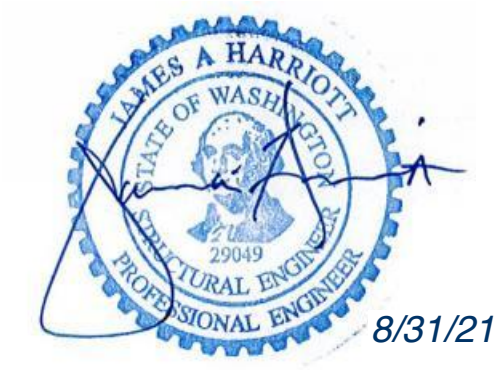
STRUCTURAL CALCULATIONS

Project:
Sherland Residence
7234 91st Avenue Southeast
Mercer Island, Washington 98040

Architect:
Patricia Brennan Architects
224 Pontius Avenue North, Suite 117
Seattle, Washington 98109

Structural Engineer:
Harriott Valentine Engineers, Inc.
1932 First Avenue, Suite 720
Seattle, Washington 98101
tel. 206-624-4760



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SECTION 1: GENERAL

1932 First Avenue, Suite 720
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CRITERIA

Gravity

Roof	dead	asphalt shingles	2.5	live	snow	25.0 psf
		1/2" plywood	1.5			
		R30 insulation	1.2			
		2x10 @ 24"oc	1.9			
		5/8" gyp. wallboard	2.8			
		slope factor	0.5			
		miscellaneous	1.6 13%			
			12.0 psf			
	total	dead + live	37.0 psf			
Floor	dead	3/4" hardwood	3.0	live	residential	40.0 psf
		3/4" plywood	2.3			
		2x10 @ 16"oc	2.8			
		acoustic insulation	1.0			
		1/2" gyp. wallboard	2.2			
		miscellaneous	1.7 13%			
			13.0 psf			
	total					
		dead + live	53.0 psf			
deck	dead	2x decking	4.3	live	deck	60.0 psf
		2x8 @ 12"oc	3.0			
		miscellaneous	1.7 19%			
			9.0 psf			
	total					
		dead + live	69.0 psf			
Walls		cement fiber board	4.1			
		battens 2x2 @ 24"oc	0.3			
		1/2" plywood	1.5			
		2x6 @ 16"oc	1.7			
		R21 insulation	0.8			
		1/2" gyp. wallboard	2.2			
		miscellaneous	0.4 4%			
			11.0 psf			

Lateral

Wind	wind importance factor	1.0		
	basic wind speed	110	mph	
	wind exposure	B		
	topographical factor (Kzt)	1.60		
Seismic	seismic importance factor	1.0		
	latitude	47.537	°	
	longitude	-122.218	°	
	mapped spectral response accel. at short periods (Ss)	1.457	g	(from SEAOC)
	seismic design category	D		
	response modification factor (R)	6.5		

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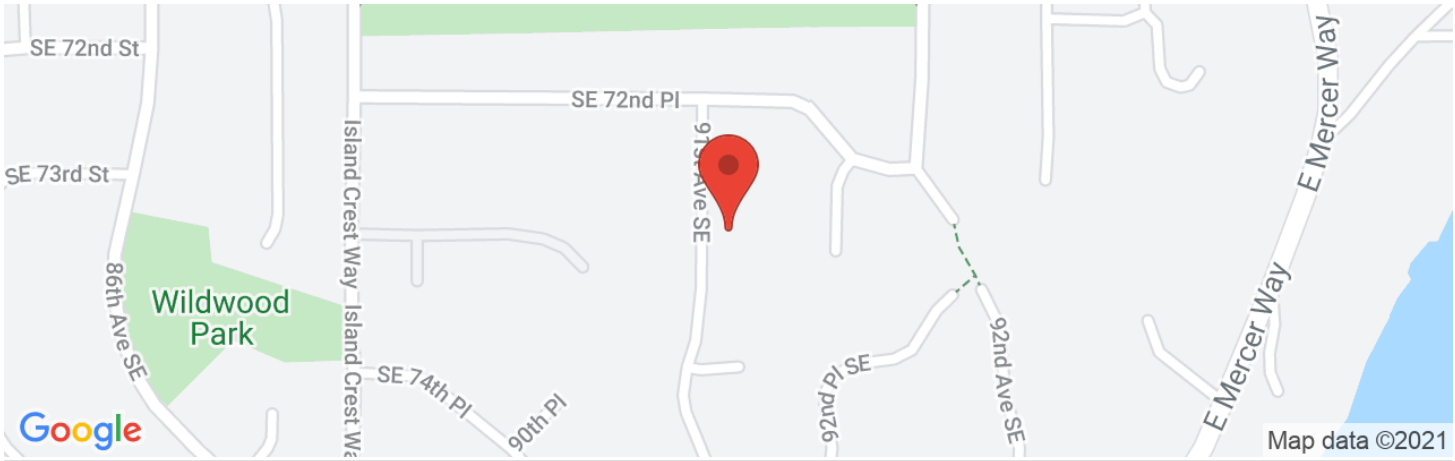
7234 91st Ave SE, Mercer Island, WA 98040, USA

Latitude, Longitude: 47.5371329, -122.2181836



Date	7/23/2021, 2:50:51 PM
Design Code Reference Document	ASCE7-16
Risk Category	II
Site Class	D - Default (See Section 11.4.3)

Type	Value	Description
S_S	1.457	MCE_R ground motion. (for 0.2 second period)
S_1	0.503	MCE_R ground motion. (for 1.0s period)
S_{MS}	1.748	Site-modified spectral acceleration value
S_{M1}	null -See Section 11.4.8	Site-modified spectral acceleration value
S_{DS}	1.165	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

Type	Value	Description
SDC	null -See Section 11.4.8	Seismic design category
F_a	1.2	Site amplification factor at 0.2 second
F_v	null -See Section 11.4.8	Site amplification factor at 1.0 second
PGA	0.623	MCE_G peak ground acceleration
F_{PGA}	1.2	Site amplification factor at PGA
PGA_M	0.748	Site modified peak ground acceleration
T_L	6	Long-period transition period in seconds
SsRT	1.457	Probabilistic risk-targeted ground motion. (0.2 second)
SsUH	1.615	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
SsD	4.302	Factored deterministic acceleration value. (0.2 second)
S1RT	0.503	Probabilistic risk-targeted ground motion. (1.0 second)
S1UH	0.56	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
S1D	1.639	Factored deterministic acceleration value. (1.0 second)
PGAd	1.423	Factored deterministic acceleration value. (Peak Ground Acceleration)
C_{RS}	0.902	Mapped value of the risk coefficient at short periods
C_{R1}	0.898	Mapped value of the risk coefficient at a period of 1 s

