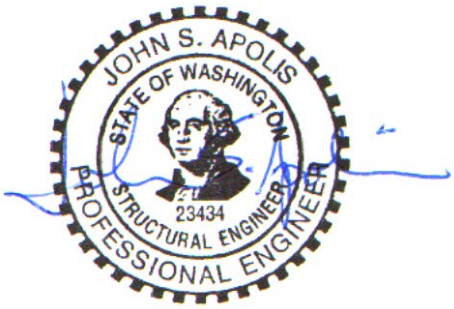
Structural Calculations Cover Sheet

Project Number:	**2020.096**	**Date:**	**December 15, 2020**
Project Name:	**Eberhard**	**Architect:**	**Paker Eberhard**

Structural Design For: Structural design for a new addition to an existing residence
Construction Type: Conventional wood framed construction.

CODES

2015 International Building Code (IBC)
2015 NDS
ASCE 7-10



LOADS

Floor Live Load	40 psf
Dead Loads	As required
Roof snow Load	25 psf
Wind	110 mph, Exposure D, Per ASCE 7-10 Section 28, Kzt = 1.6
Seismic	Per ASCE 7-10 Section 12

Peak Ground Accelerations (PGA) based on USGS Hazards Program (by address).
PGA 1 sec = .506 PGA .2 sec = 1.461 %V = .150 * DL

Material Design Values

Soils (assumed)	Minimum 1,500 psf allowed bearing (subject to field verification)	
Concrete	f'c=2,500 psi; 5-1/2 sack mix, or alternate mix pre-approved by bldg. dept.	
Reinforcing	Grade 60; Fy=60,000 psi	
Sawn Lumber	Joists, Rafters:	DF #2 and better
	Beams:	4x_ DF-L #2
		6x_ DF-L #2
	Posts:	Hem-Fir standard
	Studs & Plates:	Hem-Fir Standard
Glu-Lam Beams	24F-V4 for simple span beams, 24F-V8 for cantilevered beams	
Parallam Beams	2.0E PSL, Fb=2,900 psi, Fv=290 psi, E=2.0*10^6 psi (minimum)	
Microllam Beams	1.9E LVL, Fb=2,600 psi, Fv=285 psi, E=1.9*10^6 psi (minimum)	
Anchor Bolts	ASTM A325 hold down bolts, F1554 Anchor Bolts, A307 other bolts	

CONSULTING STRUCTURAL ENGINEERING SERVICES, INC.
6311 - 17th Avenue NE, Seattle WA 98115 (206) 527-1288 email john@cses-engineering.com
Structural Engineering Consulting and Design

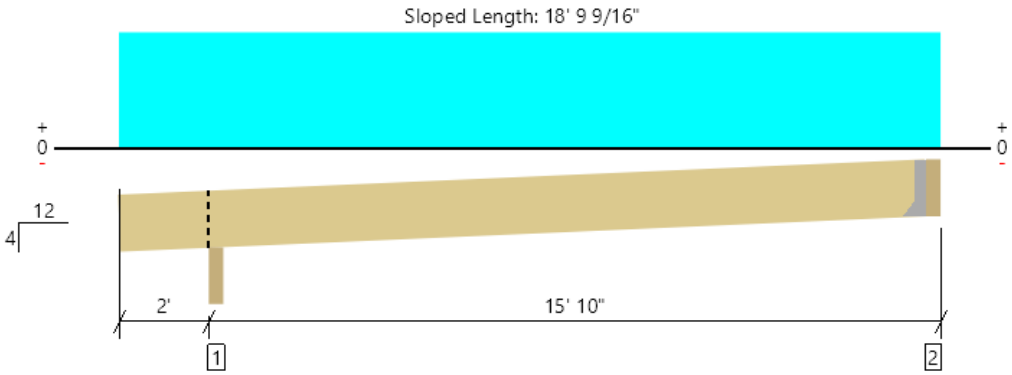
FORTE WEB

MEMBER REPORT

PASSED

Level, Roof: Joist

1 piece(s) 4 x 10 Douglas Fir-Larch No. 2 @ 42" OC



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

Member Length : 18' 9"

System : Roof
Member Type : Joist
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD
Member Pitch : 4/12

