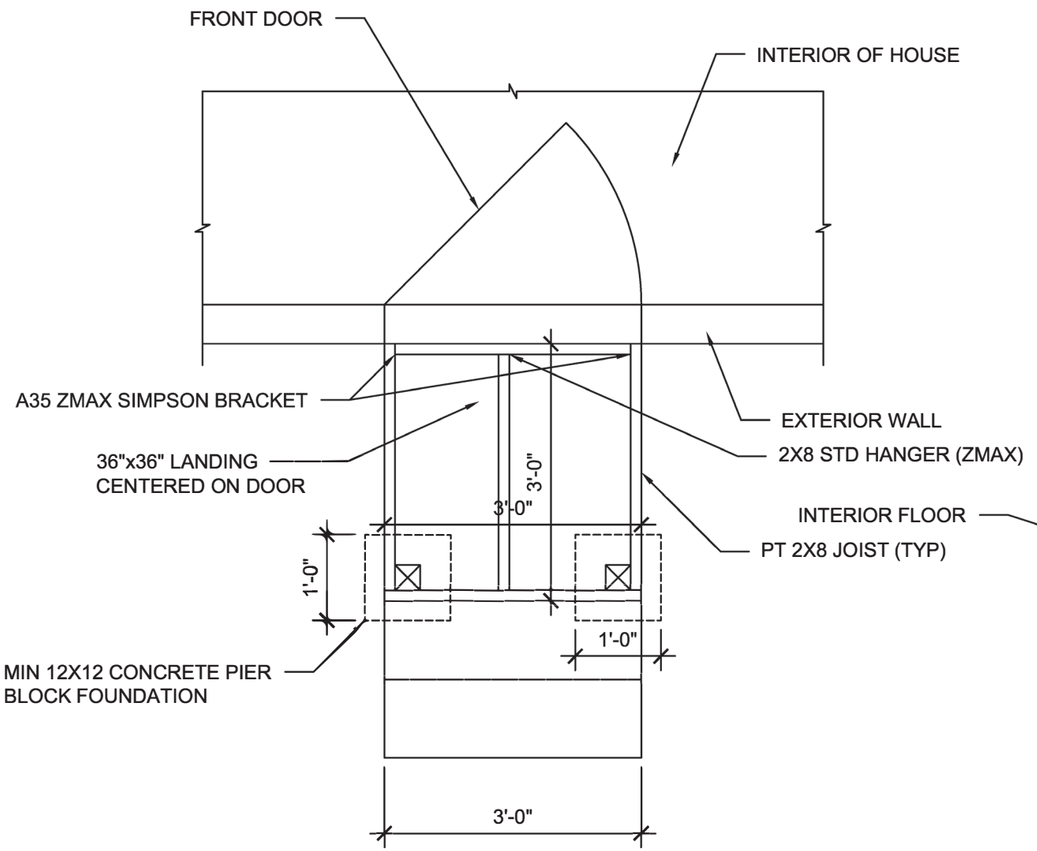
General Notes

Firm Name and Address
Wolf Industries
1511 SE 4th Ave
Battle Ground, WA 98604

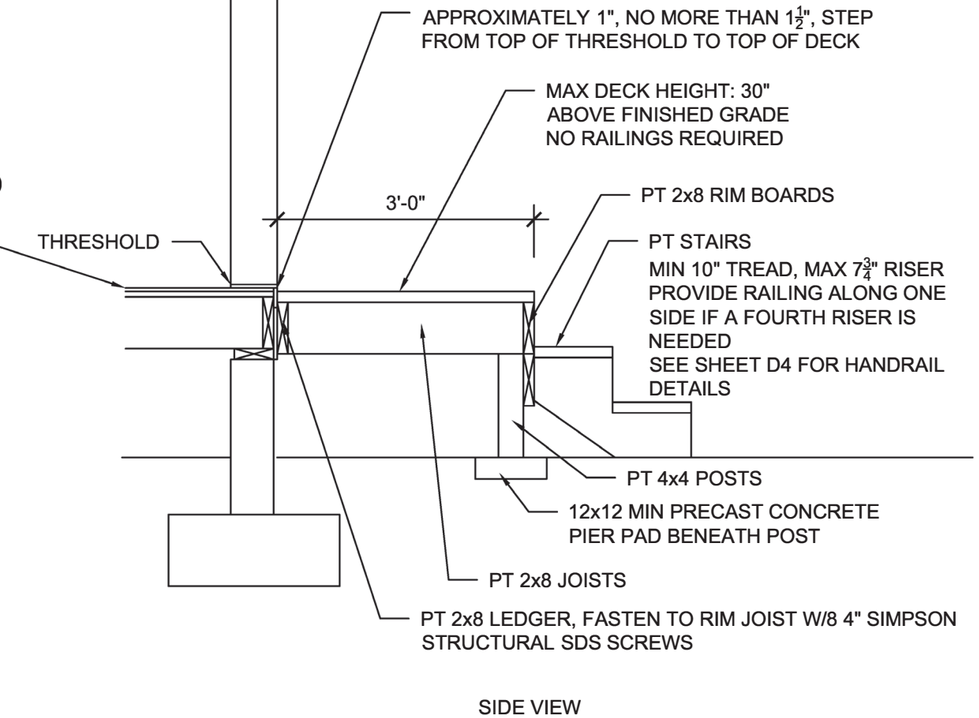
Project Name and Address

Project	Sheet
----	D2
Date	
Scale: N.A.	

Standard Details 2/9/2018 Daniel Landsem, Wolf Industries



TOP VIEW



SIDE VIEW

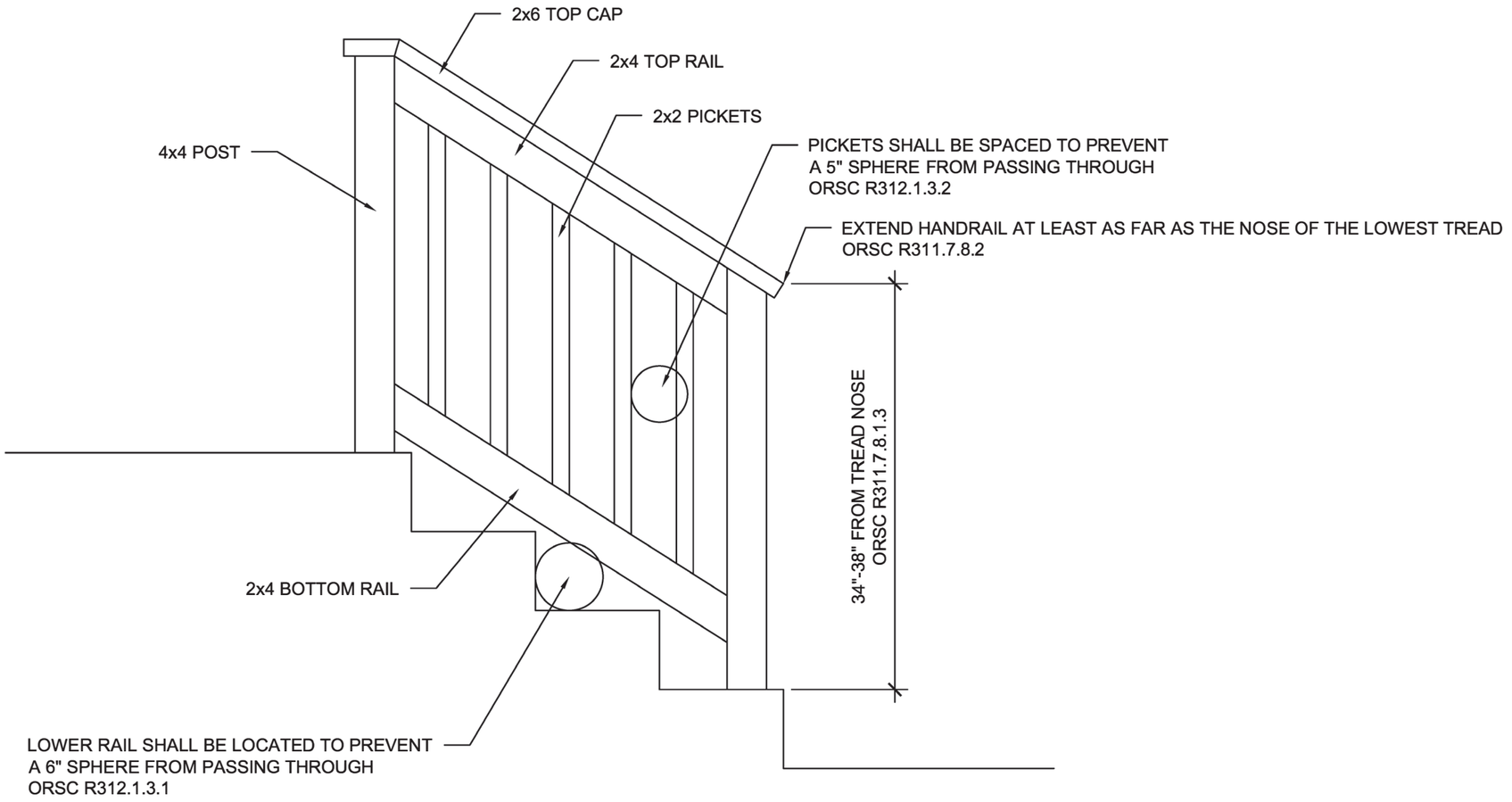
TYPICAL LANDING AND STAIRS DETAIL
Scale: N.A.

General Notes

Firm Name and Address
Wolf Industries
1511 SE 4th Ave
Battle Ground, WA 98604

Project Name and Address

Project	Sheet
----	D3C
Date	
Scale N.A.	



TYPICAL HANDRAIL DETAIL

Scale: N.A.

General Notes

Firm Name and Address

Wolf Industries
1511 SE 4th Ave
Battle Ground, WA 98604

Project Name and Address

Project

Date

Scale
N.A.

Sheet
D4

Standard Details

2/9/2018

Daniel Landsem, Wolf Industries

PROJECT STRUCTURAL NOTES: (STATE OF OREGON)

GENERAL INFORMATION:

1. GOVERNING CODE IS THE 2018 INTERNATIONAL BUILDING CODE AS AMENDED BY THE STATE OF OREGON WITH 2019 OREGON STRUCTURAL SPECIALTY CODE.
2. THE PROJECT WAS DESIGNED FOR THE FOLLOWING LOADS:
   a. LIVE LOADS:
      i. ROOF 30 PSF SNOW LOAD WITH SNOW DRIFT
      ii. FLOOR 40 PSF
   b. GROUND SNOW LOAD: 30 PSF
   c. WIND LOAD: 145 MPH EXPOSURE B (LRFD)
   d. SEISMIC LOAD: SEISMIC DESIGN CATEGORY: D
      SEISMIC SITE CLASS: D
      S_S = 0.901g
      S_1 = 0.412g
3. THE GENERAL CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING WORK.
4. SHOP DRAWINGS SHALL BE REQUIRED FOR REINFORCING STEEL, AND PREFABRICATED BEAMS OR AS REQUIRED BY REVIEWING JURISDICTION. SUBMIT 3 SETS OF DRAWINGS FOR REVIEW.
5. SHOP DRAWINGS, STAMPED BY A REGISTERED ENGINEER IN THE STATE OF OREGON ARE REQUIRED ON THE PREMANUFACTURED GANG-NAILED TRUSSES. SUBMIT 3 SETS OF DRAWINGS AND CALCULATIONS FOR REVIEW.
6. ALL FEATURES OF CONSTRUCTION NOT FULLY SHOWN SHALL BE OF THE SAME TYPE AND CHARACTER AS SHOWN FOR SIMILAR CONDITIONS, SUBJECT TO REVIEW OF AOR AND EOR.

SPECIAL INSPECTION:

1. SPECIAL INSPECTION REQUIRED SHALL BE PROVIDED PER IBC CHAPTER 17 AND AS REQUIRED BY LOCAL JURISDICTION.

FOUNDATIONS:

1. FOUNDATION SIZES ARE BASED ON AN ASSUMED TOTAL LOAD BEARING PRESSURE OF 1500 PSF PER MIN. IBC REQUIREMENTS. VERIFY WITH GEOTECHNICAL REPORT IF GEOTECHNICAL INVESTIGATION WAS PERFORMED.
2. ALL FOOTINGS SHALL BE PLACED ON FIRM, UNDISTURBED NATIVE SOIL, OR ON ENGINEERED FILL COMPACTED TO MINIMUM OF 95% OF THE ASTM d 1557 DENSITY U.N.O. BY THE GEOTECHNICAL REPORT.
3. BOTTOM OF ALL FOOTINGS TO BE EMBEDDED BELOW FROST DEPTH OR PER GEOTECHNICAL REPORT, WHICHEVER IS GREATER.

REINFORCING STEEL:

1. ALL REINFORCING STEEL SHALL CONFORM TO ASTM A 615 GRADE 60.
2. WELDED WIRE FABRIC TO BE PER ASTM A185.
3. PLACE 2-0 X 2-0 BARS AT CORNERS AND INTERSECTIONS.
4. ALL REINFORCING STEEL SHALL BE DETAILED, FABRICATED, AND PLACED IN ACCORDANCE WITH ACI DETAILING MANUAL 315.
5. LAP ALL REINFORCING BARS MINIMUM 30".
6. SECURELY TIE ALL REINFORCING PRIOR TO PLACING CONCRETE.
7. PROVIDE 3" CLEARANCE FOR ALL REINFORCING IN CONCRETE CAST AGAINST EARTH, 2" FOR CONCRETE EXPOSED TO AIR, AND 1 1/2" FOR ALL INTERIOR EXPOSURE.

CONCRETE:

1. ALL CONCRETE SHALL DEVELOP A MINIMUM 28-DAY LAB CURED COMPRESSIVE STRENGTH OF 2500 PSI.
2. ALL EXPOSED CONCRETE TO HAVE 5% PLUS OR MINUS 1% AIR, BY VOLUME, CONFORMING TO ASTM C 260.

FRAMING LUMBER:

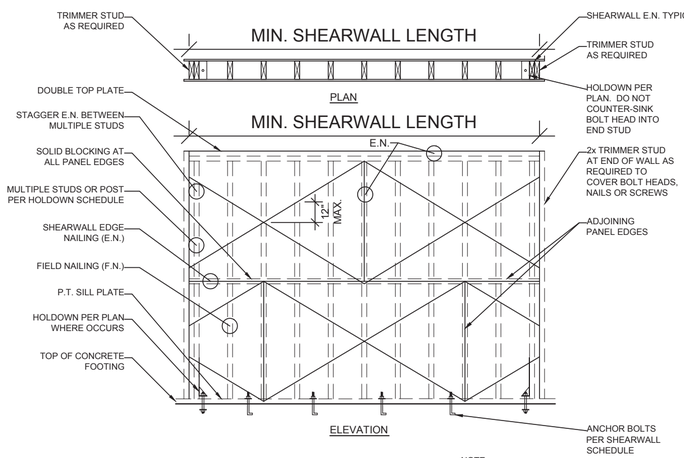
1. ALL FRAMING LUMBER SHALL BE DOUGLAS FIR-LARCH AND SHALL BE GRADED UNDER THE MOST RECENTLY ADOPTED RULES OF THE WEST COAST LUMBER INSPECTION BUREAU (WCLIB).
2. ALL BEAMS AND JOISTS SHALL BE NUMBER 2 OR NUMBER 1 AS INDICATED ON THE PLANS.
3. ALL STUDS AND BLOCKING SHALL BE NUMBER 2.
4. ALL LUMBER IN CONTACT WITH CONCRETE OR EXPOSED SHALL BE PRESSURE TREATED IN ACCORDANCE WITH AWPA STANDARD C-2 AND SHALL BEAR THE AWPA QUALITY MARK.
1. DOUBLE ALL JOISTS UNDER WALL PARTITIONS, AND PROVIDE BLOCKING BETWEEN JOISTS WHERE BEARING WALLS ARE PERPENDICULAR TO JOISTS.
6. ALL GLULAMS BEAMS TO BE 24F-V4 TYPICAL, 24F-V8 FOR CANTILEVERED OR CONTINUOUS SPAN.
7. ALL LVL LUMBER TO BE MICROLAM LVL OR APPROVED EQUAL.
8. ALL PSL LUMBER TO BE PARALLAM PSL OR APPROVED EQUAL.