SECTION 2: FRAMING

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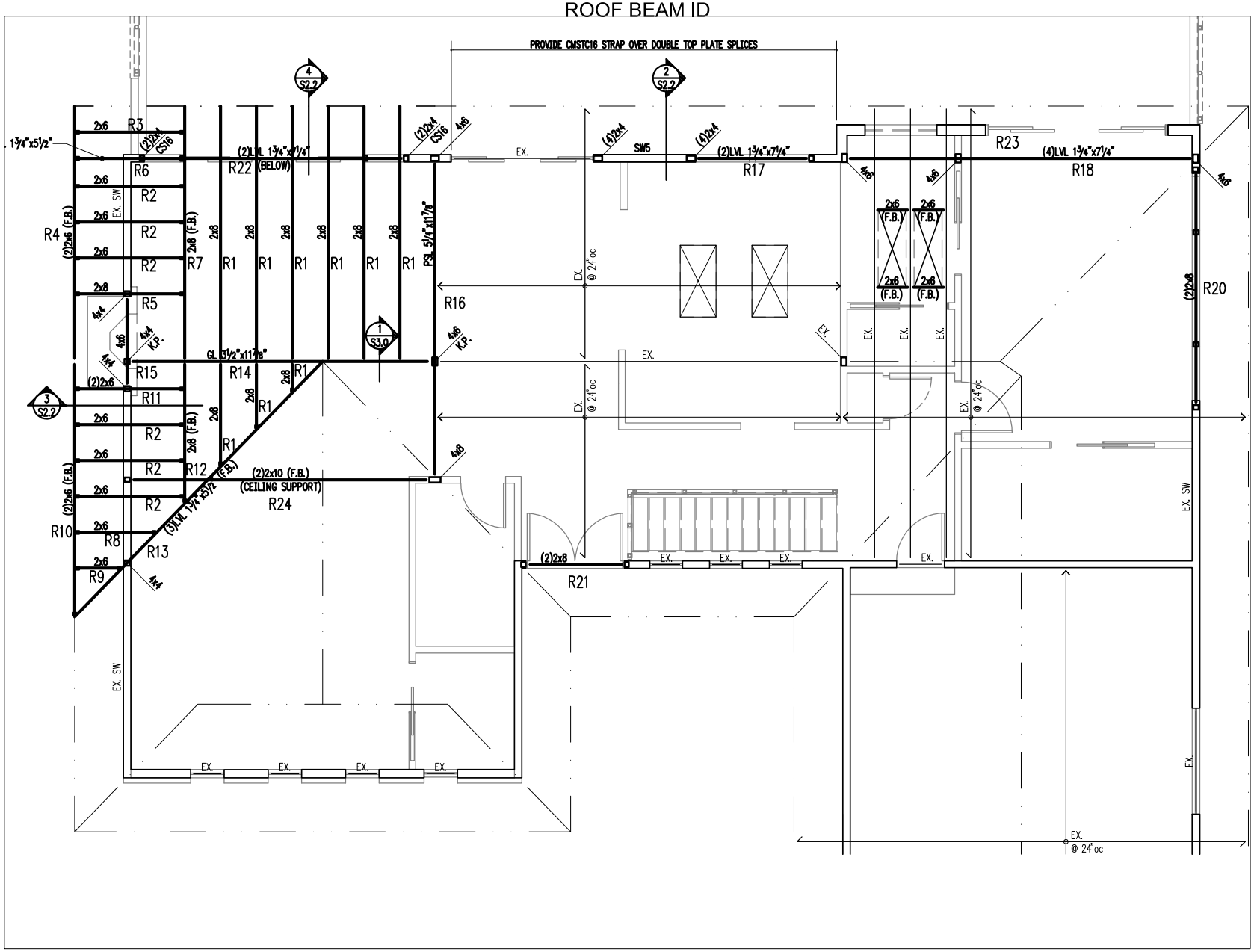
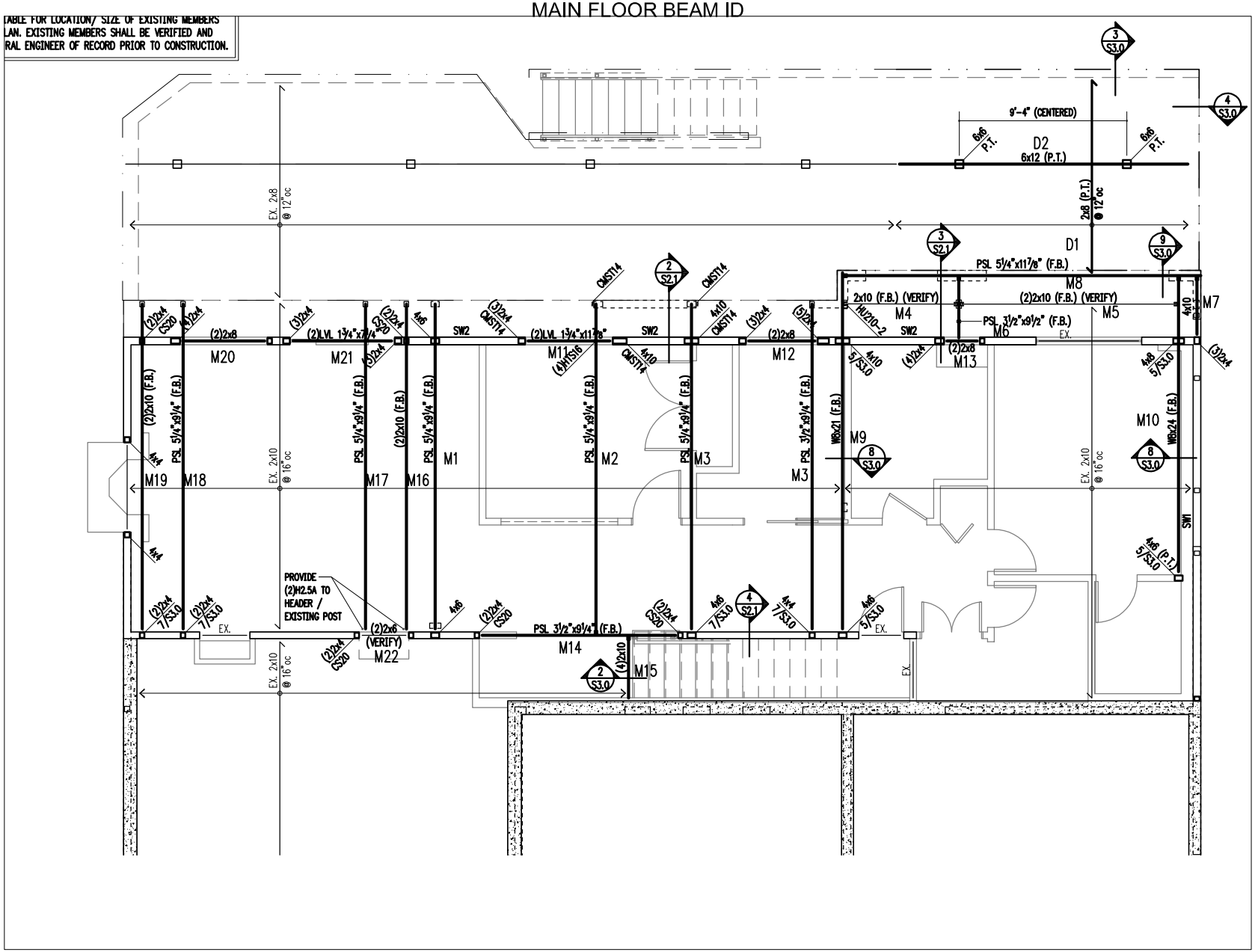
ROOF BEAM ID


