

STRUCTURAL CALCULATIONS

**GRAVITY LOAD ANALYSIS AND DESIGN
WIND AND SEISMIC ANALYSIS & DESIGN
RETAINING WALLS & FOUNDATION**

PROJECT

Scallon-Smith Connolly

ENGINEER

**I.B.I. COMPANY
CONSULTING ENGINEERS**

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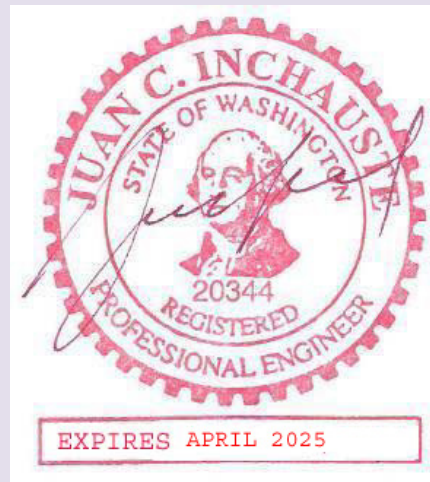
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JOB #	23-41
DATE:	11/12/2024

JUAN C. INCHAUSTE, M.S., P.E.

PROJECT:**Scallon-Smith Connolly****JOB #****23-41**

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General Building Information		
Roof Angle =	18.68	°
Building Height (Top of Ridge) from Finish Grade =	21.45	(Ft)
Mean Roof Height =	18.88	(Ft)
Eave Height =	16.30	(Ft)
2nd. Level Wall Height =	7.89	(Ft)
2nd Level Finish Floor Elevation=	8.41	(Ft)
2nd Floor Assembly + !	10.00	(in)
1st. Level Wall Height =	7.58	(Ft)
1st Level Finish Floor Elevation=	0.00	(Ft)
Finish Grade Reference Elevation =	0.00	(Ft)

Diaphragm Areas / Perimeter / External and Internal Walls						
Diaphragm/ Level	Area		width (X)		Length (Y)	
ROOF	1681.43	Sq. Ft	48.875	(Ft)	40.375	(Ft)

Diaphragm/ Level	Area		width (X)		Length (Y)	
Level 2 / Main Floor	1620.41	Sq. Ft	47.375	(Ft)	40.375	(Ft)
	Perimeter		External Walls		Interior Walls	
	191.50	(Ft)	191.50	(Ft)	105.24	(Ft)

Diaphragm/ Level	Area		width (X)		Length (Y)	
Level 1 / Basemment	1257.98	Sq. Ft	49.47	(Ft)	26.50	(Ft)
	Perimeter		External Walls		Interior Walls	
	152.00	(Ft)	76.00	(Ft)	142.31	(Ft)

Foundation	Area		width (X)		Length (Y)	
FOUNDATION	1257.98	Sq. Ft	49.47	(Ft)	26.50	(Ft)

	Yellow cells are calculated values					
	No fill cell are input values from drawings & other data sources					

PROJECT:**Scallon-Smith Connolly****JOB#:****23-41****Load Definitions (Per section 1602, I.B.C. 2021)**

LOADS. Forces or other actions that result from the weight of building materials, occupants and their possessions, environmental effects, differential movement and restrained dimensional changes. Permanent loads are those loads in which variations over time are rare or of small magnitude, such as dead loads. All other loads are variable loads.

Symbols & Notations

D = Dead Load.

D_i = Weight of ice in accordance with Chapter 10 of ASCE 7.

E = Combined effect of horizontal and vertical earthquake induced forces as defined in Section 12.4.2 of ASCE 7.

F = Load due to fluids with well-defined pressures and maximum heights.

F_a = Flood Load in accordance with Chapter 5 of ASCE 7.

H = Load due to lateral earth pressures, ground water pressure or pressure of bulk materials.

L = Live load.

L_r = Roof live load.

R = Rain load.

S = Snow Load.

T = Cumulative effects of self-straining load forces and effects.

V_{asd} = Allowable stress design wind speed, miles per hour (mph)(km/h) where applicable.

V = Basic design wind speeds, miles per hour (mph) (km/hr) determined from Figures 1609.3(1) through 1609.3(12) or ASCE-7.

W = Load due to wind pressure.

W_i = Wind-on-ice in accordance with Chapter 10 ASCE 7.

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General Design Requirements (Per Section 1604 of the I.B.C. 2021)

1604.1 General. Building structures and parts thereof shall be designed and constructed in accordance with allowable stress design, as permitted by the applicable materials.

1604.2 Strength. Buildings and other structures, and parts thereof, shall be design and constructed to support safely the nominal loads in load combinations defined in the I.B.C. 2021 Code without exceeding the appropriate specified allowable stresses forthe materials of construction.

1604.3 Serviceability. Structural systems and members thereof shall be design to have adequate stiffness to limit deflections and lateral drift as required by Table 1604.3 of the IBC 2021 Code and Section 12.12.1 of the ASCE 7.

Table 1604.3
Deflection Limits ^{a,b,c,h,I}

Construction	Lor Lr	S or W	D + L ^{d,g}
Roof Members			
Supporting plaster or stucco ceiling	l/360	l/360	l/240
Supporting non plaster ceiling	l/240	l/240	l/180
Not supporting ceiling	l/180	l/180	l/120
Floor members	l/360	-----	L/240
Exterior Walls			
With plaster or stucco finish	-----	l/360	-----
With other brittle material	-----	l/240	-----
With flexible finishes	-----	l/120	-----
Interior Walls			
With plaster or stucco finish	l/360	-----	-----
With other brittle material	l/240	-----	-----
With flexible finishes	l/120	-----	-----

Refer to Table 1604.3 of the I.B.C. 2021 for footnotes a,b,c,d,e,g,h, and l.

PROJECT:**Scallon-Smith Connolly****JOB#:****23-41****LOAD COMBINATIONS PER SECTION 1605 I.B.C. 2021**

Section 1605.1 General. Buildings and other structures and portions thereof shall be designed to resist the strength load combinations specified in ASCE-7, Section 2.3, the allowable stress design load combinations specified in ASCE-7, Section 2.4 or the alternative allowable stress stress design load combinations of Section 1605.2.

Exceptions:

- 1.- The modifications to load combinations of ASCE-7 Section 2.3, ASCE-7 Section 2.4 and Section 1605.2 specified in ASCE-7 Chapters 18 and 19 shall apply.
- 2.- Where the allowable stress design load combinations of ASCE-7 Section 2.4 are used, flat roof snow loads of 30 psf and roof live loads of 30 psf or less need not be combined with seismic loads. Where flat roof snow loads exceed 30 psf, 20 percent shall be combined with seismic loads.
- 3.- Where the allowable stress design load combinations of ASCE-7 Section 2.4 are used, crane hook loads need not be combined with roof live loads or with more than 3/4 of the snow load or 1/2 of the wind loads.

Section 1605.1.1 Stability. Regardless of which load combinations are used to design strength, where overall structure stability (such as stability against overturning, sliding, or buoyancy) is being verified, use of the load combinations specified in Sections 2.3 or 2.4 of ASCE-7, and Section 1605.2 shall be permitted. Where the load combinations specified in ASCE-7, Section 2.3 are used, strength reduction factors applicable to soil resistance shall be provided by a registered design professional. The stability of retaining walls shall be verified in accordance with Section 1807.2.3.

Section 1605.2 Alternative allowable stress design load combinations. In lieu of the load combinations in ASCE-7, Section 2.4, structures and portion thereof shall be permitted to be designed for the most critical effects resulting from the following combinations.

$D + L + (L \text{ or } S \text{ or } R)$ Equation 16-1

$D + L + 0.6W$ Equation 16-2

$D + L + 0.6W + S/2$ Equation 16-3

$D + L + S + 0.6W/2$ Equation 16-4

$D + L + S + E/1.4$ Equation 16-5

$0.9D + E/1.4$ Equation 16-6

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Dead Loads (Per Section 1606, I.B.C.)

Design dead loads. For purposes of design, the actual weights of materials of construction and fixed service equipment shall be used. In absence of definite information, values used shall be subject to the approval of the building official.

Roof Dead Loads

Roofing	2.00	p.s.f.
5/8" Plywood	2.00	p.s.f.
#30 Felt	0.30	p.s.f.
2x10 Rafters @ 24" o.c	1.95	p.s.f.
Insulation	1.50	p.s.f.
5/8" G.W.B.	2.50	p.s.f.
Electrical/Mechanical	1.50	p.s.f.
<u>TOTAL LOADS</u>	<u>11.75</u>	<u>p.s.f.</u>

USE. for Design :	12.00	p.s.f.
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LATERAL LOADS

Use: 5.00 p.s.f. FOR DESIGN
 (Per Section 1607.16 of the IBC 2021 Code)

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Dead Loads (Per Section 1606, I.B.C.)

Design dead loads. For purposes of design, the actual weights of materials of construction and fixed service equipment shall be used. In absence of definite information, values used shall be subject to the approval of the building official.

Level 2 / Main Floor Dead Loads

Carpet and Pad	1.00	p.s.f.
3/4" Plywood	2.40	p.s.f.
2x10 Joists @ 16" o.c	2.93	p.s.f.
Insulation	1.50	p.s.f.
1/2" G.W.B.	2.00	p.s.f.
Electrical/Mechanical	1.50	p.s.f.
<u>TOTAL LOADS</u>	<u>11.33</u>	<u>p.s.f.</u>

USE. for Design :	12.00	p.s.f.
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LATERAL LOADS

*Use: 5.00 p.s.f. FOR DESIGN
(Per Section 1607.16 of the IBC 2021 Code)*

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Dead Loads (Per Section 1606, I.B.C. 2021)

Design dead loads. For purposes of design, the actual weights of materials of construction and fixed service equipment shall be used. In absence of definite information, values used shall be subject to the approval of the building official.

Level 1 / Basement Floor Dead Loads

Flooring	1.00	p.s.f.
4" Concrete Slab	50.00	p.s.f.

USE. for Design :	51.00	p.s.f.
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*Use: 5.00 p.s.f. FOR DESIGN
(Per Section 1607.16 of the IBC 2021 Code)*

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Dead Loads (Per Section 1606, I.B.C. 2021)

Design dead loads. For purposes of design, the actual weights of materials of construction and fixed service equipment shall be used. In absence of definite information, values used shall be subject to the approval of the building official.

Exterior Wall Dead Loads

Siding	.....	1.00	p.s.f.
1/2" Plywood	.....	1.60	p.s.f.
#30 Felt	.....	0.30	p.s.f.
2x6 Studs @ 16" o.c.	.....	1.73	p.s.f.
2x6 Top & Bottom Plates	.....	1.00	p.s.f.
1/2" G.W.B.	.....	2.00	p.s.f.
Electrical/Mechanical	1.50	p.s.f.
TOTAL LOADS	8.13	p.s.f.

USE. for Design :	9.00	p.s.f.
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LATERAL LOADS

Use: 5.00 p.s.f. FOR DESIGN
 (Per Section 1607.16 of the IBC 2021 Code)

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Dead Loads (Per Section 1606, I.B.C. 2021)

Design dead loads. For purposes of design, the actual weights of materials of construction and fixed service equipment shall be used. In absence of definite information, values used shall be subject to the approval of the building official.

2 X INTERIOR WALLS

1/2" G.W.B.	2.00	p.s.f.
2x4 Studs @ 16" o.c.	1.13	p.s.f.
2x4 Top & Bottom Plates.....	0.75	p.s.f.
1/2" G.W.B.	2.00	p.s.f.
Insulation	1.00	p.s.f.
Electrical/Mechanical	1.50	p.s.f.
TOTAL LOADS	8.38	p.s.f.

USE. for Design :	9.00	p.s.f.
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LATERAL LOADS

Use: 5.00 p.s.f. FOR DESIGN
 (Per Section 1607.16 of the IBC 2021 Code)

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Dead Loads (Per Section 1606, I.B.C. 2021)

Design dead loads. For purposes of design, the actual weights of materials of construction and fixed service equipment shall be used. In absence of definite information, values used shall be subject to the approval of the building official.

Basement & Foundation Walls

8" Concrete Wall	100.00	p.s.f.
TOTAL LOADS	<u>100.00</u>	<u>p.s.f.</u>

USE. for Design :	100.00	p.s.f.
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LATERAL LOADS

Use: 5.00 p.s.f. FOR DESIGN
 (Per Section 1607.16 of the IBC 2021 Code)

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Alternate floor live load reduction (Per section 1607.12.2 IBC 2021)

As an alternative to Section 1607.12.1 and subject to the limitation of Table 1607.1 uniformly distributed live loads are permitted to be reduced in accordance with the provisions 1 through 4 of Section 1607.12.2 of the IBC 2021 Code.

For live loads not exceeding 100 p.s.f. the design live load for any structural member supporting 150 square feet or more is permitted to be reduced in accordance with Equation 16-8

$R = 0.08(A-1)$ (Equation 16-8)

Such reduction shall not exceed the smallest of:

- 1.- 40 percent for members supporting one floor.
- 2.- 60 percent for members supporting two or more floors.
- 3.- R as determined by the following equation.

$R = 23.1(1+L)$ (Equation 16-9)

- A = Area of floor supported by the member in square feet
- D = Dead load per square foot of area supported
- Lo = Unreduced live load per square foot of area supported
- R = Reduction in percent.

Reduction in roof live load (Per Section 1607.14.2 IBC 2021)

$L_r = L_o R_1 R_2$ (Equation 16-10)

where: $12 \leq L_r \leq 20$

Lo = Unreduced roof live load per square foot of horizontal projection supported by the member. (See Table 1607.1)

Lr = Reduced live load per square foot of horizontal projection in pounds per square foot.

The reduction factors R₁ and R₂ shall be determined as follows:

$R_1 = 1$ for $A_t \leq 200$ Sq. Ft. (Equation 16-11)

$R_1 = 1.2 - 0.001 \cdot A_t$ for $200 < A_t < 600$ Sq. Ft. (Equation 16-12)

$R_1 = 0.6$ for $A_t > 600$ Sq. Ft. (Equation 16-13)

where:

At = Tributary span (span length multiplied by effective width) in square feet supported by any structural member, and

F = for a sloped roof, the number of inches of rise per foot, and

F = for an arch dome, rise-to-span ratio multiplied by 32, and

$R_2 = 1$ for $F \leq 4$ (Equation 16-14)

$R_2 = 1.2 - 0.05F$ for $4 < F < 12$ (Equation 16-15)

$R_2 = 0.6$ for $F > 12$ (Equation 16-16)

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Snow Loads (Per Section 1608 IBC 2021)

1608.1 General. Design snow loads shall be determined in accordance with chapter Chapter 7 of ASCE 7, but the design roof load shall not be less than determined Section 1607.

Ground Snow Loads (Per Section 1608.2 IBC 2021)

The ground snow loads to be used in determining the design snow loads for roofs shall be determined in accordance with ASCE-7 or Figures 1608.2(1) & 1608.2(2) for the contiguous United States and Table 1608.2 for Alaska. Site-specific case studies shall be made studies shall be made in areas designated "CS" in Figures 1608.2(1) & 1608.2(2).

Ground snow loads for sites at elevations above the limits indicated in Figures 1608.2(1) and 1608.2(2) and for all sites within the CS areas shall be approved.

Ground snow load: $P_g = 20$ psf (From Fig. 7.2-1 for the contiguous U.S. & Table 7.2-1 for Alaska. Site specific case studies shall be made to determine ground snow loads in areas designated "CS" in Figure 7.2.-1 (see also tables 7.2-2 through 7.2-8)

Importance factor: $I_s = 1.00$ (From Table 1.5-2 based on Risk Category from Table 1.5-1 of ASCE 7)

Snow exposure factor: $C_e = 1.00$ (From Table 7.3-1 ASCE-7)

Thermal factor: $C_t = 1.00$ (From Table 7.3-2 ASCE-7)

Roof slope factor: $C_s = 1.00$ (From Fig.7.4-1 from ASCE-7)

Design snow load: $S = 0.7 * C_e * C_t * C_s * I_s * P_g$ (Flat & Sloped Roofs)

Use 25 psf Snow Load for Design
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PROJECT:**Scallon-Smith Connolly****JOB#:****23-41****Wind Loads (Per Section Section 1609 IBC 2021)**

1609.1 Applications. Buildings, structures and parts thereof shall be designed to withstand the minimum wind loads prescribed herein. Decreases in wind loads shall not be made for the effect of shielding by other structures.

1609.1.1 Determination of wind loads. Wind loads on every building shall be determined in accordance with Chapters 26 to 30 of ASCE 7. The type of opening protection required, the basic design wind speed, V , and the exposure category for a site is permitted to be determined in accordance with Section 1609 or ASCE-7.

Wind shall be assumed to come from any horizontal direction and wind pressures shall be assumed to act normal to the surface considered.

1609.3 Basic design wind speed. The basic design wind speed V , in mph, for the determination of the wind loads shall be determined by Figures 1609.3(1) through 1609.3(12)

Table 28.2-1 Steps to Determine Wind Loads on MWFRS Low-Rise Buildings

Step 1: Determine risk cat. **II**

Step 2: Determine the basic wind speed V for applicable risk category

Figures 25.1 and **110 mph**

Step 3: Determine wind load parameters

Exposure Category **B**

Topographic factor K_{zt} : see Section 26.8 and Figure 26.8-1

Step 4: Enter figure to determine wind pressures for $h = 30$ ft., p_{s30} :

see Fig. 28.5-2.

Step 5: Enter figure to determine adjustment for building height and exposure

λ : see Fig. 28.5-1.

Step 6: Determine adjusted wind pressures, p_s : see Eq.(28.5-1).

$$p_s = \lambda K_{zt} p_{s30}$$

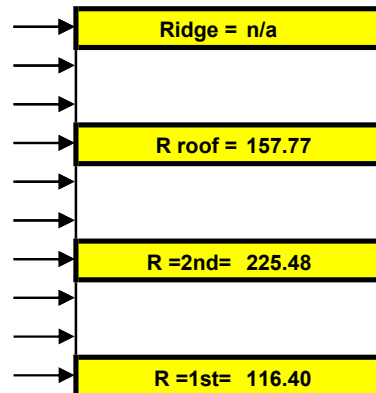
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Wind Loads (Per Chapter 28 of the ASCE 7-10)

Diaphragm Wind Loads

Level	Height	Pressure	Wind Loads
	Ft	Psf	Lbs / Ft
Ridge	21.45	9.46	n/a
Roof	16.30	27.65	157.77
2nd/Upper	8.41	27.67	225.48
Level 1 /Basement	0.00	27.65	116.40



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Level 2 Effective Seismic Wall Weight Tributary Calculation

Calculate the weight of the exterior and interior walls for the contribution to the seismic effective weight to the roof diaphragm.

Length of exterior Level 2 2x stud wood perimeter walls = 191.50 Ft

Length of interior Level 2 2x stud wood walls = 105.24 Ft

1/2 of 2nd level wall height tributary to the roof diaphragm = 3.95 Ft

Weight of Level 2 exterior 2x stud wood walls + finishes = 9.00 p.s.f

Weight of Level 2 interior 2x stud wood walls + finishes = 9.00 p.s.f

ROOF DIAPHRAGM

Roof diaphragm self weight = 12.00 p.s.f

Roof diaphragm plan area = 1681.43 Ft.²

Effective Level 2 seismic wall weight applied to the roof diahragm = 10535.75 Lbs

Effective Level 2 wall seismic weight per Sq. Ft. of roof diaphragm = 6.27 p.s.f

Effective seismic weight of roof diaphragm = 20177.16 Lbs

Total effective seismic weight "W_R" applied to the roof diaphragm = 30712.91 Lbs

LEVEL 2 FLOOR DIAPHRAGM

Level 2 Floor diaphragm self weight = 12.00 p.s.f

Level 2 Floor diaphragm plan area = 1620.41 Ft.²

Effective Level 2 seismic wall weight applied to the Floor diahragm = 10535.75 Lbs

Effective Level 2 wall seismic weight per Sq. Ft. of Floor diaphragm = 6.50 p.s.f

Effective seismic weight of Level 2 floor diaphragm = 19444.92 Lbs

Total effective seismic weight "W_{2ND}" applied to Level 2 floor diaphragm = 29980.67 Lbs

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Level 1 Effective Seismic Wall Weight Tributary Calculation

Calculate the weight of the exterior and interior walls for the contribution to the seismic effective weight to the roof diaphragm.

Length of exterior Level 1 basement perimeter walls = 152.00 Ft

Length of interior level 1 2x stud wood walls = 142.31 Ft

1/2 of 2nd level wall height tributary to the roof diaphragm = 3.79 Ft

Weight of Level 1 exterior 8" concrete basement walls = 100.00 p.s.f

Weight of Level 1 interior 2x stud wood walls + finishes = 9.00 p.s.f

LEVEL 2 FLOOR DIAPHRAGM

Level 2 floor diaphragm self weighth = 12.00 p.s.f

Level 2 diaphragm plan area = 1620.41 Ft.²

Effective Level 1 seismic wall weight applied to Level 2 diahragm = 62462.19 Lbs

Effective Level 1 wall seismic weight per Sq. Ft. of Level 2 diaphragm = 38.55 p.s.f

Total effective seismic weight "W_{2ND}" applied to Level 2 diaphragm = 62462.19 Lbs

LEVEL 1 FLOOR DIAPHRAGM

Level 1 Floor diaphragm self weighth = 51.00 p.s.f

Level 1 Floor diaphragm plan area = 1257.98 Ft.²

Effective Level 1 seismic wall weight applied to the Floor diahragm = 62462.19 Lbs

Effective Level 1 wall seismic weight per Sq. Ft. of Floor diaphragm = 49.65 p.s.f

Effective seismic weight of Level 1 floor diaphragm = 64156.98 Lbs

Total effective seismic weight "W_{1ST}" applied to Level 1 floor diaphragm = 126619.17 Lbs

W = 249774.96 Lbs

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Earthquake Loads (Per Section 1613 IBC 2021)

1613.1 Scope. Every structure, and portion thereof, including nonstructural components that are permanently attached to structures and their supports and attachments, shall be designed and constructed to resist the effects of earthquake motion in accordance with ASCE-7, excluding Chapter 14

The seismic design category for a structure is permitted to be determined in accordance with Section 1613 IBC 2021 or ASCE 7.

Risk Category of Building **II** (From Table 1.5-1 ASCE-7) **RCB**

Site Class **D** (According to section 11.4.3 and Chapter 20 of ASCE-7) **SC**

F_a Short period site coefficient (at 0.2 s-period) Section 11.4.4 ASCE 7 **F_a** =

F_v Long period site coefficient (at 0.1 s-period) Section 11.4.4 ASCE 7 **F_v** =

S_s mapped MCE_R 5 % damped, spectra response acceleration parameter at short periods as defined in Section 11.4.2 and 14.4.4 ASCE 7 **S_s** = g

S₁ mapped MCE_R 5 % damped, spectra response acceleration parameter at 1 second as defined in Section 11.4.2 ASCE 7 **S₁** = g

S_{MS} The MCE_R 5 % damped, spectra response acceleration parameter at periods period of 1 second adjusted for site class effects as defined in Section 11.4.4 ASCE **S_{MS}** = g
 $S_{MS} = F_a S_s$ (Equation 11-4-1)

S_{M1} The MCE_R 5 % damped, spectra response acceleration parameter at short period adjusted for site class effects as defined in Section 11.4.4 ASCE 7 **S_{M1}** = g
 $S_{M1} = F_v S_1$ (Equation 11-4-2)

S_{DS} Design 5 % damped, spectra response acceleration parameter at a period of 1 second as defined in Section 11.4.5 ASCE 7 **S_{DS}** = g
 $S_{DS} = (2/3) * S_{MS}$ (Equation 11-4-3)

S_{D1} Design 5 % damped, spectra response acceleration parameter at short periods as defined in Section 11.4.5 ASCE 7 **S_{D1}** = g
 $S_{D1} = (2/3) * S_{M1}$ (Equation 11-4-3)

I_e Importance factor as prescribed (Section 11.5.1 & Table 1.5-2 ASCE 7) **I_e** =
 Seismic Design Category **D** (According to Tables 11.6-1 & 11-52 ASCE7) **SDC** =
 Response Modification Factor **R** (According to Table 12.2-1 ASCE-7) **R** =
 System Overstrength Factor Ω_o (According to Table 12.2-1 or 12-14.1 ASCE-7) **Ω_o** =
 Deflection Amplification Factor **C_d** (According to Table 12.2-1 ASCE 7) **C_d** =

PROJECT:**Scallon-Smith Connolly****JOB#:****23-41****Section 12.8 ASCE-7 Equivalent Lateral Force (ELF)****Parameter definitions**

C_s = The seismic response coefficient determined in accordance with 'Section 12.8.1.1

h_n = The structural height as defined in Section 11.2

I_e = The Importance Factor determined in accordance with Section 11.5.1

R = The response modification factor in Table 12.1-1

S_1 = The mapped maximum considered earthquake spectral response acceleration parameter determined in accordance with 'Section 11.4.2 or 11.4.4

S_{D1} = The design spectral response acceleration parameter at a period of '1.0 s, as determined from Section 11.4.5 or 11.4.6

S_{DS} = The design spectral response acceleration parameter at a period of '1.0 s, as determined from Section 11.4.5 or 11.4.8

T = The fundamental period of the structure(s) determined Section 12.8.2.