PLYWOOD SHEATHING:

1. ALL PLYWOOD SHALL BE C-D GRADE WITH EXTERIOR GLUE MANUFACTURED IN ACCORDANCE WITH THE UNITED STATES PRODUCT STANDARD PS 1-83/ANSI A199.1 "FOR CONSTRUCTION AND INDUSTRIAL PLYWOOD" AND SHALL CONFORM TO UBC STANDARD 23-2 AND SHALL BEAR THE APA TRADEMARK OF THE APA.
2. PLYWOOD SHALL BE LAID WITH END JOINTS STAGGERED.
3. BLOCK ALL SHEAR WALL SHEATHING WITH 2X BLOCKING AT ALL EDGES.
4. ROOF SHEATHING TO BE UNBLOCKED ½" C-D 24/0 PLY WITH 8d AT 6" O.C. PANEL EDGE NAILING AND 12" O.C. FIELD NAILING TYPICAL.
5. FLOOR SHEATHING TO BE UNBLOCKED 3/4" T&G C-D 32/16 PLY WITH 10d AT 6" O.C. PANEL EDGE NAILING AND 12" O.C. FIELD NAILING TYPICAL, U.N.O.
2. EXTERIOR WALLS TO BE 3/8" EXPOSURE I, C-D PLY OR OSB SHEATHING WITH 10d AT 6" O.C. PANEL EDGE NAILING AND 12" O.C. FIELD NAILING UNO. SEE SHEARWALL CALLOUTS AND SCHEDULE.
7. OSB MAY BE SUBSTITUTED FOR PLYWOOD WITH SAME SPAN RATING.

TIMBER FASTENERS:

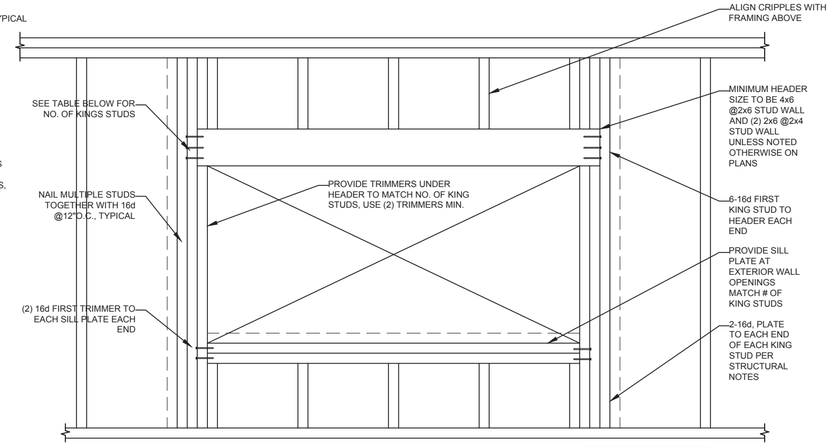
1. ALL TIMBER MATERIAL SHALL BE FASTENED PER IBC TABLE 2304.9.1, "FASTENING SCHEDULE" U.N.O.



1 / S1 **SHEARWALL DETAIL**

1" = 1'-0"

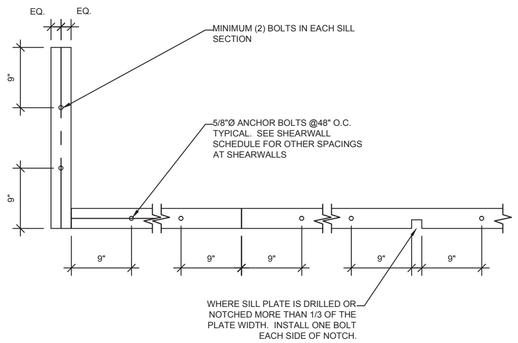
NOTE:
SHEATHING MAYBE HORIZONTAL OR VERTICAL. EITHER IS ACCEPTABLE W/ SAME REQUIREMENTS MET



HDR LENGTH	NO. OF KING STUDS
L ≤ 6'-0"	1
6'-0" ≤ L ≤ 10'-0"	2
10'-0" ≤ L ≤ 12'-0"	3

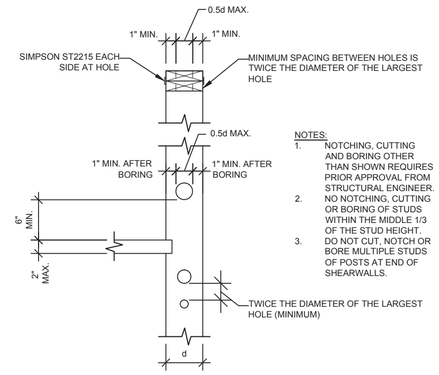
2 / S1 **TYPICAL WALL OPEN'G ELEVATION**

1" = 1'-0"



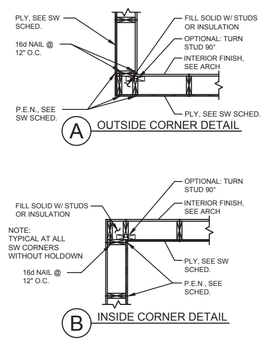
3 / S1 **TYPICAL SILL PLATE NOTCH DETAIL**

1" = 1'-0"



4 / S1 **TYPICAL STUD NOTCHING/ CUTTING AND BORING**

1" = 1'-0"



5 / S1 **SHEARWALL DETAIL @ CORNER**

1" = 1'-0"

STRUCTURAL
11815 NE 113th St, Ste 104
360-901-6463

NO	BY	DATE
PLAN CHECK REVIEW COMMENTS		

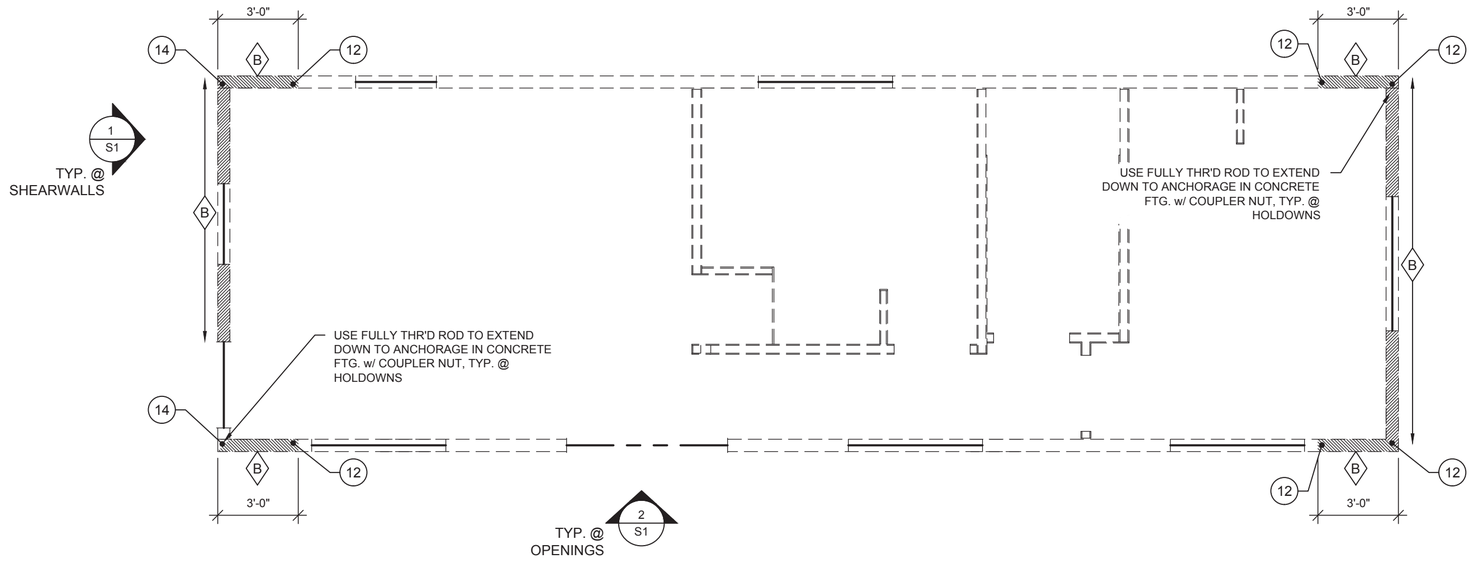
WOLF INDUSTRIES
TINY HOUSE_MODEL E
| STATE OF WASHINGTON |

DATE:	07-22-2020
DRAWN BY:	JES
CHECK BY:	JES
JOB:	18-081

STRUCTURAL NOTES SCHEDULES & DETAILS

SHEET:

S1

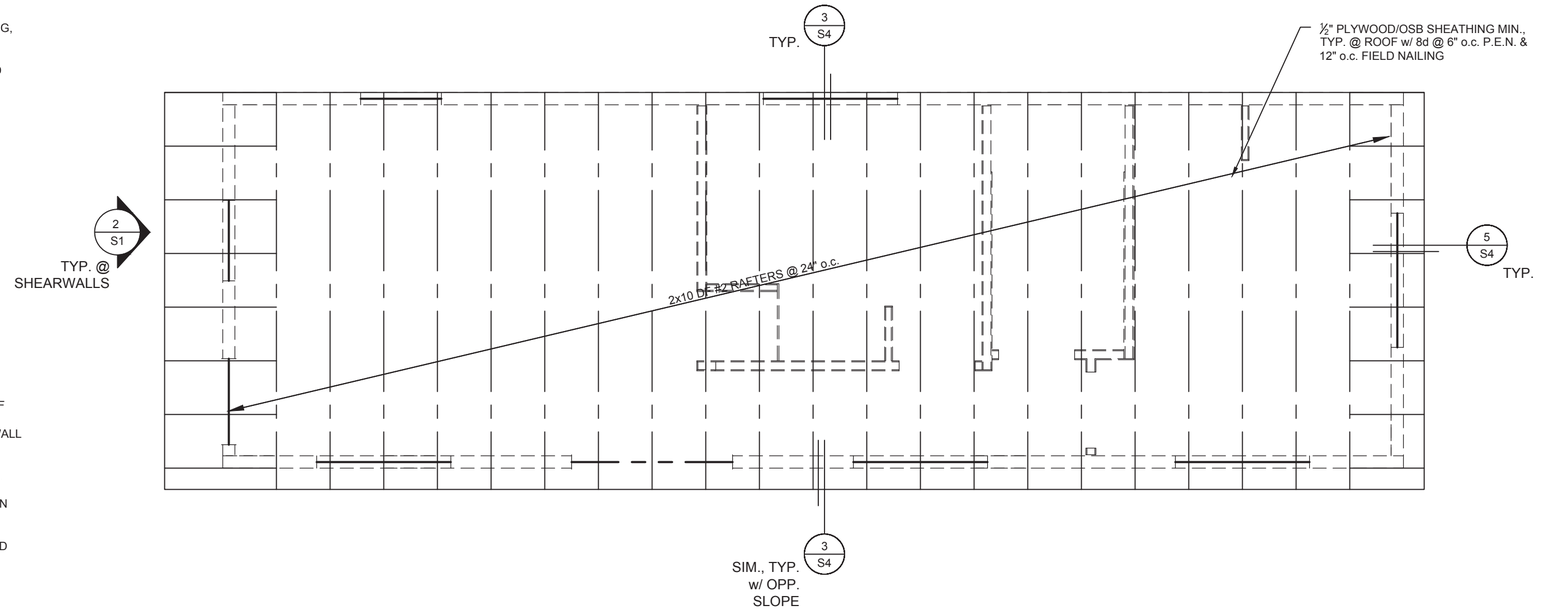


1/S2 STRUCTURAL SHEARWALL/HOLDOWN PLAN

1/4" = 1'-0"

FOUNDATION AND FRAMING PLAN NOTES:

1. DIMENSIONS SHOWN ARE FOR REFERENCE ONLY, CONFIRM W/ DESIGNER PLANS & DETAILS FOR ALL DIMENSIONING.
2. CRIPPLE WALLS, AS REQUIRED, TO BE NAILED SAME AS FULL HEIGHT WALL ABOVE.
3. (X) INDICATES HOLDDOWN TYPE & LOCATION. HOLDDOWNS TO BE LOCATED AT END OF SHEARWALLS, TYPICAL U.N.O. ON PLAN.
4. BOTTOM OF FOOTINGS TO BE PLACED BELOW FROST DEPTH.
5. ALL FOOTINGS ARE TO BE CENTERED UNDER COLUMNS U.N.O. ALL WOOD POSTS TO HAVE SIMPSON BP, U.N.O.
6. ALL FOOTINGS TO BEAR OVER GRADE OVER FIRM, UNDISTURBED, NON-ORGANIC, NON-EXPANSIVE NATIVE MATERIAL, OR STRUCTURAL FILL AS REQUIRED PER GEOTECHNICAL REPORT.
7. REFER TO 3/S1 AND 4/S1 FOR ALL PLATE AND STUD TYPICAL NOTCHING, BORING AND CUTTING REQUIREMENTS.
8. REFER TO S1 FOR STRUCTURAL NOTES AND S3 FOR SHEARWALL AND HOLDOWN SCHEDULE.
9. ALL BEAMS TO HAVE SOLID STUD BEARING MINIMUM FROM BEARING LOCATION DOWN TO FOUNDATION.



2/S2 ROOF FRAMING PLAN

1/4" = 1'-0"

ROOF FRAMING NOTES:

1. COORDINATE ALL DIMENSIONS & FEATURES NOT SHOWN WITH ARCHITECTURAL PLANS.
2. (A) INDICATES SHEARWALL TYPE, SEE SHEARWALL SCHEDULE.
3. (A) INDICATES PERFORATED SHEARWALL. ARROWS INDICATE LENGTH OF PERFORATED SHEARWALL. PROVIDE NAILING PER SHEARWALL SCHEDULE @ PANEL EDGES & AROUND ALL OPENINGS FOR ENTIRE WALL LENGTH
4. INDICATES SHEARWALL LOCATION BELOW FRAMING. SEE SCHEDULE.
5. TYPICAL EXTERIOR HEADER IS 4X6 D.F. USE (2) 2x6 TRIMMERS UNO ON PLANS.
6. SEE SHEET S1 FOR STRUCTURAL NOTES AND S3 FOR SHEARWALL AND HOLDOWN SCHEDULE.