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1224 @ 17' 6 1/2"	3281 (1.50")	Passed (37%)	--	1.0 D + 1.0 S (Alt Spans)
Shear (lbs)	1124 @ 3' 1/4"	4468	Passed (25%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	4644 @ 9' 11 7/16"	5166	Passed (90%)	1.15	1.0 D + 1.0 S (Alt Spans)
Live Load Defl. (in)	0.325 @ 9' 10 7/16"	0.811	Passed (L/599)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.593 @ 9' 10 9/16"	1.082	Passed (L/329)	--	1.0 D + 1.0 S (Alt Spans)

- Deflection criteria: LL (L/240) and TL (L/180).
- Overhang deflection criteria: LL (2L/240) and TL (2L/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	Snow	Total	
1 - Beveled Plate - HF	3.50"	3.50"	1.50"	737	874	1611	Blocking
2 - Hanger on 9 1/4" DF beam	3.50"	Hanger[1]	1.50"	577	693	1270	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)	18' 6" o/c	
Bottom Edge (Lu)	18' 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	LSSR410Z	1.88"	N/A	22-16dx2.5	18-16dx2.5	

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

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 17' 10"	42"	20.0	25.0	Default Load

Weyerhaeuser Notes

Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional as determined by the authority having jurisdiction. The designer of record, builder or framer is responsible to assure that this calculation is compatible with the overall project. Accessories (Rim Board, Blocking Panels and Squash Blocks) are not designed by this software. Products manufactured at Weyerhaeuser facilities are third-party certified to sustainable forestry standards. Weyerhaeuser Engineered Lumber Products have been evaluated by ICC-ES under evaluation reports ESR-1153 and ESR-1387 and/or tested in accordance with applicable ASTM standards. For current code evaluation reports, Weyerhaeuser product literature and installation details refer to www.weyerhaeuser.com/woodproducts/document-library.

The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
William Nocka CSES (978) 503-9935 11wnocka@gmail.com	

Weyerhaeuser

12/18/2020 10:21:25 PM UTC

ForteWEB v3.1, Engine: V8.1.5.1, Data: V8.0.1.0

File Name: 2020.096 Eberhard

John S. Apolis, P.E.	**CSES, Inc.**	Job number:	**2020.096**
Project:	**Eberhard Addition/Remodel**	Date:	15-Dec-20
Architect:	**Parker Eberhard**	Page number:	R2

BEAM DESIGN (Uniform Load+Concentrated Load)

2015 International Building Code (IBC) **2015 NDS**

Beam Description: Ridge Beam

Fully Supported:	1	Snow Load:	1	Wind Load:	
Repetitive Member:		P.T. Lumber:		Wet Use:	

Geometry and Loads:

Span:	14.25 ft	Tributary Width:	9.5 ft	P@x > (L-x)=	14.25 ft
Add'l uniform DL:		DL unit load:	20 psf	Concentrated DL:	
Add'l uniform LL:		LL unit load:		Concentrated LL:	
Add'l uniform SL:		SL unit load:	25 psf	Concentrated SL:	
Add'l uniform WL:		WL unit load:		Concentrated WL:	

DL Reaction 1:	1354 lbs	DL Reaction 2:	1354 lbs	Note: Design automatically uses
LL Reaction 1:	0 lbs	LL Reaction 2:	0 lbs	load combinations
SL Reaction 1:	1692 lbs	SL Reaction 2:	1692 lbs	
WL Reaction 1:	0 lbs	WL Reaction 2:	0 lbs	
Total Reaction 1:	**3046 lbs**	Total Reaction 2:	**3046 lbs**	

Material Properties:

E	1.8 msi	E'	1.8 msi
Fb	2400 psi	Fb'	2760 psi
Fv	265 psi	Fv'	305 psi
Fc perp	650 psi	Fc perp'	650 psi
Emin	0.95 msi	Emin'	0.95 msi

Deflection analysis:

For total load: Allowed deflection criteria, span/ 240

For LL only: Allowed deflection criteria, span/ 480

Max. allowed total defl:	0.7125 ft in	Max LL defl:	0.35625 in
Total defl. * I:	220.3	Required I:	309 in^4
LL defl. * I:	122.4	Required I:	344 in^4
Actual deflections:	TOTAL: 0.561 inches		0.312 inches

Force analysis:

Max. moment:	10851 ft-lb	Max Shear:	3046 lbs

Selected Member: (1) GLB **5.5** **x** **9.5**

Member properties:	**Provided:**		**Required:**
Moment of inertia:	393.0 in^4		343.6 in^4
Section Modulus:	82.7 in^3		47.2 in^3
Section Area:	52.3 in^2		15.0 in^2
Bearing Area:			4.7 in^2
Minimum bearing dimensions:	5.5	x	0.9 inches

John S. Apolis, P.E.	**CSES, Inc.**	Job number:	**2020.096**
Project:	**Eberhard Addition/Remodel**	Date:	15-Dec-20
Architect:	**Parker Eberhard**	Page number:	R3

BEAM DESIGN (Uniform Load+Concentrated Load)

2015 International Building Code (IBC) **2015 NDS**

Beam Description: Pantry Header (Attic)

Fully Supported:	1	Snow Load:	1	Wind Load:	
Repetitive Member:		P.T. Lumber:		Wet Use:	

Geometry and Loads:

Span:	10 ft	Tributary Width:	2 ft	P@x > (L-x)=	10 ft
Add'l uniform DL:		DL unit load:	8 psf	Concentrated DL:	
Add'l uniform LL:		LL unit load:	10 psf	Concentrated LL:	
Add'l uniform SL:		SL unit load:	25 psf	Concentrated SL:	
Add'l uniform WL:		WL unit load:		Concentrated WL:	

DL Reaction 1:	80 lbs	DL Reaction 2:	80 lbs	Note: Design automatically uses
LL Reaction 1:	100 lbs	LL Reaction 2:	100 lbs	load combinations
SL Reaction 1:	250 lbs	SL Reaction 2:	250 lbs	
WL Reaction 1:	0 lbs	WL Reaction 2:	0 lbs	
Total Reaction 1:	**343 lbs**	Total Reaction 2:	**343 lbs**	

Material Properties:

E	1.3 msi	E'	1.3 msi
Fb	850 psi	Fb'	1173 psi
Fv	150 psi	Fv'	173 psi
Fc perp	405 psi	Fc perp'	405 psi
Emin	0.47 msi	Emin'	0.47 msi

Deflection analysis:

For total load: Allowed deflection criteria, span/		240	
For LL only: Allowed deflection criteria, span/		480	
Max. allowed total defl:	0.5 ft in	Max LL defl:	0.25 in
Total defl. * I:	14.9	Required I:	30 in^4
LL defl. * I:	12.1	Required I:	48 in^4
Actual deflections:	TOTAL: 0.156 inches		0.127 inches

Force analysis:

Max. moment:	856 ft-lb	Max Shear:	343 lbs

Selected Member: (2) HF#2 **1.5** **x** **7.25**

Member properties:	**Provided:**		**Required:**
Moment of inertia:	95.3 in^4		48.5 in^4
Section Modulus:	26.3 in^3		8.8 in^3
Section Area:	21.8 in^2		3.0 in^2
Bearing Area:			0.8 in^2
Minimum bearing dimensions:	3.0	x	0.3 inches

John S. Apolis, P.E.	**CSES, Inc.**	Job number:	**2020.096**
Project:	**Eberhard Addition/Remodel**	Date:	15-Dec-20
Architect:	**Parker Eberhard**	Page number:	R4

BEAM DESIGN (Uniform Load+Concentrated Load)

2015 International Building Code (IBC) **2015 NDS**

Beam Description: Pantry Header (Attic)

Fully Supported:	1	Snow Load:	1	Wind Load:	
Repetitive Member:		P.T. Lumber:		Wet Use:	

Geometry and Loads:

Span:	7.5 ft	Tributary Width:	9.5 ft	P@x > (L-x)=	7.5 ft
Add'l uniform DL:		DL unit load:	23 psf	Concentrated DL:	
Add'l uniform LL:		LL unit load:	10 psf	Concentrated LL:	
Add'l uniform SL:		SL unit load:	25 psf	Concentrated SL:	
Add'l uniform WL:		WL unit load:		Concentrated WL:	

DL Reaction 1:	819 lbs	DL Reaction 2:	819 lbs	Note: Design automatically uses
LL Reaction 1:	356 lbs	LL Reaction 2:	356 lbs	load combinations
SL Reaction 1:	891 lbs	SL Reaction 2:	891 lbs	
WL Reaction 1:	0 lbs	WL Reaction 2:	0 lbs	
Total Reaction 1:	**1755 lbs**	Total Reaction 2:	**1755 lbs**	