T_a = The approximate fundamental period according to Section 12.8.2.1.

T_L = Long -period transition period(s) determined in Section 11.4.6.

V = Seismic Base Shear according to Section 12.8.1.

W = The effective seismic weight per Section 12.7.2

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Section 12.8 ASCE-7 Equivalent Lateral Force (ELF)

Design equations

$V = C_s * W$ (E) (Equation 12.8-1)

$C_s = S_{DS} / (R/I_e)$ (E) (Equation 12.8-2)

$C_s = S_{D1} / T * (R/I_e)$, For $T \leq T_L$ (Equation 12.8-3)

$C_s = S_{D1} * T_L / T^2 * (R/I_e)$, For $T > T_L$ (Equation 12.8-4)

$C_s =$ Shall not be less than $0.044 * S_{DS} * I_e \geq 0.01$ (Equation 12.8-5)

$C_s =$ Shall not be less than $0.5 * S_1 / (R/I_e)$ when $S_1 > 0.6g$ (Equation 12.8-6)

$T_a = C_t * h_n^x$ (I) (Equation 12.8-7)

TABLE 12.8-1 COEFFICIENT FOR UPPER LIMIT ON CALCULATED PERIOD
<i>Moment resisting frame systems in which the frames resist 100% of the required seismic force or adjoined y components that are more rigid and are not enclosed an will prevent the frames from deflecting where subjected to seismic forces:</i>

Structure Type	C_t	x
Steel moment resisting frames	0.028	0.8
Concrete moment resisting frames	0.016	0.9
Steel eccentrically braced frames in accordance with Table 12.2-1 Lines B1 or D1	0.03	0,75
Steel buckin-restrained braced frames	0.03	0,75
All other structural systems	0.02	0,75

PROJECT:	Scallon-Smith Connolly
-----------------	-------------------------------

JOB#:	23-41
--------------	--------------

Equivalent Lateral Force (ELF) Cs Calculations

$$C_t = 0.02$$

$$g = 32.2$$

$$h_n = 16.30$$

$$I_e = 1.0$$

$$R = 6.50$$

$$S_1 = 0.404$$

$$S_{D1} = \text{N/A}$$

$$S_{DS} = 0.980$$

$$T_L = 6$$

$$W = 249775$$

$$x = 0.75$$

(12.8-2)

$$C_s = S_{DS}/(R/I_e)$$

$$C_s = 0.151$$

(12.8-7)

$$T_a = C_t * h_n^x$$

$$T_a = 0.162$$

(12.8-3)

$$C_s = S_{D1}/T_a * (R/I_e)$$

For $T_a \leq T_L$

$$C_s = \text{N/A}$$

(12.8-4)

$$C_s = S_{D1} * T_L / T_a^2 * (R/I_e)$$

For $T_a > T_L$

$$C_s = \text{N/A}$$

(12.8-5)

$$C_s = \text{Shall not be less than } 0.044 * S_{DS} * I_e \geq 0.01$$

$$C_s = 0.043$$

(12.8-6)

$$C_s = \text{Shall not be less than } 0.5 * S_1 / (R/I_e) \text{ when } S_1 \geq 0.6g$$

$$C_s = \text{N/A}$$

$$V = C_s * W$$

(12.8-1)

$$\text{Use } C_s = 0.151$$

$$V = 37716.02$$

PROJECT: Scallon-Smith Connolly

JOB: 23-41

V = 37716.02 Lbs

S_{DS} = 0.980

R = 6.50

C_s = 0.151

Seismic Loads (Per Section 1214.8.1 ASCE-7)

le = 1.0

Level	h (Ft)	Width (x) (Ft)	Width (y) (Ft)	Area (Sq. Ft.)	Dead Load (psf)	Partition Load (psf)	Weight W (Lbs)	w _x h _x ^k	C _{vx}	F (Lbs)	F _x (Lbs/Ft)	F _y (Lbs/Ft)
Roof	21.45	48.88	40.38	1681.43	12.00	6.27	30712.91	658792.00	0.30	11471.81	284.13	234.72
Level 2	16.30	47.38	40.38	1620.41	12.00	45.05	92442.87	1507126.89	0.70	26244.21	650.01	553.97
Level 1	0.00	49.47	26.50	1257.98	51.00	49.65	126619.17	0.00	0.00	0.00	0.00	0.00
TOTAL WEIGHT (Lbs) =							249774.96					
Sumation of w_xh_x^k (Lbs-Ft) =								2165918.89				
Base Shear V = C_s*W (Lbs) =									37716.02			

$V = C_s \times W$ (Equation 12.8-1)

$W = \text{Area} \times (D.L. + W.W.)$

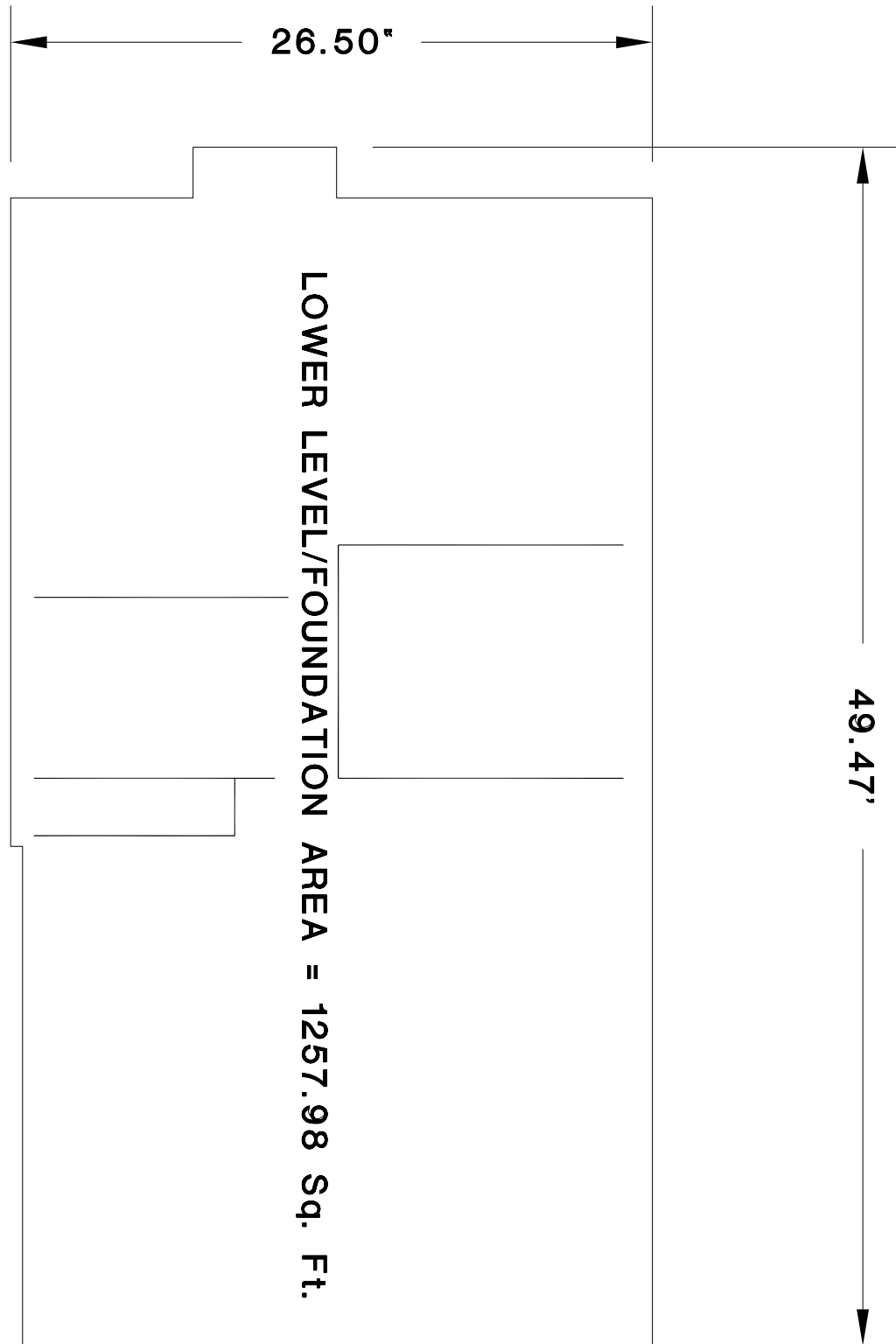
$F_x = W / \text{Width}(x)$

$F_y = W / \text{Width}(y)$

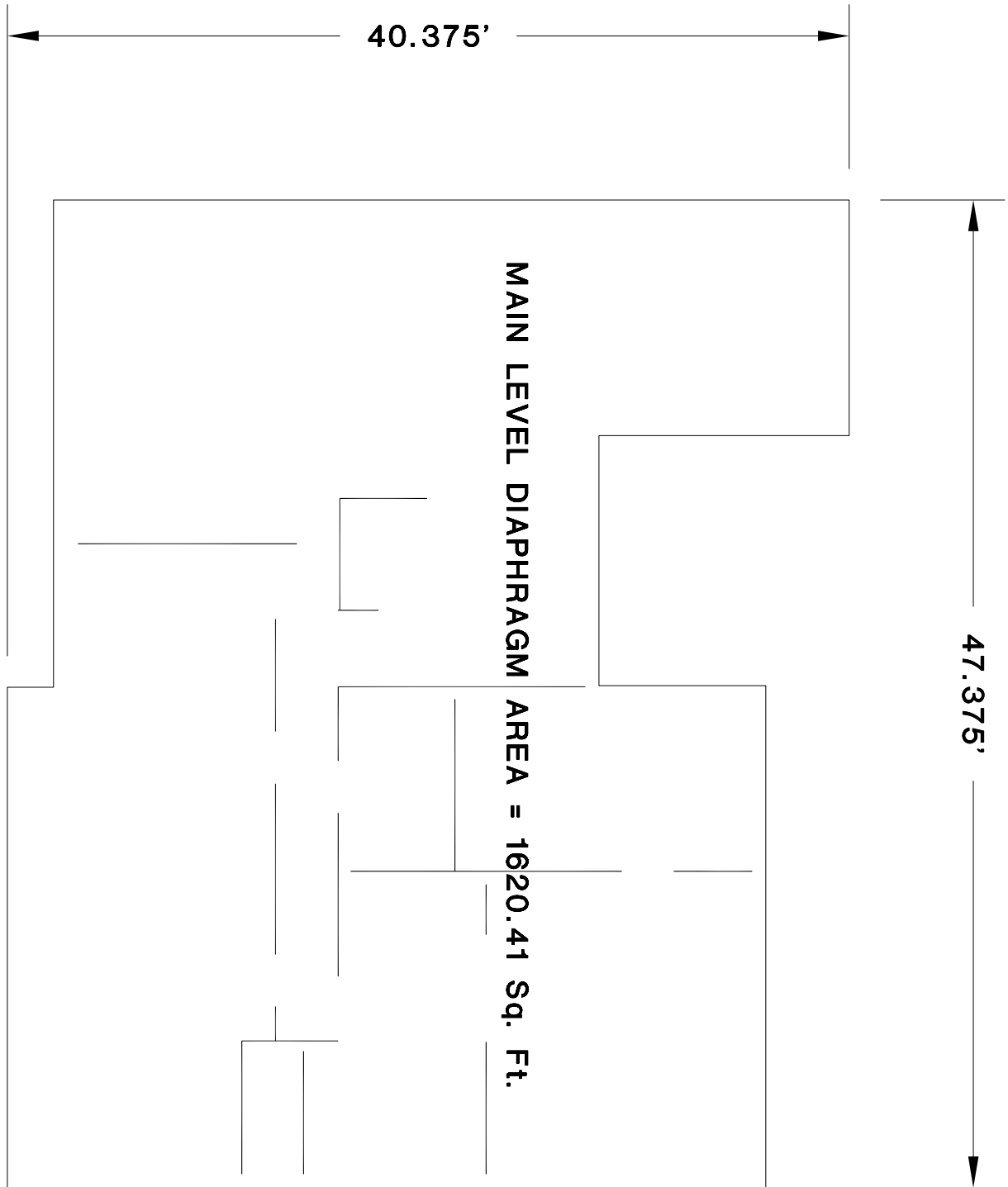
$C_s = S_{DS} / (R I_e)$

$C_s = S_{D1} / (R I_e)$ For $T \leq T_L$

$C_s = (S_{D1} * T_L) / (R I_e)$ For $T > T_L$

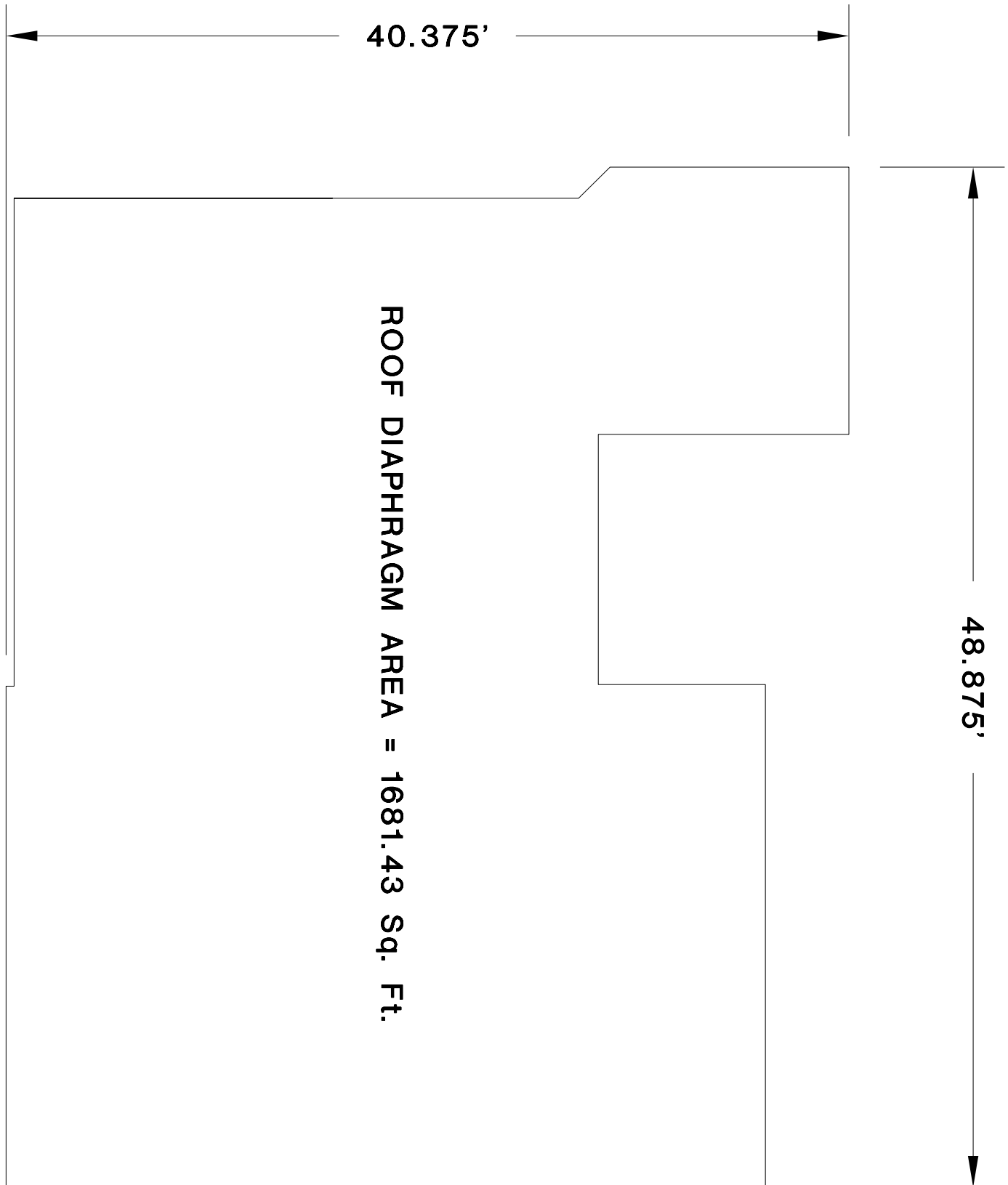


LENGTH OF PERIMETER WALLS = 152.00 Ft
LENGTH OF INTERIOR WALLS = 66.31 Ft.



LENGTH OF PERIMETER WALLS = 191.50 Ft

LENGTH OF INTERIOR WALLS = 105.24 Ft.





Seismic

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

Results:

S_s :	1.409	S_{D1} :	N/A
S_1 :	0.49	T_L :	6
F_a :	1.2	PGA :	0.603
F_v :	N/A	PGA _M :	0.723
S_{MS} :	1.69	F_{PGA} :	1.2
S_{M1} :	N/A	I_e :	1
S_{DS} :	1.127	C_v :	1.382

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

Data Accessed: Sat Jan 20 2024

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

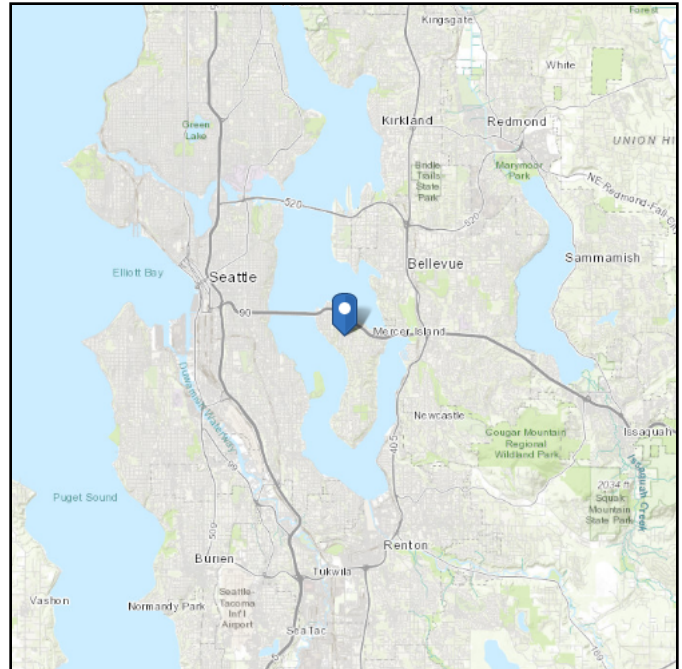
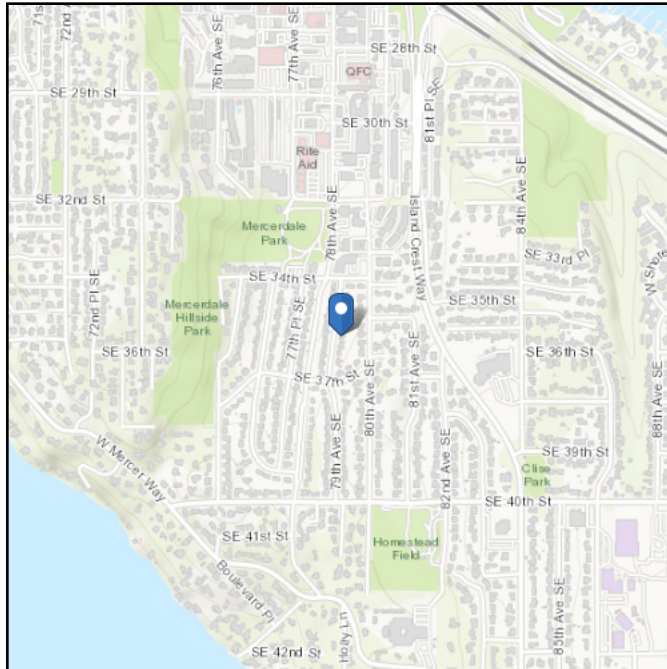


ASCE Hazards Report

Address:
 3450 79th Ave SE
 Mercer Island, Washington
 98040

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

Latitude: 47.578535
Longitude: -122.233353
Elevation: 0 ft (NAVD 88)



Wind

Results:

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

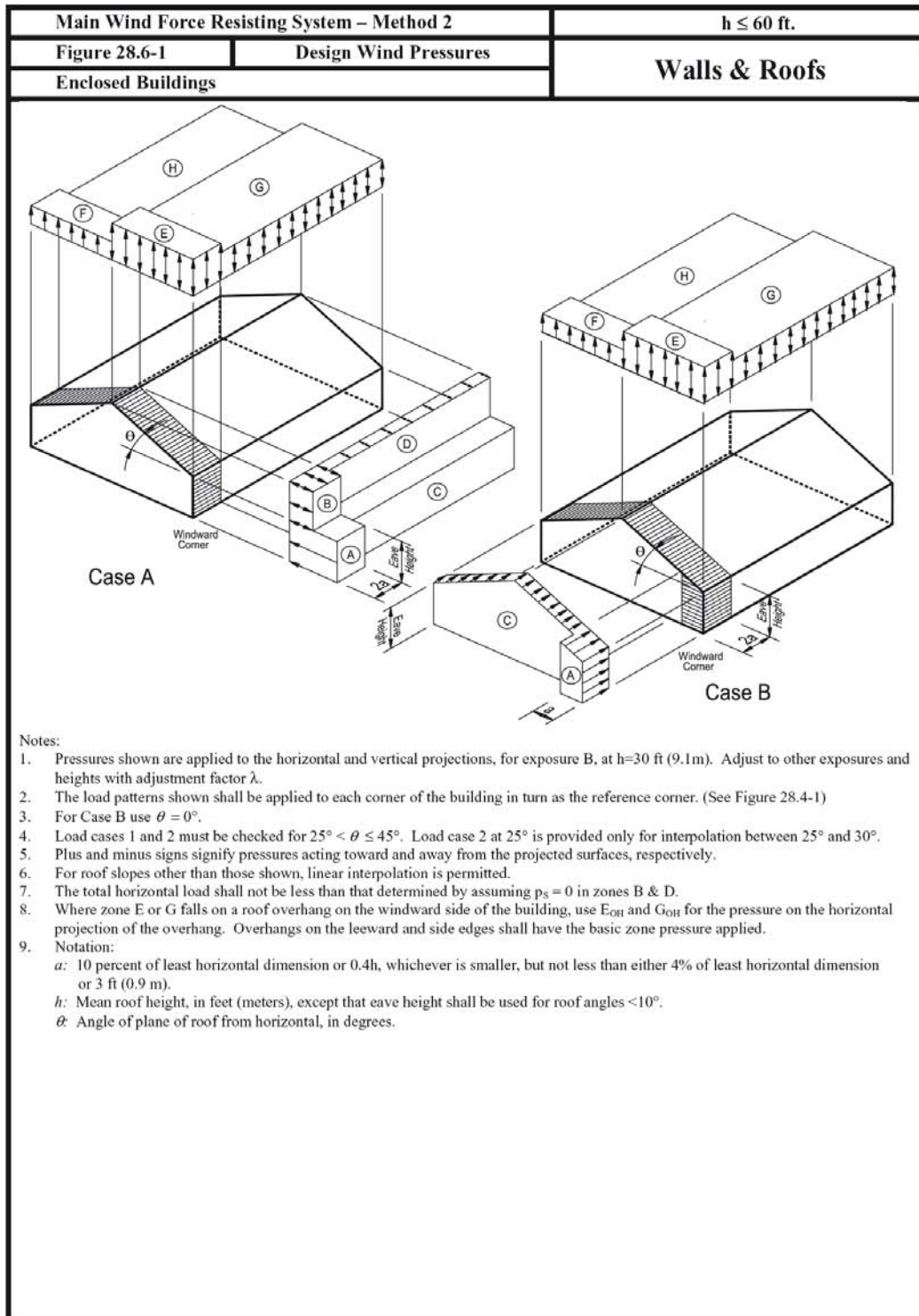
Data Source: ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2