STRUCTURAL
11815 NE 113th St, Ste 104
360-901-6463

NO	BY	DATE
PLAN CHECK REVIEW COMMENTS		

WOLF INDUSTRIES
TINY HOUSE_MODEL E
| STATE OF WASHINGTON |

DATE:	07-22-2020
DRAWN BY:	JES
CHECK BY:	JES
JOB:	18-081

STRUCTURAL LAYOUT

SHEET:

S2

REGISTERED PROFESSIONAL ENGINEER
56354
OREGON
JULY 13, 2004
JASON E. STANEK
EXPIRES: 6/30/22

SHEARWALL SCHEDULE (Not All Symbols Used on Plans)

◇X◇	SHEATHING	SHEAR (PLF)	NAIL/STAPLE SIZE	EDGE NAILS/ STAPLES (O.C.)	FIELDNAILS/ STAPLES (O.C)	BOT. PLATE NAILING (O.C)	TOP PLATE A35 (O.C)	5/8"x10" A.B. (O.C.)	REMARKS
G1	5/8" GYPSUM, ONE SIDE	88	7d COOLER	4"	10"	16d @ 12"	5'-0"	6'-0"	
A	7/16" APA RATED, ONE SIDE	260	8d/16 GA	6"/4"	12"	16d @ 6"	1'-9"	5'-0"	
B	7/16" APA RATED, ONE SIDE	349	8d/16 GA	4"/3"	12"	16d @ 4"	1'-0"	3'-6"	
C	7/16" APA RATED, ONE SIDE	490	8d/16 GA	3"/2"	12"	16d @ 3"	0'-11"	2'-9"	
D	7/16" APA RATED, ONE SIDE	640	8d	2"	12"	16d @ 2"	0'-8"	2'-0"	USE 3x STUDS

1. ALL PLYWOOD TO BE APA RATED STRUCTURAL 1 EXTERIOR SHEATHING
2. ALL NAILS TO BE COMMON OR GALVANIZED BOX TYPE.
3. FLOOR AND ROOF DIAPHRAGMS TO BE NAILED WITH 10d NAILS @ 6" O.C. EDGE NAILING AND 12" ON CENTER FIELD NAILING. USE PLYWOOD THICKNESS AS INDICATED ON PLAN.
4. ATTACH RIM JOIST AND / OR BLOCKING TO SHEARWALL AS INDICATED IN TABLE ABOVE.
5. ALL WALL SHEATHING TO EXTEND FULL HEIGHT OF WALL, TOP PLATE TO BOTTOM PLATE.
6. ALL SHEARWALLS AND HOLDOWNS MUST HAVE CONTINUOUS LOAD PATH TO FOUNDATION.
7. USE 3" x 3" x 1/4" PLATE WASHER TYPICAL AT ALL ANCHOR BOLTS.
8. WHERE TOP PLATE FASTENING IS LESS THAN 12" O.C., USE MINIMUM BLOCKING OF 2-1/2" MANUFACTURED LUMBER (MICROLLAM LVL, OR PARALLAM PSL).
9. GYPSUM SHEATHING TO BE ATTACHED WITH SCREWS (TYPE AS NOTED IN SCHEDULE). SCREWS FOR ATTACHMENT OF GYPSUM SHEATHING MUST BE TYPE W OR S.
10. ALL SHEAR WALLS TO BE FULLY BLOCKED U.N.O. BLOCKING TO MATCH REQUIREMENTS FOR PANEL EDGE STUDS.
11. FOR SHEARWALLS W/ (2) ROWS OF BOTTOM PLATE NAILING, USE MIN. 1-3/4" RIM BOARD, SPACE ROWS A MIN. OF 1/2" APART, AND STAGGER NAILS.
12. FOR SHEARWALLS W/ STUDS SPACED AT 16" O.C. MAX. INSTALL SHEATHING WITH LONG DIMENSION ACROSS STUDS.

HOLDOWN SCHEDULE (Not All Symbols Used on Plans)

(Y)	SIMPSON MODEL	ALLOWABLE LOAD (LBS.)	MINIMUM POST THICKNESS	FASTENERS	ANCHORS	REMARKS
4A	MSTCM40	4220	(2) 2x STUDS	26-16d SINKERS 14- 1/4x1 3/4 TITEN	-	IN WOOD IN CONCRETE
4B	MSTC40	2695	(2) 2x STUDS	18-16d SINKERS	-	
12	HDU2-SDS2.5	3075	(2) 2x STUDS	10 SDS1/4x3-1/2 SCREWS	SSTB16	
14	HDU5-SDS2.5	5465	(2) 2x STUDS	16 SDS1/4x3-1/2 SCREWS	SSTB20	

1

1. NAILS ARE TO BE COMMON WIRE NAILS, U.N.O.
2. HARDWARE IS TO BE SIMPSON, U.N.O.
3. HOLDOWN HARDWARE CAN BE EXTENDED WITH A307 THRD ROD AND COUPLER.
4. ALIGN ALL HOLDOWNS FOR THE FULL HEIGHT OF STRUCTURE.
5. ALL HARDWARE TO BE INSTALLED PER MANUFACTURE'S SPECIFICATIONS.
6. HOLDOWN ANCHOR BOLTS ARE IN ADDITION TO TYPICAL SILL PLATE ANCHOR BOLTS.
7. CAPACITIES PER REVISED SIMPSON CATALOG C-2015.
8. EXTEND THREADED ROD TO WITHIN 3" CLEAR OF BOTTOM OF FOOTING.
9. STRAP HOLDOWNS (MSTC ETC.) LOADS ARE BASED ON FLOOR TO FLOOR CLEAR SPAN TABLES W/ A CLEAR SPAN OF 18" (11 7/8-12 DEPTH).

FOUNDATION AND FRAMING PLAN NOTES:

1. DIMENSIONS SHOWN ARE FOR REFERENCE ONLY, CONFIRM W/ DESIGNER PLANS & DETAILS FOR ALL DIMENSIONING.
2. CRIPPLE WALLS, AS REQUIRED, TO BE NAILED SAME AS FULL HEIGHT WALL ABOVE.
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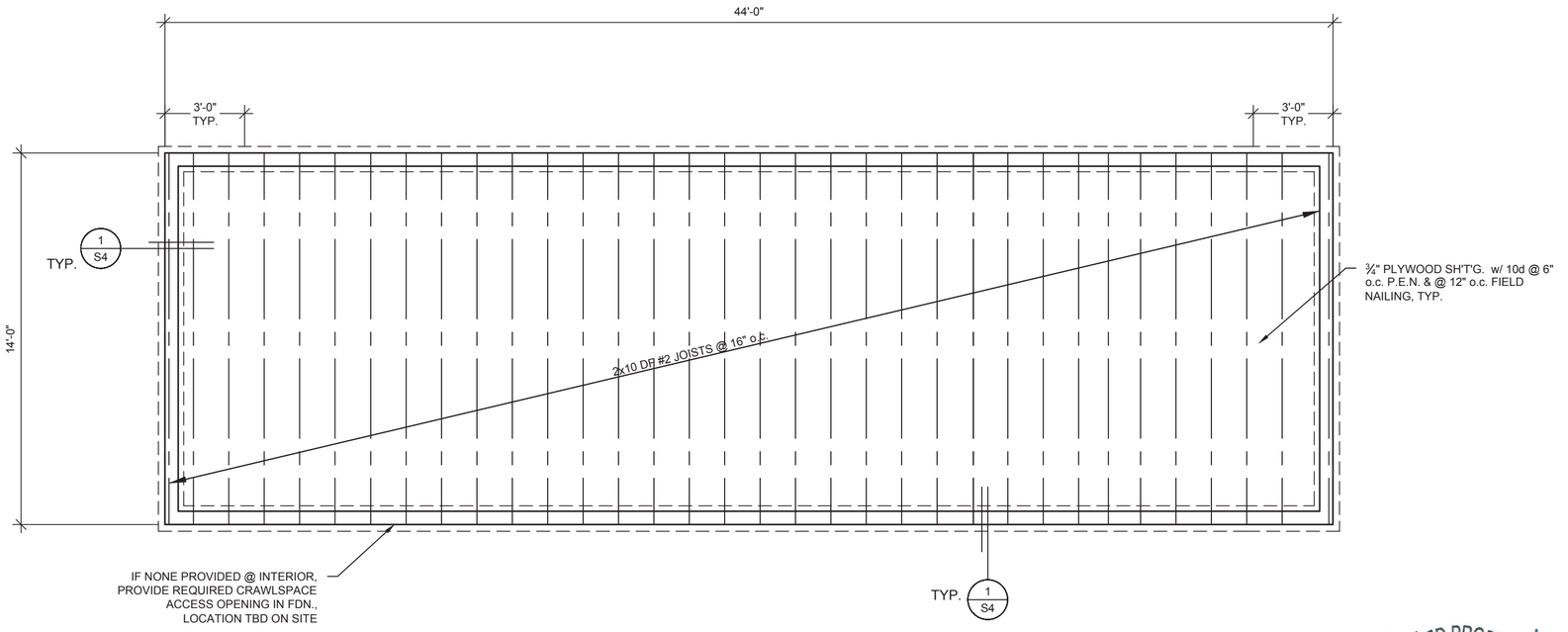
9. ALL BEAMS TO HAVE SOLID STUD BEARING MINIMUM FROM BEARING LOCATION DOWN TO FOUNDATION.



1/S3 **FOUNDATION/FLOOR FRAMING PLAN**

1/4" = 1'-0"

REGISTERED PROFESSIONAL ENGINEER 56354 OREGON JULY 13, 2004 JASON E. STANEK EXPIRES: 6/30/22

STRUCTURAL
11815 NE 113th St, Ste 104
360-901-6463

NO	BY	DATE

PLAN CHECK REVIEW COMMENTS

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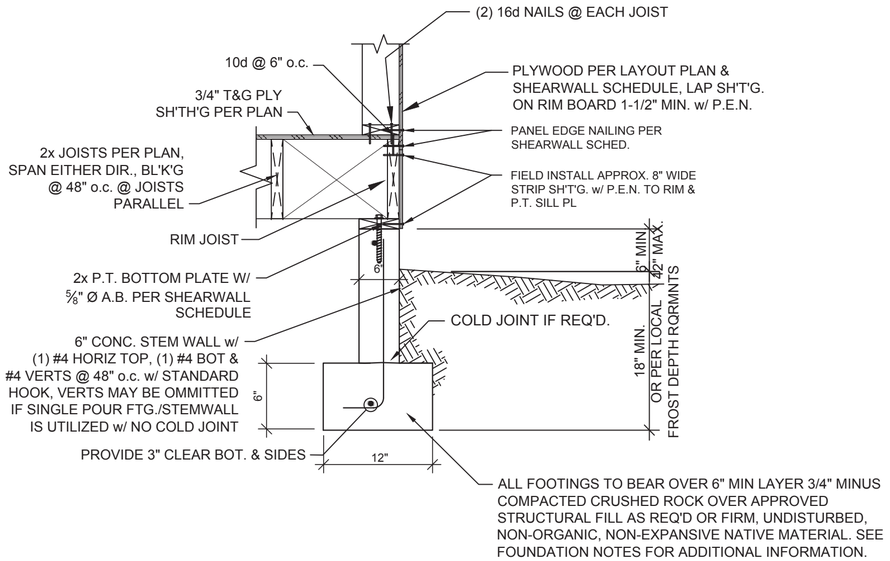
TINY HOUSE_MODEL E
| STATE OF WASHINGTON |

DATE:	07-22-2020
DRAWN BY:	JES
CHECK BY:	JES
JOB:	18-081

STRUCTURAL LAYOUT, FRAMING & FOUNDATION

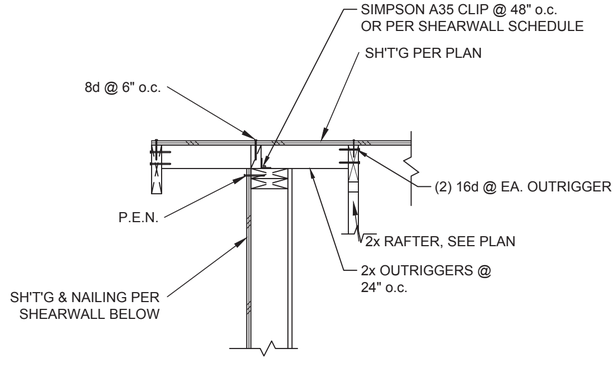
SHEET:

S3



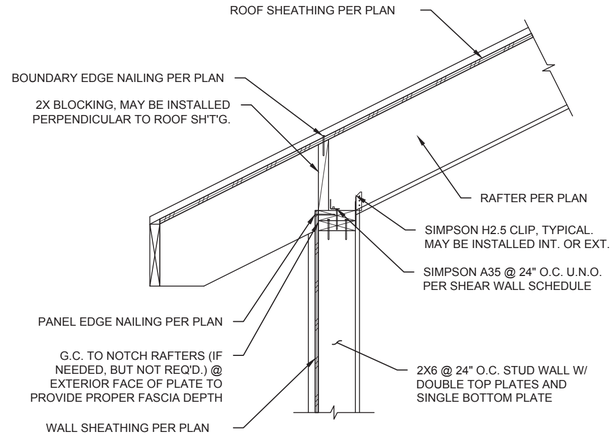
1/S4 SECTION @ FOUNDATION

3/4" = 1'-0"



2/S4 SECTION @ POST/BM./FTG.

