

Structural Calculations for: 61st Ave Residence

Project Address: 3038 61st Ave SE Mercer Island, WA 98040

Design per 2018 International Building Code

Contents:

Key Plans Framing Design Lateral Design



W= 230(36)/8=31560 #062 = 38 = M Paperpoin 211=58/6117 = 12. PER NOTE 13 M (19041) M- \$0 765601 = 98/201/26 =)=1 TYP TOP PL PER NOTE B 487 D= 1300 S= 1950 2x4 @ 24" OC OUTRIGGERS 282 TO SIM X 4x6 MULLION-W/ (2) A35's @ TOP & BOT beld CMSTC167 x 16'-0"LG 38 0=1000 0=190 ROOF FRAMING PLAN 15- 413/18- 228# : DNAODED 2x4 @ 24" OC-RB5 6x10(D) T=C= 12748/8= 707#: SPE 243 W-(TQ) SSURT CMSTC16 ×8-0"LS SW2 (3-9") CMSTC16-x 8-0"LG X AT OPNG (PERP.) BLOCKED ROOF PER NOTE 13 RB2 PRE-MRED ROOF TRUSSES INCLUDING GRAVITY. UPLET & LATERAL CONNECTIONS TO BE DESIGNED BY ALCENSED PROFESSIONAL, ENGINEER IN THE STATE OF WASHINGTON, SEE LOAD RECT'S IN THE GENERAL MOTES.

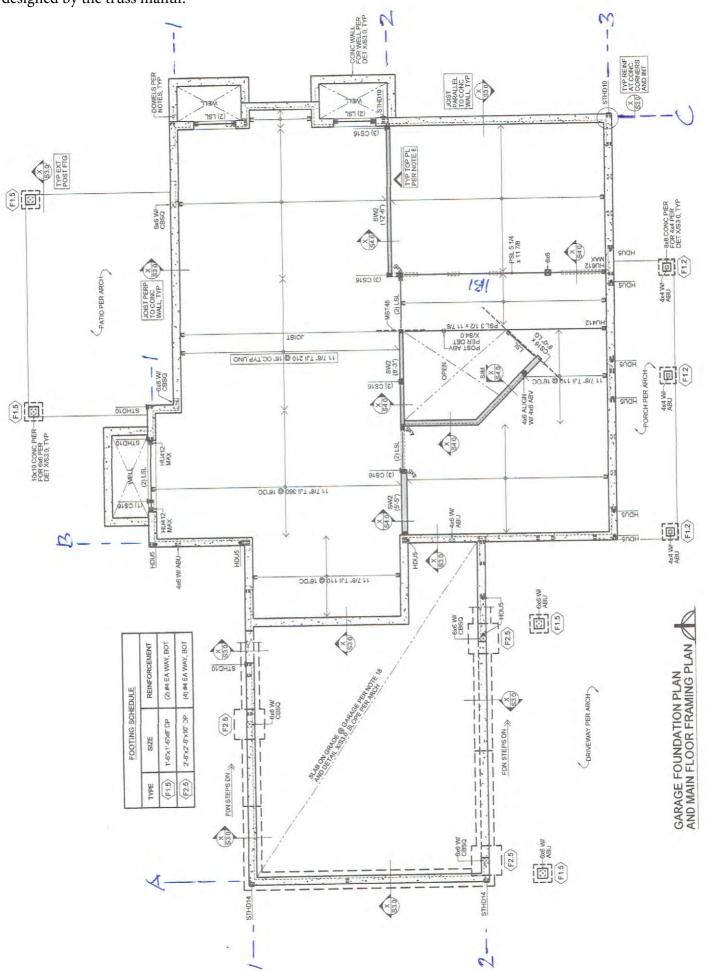
 REUSS MET'S TRUSS LAYOUT, SHOP DWAS & CALCULATIONS MUST BE SUBMITTED TO THE STRUCTURAL, ENGINEER AND ARCHITECT PRIOR TO FARRICATION OR CONSTRUCTION.

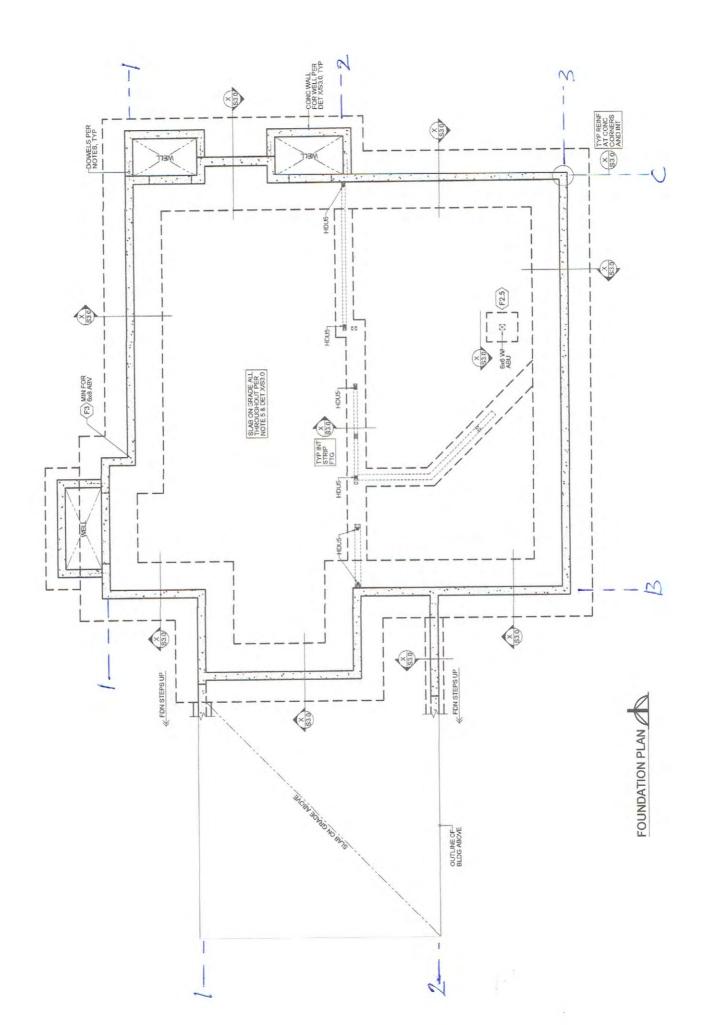
 TRUSS PROFILE AND SLOPE PER ARCH, TYPICAL. PRE-MFRD TRUSSES @ 24"OC, TYP, UNO TYP HOR PER NOTE 4, UNO 111= (70 (25) 1/8 = 12,740 TRUSS TOP CHORD CANT, TYP W= 8225 = 130# an-s (controw) SW XX 2038 GIST Re, SF, Mercer Istart, WA 98040 18° 9YT MULLIONS PER—/ 2x4 @ 24" OC ARCH (2) 2x MIN, OUTRIGGERS W/ (2) A35's @ TOP & BOT, TYP, UNO TRUSS CORNERS X X S40 PER NOTE 13 #2197 N

Calculations show design for manuf beams and joists, however it was decided to utilize premanuf trusses, to be designed by the truss manuf. (2) LSL (a) 01x4 11 7/8" TJI 230 @ 16" OC 0180 SWX (12-9") 5101 =0 OUTRIGGERS MST48 LSL 3 1/2 x 11 7/8 (DS) 888 @ 16" OC OPEN (2) CS16 -MST48 6x8 W/ DECK 11 7/8" TJI 230 @ 16" OC 61117 SWX (7-8") (\$ 5 t) XX 9 24" OC UBG ROOF UBB (2) LSL S4.0 (2) CS16 280 SA.0 \$ SW2 (Z) CS16 MST487 (2) CS16 11 7/8" TJI 110 @ 16" OC, TYP, UNO UBI UPPER FLOOR FRAMING PLAN 2x6 @ 24" 0C ecco Ecco 0=240 CER Zen 9 HGU5.62 GLB 5 1/2 x 21 (2) CS16 2x6 @ 24" OC CORNERS SAQ TYP EXT SW W JOIST SUPPORTED ON WALL (2) CS-16

N

Calculations show design for manuf beams and joists, however it was decided to utilize premanuf trusses, to be designed by the truss manuf.







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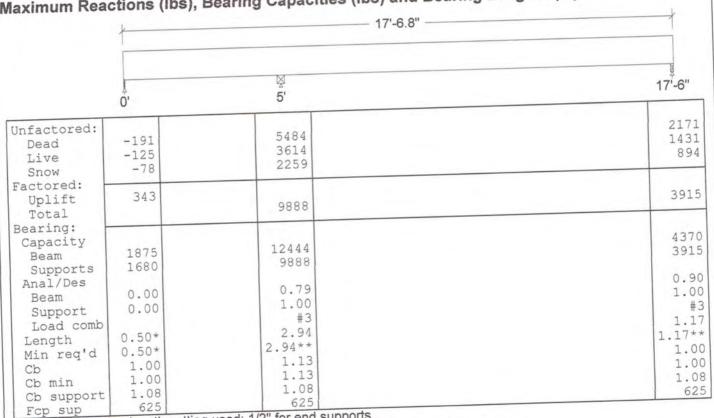
1B1

Design Check Calculation Sheet

WoodWorks Sizer 10.2

oads:	Type	Distribution		Location	[ft] End	Magnitude Start End	Unit
Load1	Dead	Full UDL	No	Start	EIIG	100.0	plf plf
Load2 Load3 Load4 Load5 Load6	Dead Dead Live Dead Snow Dead	Full UDL	No No No No No			105.0 280.0 105.0 175.0 14.9	plf plf plf plf plf

Maximum Reactions (lbs), Bearing Capacities (lbs) and Bearing Lengths (in):



*Minimum bearing length setting used: 1/2" for end supports

PSL Beam, 2.2, 2900, 5"x11"

Supports: All - Timber-soft Beam, D.Fir-L No.2

Total length: 17'-6.8";

^{**}Minimum bearing length governed by the required width of the supporting member.

1B1

WoodWorks® Sizer 10.2

Page 2

Analysis vs. Allowable Stress (psi) and Deflection (in) using NDS 2012:

Criterion	Analysis Value	Design Value	Analysis/Design
Shear Bending(+) Bending(-) Live Defl'n Total Defl'n	fv = 123	Fv' = 290	fv/Fv' = 0.42
	fb = 1075	Fb' = 2851	fb/Fb' = 0.38
	fb = 1245	Fb' = 2851	fb/Fb' = 0.44
	0.08 = <l 999<="" td=""><td>0.42 = L/360</td><td>0.20</td></l>	0.42 = L/360	0.20
	0.24 = L/617	0.63 = L/240	0.39

Additional Data:

Additiona					O.T.	017	Cfu	Cr	Cfrt	Ci	Cn	LC#
FACTORS:	F/E(psi)CD	CM	Ct	CL	CV	CIU		1.00	-	1.00	2
Fv'	290	1.00	-	1.00	_	-	-				1.00	2
		1.00	_	1.00	0.983	1.00	-	1.00	1.00	-	-	2
Fb'+	2900					1.00	-	1.00	1.00	-	_	2
Fb'-	2900	1.00	-	1.00	0.983	1.00				-	_	_
Fcp'	750	-	-	1.00	-	-	-	-	1.00			~
-			-	1.00	_	-	_	-	1.00	-	-	3
E'		million					_	-	1.00	-	-	3
Eminy'	1.14	million	-	1.00	-	_	-		1.00			

CRITICAL LOAD COMBINATIONS:

Shear : LC #2 = D+L, V = 5243, V design = 4514 lbs Bending(+): LC #2 = D+L, M = 9033 lbs-ft Bending(-): LC #2 = D+L, M = 10463 lbs-ft Deflection: LC #3 = D+.75(L+S) (live) LC #3 = D+.75(L+S) (total)

D=dead L=live S=snow W=wind I=impact Lr=roof live Lc=concentrated E=earthquake

All LC's are listed in the Analysis output Load combinations: ASCE 7-10 / IBC 2012

CALCULATIONS:

Deflection: EI = 1220e06 lb-in2

"Live" deflection = Deflection from all non-dead loads (live, wind, snow...)

Total Deflection = 1.50(Dead Load Deflection) + Live Load Deflection.

- 1. WoodWorks analysis and design are in accordance with the ICC International Building Code (IBC 2012), the National Design Specification (NDS 2012), and NDS Design Supplement.
- 2. Please verify that the default deflection limits are appropriate for your application.
- 3. SCL-BEAMS (Structural Composite Lumber): the attached SCL selection is for preliminary design only. For final member design contact your local SCL manufacturer.
- 4. Size factors vary from one manufacturer to another for SCL materials. They can be changed in the database editor.
- 5. FIRE RATING: LVL, PSL and LSL are not rated for fire endurance.