Date Accessed: Sat Jan 20 2024

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

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

MINIMUM DESIGN LOADS



CHAPTER 28 WIND LOADS ON BUILDINGS—MWFRS (ENVELOPE PROCEDURE)

Main Wind Force Resisting System – Method 2				h ≤ 60 ft.									
Figure 28.6-1 (cont'd)		Design Wind Pressures		Walls & Roofs									
Enclosed Buildings													
Simplified Design Wind Pressure , ps ₃₀ (psf) (Exposure B at h = 30 ft. 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	E _{OH}	G _{OH}	
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	-----	-----	-----	
	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	
115	0 to 5°	1	21.0	-10.9	13.9	-6.5	-25.2	-14.3	-17.5	-11.1	-35.3	-27.6	
	10°	1	23.7	-9.8	15.7	-5.7	-25.2	-15.4	-17.5	-11.8	-35.3	-27.6	
	15°	1	26.3	-8.7	17.5	-5.0	-25.2	-16.5	-17.5	-12.6	-35.3	-27.6	
	20°	1	29.0	-7.7	19.4	-4.2	-25.2	-17.5	-17.5	-13.3	-35.3	-27.6	
	25°	1	26.3	4.2	19.1	4.3	-11.7	-15.9	-8.5	-12.8	-21.8	-18.5	
		2	-----	-----	-----	-----	-4.4	-8.7	-1.2	-5.5	-----	-----	
	30 to 45	1	23.6	16.1	18.8	12.9	1.8	-14.3	0.6	-12.3	-8.3	-9.5	
		2	23.6	16.1	18.8	12.9	9.1	-7.1	7.9	-6.0	-8.3	-9.5	
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	
130	0 to 5°	1	26.8	-13.9	17.8	-8.2	-32.2	-18.3	-22.4	-14.2	-45.1	-35.3	
	10°	1	30.2	-12.5	20.1	-7.3	-32.2	-19.7	-22.4	-15.1	-45.1	-35.3	
	15°	1	33.7	-11.2	22.4	-6.4	-32.2	-21.0	-22.4	-16.1	-45.1	-35.3	
	20°	1	37.1	-9.8	24.7	-5.4	-32.2	-22.4	-22.4	-17.0	-45.1	-35.3	
	25°	1	33.6	5.4	24.3	5.5	-14.9	-20.4	-10.8	-16.4	-27.8	-23.7	
		2	-----	-----	-----	-----	-5.7	-11.1	-1.5	-7.1	-----	-----	
	30 to 45	1	30.1	20.6	24.0	16.5	2.3	-18.3	0.8	-15.7	-10.6	-12.1	
		2	30.1	20.6	24.0	16.5	11.6	-9.0	10.0	-6.4	-10.6	-12.1	
140	0 to 5°	1	31.1	-16.1	20.6	-9.6	-37.3	-21.2	-26.0	-16.4	-52.3	-40.9	
	10°	1	35.1	-14.5	23.3	-8.5	-37.3	-22.8	-26.0	-17.5	-52.3	-40.9	
	15°	1	39.0	-12.9	26.0	-7.4	-37.3	-24.4	-26.0	-18.6	-52.3	-40.9	
	20°	1	43.0	-11.4	28.7	-6.3	-37.3	-26.0	-26.0	-19.7	-52.3	-40.9	
	25°	1	39.0	6.3	28.2	6.4	-17.3	-23.6	-12.5	-19.0	-32.3	-27.5	
		2	-----	-----	-----	-----	-6.6	-12.8	-1.8	-8.2	-----	-----	
	30 to 45	1	35.0	23.9	27.8	19.1	2.7	-21.2	0.9	-18.2	-12.3	-14.0	
		2	35.0	23.9	27.8	19.1	13.4	-10.5	11.7	-7.5	-12.3	-14.0	
150	0 to 5°	1	35.7	-18.5	23.7	-11.0	-42.9	-24.4	-29.8	-18.9	-60.0	-47.0	
	10°	1	40.2	-16.7	26.8	-9.7	-42.9	-26.2	-29.8	-20.1	-60.0	-47.0	
	15°	1	44.8	-14.9	29.8	-8.5	-42.9	-28.0	-29.8	-21.4	-60.0	-47.0	
	20°	1	49.4	-13.0	32.9	-7.2	-42.9	-29.8	-29.8	-22.6	-60.0	-47.0	
	25°	1	44.8	7.2	32.4	7.4	-19.9	-27.1	-14.4	-21.8	-37.0	-31.6	
		2	-----	-----	-----	-----	-7.5	-14.7	-2.1	-9.4	-----	-----	
	30 to 45	1	40.1	27.4	31.9	22.0	3.1	-24.4	1.0	-20.9	-14.1	-16.1	
		2	40.1	27.4	31.9	22.0	15.4	-12.0	13.4	-8.6	-14.1	-16.1	

Unit Conversions – 1.0 ft = 0.3048 m; 1.0 psf = 0.0479 kN/m²

MINIMUM DESIGN LOADS

Main Wind Force Resisting System – Method 2					h ≤ 60 ft.							
Figure 28.6-1 (cont'd)		Design Wind Pressures			Walls & Roofs							
Enclosed Buildings												
Simplified Design Wind Pressure , p_{S30} (psf) (Exposure B at h = 30 ft.)												
Basic Wind Speed (mph)	Roof Angle (degrees)	Load Case	Zones									
			Horizontal Pressures				Vertical Pressures				Overhangs	
			A	B	C	D	E	F	G	H	E _{OH}	G _{OH}
160	0 to 5°	1	40.6	-21.1	26.9	-12.5	-48.8	-27.7	-34.0	-21.5	-68.3	-53.5
	10°	1	45.8	-19.0	30.4	-11.1	-48.8	-29.8	-34.0	-22.9	-68.3	-53.5
	15°	1	51.0	-16.9	34.0	-9.6	-48.8	-31.9	-34.0	-24.3	-68.3	-53.5
	20°	1	56.2	-14.8	37.5	-8.2	-48.8	-34.0	-34.0	-25.8	-68.3	-53.5
	25°	1	50.9	8.2	36.9	8.4	-22.6	-30.8	-16.4	-24.8	-42.1	-35.9
		2	-----	-----	-----	-----	-8.6	-16.8	-2.3	-10.7	-----	-----
	30 to 45	1	45.7	31.2	36.3	25.0	3.5	-27.7	1.2	-23.8	-16.0	-18.3
		2	45.7	31.2	36.3	25.0	17.6	-13.7	15.2	-9.8	-16.0	-18.3
180	0 to 5°	1	51.4	-26.7	34.1	-15.8	-61.7	-35.1	-43.0	-27.2	-86.4	-67.7
	10°	1	58.0	-24.0	38.5	-14.0	-61.7	-37.7	-43.0	-29.0	-86.4	-67.7
	15°	1	64.5	-21.4	43.0	-12.2	-61.7	-40.3	-43.0	-30.8	-86.4	-67.7
	20°	1	71.1	-18.8	47.4	-10.4	-61.7	-43.0	-43.0	-32.6	-86.4	-67.7
	25°	1	64.5	10.4	46.7	10.6	-28.6	-39.0	-20.7	-31.4	-53.3	-45.4
		2	-----	-----	-----	-----	-10.9	-21.2	-3.0	-13.6	-----	-----
	30 to 45	1	57.8	39.5	45.9	31.6	4.4	-35.1	1.5	-30.1	-20.3	-23.2
		2	57.8	39.5	45.9	31.6	22.2	-17.3	19.3	-12.3	-20.3	-23.2
200	0 to 5°	1	63.4	-32.9	42.1	-19.5	-76.2	-43.3	-53.1	-33.5	-106.7	-83.5
	10°	1	71.5	-29.7	47.6	-17.3	-76.2	-46.5	-53.1	-35.8	-106.7	-83.5
	15°	1	79.7	-26.4	53.1	-15.0	-76.2	-49.8	-53.1	-38.0	-106.7	-83.5
	20°	1	87.8	-23.2	58.5	-12.8	-76.2	-53.1	-53.1	-40.2	-106.7	-83.5
	25°	1	79.6	12.8	57.6	13.1	-35.4	-48.2	-25.6	-38.7	-65.9	-56.1
		2	-----	-----	-----	-----	-13.4	-26.2	-3.7	-16.8	-----	-----
	30 to 45	1	71.3	48.8	56.7	39.0	5.5	-43.3	1.8	-37.2	-25.0	-28.7
		2	71.3	48.8	56.7	39.0	27.4	-21.3	23.8	-15.2	-25.0	-28.7

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

Unit Conversions – 1.0 ft = 0.3048 m; 1.0 psf = 0.0479 kN/m²

CHAPTER 26 WIND LOADS: GENERAL REQUIREMENTS

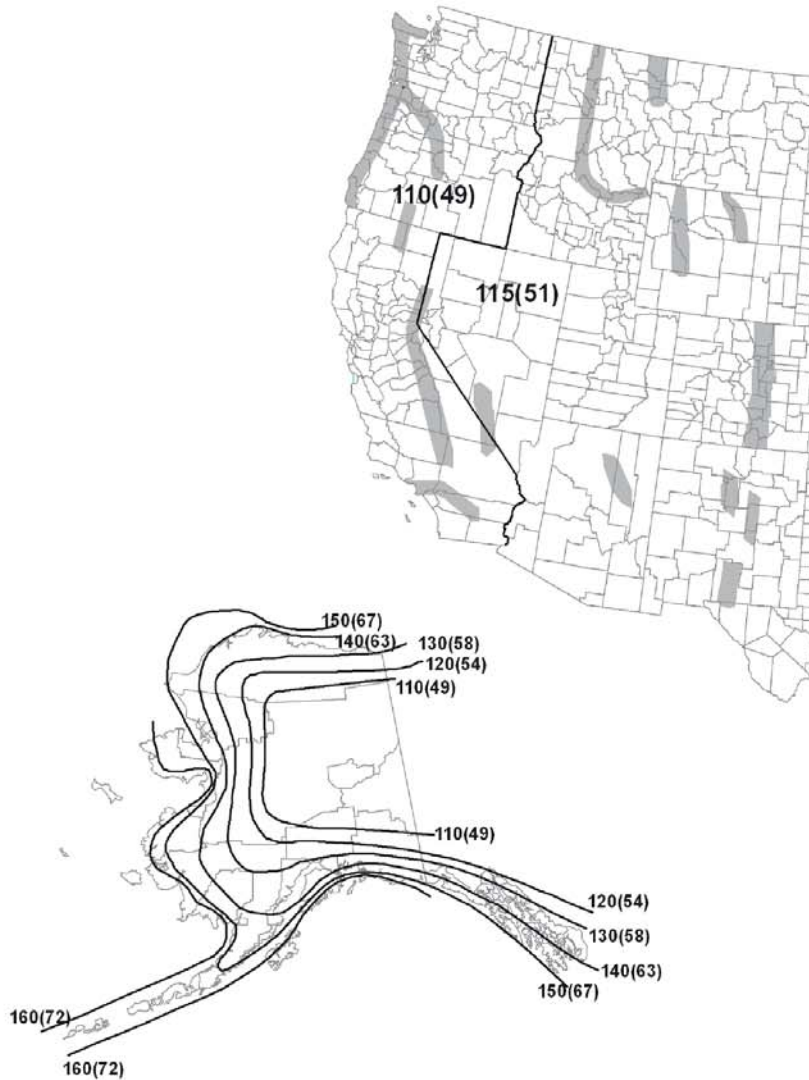


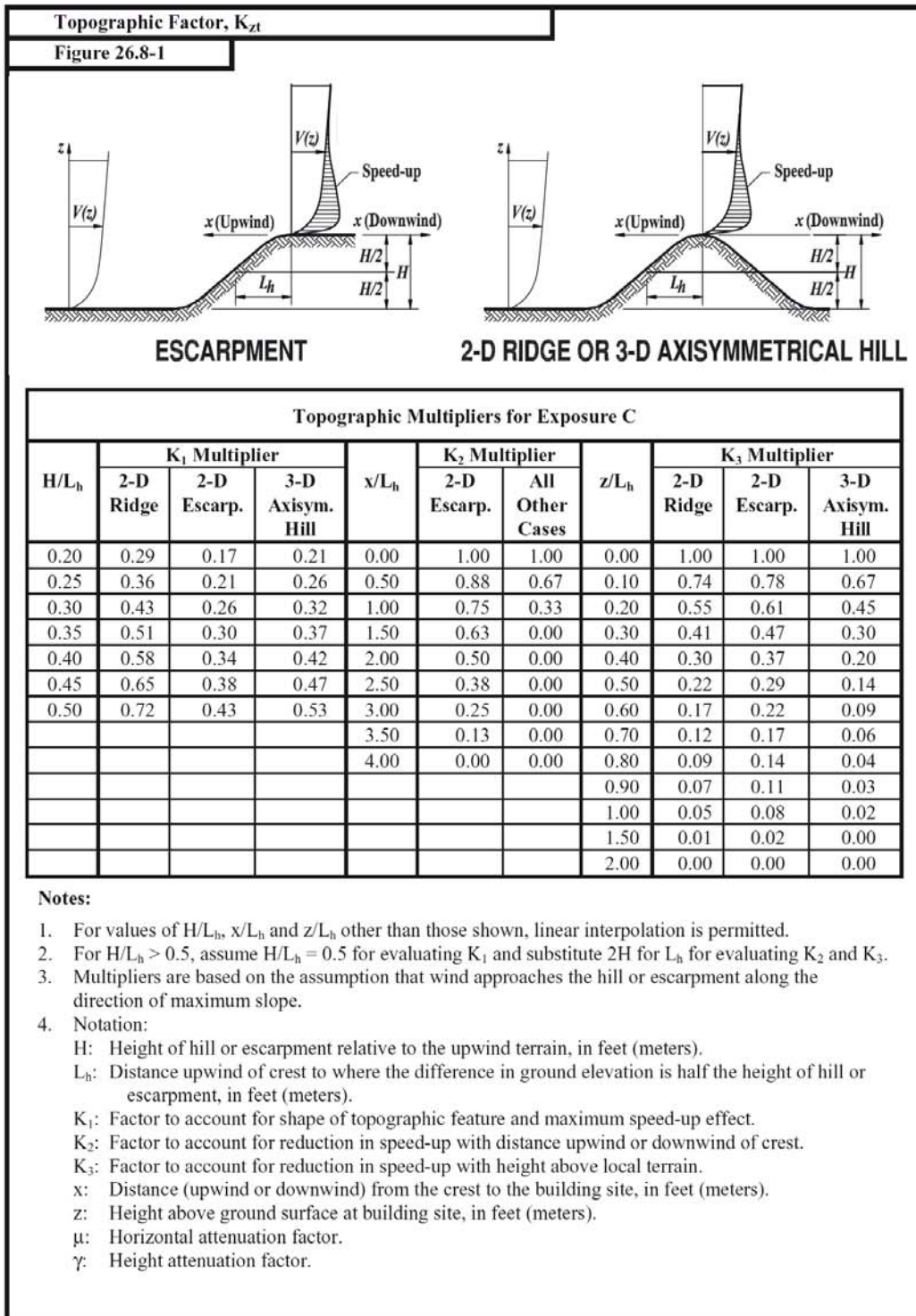
Figure 26.5-1A Basic Wind Speeds for Occupancy Category II Buildings and Other Structures.

Notes:

1. Values are nominal design 3-second gust wind speeds in miles per hour (m/s) at 33 ft (10m) above ground for Exposure C category.
2. Linear interpolation between contours is permitted.
3. Islands and coastal areas outside the last contour shall use the last wind speed contour of the coastal area.
4. Mountainous terrain, gorges, ocean promontories, and special wind regions shall be examined for unusual wind conditions.
5. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (Annual Exceedance Probability = 0.00143, MRI = 700 Years).

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CHAPTER 26 WIND LOADS: GENERAL REQUIREMENTS



CHAPTER 26 WIND LOADS: GENERAL REQUIREMENTS

Main Wind Force Resisting System and Components and Cladding		All Heights								
Table 26.11-1	Internal Pressure Coefficient, (GC_{pi})	Walls & Roofs								
Enclosed, Partially Enclosed, and Open Buildings										
<table border="1"> <thead> <tr> <th>Enclosure Classification</th> <th>(GC_{pi})</th> </tr> </thead> <tbody> <tr> <td>Open Buildings</td> <td>0.00</td> </tr> <tr> <td>Partially Enclosed Buildings</td> <td>+0.55 -0.55</td> </tr> <tr> <td>Enclosed Buildings</td> <td>+0.18 -0.18</td> </tr> </tbody> </table>			Enclosure Classification	(GC_{pi})	Open Buildings	0.00	Partially Enclosed Buildings	+0.55 -0.55	Enclosed Buildings	+0.18 -0.18
Enclosure Classification	(GC_{pi})									
Open Buildings	0.00									
Partially Enclosed Buildings	+0.55 -0.55									
Enclosed Buildings	+0.18 -0.18									
<p>Notes:</p> <ol style="list-style-type: none"> 1. Plus and minus signs signify pressures acting toward and away from the internal surfaces, respectively. 2. Values of (GC_{pi}) shall be used with q_z or q_h as specified. 3. Two cases shall be considered to determine the critical load requirements for the appropriate condition: <ol style="list-style-type: none"> (i) a positive value of (GC_{pi}) applied to all internal surfaces (ii) a negative value of (GC_{pi}) applied to all internal surfaces 										

IBI Company

Project : SCALLON-CONNOLLY
Subject : Wind-Loads
Location : Mercer Island

File : 23-041
Date : 1/16/2024
Eng : JCI

Design Wind Pressure, p, Equation 28.6-1 (ASCE 7-10)

System Type	Structure Type	Equation
Main Wind Force Resisting System (Envelope Procedure)	Rigid Structures	$ps = \lambda Kzt (ps30)$
	Low-Rise Buildings	λ : Adjustment Factor
	Simple Diaphragm	Kzt : Topographic Factor
	Enclosed Buildings	ps30 : Figure 28.6-1

Building Height = 18.88 ft
 Roof Angle = 18.68 deg.
 Basic Wind Speed = 110 mph (Figure 26.5-1 A-C)
 Occupancy Category = II (Table 1.5-1)
 Exposure Category = B (Section 26.7.3)
 Topography = 3-D Axisym. Hill
 Kzt @ h = Topographic factor (Figure 26.8-1)
 = $(1 + K1 \cdot K2 \cdot K3)^2$
 = 1.60

Design Wind Pressure, p, Figure 26.8-1 - Load Case 1

Location	Adjustment Factor	Case A Ps30 (psf)	Case A Ending P (psf)	Case B Ps30 (psf)	Case B Ending P (psf)
Zone A	1.00	25.94	41.57	19.20	30.77
Zone B	1.00	-7.26	-11.64	-10.00	-16.03
Zone C	1.00	17.25	27.65	12.70	20.35
Zone D	1.00	-4.08	-6.55	-5.90	-9.46
Zone E	1.00	-23.10	-37.02	-23.10	-37.02
Zone F	1.00	-15.76	-25.26	-13.10	-20.99
Zone G	1.00	-16.00	-25.64	-16.00	-25.64
Zone H	1.00	-12.02	-19.26	-10.10	-16.19
Eoh	1.00	-32.30	-51.76	-32.30	-51.76
Goh	1.00	-25.30	-40.55	-25.30	-40.55

WOOD STRUCTURAL PANEL SHEAR WALLS
GYPSUM BOARD PANEL SHEAR WALLS
ANALYSIS & DESIGN PER IBC 2021

PROGRAM : SWD-2021 BY I.B.I. C O M P A N Y
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THE RESULTS FROM THIS COMPUTER PROGRAM SHALL BE
INTERPRETED BY A REGISTERED PROFESSIONAL ENGINEER,
ARCHITECT AND THE PROPER BUILDING AUTHORITIES.
FOR INQUIRES ABOUT THE COMPUTER PROGRAM, CONTACT
I.B.I. COMPANY BY PHONE AT PH:(425)-450-0316 OR BY
FAX:(425)-450-0316 & E-MAIL info@ibicompany.com

P R O J E C T I N F O R M A T I O N

PROJECT NAME : SCALLON SMITH-CONNOLLY
JOB NUMBER : 23-41
CLIENT NAME : SCALLON SMITH-CONNOLLY
DATE : 08-18-2024
INPUT FILE : C:\SWAN\23-41\23-41-L1.DAT
OUTPUT FILE : C:\SWAN\23-41\23-41-L1.OUT

G E N E R A L B U I L D I N G I N F O R M A T I O N

BUILDING HEIGHT= 21.45 [Ft.]
BUILDING WIDTH IN THE X - DIRECTION.....= 49.47 [Ft.]
BUILDING WIDTH IN THE Y - DIRECTION.....= 26.50 [Ft.]
BUILDING HEIGHT TO WIDTH RATIO X - DIRECTION = 0.43
BUILDING HEIGHT TO WIDTH RATIO Y - DIRECTION = 0.81
GROUND FLOOR AREA OF THE STRUCTURE.....= 1257.98 [Sq. Ft.]
RISK CATEGORY PER TABLE 1.5-1 ASCE-7-10.....= II

W I N D L O A D C R I T E R I A
PER SECTION 1609 IBC 2021 OR CHAPTERS 26,27 or 28 ASCE-7-10

EXPOSURE CATEGORY = B
BASIC WIND SPEED = 110.00
IMPORTANCE FACTOR I_w = 1.00
Diaphragm wind loads have been calculated based on Chapter 26, 27 or 28
ASCE-1-10 or section 1609 of the IBC 2021 depending on building type

S E I S M I C L O A D C R I T E R I A
PER SECTION 1613 IBC 2021 AND CHAPTERS 11 AND 12 ASCE-7-10

SITE CLASS PER SECTION 11.4.2 ASCE-7-10 = D
SEISMIC DESIGN CATEGORY PER TABLES 11.6-1 & 11.6-2 asce-7-10 = D
IMPORTANCE FACTOR PER TABLE 1.5-2 ASCE-7-10 $I_e = 1.00$
RESPONSE MODIFICATION FACTOR PER TABLE 12.2-1 ASCE-7-10= 6.50
DESIGN 5% DAMPED SPECTRA RESPONSE ACCELERATION AT SHORT PERIODS = 1.00
DESIGN 5% DAMPED SPECTRA RESPONSE ACCELERATION AT 1 SEC. PERIOD = 1.00
SYSTEM OVERSTRENGTH FACTOR $\Omega(0)$ PER TABLE 12.2-1 ASCE-7-10..= 2.50

Diaphragm seismic loads have been calculated based on Chapters 11 and 12 of the ASCE-7-10 and Section 1613 of the IBC 2021 Code

M A T E R I A L P R O P E R T I E S
T A B L E 4A O F T H E 2021 N D S

SPECIES AND GRADE USED FOR STUD : SPRUCE-PINE-FIR STUD 2" & WIDER
SPECIES AND GRADE USED FOR PLATES: HEM-FIR NO 2 2" & WIDER

MATERIAL PROPERTIES
FOR STUDS & CHORDS

MATERIAL PROPERTIES
BOTTOM & TOP PLATES

Fbs = 675.00 [psi.]
Ft = 350.00 [psi.]
Fv = 135.00 [psi.]
Fcp = 425.00 [psi.]
Fc = 725.00 [psi.]
E = 1200.00 [ksi.]
SG = 0.42 [pcf.]

Fbs = 850.00 [psi.]
Ft = 525.00 [psi.]
Fv = 150.00 [psi.]
Fcp = 405.00 [psi.]
Fc = 1300.00 [psi.]
E = 1300.00 [ksi.]
SG = 0.43 [pcf.]

WOOD STRUCTURAL PANEL SHEAR WALL MATERIAL AND FASTENERS
TABLE 4.3A OF THE NDS 2021 ADJUSTED PER SECTION 4.3.3 FOR ADS

7/16" SHEATHING WITH 8D NAILS FOOTNOTE (G)

CONCRETE AND ANCHOR BOLT STEEL MATERIAL PROPERTIES
CHAPTERS 12 AND 22 OF THE IBC 2021

MINIMUM CONCRETE STRENGTH $F'_c = 2500.00$ [psi.]