3/4" = 1'-0"



3/S4 SECTION @ FRAMING

3/

4/S4 NOT USED

3/4" = 1'-0"

5/S4 SECTION @ OUTRIGGER

3/4" = 1'-0"

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360-901-6463

NO	BY	DATE
	PLAN CHECK REVIEW COMMENTS	

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TINY HOUSE_MODEL E
| STATE OF WASHINGTON |

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JOB:	18-081

STRUCTURAL DETAILS

SHEET:

S4

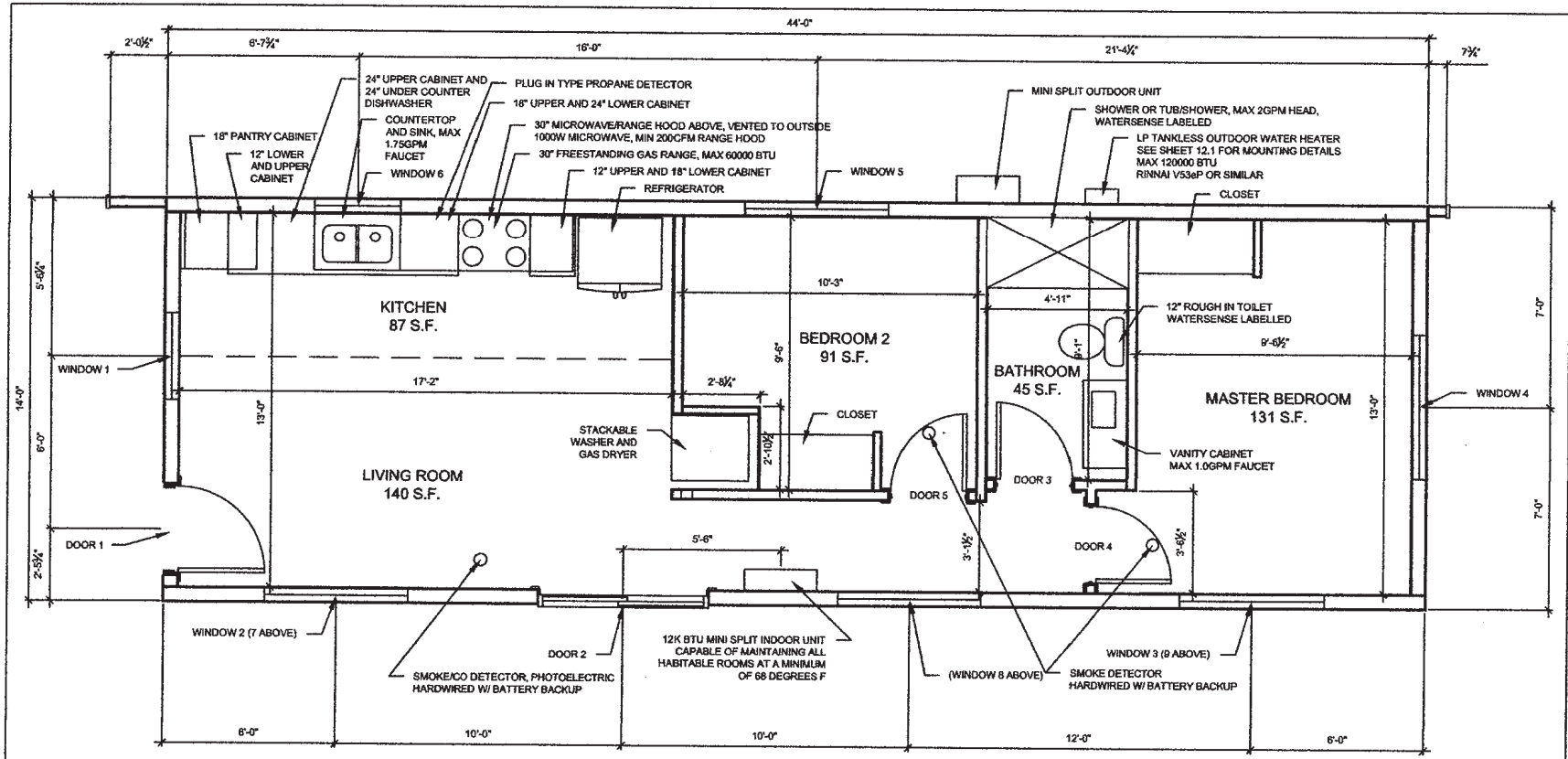
REGISTERED PROFESSIONAL ENGINEER
56354
OREGON
JULY 13, 2004
JASON E. STANEK
EXPIRES: 6/30/20 22

PROJECT DESCRIPTION:

Provide analysis and design for the new wood framed single story tiny home, 14' wide x 44' long. Standard wood framed design with 2x rafter, shed roof construction and solid wood joist floor. Lateral forces induced by wind and/or seismic loads will be resisted via horizontally sheathed roof diaphragm and vertically sheathed shearwalls that carry loads down to concrete foundations as needed.

CONTENTS:

Sample Plans/Elevations/Sections	P-1/P-5
Lateral Force Analysis	LFA-1/LFA-9
Framing Design	F-1/F-8



DOOR SCHEDULE

LABEL	LOCATION	WIDTH	HEIGHT	HARDWARE	DOOR TYPE
1	ENTRY	3'-0"	6'-8"	ENTRY W/ DEADBOLT	EXTERIOR PREHUNG
2	SIDE	6'-0"	6'-8"	INTEGRAL	SLIDING
3	BATHROOM	2'-6"	6'-8"	PRIVACY	INTERIOR PREHUNG
4	MASTER BEDROOM	2'-6"	6'-8"	PRIVACY	INTERIOR PREHUNG
5	BEDROOM 2	2'-6"	6'-8"	PRIVACY	INTERIOR PREHUNG

WINDOW SCHEDULE

LABEL	WIDTH	HEIGHT	OPERATION	FRAME	GLASS
1	3'-0"	3'-0"	SLIDER	VINYL	ANNEALED
2	5'-0"	4'-0"	SLIDER	VINYL	TEMPERED
3	5'-0"	4'-0"	SLIDER	VINYL	ANNEALED
4	5'-0"	1'-6"	PICTURE	VINYL	ANNEALED
5	5'-0"	4'-0"	SLIDER	VINYL	ANNEALED
6	3'-0"	3'-0"	SLIDER	VINYL	ANNEALED
7	5'-0"	1'-6"	PICTURE	VINYL	ANNEALED
8	5'-0"	1'-6"	PICTURE	VINYL	ANNEALED
9	5'-0"	1'-6"	PICTURE	VINYL	ANNEALED

MODEL C FLOOR PLAN
Scale: 1/4" = 1'-0"

General Notes

ALL "HABITABLE SPACES" EXCEPT KITCHEN SHALL BE AT LEAST 70 S.F. (2017 ORSC R304.1)

UNDERFLOOR ACCESS SHALL BE PROVIDED FROM EXTERIOR THROUGH FOUNDATION (2017 ORSC R408.4)

ALL PERMANENTLY INSTALLED LIGHTING FIXTURES SHALL HAVE HIGH EFFICACY LAMPS

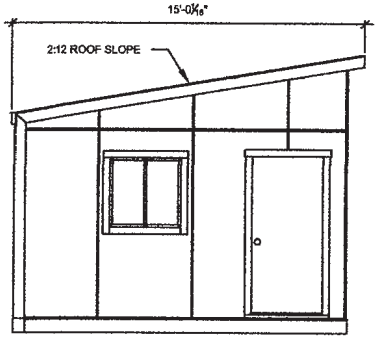
Firm Name and Address
Wolf Industries
1511 SE 4th Ave
Battle Ground, WA 98604

Project Name and Address

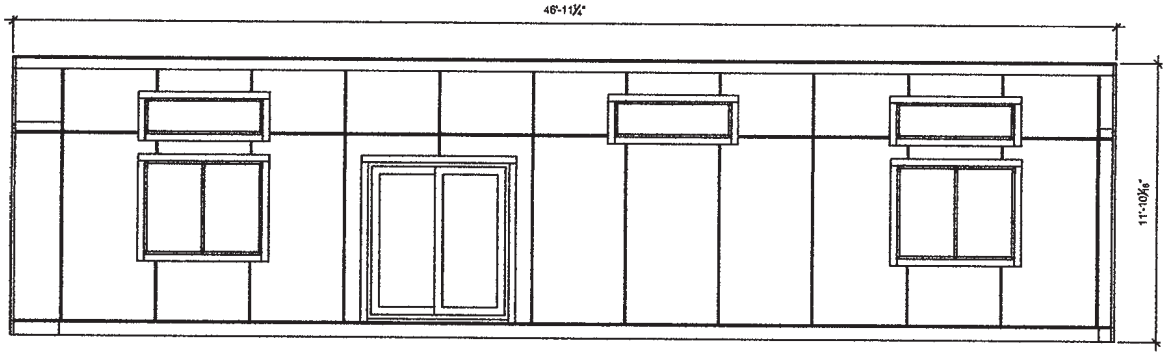
Project ---
Date
Scale N.A.
Sheet A1

Daniel Landsem, Wolf Industries 7/5/2018 Model E

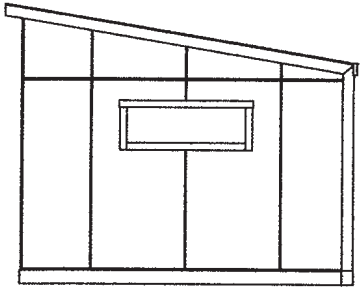
A1.5



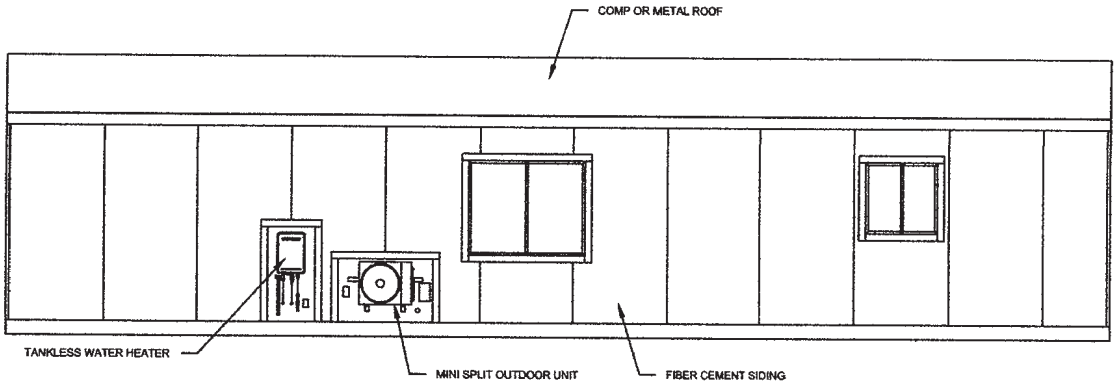
LEFT ELEVATION
Scale: 3/16" = 1'-0"



FRONT ELEVATION
Scale: 3/16" = 1'-0"



RIGHT ELEVATION
Scale: 3/16" = 1'-0"



BACK ELEVATION
Scale: 3/16" = 1'-0"

General Notes

Firm Name and Address
Wolf Industries
1511 SE 4th Ave
Battle Ground, WA 98604

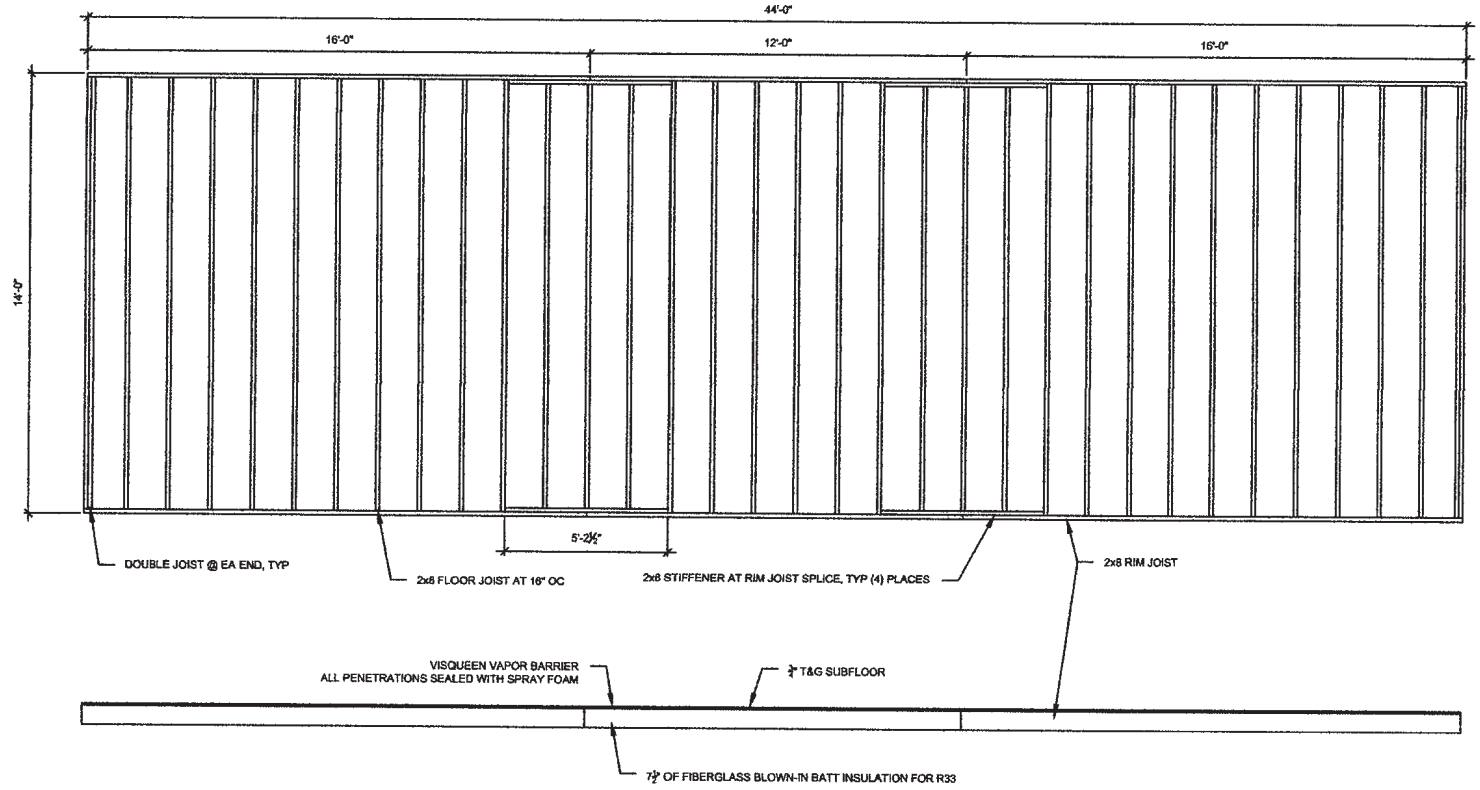
Project Name and Address
—

Project
—
Date
Scale
N.A.

Sheet
A2

Daniel Landsem, Wolf Industries 7/5/2018 Model E

P.2



FLOOR FRAMING PLAN AND ELEVATION

Scale: 1/4" = 1'-0"