PROVIDE CMSTC16 STRAP OVER DOUBLE TOP PLATE SPLICES
1¾"x5½"
(2)LVL 1¾"x7¼"
R22 (BELOW)
(2)2x4 CS16
4x6
EX.
(4)2x4
SW5
(2)LVL 1¾"x7¼"
R17
R23
(4)LVL 1¾"x7¼"
R18
R3
R6
R2
R4
(2)2x6 (F.B.)
EX. SW
2x8 (F.B.)
R7
R1
PSL 5¼"x11⅞"
R16
R5
4x4
4x6 K.P.
GL 3½"x11⅞"
R15
R14
R11
(2)2x6
R12
(2)2x10 (F.B.)
(CEILING SUPPORT)
R24
(3)LVL 1¾"x5½" (F.B.)
R10
R8
R13
R9
R21
2x6 (F.B.)
R20
(2)2x8
EX. @ 24" oc
S2.2
S3.0

MAIN FLOOR BEAM ID



Roof			
Member Name	**Results**	**Current Solution**	**Comments**
R1	Passed	1 piece(s) 2 x 8 HF No.2 @ 24" OC	
R2	Passed	1 piece(s) 2 x 6 HF No.2	
R3	Passed	1 piece(s) 2 x 6 HF No.2	
R4	Passed	2 piece(s) 2 x 6 HF No.2	
R5	Passed	2 piece(s) 2 x 6 HF No.2	
R6	Passed	2 piece(s) 1 3/4" x 5 1/2" 2.0E Microllam® LVL	
R7	Passed	1 piece(s) 2 x 8 HF No.2	
R8	Passed	1 piece(s) 2 x 6 HF No.2	
R9	Passed	1 piece(s) 2 x 6 HF No.2	
R10	Passed	2 piece(s) 2 x 6 HF No.2	
R11	Passed	2 piece(s) 2 x 6 HF No.2	
R12	Passed	1 piece(s) 2 x 8 HF No.2	
R13	Passed	3 piece(s) 1 3/4" x 5 1/2" 2.0E Microllam® LVL	
R14	Passed	1 piece(s) 3 1/2" x 11 7/8" 24F-V4 DF Glulam	
R15	Passed	1 piece(s) 4 x 6 HF No.1	
R16	Passed	1 piece(s) 5 1/4" x 11 7/8" 2.2E Parallam® PSL	
R17	Passed	2 piece(s) 1 3/4" x 7 1/4" 2.0E Microllam® LVL	
R18	Passed	4 piece(s) 1 3/4" x 7 1/4" 2.0E Microllam® LVL	
R20	Passed	2 piece(s) 2 x 8 HF No.2	
R21	Passed	2 piece(s) 2 x 8 HF No.2	
R22	Failed	2 piece(s) 1 3/4" x 7 1/4" 2.0E Microllam® LVL	An excessive uplift of -1130 lbs at support located at 1 1/2" failed this product.
R23	Passed	2 piece(s) 2 x 4 HF No.2	
R24	Passed	2 piece(s) 2 x 10 HF No.2	
Main Floor			
Member Name	**Results**	**Current Solution**	**Comments**
M1	Passed	1 piece(s) 5 1/4" x 9 1/4" 2.2E Parallam® PSL	
M2	Passed	1 piece(s) 5 1/4" x 9 1/2" 2.2E Parallam® PSL	
M3	Passed	1 piece(s) 5 1/4" x 9 1/4" 2.2E Parallam® PSL	
M4	Passed	1 piece(s) 2 x 10 HF No.2	
M5	Passed	2 piece(s) 2 x 10 HF No.2	
M6	Passed	1 piece(s) 3 1/2" x 9 1/2" 2.2E Parallam® PSL	
M7	Passed	1 piece(s) 4 x 10 HF No.1	
M8	Passed	1 piece(s) 5 1/4" x 11 7/8" 2.2E Parallam® PSL	
M11	Passed	2 piece(s) 1 3/4" x 11 7/8" 2.0E Microllam® LVL	
M12	Passed	2 piece(s) 2 x 8 HF No.2	
M13	Passed	2 piece(s) 2 x 8 HF No.2	
M14	Passed	1 piece(s) 3 1/2" x 9 1/4" 2.2E Parallam® PSL	
M15	Passed	4 piece(s) 2 x 10 HF No.2	
M16	Passed	2 piece(s) 2 x 10 HF No.2	
M17	Passed	1 piece(s) 5 1/4" x 9 1/4" 2.2E Parallam® PSL	
M18	Passed	1 piece(s) 5 1/4" x 9 1/4" 2.2E Parallam® PSL	
M19	Failed	2 piece(s) 2 x 10 HF No.2	An excessive uplift of -1026 lbs at support located at 16' 5 1/4" failed this product.
M20	Passed	2 piece(s) 2 x 8 HF No.2	
M21	Passed	2 piece(s) 1 3/4" x 7 1/4" 2.0E Microllam® LVL	
M22	Passed	2 piece(s) 2 x 6 HF No.2	

ForteWEB Software Operator	Job Notes
Jacob Wachtendonk Harriott Valentine Engineers (425) 281-0788 jwachtendonk@harriottvalentine.com	

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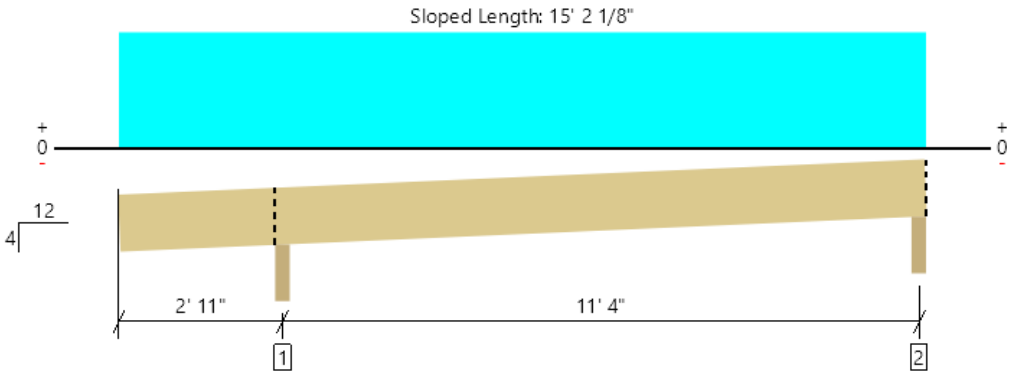
Deck			
Member Name	**Results**	**Current Solution**	**Comments**
D1	Passed	1 piece(s) 2 x 8 HF No.2 @ 12" OC	
D2	Passed	1 piece(s) 6 x 12 HF No.2	