MATERIAL FOR ANCHOR BOLTS AND TIE RODS $F_y = 36000.00$ [psi.]

S H E A R W A L L D E S I G N
 FROM ROOF LEVEL TO MAIN LEVEL

FROM ROOF LEVEL TO MAIN LEVEL HEIGHT = 7.89 [Ft.]
 SHEAR WALL HEIGHT FROM TOP TO BOTTOM PLATE = 7.89 [Ft.]

X DIRECTION HORIZONTAL DIAPHRAGM FORCES ROOF LEVEL:

DIAPHRAGM WIND LOADS = 157.77 [Lb./Ft.]
 DIAPHRAGM SEISMIC LOADS = 150.87 [Lb./Ft.]

THE FOLLOWING LOADS ARE NOT APPLICABLE TO THIS STRUCTURE

F = Load due to fluids with well-defined pressure and maximum heights

Fa= Flood loads

H = Load due to lateral earth, ground water and bulk material pressures

T = Self-straining force

Wi= Wind-on-ice determined in accordance with Chapter 10, ASCE-7-10

S H E A R W A L L V E R T I C A L L O A D S
 DEAD LOADS PER CHAPTER 3 AND SECTION 12.4.2.2 ASCE-7-10

DEAD LOAD = 13.00 [PSF] WALL WEIGHT = 10.00 [PSF]
 LIVE LOAD = 25.00 [PSF] WIND LOAD = -16.00 [PSF]
 SHEAR WALL HEIGHT FROM TOP TO BOTTOM PLATE = 7.89 [Ft.]

WALL LABEL	TRIBUTARY LENGTH [Ft.]	WALL WEIGHT [Lb./Ft.]	DEAD LOAD [Lb./Ft.]	TOTAL DEAD LOAD [Lb./Ft.]	0.20*SDS*DL [Lb./Ft.]
1X	8.79	78.90	114.27	193.17	38.63
2X	16.19	78.90	210.47	289.37	57.87
3X	6.36	78.90	82.68	161.58	32.32
4X	0.61	78.90	7.93	86.83	17.37
5X	0.61	78.90	7.93	86.83	17.37

EQ. 12.4-4

S H E A R W A L L V E R T I C A L L O A D S
 LIVE LOADS PER CHAPTER 4 OF THE ASCE-7-10
 BASIC LOAD COMBINATIONS PER SECTION 1605.3 IBC 2021

DEAD LOAD = 13.00 [PSF] WALL WEIGHT = 10.00 [PSF]
 LIVE LOAD = 25.00 [PSF] WIND LOAD = -16.00 [PSF]
 SHEAR WALL HEIGHT FROM TOP TO BOTTOM PLATE = 7.89 [Ft.]

WALL LABEL	LIVE LOAD [Lb./Ft.]	WIND LOAD [Lb./Ft.]	DEAD+LIVE [Lb./Ft.]	DL+0.75*(0.6*W+LL) [Lb./Ft.]	0.6*D+0.6*W [Lb./Ft.]
			EQ. 16-9/10	EQ. 16-13	EQ. 16-15

1X	219.75	-140.64	412.92	294.69	31.52
2X	404.75	-259.04	694.12	476.36	18.20
3X	159.00	-101.76	320.58	235.04	35.89
4X	15.25	-9.76	102.08	93.88	46.24
5X	15.25	-9.76	102.08	93.88	46.24

S H E A R W A L L V E R T I C A L L O A D S
LIVE LOADS PER CHAPTER 4 OF THE ASCE-7-10
BASIC LOAD COMBINATIONS PER SECTION 1605.3 IBC 2021

DEAD LOAD = 13.00 [PSF] WALL WEIGHT = 10.00 [PSF]
LIVE LOAD = 25.00 [PSF] WIND LOAD = -16.00 [PSF]
SHEAR WALL HEIGHT FROM TOP TO BOTTOM PLATE = 7.89 [Ft.]

WALL LABEL	D+0.75*(LL+0.75*EQ) [Lb./Ft.] EQ. 16-14	D+0.75(LL-0.75*EQ) [Lb./Ft.] EQ. 16-14	0.6*D+0.7*EQ [Lb./Ft.] EQ. 16-16	0.6*D-0.7*EQ [Lb./Ft.] EQ. 16-16
1X	386.96	329.01	142.95	88.86
2X	636.34	549.53	214.13	133.11
3X	305.07	256.59	119.57	74.33
4X	111.29	85.24	64.25	39.94
5X	111.29	85.24	64.25	39.94

H E I G H T T O W I D T H R A T I O C A L C U L A T I O N
PER SECTION 4.3.4 & TABLE 4.3.4 OF THE AF&PA SDPWD-2021

WALL LABEL	H/W RATIO	2*W/H ADJUSTMENT FACTOR	PLYWOOD WALLS BLOCKED H/W = 3.5	GYPSUM WALLBOARD WALLS BLOCKED H/W = 2.0	UNBLOCKED H/W = 1.50
1X	0.46	1.00	SHEAR WALL IS DESIGNED WITH HOLE CUT OUTS		
2X	0.33	1.00	SHEAR WALL IS DESIGNED WITH HOLE CUT OUTS		
3X	0.59	1.00	SHEAR WALL IS DESIGNED WITH HOLE CUT OUTS		
4X	0.69	1.00	SHEAR WALL IS DESIGNED WITH HOLE CUT OUTS		
5X	1.13	1.00	YES	YES	YES

For design to resist seismic forces, shear wall height to width ratios greater than 2:1, but not exceeding 3-1/2:1, are permitted provided the allowable shear values in Table 4.3A NDS 2021 are multiplied by 2w/h

W I N D A N A L Y S I S
WIND LOAD ARE AT STRENGTH LEVEL

WALL LABEL	LENGTH FOR SHEAR [Ft.]	LENGTH FOR MOMENT [Ft.]	TRIBUTARY LENGTH [Ft.]	FORCE [Lb.]	OVERTURNING MOMENT [Ft.-Lb.]
1X	5.15	17.31	15.42	831.39	6559.64
2X	9.92	24.01	15.42	1601.43	12635.26
3X	4.29	13.29	17.24	2719.95	21460.44
4X	5.60	11.43	6.16	432.28	3410.71
5X	6.99	6.99	6.16	539.58	4257.29

R E D U N D A N C Y / R E L I A B I L I T Y F A C T O R
A C C O R D I N G T O S E C T I O N 12.3.4 ASCE-7-10

RELIABILITY/REDUNDANCY FACTOR RHO.....= 1.00

S E I S M I C A N A L Y S I S
SEISMIC LOADS ARE AT STRENGTH LEVEL

WALL LABEL	LENGTH FOR SHEAR [Ft.]	LENGTH FOR MOMENT [Ft.]	TRIBUTARY LENGTH [Ft.]	FORCE [Lb.]	OVERTURNING MOMENT [Ft.-Lb.]
1X	5.15	17.31	15.42	795.03	6272.75
2X	9.92	24.01	15.42	1531.39	12082.66
3X	4.29	13.29	17.24	2601.00	20521.88
4X	5.60	11.43	6.16	413.38	3261.54
5X	6.99	6.99	6.16	515.98	4071.10

S E I S M I C A N D W I N D S H E A R S
(WIND & SEISMIC SHEARS ARE AT ALLOWABLE STRENGTH DESIGN ASD LEVEL)

WALL LABEL	WALL LINE	LENGTH FOR SHEAR [Ft.]	SHEAR DUE TO WIND 0.6W [Lb./Ft.]	SHEAR DUE TO SEISMIC 0.7*EQ [Lb./Ft.]
1X	A	5.15	96.86	108.06
2X	A	9.92	96.86	108.06
3X	B	4.29	380.41	424.41
4X	C	5.60	46.32	51.67
5X	C	6.99	46.32	51.67

S E I S M I C A N D W I N D S H E A R S
(WIND & SEISMIC SHEARS ARE AT ALLOWABLE STRENGTH DESIGN ASD LEVEL)
(SHEARS AT THE BASE OF THE SHEAR WALL FOR PLATE FASTENER DESIGN)

WALL LABEL	WALL LINE	LENGTH FOR SHEAR [Ft.]	SHEAR DUE TO WIND 0.6*W [Lb./Ft.]	SHEAR DUE TO SEISMIC 0.7*EQ [Lb./Ft.]
1X	A	17.31	28.82	32.15
2X	A	24.01	40.02	44.65
3X	B	13.29	122.80	137.00
4X	C	11.43	22.69	25.32
5X	C	6.99	46.32	51.67

W I N D O V E R T U R N I N G A N D R E S I S T I N G
M O M E N T S F O R S T A B I L I T Y C A L C U L A T I O N S

WALL LABEL	OVERTURNING MOMENT WIND LOAD	RESISTING MOMENT DL+0.75*(0.6*W+LL)	RESISTING MOMENT 0.6*D+0.6*W
1X	6559.64	44150.55	4721.96
2X	12635.26	137307.33	5245.39
3X	21460.44	20756.69	3169.70
4X	3410.71	6132.18	3020.64
5X	4257.29	2293.38	1129.69

OVERTURNING MOMENTS HAVE BEEN CALCULATED TO ACCOUNT FOR THE CRITICAL LOAD COMBINATIONS PER SECTION 1605.3 EQUATIONS 16-13 & 16-15 IBC 2021

S E I S M I C O V E R T U R N I N G A N D R E S I S T I N G
M O M E N T S F O R S T A B I L I T Y C A L C U L A T I O N S

WALL LABEL	OVERTURNING MOMENT 0.70*EQ	RESISTING MOMENT D+0.75*(LL-0.7*EQ)	RESISTING MOMENT 0.6D - 0.7*EQ
1X	4390.93	49291.19	13312.56
2X	8457.86	158395.69	38367.70
3X	14365.32	22660.26	6563.95
4X	2283.08	5568.28	2609.10
5X	2849.77	2082.49	975.78

OVERTURNING MOMENTS HAVE BEEN CALCULATED TO ACCOUNT FOR THE CRITICAL LOAD COMBINATIONS PER SECTION 1605.3 EQUATIONS 16-14 & 16-16 IBC 2021

S H E A R W A L L C H O R D C O M P R E S S I O N L O A D S
(WIND COMPRESSION LOADS ARE AT ALLOWABLE STRENGTH DESIGN ASD LEVEL)

WALL LABEL	COMPRESSION WIND LOAD	COMPRESSION $DL+0.75*(0.6*W+LL)$	COMPRESSION $0.6*D+0.6*W$
1X	378.95	2834.79	651.74
2X	526.25	6113.44	744.72
3X	1614.78	2772.91	1853.28
4X	298.40	760.30	562.67
5X	609.05	784.89	770.67

CHORD COMPRESSION LOADS HAVE BEEN CALCULATED TO ACCOUNT FOR THE CRITICAL LOAD COMBINATIONS PER SECTION 1605.3 EQUATIONS 16-13 & 16-15 IBC 2021

S H E A R W A L L C H O R D C O M P R E S S I O N L O A D S
(SEISMIC COMPRESSION LOADS ARE AT ALLOWABLE STRENGTH DESIGN ASD LEVEL)

WALL LABEL	COMPRESSION $0.70*EQ$	COMPRESSION $D+0.75*(LL+0.7*EQ)$	COMPRESSION $0.6D+0.7*EQ$
1X	253.66	3620.90	1490.86
2X	352.26	8016.66	2922.94
3X	1080.91	3185.29	1875.45
4X	199.74	850.05	566.96
5X	407.69	825.78	632.26

CHORD COMPRESSION LOADS HAVE BEEN CALCULATED TO ACCOUNT FOR THE CRITICAL LOAD COMBINATIONS PER SECTION 1605.3 EQUATIONS 16-14 & 16-16 IBC 2021

C R I T I C A L S H E A R W A L L C H O R D C O M P R E S S I O N
(WIND & SEISMIC COMPRESSION LOADS ARE AT ASD LEVEL)

WALL LABEL	WIND COMPRESSION CRITICAL	SEISMIC COMPRESSION CRITICAL	COMPRESSION LOAD USED FOR DESIGN
1X	2834.79	3620.90	3620.90
2X	6113.44	8016.66	8016.66
3X	2772.91	3185.29	3185.29
4X	760.30	850.05	850.05
5X	784.89	825.78	825.78

S H E A R W A L L C H O R D T E N S I O N L O A D S
(WIND TENSION LOADS ARE AT ALLOWABLE STRENGTH DESIGN ASD LEVEL)

WALL LABEL	UPLIFT TENSION WIND LOAD	UPLIFT TENSION DL+0.75*(0.6W+LL)	UPLIFT TENSION 0.6*D+0.6*W
1X	378.95	-2266.37	106.16
2X	526.25	-5324.07	307.78
3X	1614.78	-350.74	1376.28
4X	298.40	-312.70	34.13
5X	609.05	128.70	447.44

CHORD TENSION LOADS HAVE BEEN CALCULATED TO ACCOUNT FOR THE CRITICAL LOAD COMBINATIONS PER SECTION 1605.3 EQUATIONS 16-13 & 16-15 IBC 2021

S H E A R W A L L C H O R D T E N S I O N L O A D S
(SEISMIC TENSION LOADS ARE AT ALLOWABLE STRENGTH DESIGN ASD LEVEL)

WALL LABEL	UPLIFT TENSION 0.70*EQ	UPLIFT TENSION D+0.75*(LL-0.7*EQ)	UPLIFT TENSION 0.6D - 0.7*EQ
1X	253.66	-2575.77	-515.40
2X	352.26	-6219.65	-1245.72
3X	1080.91	-546.94	587.01
4X	199.74	-273.15	-28.52
5X	407.69	138.89	268.10

CHORD TENSION LOADS HAVE BEEN CALCULATED TO ACCOUNT FOR THE CRITICAL LOAD COMBINATIONS PER SECTION 1605.3 EQUATIONS 16-14 & 16-16 IBC 2021

C R I T I C A L S H E A R W A L L C H O R D T E N S I O N L O A D S
(WIND & SEISMIC TENSION LOADS ARE AT ASD LEVEL)

WALL LABEL	WIND TENSION CRITICAL	SEISMIC TENSION CRITICAL	UPLIFT TENSION USED FOR DESIGN
1X	106.16	-515.40	106.16
2X	307.78	-1245.72	307.78
3X	1376.28	587.01	1376.28
4X	34.13	-28.52	34.13
5X	447.44	268.10	447.44

A L L O W A B L E S H E A R S
(PER TABLE 4.3A OF THE NDS 2021)
WIND LOADS HAVE BEEN INCREASE BY 40% PER TABLE 4.3A COLUMN B

WALL TYPE	SEISMIC ALLOWABLE SHEARS [LBS/FT]	WIND ALLOWABLE SHEARS [LBS/FT]	NUMBER OF SIDES WITH SHEATHING
P1 - 6	239.20	334.88	1
P1 - 4	349.60	489.44	1
P1 - 3	450.80	631.12	1
P1 - 2	588.80	824.32	1
P2 - 6	478.40	669.76	2
P2 - 4	699.20	978.88	2
P2 - 3	901.60	1262.24	2
P2 - 2	1177.60	1648.64	2

S H E A R W A L L S C H E D U L E

SHEAR WALLS FROM ROOF LEVEL TO MAIN LEVEL

WALL LABEL	SEISMIC SHEAR [Lbs/Ft.]	WIND SHEAR [Lbs/Ft.]	CRITICAL SHEAR [Lbs/Ft.]	SHEAR PANEL DESIGNATION
1X	108.06	96.86	108.06	EX-OK
2X	108.06	96.86	108.06	EX-OK
3X	424.41	380.41	424.41	EX-OK
4X	51.67	46.32	51.67	P1 - 6
5X	51.67	46.32	51.67	P1 - 6

S I L L P L A T E R E Q U I R E M E N T S
(FOR SEISMIC DESIGN CATEGORY D, E AND F)

WALL LABEL	WALL LINE	LENGTH FOR SHEAR [Ft.]	SHEAR DUE TO SEISMIC 0.7*EQ [Lb./Ft.]	SILL PLATE REQUIRED AND BOLT SPACING
1X	A	17.31	32.15	2x PER SCHEDULE
2X	A	24.01	44.65	2x PER SCHEDULE
3X	B	13.29	137.00	2x PER SCHEDULE
4X	C	11.43	25.32	2x PER SCHEDULE
5X	C	6.99	51.67	2x PER SCHEDULE

Refer to shear wall schedule on the structural drawings for anchor bolt spacing. Use 3-inx3-inx0.229-in plate washers. For shear loads between 350 [Lbs/Ft.] and 600 [Lbs/Ft.] use 2x plates with bolt spacing of 1/2 the spacing shown on the plans and shear wall schedule.

S H E A R W A L L T O D I A P H R A G M
C O N N E C T I O N D E T A I L S U M M A R Y
(R E F F E R T O S T R U C T U R A L P L A N S A N D D E T A I L S H E E T S)

WALL LABEL	TOP DETAIL CONNECTION	STRUCTURAL DETAIL SHEET	BOTTOM DETAIL CONNECTION	STRUCTURAL DETAIL SHEET
1X	2	SD2	2	SD1
2X	1	SD2	1	SD1
3X	2	SD2	6	SD1
4X	4	SD2	4	SD1
5X	4	SD2	4	SD1

H O L D - D O W N S C H E D U L E

HOLD-DOWNS FROM ROOF LEVEL TO MAIN LEVEL

WALL LABEL	WALL END	UPLIFT LOADS	USP HOLDOWNS & STRAPS AT END OF THE WALLS	STUDS REQUIRED FOR HOLDOWN ASSEMBLY
1X	BOTH	106.16	NOT REQUIRED	
2X	BOTH	307.78	NOT REQUIRED	
3X	BOTH	1376.28	NOT REQUIRED	
4X	BOTH	34.13	NOT REQUIRED	
5X	BOTH	447.44	(1) STHD10 STRAP	(2) (2x4) / (2) (2x6)

NOTE.- THE SHEAR WALLS CALLED OUT ON THE PLANS SHALL PROVIDE EQUAL OR GREATER SHEAR LOAD CAPACITY PER LINEAL FOOT.

THE HOLD-DOWNS CALLED OUT ON THE PLANS SHALL PROVIDE EQUAL OR GREATER UPLIFT LOAD CAPACITY.
GREATER UPLIFT LOAD CAPACITY ACCORDING TO USP CATALOG.

AT CROSS WALLS USP MPA1 CLIPS MAY BE USED TO RESIST UPLIFT

S H E A R W A L L D E S I G N
 FROM ROOF LEVEL TO MAIN LEVEL

FROM ROOF LEVEL TO MAIN LEVEL HEIGHT = 7.89 [Ft.]
 SHEAR WALL HEIGHT FROM TOP TO BOTTOM PLATE = 7.89 [Ft.]

Y DIRECTION HORIZONTAL DIAPHRAGM FORCES ROOF LEVEL:

DIAPHRAGM WIND LOADS = 157.77 [Lb./Ft.]
 DIAPHRAGM SEISMIC LOADS = 124.63 [Lb./Ft.]

THE FOLLOWING LOADS ARE NOT APPLICABLE TO THIS STRUCTURE

F = Load due to fluids with well-defined pressure and maximum heights

Fa= Flood loads

H = Load due to lateral earth, ground water and bulk material pressures

T = Self-straining force

Wi= Wind-on-ice determined in accordance with Chapter 10, ASCE-7-10

S H E A R W A L L V E R T I C A L L O A D S
 DEAD LOADS PER CHAPTER 3 AND SECTION 12.4.2.2 ASCE-7-10

DEAD LOAD = 13.00 [PSF] WALL WEIGHT = 10.00 [PSF]
 LIVE LOAD = 25.00 [PSF] WIND LOAD = -16.00 [PSF]
 SHEAR WALL HEIGHT FROM TOP TO BOTTOM PLATE = 7.89 [Ft.]

WALL LABEL	TRIBUTARY LENGTH [Ft.]	WALL WEIGHT [Lb./Ft.]	DEAD LOAD [Lb./Ft.]	TOTAL DEAD LOAD [Lb./Ft.]	0.20*SDS*DL [Lb./Ft.]
1Y	0.69	78.90	8.97	87.87	17.57
2Y	0.69	78.90	8.97	87.87	17.57
3Y	4.33	78.90	56.29	135.19	27.04
4Y	6.02	78.90	78.26	157.16	31.43
5Y	1.00	78.90	13.00	91.90	18.38
6Y	6.02	78.90	78.26	157.16	31.43

S H E A R W A L L V E R T I C A L L O A D S
 LIVE LOADS PER CHAPTER 4 OF THE ASCE-7-10
 BASIC LOAD COMBINATIONS PER SECTION 1605.3 IBC 2021

DEAD LOAD = 13.00 [PSF] WALL WEIGHT = 10.00 [PSF]
 LIVE LOAD = 25.00 [PSF] WIND LOAD = -16.00 [PSF]
 SHEAR WALL HEIGHT FROM TOP TO BOTTOM PLATE = 7.89 [Ft.]

WALL LABEL	LIVE LOAD [Lb./Ft.]	WIND LOAD [Lb./Ft.]	DEAD+LIVE [Lb./Ft.]	DL+0.75*(0.6*W+LL) [Lb./Ft.]	0.6*D+0.6*W [Lb./Ft.]
			EQ. 16-9/10	EQ. 16-13	EQ. 16-15

1Y	17.25	-11.04	105.12	95.84	46.10
2Y	17.25	-11.04	105.12	95.84	46.10
3Y	108.25	-69.28	243.44	185.20	39.55
4Y	150.50	-96.32	307.66	226.69	36.50
5Y	25.00	-16.00	116.90	103.45	45.54
6Y	150.50	-96.32	307.66	226.69	36.50

S H E A R W A L L V E R T I C A L L O A D S
LIVE LOADS PER CHAPTER 4 OF THE ASCE-7-10
BASIC LOAD COMBINATIONS PER SECTION 1605.3 IBC 2021

DEAD LOAD = 13.00 [PSF] WALL WEIGHT = 10.00 [PSF]
LIVE LOAD = 25.00 [PSF] WIND LOAD = -16.00 [PSF]
SHEAR WALL HEIGHT FROM TOP TO BOTTOM PLATE = 7.89 [Ft.]