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UB1

Design Check Calculation Sheet

WoodWorks Sizer 10.2

Loads:

Load	Type	Distribution		Location Start	[ft] End	Magnitude Start End	Unit
Load1 Load2 Load3 Load4 Load5 Load6 Load7	Dead Live Dead Dead Snow Earthquake Earthquake	Full UDL Full UDL Full UDL Full UDL Full UDL Point Point Full UDL	tern	3.56 11.56	End	20.0 60.0 100.0 165.0 275.0 7258 -7258 20.9	plf plf plf plf plf lbs lbs plf

Maximum Reactions (lbs), Bearing Capacities (lbs) and Bearing Lengths (in): = 2903×2,5

15'-1.2"	

Unfactored: Dead Live Snow Earthquake	2311 454 2079 3871	2306 453 2074 -3871
Factored: Uplift Total	6242	1264 4380
Bearing: Capacity Beam Supports Anal/Des	7491 6242	5256 4380 0.83
Beam Support Load comb	0.83 1.00 #5	1.00 #4 1.00
Length Min req'd Cb	1.43 1.43** 1.00	1.00**
Cb min Cb support	1.00 1.00 625	1.00 1.00 625

**Minimum bearing length governed by the required width of the supporting member.

PSL Beam, 2.2, 2900, 7"x11"

Supports: All - Timber-soft Beam, D.Fir-L No.2 Total length: 15'-1.2";

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WoodWorks® Sizer 10.2

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Analysis vs. Allowable Stress (psi) and Deflection (in) using NDS 2012:

Criterion	Analysis Value	Design Value	Analysis/Design
Shear	fv = 110	Fv' = 464	fv/Fv' = 0.24
Bending(+)	fb = 1389	Fb' = 3299	fb/Fb' = 0.42
Live Defl'n	0.18 = L/981	0.50 = L/360	0.37
Total Defl'n	0.49 = L/367	0.75 = L/240	0.65

Additional Data:

7100100110							~ ~	-	00	0:	0-	TOH
FACTORS:	F/E(p	si)CD	CM	Ct	CL	CV	Cfu	Cr	Cfrt	Cl	Cn	LC#
Fv	290	1.60	_	1.00	-	-	-	-	1.00	-	1.00	5
Fb'+	2900	1.15	_	1.00	0.989	1.00	-	1.00	1.00	-	-	4
Fcp'	750	-	_	1.00	_	_	-	-	1.00	-	-	-
E,		illion	_	1.00	-	-	-	-	1.00	-	-	4
Eminy'		illion	_	1.00	-	-	-	-	1.00	-	-	4
And All take a a y												

CRITICAL LOAD COMBINATIONS:

: LC #5 = D+.75(L+S+.7E), V = 6211, V design = 5667 lbs

Bending(+): LC #4 = D+S, M = 16337 lbs-ft

Deflection: LC #4 = D+S (live) LC #4 = D+S (total)

D=dead L=live S=snow W=wind I=impact Lr=roof live Lc=concentrated E=earthquake

All LC's are listed in the Analysis output Load combinations: ASCE 7-10 / IBC 2012

CALCULATIONS:

Deflection: EI = 1708e06 lb-in2

"Live" deflection = Deflection from all non-dead loads (live, wind, snow...)

Total Deflection = 1.50(Dead Load Deflection) + Live Load Deflection.

Design Notes:

1. WoodWorks analysis and design are in accordance with the ICC International Building Code (IBC 2012), the National Design Specification (NDS 2012), and NDS Design Supplement.

2. Please verify that the default deflection limits are appropriate for your application.

3. SCL-BEAMS (Structural Composite Lumber): the attached SCL selection is for preliminary design only. For final member design contact your local SCL manufacturer.

4. Size factors vary from one manufacturer to another for SCL materials. They can be changed in the database editor.

5. FIRE RATING: LVL, PSL and LSL are not rated for fire endurance.



625

Fcp sup

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625

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Design Check Calculation Sheet

WoodWorks Sizer 10.2

Loads:

Load	Type	Distribution	Pat- tern	Location Start	n [ft] End	Magni Start		Unit
Load1	Dead	Point		2.68		1959		lbs
Load2	Snow	Point		2.68		2833		lbs
Load3	Dead	Partial UDL		0.18	2.68	100.0	100.0	plf
Load4	Dead	Point		2.68		2306		lbs
Load5	Live	Point		2.68		453		lbs
Load6	Snow	Point		2.68		2074		lbs
Load7	Dead	Partial UDL		2.68	19.68	210.0	210.0	plf
Load8	Live	Partial UDL		2.68	19.68	560.0	560.0	plf
Load9	Earthquake	Point		2.68		D 3 2 2 7 2 2	4	lbs
Self-weight	Dead	Full UDL				26.6		plf

Maximum Reactions (lbs), Bearing Capacities (lbs) and Bearing Lengths (in): PF = 2903 × 2,5 - 19'-9.4" ---19'-6" 0' Unfactored: 2836 5768 Dead 5428 Live 4545 629 Snow 4278 931 Earthquake 6327 Factored: 8264 15706 Total Bearing: Capacity 8264 15706 Beam 8488 Supports 16132 Anal/Des 1.00 Beam 1.00 0.97 0.97 Support #2 #5 Load comb 2.31 4.39 Length 2.31 Min req'd 4.39 1.00 1.00 Cb 1.00 1.00 Cb min 1.07 1.07 Cb support

Glulam-Bal., West Species, 24F-1.8E WS, 5-1/2"x21"

14 laminations, 5-1/2" maximum width, Supports: All - Timber-soft Beam, D.Fir-L No.2 Total length: 19'-9.4";

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WoodWorks® Sizer 10.2

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Analysis vs. Allowable Stress (psi) and Deflection (in) using NDS 2012:

Criterion	Analysis Value	Design Value	Analysis/Design
Shear Bending(+) Live Defl'n Total Defl'n	fv = 157	Fv' = 305	fv/Fv' = 0.52
	fb = 1273	Fb' = 2186	fb/Fb' = 0.58
	0.28 = L/850	0.65 = L/360	0.42
	0.51 = L/460	0.97 = L/240	0.52

Additional Data:

Additionit							~ ~	~	C.C.L	37-4	an + C	TC#
FACTORS:	F/E(psi)CD	CM	Ct					CITT	Notes	Cn*Cvr	TIC#
Fv'	265	1.15	1 00	1.00	-	-	-		1.00	1.00	1.00	3
-	200	1.00	1.00	1 00	0 011	0 916	1 00	1 00				
Fb'+	2400	1.00	1.00	1.00	0.911	0.940	1.00	1.00	1.00	1.00		
Fcp'	650	-	1.00	1.00	-	-	-	_			-	_
E	1 8	million	1.00	1.00	_	-	-	-	1.00	-	-	5
						-	_	-	1.00	-	-	5
Eminy'	0.85	MITITION	1.00						_,,,,			
Only the	lesser	of CL a	nd CV	is app	lied, a	s per N	IDS 5.3	5.0				

CRITICAL LOAD COMBINATIONS:

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Shear : LC \#3 = D+.75(L+S), V = 12385, V design = 12094 lbs
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Bending(+): LC #2 = D+L, M = 42867 lbs-ft Deflection: LC #5 = D+.75(L+S+.7E) (live) LC #5 = D+.75(L+S+.7E) (total)

D=dead L=live S=snow W=wind I=impact Lr=roof live Lc=concentrated E=earthquake

All LC's are listed in the Analysis output Load combinations: ASCE 7-10 / IBC 2012

CALCULATIONS:

Deflection: EI = 7640e06 lb-in2

"Live" deflection = Deflection from all non-dead loads (live, wind, snow...)

Total Deflection = 1.50(Dead Load Deflection) + Live Load Deflection.

- 1. WoodWorks analysis and design are in accordance with the ICC International Building Code (IBC 2012), the National Design Specification (NDS 2012), and NDS Design Supplement.
- 2. Please verify that the default deflection limits are appropriate for your application.
- 3. Glulam design values are for materials conforming to ANSI 117-2010 and manufactured in accordance with ANSI A190.1-2007
- GLULAM: bxd = actual breadth x actual depth.
- 5. Glulam Beams shall be laterally supported according to the provisions of NDS Clause 3.3.3.
- 6. GLULAM: bearing length based on smaller of Fcp(tension), Fcp(comp'n).



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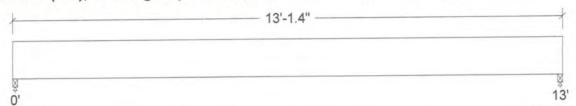
Design Check Calculation Sheet

WoodWorks Sizer 10.2

Loads:

Load	Type	Distribution	Pat- tern	Location Start	[ft] End	Magnitude Start End	Unit
Load1 Load2 Self-weight	Dead Live Dead	Full UDL Full UDL Full UDL	Cern	Dtart	LIIG	120.0 320.0 8.9	plf plf plf

Maximum Reactions (lbs), Bearing Capacities (lbs) and Bearing Lengths (in):



Unfactored: Dead Live	845 2099	845 2099
Factored: Total Bearing:	2944	2944
Capacity Beam Supports Anal/Des	3140 2944	3140 2944
Beam Support	0.94	0.94 1.00 #2
Load comb	#2 1.40	1.40 1.40**
Min req'd	1.40**	1.00
Cb min Cb support	1.00	1.13
Fcp sup	625	

**Minimum bearing length governed by the required width of the supporting member.

PSL Beam, 2.2, 2900, 3"x11"

Supports: All - Timber-soft Beam, D.Fir-L No.2 Total length: 13'-1.4";

Lateral support: top= at supports, bottom= at supports;

Analysis vs. Allowable Stress (psi) and Deflection (in) using NDS 2012:

Criterion	Analysis Value	Design Value	Analysis/Design
Shear Bending(+) Live Defl'n Total Defl'n	fv = 113	Fv' = 290	fv/Fv' = 0.39
	fb = 1881	Fb' = 2628	fb/Fb' = 0.72
	0.28 = L/555	0.43 = L/360	0.65
	0.45 = L/346	0.65 = L/240	0.69

WoodWorks® Sizer 10.2

Page 2

Additiona			011	0.5	O.T.	CIT	C.f.	Cr	Cfrt	Ci	Cn	LC#	
				Ct	CL	CV	Cfu				1.00	2	
	290		-	1.00	7	-	-	_	1.00		1.00		
Fb'+	2900	1.00	-	1.00	0.906	1.00	-		1.00		-	2	
Fcp!	750	_	-	1.00	-	-	-	-	1.00		-	-	
E!	2.2 mi	llion	-	1.00	-	-	-	-	1.00		-	2	
Eminy'				1.00	-	-	-	-	1.00	-	-	2	
CRITICAL L													
Shear	• T.C. #	2 - D-	L. V	- 29	18, V d	esign -	248	80 lbs					
Bending (+\: T.C #	2 = D-	-T. M	= 94	84 lbs-	ft							
Deflecti	07. IC #	2 - D-	LT. /	livel	712								
Dellecti		2 = D											
D=dead L	T/C #	Z - D.	LT1 (T i	a+ T ~-~	oof 111	o To-	concent	rated	Feear	thanake	2	
D=dead L	=live S=	snow Wa	=wina	T=IMPa	Cr PI-I	001 11/	e TC-	CONCENT	Lacca	L Car	ciiquane		
All LC's	are lis	ted in	the A	Analysi	s outpu	T.							
Load com	bination	s: ASC	E 7-1) / IBC	2012								
CALCULAT	IONS:												
Deflecti	on: EI	= 7:	32e06	1b-in2									
"Tive" d	eflectio	n = De	flect	ion fro	m all n	on-dead	load	s (live	e, wind	, sno	W)		
Total De	£1 = = ± i = =	_ 1 =	0/000	LOOK L	Dofloat	t lani	T 1 170	Load De	flecti	on			

- 1. WoodWorks analysis and design are in accordance with the ICC International Building Code (IBC 2012), the National Design Specification (NDS 2012), and NDS Design Supplement.
- 2. Please verify that the default deflection limits are appropriate for your application.
- 3. SCL-BEAMS (Structural Composite Lumber): the attached SCL selection is for preliminary design only. For final member design contact your local SCL manufacturer.
- 4. Size factors vary from one manufacturer to another for SCL materials. They can be changed in the database editor.
- 5. FIRE RATING: LVL, PSL and LSL are not rated for fire endurance.



PROJECT

Dec. 21, 2021 11:28

UB4

Design Check Calculation Sheet

WoodWorks Sizer 10.2

Loads:

Load	Type	Distribution	Pat- tern	Location	on [ft] End	Magnit Start	tude End	Unit
Loadl	Dead	Point		12.09		5768		lbs
Load2	Live	Point		12.09		4545		lbs
Load3	Snow	Point		12.09		4278		lbs
Load4	Dead	Full UDL				38.0		plf
Load5	Snow	Full UDL				63.0		plf
Load6	Dead	Partial UDL		0.09	12.09	100.0	100.0	plf
Load7	Dead	Partial UDL		0.09	12.09	23.0	23.0	plf
Load8	Snow	Partial UDL		0.09	12.09	38.0	. 38.0	plf
Load9	Earthquake	Point		12.09		7258		lbs
Self-weight	Dead	Full UDL				26.6		plf

Maximum Reactions (lbs), Bearing Capacities (lbs) and Bearing Lengths (in): PE = 2903 +2,5

		18'-8.8"	+
	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\		18'-6"
Unfactored: Dead	3625		482

Dead Live Snow Earthquake	3625 1597 2400 2550	4823 2948 3514 4708
Factored: Total Bearing:	7961	12142
Capacity Beam Supports	7961 8177	12142 12471
Anal/Des Beam Support	1.00	1.00 0.97 #5
Load comb Length Min req'd	#5 2.23 2.23	3.40 3.40
Cb Cb min	1.00	1.00
Cb support Fcp sup	1.07	1.07 625

Glulam-Bal., West Species, 24F-1.8E WS, 5-1/2"x21"

14 laminations, 5-1/2" maximum width,
Supports: All - Timber-soft Beam, D.Fir-L No.2
Total length: 18'-8.8";

WoodWorks® Sizer 10.2

Page 2

Analysis vs. Allowable Stress (psi) and Deflection (in) using NDS 2012:

Criterion	Analysis Value	Design Value	Analysis/Design
Shear Bending(+) Live Defl'n Total Defl'n	fv = 123 $fb = 2270$ $0.30 = L/741$ $0.61 = L/365$	Fv' = 305 Fb' = 2960 0.62 = L/360 0.93 = L/240	fv/Fv' = 0.40 fb/Fb' = 0.77 0.49 0.66

Additional Data:

Additions			4.0	-	~ *	CV	05	0.00	CENT	Motos	Cn*Cttr	T.C#
FACTORS:	F/E	(psi)CD	CM	Ct	CL	CV	CIU	CI	CIIL	Noces	CILCAT	TIO II
Fv'	265	1 15	1 00	1.00	-	-	-	-	1.00	1.00		3
Fb'+	2400	1.60	1 00	1.00	0.771	0.951	1.00	1.00	1.00	1.00	-	5
272	2400	1.00	1.00	1 00		_	_	_	1.00	-	_	-
Fcp'	650	-	1.00	1.00	_						_	5
E t	1.8	million	1.00	1.00	-	-	-	-	1.00	-		
Eminy!	0.85	million	1.00	1.00	-	-	-	_	1.00	-	-	5
Only the	lesser	c of CL a	nd CV	is app	lied, a	s per N	IDS 5.3	. 6				

CRITICAL LOAD COMBINATIONS:

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Shear : LC #3 = D+.75(L+S), V = 9658, V design = 9433 lbs Bending(+): LC #5 = D+.75(L+S+.7E), M = 76479 lbs-ft
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Deflection: LC #5 = D+.75(L+S+.7E) (live) (total)

LC #5 = D+.75(L+S+.7E)D=dead L=live S=snow W=wind I=impact Lr=roof live Lc=concentrated E=earthquake

All LC's are listed in the Analysis output Load combinations: ASCE 7-10 / IBC 2012

CALCULATIONS:

Deflection: EI = 7640e06 lb-in2

"Live" deflection = Deflection from all non-dead loads (live, wind, snow...)