Roof, R1

1 piece(s) 2 x 8 HF No.2 @ 24" OC



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

Member Length : 15' 4 1/2"

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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	672 @ 2' 11"	2241 (3.50")	Passed (30%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	399 @ 3' 7 5/8"	1251	Passed (32%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	1091 @ 8' 9 5/8"	1477	Passed (74%)	1.15	1.0 D + 1.0 S (Alt Spans)
Live Load Defl. (in)	0.300 @ 8' 7 3/8"	0.396	Passed (L/476)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.438 @ 8' 7 11/16"	0.594	Passed (L/325)	--	1.0 D + 1.0 S (Alt Spans)

- Deflection criteria: LL (L/360) and TL (L/240).
- Overhang deflection criteria: LL (2L/360) and TL (2L/240). Upward deflection on left cantilever exceeds overhang deflection criteria.
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A 15% increase in the moment capacity has been added to account for repetitive member usage.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Beveled Plate - SPF	3.50"	3.50"	1.50"	226	446	672	Blocking
2 - Beveled Plate - SPF	3.50"	3.50"	1.50"	138	283	421	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	6' 9" o/c	
Bottom Edge (Lu)	15' 2" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 14' 4 3/4"	24"	12.0	25.0	Default Load

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

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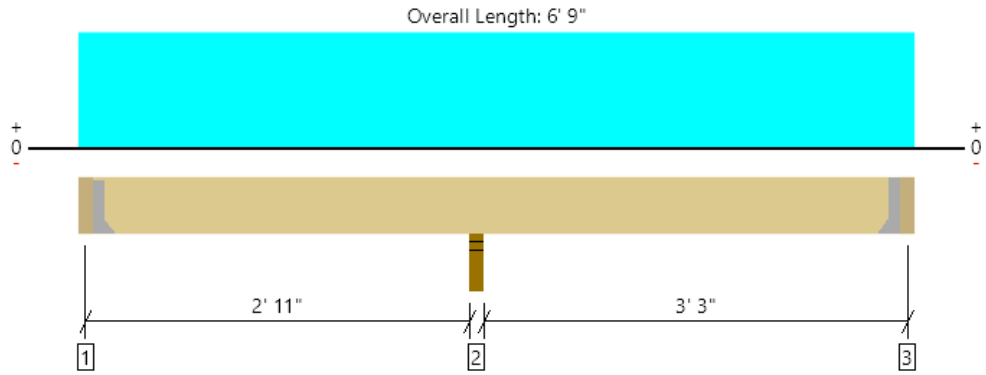
Roof, R2

1 piece(s) 2 x 6 HF No.2



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	294 @ 3' 2 1/2"	2126 (3.50")	Passed (14%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	106 @ 3' 9 3/4"	949	Passed (11%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	-91 @ 3' 2 1/2"	801	Passed (11%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.003 @ 4' 11 5/16"	0.108	Passed (L/999+)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.004 @ 4' 11 1/2"	0.162	Passed (L/999+)	--	1.0 D + 1.0 S (Alt Spans)

System : Roof
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD
Member Pitch : 0/12

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Hanger on 5 1/2" SPF beam	3.50"	Hanger[1]	1.50"	34	73	107	See note [1]
2 - Stud wall - SPF	3.50"	3.50"	1.50"	101	193	294	None
3 - Hanger on 5 1/2" SPF beam	3.50"	Hanger[1]	1.50"	40	81	121	See note [1]

- At hanger supports, the Total Bearing dimension is equal to the width of the material that is supporting the hanger
- [1] See Connector grid below for additional information and/or requirements.

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

•Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-Tie

Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
1 - Face Mount Hanger	LU26	1.50"	N/A	6-10dx1.5	4-10dx1.5	
3 - Face Mount Hanger	LU26	1.50"	N/A	6-10dx1.5	4-10dx1.5	

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	3 1/2" to 6' 5 1/2"	N/A	2.1	--	
1 - Uniform (PSF)	0 to 6' 9" (Front)	1'	12.0	25.0	Default Load
2 - Uniform (PSF)	0 to 6' 9" (Back)	1'	12.0	25.0	Default Load

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

ForteWEB Software Operator	Job Notes
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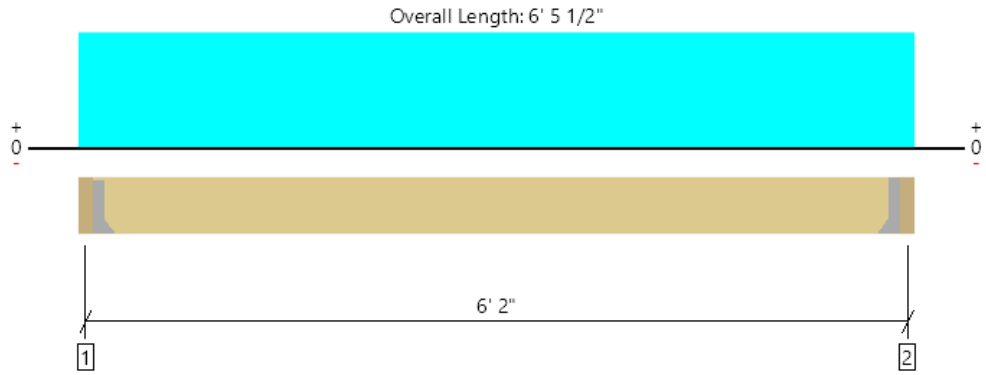
Roof, R3

1 piece(s) 2 x 6 HF No.2



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	251 @ 3 1/2"	911 (1.50")	Passed (28%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	212 @ 9"	949	Passed (22%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	368 @ 3' 2 3/4"	801	Passed (46%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.056 @ 3' 2 3/4"	0.196	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.085 @ 3' 2 3/4"	0.294	Passed (L/833)	--	1.0 D + 1.0 S (All Spans)

System : Roof
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD
Member Pitch : 0/12

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Hanger on 5 1/2" SPF beam	3.50"	Hanger[1]	1.50"	93	182	275	See note [1]
2 - Hanger on 5 1/2" SPF beam	3.50"	Hanger[1]	1.50"	93	182	275	See note [1]