WALL LABEL	D+0.75*(LL+0.75*EQ) [Lb./Ft.] EQ. 16-14	D+0.75(LL-0.75*EQ) [Lb./Ft.] EQ. 16-14	0.6*D+0.7*EQ [Lb./Ft.] EQ. 16-16	0.6*D-0.7*EQ [Lb./Ft.] EQ. 16-16
1Y	113.99	87.63	65.02	40.42
2Y	113.99	87.63	65.02	40.42
3Y	236.66	196.10	100.04	62.19
4Y	293.61	246.46	116.30	72.29
5Y	124.43	96.86	68.01	42.27
6Y	293.61	246.46	116.30	72.29

H E I G H T T O W I D T H R A T I O C A L C U L A T I O N
PER SECTION 4.3.4 & TABLE 4.3.4 OF THE AF&PA SDPWD-2021

WALL LABEL	H/W RATIO	2*W/H ADJUSTMENT FACTOR	PLYWOOD WALLS	GYPSUM WALLBOARD WALLS	
			BLOCKED H/W = 3.5	BLOCKED H/W = 2.0	UNBLOCKED H/W = 1.50
1Y	1.05	1.00	YES	YES	YES
2Y	0.32	1.00	SHEAR WALL IS DESIGNED WITH HOLE CUT OUTS		
3Y	0.66	1.00	SHEAR WALL IS DESIGNED WITH HOLE CUT OUTS		
4Y	0.99	1.00	YES	YES	YES
5Y	0.28	1.00	YES	YES	YES
6Y	0.99	1.00	YES	YES	YES

For design to resist seismic forces, shear wall height to width ratios greater than 2:1, but not exceeding 3-1/2:1, are permitted provided the allowable shear values in Table 4.3A NDS 2021 are multiplied by 2w/h

W I N D A N A L Y S I S
WIND LOAD ARE AT STRENGTH LEVEL

WALL LABEL	LENGTH FOR SHEAR [Ft.]	LENGTH FOR MOMENT [Ft.]	TRIBUTARY LENGTH [Ft.]	FORCE [Lb.]	OVERTURNING MOMENT [Ft.-Lb.]
1Y	7.53	7.53	7.16	378.05	2982.82
2Y	14.97	24.95	7.16	751.58	5929.99
3Y	6.32	11.99	11.65	1838.02	14501.98
4Y	8.00	8.00	18.04	2846.17	22456.29
5Y	28.37	28.37	11.88	1462.03	11535.43
6Y	8.00	8.00	11.88	412.28	3252.85

R E D U N D A N C Y / R E L I A B I L I T Y F A C T O R
A C C O R D I N G T O S E C T I O N 12.3.4 ASCE-7-10

RELIABILITY/REDUNDANCY FACTOR RHO.....= 1.00

S E I S M I C A N A L Y S I S
SEISMIC LOADS ARE AT STRENGTH LEVEL

WALL LABEL	LENGTH FOR SHEAR [Ft.]	LENGTH FOR MOMENT [Ft.]	TRIBUTARY LENGTH [Ft.]	FORCE [Lb.]	OVERTURNING MOMENT [Ft.-Lb.]
1Y	7.53	7.53	7.16	298.64	2356.27
2Y	14.97	24.95	7.16	593.71	4684.38
3Y	6.32	11.99	11.65	1451.94	11455.80
4Y	8.00	8.00	18.04	2248.33	17739.29
5Y	28.37	28.37	11.88	1154.93	9112.38
6Y	8.00	8.00	11.88	325.68	2569.58

S E I S M I C A N D W I N D S H E A R S
(WIND & SEISMIC SHEARS ARE AT ALLOWABLE STRENGTH DESIGN ASD LEVEL)

WALL LABEL	WALL LINE	LENGTH FOR SHEAR [Ft.]	SHEAR DUE TO WIND 0.6W [Lb./Ft.]	SHEAR DUE TO SEISMIC 0.7*EQ [Lb./Ft.]
1Y	D	7.53	30.12	27.76
2Y	D	14.97	30.12	27.76
3Y	E	6.32	174.50	160.82
4Y	F	8.00	213.46	196.73
5Y	G	28.37	30.92	28.50
6Y	G	8.00	30.92	28.50

S E I S M I C A N D W I N D S H E A R S
(WIND & SEISMIC SHEARS ARE AT ALLOWABLE STRENGTH DESIGN ASD LEVEL)
(SHEARS AT THE BASE OF THE SHEAR WALL FOR PLATE FASTENER DESIGN)

WALL LABEL	WALL LINE	LENGTH FOR SHEAR [Ft.]	SHEAR DUE TO WIND 0.6*W [Lb./Ft.]	SHEAR DUE TO SEISMIC 0.7*EQ [Lb./Ft.]
1Y	D	7.53	30.12	27.76
2Y	D	24.95	18.07	16.66
3Y	E	11.99	91.98	84.77
4Y	F	8.00	213.46	196.73
5Y	G	28.37	30.92	28.50
6Y	G	8.00	30.92	28.50

W I N D O V E R T U R N I N G A N D R E S I S T I N G
M O M E N T S F O R S T A B I L I T Y C A L C U L A T I O N S

WALL LABEL	OVERTURNING MOMENT WIND LOAD	RESISTING MOMENT DL+0.75*(0.6*W+LL)	RESISTING MOMENT 0.6*D+0.6*W
1Y	2982.82	2717.09	1306.90
2Y	5929.99	29830.17	14348.06
3Y	14501.98	13312.29	2842.57
4Y	22456.29	7254.11	1168.13
5Y	11535.43	41631.22	18326.59
6Y	3252.85	7254.11	1168.13

OVERTURNING MOMENTS HAVE BEEN CALCULATED TO ACCOUNT FOR THE CRITICAL LOAD COMBINATIONS PER SECTION 1605.3 EQUATIONS 16-13 & 16-15 IBC 2021

S E I S M I C O V E R T U R N I N G A N D R E S I S T I N G
M O M E N T S F O R S T A B I L I T Y C A L C U L A T I O N S

WALL LABEL	OVERTURNING MOMENT 0.70*EQ	RESISTING MOMENT D+0.75*(LL-0.7*EQ)	RESISTING MOMENT 0.6D - 0.7*EQ
1Y	1649.39	2484.27	1145.93
2Y	3279.06	27274.02	12580.84
3Y	8019.06	14095.61	4470.03
4Y	12417.50	7886.75	2313.40
5Y	6378.67	38981.23	17012.26
6Y	1798.71	7886.75	2313.40

OVERTURNING MOMENTS HAVE BEEN CALCULATED TO ACCOUNT FOR THE CRITICAL LOAD COMBINATIONS PER SECTION 1605.3 EQUATIONS 16-14 & 16-16 IBC 2021

S H E A R W A L L C H O R D C O M P R E S S I O N L O A D S
(WIND COMPRESSION LOADS ARE AT ALLOWABLE STRENGTH DESIGN ASD LEVEL)

WALL LABEL	COMPRESSION WIND LOAD	COMPRESSION $DL+0.75*(0.6*W+LL)$	COMPRESSION $0.6*D+0.6*W$
1Y	396.12	657.93	569.68
2Y	237.67	1373.85	812.75
3Y	1209.51	2017.41	1446.58
4Y	2807.04	3012.04	2953.05
5Y	406.61	1772.39	1052.59
6Y	406.61	1211.72	552.62

CHORD COMPRESSION LOADS HAVE BEEN CALCULATED TO ACCOUNT FOR THE CRITICAL LOAD COMBINATIONS PER SECTION 1605.3 EQUATIONS 16-13 & 16-15 IBC 2021

S H E A R W A L L C H O R D C O M P R E S S I O N L O A D S
(SEISMIC COMPRESSION LOADS ARE AT ALLOWABLE STRENGTH DESIGN ASD LEVEL)

WALL LABEL	COMPRESSION $0.70*EQ$	COMPRESSION $D+0.75*(LL+0.7*EQ)$	COMPRESSION $0.6D+0.7*EQ$
1Y	219.04	663.85	463.86
2Y	131.43	1562.81	942.60
3Y	668.81	2135.34	1268.56
4Y	1552.19	2837.49	2017.38
5Y	224.84	2006.01	1189.50
6Y	224.84	1415.33	690.03

CHORD COMPRESSION LOADS HAVE BEEN CALCULATED TO ACCOUNT FOR THE CRITICAL LOAD COMBINATIONS PER SECTION 1605.3 EQUATIONS 16-14 & 16-16 IBC 2021

C R I T I C A L S H E A R W A L L C H O R D C O M P R E S S I O N
(WIND & SEISMIC COMPRESSION LOADS ARE AT ASD LEVEL)

WALL LABEL	WIND COMPRESSION CRITICAL	SEISMIC COMPRESSION CRITICAL	COMPRESSION LOAD USED FOR DESIGN
1Y	657.93	663.85	663.85
2Y	1373.85	1562.81	1562.81
3Y	2017.41	2135.34	2135.34
4Y	3012.04	2837.49	3012.04
5Y	1772.39	2006.01	2006.01
6Y	1211.72	1415.33	1415.33

S H E A R W A L L C H O R D T E N S I O N L O A D S
(WIND TENSION LOADS ARE AT ALLOWABLE STRENGTH DESIGN ASD LEVEL)

WALL LABEL	UPLIFT TENSION WIND LOAD	UPLIFT TENSION DL+0.75*(0.6W+LL)	UPLIFT TENSION 0.6*D+0.6*W
1Y	396.12	-63.74	222.57
2Y	237.67	-1017.34	-337.40
3Y	1209.51	-203.15	972.43
4Y	2807.04	1198.51	2661.02
5Y	406.61	-1162.48	-239.38
6Y	406.61	-601.81	260.59

CHORD TENSION LOADS HAVE BEEN CALCULATED TO ACCOUNT FOR THE CRITICAL LOAD COMBINATIONS PER SECTION 1605.3 EQUATIONS 16-13 & 16-15 IBC 2021

S H E A R W A L L C H O R D T E N S I O N L O A D S
(SEISMIC TENSION LOADS ARE AT ALLOWABLE STRENGTH DESIGN ASD LEVEL)

WALL LABEL	UPLIFT TENSION 0.70*EQ	UPLIFT TENSION D+0.75*(LL-0.7*EQ)	UPLIFT TENSION 0.6D - 0.7*EQ
1Y	219.04	-95.23	66.86
2Y	131.43	-952.33	-372.82
3Y	668.81	-459.03	296.00
4Y	1552.19	677.21	1263.01
5Y	224.84	-1133.13	-374.82
6Y	224.84	-744.95	-64.34

CHORD TENSION LOADS HAVE BEEN CALCULATED TO ACCOUNT FOR THE CRITICAL LOAD COMBINATIONS PER SECTION 1605.3 EQUATIONS 16-14 & 16-16 IBC 2021

C R I T I C A L S H E A R W A L L C H O R D T E N S I O N L O A D S
(WIND & SEISMIC TENSION LOADS ARE AT ASD LEVEL)

WALL LABEL	WIND TENSION CRITICAL	SEISMIC TENSION CRITICAL	UPLIFT TENSION USED FOR DESIGN
1Y	222.57	66.86	222.57
2Y	-337.40	-372.82	-337.40
3Y	972.43	296.00	972.43
4Y	2661.02	1263.01	2661.02
5Y	-239.38	-374.82	-239.38
6Y	260.59	-64.34	260.59

A L L O W A B L E S H E A R S
(PER TABLE 4.3A OF THE NDS 2021)
WIND LOADS HAVE BEEN INCREASE BY 40% PER TABLE 4.3A COLUMN B

WALL TYPE	SEISMIC ALLOWABLE SHEARS [LBS/FT]	WIND ALLOWABLE SHEARS [LBS/FT]	NUMBER OF SIDES WITH SHEATHING
P1 - 6	239.20	334.88	1
P1 - 4	349.60	489.44	1
P1 - 3	450.80	631.12	1
P1 - 2	588.80	824.32	1
P2 - 6	478.40	669.76	2
P2 - 4	699.20	978.88	2
P2 - 3	901.60	1262.24	2
P2 - 2	1177.60	1648.64	2

S H E A R W A L L S C H E D U L E

SHEAR WALLS FROM ROOF LEVEL TO MAIN LEVEL

WALL LABEL	SEISMIC SHEAR [Lbs/Ft.]	WIND SHEAR [Lbs/Ft.]	CRITICAL SHEAR [Lbs/Ft.]	SHEAR PANEL DESIGNATION
1Y	27.76	30.12	30.12	EX-OK
2Y	27.76	30.12	30.12	EX-OK
3Y	160.82	174.50	174.50	P1 - 6
4Y	196.73	213.46	213.46	P1 - 6
5Y	28.50	30.92	30.92	EX-OK
6Y	28.50	30.92	30.92	P1 - 6

S I L L P L A T E R E Q U I R E M E N T S
(FOR SEISMIC DESIGN CATEGORY D, E AND F)

WALL LABEL	WALL LINE	LENGTH FOR SHEAR [Ft.]	SHEAR DUE TO SEISMIC 0.7*EQ [Lb./Ft.]	SILL PLATE REQUIRED AND BOLT SPACING
1Y	D	7.53	27.76	2x PER SCHEDULE
2Y	D	24.95	16.66	2x PER SCHEDULE
3Y	E	11.99	84.77	2x PER SCHEDULE
4Y	F	8.00	196.73	2x PER SCHEDULE
5Y	G	28.37	28.50	2x PER SCHEDULE
6Y	G	8.00	28.50	2x PER SCHEDULE

Refer to shear wall schedule on the structural drawings for anchor bolt spacing. Use 3-inx3-inx0.229-in plate washers. For shear loads between 350 [Lbs/Ft.] and 600 [Lbs/Ft.] use 2x plates with bolt spacing of 1/2 the spacing shown on the plans and shear wall schedule.

S H E A R W A L L T O D I A P H R A G M
C O N N E C T I O N D E T A I L S U M M A R Y
(R E F F E R T O S T R U C T U R A L P L A N S A N D D E T A I L S H E E T S)

WALL LABEL	TOP DETAIL CONNECTION	STRUCTURAL DETAIL SHEET	BOTTOM DETAIL CONNECTION	STRUCTURAL DETAIL SHEET
1Y	3	SD2	5	SD1
2Y	3	SD2	3	SD1
3Y	5	SD2	5	SD1
4Y	6	SD2	5	SD1
5Y	3	SD2	3	SD1
6Y	6	SD2	5	SD1

H O L D - D O W N S C H E D U L E

HOLD-DOWNS FROM ROOF LEVEL TO MAIN LEVEL

WALL LABEL	WALL END	UPLIFT LOADS	USP HOLDOWNS & STRAPS AT END OF THE WALLS	STUDS REQUIRED FOR HOLDOWN ASSEMBLY
1Y	BOTH	222.57	NOT REQUIRED	
2Y	BOTH	-337.40	NOT REQUIRED	
3Y	BOTH	972.43	(1) STHD10 STRAP	(2) (2x4) / (2) (2x6)
4Y	BOTH	2661.02	(1) STHD10 STRAP	(2) (2x4) / (2) (2x6)
5Y	BOTH	-239.38	NOT REQUIRED	
6Y	BOTH	260.59	(1) STHD10 STRAP	(2) (2x4) / (2) (2x6)

NOTE.- THE SHEAR WALLS CALLED OUT ON THE PLANS SHALL PROVIDE EQUAL OR GREATER SHEAR LOAD CAPACITY PER LINEAL FOOT.

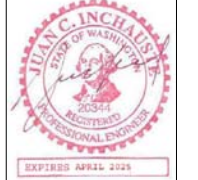
THE HOLD-DOWNS CALLED OUT ON THE PLANS SHALL PROVIDE EQUAL OR GREATER UPLIFT LOAD CAPACITY.

GREATER UPLIFT LOAD CAPACITY ACCORDING TO USP CATALOG.

AT CROSS WALLS USP MPA1 CLIPS MAY BE USED TO RESIST UPLIFT

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The Seal below shall be valid only if seal is wet stamped and bears an original signature:



EXPIRES APRIL 2025

The liability of the above named consultant shall be limited to the area of expertise and to those services provided by the consultant.

I.B.I. Company
 Consulting Engineers

P.O. Box 3194
 Bellevue, Washington 98009

1372 Bellevue Way N.E. # 3
 Bellevue, Washington 98004

Phone: (425) 450-0316
 Fax: (425) 454-0316
 ibicompany@comcast.net

* Denotes Shear Wall with CS-16 Simpson Straps at window sill location. For installation of horizontal tie see 1/SD2

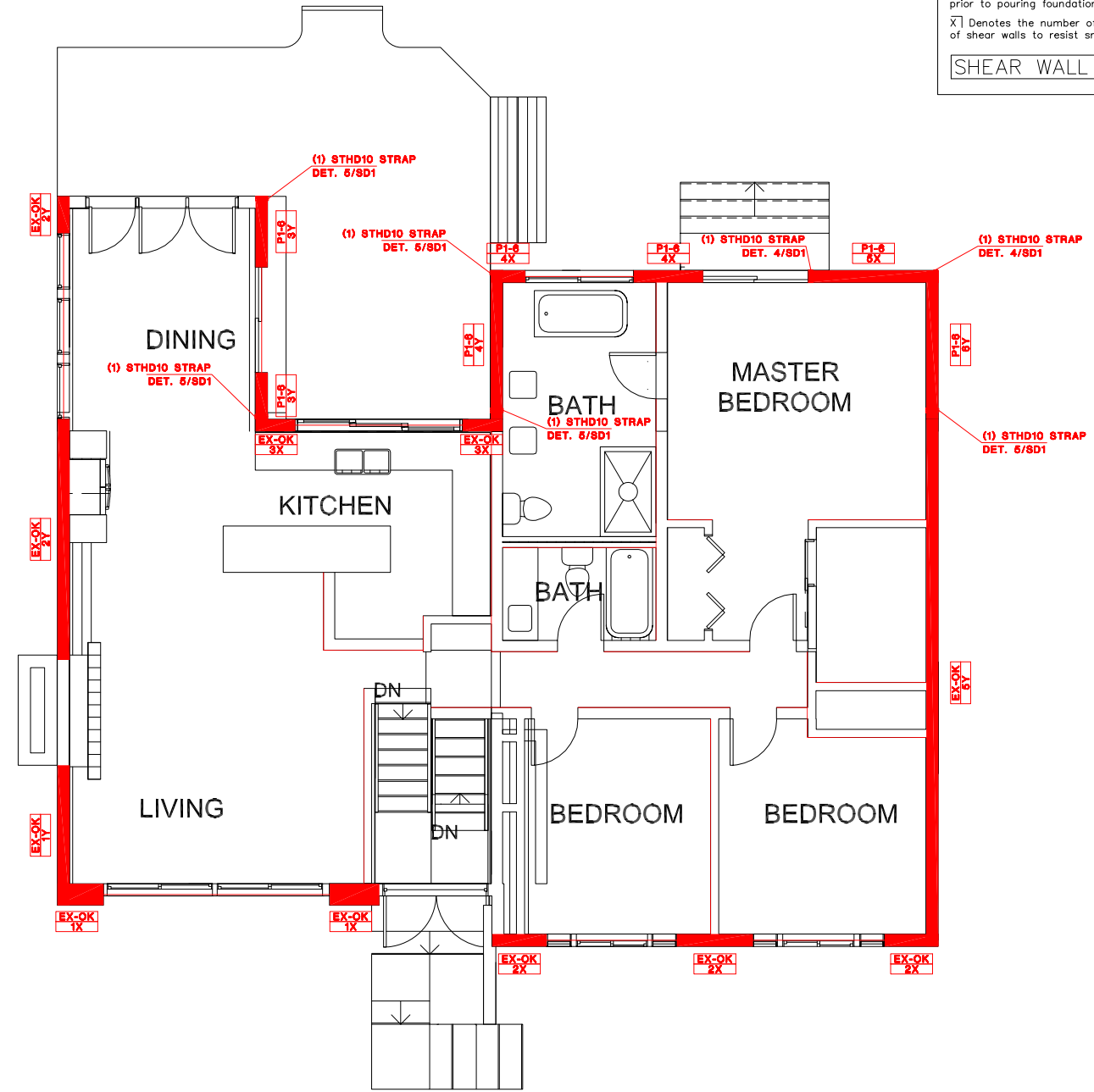
XX-X Denotes Shear Wall Panel Type and Nailing Spacing
 XX Denotes Shear Wall Label per Structural Calculations

For additional information of the Shear Wall materials, nailing, anchor bolts and holdowns see shear wall Table #1 and holdown Table #2 on sheet S-2.

The foundation contractor shall verify the location and spacing of all shear wall anchor bolts, as well as holdown anchor bolts prior to pouring foundation walls, footings and slabs on grade.

X] Denotes the number of A35 Simpson Clips to connect corners of shear walls to resist small uplift loads with the cross walls.

SHEAR WALL SYMBOL DESCRIPTION



FIRST FLOOR SHEAR WALLS & HOLDOWNS
 Scale 1/4" = 1'-0"

Project: Scallon-Smith Connolly Residence Remodel
 3450 79th Ave. S.E.
 Mercer Island, WA 98040

Designer: Elizabeth Scallon
 And Shena Smith-Connolly
 3450 79th Ave. S.E.
 Mercer Island, WA 98040

Owners: Elizabeth Scallon
 And Shena Smith-Connolly
 3450 79th Ave. S.E.
 Mercer Island, WA 98040

Jurisdiction: City of Edmonds
 Department of Planning
 & Community Development
 121 5th Ave. North
 Edmonds, WA 98020
 Phone: (425)-771-0220

Applicable Codes:
 IBC & IRC 2021

I.B.I. Co. FILE DIRECTORY
 B: \JOBS23\JOB23-41
 Start Date: Feb, 15, 2024
 Plot Date: Nov. 05, 2024

Revisions:

Mark	Description	Date

Sheet Content:
 PROPOSED MAIN LEVEL SHEAR WALLS & HOLDOWNS FOR ADDITION

Drawn By: R.I. | Checked By: JCI.

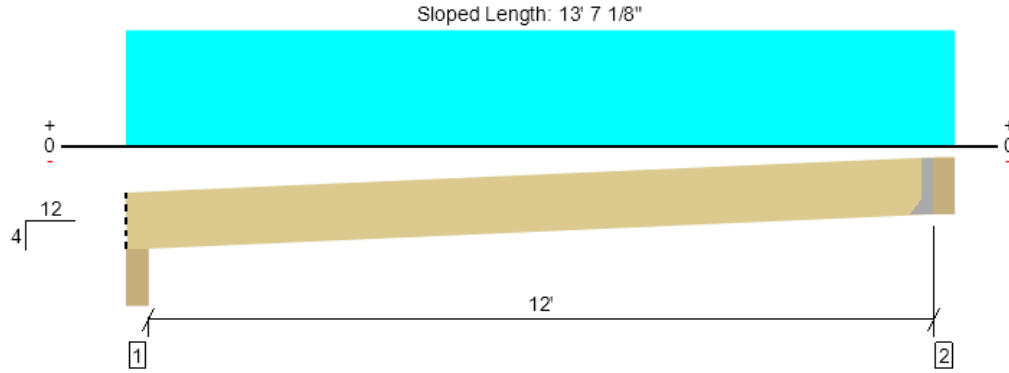
Date of Issue: Nov. 05, 24
 Project No. 23-41 | Sheet No. S-05

Roof			
Member Name	Results (Max UTIL %)	Current Solution	Comments
Roof: RAF-01	Passed (90% M)	1 piece(s) 2 x 8 DF No.2 @ 24" OC	
Roof: RAF-02	Passed (82% M)	1 piece(s) 2 x 8 DF No.2 @ 24" OC	
Roof: RAF-03	Passed (16% M)	1 piece(s) 2 x 8 DF No.2 @ 24" OC	
Roof: RAF-04	Passed (52% M)	1 piece(s) 2 x 8 DF No.2	
Roof: HRB-01	Passed (64% M)	1 piece(s) 5 1/4" x 16" 2.2E Parallam® PSL	
Roof: HRB-02	Passed (92% R)	1 piece(s) 3 1/2" x 9 1/4" 2.2E Parallam® PSL	
Roof: HRB-03	Passed (25% M)	1 piece(s) 3 1/2" x 11 1/4" 2.2E Parallam® PSL	
Roof: HRB-04	Passed (81% M)	1 piece(s) 3 1/2" x 11 1/4" 2.2E Parallam® PSL	
Roof: HRB-05	Passed (6% M)	1 piece(s) 4 x 8 DF No.2	
Roof: HRB-06	Passed (51% V)	1 piece(s) 4 x 8 DF No.2	
Roof: HRB-07	Passed (83% M)	1 piece(s) 4 x 10 DF No.2	
Roof: HRB-08	Passed (71% M)	1 piece(s) 4 x 10 DF No.2	
Roof: HRB-09	Passed (60% ΔT)	1 piece(s) 3 1/2" x 9 1/4" 2.2E Parallam® PSL	
Roof: HRB-10	Passed (85% ΔT)	3 piece(s) 1 3/4" x 7 1/4" 2.0E Microllam® LVL	
Roof: HRB-11	Passed (71% M)	1 piece(s) 4 x 10 DF No.2	
Roof: HRB-12	Passed (71% M)	1 piece(s) 4 x 10 DF No.2	

ForteWEB Software Operator	Job Notes
Juan C. Inchauste IBI Company (425) 785-6080 info@ibicompany.com	Design roof rafters & beams



Roof, Roof: RAF-01
 1 piece(s) 2 x 8 DF No.2 @ 24" OC



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	468 @ 12' 5 1/2"	1406 (1.50")	Passed (33%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	423 @ 11' 10 5/8"	1501	Passed (28%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	1413 @ 6' 5"	1564	Passed (90%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.350 @ 6' 5"	0.637	Passed (L/437)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.541 @ 6' 5"	0.849	Passed (L/282)	--	1.0 D + 1.0 S (All Spans)

Member Length : 13' 4"
 System : Roof
 Member Type : Joist
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD
 Member Pitch : 4/12

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

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Roof Live	Snow	Factored	
1 - Birdsmouth - HF	5.50"	5.50"	1.50"	176	257	321	497	Blocking
2 - Hanger on 7 1/4" PSL beam	5.25"	Hanger ¹	1.50"	177	259	324	501	See note ¹

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	4' 9" o/c	
Bottom Edge (Lu)	13' 2" o/c	

•Maximum allowable bracing intervals based on applied load.