Total Deflection = 1.50(Dead Load Deflection) + Live Load Deflection.

- 1. WoodWorks analysis and design are in accordance with the ICC International Building Code (IBC 2012), the National Design Specification (NDS 2012), and NDS Design Supplement.
- 2. Please verify that the default deflection limits are appropriate for your application.
- 3. Glulam design values are for materials conforming to ANSI 117-2010 and manufactured in accordance with ANSI A190.1-2007
- 4. GLULAM: bxd = actual breadth x actual depth.
- 5. Glulam Beams shall be laterally supported according to the provisions of NDS Clause 3.3.3.
- GLULAM: bearing length based on smaller of Fcp(tension), Fcp(comp'n).



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Dec. 16, 2021 22:20 UB5

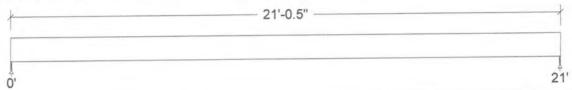
Design Check Calculation Sheet

WoodWorks Sizer 10.2

Loads:

Load	Type	Distribution	Pat-	Location	[ft]	Magnitude	Unit
	-15		tern	Start	End	Start End	
Load1 Load2 Self-weight	Dead Snow Dead	Full UDL Full UDL Full UDL				60.0 100.0 14.9	plf plf plf

Maximum Reactions (lbs), Bearing Capacities (lbs) and Bearing Lengths (in):



	•	
Unfactored: Dead Snow	788 1052	788 1052
Factored: Total Bearing:	1840	1840
Capacity Beam Supports Anal/Des	2054 1840	2054 1840
Beam Support Load comb	0.90 1.00 #2	0.90 1.00 #2
Length Min req'd	0.55 0.55**	0.55 0.55** 1.00
Cb Cb min	1.00	1.00
Cb support	1.08	625

**Minimum bearing length governed by the required width of the supporting member.

PSL Beam, 2.2, 2900, 5"x11"

Supports: All - Timber-soft Beam, D.Fir-L No.2 Total length: 21'-0.5";

Lateral support: top= at supports, bottom= at supports;

Analysis vs. Allowable Stress (psi) and Deflection (in) using NDS 2012:

Criterion	Analysis Value	Design Value	Analysis/Design
Shear Bending(+) Live Defl'n Total Defl'n	fv = 46	Fv' = 334	fv/Fv' = 0.14
	fb = 1147	Fb' = 3190	fb/Fb' = 0.36
	0.36 = L/702	0.70 = L/360	0.51
	0.76 = L/330	1.05 = L/240	0.73

WoodWorks® Sizer 10.2

												_
Additiona	al Data:											
FACTORS:	F/E(psi)CD	CM	Ct	CL	CV	Cfu	Cr	Cfrt	Ci	Cn	LC#	
	290 1.15		.00	-	-	-	-	1.00	-	1.00	2	
-	2900 1.15		.00	0.957	1.00	-	1.00	1.00		-	2	
	750 -		.00	-	-	-	-	1.00	_	-	-	
	2.2 million			-	2	-	-	1.00	-	-	2	
	1.14 million		.00	_	-	-	-	1.00	-	-	2	
	LOAD COMBINATIO											
Shear	: LC #2 - D	+S, V =	183	36, V d	esign =	16	72 lbs					
Bending	(+): LC #2 = D	+S, $M =$	964	1 lbs-	ft							
Deflect	ion: LC #2 = D	+S (liv	e)									
	$T_{1}C_{1} # 2 = D_{1}$	+S (tot	al)									
D=dead 1	L=live S=snow W	=wind I=	impad	ct Lr=r	oof liv	e Lc=	concent	rated	E=ear	thquake	3	
All LC's	s are listed in	the Ana	lysis	outpu	t							
Load cor	mbinations: ASC	E 7-10 /	IBC	2012								
CALCULAT												
Deflect:		20e06 lb	-in2									
Derrect.	1011. 11. 15	20000 20					F 69 3			\		

Design Notes:

1. WoodWorks analysis and design are in accordance with the ICC International Building Code (IBC 2012), the National Design Specification (NDS 2012), and NDS Design Supplement.

"Live" deflection = Deflection from all non-dead loads (live, wind, snow...)
Total Deflection = 1.50(Dead Load Deflection) + Live Load Deflection.

- 2. Please verify that the default deflection limits are appropriate for your application.
- 3. SCL-BEAMS (Structural Composite Lumber): the attached SCL selection is for preliminary design only. For final member design contact your local SCL manufacturer.
- 4. Size factors vary from one manufacturer to another for SCL materials. They can be changed in the database editor.
- 5. FIRE RATING: LVL, PSL and LSL are not rated for fire endurance.

Page 2



PROJECT

Dec. 16, 2021 22:21

UB6

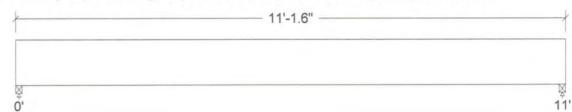
Design Check Calculation Sheet

WoodWorks Sizer 10.2

Loads:

Load	Type	Distribution	Pat-	Location	[ft]	Magnitude	Unit
			tern	Start	End	Start End	
Loadl	Dead	Full UDL				143.0	plf
Load2	Live	Full UDL				380.0	plf
Load3	Dead	Full UDL				100.0	plf
Load4	Dead	Full UDL				180.0	plf
Load5	Snow	Full UDL	l i			300.0	plf
Self-weight	Dead	Full UDL				14.9	plf

Maximum Reactions (lbs), Bearing Capacities (lbs) and Bearing Lengths (in):



	0.	11:
Unfactored: Dead Live Snow Factored:	2436 2115 1670	2436 2115 1670
Total	5274	5274
Bearing: Capacity Beam Supports Anal/Des Beam Support Load comb	5888 5274 0.90 1.00 #3	5888 5274 0.90 1.00 #3
Length Min req'd	1.57 1.57**	1.57 1.57**
Cb Cb min	1.00	1.00
Cb support Fcp sup	1.08 625	1.08

^{**}Minimum bearing length governed by the required width of the supporting member.

PSL Beam, 2.2, 2900, 5"x11"

Supports: All - Timber-soft Beam, D.Fir-L No.2 Total length: 11'-1.6";

WoodWorks® Sizer 10.2

Page 2

Analysis vs. Allowable Stress (psi) and Deflection (in) using NDS 2012:

Criterion	Analysis Value	Design Value	Analysis/Design
Shear	fv = 117	Fv' = 334	fv/Fv' = 0.35
Bending(+)	fb = 1706	Fb' = 3277	fb/Fb' = 0.52
Live Defl'n	0.14 = L/958	0.37 = L/360	0.38
Total Defl'n	0.32 = L/418	0.55 = L/240	0.57

Additional Data:

FACTORS:	F/E(n	si)CD	CM	Ct	CL	CV	Cfu	Cr	Cfrt	Ci	Cn	LC#
Fu!	290	1.15	-	1.00	_	_	_	-	1.00	-	1.00	3
Fb'+	2900	1.15	_	1.00	0.983	1.00	_	1.00	1.00	_	-	3
Fcp'	750	_	-	1.00	_	-	-	-	1.00	-	-	-
E'		illion	-	1.00	-	-	-	-	1.00	-	-	3
Eminy'		illion	-	1.00	-	-	-	-	1.00	-	-	3

CRITICAL LOAD COMBINATIONS:

Shear : LC #3 = D+.75(L+S), V = 5213, V design = 4283 lbs Bending(+): LC #3 = D+.75(L+S), M = 14337 lbs-ft Deflection: LC #3 = D+.75(L+S) (live) LC #3 = D+.75(L+S) (total)

D=dead L=live S=snow W=wind I=impact Lr=roof live Lc=concentrated E=earthquake

All LC's are listed in the Analysis output Load combinations: ASCE 7-10 / IBC 2012

CALCULATIONS:

Deflection: EI = 1220e06 lb-in2

"Live" deflection = Deflection from all non-dead loads (live, wind, snow...)

Total Deflection = 1.50(Dead Load Deflection) + Live Load Deflection.

- 1. WoodWorks analysis and design are in accordance with the ICC International Building Code (IBC 2012), the National Design Specification (NDS 2012), and NDS Design Supplement.
- 2. Please verify that the default deflection limits are appropriate for your application.
- 3. SCL-BEAMS (Structural Composite Lumber): the attached SCL selection is for preliminary design only. For final member design contact your local SCL manufacturer.
- 4. Size factors vary from one manufacturer to another for SCL materials. They can be changed in the database editor.
- FIRE RATING: LVL, PSL and LSL are not rated for fire endurance.



PROJECT

Dec. 21, 2021 11:21

UB7

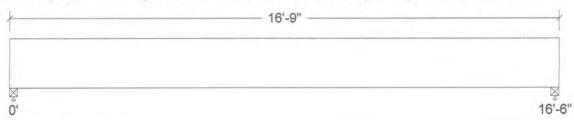
Design Check Calculation Sheet

WoodWorks Sizer 10.2

Loads:

Load	Type	Distribution	Pat- tern	Location Start	[ft] End	Magnitude Start End	Unit
Load1	Dead	Full UDL				150.0	plf
Load2	Live	Full UDL				400.0	plf
Load3	Dead	Full UDL				100.0	plf
Load4	Dead	Full UDL				195.0	plf
Load5	Snow	Full UDL				325.0	plf
Load6	Dead	Point		8.12		1175	lbs
Load7	Snow	Point		8.12		1811	lbs
Load8	Earthquake	Point		5.12		1218	lbs
Load9	Earthquake	Point		8.12		-1218	lbs
Load10	Earthquake	Point		13.62		1218	lbs
Self-weight	Dead	Full UDL				24.4	plf

Maximum Reactions (lbs), Bearing Capacities (lbs) and Bearing Lengths (in) : $\frac{p_c}{F} = 4877 \times 2.5$



Unfactored: Dead Live Snow Earthquake	4533 3350 3655 443	4498 3350 3600 775
Factored: Total	10019	10118
Bearing: Capacity Beam Supports	11184 10019	11294 10118
Anal/Des Beam Support	0.90	0.90 1.00 #5
Load comb Length Min req'd	#5 2.98 2.98**	3.01 3.01**
Cb min Cb support	1.00 1.00 1.08	1.00 1.00 1.08
Fcp sup	625	625

**Minimum bearing length governed by the required width of the supporting member.

PSL Beam, 2.2, 2900, 5"x18" actual

Supports: All - Timber-soft Beam, D.Fir-L No.2 Total length: 16'-9.0";

WoodWorks® Sizer 10.2

Page 2

WARNING: this CUSTOM SIZE is not in the database. Refer to online help.

Analysis vs. Allowable Stress (psi) and Deflection (in) using NDS 2012:

Criterion	Analysis Value	Design Value	Analysis/Design
Shear	fv = 134	Fv' = 334	fv/Fv' = 0.40
Bending(+)	fb = 1995	Fb' = 3091	fb/Fb' = 0.65
Live Defl'n	0.22 = L/913	0.55 = L/360	0.39
Total Defl'n	0.49 = L/404	0.82 = L/240	0.59

Additional Data:

FACTORS:	F/E(p	si)CD	CM	Ct	CL	CV	Cfu	Cr	Cfrt	Ci	Cn	LC#
Fv'	290	1.15	-	1.00	-	_	-	_	1.00	_	1.00	3
Fb'+	2900	1.15	-	1.00	0.927	1.00	-	1.00	1.00	-	-	3
Fcp'	750	-	-	1.00	-	-	_	-	1.00	-	-	-
E'	2.2 m	illion	-	1.00	_	-	-	_	1.00	-	-	5
Eminy'	1.14 m	illion	-	1.00	-	-	-	-	1.00	-	-	5

CRITICAL LOAD COMBINATIONS:

Shear : LC #3 = D+.75(L+S), V = 9663, V design = 8018 lbs

Bending(+): LC #3 = D+.75(L+S), M = 44886 lbs-ft

Deflection: LC #5 = D+.75(L+S+.7E) (live) LC #5 = D+.75(L+S+.7E) (total)

D=dead L=live S=snow W=wind I=impact Lr=roof live Lc=concentrated E=earthquake

All LC's are listed in the Analysis output

Load combinations: ASCE 7-10 / IBC 2012

CALCULATIONS:

Deflection: EI = 5346e06 lb-in2

"Live" deflection = Deflection from all non-dead loads (live, wind, snow...)

Total Deflection = 1.50(Dead Load Deflection) + Live Load Deflection.