- At hanger supports, the Total Bearing dimension is equal to the width of the material that is supporting the hanger
- [1] See Connector grid below for additional information and/or requirements.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	5' 11" o/c	
Bottom Edge (Lu)	5' 11" 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
1 - Face Mount Hanger	LU26	1.50"	N/A	6-10dx1.5	4-10dx1.5	
2 - Face Mount Hanger	LU26	1.50"	N/A	6-10dx1.5	4-10dx1.5	

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	3 1/2" to 6' 2"	N/A	2.1	--	
1 - Uniform (PSF)	0 to 6' 5 1/2" (Front)	9"	12.0	25.0	Default Load
2 - Uniform (PSF)	0 to 6' 5 1/2" (Back)	1' 6"	12.0	25.0	Default Load

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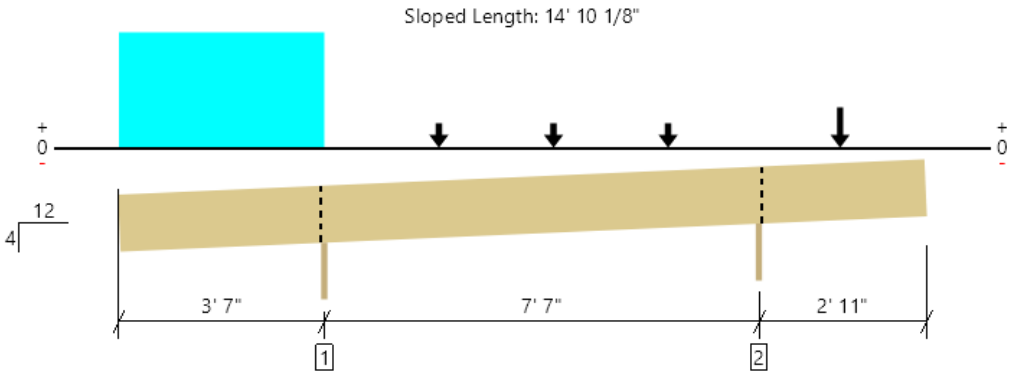
Roof, R4

2 piece(s) 2 x 6 HF No.2



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

Member Length : 15'

System : Roof
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD
Member Pitch : 4/12

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	508 @ 11' 2"	1921 (1.50")	Passed (26%)	--	1.0 D + 1.0 S (Adj Spans)
Shear (lbs)	286 @ 11' 7 15/16"	1898	Passed (15%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	-408 @ 11' 2"	1602	Passed (25%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.066 @ 14' 1"	0.205	Passed (2L/999+)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.087 @ 14' 1"	0.307	Passed (2L/850)	--	1.0 D + 1.0 S (Alt Spans)

- Deflection criteria: LL (L/360) and TL (L/240).
- Overhang deflection criteria: LL (2L/360) and TL (2L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Beveled Plate - SPF	1.50"	1.50"	1.50"	107	170	277	Blocking
2 - Beveled Plate - SPF	1.50"	1.50"	1.50"	184	324	508	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	14' 10" o/c	
Bottom Edge (Lu)	14' 10" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 14' 1"	N/A	4.2	--	
1 - Uniform (PSF)	0 to 3' 7"	9"	12.0	25.0	Default Load
2 - Point (lb)	5' 7"	N/A	34	73	Linked from: R2, Support 1
3 - Point (lb)	7' 7"	N/A	34	73	Linked from: R2, Support 1
4 - Point (lb)	9' 7"	N/A	34	73	Linked from: R2, Support 1
5 - Point (lb)	12' 7"	N/A	93	182	Linked from: R3, Support 1

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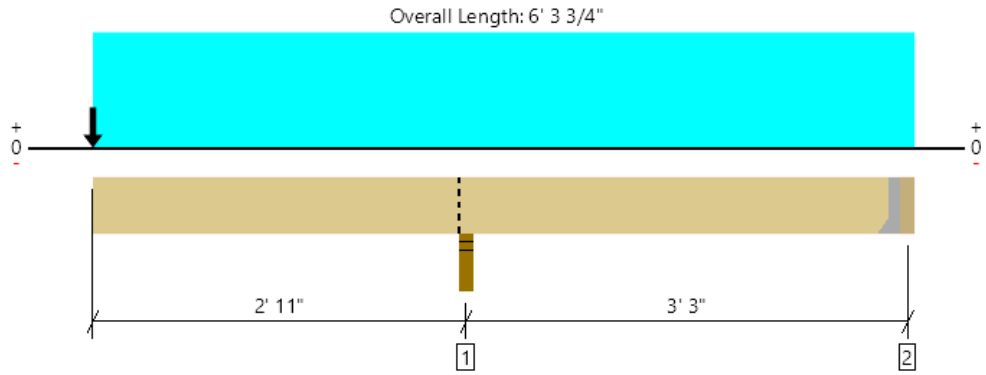
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Jacob Wachtendonk Harriott Valentine Engineers (425) 281-0788 jwachtendonk@harriottvalentine.com	

Weyerhaeuser

Roof, R5

2 piece(s) 2 x 6 HF No.2



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	994 @ 2' 11"	4253 (3.50")	Passed (23%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	458 @ 2' 3 3/4"	1898	Passed (24%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	-1140 @ 2' 11"	1602	Passed (71%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.125 @ 0	0.200	Passed (2L/560)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.200 @ 0	0.292	Passed (2L/350)	--	1.0 D + 1.0 S (Alt Spans)

System : Roof
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD
Member Pitch : 0/12

- Deflection criteria: LL (L/360) and TL (L/240).
- Overhang deflection criteria: LL (2L/0.2") and TL (2L/240).
- Left cantilever length exceeds 1/3 member length or 1/2 back span length. Additional bracing should be considered.
- Allowed moment does not reflect the adjustment for the beam stability factor.
- -263 lbs uplift at support located at 6' 1/4". Strapping or other restraint may be required.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Stud wall - SPF	3.50"	3.50"	1.50"	372	622	994	Blocking
2 - Hanger on 5 1/2" SPF beam	3.50"	Hanger[1]	1.50"	-88	-175	-263	See note [1]

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	6' o/c	
Bottom Edge (Lu)	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	LUS26-2	2.00"	N/A	4-10dx1.5	3-10d	

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 6' 1/4"	N/A	4.2	--	
1 - Uniform (PSF)	0 to 6' 3 3/4" (Front)	1'	12.0	25.0	Default Load
2 - Uniform (PSF)	0 to 6' 3 3/4" (Back)	1'	12.0	25.0	Default Load
3 - Point (lb)	0 (Top)	N/A	107	170	Linked from: R4, Support 1