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

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

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Roof Live (1.25)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 12' 10 3/4"	24"	13.0	20.0	25.0	Roof distributed load

Member Notes
Roof rafter to reinforce truss top chord

ForteWEB Software Operator	Job Notes
Juan C. Inchauste IBI Company (425) 785-6080 info@ibicompany.com	Design roof rafters & beams



Weyerhaeuser Notes

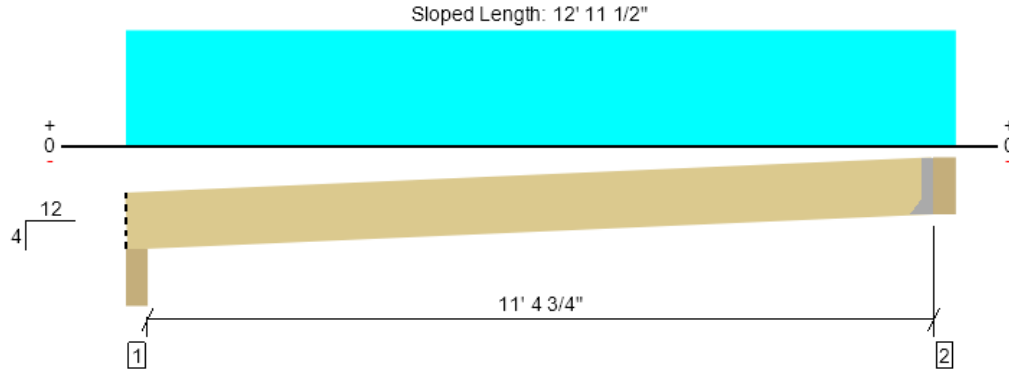
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The product application, input design loads, dimensions and support information have been provided by Juan C. Inchauste

FortewEB Software Operator	Job Notes
Juan C. Inchauste IBI Company (425) 785-6080 info@ibicompany.com	Design roof rafters & beams



Roof, Roof: RAF-02
1 piece(s) 2 x 8 DF No.2 @ 24" OC



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	444 @ 11' 10"	1406 (1.50")	Passed (32%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	400 @ 11' 3 1/8"	1501	Passed (27%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	1275 @ 6' 1 1/8"	1564	Passed (82%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.285 @ 6' 1 1/8"	0.605	Passed (L/510)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.441 @ 6' 1 1/8"	0.807	Passed (L/329)	--	1.0 D + 1.0 S (All Spans)

Member Length : 12' 8 1/8"
System : Roof
Member Type : Joist
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD
Member Pitch : 4/12

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

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Roof Live	Snow	Factored	
1 - Birdsmouth - HF	5.25"	5.25"	1.50"	167	244	305	472	Blocking
2 - Hanger on 7 1/4" PSL beam	5.50"	Hanger ¹	1.50"	169	248	310	479	See note ¹

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	6' 8" o/c	
Bottom Edge (Lu)	12' 6" o/c	

•Maximum allowable bracing intervals based on applied load.

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

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

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Roof Live (1.25)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 12' 3 1/2"	24"	13.0	20.0	25.0	Roof distributed load

Member Notes
Roof rafter to reinforce truss top chord

ForteWEB Software Operator	Job Notes
Juan C. Inchauste IBI Company (425) 785-6080 info@ibicompany.com	Design roof rafters & beams



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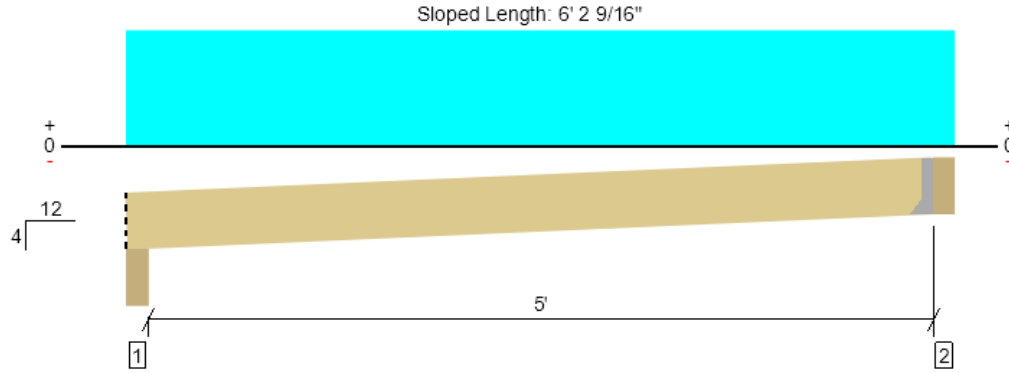
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The product application, input design loads, dimensions and support information have been provided by Juan C. Inchauste

FortewEB Software Operator	Job Notes
Juan C. Inchauste IBI Company (425) 785-6080 info@ibicompany.com	Design roof rafters & beams



Roof, Roof: RAF-03
1 piece(s) 2 x 8 DF No.2 @ 24" OC



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	197 @ 5' 5 1/2"	1406 (1.50")	Passed (14%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	152 @ 4' 10 5/8"	1501	Passed (10%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	250 @ 2' 11"	1564	Passed (16%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.011 @ 2' 11"	0.268	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.017 @ 2' 11"	0.357	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)

Member Length : 5' 11 7/16"
System : Roof
Member Type : Joist
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD
Member Pitch : 4/12

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

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Roof Live	Snow	Factored	
1 - Birdsmouth - HF	5.50"	5.50"	1.50"	80	117	146	226	Blocking
2 - Hanger on 7 1/4" PSL beam	5.25"	Hanger ¹	1.50"	81	119	149	230	See note ¹

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	5' 9" o/c	
Bottom Edge (Lu)	5' 9" o/c	

•Maximum allowable bracing intervals based on applied load.

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

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

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Roof Live (1.25)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 5' 10 3/4"	24"	13.0	20.0	25.0	Roof distributed load

Member Notes
Roof rafter to reinforce truss top chord

FortewEB Software Operator	Job Notes
Juan C. Inchauste IBI Company (425) 785-6080 info@ibicompany.com	Design roof rafters & beams



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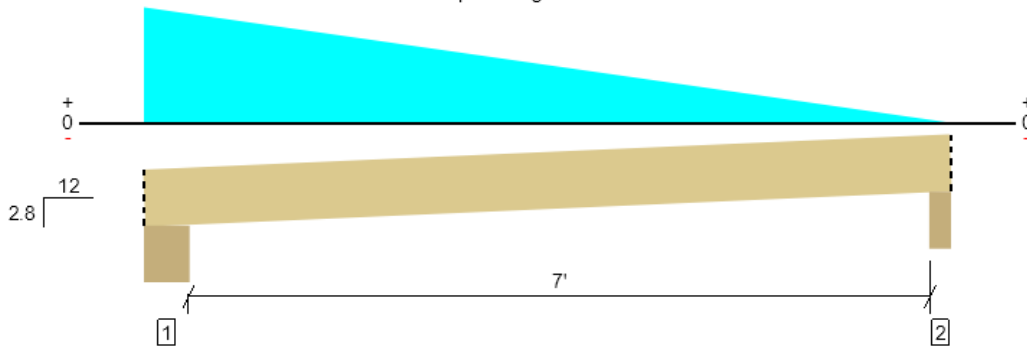
The product application, input design loads, dimensions and support information have been provided by Juan C. Inchauste

FortewEB Software Operator	Job Notes
Juan C. Inchauste IBI Company (425) 785-6080 info@ibicompany.com	Design roof rafters & beams



Roof, Roof: RAF-04
1 piece(s) 2 x 8 DF No.2

Sloped Length: 8' 6 15/16"



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	658 @ 9 1/2"	7013 (11.00")	Passed (9%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	358 @ 1' 6 1/16"	1501	Passed (24%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	701 @ 3' 10 7/8"	1360	Passed (52%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.057 @ 4' 3 11/16"	0.372	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.090 @ 4' 3 11/16"	0.496	Passed (L/993)	--	1.0 D + 1.0 S (All Spans)

Member Length : 8' 8 5/8"
System : Roof
Member Type : Drop Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD
Member Pitch : 2.8/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Roof Live	Snow	Factored	
1 - Beveled Plate - SPF	11.00"	11.00"	1.50"	237	337	421	658	Blocking
2 - Beveled Plate - PSL	5.25"	5.25"	1.50"	100	133	167	267	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	8' 7" o/c	
Bottom Edge (Lu)	8' 7" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Roof Live (1.25)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 8' 4 1/4"	N/A	2.8	--	--	
1 - Tapered (PSF)	0 to 8' 4 1/4"	5' 7 3/4" to 0	13.0	20.0	25.0	Roof distributed load

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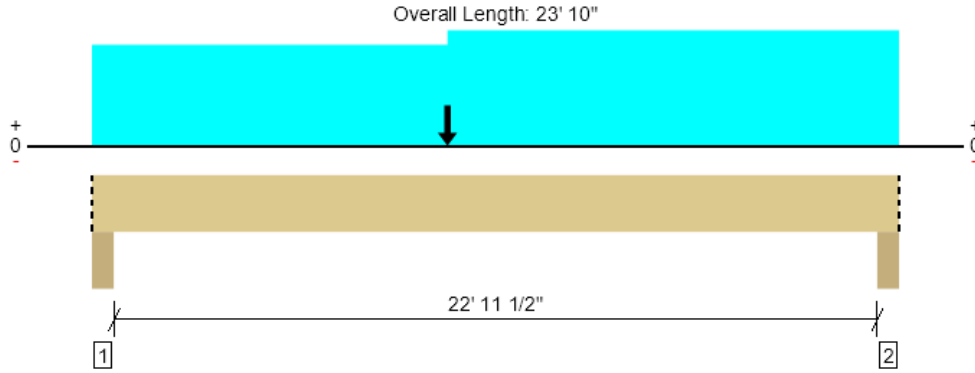
The product application, input design loads, dimensions and support information have been provided by Juan C. Inchauste

ForteWEB Software Operator	Job Notes
Juan C. Inchauste IBI Company (425) 785-6080 info@ibicompany.com	Design roof rafters & beams



Roof, Roof: HRB-01

1 piece(s) 5 1/4" x 16" 2.2E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	6272 @ 23' 6 1/4"	17227 (5.25")	Passed (36%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	5417 @ 22' 3/4"	18676	Passed (29%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	38785 @ 10' 10 3/16"	60297	Passed (64%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.602 @ 11' 10 9/16"	1.160	Passed (L/463)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.973 @ 11' 10 9/16"	1.547	Passed (L/286)	--	1.0 D + 1.0 S (All Spans)

Member Length : 23' 10"
 System : Roof
 Member Type : Drop Beam
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD
 Member Pitch : 0/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Roof Live	Snow	Factored	
1 - Column - PSL	5.25"	5.25"	1.86"	2335	3014	3768	6103	Blocking
2 - Column - PSL	5.25"	5.25"	1.91"	2384	3110	3888	6272	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	23' 10" o/c	
Bottom Edge (Lu)	23' 10" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Roof Live (1.25)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 23' 10"	N/A	26.3	--	--	
1 - Uniform (PSF)	0 to 10' 6" (Top)	10' 6"	13.0	20.0	25.0	Roof distributed load
2 - Uniform (PSF)	10' 6" to 23' 10" (Top)	12' 1/4"	13.0	20.0	25.0	Roof Distributed Load
3 - Point (lb)	10' 6" (Back)	N/A	577	714	893	Linked from: Roof: HRB-10, Support 2

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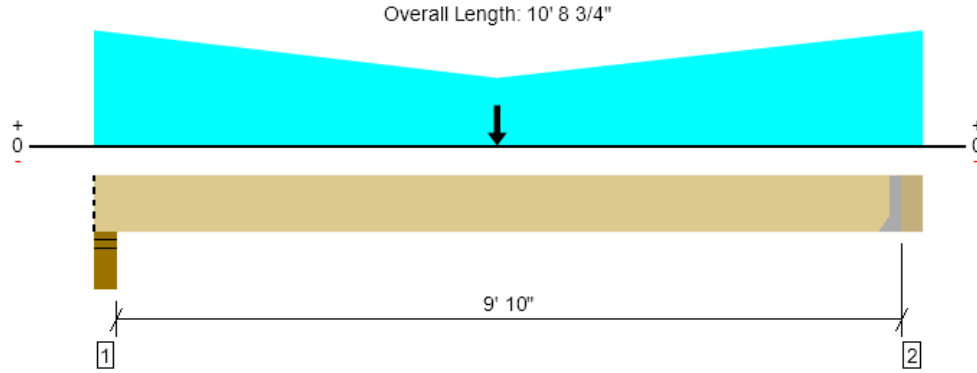
The product application, input design loads, dimensions and support information have been provided by Juan C. Inchauste

ForteWEB Software Operator	Job Notes
Juan C. Inchauste IBI Company (425) 785-6080 info@ibicompany.com	Design roof rafters & beams



Roof, Roof: HRB-02

1 piece(s) 3 1/2" x 9 1/4" 2.2E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	3012 @ 10' 3 1/2"	3281 (1.50")	Passed (92%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	2627 @ 9' 6 1/4"	7198	Passed (36%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	9391 @ 5' 4 5/16"	14278	Passed (66%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.209 @ 5' 4 5/16"	0.498	Passed (L/573)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.330 @ 5' 4 5/16"	0.664	Passed (L/362)	--	1.0 D + 1.0 S (All Spans)

Member Length : 10' 3 1/2"
 System : Roof
 Member Type : Drop Beam
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD
 Member Pitch : 0/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Roof Live	Snow	Factored	
1 - Stud wall - DF	5.50"	5.50"	1.50"	1158	1616	2021	3179	Blocking
2 - Hanger on 9 1/4" PSL beam	5.25"	Hanger ¹	1.50"	1174	1643	2055	3229	See note ¹

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	10' 4" o/c	
Bottom Edge (Lu)	10' 4" o/c	

•Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-Tie						
Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
2 - Face Mount Hanger	HHUS48	3.00"	N/A	22-10d	8-10d	

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Roof Live (1.25)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 10' 3 1/2"	N/A	10.1	--	--	
1 - Tapered (PSF)	0 to 5' 4 5/16" (Top)	13' 9" to 8' 1"	13.0	20.0	25.0	Roof distributed load
2 - Tapered (PSF)	5' 4 5/16" to 10' 8 3/4" (Top)	8' 1" to 13' 9"	13.0	20.0	25.0	Roof distributed load
3 - Point (lb)	5' 4 5/16" (Back)	N/A	100	133	167	Linked from: Roof: RAF-04, Support 2
4 - Point (lb)	5' 4 5/16" (Back)	N/A	100	133	167	Linked from: Roof: RAF-04, Support 2
5 - Point (lb)	5' 4 5/16" (Back)	N/A	508	655	819	Linked from: Roof: HRB-09, Support 2

ForteWEB Software Operator	Job Notes
Juan C. Inchauste IBI Company (425) 785-6080 info@ibicompany.com	Design roof rafters & beams



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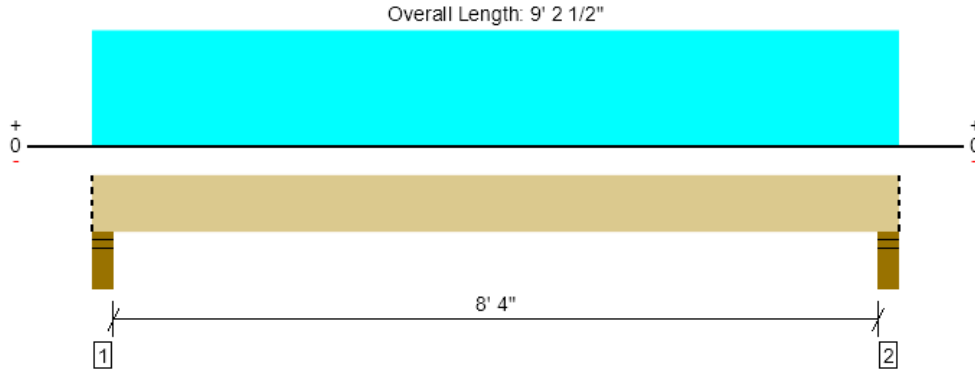
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FortewEB Software Operator	Job Notes
Juan C. Inchauste IBI Company (425) 785-6080 info@ibicompany.com	Design roof rafters & beams



Roof, Roof: HRB-03

1 piece(s) 3 1/2" x 11 1/4" 2.2E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	2539 @ 3 3/4"	11484 (5.25")	Passed (22%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1781 @ 1' 4 1/2"	8754	Passed (20%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	5078 @ 4' 7 1/4"	20666	Passed (25%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.056 @ 4' 7 1/4"	0.429	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.087 @ 4' 7 1/4"	0.572	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)

Member Length : 9' 2 1/2"
 System : Roof
 Member Type : Drop Beam
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD
 Member Pitch : 0/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Roof Live	Snow	Factored	
1 - Stud wall - DF	5.25"	5.25"	1.50"	906	1306	1633	2539	Blocking
2 - Stud wall - DF	5.25"	5.25"	1.50"	906	1306	1633	2539	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	9' 3" o/c	
Bottom Edge (Lu)	9' 3" o/c	

- Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Roof Live (1.25)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 9' 2 1/2"	N/A	12.3	--	--	
1 - Uniform (PSF)	0 to 9' 2 1/2" (Top)	14' 2 1/4"	13.0	20.0	25.0	Roof distributed load

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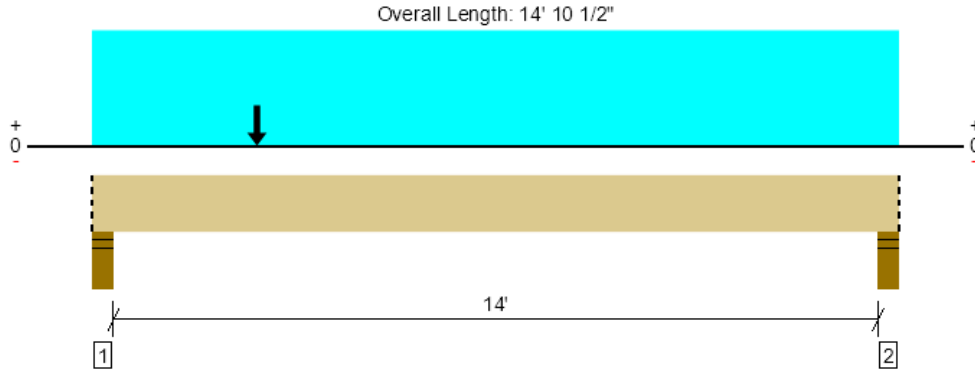
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ForteWEB Software Operator	Job Notes
Juan C. Inchauste IBI Company (425) 785-6080 info@ibicompany.com	Design roof rafters & beams



Roof, Roof: HRB-04

1 piece(s) 3 1/2" x 11 1/4" 2.2E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	5660 @ 3 3/4"	11484 (5.25")	Passed (49%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	4902 @ 1' 4 1/2"	8754	Passed (56%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	16751 @ 6' 9 3/16"	20666	Passed (81%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.467 @ 7' 3 3/8"	0.712	Passed (L/366)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.725 @ 7' 3 3/8"	0.950	Passed (L/236)	--	1.0 D + 1.0 S (All Spans)

Member Length : 14' 10 1/2"
 System : Roof
 Member Type : Drop Beam
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD
 Member Pitch : 0/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Roof Live	Snow	Factored	
1 - Stud wall - DF	5.25"	5.25"	2.59"	2015	2916	3645	5660	Blocking
2 - Stud wall - DF	5.25"	5.25"	2.04"	1594	2301	2877	4471	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	14' 11" o/c	
Bottom Edge (Lu)	14' 11" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Roof Live (1.25)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 14' 10 1/2"	N/A	12.3	--	--	
1 - Uniform (PSF)	0 to 14' 10 1/2" (Top)	14' 2 1/4"	13.0	20.0	25.0	Roof distributed load
2 - Point (lb)	3' 1/2" (Top)	N/A	682	997	1246	Linked from: Roof: HRB-12, Support 2

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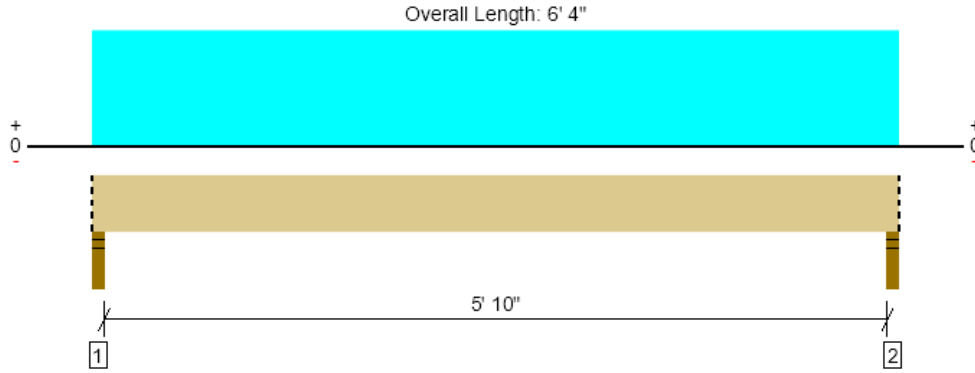
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The product application, input design loads, dimensions and support information have been provided by Juan C. Inchauste

FortewEB Software Operator	Job Notes
Juan C. Inchauste IBI Company (425) 785-6080 info@ibicompany.com	Design roof rafters & beams



Roof, Roof: HRB-05
1 piece(s) 4 x 8 DF No.2



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	141 @ 1 1/2"	6563 (3.00")	Passed (2%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	103 @ 10 1/4"	3502	Passed (3%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	206 @ 3' 2"	3438	Passed (6%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.004 @ 3' 2"	0.304	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.008 @ 3' 2"	0.406	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)

Member Length : 6' 4"
System : Roof
Member Type : Drop Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD
Member Pitch : 0/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Roof Live	Snow	Factored	
1 - Stud wall - DF	3.00"	3.00"	1.50"	62	63	79	141	Blocking
2 - Stud wall - DF	3.00"	3.00"	1.50"	62	63	79	141	Blocking

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

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

•Maximum allowable bracing intervals based on applied load.