General Notes

Firm Name and Address

Wolf Industries
1511 SE 4th Ave
Battle Ground, WA 98604

Project Name and Address

—

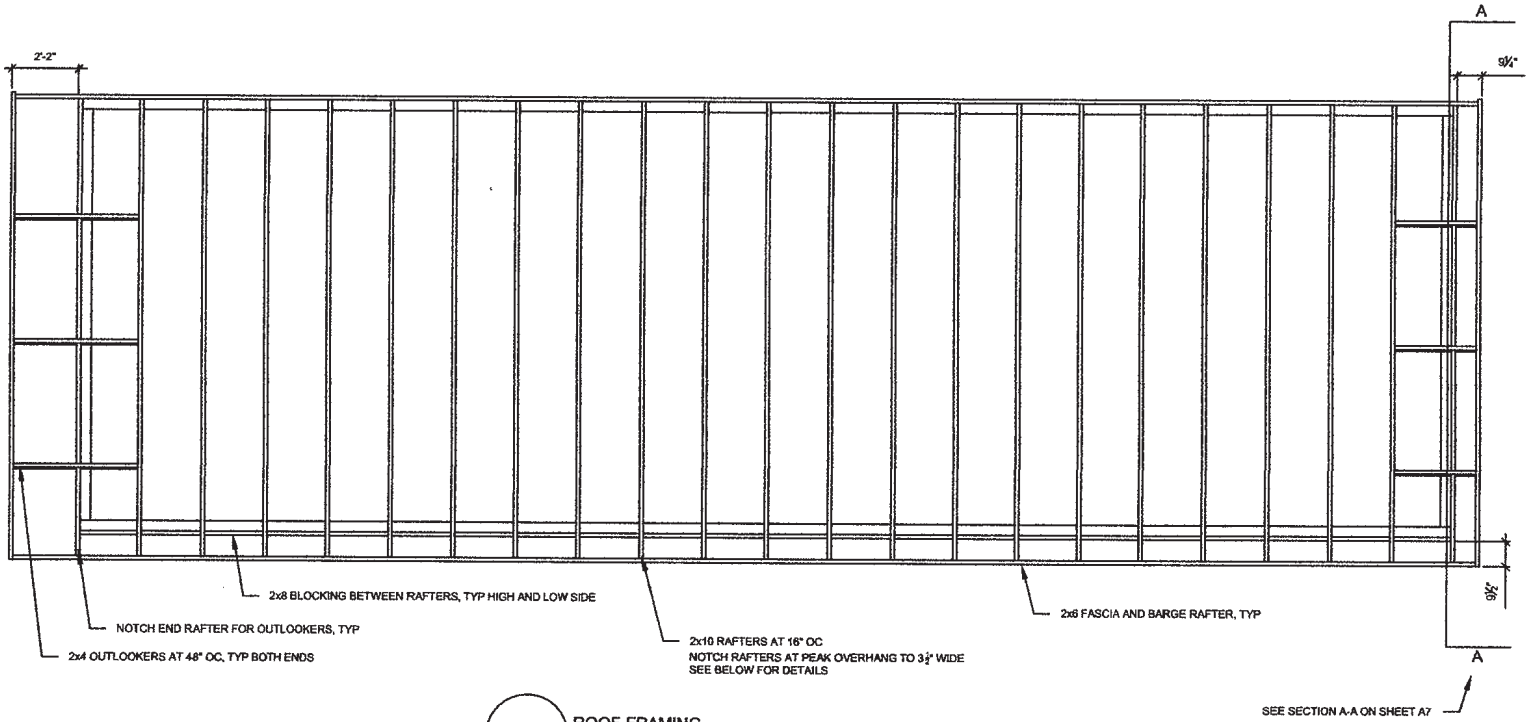
Project —

Date

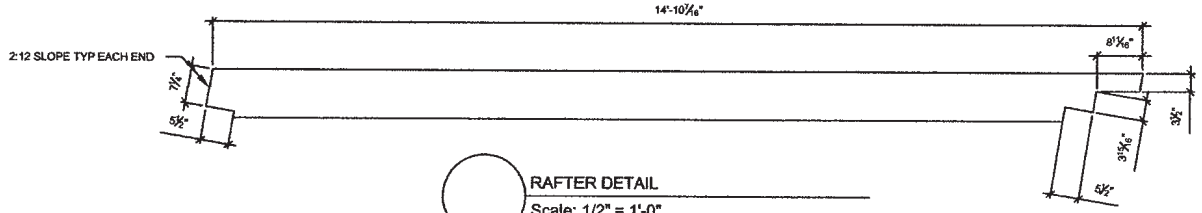
Scale N.A.

Sheet A4

Daniel Landsem, Wolf Industries 7/5/2018 Model E



ROOF FRAMING
Scale: 1/4" = 1'-0".



RAFTER DETAIL
Scale: 1/2" = 1'-0".

General Notes

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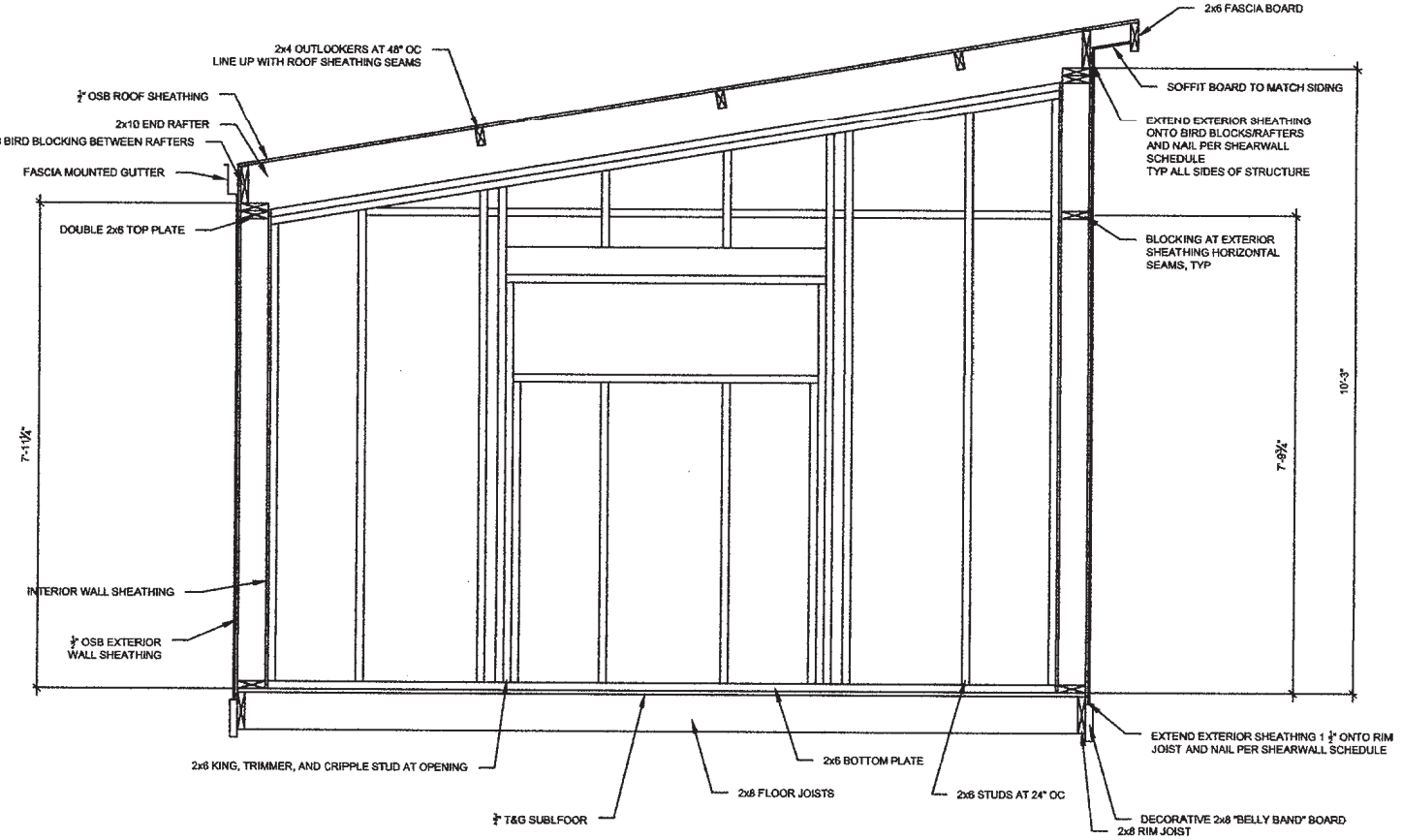
Wolf Industries
1511 SE 4th Ave
Battle Ground, WA 98604

Project Name and Address
—

Project —
Date
Scale N.A.
Sheet A6

Daniel Landsem, Wolf Industries 7/5/2018 Model E

R+



SECTION A-A - SECTION AT END WALL
Scale: 1/2" = 1'-0"

General Notes

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1511 SE 4th Ave
Battle Ground, WA 98604

Project Name and Address

Project

Date
Scale
N.A.

Sheet
A7

Daniel Landsem, Wolf Industries 7/5/2018 Model E

P.57

JS STRUCTURAL, PLLC
11815 NE 113th Street, Ste 104, Vancouver, WA 98662
c. 360.901.6463
o. 360.883.5331

WOLF INDUSTRIES
TINY HOUSE_MODEL
JS Project No.: 18-081

BUILDING FORCES:

-
- International Building Code 2015/Oregon Structural Specialty Code 2017/ASCE 7-10

Simplified Wind: 145 mph-3 second Gust (LRFD)
Exposure Type 'B'

Equivalent Lateral Force Procedure:

S_s =	.987g
S_1 =	0.5424g
R =	6.5
I =	1.0
Soil Type =	'D'
SDC =	'D'
S_{ds} =	0.727g
S_{d1} =	0.446g

- Typical Plate Height = 8'-0"
- Roof Slope = 3:12 === 14°
- Mean Roof Height, h_n = 8' + 4/2' = 10'
- a = 0.4 (hn) OR a = 0.1 (Least Dimension) BUT NOT LESS THAN 3'
  a = 0.4(10') OR a = 0.1(14')
  a = 4.0' OR a = 1.4' 3' CONTROLS
  a = 3'
  2a = 6'

A = End Zone of Wall = 25.7 psf
B = End Zone of Roof = 10.0 psf
C = Interior Zone of Wall = 18.0 psf
D = Interior Zone of Roof = 6.0psf
γ = 1.0

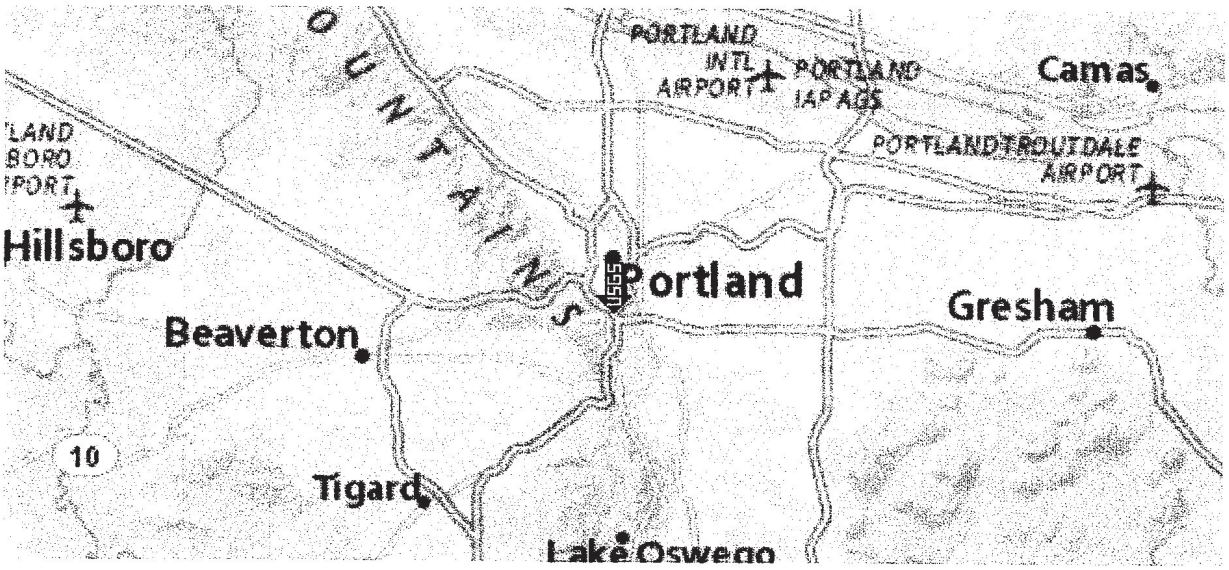
A' = End Zone of Wall = psf
B' = End Zone of Roof = psf
C' = Interior Zone of Wall = psf
D' = Interior Zone of Roof = psf

USGS Design Maps Summary Report

LRA.2

User-Specified Input

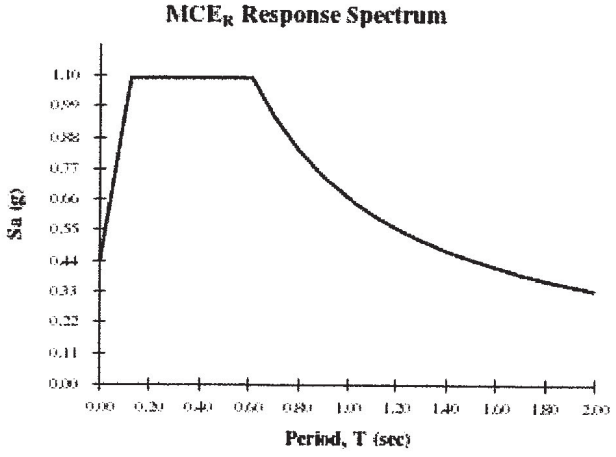
Report Title	Tiny Home_Oregon Wed August 1, 2018 16:10:07 UTC
Building Code Reference Document	2012/2015 International Building Code (which utilizes USGS hazard data available in 2008)
Site Coordinates	45.51176°N, 122.67557°W
Site Soil Classification	Site Class D – "Stiff Soil"
Risk Category	I/II/III

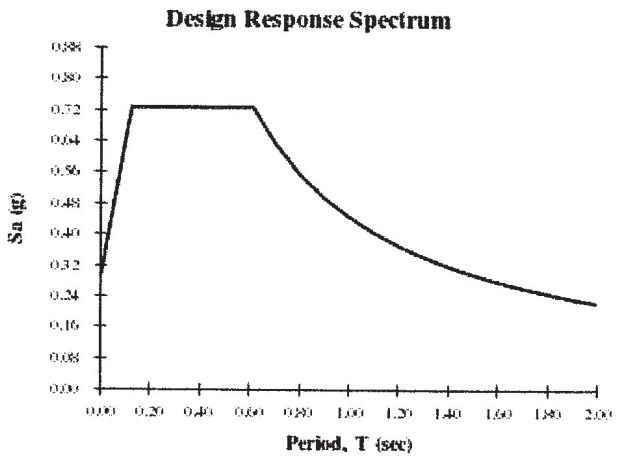


USGS-Provided Output

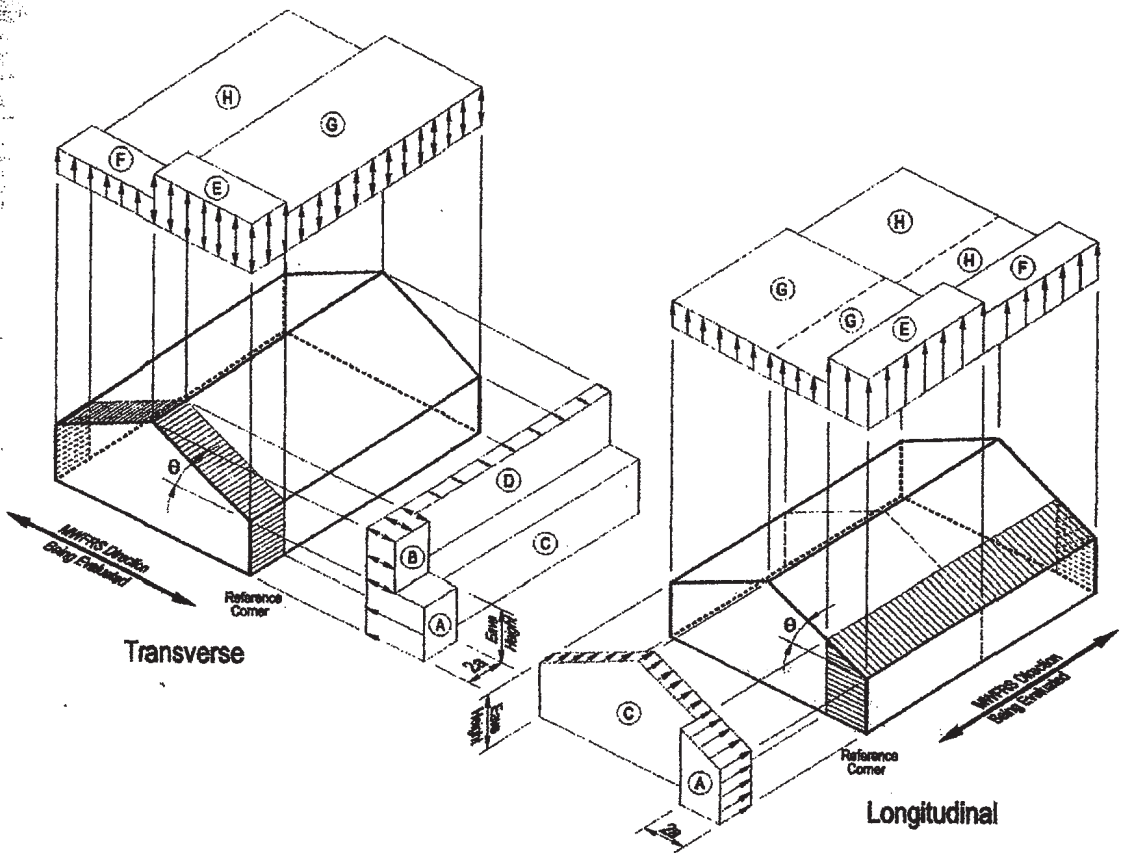
S_S =	0.987 g	S_{MS} =	1.091 g	S_{DS} =	0.727 g
S_1 =	0.424 g	S_{M1} =	0.668 g	S_{D1} =	0.446 g

For information on how the SS and S1 values above have been calculated from probabilistic (risk-targeted) and deterministic ground motions in the direction of maximum horizontal response, please return to the application and select the "2009 NEHRP" building code reference document.