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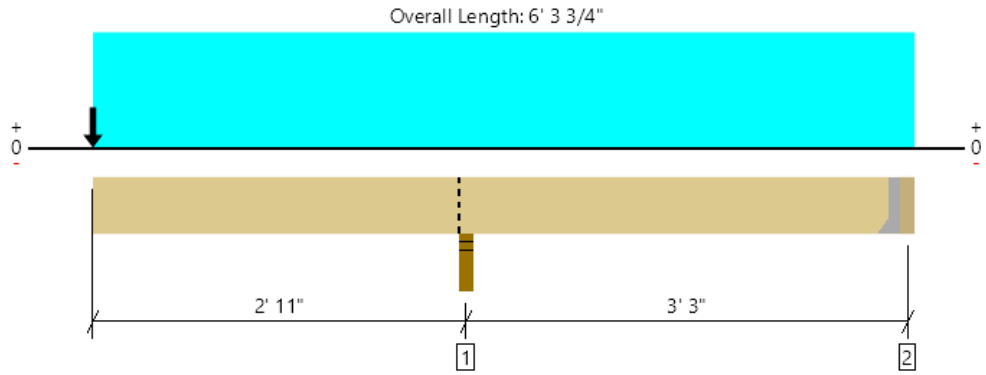
Roof, R6

2 piece(s) 1 3/4" x 5 1/2" 2.0E Microllam® LVL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1450 @ 2' 11"	5206 (3.50")	Passed (28%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	692 @ 2' 3 3/4"	4206	Passed (16%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	-1820 @ 2' 11"	4889	Passed (37%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.123 @ 0	0.200	Passed (2L/568)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.193 @ 0	0.292	Passed (2L/364)	--	1.0 D + 1.0 S (Alt Spans)

System : Roof
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD
Member Pitch : 0/12

- Deflection criteria: LL (L/360) and TL (L/240).
- Overhang deflection criteria: LL (2L/0.2") and TL (2L/240).
- Left cantilever length exceeds 1/3 member length or 1/2 back span length. Additional bracing should be considered.
- Allowed moment does not reflect the adjustment for the beam stability factor.
- -480 lbs uplift at support located at 6' 1/4". Strapping or other restraint may be required.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Stud wall - SPF	3.50"	3.50"	1.50"	530	920	1450	Blocking
2 - Hanger on 5 1/2" SPF beam	3.50"	Hanger[1]	1.50"	-161	-320	-481	See note [1]

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	6' o/c	
Bottom Edge (Lu)	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	LUS46	2.00"	N/A	4-10dx1.5	4-10d	

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 6' 1/4"	N/A	5.6	--	
1 - Uniform (PSF)	0 to 6' 3 3/4" (Front)	1'	12.0	25.0	Default Load
2 - Uniform (PSF)	0 to 6' 3 3/4" (Back)	1'	12.0	25.0	Default Load
3 - Point (lb)	0 (Top)	N/A	184	324	Linked from: R4, Support 2

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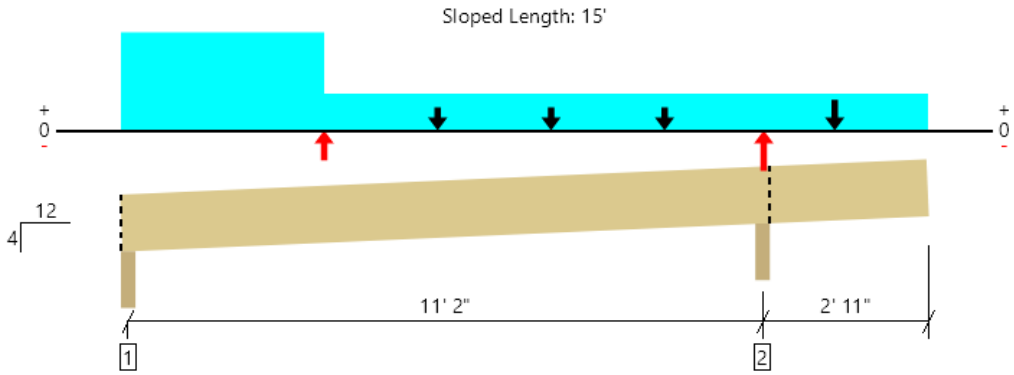
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Roof, R7

1 piece(s) 2 x 8 HF No.2



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

Member Length : 15' 2 3/8"

System : Roof
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD
Member Pitch : 4/12

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	379 @ 11' 3 3/4"	2241 (3.50")	Passed (17%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	437 @ 10' 7 1/8"	1251	Passed (35%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	848 @ 6' 1 3/4"	1284	Passed (66%)	1.15	1.0 D + 1.0 S (Alt Spans)
Live Load Defl. (in)	0.211 @ 5' 11 9/16"	0.392	Passed (L/667)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.311 @ 5' 10 15/16"	0.587	Passed (L/454)	--	1.0 D + 1.0 S (Alt Spans)

- Deflection criteria: LL (L/360) and TL (L/240).
- Overhang deflection criteria: LL (2L/360) and TL (2L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Beveled Plate - SPF	3.50"	3.50"	1.50"	116	216	332	Blocking
2 - Beveled Plate - SPF	3.50"	3.50"	1.50"	144	234	378	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	9' 4" o/c	
Bottom Edge (Lu)	15' o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 14' 2 3/4"	N/A	2.8	--	
1 - Uniform (PSF)	0 to 14' 2 3/4"	1'	12.0	25.0	Default Load
2 - Uniform (PSF)	0 to 3' 7"	1' 8"	12.0	25.0	Default Load
3 - Point (lb)	12' 7"	N/A	93	182	Linked from: R3, Support 2
4 - Point (lb)	3' 7"	N/A	-88	-175	Linked from: R5, Support 2
5 - Point (lb)	11' 4"	N/A	-161	-320	Linked from: R6, Support 2
6 - Point (lb)	5' 7"	N/A	40	81	Linked from: R2, Support 3
7 - Point (lb)	7' 7"	N/A	40	81	Linked from: R2, Support 3
8 - Point (lb)	9' 7"	N/A	40	81	Linked from: R2, Support 3

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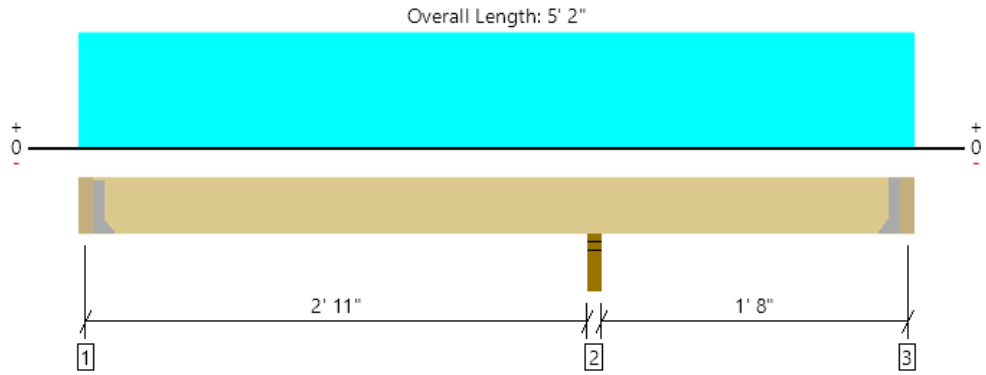
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Roof, R8