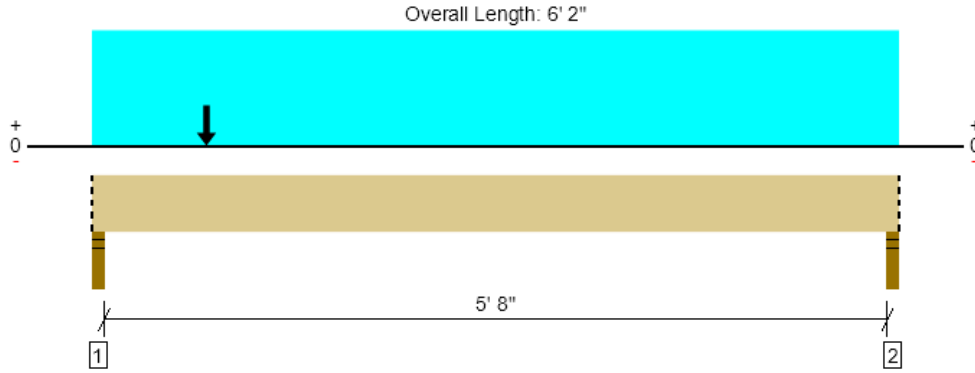
Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Roof Live (1.25)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 6' 4"	N/A	6.4	--	--	
1 - Uniform (PSF)	0 to 6' 4" (Top)	1'	13.0	20.0	25.0	Roof distributed load

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The product application, input design loads, dimensions and support information have been provided by Juan C. Inchauste

ForteWEB Software Operator	Job Notes
Juan C. Inchauste IBI Company (425) 785-6080 info@ibicompany.com	Design roof rafters & beams



Roof, Roof: HRB-06
1 piece(s) 4 x 8 DF No.2



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1821 @ 1 1/2"	6563 (3.00")	Passed (28%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1783 @ 10 1/4"	3502	Passed (51%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	1349 @ 10 1/2"	3438	Passed (39%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.024 @ 2' 9 5/16"	0.296	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.038 @ 2' 9 7/16"	0.394	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)

Member Length : 6' 2"
System : Roof
Member Type : Drop Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD
Member Pitch : 0/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Roof Live	Snow	Factored	
1 - Stud wall - DF	3.00"	3.00"	1.50"	655	932	1165	1821	Blocking
2 - Stud wall - DF	3.00"	3.00"	1.50"	146	188	235	381	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	6' 2" o/c	
Bottom Edge (Lu)	6' 2" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Roof Live (1.25)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 6' 2"	N/A	6.4	--	--	
1 - Uniform (PSF)	0 to 6' 2" (Top)	1'	13.0	20.0	25.0	Roof distributed load
2 - Point (lb)	10 1/2" (Top)	N/A	682	997	1246	Linked from: Roof: HRB-12, Support 1

Weyerhaeuser Notes

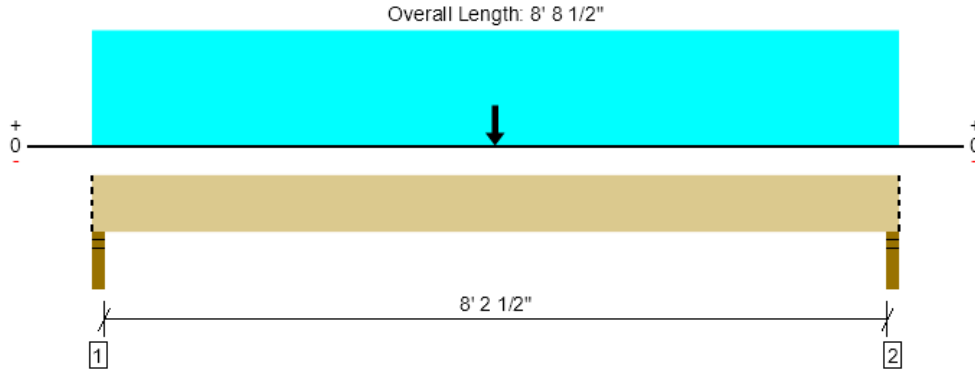
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The product application, input design loads, dimensions and support information have been provided by Juan C. Inchauste

Forteweb Software Operator	Job Notes
Juan C. Inchauste IBI Company (425) 785-6080 info@ibicompany.com	Design roof rafters & beams



Roof, Roof: HRB-07
1 piece(s) 4 x 10 DF No.2



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1114 @ 1' 1/2"	6563 (3.00")	Passed (17%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1067 @ 1' 1/4"	4468	Passed (24%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	4270 @ 4' 4 3/16"	5166	Passed (83%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.075 @ 4' 4 1/4"	0.423	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.122 @ 4' 4 1/4"	0.564	Passed (L/832)	--	1.0 D + 1.0 S (All Spans)

Member Length : 8' 8 1/2"
System : Roof
Member Type : Drop Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD
Member Pitch : 0/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Roof Live	Snow	Factored	
1 - Stud wall - DF	3.00"	3.00"	1.50"	433	545	682	1114	Blocking
2 - Stud wall - DF	3.00"	3.00"	1.50"	432	544	680	1112	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	8' 9" o/c	
Bottom Edge (Lu)	8' 9" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Roof Live (1.25)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 8' 8 1/2"	N/A	8.2	--	--	
1 - Uniform (PSF)	0 to 8' 8 1/2" (Top)	1'	13.0	20.0	25.0	Roof distributed load
2 - Point (lb)	4' 4 3/16" (Top)	N/A	680	915	1144	Linked from: Roof: HRB-09, Support 1

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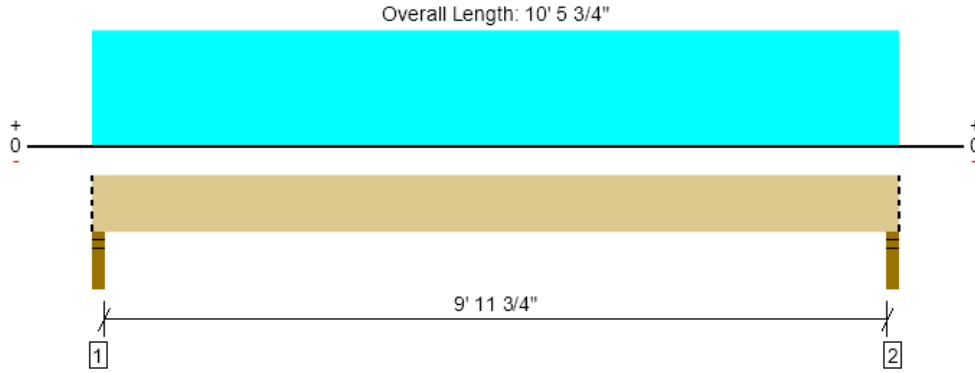
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The product application, input design loads, dimensions and support information have been provided by Juan C. Inchauste

Forteweb Software Operator	Job Notes
Juan C. Inchauste IBI Company (425) 785-6080 info@ibicompany.com	Design roof rafters & beams



Roof, Roof: HRB-08
1 piece(s) 4 x 10 DF No.2



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1467 @ 1' 1/2"	6563 (3.00")	Passed (22%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1181 @ 1' 1/4"	4468	Passed (26%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	3661 @ 5' 2 7/8"	5166	Passed (71%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.119 @ 5' 2 7/8"	0.511	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.187 @ 5' 2 7/8"	0.682	Passed (L/658)	--	1.0 D + 1.0 S (All Spans)

Member Length : 10' 5 3/4"
System : Roof
Member Type : Drop Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD
Member Pitch : 0/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Roof Live	Snow	Factored	
1 - Stud wall - DF	3.00"	3.00"	1.50"	530	749	937	1467	Blocking
2 - Stud wall - DF	3.00"	3.00"	1.50"	530	749	937	1467	Blocking

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

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Roof Live (1.25)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 10' 5 3/4"	N/A	8.2	--	--	
1 - Uniform (PSF)	0 to 10' 5 3/4" (Top)	7' 1 13/16"	13.0	20.0	25.0	Roof distributed load

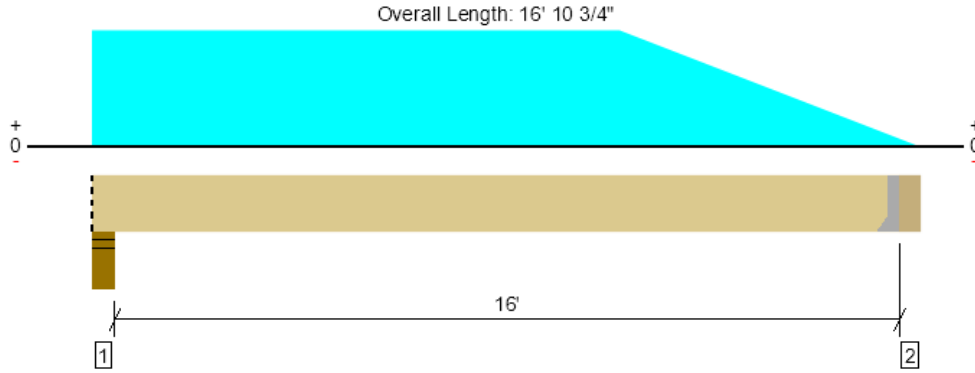
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The product application, input design loads, dimensions and support information have been provided by Juan C. Inchauste

ForteWEB Software Operator	Job Notes
Juan C. Inchauste IBI Company (425) 785-6080 info@ibicompany.com	Design roof rafters & beams



Roof, Roof: HRB-09

1 piece(s) 3 1/2" x 9 1/4" 2.2E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1319 @ 16' 5 1/2"	3281 (1.50")	Passed (40%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1547 @ 1' 2 3/4"	7198	Passed (21%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	6802 @ 8' 1 3/8"	14278	Passed (48%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.401 @ 8' 3 11/16"	0.806	Passed (L/482)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.641 @ 8' 3 3/4"	1.075	Passed (L/302)	--	1.0 D + 1.0 S (All Spans)

Member Length : 16' 5 1/2"
 System : Roof
 Member Type : Drop Beam
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD
 Member Pitch : 0/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Roof Live	Snow	Factored	
1 - Stud wall - DF	5.50"	5.50"	1.50"	680	915	1144	1824	Blocking
2 - Hanger on 9 1/4" PSL beam	5.25"	Hanger ¹	1.50"	508	655	819	1327	See note ¹

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	16' 6" o/c	
Bottom Edge (Lu)	16' 6" o/c	

•Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-Tie						
Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
2 - Face Mount Hanger	LUS410	2.00"	N/A	8-10dx1.5	6-10d	

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Roof Live (1.25)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 16' 5 1/2"	N/A	10.1	--	--	
1 - Uniform (PSF)	0 to 10' 11" (Front)	5' 7 13/16"	13.0	20.0	25.0	Roof distributed load
2 - Tapered (PSF)	10' 11" to 16' 10" (Front)	5' 7 13/16" to 0	13.0	20.0	25.0	Roof distributed load

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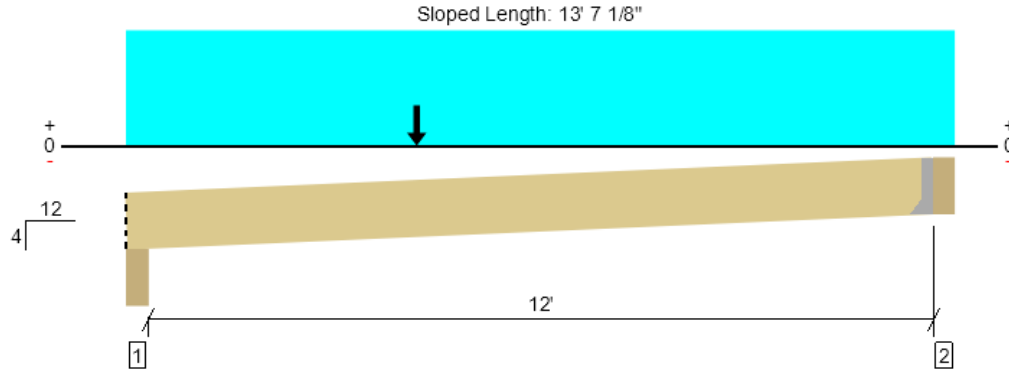
The product application, input design loads, dimensions and support information have been provided by Juan C. Inchauste

ForteWEB Software Operator	Job Notes
Juan C. Inchauste IBI Company (425) 785-6080 info@ibicompany.com	Design roof rafters & beams



Roof, Roof: HRB-10

3 piece(s) 1 3/4" x 7 1/4" 2.0E Microllam® LVL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1454 @ 12' 5 1/2"	5906 (1.50")	Passed (25%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	2351 @ 1' 3/8"	8317	Passed (28%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	9821 @ 4' 7 3/4"	12273	Passed (80%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.449 @ 5' 11 3/4"	0.639	Passed (L/342)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.724 @ 5' 11 7/8"	0.852	Passed (L/212)	--	1.0 D + 1.0 S (All Spans)

Member Length : 13' 4"
 System : Roof
 Member Type : Drop Beam
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD
 Member Pitch : 4/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Roof Live	Snow	Factored	
1 - Beveled Plate - DF	5.50"	5.50"	1.50"	919	1187	1484	2403	Blocking
2 - Hanger on 7 1/4" PSL beam	5.25"	Hanger ¹	1.50"	577	714	893	1471	See note ¹

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	13' 2" o/c	
Bottom Edge (Lu)	13' 2" o/c	

•Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-Tie						
Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
2 - Face Mount Hanger	HU68X SLD18	2.50"	N/A	14-10dx1.5	6-10d	

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Roof Live (1.25)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 12' 5 1/2"	N/A	11.1	--	--	
1 - Uniform (PSF)	0 to 12' 10 3/4"	1'	13.0	20.0	25.0	Roof distributed load
2 - Point (lb)	4' 7 3/4"	N/A	1174	1643	2055	Linked from: Roof: HRB-02, Support 2

Weyerhaeuser Notes

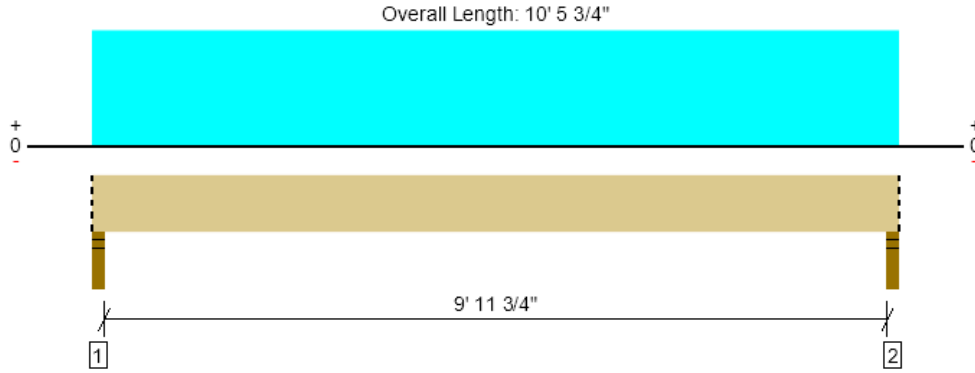
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ForteWEB Software Operator	Job Notes
Juan C. Inchauste IBI Company (425) 785-6080 info@ibicompany.com	Design roof rafters & beams



Roof, Roof: HRB-11
1 piece(s) 4 x 10 DF No.2



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1467 @ 1' 1/2"	6563 (3.00")	Passed (22%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1181 @ 1' 1/4"	4468	Passed (26%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	3661 @ 5' 2 7/8"	5166	Passed (71%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.119 @ 5' 2 7/8"	0.511	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.187 @ 5' 2 7/8"	0.682	Passed (L/658)	--	1.0 D + 1.0 S (All Spans)

Member Length : 10' 5 3/4"
System : Roof
Member Type : Drop Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD
Member Pitch : 0/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Roof Live	Snow	Factored	
1 - Stud wall - DF	3.00"	3.00"	1.50"	530	749	937	1467	Blocking
2 - Stud wall - DF	3.00"	3.00"	1.50"	530	749	937	1467	Blocking

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

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

•Maximum allowable bracing intervals based on applied load.

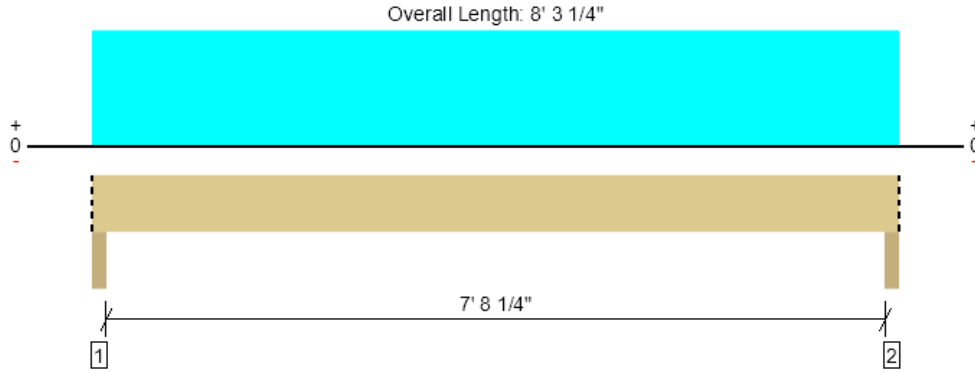
Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Roof Live (1.25)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 10' 5 3/4"	N/A	8.2	--	--	
1 - Uniform (PSF)	0 to 10' 5 3/4" (Top)	7' 1 13/16"	13.0	20.0	25.0	Roof distributed load

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The product application, input design loads, dimensions and support information have been provided by Juan C. Inchauste

ForteWEB Software Operator	Job Notes
Juan C. Inchauste IBI Company (425) 785-6080 info@ibicompany.com	Design roof rafters & beams



Roof, Roof: HRB-12
1 piece(s) 4 x 10 DF No.2



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1928 @ 2"	7656 (3.50")	Passed (25%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1432 @ 1' 3/4"	4468	Passed (32%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	3671 @ 4' 1 5/8"	5166	Passed (71%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.073 @ 4' 1 5/8"	0.397	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.113 @ 4' 1 5/8"	0.529	Passed (L/845)	--	1.0 D + 1.0 S (All Spans)

Member Length : 8' 3 1/4"
System : Roof
Member Type : Drop Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD
Member Pitch : 0/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Roof Live	Snow	Factored	
1 - Column - HF	3.50"	3.50"	1.50"	682	997	1246	1928	Blocking
2 - Column - HF	3.50"	3.50"	1.50"	682	997	1246	1928	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	8' 3" o/c	
Bottom Edge (Lu)	8' 3" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Roof Live (1.25)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 8' 3 1/4"	N/A	8.2	--	--	
1 - Uniform (PSF)	0 to 8' 3 1/4" (Top)	12' 5/8"	13.0	20.0	25.0	Roof distributed load

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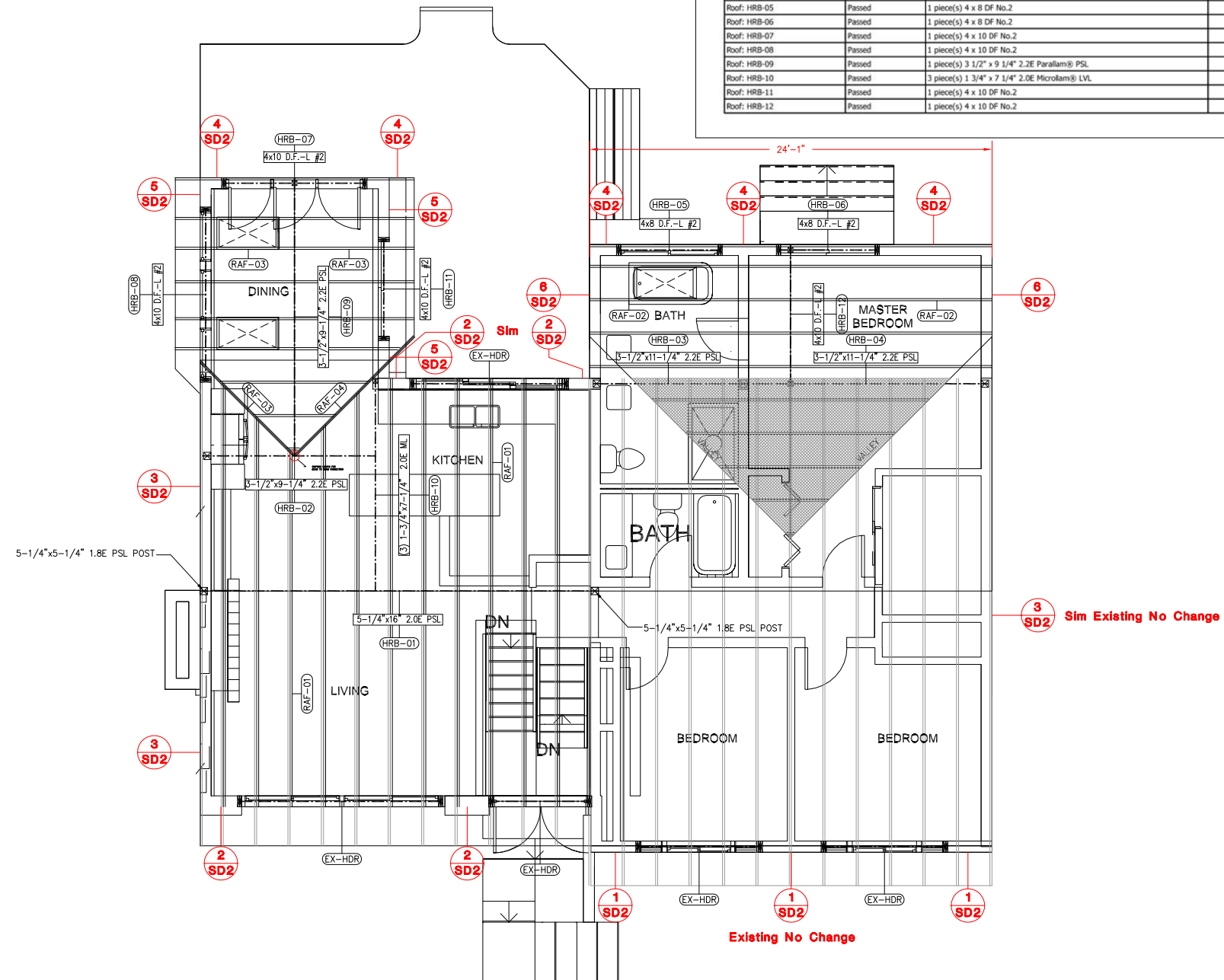
ForteWEB Software Operator	Job Notes
Juan C. Inchauste IBI Company (425) 785-6080 info@ibicompany.com	Design roof rafters & beams



ROOF BEAM SCHEDULE

FORTEWEB JOB SUMMARY REPORT
SCALLON-SMITH-CONNOLLY

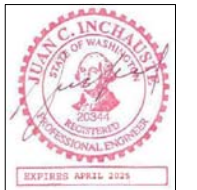
Member Name	Results	Current Solution	Comments
Roof: RAF-01	Passed	1 piece(s) 2 x 8 DF No.2 @ 24" OC	
Roof: RAF-02	Passed	1 piece(s) 2 x 8 DF No.2 @ 24" OC	
Roof: RAF-03	Passed	1 piece(s) 2 x 8 DF No.2 @ 24" OC	
Roof: RAF-04	Passed	1 piece(s) 2 x 8 DF No.2	
Roof: HRB-01	Passed	1 piece(s) 5 1/4" x 16" 2.2E Parallam® PSL	
Roof: HRB-02	Passed	1 piece(s) 3 1/2" x 9 1/4" 2.2E Parallam® PSL	
Roof: HRB-03	Passed	1 piece(s) 3 1/2" x 11 1/4" 2.2E Parallam® PSL	
Roof: HRB-04	Passed	1 piece(s) 3 1/2" x 11 1/4" 2.2E Parallam® PSL	
Roof: HRB-05	Passed	1 piece(s) 4 x 8 DF No.2	
Roof: HRB-06	Passed	1 piece(s) 4 x 8 DF No.2	
Roof: HRB-07	Passed	1 piece(s) 4 x 10 DF No.2	
Roof: HRB-08	Passed	1 piece(s) 4 x 10 DF No.2	
Roof: HRB-09	Passed	1 piece(s) 3 1/2" x 9 1/4" 2.2E Parallam® PSL	
Roof: HRB-10	Passed	3 piece(s) 1 3/4" x 7 1/4" 2.0E Microlam® LVL	
Roof: HRB-11	Passed	1 piece(s) 4 x 10 DF No.2	
Roof: HRB-12	Passed	1 piece(s) 4 x 10 DF No.2	



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The liability of the above named consultant shall be limited to the area of expertise and to those services provided by the consultant.

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Project: Scallon-Smith Connolly
Residence Remodel
3450 79th Ave. S.E.
Mercer Island, WA 98040

Designer: Elizabeth Scallon
And Shena Smith-Connolly
3450 79th Ave. S.E.
Mercer Island, WA 98040

Owners: Elizabeth Scallon
And Shena Smith-Connolly
3450 79th Ave. S.E.
Mercer Island, WA 98040

Jurisdiction: City of Edmonds
Department of Planning
& Community Development
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Phone: (425)-771-0220

Applicable Codes:

IBC & IRC 2021

I.B.I. Co. FILE DIRECTORY
B: \JOBS23\JOB23-41
Start Date: Feb. 15, 2024
Plot Date: Nov. 05, 2024

Mark	Description	Date

Sheet Content:
PROPOSED ROOF
FRAMING PLAN FOR
ADDITION

Drawn By: R.I. | Checked By: JCI.