- 1. WoodWorks analysis and design are in accordance with the ICC International Building Code (IBC 2012), the National Design Specification (NDS 2012), and NDS Design Supplement.
- 2. Please verify that the default deflection limits are appropriate for your application.
- 3. SCL-BEAMS (Structural Composite Lumber): the attached SCL selection is for preliminary design only. For final member design contact your local SCL manufacturer.
- 4. Size factors vary from one manufacturer to another for SCL materials. They can be changed in the database editor.
- 5. FIRE RATING: LVL, PSL and LSL are not rated for fire endurance.



PROJECT

Dec. 21, 2021 11:23

UB8

Design Check Calculation Sheet

WoodWorks Sizer 10.2

Loads:

Load	Type	Distribution	Pat-	Location	[ft]	Magnitude	Unit
			tern	Start	End	Start End	
Load1	Dead	Full UDL				100.0	plf
Load2	Dead	Full UDL				20.0	plf
Load3	Live	Full UDL				60.0	plf
Load4	Dead	Full UDL				25.0	plf
Load5	Snow	Full UDL			1	40.0	plf
Load6	Earthquake	Point		2.32		5380	lbs
Load7	Earthquake	Point		11.32		-5380	lbs
Self-weight	Dead	Full UDL				8.9	plf

Maximum Reactions (lbs), Bearing Capacities (lbs) and Bearing Lengths (in): Pz= 2152 +2,5

13'-10.2"	

Unfactored: Dead Live Snow Earthquake	1068 417 278 3521	1063 414 276 -3521
Factored: Uplift Total	3533	1803 1581
Bearing: Capacity Beam Supports Anal/Des	3769 3533	1686 1581
Beam Support Load comb	0.94 1.00 #8	0.94 1.00 #3
Length Min req'd	1.68	0.75 0.75**
Cb min Cb support	1.00 1.00 1.13	1.00 1.00 1.13
Fcp sup	625	625

^{**}Minimum bearing length governed by the required width of the supporting member.

PSL Beam, 2.2, 2900, 3"x11"

Supports: All - Timber-soft Beam, D.Fir-L No.2

Total length: 13'-10.2";

WoodWorks® Sizer 10.2

Page 2

Analysis vs. Allowable Stress (psi) and Deflection (in) using NDS 2012:

Criterion	Analysis Value	Design Value	Analysis/Design
Shear	fv = 153	Fv' = 464	fv/Fv' = 0.33
Bending(+)	fb = 1495	Fb' = 3288	fb/Fb' = 0.45
Live Defl'n	$0.09 = \langle L/999$	0.46 = L/360	0.19
Total Defl'n	0.34 = L/490	0.69 = L/240	0.49

Additional Data:

FACTORS:	F/E(p	si)CD	CM	Ct	CL	CV	Cfu	Cr	Cfrt	Ci	Cn	LC#
Fv'	290	1.60	-	1.00	_	-	-	-	1.00	-	1.00	8
Fb'+	2900	1.60	-	1.00	0.709	1.00	-	1.00	1.00	-	-	8
Fcp'	750	-	-	1.00	-	-	-	_	1.00	-	_	-
E	2.2 m	illion	-	1.00	-	-	-	-	1.00	-	-	3
Eminy'	1.14 m	illion	-	1.00	-	-	-	-	1.00	-		3

CRITICAL LOAD COMBINATIONS:

Shear : LC #8 = D+.7E, V = 3523, V design = 3377 lbs Bending(+): LC #8 = D+.7E, M = 7538 lbs-ft Deflection: LC #5 = D+.75(L+S+.7E) (live)

LC #3 = D+.75(L+S) (total)

D=dead L=live S=snow W=wind I=impact Lr=roof live Lc=concentrated E=earthquake

All LC's are listed in the Analysis output

Load combinations: ASCE 7-10 / IBC 2012

CALCULATIONS:

Deflection: EI = 732e06 lb-in2

"Live" deflection = Deflection from all non-dead loads (live, wind, snow...)

Total Deflection = 1.50(Dead Load Deflection) + Live Load Deflection.

Design Notes:

1. WoodWorks analysis and design are in accordance with the ICC International Building Code (IBC 2012), the National Design Specification (NDS 2012), and NDS Design Supplement.

2. Please verify that the default deflection limits are appropriate for your application.

- 3. SCL-BEAMS (Structural Composite Lumber): the attached SCL selection is for preliminary design only. For final member design contact your local SCL manufacturer.
- 4. Size factors vary from one manufacturer to another for SCL materials. They can be changed in the database editor.
- 5. FIRE RATING: LVL, PSL and LSL are not rated for fire endurance.



PROJECT

Dec. 21, 2021 11:25 UB9

Design Check Calculation Sheet

WoodWorks Sizer 10.2

Loads:

Load	Type	Distribution	Pat-	Location	[ft]	Magnitude	Unit
			tern	Start	End	Start Er	nd
Load1	Dead	Full UDL				105.0	plf
Load2	Live	Full UDL				280.0	plf
Load3	Dead	Point		5.62		1015	lbs
Load4	Live	Point		5.62		770	lbs
Load5	Snow	Point		5.62		535	lbs
Load6	Snow	Point		5.62		2772	lbs
Load7	Dead	Point		5.62		2216	lbs
Load8	Dead	Point		1.62		1063	lbs
Load9	Live	Point		1.62		414	lbs
Load10	Snow	Point		1.62		276	lbs
Load11	Snow	Point		1.62		100	lbs
Load12	Earthquake	Point		1.71		5380	lbs
Self-weight	Dead	Full UDL				8.9	plf

Maximum Reactions (lbs), Bearing Capacities (lbs) and Bearing Lengths (in): $P_F = 2/52 \times 2.5$

		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
Unfactored: Dead Live Snow Earthquake	2049 1564 1096 4205	3098 1723 2587 1175
Factored: Total	6252	6948
Bearing: Capacity Beam Supports Anal/Des Beam	6669 6252 0.94	7411 6948 0.94
Support Load comb Length Min req'd Cb	1.00 #5 2.96 2.96** 1.00	1.00 #5 3.29 3.29**
Cb min Cb support Fcp sup	1.00 1.13 625 ng length governed by the required width of the supp	1.00 1.13 625

#### WoodWorks® Sizer 10.2

Page 2

#### PSL Beam, 2.2, 2900, 3"x11"

Supports: All - Timber-soft Beam, D.Fir-L No.2 Total length: 7'-6.1";

Lateral support: top= at supports, bottom= at supports;

#### Analysis vs. Allowable Stress (psi) and Deflection (in) using NDS 2012:

Criterion	Analysis Value	Design Value	Analysis/Design
Shear	fv = 270	Fv' = 334	fv/Fv' = 0.81
Bending(+)	fb = 2084	Fb' = 3178	fb/Fb' = 0.66
Live Defl'n	0.10 = L/915	0.24 = L/360	0.39
Total Defl'n	0.19 = L/463	0.36 = L/240	0.52

#### **Additional Data:**

FACTORS:	F/E(r	osi)CD	CM	Ct	CL	CV	Cfu	Cr	Cfrt	Ci	Cn	LC#
Fv'	290	1.15	-	1.00	-	_	_	-	1.00	-	1.00	3
Fb'+	2900	1.15	-	1.00	0.953	1.00	_	1.00	1.00	-	-	3
Fcp'	750	-	-	1.00	-	-	-	-	1.00	-	-	-
E'	2.2 n	nillion	-	1.00	-	-	_	-	1.00	-	-	5
Eminy'		million	-	1.00	-	-	-	-	1.00	-	_	5

#### CRITICAL LOAD COMBINATIONS:

Shear : LC #3 = D+.75(L+S), V = 6288, V design = 5947 lbs

Bending(+): LC #3 = D+.75(L+S), M = 10507 lbs-ft

Deflection: LC #5 = D+.75(L+S+.7E) (live) LC #5 = D+.75(L+S+.7E) (total)

D=dead L=live S=snow W=wind I=impact Lr=roof live Lc=concentrated E=earthquake

All LC's are listed in the Analysis output

Load combinations: ASCE 7-10 / IBC 2012

#### CALCULATIONS:

Deflection: EI = 732e06 lb-in2

"Live" deflection = Deflection from all non-dead loads (live, wind, snow...)

Total Deflection = 1.50 (Dead Load Deflection) + Live Load Deflection.

- 1. WoodWorks analysis and design are in accordance with the ICC International Building Code (IBC 2012), the National Design Specification (NDS 2012), and NDS Design Supplement.
- 2. Please verify that the default deflection limits are appropriate for your application.
- 3. SCL-BEAMS (Structural Composite Lumber): the attached SCL selection is for preliminary design only. For final member design contact your local SCL manufacturer.
- 4. Size factors vary from one manufacturer to another for SCL materials. They can be changed in the database editor.
- 5. FIRE RATING: LVL, PSL and LSL are not rated for fire endurance.



**PROJECT** 

Dec. 14, 2021 17:20

RB1

# **Design Check Calculation Sheet**

WoodWorks Sizer 10.2

#### Loads:

Load	Type	Distribution	Pat- tern	Location [ft] Start End	Magnitude Start End	Unit
Load1 Load2	Dead Snow	Triangular Triangular	00211	0.03 21.28 0.03 21.28		plf
Self-weight	Dead	Full UDL			24.4	plf

# Maximum Reactions (lbs), Bearing Capacities (lbs) and Bearing Lengths (in):

21'-4.1"

	0.	21'-3"
Unfactored:    Dead    Snow Factored:	1109 1417	1959 2833
Total Bearing:	2526	4792
Capacity Beam Supports Anal/Des	2819 2526	5350 4792
Beam Support	0.90	0.90
Load comb	#2	1.00
Length Min req'd	0.75 0.75**	1.43
Cb Cb min	1.00	1.00
Cb support Fcp sup	1.08	1.08

^{**}Minimum bearing length governed by the required width of the supporting member.

PSL Beam, 2.2, 2900, 5"x18" actual

Supports: All - Timber-soft Beam, D.Fir-L No.2

Total length: 21'-4.1";

Lateral support: top= at supports, bottom= at supports;

DECET, Dosign by MITZ OCALCS FOR END Deactions only

WARNING: this CUSTOM SIZE is not in the database. Refer to online help.

# Analysis vs. Allowable Stress (psi) and Deflection (in) using NDS 2012:

Criterion	Analysis Value	Design Value	Analysis/Design
Shear	fv = 64	Fv' = 334	fv/Fv' = 0.19
Bending(+)	fb = 883	Fb' = 2943	fb/Fb' = 0.30
Live Defl'n	$0.17 = \langle L/999$	0.71 = L/360	0.24
Total Defl'n	0.36 = L/713	1.06 = L/240	0.34

#### WoodWorks® Sizer 10.2

Page 2

# **Additional Data:**

FACTORS:	F/E	(psi)CD	CM	Ct	CL	CV	Cfu	Cr	Cfrt	Ci	Cn	LC#
Fv'	290	1.15	-	1.00	-	-	_	_	1.00	_	1 00	2
Fb'+	2900	1.15	-	1.00	0.882	1.00	_	1.00	1.00	-	-	2
Fcp'	750	-	-	1.00	_	_	-	-	1.00	-	_	_
E'	2.2	million	-	1.00	_	_	_	-	1.00	_		2
Eminy'	1.14	million	-	1.00	-	-	-	_	1.00	_	-	2

#### CRITICAL LOAD COMBINATIONS:

Shear : LC #2 = D+S, V = 4792, V design = 3827 lbs Bending(+): LC #2 = D+S, M = 19858 lbs-ft

Deflection: LC #2 = D+S (live) LC #2 = D+S (total)

D=dead L=live S=snow W=wind I=impact Lr=roof live Lc=concentrated E=earthquake All LC's are listed in the Analysis output

Load combinations: ASCE 7-10 / IBC 2012

#### CALCULATIONS:

Deflection: EI = 5346e06 lb-in2

"Live" deflection = Deflection from all non-dead loads (live, wind, snow...)

Total Deflection = 1.50(Dead Load Deflection) + Live Load Deflection.

- 1. WoodWorks analysis and design are in accordance with the ICC International Building Code (IBC 2012), the National Design Specification (NDS 2012), and NDS Design Supplement.
- 2. Please verify that the default deflection limits are appropriate for your application.
- 3. SCL-BEAMS (Structural Composite Lumber): the attached SCL selection is for preliminary design only. For final member design contact your local SCL manufacturer.
- 4. Size factors vary from one manufacturer to another for SCL materials. They can be changed in the database editor.
- 5. FIRE RATING: LVL, PSL and LSL are not rated for fire endurance.