Main Wind Force Resisting System – Method 1		h ≤ 60 ft.
Figure 6-2	Design Wind Pressures	Walls & Roofs
Enclosed Buildings		



Notes:

1. Pressures shown are applied to the horizontal and vertical projections, for exposure B, at h=30 ft (9.1m), I=1.0, and K_{zt} = 1.0. Adjust to other conditions using Equation 6-1.
2. The load patterns shown shall be applied to each corner of the building in turn as the reference corner. (See Figure 6-10)
3. For the design of the longitudinal MWFRS use $\theta = 0°$, and locate the zone E/F, G/H boundary at the mid-length of the building.
4. Load cases 1 and 2 must be checked for $25° < \theta \leq 45°$. Load case 2 at 25° is provided only for interpolation between 25° to 30°.
5. Plus and minus signs signify pressures acting toward and away from the projected surfaces, respectively.
6. For roof slopes other than those shown, linear interpolation is permitted.
7. The total horizontal load shall not be less than that determined by assuming $p_s = 0$ in zones B & D.
8. The zone pressures represent the following:
   Horizontal pressure zones – Sum of the windward and leeward net (sum of internal and external) pressures on vertical projection of:
   - A - End zone of wall
   - B - End zone of roof
   - C - Interior zone of wall
   - D - Interior zone of roof

   Vertical pressure zones – Net (sum of internal and external) pressures on horizontal projection of:
   - E - End zone of windward roof
   - F - End zone of leeward roof
   - G - Interior zone of windward roof
   - H - Interior zone of leeward roof
9. Where zone E or G falls on a roof overhang on the windward side of the building, use E_{OH} and G_{OH} for the pressure on the horizontal projection of the overhang. Overhangs on the leeward and side edges shall have the basic zone pressure applied.
10. Notation:
    - *a:* 10 percent of least horizontal dimension or 0.4h, whichever is smaller, but not less than either 4% of least horizontal dimension or 3 ft (0.9 m).
    - *h:* Mean roof height, in feet (meters), except that eave height shall be used for roof angles <10°.
    - *θ:* Angle of plane of roof from horizontal, in degrees.

LFA-4

Simplified Design Wind Pressure, p_{s30} (psf) *(Exposure B at h = 30 ft., K_{zt} = 1.0, with I = 1.0)*

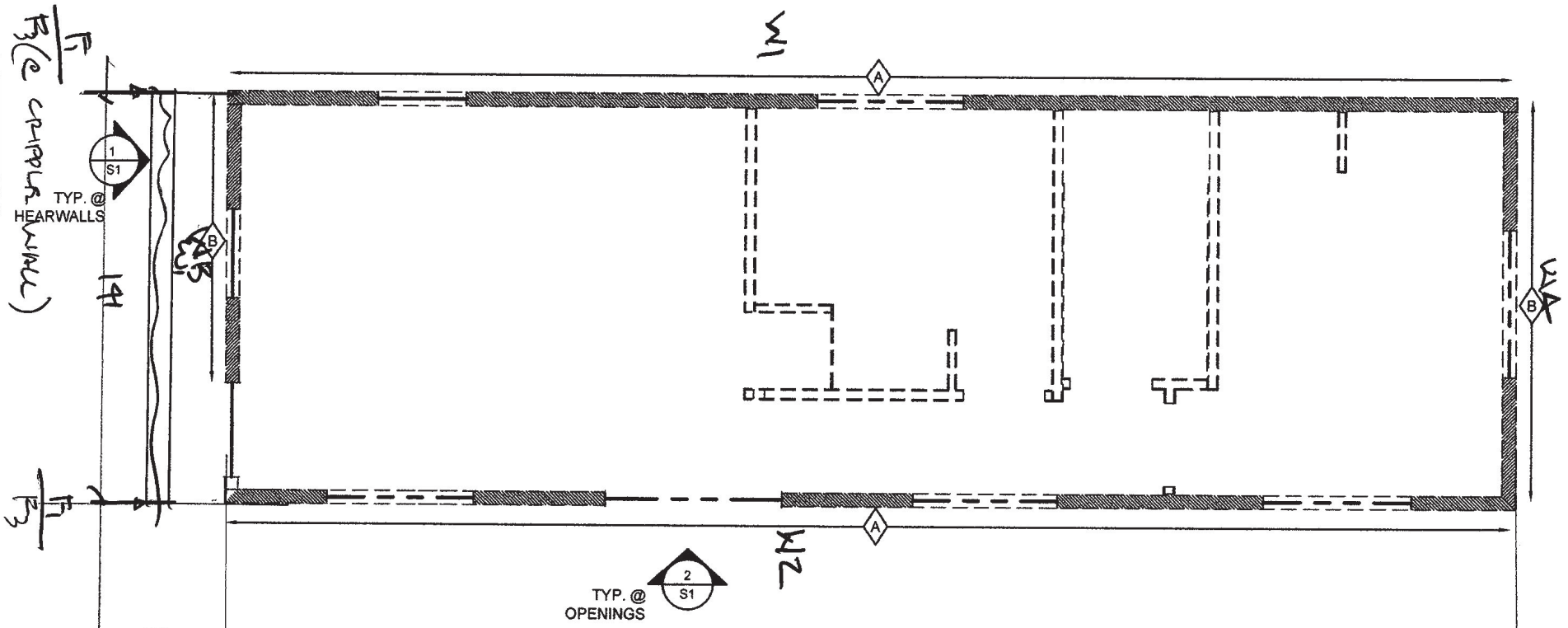
Basic Wind Speed (mph)	Roof Angle (degrees)	Load Case	Zones									
			Horizontal Pressures				Vertical Pressures				Overhangs	
			A	B	C	D	E	F	G	H	EOH	GOH
85	0 to 5°	1	11.5	-5.9	7.6	-3.5	-13.8	-7.8	-9.6	-6.1	-19.3	-15.1
	10°	1	12.9	-5.4	8.6	-3.1	-13.8	-8.4	-9.6	-6.5	-19.3	-15.1
	15°	1	14.4	-4.8	9.6	-2.7	-13.8	-9.0	-9.6	-6.9	-19.3	-15.1
	20°	1	15.9	-4.2	10.6	-2.3	-13.8	-9.6	-9.6	-7.3	-19.3	-15.1
	25°	1	14.4	2.3	10.4	2.4	-6.4	-8.7	-4.6	-7.0	-11.9	-10.1
		2	-------	-------	-------	-------	-2.4	-4.7	-0.7	-3.0	-------	-------
	30 to 45	1	12.9	8.8	10.2	7.0	1.0	-7.8	0.3	-6.7	-4.5	-5.2
		2	12.9	8.8	10.2	7.0	5.0	-3.9	4.3	-2.8	-4.5	-5.2
90	0 to 5°	1	12.8	-6.7	8.5	-4.0	-15.4	-8.8	-10.7	-6.8	-21.6	-16.9
	10°	1	14.5	-6.0	9.6	-3.5	-15.4	-9.4	-10.7	-7.2	-21.6	-16.9
	15°	1	16.1	-5.4	10.7	-3.0	-15.4	-10.1	-10.7	-7.7	-21.6	-16.9
	20°	1	17.8	-4.7	11.9	-2.6	-15.4	-10.7	-10.7	-8.1	-21.6	-16.9
	25°	1	16.1	2.6	11.7	2.7	-7.2	-9.8	-5.2	-7.8	-13.3	-11.4
		2	-------	-------	-------	-------	-2.7	-5.3	-0.7	-3.4	-------	-------
	30 to 45	1	14.4	9.9	11.5	7.9	1.1	-8.8	0.4	-7.5	-5.1	-5.8
		2	14.4	9.9	11.5	7.9	5.6	-4.3	4.8	-3.1	-5.1	-5.8
100	0 to 5°	1	15.9	-8.2	10.5	-4.9	-19.1	-10.8	-13.3	-8.4	-26.7	-20.9
	10°	1	17.9	-7.4	11.9	-4.3	-19.1	-11.6	-13.3	-8.9	-26.7	-20.9
	15°	1	19.9	-6.6	13.3	-3.8	-19.1	-12.4	-13.3	-9.5	-26.7	-20.9
	20°	1	22.0	-5.8	14.6	-3.2	-19.1	-13.3	-13.3	-10.1	-26.7	-20.9
	25°	1	19.9	3.2	14.4	3.3	-8.8	-12.0	-6.4	-9.7	-16.5	-14.0
		2	-------	-------	-------	-------	-3.4	-6.6	-0.9	-4.2	-------	-------
	30 to 45	1	17.8	12.2	14.2	9.8	1.4	-10.8	0.5	-9.3	-6.3	-7.2
		2	17.8	12.2	14.2	9.8	6.9	-5.3	5.9	-3.8	-6.3	-7.2
105	0 to 5°	1	17.5	-9.0	11.6	-5.4	-21.1	-11.9	-14.7	-9.3	-29.4	-23.0
	10°	1	19.7	-8.2	13.1	-4.7	-21.1	-12.8	-14.7	-9.8	-29.4	-23.0
	15°	1	21.9	-7.3	14.7	-4.2	-21.1	-13.7	-14.7	-10.5	-29.4	-23.0
	20°	1	24.3	-8.4	16.1	-3.5	-21.1	-14.7	-14.7	-11.1	-29.4	-23.0
	25°	1	21.9	3.5	15.9	3.5	-9.7	-13.2	-7.1	-10.7	-18.2	-15.4
		2	-----	-----	-----	-----	-3.7	-7.3	-1.0	-4.6	-----	-----
	30 to 45	1	19.6	13.5	15.7	10.8	1.5	-11.9	0.6	-10.3	-6.9	-7.9
		2	19.6	13.5	15.7	10.8	7.6	-5.8	6.5	-4.2	-6.9	-7.9
110	0 to 5°	1	19.2	-10.0	12.7	-5.9	-23.1	-13.1	-16.0	-10.1	-32.3	-25.3
	10°	1	21.6	-9.0	14.4	-5.2	-23.1	-14.1	-16.0	-10.8	-32.3	-25.3
	15°	1	24.1	-8.0	16.0	-4.6	-23.1	-15.1	-16.0	-11.5	-32.3	-25.3
	20°	1	26.6	-7.0	17.7	-3.9	-23.1	-16.0	-16.0	-12.2	-32.3	-25.3
	25°	1	24.1	3.9	17.4	4.0	-10.7	-14.6	-7.7	-11.7	-19.9	-17.0
		2	-------	-------	-------	-------	-4.1	-7.9	-1.1	-5.1	-------	-------
	30 to 45	1	21.6	14.8	17.2	11.8	1.7	-13.1	0.6	-11.3	-7.6	-8.7
		2	21.6	14.8	17.2	11.8	8.3	-6.5	7.2	-4.6	-7.6	-8.7
120	0 to 5°	1	22.8	-11.9	15.1	-7.0	-27.4	-15.6	-19.1	-12.1	-38.4	-30.1
	10°	1	25.8	-10.7	17.1	-6.2	-27.4	-16.8	-19.1	-12.9	-38.4	-30.1
	15°	1	28.7	-9.5	19.1	-5.4	-27.4	-17.9	-19.1	-13.7	-38.4	-30.1
	20°	1	31.6	-8.3	21.1	-4.6	-27.4	-19.1	-19.1	-14.5	-38.4	-30.1
	25°	1	28.6	4.6	20.7	4.7	-12.7	-17.3	-9.2	-13.9	-23.7	-20.2
		2	-------	-------	-------	-------	-4.8	-9.4	-1.3	-6.0	-------	-------
	30 to 45	1	25.7	17.6	20.4	14.0	2.0	-15.6	0.7	-13.4	-9.0	-10.3
		2	25.7	17.6	20.4	14.0	9.9	-7.7	8.6	-5.5	-9.0	-10.3

Unit Conversions—1.0 ft = 0.3048 m; 1.0 psf = 0.0479 kN/m^2

Main Wind Force Resisting System – Method 1		h ≤ 60 ft.
Figure 6-2 (cont'd)	Design Wind Pressures	Walls & Roofs
Enclosed Buildings		

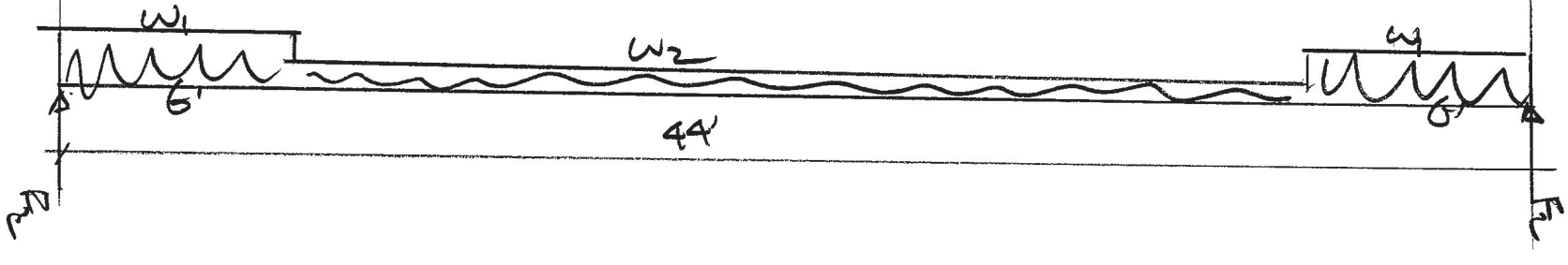
Adjustment Factor for Building Height and Exposure, λ

Mean roof height (ft)	Exposure		
	B	C	D
15	1.00	1.21	1.47
20	1.00	1.29	1.55
25	1.00	1.35	1.61
30	1.00	1.40	1.66
35	1.05	1.45	1.70
40	1.09	1.49	1.74
45	1.12	1.53	1.78
50	1.16	1.56	1.81
55	1.19	1.59	1.84
60	1.22	1.62	1.87



STRUCTURAL SHEARWALL/HOLDOWN PLAN

1/4" = 1'-0"



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CLIENT WOLF INDUSTRIES
PROJECT TINY HOUSE_MODEL E (14x44)
BY JES DATE JULY 31, 2018
PROJECT NO. 18-081 SHEET 4 OF 7