Date of Issue: Nov. 05, 24

Project No. 23-41 | Sheet No. S-06

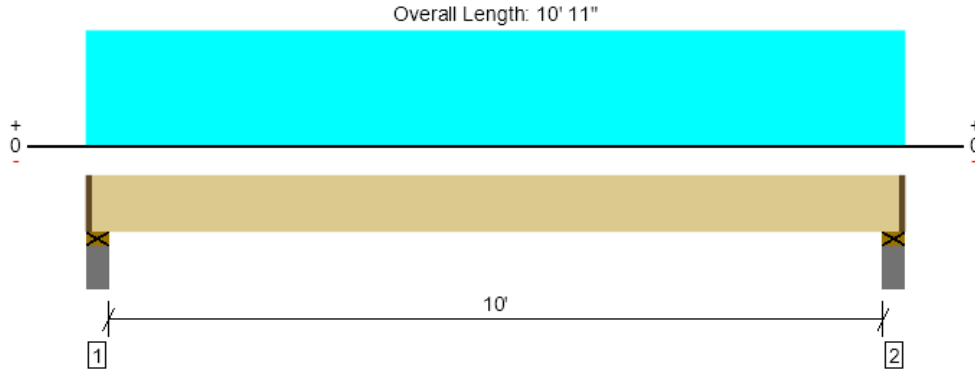
Roof			
Member Name	Results (Max UTIL %)	Current Solution	Comments
Floor: JST-01	Passed (44% M)	1 piece(s) 2 x 10 DF No.2 @ 16" OC	
Floor: JST-02	Passed (55% M)	1 piece(s) 2 x 10 DF No.2 @ 16" OC	
Floor: MFB-01	Passed (90% M)	1 piece(s) 4 x 10 DF No.2	

ForteWEB Software Operator	Job Notes
Juan C. Inchauste IBI Company (425) 785-6080 info@ibicompany.com	Design roof rafters & beams



Roof, Floor: JST-01

1 piece(s) 2 x 10 DF No.2 @ 16" OC



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	370 @ 4 1/2"	3750 (4.00")	Passed (10%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	293 @ 1' 2 3/4"	1665	Passed (18%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	896 @ 5' 5 1/2"	2029	Passed (44%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.081 @ 5' 5 1/2"	0.254	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.105 @ 5' 5 1/2"	0.508	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	N/A	N/A	N/A	--	N/A

Member Length : 10' 8"
 System : Floor
 Member Type : Joist
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Plate on concrete - DF	5.50"	4.00"	1.50"	87	291	378	1 1/2" Rim Board
2 - Plate on concrete - DF	5.50"	4.00"	1.50"	87	291	378	1 1/2" Rim Board

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

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

•Maximum allowable bracing intervals based on applied load.

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Floor Live (1.00)	Comments
1 - Uniform (PSF)	0 to 10' 11"	16"	12.0	40.0	Main Floor Distributed Load

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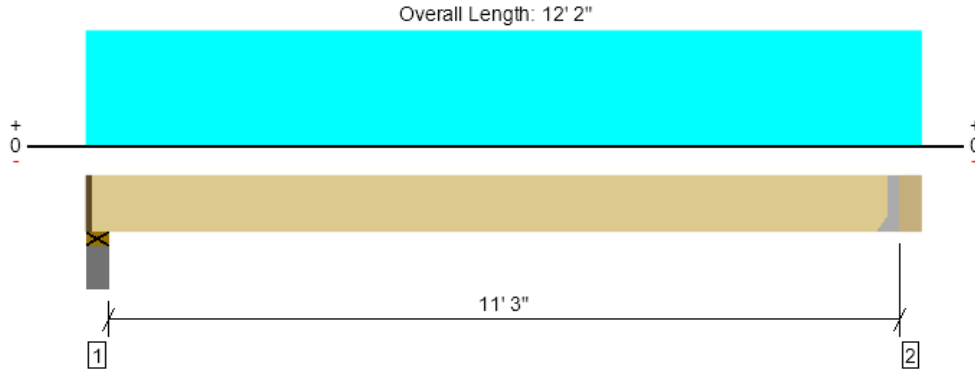
The product application, input design loads, dimensions and support information have been provided by Juan C. Inchauste

FortewEB Software Operator	Job Notes
Juan C. Inchauste IBI Company (425) 785-6080 info@ibicompany.com	Design roof rafters & beams



Roof, Floor: JST-02

1 piece(s) 2 x 10 DF No.2 @ 16" OC



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	393 @ 11' 8 1/2"	1406 (1.50")	Passed (28%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	339 @ 10' 11 1/4"	1665	Passed (20%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	1113 @ 6' 1/2"	2029	Passed (55%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.125 @ 6' 1/2"	0.283	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.163 @ 6' 1/2"	0.567	Passed (L/836)	--	1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	N/A	N/A	N/A	--	N/A

Member Length : 11' 7"
 System : Floor
 Member Type : Joist
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Plate on concrete - DF	5.50"	4.00"	1.50"	97	322	419	1 1/2" Rim Board
2 - Hanger on 9 1/4" DF beam	5.50"	Hanger ¹	1.50"	98	327	425	See note ¹

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

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

•Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-Tie							
Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories	
2 - Face Mount Hanger	LU28	1.50"	N/A	8-10dx1.5	6-10dx1.5		

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

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Floor Live (1.00)	Comments
1 - Uniform (PSF)	0 to 12' 2"	16"	12.0	40.0	Main Floor Distributed Load

Weyerhaeuser Notes

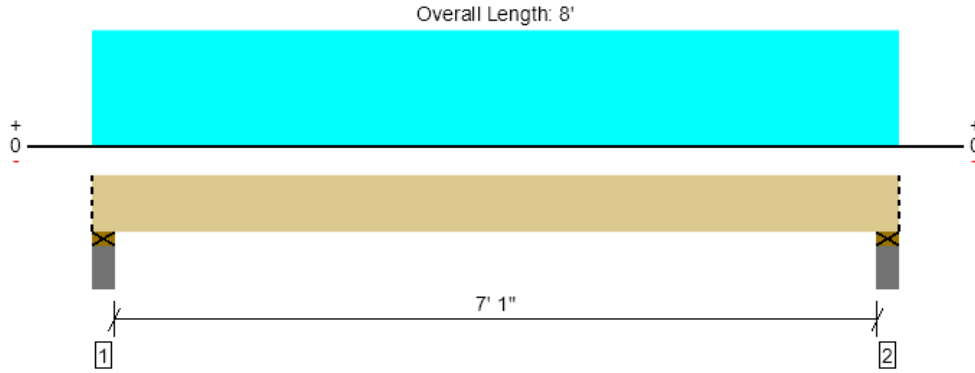
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ForteWEB Software Operator Juan C. Inchauste IBI Company (425) 785-6080 info@ibicompany.com	Job Notes Design roof rafters & beams
---	--



Roof, Floor: MFB-01
1 piece(s) 4 x 10 DF No.2



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	2399 @ 4"	12031 (5.50")	Passed (20%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	1662 @ 1' 2 3/4"	3885	Passed (43%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	4031 @ 4'	4492	Passed (90%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.080 @ 4'	0.244	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.106 @ 4'	0.367	Passed (L/833)	--	1.0 D + 1.0 L (All Spans)

Member Length : 8'
System : Floor
Member Type : Drop Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Plate on concrete - DF	5.50"	5.50"	1.50"	579	1820	2399	Blocking
2 - Plate on concrete - DF	5.50"	5.50"	1.50"	579	1820	2399	Blocking

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

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 8'	N/A	8.2	--	
1 - Uniform (PSF)	0 to 8' (Front)	11' 4 1/2"	12.0	40.0	Main Floor Distributed Load

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ForteWEB Software Operator	Job Notes
Juan C. Inchauste IBI Company (425) 785-6080 info@ibicompany.com	Design roof rafters & beams



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Bellevue, Washington 98004
Phone: (425) 450-0316
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Project: Scallon-Smith Connolly Residence Remodel
3450 79th Ave. S.E.
Mercer Island, WA 98040

Designer: Elizabeth Scallon
And Shena Smith-Connolly
3450 79th Ave. S.E.
Mercer Island, WA 98040

Owners: Elizabeth Scallon
And Shena Smith-Connolly
3450 79th Ave. S.E.
Mercer Island, WA 98040

Jurisdiction: City of Edmonds
Department of Planning
& Community Development
121 5th Ave. North
Edmonds, WA 98020
Phone: (425)-771-0220

Applicable Codes:

IBC & IRC 2021

I.B.I. Co. FILE DIRECTORY
B: \JOBS23\JOB23-41
Start Date: Feb. 15, 2024
Plot Date: Nov. 05, 2024

Revisions:		
Mark	Description	Date

Sheet Content:
PROPOSED MAIN FLOOR FRAMING PLAN FOR ADDITION

Drawn By: R.I. | Checked By: J.C.I.

Date of Issue: **Nov. 08, 2024**

Project No. 23-41 | Sheet No. S-04

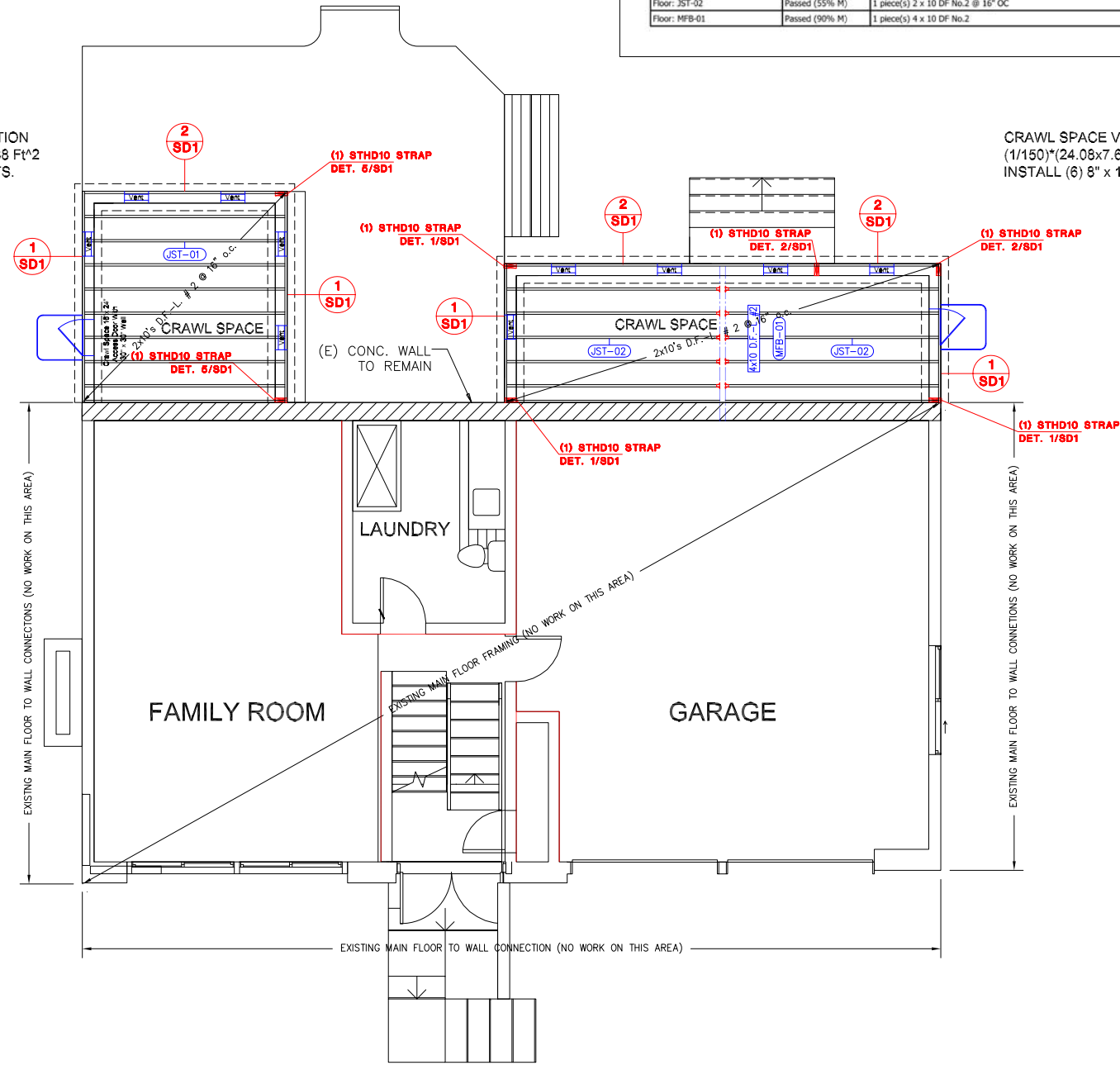
MAIN FLOOR BEAM SCHEDULE

FORTEWEB JOB SUMMARY REPORT
SCALLON-SMITH-CONNOLLY

Member Name	Results (Max UTIL %)	Current Solution	Comments
Floor: JST-01	Passed (44% M)	1 piece(s) 2 x 10 DF No.2 @ 16" OC	
Floor: JST-02	Passed (55% M)	1 piece(s) 2 x 10 DF No.2 @ 16" OC	
Floor: MFB-01	Passed (90% M)	1 piece(s) 4 x 10 DF No.2	

CRAWL SPACE VENTILATION
(1/150)*(11.67*11.33) = 0.88 Ft²
INSTALL (6) 8" x 16" VENTS.

CRAWL SPACE VENTILATION
(1/150)*(24.08*7.66) = 1.22 Ft²
INSTALL (6) 8" x 16" VENTS.



FIRST FLOOR FRAMING PLAN
Scale 1/4" = 1'-0"

1372 Bellevue Way N.E. # 3
Bellevue, WA, 98004



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Project:	Scallon - Connolly Remodel	Location:	Mercer Island
Client:	Scallon - Connolly	By:	J.C.F.
Subject:	2" Steel Pin Pile	Date:	08/19/2029

Calculate Loads on Pin Piles and determine spacing

$$\text{Roof Dead Load} = 13 \text{ psf}$$

$$\text{Roof Snow Load} = 25 \text{ psf}$$

$$\text{Floor Dead Load} = 12 \text{ psf}$$

$$\text{Floor Live Load} = 40 \text{ psf}$$

$$\text{Wood Stud Wall} = 10 \text{ psf}$$

$$\text{Concrete footings} = 145 \text{ psf}$$

Calculate highest Load on pile

$$\begin{aligned} \text{W.L.} &= \overbrace{\left(\frac{20.08}{2} \right) (13 + 25)}^{\text{Roof}} + \overbrace{(10)(8)}^{\text{Wall}} + \overbrace{\left(\frac{12.09}{2} \right) (12 + 40)}^{\text{Floor}} \\ &+ \underbrace{\frac{(8)(145)(8)}{12} + \frac{(8)(16)(145)}{144}}_{\text{Footings}} = 1096 \text{ \#/ft} \end{aligned}$$

$$\text{Capacity of 2" pile} = 3 \text{ Tons} = 2209 \text{ [Lbs]}$$

$$\text{Spacing} \frac{6613}{1096} = 6.03' \text{ (Plan spacing O.K.)}$$

2" PIPE PILE SPECIFICATIONS

PIPE PILES

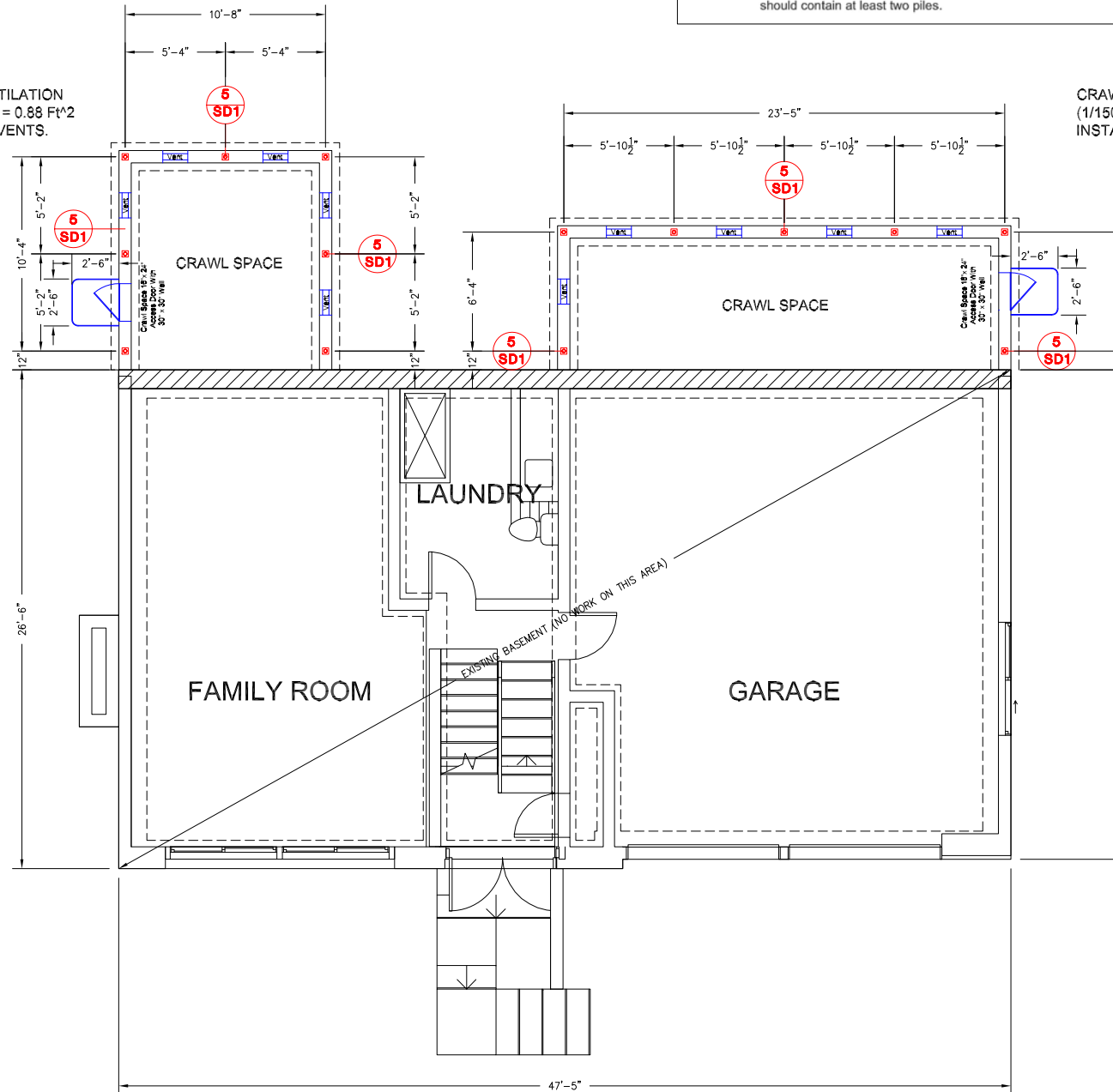
A 2-inch-diameter pipe pile driven with a minimum 90-pound jackhammer or a 140-pound Rhino hammer to a final penetration rate of 1-inch or less for one minute of continuous driving may be assigned an allowable compressive load of 3 tons. Load tests are not required to verify this allowable capacity.

Extra-strong steel pipe should be used. The site soils are not highly organic, and are not located near salt water. As a result, they do not have an elevated corrosion potential. Considering this, it is our opinion that standard "black" pipe can be used, and corrosion protection, such as galvanizing, is not necessary for the pipe piles. Subsequent pipe sections should be connected together using threaded or slip couplers, or by welding. If slip couplers are used, they must fit snugly into the ends of the pipes. This can require that shims or beads of welding flux be applied to the couplers.

Pile caps and grade beams should be used to transmit loads to the piles. Any isolated pile caps should contain at least two piles.

CRAWL SPACE VENTILATION
 $(1/150) * (11.67 * 11.33) = 0.88 \text{ Ft}^2$
 INSTALL (6) 8" x 16" VENTS.

CRAWL SPACE VENTILATION
 $(1/150) * (24.08 * 7.66) = 1.22 \text{ Ft}^2$
 INSTALL (6) 8" x 16" VENTS.



2" STEEL PILES FOUNDATION DIMENSTION LAYOUT
 Scale 1/4" = 1'-0"

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Project: Scallon-Smith Connolly Residence Remodel
 3450 79th Ave. S.E.
 Mercer Island, WA 98040

Designer: Elizabeth Scallon
 And Shena Smith-Connolly
 3450 79th Ave. S.E.
 Mercer Island, WA 98040

Owners: Elizabeth Scallon
 And Shena Smith-Connolly
 3450 79th Ave. S.E.
 Mercer Island, WA 98040

Jurisdiction: City of Edmonds
 Department of Planning
 & Community Development
 121 5th Ave. North
 Edmonds, WA 98020
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Applicable Codes:
 IBC & IRC 2021

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 Start Date: Feb. 15, 2024
 Plot Date: Nov. 05, 2024

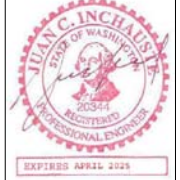
Revisions:		
Mark	Description	Date

Sheet Content:
 PROPOSED FOOTINGS
 & FOUNDATION
 WALLS FOR ADDITION

Drawn By: R.I.	Checked By: JCI.
Date of Issue: Nov. 05, 24	Project No. 23-41
Sheet No. S-03.1	

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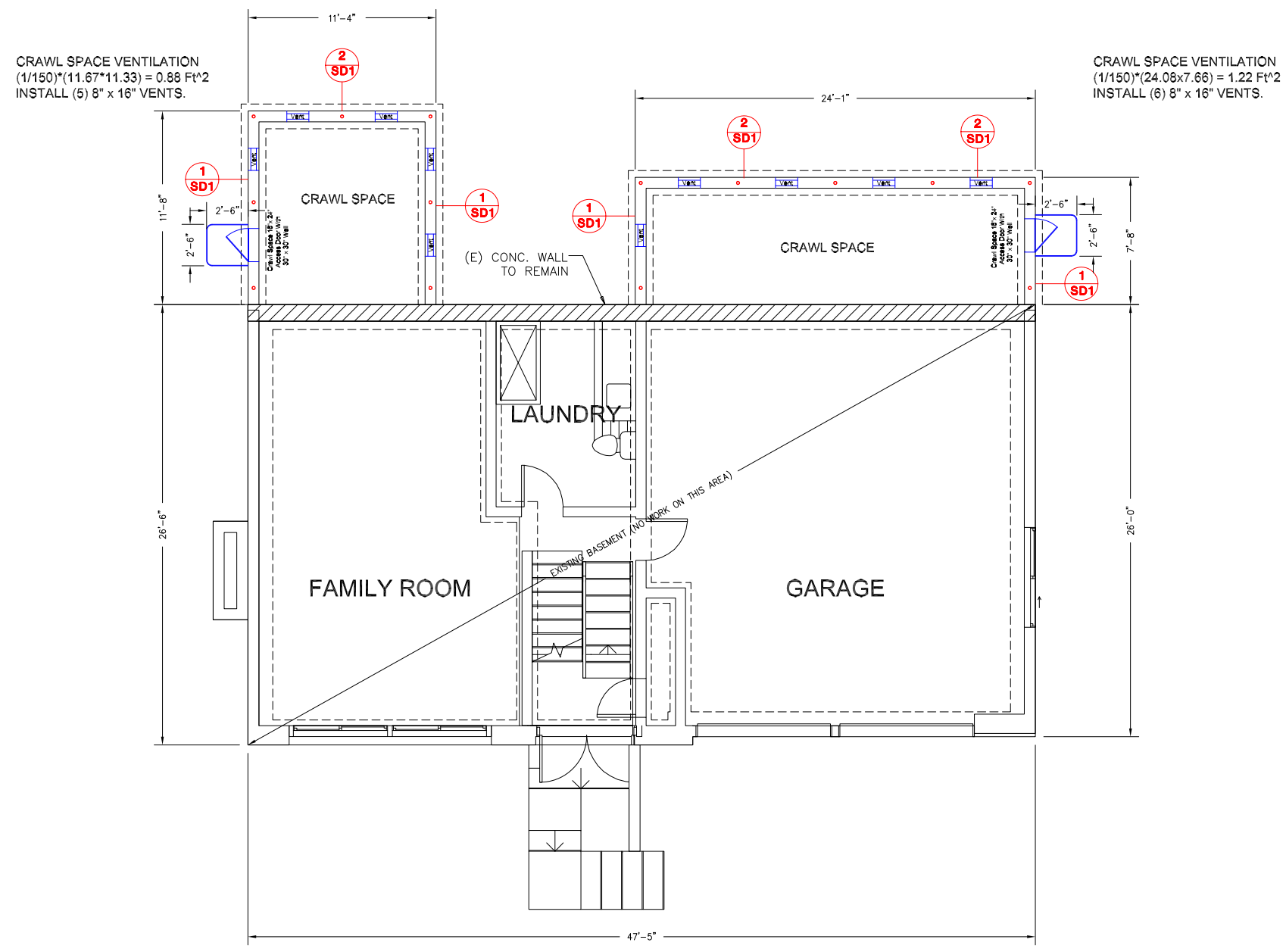
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Sheet Content:
 PROPOSED FOOTINGS & FOUNDATION WALLS FOR ADDITION

Drawn By: R.I. | Checked By: JCI.

Date of Issue: Nov. 05, 24
 Project No. 23-41 | Sheet No. S-03



FOUNDATION PLAN SHOWING 2" STEEL PILES
 Scale 1/4" = 1'-0"