Material Properties:

E	1.3 msi	E'	1.3 msi
Fb	850 psi	Fb'	1173 psi
Fv	150 psi	Fv'	173 psi
Fc perp	405 psi	Fc perp'	405 psi
Emin	0.47 msi	Emin'	0.47 msi

Deflection analysis:

For total load: Allowed deflection criteria, span/		240	
For LL only: Allowed deflection criteria, span/		480	
Max. allowed total defl:	0.375 ft in	Max LL defl:	0.1875 in
Total defl. * I:	30.2	Required I:	80 in^4
LL defl. * I:	18.2	Required I:	97 in^4
Actual deflections:	TOTAL: 0.317 inches		0.191 inches

Force analysis:

Max. moment:	3290 ft-lb	Max Shear:	1755 lbs

Selected Member:	(2) HF#2	**1.5**	**x**	**7.25**

Member properties:	**Provided:**		**Required:**
Moment of inertia:	95.3 in^4		97.1 in^4
Section Modulus:	26.3 in^3		33.7 in^3
Section Area:	21.8 in^2		15.3 in^2
Bearing Area:			4.3 in^2
Minimum bearing dimensions:	3.0	x	1.4 inches

John S. Apolis, P.E.	**CSES, Inc.**	Job number:	**2020.096**
Project:	**Eberhard Addition/Remodel**	Date:	15-Dec-20
Architect:	**Parker Eberhard**	Page number:	R5

BEAM DESIGN (Uniform Load+Concentrated Load)

2015 International Building Code (IBC) **2015 NDS**

Beam Description: Booth Header

Fully Supported:	1	Snow Load:	1	Wind Load:	
Repetitive Member:		P.T. Lumber:		Wet Use:	

Geometry and Loads:

Span:	7.5 ft	Tributary Width:	9.5 ft	P@x > (L-x)=	7.5 ft
Add'l uniform DL:		DL unit load:	23 psf	Concentrated DL:	
Add'l uniform LL:		LL unit load:	10 psf	Concentrated LL:	
Add'l uniform SL:		SL unit load:	25 psf	Concentrated SL:	
Add'l uniform WL:		WL unit load:		Concentrated WL:	

DL Reaction 1:	819 lbs	DL Reaction 2:	819 lbs	Note: Design automatically uses
LL Reaction 1:	356 lbs	LL Reaction 2:	356 lbs	load combinations
SL Reaction 1:	891 lbs	SL Reaction 2:	891 lbs	
WL Reaction 1:	0 lbs	WL Reaction 2:	0 lbs	
Total Reaction 1:	**1755 lbs**	Total Reaction 2:	**1755 lbs**	

Material Properties:

E	1.3 msi	E'	1.3 msi
Fb	850 psi	Fb'	1075 psi
Fv	150 psi	Fv'	173 psi
Fc perp	405 psi	Fc perp'	405 psi
Emin	0.47 msi	Emin'	0.47 msi

Deflection analysis:

For total load: Allowed deflection criteria, span/ 240

For LL only: Allowed deflection criteria, span/ 480

Max. allowed total defl:	0.375 ft in	Max LL defl:	0.1875 in
Total defl. * I:	30.2	Required I:	80 in^4
LL defl. * I:	18.2	Required I:	97 in^4
Actual deflections:	TOTAL: 0.153 inches		0.092 inches

Force analysis:

Max. moment:	3290 ft-lb	Max Shear:	1755 lbs

Selected Member: (2) HF#2 **1.5** **x** **9.25**

Member properties:	**Provided:**		**Required:**
Moment of inertia:	197.9 in^4		97.1 in^4
Section Modulus:	42.8 in^3		36.7 in^3
Section Area:	27.8 in^2		15.3 in^2
Bearing Area:			4.3 in^2
Minimum bearing dimensions:	3.0	x	1.4 inches

John S. Apolis, P.E.	**CSES, Inc.**	Job number:	**2020.096**
Project:	**Eberhard Addition/Remodel**	Date:	15-Dec-20
Architect:	**Parker Eberhard**	Page number:	R6

BEAM DESIGN (Uniform Load+Concentrated Load)