LATERAL FORCE ANALYSIS

BUILDING FORCES:

WIND:

PRESSURES:

$w_1 = 4(B) + \frac{8}{2}(A) = 4(10.0) + 4(25.7) = 143$ PLF

$w_2 = 4(D) + \frac{8}{2}(C) = 4(6.0) + 4(18.0) = 96$ PLF

FORCES:

$P_1 = 143\ (14/2) =$ 1001 #

$P_2 = (143 - 96)(6) + 96\ (44/2) =$ 2394 #

BASE SHEARS

$V_{BS,\ FRAME} = 2(P_2) = 4788$ #

$V_{BS,\ SHEAR} = 2(P_1) = 2002$ #

∴ WIND CONTROLS OVER SEISMIC BOTH DIRECTIONS

SEISMIC:

$V_{BS,\ SEIS} = C_S W$

$C_S = \frac{S_{DS}}{(R/I)}$

$S_{DS} = 0.727$
$R = 6.5$
$I = 1.0$

$= \frac{0.727}{(6.5/1.0)} = 0.112$

$= 0.112\ W$

WEIGHTS, W:

$W = ROOF = (14 \times 44)(15) = 9240$ #
$FLOOR = 9240$ #
$WALL = (44 \times 2 \times 1\frac{1}{2})(40\ PSF) = 4620$
} 22880 #

$V_{BS,\ SEIS} = 0.112\ (22880) = 2562$ # (ULTIMATE)

$2562/1.4 = 1830$ # (ALLOWABLE)

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PROJECT NO. ~~18-081~~ SHEET LSA.8 OF

LSA

SHEARWALLS:

WALL W1:

F_2 = 1001 #
V_{W2} = 28 PLF

L_{TOT} = 44'
L_{SOLID} = 36'
H_T = 8'
H_O = 4'

V_{ADJ} = 31 PLF
$F_{T,up}$ = 244 #

8d @ 6" o.c. / 240 PLF - TYPE A
NO HOLDOWNS REQ'D

WALL W2:

F_2 = 1001 #
V_W = 44'

L_{TOT} = 44'
L_{SOLID} = 23'
H_T = 10'
H_O = 7'

V_{ADJ} = 76 PLF
$F_{T,up}$ = 764 #

8d @ 6" o.c. / 240 PLF - TYPE A
NO HOLDOWNS REQ'D

WALL WA:

F_2 = 2394 #
V_{W2} = 266 PLF

L_{TOT} = 14'
L_{SOLID} = 9'
H_T = 9'
H_O = 1'-6"

V_{ADJ} = 266 PLF
$F_{T,up}$ = 2394 #

8d @ 4" o.c. / 380 PLF - TYPE B
HTT4 - SDS 2.5 / 3075# - TYPE 12

WALL WB:

F_2 = 2394 #
V_W = 342 PLF

L_{TOT} = 10'
L_{SOLID} = 7'
H_T = 9'
H_O = 3'

V_{ADJ} = 393 PLF
$F_{T,up}$ = 3538 #

8d @ 4" o.c. / 380 PLF - TYPE B
HTT4 - SDS 2.5 / 4765# - TYPE 13

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PROJECT TINY HOUSE_MODEL F (14x44)
BY JES DATE JULY 31, 2018
PROJECT NO. ~~18-081~~ SHEET ~~1 EX 84~~ OF

LRH-

CHECK 3' SECTIONS OF SHEATHWALL (@ LONG WALL SIDES)

F_i = 1001 #
l_w = 3' + 3' = 6'
v_w = 334 PLF

8de 4' oc. /380 PLF-TYPE B

OVERTURNING (FRONT WALL WORST CASE w/ 10' TALL WALL)

OTM = 1001 (10) = 10010 * 3/6 = 5005 #
R.M. = w_r (14/2+1)(15) = 120 PLF
WALL = 10 (10) = 100 PLF } 220 PLF
P = 500 # (WALL LOAD)

$M_R = \left[\frac{220(3)^2}{2} + 500(3)\right] 0.6 = 1.5^{1k}$

$T_{T,up} = \frac{5005 - 1500}{3} = 1168$ #

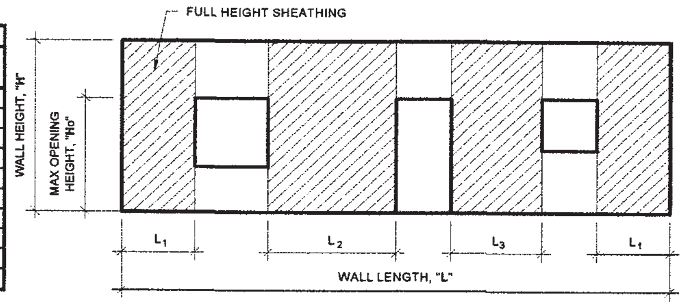
HTT22-SDS2.5/2275 #-TYPE 9

LFA.9

IBC Shearwall Design - PERFORATED SHEARWALL
per 2305.3.7.2

Table 2305.3.7.2 Shear Resistance Adjustment Factor (Co)

% Full Ht Sheathing	Maximum Opening Height				
	33% H/3	50% H/2	67% 2H/3	83% 5H/6	100% H
10%	1	0.69	0.53	0.43	0.36
20%	1	0.71	0.56	0.45	0.38
30%	1	0.74	0.59	0.49	0.42
40%	1	0.77	0.63	0.53	0.45
50%	1	0.8	0.67	0.57	0.5
60%	1	0.83	0.71	0.63	0.56
70%	1	0.87	0.77	0.69	0.63
80%	1	0.91	0.83	0.77	0.71
90%	1	0.95	0.91	0.87	0.83
100%	1	1	1	1	1



$$v = \left(V / Co \sum Li\right)$$

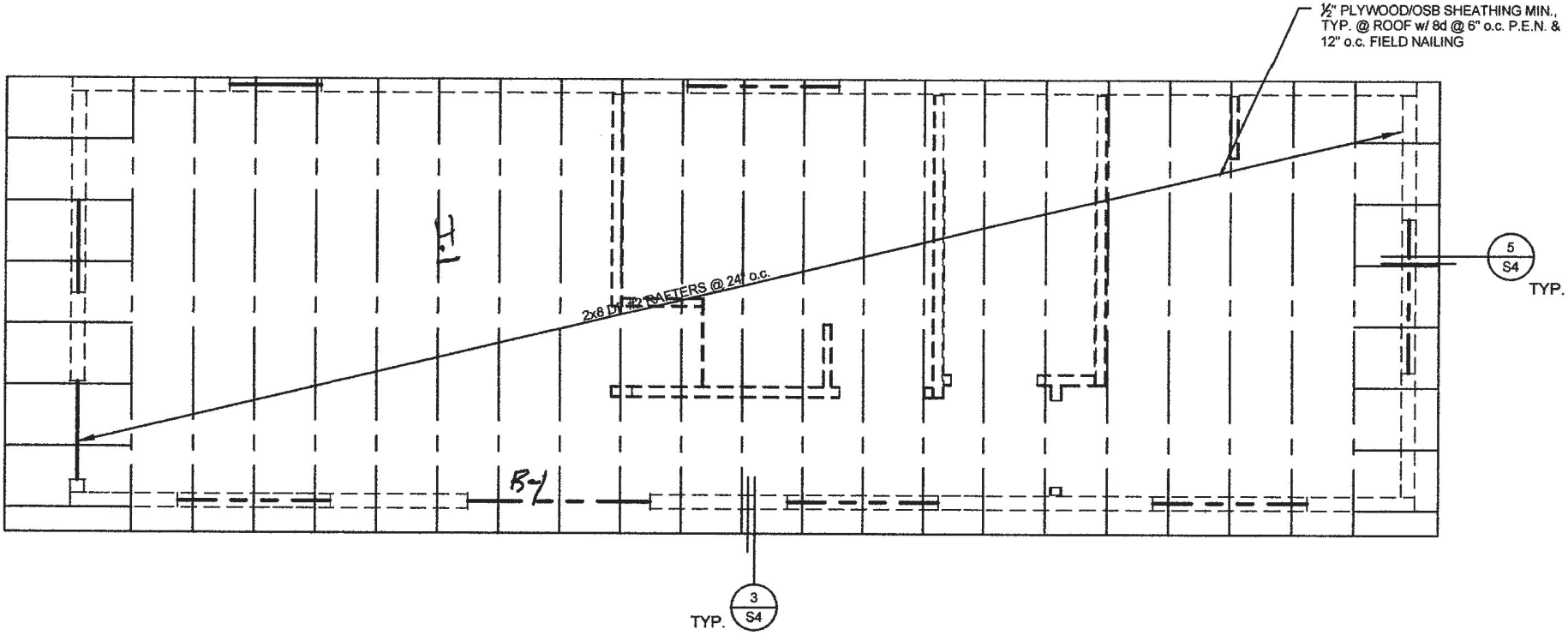
$$T = \left(VH / Co \sum Li\right)$$

Wind (W) or Seimic (S) Controls?	W				
Maximum Shearwall Aspect Ratio	3.5				
	Full Height of Wall (ft)				
	8	9	10	11	12
Min. Width of Shearwall Segment	2.29	2.57	2.86	3.14	3.43

Wall Identification	Shear **V** (lb)	Height of Wall[4] **H** (ft)	Total Length of Wall **L** (ft)	Sum of Full Height Sheath. **ΣLi** (ft)	Max Opening Height **Ho** (ft)	% Full Height Sheathing **%**	% Max Opening Height **%**	**Co**	Unit Shear[3] ***v*** (plf)	**Shearwall Type[1]**	Uplift @ Wall End **T** (lb)	**Holdown[2]**
Wall W1	1,001	8	44	36	4.00	0.82	0.50	**0.91**	**31**	**A**	**244**	**CORNER DETAIL**
Wall W2	1,001	10	44	23	7.00	0.52	0.70	**0.57**	**76**	**A**	**764**	**CORNER DETAIL**
Wall WA	2,394	9	14	9	1.50	0.64	0.17	**1**	**266**	**B**	**2394**	**MSTC40/HDU2-SDS2.5**
Wall WB	2,394	9	10	7	3.00	0.70	0.33	**0.87**	**393**	**B**	**3538**	**MSTC52/HDU4-SDS2.5**
						#DIV/0!	#DIV/0!	**####**	**#DIV/0!**		**#DIV/0!**	
						#DIV/0!	#DIV/0!	**####**	**#DIV/0!**		**#DIV/0!**	
						#DIV/0!	#DIV/0!	**####**	**#DIV/0!**		**#DIV/0!**	
						#DIV/0!	#DIV/0!	**####**	**#DIV/0!**		**#DIV/0!**	
						#DIV/0!	#DIV/0!	**####**	**#DIV/0!**		**#DIV/0!**	
						#DIV/0!	#DIV/0!	**####**	**#DIV/0!**		**#DIV/0!**	
						#DIV/0!	#DIV/0!	**####**	**#DIV/0!**		**#DIV/0!**	
						#DIV/0!	#DIV/0!	**####**	**#DIV/0!**		**#DIV/0!**	

Perforated Shearwall Notes

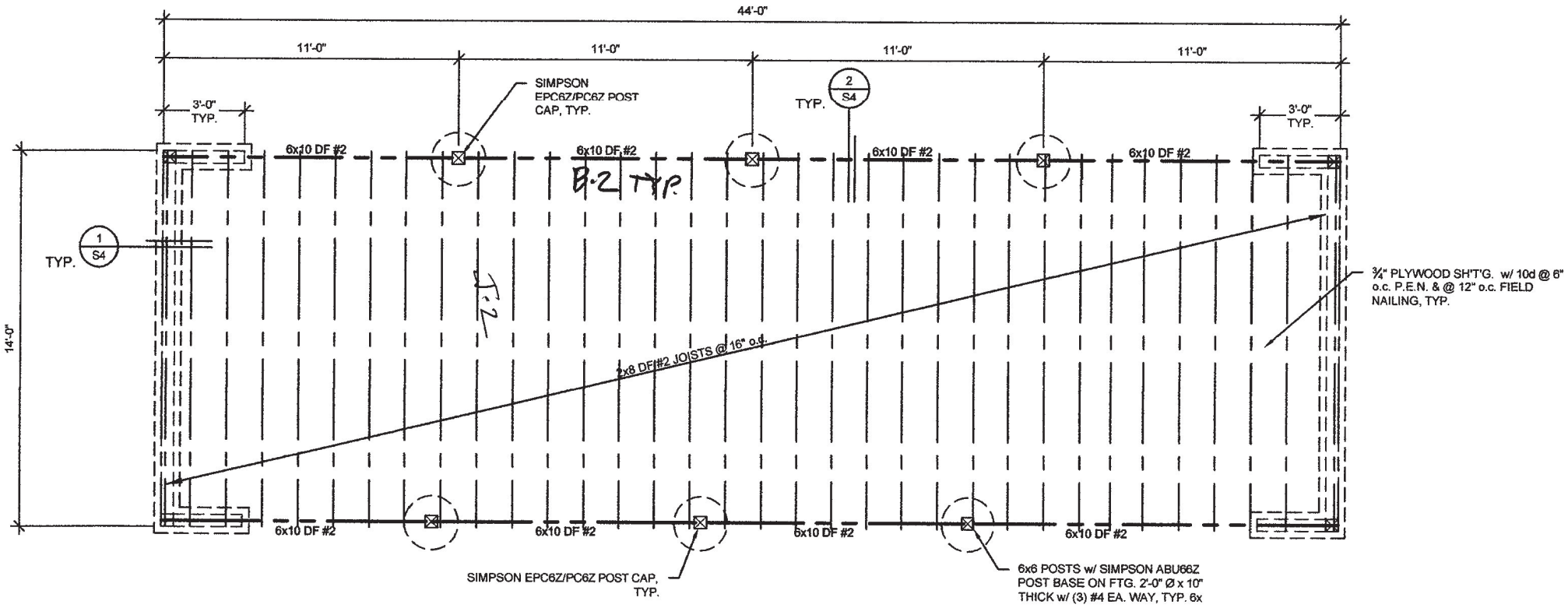
1 See Attached Shearwall Schedule
2 See Attached Holdown Schedule
3 Maximum Allowable Shear shall not exceed 490 plf.
4 Perforated Shearwall shall not exceed 20' in height.
5 A perforated shearwall segment shall be located at each end of shearwall



2/S2 ROOF FRAMING PLAN

1/4" = 1'-0"

F1/8



1/S3 FOUNDATION/FLOOR FRAMING PLAN

1/4" = 1'-0"

T-2

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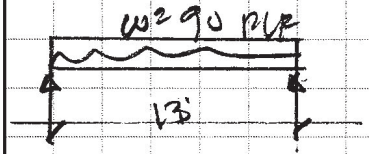
BY JES DATE JULY 31, 2018
PROJECT NO. ~~18-081~~ SHEET F. 3 OF