**PROJECT** 

Dec. 14, 2021 17:51

RB2

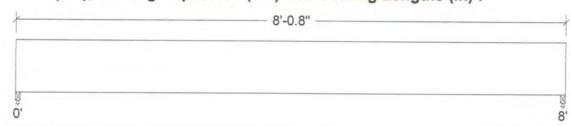
# **Design Check Calculation Sheet**

WoodWorks Sizer 10.2

#### Loads:

Load	Type	Distribution	Pat-	Location	[ft]	Magnitude	Unit
			tern	Start	End	Start End	
Load1	Dead	Full UDL				165.0	plf
Load2	Snow	Full UDL				275.0	plf
Self-weight	Dead	Full UDL				7.7	plf

# Maximum Reactions (lbs), Bearing Capacities (lbs) and Bearing Lengths (in):



Unfactored: Dead Snow	696 1109	696 1109
Factored: -	1806	1806
Bearing: Capacity Beam Supports Anal/Des	1806 1999	1806 1999
Beam Support Load comb	1.00 0.90 #2	1.00 0.90 #2
Length Min req'd	0.83	0.83 0.83
Cb Cb min	1.00	1.00
Cb support Fcp sup	1.11 625	1.11 625

### Lumber-soft, D.Fir-L, No.1, 4x10 (3-1/2"x9-1/4")

Supports: All - Timber-soft Beam, D.Fir-L No.2 Total length: 8'-0.8":

Lateral support: top= at supports, bottom= at supports;

### Analysis vs. Allowable Stress (psi) and Deflection (in) using NDS 2012:

Criterion	Analysis Value	Design Value	Analysis/Design
Shear	fv = 66	Fv' = 207	fv/Fv' = 0.32
Bending(+)	fb = 861	Fb' = 1357	fb/Fb' = 0.63
Live Defl'n	$0.06 = \langle L/999$	0.27 = L/360	0.24
Total Defl'n	0.13 = L/765	0.40 = L/240	0.31

RB₂

#### WoodWorks® Sizer 10.2

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```
Additional Data:
FACTORS: F/E(psi)CD
                       CM
                            Ct
                                  CL
                                        CF
                                               Cfu
                                                      Cr
                                                         Cfrt
                                                                 Ci
                                                                      Cn
                                                                            LC#
Fv'
          180 1.15 1.00 1.00
                                                           1.00 1.00 1.00
                                                                            2
 Fb'+
                 1.15 1.00 1.00 0.983 1.200 1.00
         1000
                                                     1.00
                                                          1.00 1.00 -
                                                                             2
                      1.00 1.00
Fcp'
         625
                                                -
                                                      _
                                                           1.00 1.00
                                                                             _
E
         1.7 million 1.00 1.00
                                                           1.00 1.00 -
                                                                             2
Emin'
        0.62 million 1.00 1.00
                                                           1.00 1.00
                                                                             2
CRITICAL LOAD COMBINATIONS:
       : LC #2 = D+S, V = 1791, V design = 1430 lbs
 Shear
Bending(+): LC #2 = D+S, M = 3582 lbs-ft
Deflection: LC #2 = D+S (live)
LC #2 = D+S (total)
D=dead L=live S=snow W=wind I=impact Lr=roof live Lc=concentrated E=earthquake
All LC's are listed in the Analysis output
Load combinations: ASCE 7-10 / IBC 2012
CALCULATIONS:
Deflection: EI =
                    392e06 lb-in2
"Live" deflection = Deflection from all non-dead loads (live, wind, snow...)
Total Deflection = 1.50(Dead Load Deflection) + Live Load Deflection.
```

- 1. WoodWorks analysis and design are in accordance with the ICC International Building Code (IBC 2012), the National Design Specification (NDS 2012), and NDS Design Supplement.
- 2. Please verify that the default deflection limits are appropriate for your application.
- 3. Sawn lumber bending members shall be laterally supported according to the provisions of NDS Clause 4.4.1.



**PROJECT** 

Dec. 14, 2021 19:00

RB3

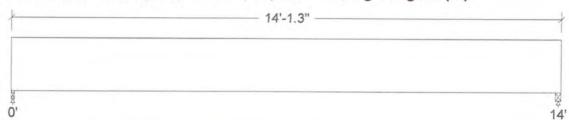
# **Design Check Calculation Sheet**

WoodWorks Sizer 10.2

#### Loads:

Load	Type	Distribution	Pat- tern	Location [ft] Start End	Magnitude Start End	Unit
Load1	Dead	Partial UDL		7.04 14.04	180.0 180.0	plf
Load2	Snow	Partial UDL		7.04 14.04	300.0 300.0	plf
Load3	Dead	Point		7.00	1000	lbs
Load4	Snow	Point		7.00	1150	lbs
Self-weight	Dead	Full UDL			13.0	plf

# Maximum Reactions (lbs), Bearing Capacities (lbs) and Bearing Lengths (in):



Unfactored: Dead Snow	909	1533 2147
Factored: Total	2012	3680
Bearing: Capacity Beam Supports Anal/Des	2146 2012	3925 3680
Beam Support	0.94	0.94
Load comb	#2	#2
Length Min req'd	0.95 0.95**	1.74
Cb min	1.00	1.00
Cb support	1.13	1.00
Fcp sup	625	625

^{**}Minimum bearing length governed by the required width of the supporting member.

PSL Beam, 2.2, 2900, 3"x16" actual

DSE GT, Design by Mfr.

Supports: All - Timber-soft Beam, D.Fir-L No.2 Total length: 14'-1.3";

Ocales for end

Lateral support: top= at supports, bottom= at supports;

reactions only

WARNING: this CUSTOM SIZE is not in the database. Refer to online help.

RB3

#### WoodWorks® Sizer 10.2

Page 2

# Analysis vs. Allowable Stress (psi) and Deflection (in) using NDS 2012:

Criterion	Analysis Value	Design Value	Analysis/Design
Shear	fv = 94	Fv' = 334	fv/Fv' = 0.28
Bending(+)	fb = 1283	Fb' = 2185	fb/Fb' = 0.59
Live Defl'n	$0.11 = \langle L/999$	0.47 = L/360	0.23
Total Defl'n	0.23 = L/720	0.70 = L/240	0.33

#### Additional Data:

F/E (p	si)CD	CM	Ct	CL	CV	Cfu	Cr	Cfrt	Ci	Cn	LC#
290	1.15	-	1.00	-	-	-	_		_		2
900	1.15	-	1.00	0.655	1.00	-	1.00		_	_	2
750	_	-	1.00	-	-	-	_	1.00	-	-	_
2.2 m	illion	-	1.00	-	-		-	1.00	-	-	2
.14 m	nillion	-	1.00	-	-	-	-	1.00	_	-	2
	290 750 2.2 n	900 1.15 750 - 2.2 million .14 million	290 1.15 - 200 1.15 - 750 2.2 million -	290 1.15 - 1.00 200 1.15 - 1.00 750 1.00 2.2 million - 1.00 14 million - 1.00	290 1.15 - 1.00 - 290 1.15 - 1.00 0.655 750 - 1.00 - 2.2 million - 1.00 - 14 million - 1.00 -	290 1.15 - 1.00 200 1.15 - 1.00 0.655 1.00 750 1.00 2.2 million - 1.00 14 million - 1.00	290 1.15 - 1.00	290 1.15 - 1.00	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	290 1.15 - 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00	290 1.15 - 1.00 1.00 - 1.00 300 1.15 - 1.00 0.655 1.00 - 1.00 1.00

CRITICAL LOAD COMBINATIONS:

Shear : LC #2 = D+S, V = 3680, V design = 3021 lbs Bending(+): LC #2 = D+S, M = 13689 lbs-ft

Deflection: LC #2 = D+S (live) LC #2 = D+S (total)

D=dead L=live S=snow W=wind I=impact Lr=roof live Lc=concentrated E=earthquake

All LC's are listed in the Analysis output Load combinations: ASCE 7-10 / IBC 2012

#### CALCULATIONS:

Deflection: EI = 2253e06 lb-in2

"Live" deflection = Deflection from all non-dead loads (live, wind, snow...)

Total Deflection = 1.50(Dead Load Deflection) + Live Load Deflection.

- 1. WoodWorks analysis and design are in accordance with the ICC International Building Code (IBC 2012), the National Design Specification (NDS 2012), and NDS Design Supplement.
- 2. Please verify that the default deflection limits are appropriate for your application.
- 3. SCL-BEAMS (Structural Composite Lumber): the attached SCL selection is for preliminary design only. For final member design contact your local SCL manufacturer.
- 4. Size factors vary from one manufacturer to another for SCL materials. They can be changed in the database editor.
- 5. FIRE RATING: LVL, PSL and LSL are not rated for fire endurance.



**PROJECT** 

Dec. 14, 2021 17:58

RB4

### **Design Check Calculation Sheet**

WoodWorks Sizer 10.2

#### Loads:

Load	Type	Distribution	Pat-	Locatio	n [ft]	Magni	tude	Unit
			tern	Start	End	Start	End	
Load1	Dead	Partial UDL		0.06	7.56	105.0	105.0	plf
Load2	Snow	Partial UDL		0.06	7.56	175.0	175.0	plf
Load3	Dead	Point		7.56		1530	_,,,,	lbs
Load4	Snow	Point		7.56		2150		lbs
Self-weight	Dead	Full UDL		11137		24.4		plf

# Maximum Reactions (lbs), Bearing Capacities (lbs) and Bearing Lengths (in):

30'-7"

	•	30-0
Unfactored: Dead Snow	2216 2772	845 690
Factored: Total Bearing:	4989	1535
Capacity Beam Supports Anal/Des	5569 4989	1875 1680
Beam Support Load comb	0.90 1.00 #2	0.82 0.91 #2
Length Min req'd	1.49	0.50*
Cb min Cb support	1.00 1.00 1.08	1.00 1.00 1.08
Fcp sup	625	625

*Minimum bearing length setting used: 1/2" for end supports

PSL Beam, 2.2, 2900, 5"x18" actual

Supports: All - Timber-soft Beam, D.Fir-L No.2 Total length: 30'-7.0";

Lateral support: top= at supports, bottom= at supports;

DSE GT, Design by mf. .
Calcs for end
reactions only

WARNING: this CUSTOM SIZE is not in the database. Refer to online help.

^{**}Minimum bearing length governed by the required width of the supporting member.

RB4

#### WoodWorks® Sizer 10.2

Page 2

# Analysis vs. Allowable Stress (psi) and Deflection (in) using NDS 2012:

Criterion	Analysis Value	Design Value	Analysis/Design
Shear	fv = 75	Fv' = 334	fv/Fv' = 0.23
Bending(+)	fb = 1282	Fb' = 2470	fb/Fb' = 0.52
Live Defl'n	0.37 = L/981	1.02 = L/360	0.37
Total Defl'n	0.89 = L/412	1.52 = L/240	0.58

#### Additional Data:

FACTORS:	F/E(F	osi)CD	CM	Ct	CL	CV	Cfu	Cr	Cfrt	Ci	Cn	LC#
Fv'	290	1.15	-	1.00	-	-	_	-	1.00	-	1.00	2
Fb'+	2900	1.15	-	1.00	0.741	1.00	-	1.00	1.00	-	_	2
Fcp'	750	-	-	1.00	-	-	-	_	1.00	-	_	-
E '	2.2 m	nillion	-	1.00	-	-	-	-	1.00	-	-	2
Eminy'		nillion	-	1.00	-	-	_	-	1.00	-	-	2

#### CRITICAL LOAD COMBINATIONS:

Shear : LC #2 = D+S, V = 4989, V design = 4524 lbs Bending(+): LC #2 = D+S, M = 28854 lbs-ft

Deflection: LC #2 = D+S (live) LC #2 = D+S (total)

D=dead L=live S=snow W=wind I=impact Lr=roof live Lc=concentrated E=earthquake

All LC's are listed in the Analysis output Load combinations: ASCE 7-10 / IBC 2012

#### CALCULATIONS:

Deflection: EI = 5346e06 lb-in2

"Live" deflection = Deflection from all non-dead loads (live, wind, snow...)

Total Deflection = 1.50(Dead Load Deflection) + Live Load Deflection.

- 1. WoodWorks analysis and design are in accordance with the ICC International Building Code (IBC 2012), the National Design Specification (NDS 2012), and NDS Design Supplement.
- 2. Please verify that the default deflection limits are appropriate for your application.
- 3. SCL-BEAMS (Structural Composite Lumber): the attached SCL selection is for preliminary design only. For final member design contact your local SCL manufacturer.
- 4. Size factors vary from one manufacturer to another for SCL materials. They can be changed in the database editor.
- 5. FIRE RATING: LVL, PSL and LSL are not rated for fire endurance.



**PROJECT** 

Dec. 14, 2021 18:02

RB5

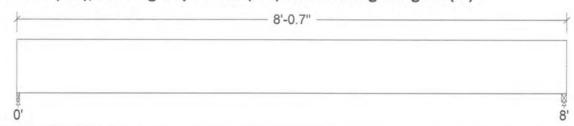
# **Design Check Calculation Sheet**

WoodWorks Sizer 10.2

#### Loads:

Load	Type	Distribution	Pat-	Locatio	n [ft]	Magni	tude	Unit
			tern	Start	End	Start	End	
Loadl	Dead	Triangular		0.02	4.52	0.0	90.0	plf
Load2	Snow	Triangular		0.02	4.52	0.0	150.0	plf
Load3	Dead	Point		4.52		1000		lbs
Load4	Snow	Point		4.52		1150		lbs
Load5	Dead	Partial UDL		4.52	8.02	195.0	195.0	plf
Load6	Snow	Partial UDL		4.52	8.02	325.0	325.0	plf
Self-weight	Dead	Full UDL				12.1		plf

# Maximum Reactions (lbs), Bearing Capacities (lbs) and Bearing Lengths (in):



Unfactored: Dead Snow Factored:	762 963	1220 1662
Total	1725	2882
Bearing: Capacity Beam Supports Anal/Des	1725 1842	2882 3079
Beam Support Load comb	1.00 0.94 #2	1.00 0.94 #2
Length Min req'd	0.50	0.84
Cb Cb min Cb support	1.00 1.00 1.07	1.00 1.00 1.07
Fcp sup	625	625

### Timber-soft, D.Fir-L, No. 1, 6x10 (5-1/2"x9-1/4")

Supports: All - Timber-soft Beam, D.Fir-L No.2 Total length: 8'-0.7";

Lateral support: top= at supports, bottom= at supports;

# Analysis vs. Allowable Stress (psi) and Deflection (in) using NDS 2012:

Criterion	Analysis Value	Design Value	Analysis/Design
Shear	fv = 73	Fv' = 195	fv/Fv' = 0.37
Bending(+)	fb = 1044	Fb' = 1552	fb/Fb' = 0.67
Live Defl'n	$0.07 = \langle L/999 \rangle$	0.27 = L/360	0.25
Total Defl'n	0.14 = L/677	0.40 = L/240	0.35

RB5

#### WoodWorks® Sizer 10.2

Page 2