1 piece(s) 2 x 6 HF No.2



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	232 @ 3' 2 1/2"	2126 (3.50")	Passed (11%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	86 @ 2' 7 1/4"	949	Passed (9%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	-61 @ 3' 2 1/2"	801	Passed (8%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.002 @ 1' 6 15/16"	0.097	Passed (L/999+)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.003 @ 1' 6 7/8"	0.146	Passed (L/999+)	--	1.0 D + 1.0 S (Alt Spans)

System : Roof
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD
Member Pitch : 0/12

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Hanger on 5 1/2" SPF beam	3.50"	Hanger[1]	1.50"	38	75	113	See note [1]
2 - Stud wall - SPF	3.50"	3.50"	1.50"	80	152	232	None
3 - Hanger on 5 1/2" SPF beam	3.50"	Hanger[1]	1.50"	16	42	58	See note [1]

- At hanger supports, the Total Bearing dimension is equal to the width of the material that is supporting the hanger
- [1] See Connector grid below for additional information and/or requirements.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	4' 7" o/c	
Bottom Edge (Lu)	4' 7" o/c	

•Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-Tie

Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
1 - Face Mount Hanger	LU26	1.50"	N/A	6-10dx1.5	4-10dx1.5	
3 - Face Mount Hanger	LU26	1.50"	N/A	6-10dx1.5	4-10dx1.5	

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	3 1/2" to 4' 10 1/2"	N/A	2.1	--	
1 - Uniform (PSF)	0 to 5' 2" (Front)	1'	12.0	25.0	Default Load
2 - Uniform (PSF)	0 to 5' 2" (Back)	1'	12.0	25.0	Default Load

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ForteWEB Software Operator	Job Notes
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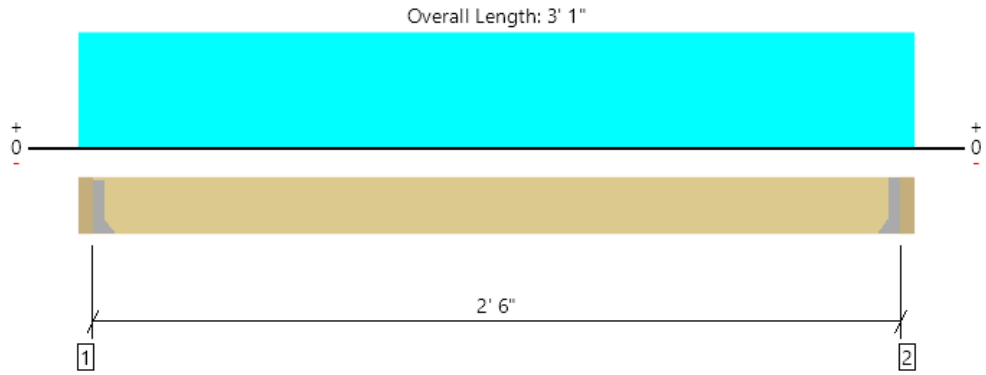
Weyerhaeuser

Roof, R9

1 piece(s) 2 x 6 HF No.2



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	95 @ 3 1/2"	911 (1.50")	Passed (10%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	60 @ 9"	949	Passed (6%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	59 @ 1' 6 1/2"	801	Passed (7%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.002 @ 1' 6 1/2"	0.083	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.002 @ 1' 6 1/2"	0.125	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)

System : Roof
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD
Member Pitch : 0/12

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Hanger on 5 1/2" SPF beam	3.50"	Hanger[1]	1.50"	40	77	117	See note [1]
2 - Hanger on 5 1/2" SPF beam	3.50"	Hanger[1]	1.50"	40	77	117	See note [1]

- 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)	2' 6" o/c	
Bottom Edge (Lu)	2' 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
1 - Face Mount Hanger	LU26	1.50"	N/A	6-10dx1.5	4-10dx1.5	
2 - Face Mount Hanger	LU26	1.50"	N/A	6-10dx1.5	4-10dx1.5	

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	3 1/2" to 2' 9 1/2"	N/A	2.1	--	
1 - Uniform (PSF)	0 to 3' 1" (Front)	1'	12.0	25.0	Default Load
2 - Uniform (PSF)	0 to 3' 1" (Back)	1'	12.0	25.0	Default Load

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ForteWEB Software Operator	Job Notes
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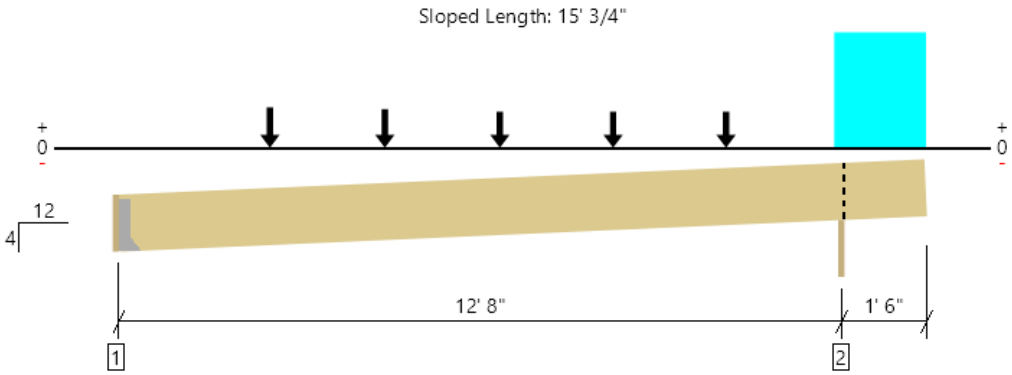
Weyerhaeuser

Roof, R10

2 piece(s) 2 x 6 HF No.2



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

Member Length : 15' 1"

System : Roof
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD
Member Pitch : 4/12

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	367 @ 12' 9 1/2"	1921 (1.50")	Passed (19%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	313 @ 12' 3 9/16"	1898	Passed (16%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	1149 @ 6' 9"	1602	Passed (72%)	1.15	1.0 D + 1.0 S (Alt Spans)
Live Load Defl. (in)	0.417 @ 6' 5 1/2"	0.445	Passed (L/384)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.668 @ 6' 5 3/8"	0.668	Passed (L/240)	--	1.0 D + 1.0 S (Alt Spans)