FRAMING DESIGN

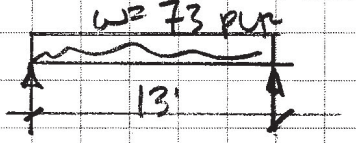
J.1



$w = 24/12\,(30+15) = 60+30 = 90$ PLF
$V_{max} = 585$ #
$M_{max} = 1901$ '#

→ USE 2x10 DFL No. 2 @ 24" o/c /SEE F. 4

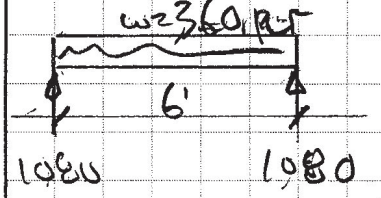
J.2



$w = 16/12\,(40+15) = 53+20 = 73$ PLF
$V_{max} = 475$ #
$M_{max} = 1542$ '#

→ USE 2x10 DFL No. 2 @ 16" o/c /SEE F. 5

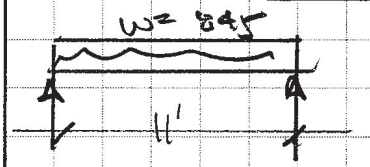
B.1



$w = (14/2+1)(30+15) = 240+120 = 360$ PLF
$V_{max} = 1080$ #
$M_{max} = 1620$ '#

→ USE 4x6 DFL No.2 /SEE F. 6
—OR— (2) 2x6 DFL No.2 SEE F.7

B.2



$w = (14/2+1)(30+15) = 240+120 = 360$
FLOOR = $14/2\,(40+15) = 280+105 = 385$
WALL = $10\,(15) = 140+105$
$V_{max} = 4648$ #
$M_{max} = 12781$ '#

520 + 325 = 845 PLF

→ USE 6x12 DFL No. 1 /SEE F. 8

Project: 18-081.Model E.Framing

Location: J-1
Roof Rafter
[2015 International Building Code(2012 NDS)]
1.5 IN x 9.25 IN x 15.0 FT (14 + 1) @ 24 O.C.
#2 - Douglas-Fir-Larch - Dry Use
Section Adequate By: 5.1%
Controlling Factor: Moment

Jason Stanek
JS Structural
11815 NE 113th Street Ste 104
Vancouver, WA 98662

StruCalc Version 9.0.2.5 8/2/2018 11:50:55 AM

DEFLECTIONS

	Center		Right	
Live Load	0.35	IN L/498	0.00	IN 2L/14460
Dead Load	0.18	in	0.00	in
Total Load	0.53	IN L/330	0.00	IN 2L/Infinity

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

RAFTER REACTIONS

	LOADS	REACTIONS
Upper Live Load @ A	210 plf	420 lb
Upper Dead Load @ A	108 plf	215 lb
Upper Total Load @ A	318 plf	635 lb
Lower Live Load @ B	241 plf	482 lb
Lower Dead Load @ B	124 plf	248 lb
Lower Total Load @ B	365 plf	730 lb

RAFTER SUPPORT DATA

	A	B
Bearing Length	0.68 in	0.78 in

RAFTER DATA

	Interior	Eave
Span Length	14 ft	1 ft
Rafter Pitch	3 :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

MATERIAL PROPERTIES

#2 - Douglas-Fir-Larch

	Base Values		Adjusted	
Bending Stress:	Fb = 900 psi		Fb' = 1309 psi	
	Cd=1.15 CF=1.10 Cr=1.15			
Shear Stress:	Fv = 180 psi		Fv' = 207 psi	
	Cd=1.15			
Modulus of Elasticity:	E = 1600 ksi		E' = 1600 ksi	
Comp. ⊥ to Grain:	Fc - ⊥ = 625 psi		Fc - ⊥' = 625 psi	

Controlling Moment: 2220 ft-lb
7.004 Ft from left support of span 2 (Center Span)
Created by combining all dead loads and live loads on span(s) 2
Controlling Shear: -559 lb
At a distance d from right 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:	20.35 in3	21.39 in3
Area (Shear):	4.05 in2	13.88 in2
Moment of Inertia (deflection):	72.02 in4	98.93 in4
Moment:	2220 ft-lb	2334 ft-lb
Shear:	-559 lb	1915 lb

LOADING DIAGRAM

RAFTER LOADING

Uniform Roof Loading

Roof Live Load:	LL =	30	psf
Roof Dead Load:	DL =	15	psf

Slope Adjusted Spans And Loads

Interior Span:	L-adj =	14.43	ft
Eave Span:	L-Eave-adj =	1.03	ft
Rafter Live Load:	wL-adj =	56	plf
Eave Live Load:	wL-Eave-adj =	56	plf
Rafter Dead Load:	wD-adj =	29	plf
Rafter Total Load:	wT-adj =	86	plf
Eave Total Load:	wT-Eave-adj =	86	plf

NOTES

Project: 18-081.Model E.Framing

Location: J-2
Floor Joist
[2015 International Building Code(2012 NDS)]
1.5 IN x 9.25 IN x 14.0 FT @ 16 O.C.
#2 - Douglas-Fir-Larch - Dry Use
Section Adequate By: 13.0%
Controlling Factor: Moment

Jason Stanek
JS Structural
11815 NE 113th Street Ste 104
Vancouver, WA 98662

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DEFLECTIONS Center

Live Load	0.20	IN L/841
Dead Load	0.07	in
Total Load	0.27	IN L/612

Live Load Deflection Criteria: L/480 Total Load Deflection Criteria: L/360

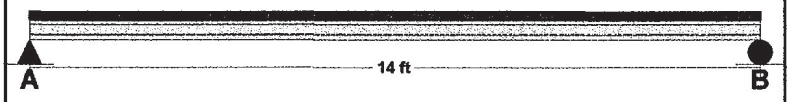
REACTIONS

	A	B
Live Load	373 lb	373 lb
Dead Load	140 lb	140 lb
Total Load	513 lb	513 lb
Bearing Length	0.55 in	0.55 in

SUPPORT LOADS

	A	B
Live Load	280 plf	280 plf
Dead Load	105 plf	105 plf
Total Load	385 plf	385 plf

LOADING DIAGRAM



MATERIAL PROPERTIES
#2 - Douglas-Fir-Larch

	Base Values	Adjusted
Bending Stress:	Fb = 900 psi	Fb' = 1139 psi
	Cd=1.00 CF=1.10 Cr=1.15	
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: 1797 ft-lb
7.0 Ft from left support of span 2 (Center Span)
Created by combining all dead loads and live loads on span(s) 2
Controlling Shear: 462 lb
At a distance d from left support of span 2 (Center Span)
Created by combining all dead loads and live loads on span(s) 2

Comparisons with required sections:	Req'd	Provided
Section Modulus:	18.94 in3	21.39 in3
Area (Shear):	3.85 in2	13.88 in2
Moment of Inertia (deflection):	84.88 in4	144.23 in4
Moment:	1797 ft-lb	2029 ft-lb
Shear:	462 lb	1665 lb

Decking Information
Plywood Thickness: T = 3/4 in
Plywood Is Glued:
Moment of Inertia Calculations For Glued Floor:
Joist Area: A-joist = 13.88 IN2
Plywood Area: A-ply = 2.08 IN2
Section Centroid: C = 5 IN ABOVE BASE
Moment of Inertia (deflection): I-comb = 144 IN4

JOIST DATA Center

Span Length	14 ft
Unbraced Length-Top	0 ft
Unbraced Length-Bottom	0 ft

Floor sheathing applied to top of joists-top of joists fully braced.
Floor Duration Factor 1.00

JOIST LOADING
Uniform Floor Loading Center

Live Load	LL =	40 psf
Dead Load	DL =	15 psf
Total Load	TL =	55 psf
TL Adj. For Joist Spacing	wT =	73.3 plf

NOTES

Project: 18-081.Model E.Framing

Location: B-1
Multi-Loaded Multi-Span Beam
[2015 International Building Code(2012 NDS)]
3.5 IN x 5.5 IN x 6.0 FT
#2 - Douglas-Fir-Larch - Dry Use
Section Adequate By: 20.7%
Controlling Factor: Moment

Jason Stanek
JS Structural
11815 NE 113th Street Ste 104
Vancouver, WA 98662

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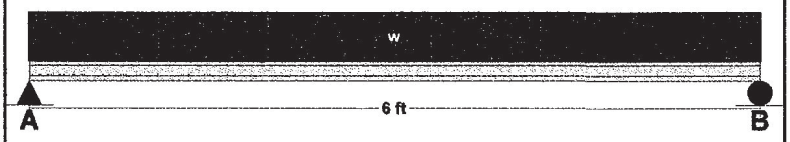
DEFLECTIONS	Center	
Live Load	0.09	IN L/799
Dead Load	0.05	in
Total Load	0.14	IN L/527

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

REACTIONS	A	B
Live Load	720 lb	720 lb
Dead Load	373 lb	373 lb
Total Load	1093 lb	1093 lb
Bearing Length	0.50 in	0.50 in

BEAM DATA	Center
Span Length	6 ft
Unbraced Length-Top	0 ft
Unbraced Length-Bottom	6 ft
Live Load Duration Factor	1.15
Notch Depth	0.00

LOADING DIAGRAM



UNIFORM LOADS	Center
Uniform Live Load	240 plf
Uniform Dead Load	120 plf
Beam Self Weight	4 plf
Total Uniform Load	364 plf

MATERIAL PROPERTIES
#2 - Douglas-Fir-Larch

	Base Values	Adjusted
Bending Stress:	Fb = 900 psi	Fb' = 1346 psi
	Cd=1.15 CF=1.30	
Shear Stress:	Fv = 180 psi	Fv' = 207 psi
	Cd=1.15	
Modulus of Elasticity:	E = 1600 ksi	E' = 1600 ksi
Comp. ⊥ to Grain:	Fc - ⊥ = 625 psi	Fc - ⊥' = 625 psi

Controlling Moment: 1639 ft-lb
3.0 Ft from left support of span 2 (Center Span)
Created by combining all dead loads and live loads on span(s) 2
Controlling Shear: 940 lb
At a distance d from left support of span 2 (Center Span)
Created by combining all dead loads and live loads on span(s) 2

Comparisons with required sections:	Req'd	Provided
Section Modulus:	14.62 in3	17.65 in3
Area (Shear):	6.81 in2	19.25 in2
Moment of Inertia (deflection):	22.12 in4	48.53 in4
Moment:	1639 ft-lb	1979 ft-lb
Shear:	940 lb	2657 lb

NOTES

Project: 18-081.Model E.Framing

Location: B-1_2
Multi-Loaded Multi-Span Beam
[2015 International Building Code(2012 NDS)]
(2) 1.5 IN x 5.5 IN x 6.0 FT
#2 - Douglas-Fir-Larch - Dry Use
Section Adequate By: 3.7%
Controlling Factor: Moment

Jason Stanek
JS Structural
11815 NE 113th Street Ste 104
Vancouver, WA 98662

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DEFLECTIONS	Center
Live Load	0.11 IN L/685
Dead Load	0.05 in
Total Load	0.16 IN L/452

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

REACTIONS	A	B
Live Load	720 lb	720 lb
Dead Load	371 lb	371 lb
Total Load	1091 lb	1091 lb
Bearing Length	0.58 in	0.58 in

BEAM DATA	Center
Span Length	6 ft
Unbraced Length-Top	0 ft
Unbraced Length-Bottom	6 ft
Live Load Duration Factor	1.15
Notch Depth	0.00

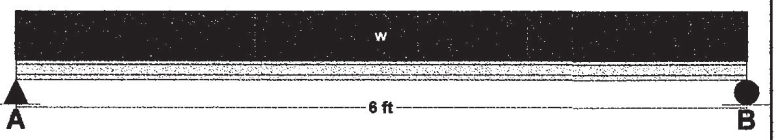
MATERIAL PROPERTIES
#2 - Douglas-Fir-Larch

	Base Values	Adjusted
Bending Stress:	Fb = 900 psi	Fb' = 1346 psi
	Cd=1.15 CF=1.30	
Shear Stress:	Fv = 180 psi	Fv' = 207 psi
	Cd=1.15	
Modulus of Elasticity:	E = 1600 ksi	E' = 1600 ksi
Comp. ⊥ to Grain:	Fc - ⊥ = 625 psi	Fc - ⊥' = 625 psi

Controlling Moment: 1636 ft-lb
3.0 Ft from left support of span 2 (Center Span)
Created by combining all dead loads and live loads on span(s) 2
Controlling Shear: 938 lb
At a distance d from left support of span 2 (Center Span)
Created by combining all dead loads and live loads on span(s) 2

Comparisons with required sections:	Req'd	Provided
Section Modulus:	14.59 in3	15.13 in3
Area (Shear):	6.8 in2	16.5 in2
Moment of Inertia (deflection):	22.08 in4	41.59 in4
Moment:	1636 ft-lb	1696 ft-lb
Shear:	938 lb	2277 lb

LOADING DIAGRAM



UNIFORM LOADS	Center
Uniform Live Load	240 plf
Uniform Dead Load	120 plf
Beam Self Weight	4 plf
Total Uniform Load	364 plf

NOTES

Project: 18-081.Model E.Framing

Location: B-2
Multi-Loaded Multi-Span Beam
[2015 International Building Code(2012 NDS)]
5.5 IN x 11.5 IN x 11.0 FT
#1 - Douglas-Fir-Larch - Dry Use
Section Adequate By: 20.8%
Controlling Factor: Moment

Jason Stanek
JS Structural
11815 NE 113th Street Ste 104
Vancouver, WA 98662

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DEFLECTIONS	Center	
Live Load	0.15	IN L/860
Dead Load	0.10	in
Total Load	0.25	IN L/521

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

REACTIONS	A	B
Live Load	2860 lb	2860 lb
Dead Load	1863 lb	1863 lb
Total Load	4723 lb	4723 lb
Bearing Length	1.37 in	1.37 in

BEAM DATA	Center
Span Length	11 ft
Unbraced Length-Top	0 ft
Unbraced Length-Bottom	11 ft
Live Load Duration Factor	1.15
Notch Depth	0.00

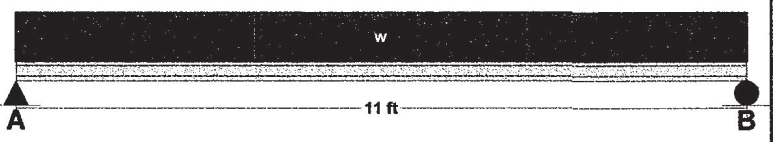
MATERIAL PROPERTIES
#1 - Douglas-Fir-Larch

	Base Values	Adjusted
Bending Stress:	Fb = 1350 psi	Fb' = 1553 psi
	Cd=1.15 CF=1.00	
Shear Stress:	Fv = 170 psi	Fv' = 196 psi
	Cd=1.15	
Modulus of Elasticity:	E = 1600 ksi	E' = 1600 ksi
Comp. ⊥ to Grain:	Fc - ⊥ = 625 psi	Fc - ⊥' = 625 psi

Controlling Moment: 12988 ft-lb
5.5 Ft from left support of span 2 (Center Span)
Created by combining all dead loads and live loads on span(s) 2
Controlling Shear: 3967 lb
At a distance d from left support of span 2 (Center Span)
Created by combining all dead loads and live loads on span(s) 2

Comparisons with required sections:	Req'd	Provided
Section Modulus:	100.39 in3	121.23 in3
Area (Shear):	30.44 in2	63.25 in2
Moment of Inertia (deflection):	321.4 in4	697.07 in4
Moment:	12988 ft-lb	15684 ft-lb
Shear:	3967 lb	8244 lb

LOADING DIAGRAM



UNIFORM LOADS	Center
Uniform Live Load	520 plf
Uniform Dead Load	325 plf
Beam Self Weight	14 plf
Total Uniform Load	859 plf

NOTES