```
Additional Data:
```

```
FACTORS: F/E(psi)CD
               CM
                    Ct CL
                              CF
                                  Cfu
                                          Cfrt
                                       Cr
                                               Ci
                                                       LC#
Fv'
       170 1.15 1.00 1.00
                                          1.00 1.00 1.00
                                                       2
Fb'+
            1350
                                                       2
Fcp'
       625
                1.00 1.00
                                          1.00 1.00
                                                       _
E.
       1.6 million 1.00 1.00
                                          1.00 1.00
```

#### CRITICAL LOAD COMBINATIONS:

```
Shear : LC \#2 = D+S, V = 2882, V design = 2474 lbs Bending(+): LC \#2 = D+S, M = 6826 lbs-ft
```

Deflection: LC #2 = D+S (live) LC #2 = D+S (total)

D=dead L=live S=snow W=wind I=impact Lr=roof live Lc=concentrated E=earthquake All LC's are listed in the Analysis output Load combinations: ASCE 7-10 / IBC 2012

#### CALCULATIONS:

```
Deflection: EI = 580e06 lb-in2 "Live" deflection = Deflection from all non-dead loads (live, wind, snow...) Total Deflection = 1.50(Dead Load Deflection) + Live Load Deflection.
```

- 1. WoodWorks analysis and design are in accordance with the ICC International Building Code (IBC 2012), the National Design Specification (NDS 2012), and NDS Design Supplement.
- 2. Please verify that the default deflection limits are appropriate for your application.
- 3. Sawn lumber bending members shall be laterally supported according to the provisions of NDS Clause 4.4.1.



**PROJECT** 

Dec. 14, 2021 18:43

RB6

### **Design Check Calculation Sheet**

WoodWorks Sizer 10.2

#### Loads:

Load	Type	Distribution	Pat- tern	Locatio	n [ft] End	Magni Start	tude End	Unit
Load1	Dead	Point		7.55		1300		lbs
Load2	Wind	Point		7.55		1950		lbs
Load3	Dead	Partial UDL		0.05	7.55	75.0	75.0	plf
Load4	Snow	Partial UDL		0.05	7.55	125.0	125.0	plf
Self-weight	Dead	Full UDL				14.6	120.0	plf

# Maximum Reactions (lbs), Bearing Capacities (lbs) and Bearing Lengths (in):

22'-6.9" —	
	22

Unfactored: Dead Snow Wind	1500 781 1300	692 156 650
Factored: Total Bearing:	2671	1101
Capacity Beam Supports Anal/Des	2849 2671	1175 1101
Beam Support Load comb	0.94 1.00 #3	0.94
Length	1.27	#3 0.52 0.52**
Cb Cb min	1.00	1.00
Cb support Fcp sup	1.13	1.13

^{**}Minimum bearing length governed by the required width of the supporting member.

- PSL Beam, 2.2, 2900, 3"x18" actual DSE GT. Design by mfr.
Supports: All - Timber-soft Beam, D. Fir-L No.2 (Calcs for end
Total length: 22'-6.9";
Lateral support: ton- at supports: bottom- at supports:

Lateral support: top= at supports, bottom= at supports;

WARNING: this CUSTOM SIZE is not in the database. Refer to online help.

### WoodWorks® Sizer 10.2

Page 2

# Analysis vs. Allowable Stress (psi) and Deflection (in) using NDS 2012:

Criterion	Analysis Value	Design Value	Analysis/Design
Shear Bending(+)	fv = 54 fb = 1102	Fv' = 334 Fb' = 1350	fv/Fv' = 0.16 fb/Fb' = 0.82
Live Defl'n	$0.14 = \langle L/999$	0.75 = L/360	0.18
Total Defl'n	0.44 = L/609	1.13 = L/240	0.39

### Additional Data:

FACTORS:	F/E(p	si)CD	CM	Ct	CL	CV	Cfu	Cr	Cfrt	Ci	Cn	LC#
Fv'	290	1.15	-	1.00	_	-	_	_	1.00	-	1.00	2
Fb'+	2900	1.60	-	1.00	0.291	1.00	-	1.00	1.00	_	_	3
Fcp'	750	-	-	1.00	-	-	-	-	1.00	-	-	_
E'	2.2 m	illion	-	1.00	-		-	_	1.00	-	_	3
Eminy'	1.14 m	illion	-	1.00	-		-	-	1.00	_	-	3
00171011												-

### CRITICAL LOAD COMBINATIONS:

: LC #2 = D+S, V = 2281, V design = 1959 lbs

D=dead L=live S=snow W=wind I=impact Lr=roof live Lc=concentrated E=earthquake

All LC's are listed in the Analysis output Load combinations: ASCE 7-10 / IBC 2012

### CALCULATIONS:

Deflection: EI = 3208e06 lb-in2

"Live" deflection = Deflection from all non-dead loads (live, wind, snow...)

Total Deflection = 1.50(Dead Load Deflection) + Live Load Deflection.

- 1. WoodWorks analysis and design are in accordance with the ICC International Building Code (IBC 2012), the National Design Specification (NDS 2012), and NDS Design Supplement.
- 2. Please verify that the default deflection limits are appropriate for your application.
- 3. SCL-BEAMS (Structural Composite Lumber): the attached SCL selection is for preliminary design only. For final member design contact your local SCL manufacturer.
- 4. Size factors vary from one manufacturer to another for SCL materials. They can be changed in the database editor.
- 5. FIRE RATING: LVL, PSL and LSL are not rated for fire endurance.



**PROJECT** 

Dec. 16, 2021 10:31

RB7

# **Design Check Calculation Sheet**

WoodWorks Sizer 10.2

### Loads:

Load	Type	Distribution	Pat- tern	Locatio Start	n [ft] End	Magni Start		Unit
Load1	Dead	Partial UDL	CCIII	0.08	3.08	180.0	180.0	plf
Load2	Snow	Partial UDL		0.08	3.08	300.0	300.0	plf
Load3	Dead	Point		3.08		2900	300.0	lbs
Load4	Snow	Point		3.08		780		lbs
Self-weight	Dead	Full UDL				14.6		plf

# Maximum Reactions (lbs), Bearing Capacities (lbs) and Bearing Lengths (in):

12'-7.3" —	

Unfactored: Dead Snow Factored:	2771 1385	852 295
Total	4155	1147
Bearing: Capacity	1,,,,	
Beam	4433	1224
Supports	4155	1147
Anal/Des		
Beam	0.94	0.94
Support	1.00	1.00
Load comb	#2	#2
Length	1.97	0.54
Min reg'd	1.97**	0.54**
Cb	1.00	1.00
Cb min	1.00	1.00
Cb support	1.13	1.13
Fcp sup	625	625

^{**}Minimum bearing length governed by the required width of the supporting member.

Supports: All - Timber-soft Beam, D. Fir-L No.2 @ caks for end Total length: 12'-7.3";

Lateral support: top= at supports, bottom= at supports;

WARNING: this CUSTOM SIZE is not in the database. Refer to online help.

### WoodWorks® Sizer 10.2

### Page 2

# Analysis vs. Allowable Stress (psi) and Deflection (in) using NDS 2012:

Criterion	Analysis Value	Design Value	Analysis/Design
Shear	fv = 95	Fv' = 334	fv/Fv' = 0.28
Bending(+)	fb = 759	Fb' = 2111	fb/Fb' = 0.36
Live Defl'n	$0.02 = \langle L/999 \rangle$	0.42 = L/360	0.04
Total Defl'n	$0.09 = \langle L/999$	0.63 = L/240	0.15

### Additional Data:

FACTORS:	F/E(	psi)CD	CM	Ct	CL	CV	Cfu	Cr	Cfrt	Ci	Cn	LC#
Fv'	290	1.15	-	1.00	_	-	-	_	1.00	_	1.00	2
Fb'+	2900	1.15	-	1.00	0.633	1.00	-	1.00	1.00	-	-	2
Fcp'	750	-	-	1.00	-	-	-	-	1.00	-	-	-
E'	2.2	million	-	1.00	-	-	-	-	1.00	-	-	2
Eminy'	1.14	million	-	1.00	-	-	-	_	1.00	-	-	2

### CRITICAL LOAD COMBINATIONS:

Shear : LC #2 = D+S, V = 4155, V design = 3421 lbs

Bending(+): LC #2 = D+S, M = 10240 lbs-ft

Deflection: LC #2 = D+S (live) LC #2 = D+S (total)

D=dead L=live S=snow W=wind I=impact Lr=roof live Lc=concentrated E=earthquake

All LC's are listed in the Analysis output Load combinations: ASCE 7-10 / IBC 2012

### CALCULATIONS:

Deflection: EI = 3208e06 lb-in2

"Live" deflection = Deflection from all non-dead loads (live, wind, snow...)

Total Deflection = 1.50(Dead Load Deflection) + Live Load Deflection.

- 1. WoodWorks analysis and design are in accordance with the ICC International Building Code (IBC 2012), the National Design Specification (NDS 2012), and NDS Design Supplement.
- 2. Please verify that the default deflection limits are appropriate for your application.
- 3. SCL-BEAMS (Structural Composite Lumber): the attached SCL selection is for preliminary design only. For final member design contact your local SCL manufacturer.
- 4. Size factors vary from one manufacturer to another for SCL materials. They can be changed in the database editor.
- 5. FIRE RATING: LVL, PSL and LSL are not rated for fire endurance.



**PROJECT** 

Dec. 16, 2021 10:38

RB8

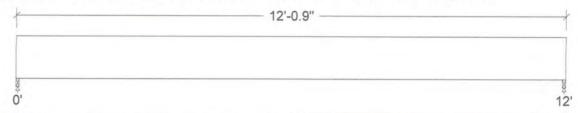
# **Design Check Calculation Sheet**

WoodWorks Sizer 10.2

### Loads:

Load	Type	Distribution	Pat-	Location	[ft]	Magnitude	Uni
			tern	Start	End	Start E	nd
Load1	Dead	Full UDL				180.0	plf
Load2	Snow	Full UDL				300.0	plf
Self-weight	Dead	Full UDL				14.7	plf

# Maximum Reactions (lbs), Bearing Capacities (lbs) and Bearing Lengths (in):



Unfactored: Dead Snow	1175 1811	1175 1811
Factored: - Total	2986	2986
Bearing: Capacity Beam Supports Anal/Des Beam Support Load comb Length Min req'd Cb Cb min Ch support	2986 3189 1.00 0.94 #2 0.87 0.87 1.00 1.00	2986 3189 1.00 0.94 #2 0.87 0.87 1.00 1.00
Cb support Fcp sup	625	625

### Timber-soft, D.Fir-L, No. 1, 6x12 (5-1/2"x11-1/4")

Supports: All - Timber-soft Beam, D.Fir-L No.2 Total length: 12'-0.9";

Lateral support: top= at supports, bottom= at supports;

## Analysis vs. Allowable Stress (psi) and Deflection (in) using NDS 2012:

Criterion	Analysis Value	Design Value	Analysis/Design
Shear	fv = 60	Fv' = 195	fv/Fv' = 0.31
Bending(+)	fb = 921	Fb' = 1531	fb/Fb' = 0.60
Live Defl'n	$0.13 = \langle L/999$	0.40 = L/360	0.34
Total Defl'n	0.26 = L/544	0.60 = L/240	0.44

### WoodWorks® Sizer 10.2

Page 2

### **Additional Data:**

```
FACTORS: F/E(psi)CD
                  CM
                       Ct
                           CL
                                  CF
                                      Cfu
                                           Cr
                                              Cfrt Ci
                                                         Cn
                                                              LC#
Fv'
        170 1.15 1.00 1.00 -
                                                1.00 1.00 1.00
                                                             2
            1.15 1.00 1.00 0.986 1.000 1.00 1.00 1.00 -
Fb'+
       1350
                                                               2
Fcp'
       625
                  1.00 1.00
                                                1.00 1.00
             _
                            _
                                 -
                                       -
                                            -
       1.6 million 1.00 1.00
E.
                                                1.00 1.00
       0.58 million 1.00 1.00
                                                1.00 1.00 -
Emin'
                                                               2
```

### CRITICAL LOAD COMBINATIONS:

```
Shear : LC \#2 = D+S, V = 2968, V design = 2486 lbs Bending(+): LC \#2 = D+S, M = 8905 lbs-ft
```

Deflection: LC #2 = D+S (live) LC #2 = D+S (total)

D=dead L=live S=snow W=wind I=impact Lr=roof live Lc=concentrated E=earthquake All LC's are listed in the Analysis output

Load combinations: ASCE 7-10 / IBC 2012

### CALCULATIONS:

Deflection: EI = 1044e06 lb-in2

"Live" deflection = Deflection from all non-dead loads (live, wind, snow...)

Total Deflection = 1.50(Dead Load Deflection) + Live Load Deflection.

- 1. WoodWorks analysis and design are in accordance with the ICC International Building Code (IBC 2012), the National Design Specification (NDS 2012), and NDS Design Supplement.
- 2. Please verify that the default deflection limits are appropriate for your application.
- 3. Sawn lumber bending members shall be laterally supported according to the provisions of NDS Clause 4.4.1.



**PROJECT** 

Dec. 16, 2021 11:23

RB9

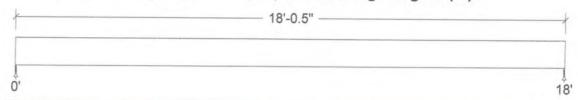
# **Design Check Calculation Sheet**

WoodWorks Sizer 10.2

### Loads:

Load	Type	Distribution	Pat- tern	Location Start	[ft] End	Magnitude Start End	Unit
Load1 Load2	Dead Snow	Point Point	00211	9.02	Direc	1175 1811	lbs lbs
Self-weight	Dead	Full UDL				14.9	plf

# Maximum Reactions (lbs), Bearing Capacities (lbs) and Bearing Lengths (in):



Unfactored: Dead Snow Factored:	722 906	722 906
Total Bearing:	1627	1627
Capacity Beam Supports Anal/Des	1875 1680	1875 1680
Beam Support Load comb	0.87 0.97 #2	0.87 0.97 #2
Length Min req'd	0.50* 0.50*	0.50* 0.50*
Cb Cb min	1.00	1.00
Cb support Fcp sup	1.08 625	1.08

*Minimum bearing length setting used: 1/2" for end supports

### PSL Beam, 2.2, 2900, 5"x11"

Supports: All - Timber-soft Beam, D.Fir-L No.2 Total length: 18'-0.5"; Lateral support: top= at supports, bottom= at supports;

# Analysis vs. Allowable Stress (psi) and Deflection (in) using NDS 2012:

Criterion	Analysis Value	Design Value	Analysis/Design
Shear	fv = 44	Fv' = 334	fv/Fv' = 0.13
Bending(+)	fb = 1671	Fb' = 3222	fb/Fb' = 0.52
Live Defl'n	0.31 = L/693	0.60 = L/360	0.52
Total Defl'n	0.66 = L/328	0.90 = L/240	0.73

### WoodWorks® Sizer 10.2

Page 2

Additiona	al Data:											
FACTORS:	F/E(psi)C	D CM	Ct	CL	CV	Cfu	Cr	Cfrt	Ci	Cn	T.C#	
Fv'	290 1.	15 -	1.00	-	-	-	-	1.00		1.00		
Fb'+	2900 1.	15 -		0.966						-		
Fcp'	750 -	-	1.00	-	_	_	_	1 00	_	_	_	
E'	2.2 milli	on -	1.00	-	_	-	-	1.00	-	-	2	
Eminy'	1.14 milli	on -	1.00	_	_	-	-	1.00	_	2	2	
CRITICAL L	OAD COMBINA	ATIONS:									Con	
Shear	: LC #2	- D+S, V	= 16	13, V de	esian -	161	13 lbs					
Bending (	+): LC #2 :	= D+S, M	= 140	40 lbs-	ft							
	on: LC #2											
		= D+S (										
D=dead L	=live S=snor			ct Lr=re	oof liv	e Tic=c	concent	rated i	Empari	thanake		
All LC's	are listed	in the	Analysi	s output	-	0 20 0	001100110	Lucca .	L Cul	criquano		
	binations:											
CALCULATI			0 / 150	2012								
	on: EI =	1220006	lh-in2									
	eflection =				on-dood	loade	171110			. 1		
	flection = 1									W)		
TOTAL DE	IICCCIOII	r.Ju (Dear	u Loau	Derrect'	LOII) T	TTAG I	Load De	TTection	311.			

- 1. WoodWorks analysis and design are in accordance with the ICC International Building Code (IBC 2012), the National Design Specification (NDS 2012), and NDS Design Supplement.
- 2. Please verify that the default deflection limits are appropriate for your application.
- 3. SCL-BEAMS (Structural Composite Lumber): the attached SCL selection is for preliminary design only. For final member design contact your local SCL manufacturer.
- 4. Size factors vary from one manufacturer to another for SCL materials. They can be changed in the database editor.
- 5. FIRE RATING: LVL, PSL and LSL are not rated for fire endurance.



**PROJECT** 

Dec. 16, 2021 10:49

**RB10** 

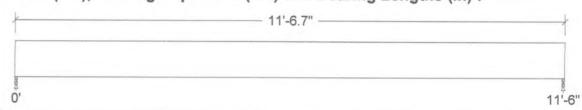
# **Design Check Calculation Sheet**

WoodWorks Sizer 10.2

### Loads:

Load	Type Distribution P.		Pat-	Location	[ft]	Magnitude	Unit
			tern	Start	End	Start End	
Load1	Dead	Full UDL				90.0	plf
Load2	Snow	Full UDL				150.0	plf
Self-weight	Dead	Full UDL				7.7	plf

# Maximum Reactions (lbs), Bearing Capacities (lbs) and Bearing Lengths (in):



Unfactored: Dead Snow Factored:	564 867	564 867
Total Bearing:	1431	1431
Capacity Beam Supports Anal/Des	1431 1584	1431 1584
Beam Support	1.00	1.00
Load comb	#2	#2
Length Min req'd	0.65 0.65	0.65
Cb Cb min	1.00	1.00
Cb support	1.11	1.00
Fcp sup	625	625

### Lumber-soft, D.Fir-L, No.1, 4x10 (3-1/2"x9-1/4")

Supports: All - Timber-soft Beam, D.Fir-L No.2

Total length: 11'-6.7";

Lateral support: top= at supports, bottom= at supports;

# Analysis vs. Allowable Stress (psi) and Deflection (in) using NDS 2012:

Criterion	Analysis Value	Design Value	Analysis/Design
Shear	fv = 57	Fv' = 207	fv/Fv' = 0.27
Bending(+)	fb = 984	Fb' = 1344	fb/Fb' = 0.73
Live Defl'n	0.15 = L/917	0.38 = L/360	0.39
Total Defl'n	0.30 = L/464	0.57 = L/240	0.52

### WoodWorks® Sizer 10.2

Page 2