2015 International Building Code (IBC) **2015 NDS**

Beam Description: West Door/Window Header

Fully Supported:	1	Snow Load:	1	Wind Load:	
Repetitive Member:		P.T. Lumber:		Wet Use:	

Geometry and Loads:

Span:	6.5 ft	Tributary Width:	9.5 ft	P@x > (L-x)=	6.5 ft
Add'l uniform DL:		DL unit load:	20 psf	Concentrated DL:	
Add'l uniform LL:		LL unit load:		Concentrated LL:	
Add'l uniform SL:		SL unit load:	25 psf	Concentrated SL:	
Add'l uniform WL:		WL unit load:		Concentrated WL:	

DL Reaction 1:	618 lbs	DL Reaction 2:	618 lbs	Note: Design automatically uses
LL Reaction 1:	0 lbs	LL Reaction 2:	0 lbs	load combinations
SL Reaction 1:	772 lbs	SL Reaction 2:	772 lbs	
WL Reaction 1:	0 lbs	WL Reaction 2:	0 lbs	
Total Reaction 1:	**1389 lbs**	Total Reaction 2:	**1389 lbs**	

Material Properties:

E	1.3 msi	E'	1.3 msi
Fb	850 psi	Fb'	1173 psi
Fv	150 psi	Fv'	173 psi
Fc perp	405 psi	Fc perp'	405 psi
Emin	0.47 msi	Emin'	0.47 msi

Deflection analysis:

For total load: Allowed deflection criteria, span/ 240

For LL only: Allowed deflection criteria, span/ 480

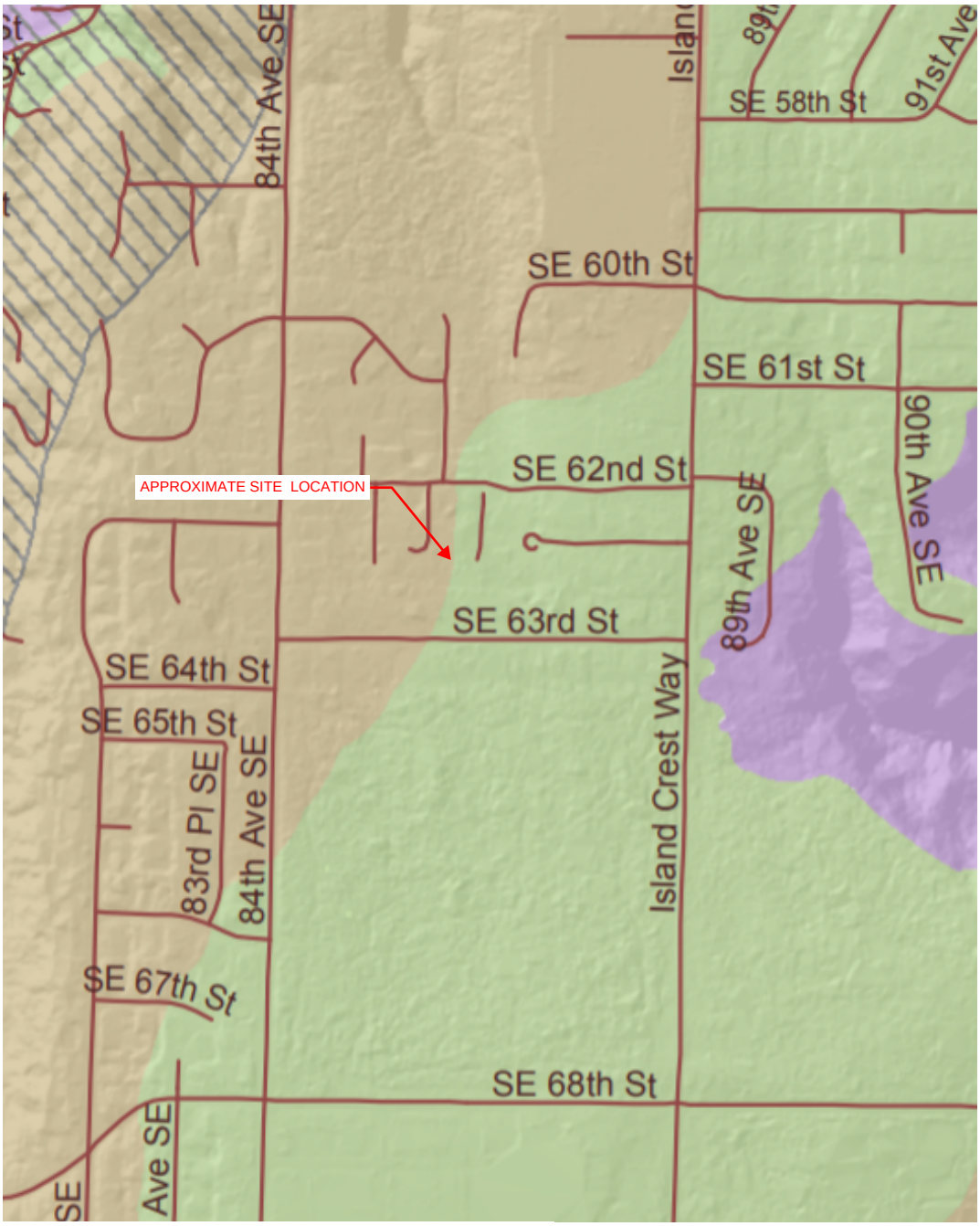
Max. allowed total defl:	0.325 ft in	Max LL defl:	0.1625 in
Total defl. * I:	13.2	Required I:	41 in^4
LL defl. * I:	7.3	Required I:	45 in^4
Actual deflections:	TOTAL: 0.139 inches		0.077 inches