```
Additional Data:
                                             CF
FACTORS:
          F/E(psi)CD
                         CM
                                Ct
                                       CL
                                                      Cfu
                                                             Cr Cfrt
                                                                        Ci
                                                                                Cn
                                                                                      LC#
Fv'
           180 1.15 1.00 1.00
                                                                   1.00 1.00 1.00
                                                                                       2
                  1.15 1.00 1.00 0.974 1.200 1.00 1.00 1.00 1.00
 Fb'+
          1000
                                                                                       2
         625 - 1.00 1.00
1.7 million 1.00 1.00
0.62 million 1.00 1.00
 Fcp'
                                                                  1.00 1.00
                                                      _
E'
                                                                  1.00 1.00
                                                                                       2
 Emin'
                                                                  1.00 1.00
                                                                                       2
CRITICAL LOAD COMBINATIONS:
Shear : LC \#2 = D+S, V = 1424, V design = 1227 lbs Bending(+): LC \#2 = D+S, M = 4095 lbs-ft
Deflection: LC #2 = D+S (live)
LC #2 = D+S (total)
D=dead L=live S=snow W=wind I=impact Lr=roof live Lc=concentrated E=earthquake
All LC's are listed in the Analysis output
Load combinations: ASCE 7-10 / IBC 2012
CALCULATIONS:
Deflection: EI =
                       392e06 lb-in2
 "Live" deflection = Deflection from all non-dead loads (live, wind, snow...)
Total Deflection = 1.50(Dead Load Deflection) + Live Load Deflection.
```

- 1. WoodWorks analysis and design are in accordance with the ICC International Building Code (IBC 2012), the National Design Specification (NDS 2012), and NDS Design Supplement.
- 2. Please verify that the default deflection limits are appropriate for your application.
- 3. Sawn lumber bending members shall be laterally supported according to the provisions of NDS Clause 4.4.1.

12.00 in

Title Dsgnr: Description....

Page: 1 Date: 24 JAN 2022

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# **Restrained Retaining Wall**

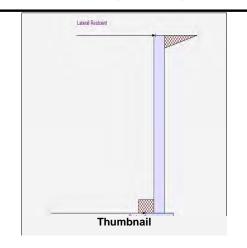
Code: IBC 2018, ACI 318-14, TMS 402-16

### Criteria Retained Height 9.00 ft Wall height above soil 0.00 ft = Total Wall Height 9.00 ft = Top Support Height 9.00 ft Slope Behind Wall = 0.00 Height of Soil over Toe 8.00 in

Soil Data		
Allow Soil Bearing	_ = .	2,000.0 psf
Equivalent Fluid Pressur Active Heel Pressure	e Metho	od 45.0 psf/ft
Active Fleet Fleesate	=	40.0 p3i/it
Passive Pressure	=	350.0 psf/ft
Soil Density	=	110.00 pcf
Footing  Soil Friction	=	0.525

Soil height to ignore

for passive pressure



### **Surcharge Loads**

Surcharge Over Heel 0.0 psf >>>Used To Resist Sliding & Overturning Surcharge Over Toe 0.0 psf Used for Sliding & Overturning

### **Axial Load Applied to Stem**

**Axial Dead Load** 0.0 lbs Axial Live Load 0.0 lbs Axial Load Eccentricity = 0.0 in

**Earth Pressure Seismic Load** 

### **Uniform Lateral Load Applied to Stem**

Lateral Load 0.0 #/ft ...Height to Top 0.00 ft = ...Height to Bottom 0.00 ft Load Type Wind (W) (Strength Level)

Wind on Exposed Stem = 0.0 psf

### **Adjacent Footing Load**

Adjacent Footing Load 0.0 lbs Footing Width 0.00 ft **Eccentricity** 0.00 in = Wall to Ftg CL Dist 0.00 ft Footing Type Line Load Base Above/Below Soil 0.0 ft at Back of Wall Poisson's Ratio 0.300

Soil Density Multiplier = 0.200 g Added seismic per unit area 138.6 psf

### **Design Summary**

Total Bearing Load	=	1,856 lbs
resultant ecc.	=	2.65 in
Soil Pressure @ Toe	=	314 psf OK
Soil Pressure @ Heel	=	1,542 psf OK
Allowable	=	2,000 psf
Soil Pressure Less	Thar	
ACI Factored @ Toe	=	377 psf
ACI Factored @ Heel	=	1,850 psf
Footing Shear @ Toe	=	0.3 psi OK
•	_	•
Footing Shear @ Heel	=	2.0 psi OK
Allowable	=	75.0 psi
Reaction at Top	=	1,225.2 lbs
Reaction at Bottom	=	2,191.8 lbs
		_,
Cliding Color		
Sliding Calcs Lateral Sliding Force	_	2,191.8 lbs
Lateral Charly 1 0106	_	2,101.0103

Vertical component of active lateral soil pressure IS NOT considered in the calculation of soil bearing

Load Factors —	
Building Code	IBC 2018,ACI
Dead Load	1.200
Live Load	1.600
Earth, H	1.600
Wind, W	1.000
Seismic, E	1.000

### **Concrete Stem Construction**

Thickness 8.00 in Fν 60,000 psi Wall Weight = 100.0 psf f'c 2,500 psi Stem is FREE to rotate at top of footing

@	Top Support	Mmax Between Top & Base	@ Base of Wall
	Stem OK	Stem OK	Stem OK
=	9.00 ft	4.08 ft	0.00 ft
=	# 4	# 4	# 4
=	12.00 in	10.00 in	12.00 in
=	Edge	Edge	Edge
=	5.50 in	6.00 in	5.50 in
=	0.000	0.865	0.000
=	0.0 ft-#	5,340.7 ft-#	0.0 ft-#
=	4,737.6 ft-#	6,174.1 ft-#	4,737.6 ft-#
=	1,863.0 lbs		2,835.0 lbs
= =	28.23 psi 75.00 psi		42.95 psi 75.00 psi
	= = = = = = = = = = = = = = = = = = = =	= 9.00 ft = # 4 = 12.00 in = Edge = 5.50 in = 0.000 = 0.0 ft-# = 4,737.6 ft-# = 1,863.0 lbs = 28.23 psi	© Top Support         Top & Base           Stem OK         Stem OK           = 9.00 ft         4.08 ft           = # 4         # 4           = 12.00 in         10.00 in           = Edge         Edge           = 5.50 in         6.00 in           = 0.000         0.865           = 0.0 ft-#         5,340.7 ft-#           = 4,737.6 ft-#         6,174.1 ft-#           = 1,863.0 lbs           = 28.23 psi

### Other Acceptable Sizes & Spacings:

Toe: None Spec'd -or- Not req'd: Mu < phi*5*lambda*sqrt(f'c)*Sm Heel:None Spec'd -or- Not reg'd: Mu < phi*5*lambda*sqrt(f'c)*Sm

Key: No key defined -or-No key defined Use menu item Settings > Printing & Title Block to set these five lines of information for your program.

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Title : Dsgnr: Description....

Page: 2 Date: 24 JAN 2022

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### **Restrained Retaining Wall**

Code: IBC 2018, ACI 318-14, TMS 402-16

### Concrete Stem Rebar Area Details

Top Support Vertical Reinforcing Horizontal Reinforcing As (based on applied moment): 0 in2/ft

(4/3) * As : 0 in2/ft Min Stem T&S Reinf Area 1.728 in2

200bd/fy: 200(12)(5.5)/60000: 0.22 in2/ft Min Stem T&S Reinf Area per ft of stem Height: 0.192 in2/ft

 0.0018bh : 0.0018(12)(8) :
 0.1728 in2/ft
 Horizontal Reinforcing Options :

 Cone layer of :
 Two layers of :

 Required Area :
 0.1728 in2/ft
 #4@ 12.50 in
 #4@ 25.00 in

 Provided Area :
 0.2 in3/ft
 #5@ 10.28 in
 #5@ 38.75 in

Provided Area : 0.1726 li12/lt #4@ 12.50 li1 #4@ 25.00 li1

Maximum Area : 0.7451 in2/ft #6@ 27.50 in #6@ 55.00 in

Mmax Between Ends Vertical Reinforcing Horizontal Reinforcing

As (based on applied moment): 0.2089 in2/ft

(4/3) * As: 0.2785 in2/ft Min Stem T&S Reinf Area 0.944 in2

200bd/fy : 200(12)(6)/60000 : 0.24 in2/ft Min Stem T&S Reinf Area per ft of stem Height : 0.192 in2/ft 0.0018bh : 0.0018(12)(8) : 0.1728 in2/ft Horizontal Reinforcing Options :

Provided Area : 0.24 in2/ft #4@ 12.50 in #4@ 25.00 in Provided Area : 0.24 in2/ft #5@ 19.38 in #5@ 38.75 in Maximum Area : 0.8128 in2/ft #6@ 27.50 in #6@ 55.00 in

Base Support Vertical Reinforcing Horizontal Reinforcing

As (based on applied moment): 0 in2/ft (4/3) * As: 0 in2/ft Min Stem T&S Reinf Area 0.784 in2

200bd/fy: 200(12)(5.5)/60000: 0.22 in2/ft Min Stem T&S Reinf Area per ft of stem Height: 0.192 in2/ft

0.0018bh : 0.0018(12)(8) : 0.1728 in2/ft Horizontal Reinforcing Options : One layer of : Two layers of : Required Area : 0.1728 in2/ft #4@ 12.50 in #4@ 25.00 in

Provided Area : 0.1728 in2/ft #4@ 12.50 in #4@ 25.00 in Provided Area : 0.2 in2/ft #5@ 19.38 in #5@ 38.75 in Maximum Area : 0.7451 in2/ft #6@ 27.50 in #6@ 55.00 in

### **Footing Strengths & Dimensions**

Toe Width	=	0.67 ft
Heel Width	=	1.33
Total Footing Width	=	2.00
Footing Thickness	=	10.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft
f'c = 2,500 psi	Fy =	60,000 psi
Footing Concrete Density	′ =	150.00 pcf
Min. As %	=	0.0018
Cover $@$ Top = $2.00$ in	@	Btm.= 3.00 in

### **Footing Design Results**

	Toe	<u>Heel</u>
=	377	1,850 psf
=	122	372 ft-#
=	53	294 ft-#
=	68	-78 ft-#
=	0.31	1.97 psi
=	75.00	75.00 psi
	= =	= 377 = 122 = 53 = 68 = 0.31

Min footing T&S reinf Area 0.43 in2
Min footing T&S reinf Area per foot 0.22 in2 /ft

If one layer of horizontal bars: If two layers of horizontal bars:

#4@ 11.11 in #4@ 22.22 in #5@ 17.22 in #5@ 34.44 in #6@ 24.44 in #6@ 48.89 in

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**Restrained Retaining Wall** 

Code: IBC 2018,ACI 318-14,TMS 402-16

### Summary of Forces on Footing: Slab RESISTS sliding, stem is PINNED at footing

### Forces acting on footing soil pressure

(taking moments about front of footing to find eccentricity) Surcharge Over Heel ft ft-# Axial Dead Load on Stem = ft ft-# lbs Soil Over Toe 49.1lbs 0.34 ft 16.5ft-# Adjacent Footing Load lbs ft ft-# Surcharge Over Toe lbs ft ft-# 900.0lbs Stem Weight 1.00 ft 903.0ft-#

Soil Over Heel = 656.7 lbs 1.67 ft 1,095.6ft-#
Footing Weight = 250.0 lbs 1.00 ft 250.0 ft-#

Total Vertical Force = 1,855.8 lbs Moment = 2,265.1 ft-#

Net Mom. at Stem/Ftg Interface = -409.2 ft-#
Allow. Mom. @ Stem/Ftg Interface = 2,961.0 ft-#
Allow. Mom. Exceeds Applied Mom.?
Therefore Uniform Soil Pressure = 927.9 psf

Vertical component of active lateral soil pressure IS NOT considered in the calculation of Sliding Resistance.

# Seismic Design Loads (ASCE 7-10)

for a Wood Framed Structure

RISK CATEGORY II Table 1-1
IMP. FACTOR 1 Table 11.5-1
SITE CLASS D Table 20.3-1
R = 6.5 Table 12.2-1
h = 30 ft

 $S_s = 1.408$  2010 ASCE 7 Standard(http://earthquake.usgs.gov/research/hazmaps/design/)  $S_1 = 0.490$  2010 ASCE 7 Standard(http://earthquake.usgs.gov/research/hazmaps/design/)  $F_s = 1$  Table 11.4-1

F_v = 1.5 Table 11.4-2

 $S_{DS} = 1.127$  $S_{D1} = 0.490$ 

Period, T= 0.26 Eqn. 12.8-7  $C_s = 0.173$  Eqn. 12.8-2  $C_{smax} = 0.29$  Eqn. 12.8-3

C_{smin}= 0.01 Eqn. 12.8-5

V_{allow} = 0.7*C_s*W 0.7 per Chapter C11 of ASCE 7-10 - see page 468)

Base Shear, V = 17262 lbs

Channella	DL (psf)	A (sq.ft.)	W (#'s)	h _x (ft)	W*h _x	C _{vx}	Lat. Load (lbs)
Shearwalls				30	1245000	0.48	8225
3rd Floor SW's	20	2075	41500	The same of the sa	980000	0.38	6474
2nd Floor SW's	20	2450	49000	20		0.15	2563
1st Floor SW's	20	1940	38800	10	388000	0.15	
Shear Walls = SW's							
		Sum=	129300	Sum=	2613000		

Diaphragm Forces (per ASCE 7-10, Section 12 10.1.1) Diaphragm Load (lbs) calc'd force sum W upper limit sum F lower limit level 8225 8225 41500 8225 13096 6548 Roof 7959 7959 90500 14699 7731 15462 3rd 5180 6122 17262 129300 12244 6122 2nd

> Project: 3038 61st Ave SE Mercer Island, WA 98040

Date: 12/17/2021 Project #: 2147 Design: JB

Sheet: L1

# Wind Design Loads (ASCE 7-10)

Method 2 - Analytical Procedure

Exposure C			Roof Angle =	27	degrees
1.0*V= 97	mph		Ground to top of roof	30	
V = 0.05		Table 26.6-1	Bottom of roof to top of roof	8	π
$K_d = 0.85$ G= 0.85		Section 26.9.1	(mean roof height) h=	26	ft

		ure 26.8-1		
Terrain= escarpm	nent (ridge,	hill, escarpment)		
Site= up	(UPwi	nd or <b>DOWN</b> wind)		
H=	ft	height of topography		
L _h =	ft	distance from H/2 to crest>0	Pressure Coe	efficients
×=	ft	distance from crest to site	from Figure 2	
Z=	ft	Height from bottom of topo. to site	Bldg Face	C _p
μ=			Windward Wall	0.8
γ=			Leeward Wall	-0.5
K ₁ value ₌			Windward Roof	0.3
K ₁₌			Leeward Roof	-0.6
K ₂₌			*Note= Cp values are	conservativ
$K_{3=}$ $K_{z1} = (1 + K_1 K_2)$	$(K_3)^2 = 1.0$	Per Mercer Island Wind Map		t case value

Pressures:					D (nos)
Ht	K.	0.6*q _z	P _{ww walls}	Piwwalls	P _{walls} (psf)
0-15	0.85	10.44	7.10	5.12	12.22
The second secon	0.9	11.06	7.52	5.12	12.63
15-20	0.94	11.55	7.85	5.12	12.97
20-25	0.98	12.04	8.19	5.12	13.30
25-30	The second secon	_	8.69	5.12	13.80
30-40	1.04	12.78	0.09	0.12	

Project: 3038 61st Ave SE Mercer Island, WA 98040 Date: 12/17/2021 Project #: 2147 Design: JB

Sheet: L2

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NORTH TO SOUTH

5414 SON 1768 6965 8734 Force Force 6727 2401 4327 0 Wind Area 490.00 Wind Area 140.00 570.00 SUM 190.00 0.00 SUM 12.22 12.63 12.22 12.63 8.83 Pressures Pressures Proof = P₁₅₋₂₀ = P₀₋₁₅ = P₁₅₋₂₀ = P₀₋₁₅ = Second Floor Shearwalls First Floor Shearwalls LEVEL

# 3038 61st Ave SE Mercer Island, WA 98040

EAST TO WEST

Force	2208	1579	0	3787	Force	1137	4277	5414
Wind Area	250.00	125.00	0.00	SUM	Wind Area	90.00	350.00	CIM
	8.83	12.63	12.22			12.63	12.22	
Pressures	Proof =	P ₁₅₋₂₀ =	١١		Pressures	P 15-20 =	٦	2

Shear Wall Lengths Third Floor Shear-walls

3038 61st Ave SE Mercer Island, WA 98040

					-						
	The state of the s			-	-	2 11000	7 11000	8 llew	Wall 9	wall 10	SUM
4	wall 1	wall 2	wall 3	wall 4	wall 5	Wall o	Wall				38.25
max		400	7 50	5 50	3.50					Name and Address of the Owner, where the Owner, which the	
00.6	14.50	67.7	00.7	00.0	2000						38.00
	14.50	7.25	7.50	5.50	3.25						13.25
aspect ratio reduc	5.75	3.75	3.75								12.75
	5.75	3.50	3.50								10.50
aspect ratio reduce	2.75	2.75	2.50	2.50						Applications of the Particular Control of th	8.60
200	230	2.30	2.00	2.00							8 25
aspect railo reduc	R 25										8 25
0.0	8.25										14 75
aspect ratio reduc	8.50	6.25									14.75
occupation radio	8.50	6.25							and an extended in contrast of the contrast of		34.75
9.00	19.00	15.75									34.75
C. Post City	19.00	15.75									
TO LOUIS	10.0	-	THE REAL PROPERTY AND ADDRESS OF THE PERSON.	Name and Address of the Owner, where the Owner, which is the Owner, where the Owner, which is the Owner, where the Owner, which is th							

Shear Wall Lengths Second Floor Shearwalls

	The second secon	Designation of the Contract of					11 -2	O II CO	0 000	- EM	200
	1 Heats	C llew	wall 3	wall 4	wall 5	wall 6	wall /	Wallo	Wall S		25.25
	Wall		0								23.63
00 6	3.75	3.00	18.50			-			The second of th		24.60
	3.50	2.60	18.50								24.50
00.6	4.00	7.50	13.00								24.30
	3.80	7.50	13.00								9.50
00 6	2.75	3.75	3.00								8.40
	2.30	3.50	2.60								20.00
9.00	20.00										20.00
	20.00										26.00
9.00	17.75	8.25									26.00
	17.75	8.25									20.00
9.00	20.00										20.00
	20.00								Market speciments of the contract of the contr		

Shear Wall Lengths First Floor Shearwalls

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	ų	wall 1	wall 2	wall 3	Wall 4	Wall	2					00.00
	mex		The same of the sa								-	
orid 1	8.00				-	-		The second secon				0.00
The state of the s	Maria Constitution of the last							STATE OF THE PERSON NAMED AND POST OF THE PER		-		000
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arid 2	8.00						-					0.00
aspect ratio reduc												0.00
	8 00									The state of the s	The same of the sa	0.00
grid 5	0.0		-							-		
aspect ratio reduc					-							00.00
orid A	8.00							-				00.00
Contraction of the Contraction o		-										00.0
aspect ratio reduc	-											0.00
arid B	8.00											0.00
or post of documents												00.0
aspect ratio reduc		-							The second second	The state of the s	-	
grid C	8.00											00.00
aspect ratio reduc	D					-	-					

FORCE DISTRIBUTION third floor seawalls and roof diaphragm

3038 61st Ave SE Mercer Island, WA 98040 L5

						etory chears.	Vs = 8225	8225	= M/	3787	east to west	
						atory arroad			= M/	6727	north to south	_
		(lbc)	(sql) /	V (ft)	7   (ft)	V.s. (plf)	V _{uw} (pif)	SW		uplift (S) lbs t	ft (S) lbs uplift (W) lbs	holdown
	grid	V seismic (103)	wind (m)	Z walls /	AN IIBM	н	25	SW1		487	224	
= to W	_	2056	947	38.00	38.00		240	CIVID		2903	1337	
	0	4113	1894	12.75	12.75		94	SVAZ		2152	991	
	1 (7)	2056	947	8.60	8.60 8.60	239	110	2001	9.00	7017		
	)										4004	1010316
					30 0		204	SW1		2243	1000	(4)
N to C	A	2056	1682	8.25	0.20			CIVIO		2510	2052	(2) CS16
200		0	0000	11 75	14 75		228	2002		2010		0110
	m	4113	2202	1.10			10	CW		532	436	NA
	C	2056	1682	34.75	34.75		01	The second second second	Dispositi	STATES AND RESIDENCE OF THE PERSON OF THE PE		

FORCE DISTRIBUTION second floor shearwalls and third floor diaphragm

						proods waste		Vs = 14699	= M/	9201	east to west	
						Story Siredis.			= M/	15461	north to south	_
		(lhe)	(sql) A	7 I (ft)	∑ 1(ft)		V _{uw} (plf)	SW		uplift (S) lbs		holdown
E to W	9 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Veelsmic (103) 3675 7349 3675	2300 4601 2300	24.60 24.30 8.40	24.60 24.30 8.40	149 302 438	93 189 274	SW1 SW2 SW3		1831 5625 6089	1066 3041 3455	HDU5 HDU5
N to S	< a €	3675 7349 3675	3865 7731 3865	26.00	20.00 26.00 20.00	184 283 184	193 297 193	SW1 SW2 SW1	9.00	3897 5054 2186		STHD14 HDU5 STHD10

FORCE DISTRIBUTION first floor shearwalls and second floor diaphragm

					- stood choose	Vs = 17262	7262	= M/		east to west	
					Story Streams			= M/	= N/A	north to south	_
	(adl)	(adl) V		7 L (ft)	V. (plf)	(hld) '\'.'\	SW	h (ft)	uplift (S) lbs	uplift (W) lbs	holdown
grid 1	4315 R631	N/A N/A N/A	N/A N/A		N/A N/A	N/A N/A	CONC	8.00	N'A N'A	A A S	A A A
	4315	N/A			N/A	N/A	CONC	8.00	N/A		
	4315	N/A		N/A	N/A	N/A	CONC	8.00	N/A	N/A A/A	A A Z
	8631 4315	A A N			N A	Z/Z	CONC	8.00	N/A	N/A	N/A