Force analysis:

Max. moment:	2258 ft-lb	Max Shear:	1389 lbs

Selected Member: (2) HF#2 **1.5** **x** **7.25**

Member properties:	**Provided:**		**Required:**
Moment of inertia:	95.3 in^4		45.2 in^4
Section Modulus:	26.3 in^3		23.1 in^3
Section Area:	21.8 in^2		12.1 in^2
Bearing Area:			3.4 in^2
Minimum bearing dimensions:	3.0	x	1.1 inches



WIND EXPOSURE CATEGORIES:

Wind Exposure Category	
	Exposure 'C' (1500 feet from Lake)
	Exposure 'B' (all other areas)

WIND SPEED-UP (TOPOGRAPHIC EFFECT) - K_zt Factor :

K_zt Factor	
	$K_zt = 1.0$
	$K_zt = 1.3$
	$K_zt = 1.6$
	$K_zt = 1.9$

6215 86th Ave SE, Mercer Island, WA 98040, USA

Latitude, Longitude: 47.54698519999999, -122.2247445

Date	12/10/2020, 9:03:47 AM
Design Code Reference Document	ASCE7-16
Risk Category	II
Site Class	D - Default (See Section 11.4.3)

Type	Value	Description
S_S	1.461	MCE_R ground motion. (for 0.2 second period)
S_1	0.506	MCE_R ground motion. (for 1.0s period)
S_{MS}	1.753	Site-modified spectral acceleration value
S_{M1}	null -See Section 11.4.8	Site-modified spectral acceleration value
S_{DS}	1.168	Numeric seismic design value at 0.2 second SA
S_{D1}	null -See Section 11.4.8	Numeric seismic design value at 1.0 second SA

John S. Apolis, P.E. **CSES, Inc.** Job number: **2020.096**
Project: **Eberhard Addition & Remodel** Date: 15-Dec-20
Designer: **Parker Eberhard** Page number: **L 1**

Lateral Loads Design per ASCE 7-10, Wind: Section 28 Seismic: Section 12

(Simplified Envelope Procedure Part 2) 2015 International Building Code (IBC)

WIND LOADS **110** mph Basic Wind Speed 2015 NDS

Ps = lambda * Kzt * Ps(30) * 0.6 Exposure **B** Roof Slope: **4.00** : 12 = 18.4

Least Horizontal Dimension, feet: **55** Mean Roof Ht, feet: **18** (degrees)

lambda = 1.00 a = 5.5 ft, 2a = 11.0 ft

Iw = 1.00 KzT = **1.60**

Tabulated Ps(30): (Refer to ASCE 7-10, Figure 28.6-1)	**Zone**	**Tabulated Wind Pressure**		**Calc'd Design Pressure** (*lambda*KzT*0.6)	**Min Design Pressure**
(horizontal)	A	25.8	psf	**24.8**	**24.8**
"	B	-7.3	psf	**-7.0**	**7.7**
"	C	17.2	psf	**16.5**	**16.5**
"	D	-4.1	psf	**-4.0**	**7.7**
(vertical)	E	-23.1	psf	**-22.2**	
"	F	-15.7	psf	**-15.1**	
"	G	-16.0	psf	**-15.4**	
"	H	-12.0	psf	**-11.5**	
(uplift on overhangs)	E(oh)	-32.3	psf	**-31.0**	
"	G(oh)	-25.3	psf	**-24.3**	

(Per section 28.6.4 minimum wind pressure is 16 PSF for zones A,C, and 8 PSF for zones B, D)

(Equivalent Lateral Force Procedure, Section 12.8)

SEISMIC LOADS Ie 1.0 R = 6.5 ASCE 7-10, Table 12.2.1

Seismic Parameters per ASCE 7-10) Group I Site Class: **D**

PGA (.2 sec) 1.461 Fa = 1.00 ASCE 7-10 Table 11.4-1

PGA (1 sec) 0.506 Fv = 1.50 ASCE 7-10 Table 11.4-2

Seismic Design Categories per ASCE 7-10 Tables 11.6-1, 11.6-2

Based on Sds: **D** Based on Sd1: **D**

PGA's based on peak ground accelerations per latest USGS Hazards Program (based on lat/lon).

Ss = 1.4610 Sms = Fa * Ss = 1.46 Equation 11.4-1

S1 = 0.5060 Sm1 = Fv * S1 = 0.76 Equation 11.4-2

Equations 11.4-3, 11.4-4 Sds = 2/3 * Sms = 0.97 Sd1 = 2/3 * Sm1 = 0.51

Equation 12.14-11 Cs (or %V) = (Sds / (R/I)) = 0.150 **Building period < 0.5 s per IBC eq 12.8-7**

Base Shear = %V * W * 0.7 = 4.72 psf, uniformly distributed over floor area

(0.7 reduction factor per ASCE 7-10, Section 2.4.1, Eq 5 (seismic vertical distribution per IBC eqs 12.8-11 & 12)

Base = top of foundation	**Roof or Floor DL (psf)**	**Wall DL (psf) dist. over floor area**	**Story Height Above Base (ft)**	**Lateral Load (psf)**
Roof	**15**	**6**	**16**	**3.00**
Main Floor	**12**	**12**	**8**	**1.72**
				0.00
Total Seismic DL:	**45**		Sum	**4.72**

LATERAL DESIGN - EXISTING HOUSE

→ CHECK LATERAL CAPACITY OF WALL IN LINE WITH WALL TO BE REMOVED BY ADDITION

→ NEW LENGTH = 22'

WIND (SOUTH LOADING)

$P_W = 1.5' \times 15' \times 24.8\ psf + 15.5' \times 15' \times 16.5\ psf$

$P_W = 4394\ \#$ //

EARTHQUAKE

$P_E = 1242\ ft^2 \times 4.72\ psf$

$P_E = 5862\ \#$ //

$v = \frac{5862\ \#}{22'} = 266\ plf < 350\ plf \Rightarrow$ SW2

UPLIFT: $266\ plf \times 16' = 4263\ \# < 4340\ \# \Rightarrow$ HDU5

CONSULTING STRUCTURAL ENGINEERING SERVICES
Residential and Commercial Structural Design
6311 17th Avenue NE, Seattle, WA 98115
Phone: (206)527-1288 Email: john@cses-engineering.com

Project No. 2020.096 Date 12/15/20
Project Name EBERHARD ADDITION
Comments
Revision Page L2

LATERAL DESIGN – ADDITION

NEW WEST SHEAR WALL (L = 4' + 6' + 4.5')

$P_W = 17.75' \times 8.75' \times 16.5\ psf$

$P_W = 2563\#$ //

$P_E = 42.5' \times 17.75' \times 1.72\ psf$

$P_E = 1298\#$ //

$v = \frac{2563\#}{14.5'} = 177\ plf < 230\ plf \Rightarrow$ SW1

UPLIFT: $177\ plf \times 8' = 1416\# < 2215\# \Rightarrow$ HDU2

CONSULTING STRUCTURAL ENGINEERING SERVICES
Residential and Commercial Structural Design
6311 17th Avenue NE, Seattle, WA 98115
Phone: (206)527-1288 Email: john@cses-engineering.com

Project No. 2020.096 Date 12-15-20
Project Name EBERHARD ADDITION
Comments
Revision Page L3