- Deflection criteria: LL (L/360) and TL (L/240).
- Overhang deflection criteria: LL (2L/360) and TL (2L/240). Upward deflection on right cantilever exceeds overhang deflection criteria.
- 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 - Hanger on 5 1/2" SPF beam	1.50"	Hanger[1]	1.50"	115	178	293	See note [1]
2 - Beveled Plate - SPF	1.50"	1.50"	1.50"	143	225	368	Blocking

- 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)	14' 11" o/c	
Bottom Edge (Lu)	14' 11" 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
1 - Face Mount Hanger	U26-2X SLU18	2.00"	N/A	8-10dx1.5	4-10d	

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	1 1/2" to 14' 3 1/2"	N/A	4.2	--	
1 - Uniform (PSF)	12' 8" to 14' 3 1/2"	9"	12.0	25.0	Default Load
2 - Point (lb)	6' 9"	N/A	34	73	Linked from: R2, Support 1
3 - Point (lb)	8' 9"	N/A	34	73	Linked from: R2, Support 1
4 - Point (lb)	10' 9"	N/A	34	73	Linked from: R2, Support 1
5 - Point (lb)	4' 9"	N/A	38	75	Linked from: R8, Support 1
6 - Point (lb)	2' 9"	N/A	40	77	Linked from: R9, Support 1

ForteWEB Software Operator	Job Notes
Jacob Wachtendonk Harriott Valentine Engineers (425) 281-0788 jwachtendonk@harriottvalentine.com	

Weyerhaeuser

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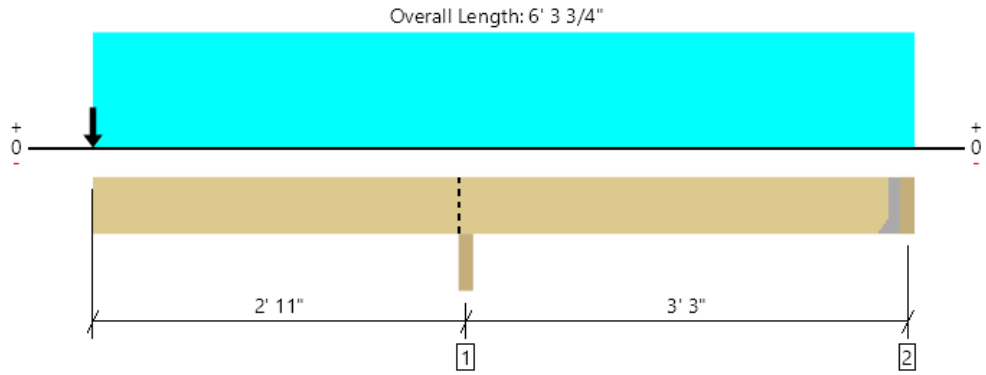
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Roof, R11

2 piece(s) 2 x 6 HF No.2



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1170 @ 2' 11"	4253 (3.50")	Passed (28%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	549 @ 2' 3 3/4"	1898	Passed (29%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	-1406 @ 2' 11"	1602	Passed (88%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.155 @ 0	0.200	Passed (2L/452)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.249 @ 0	0.292	Passed (2L/280)	--	1.0 D + 1.0 S (Alt Spans)

System : Roof
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD
Member Pitch : 0/12

- Deflection criteria: LL (L/360) and TL (L/240).
- Overhang deflection criteria: LL (2L/0.2") and TL (2L/240).
- Left cantilever length exceeds 1/3 member length or 1/2 back span length. Additional bracing should be considered.
- Allowed moment does not reflect the adjustment for the beam stability factor.
- -349 lbs uplift at support located at 6' 1/4". Strapping or other restraint may be required.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Beam - SPF	3.50"	3.50"	1.50"	442	728	1170	Blocking
2 - Hanger on 5 1/2" SPF beam	3.50"	Hanger[1]	1.50"	-122	-227	-349	See note [1]

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	6' o/c	
Bottom Edge (Lu)	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	LUS26-2	2.00"	N/A	4-10dx1.5	3-10d	

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 6' 1/4"	N/A	4.2	--	
1 - Uniform (PSF)	0 to 6' 3 3/4" (Front)	1'	12.0	25.0	Default Load
2 - Uniform (PSF)	0 to 6' 3 3/4" (Back)	1'	12.0	25.0	Default Load
3 - Point (lb)	0 (Top)	N/A	143	225	Linked from: R10, Support 2

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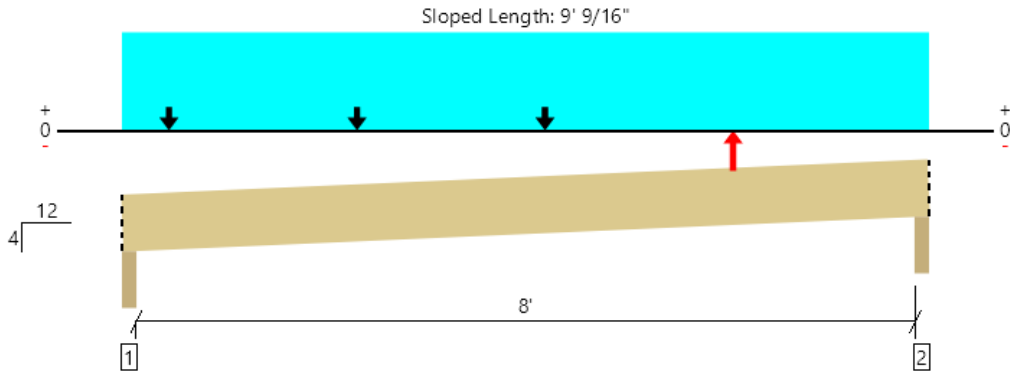
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Roof, R12

1 piece(s) 2 x 8 HF No.2



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

Member Length : 9' 3"

System : Roof
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD
Member Pitch : 4/12

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	353 @ 2"	2126 (3.50")	Passed (17%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	241 @ 10 3/8"	1251	Passed (19%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	457 @ 2' 8 15/16"	1284	Passed (36%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.050 @ 3' 8 9/16"	0.290	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.078 @ 3' 8 11/16"	0.435	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Beveled Plate - SPF	3.50"	3.50"	1.50"	124	229	353	Blocking
2 - Beveled Plate - SPF	3.50"	3.50"	1.50"	7	2	9	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	9' 1" o/c	
Bottom Edge (Lu)	9' 1" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 8' 7"	N/A	2.8	--	
1 - Uniform (PSF)	0 to 8' 7"	1'	12.0	25.0	Default Load
2 - Point (lb)	6"	N/A	40	81	Linked from: R2, Support 3
3 - Point (lb)	2' 6"	N/A	40	81	Linked from: R2, Support 3
4 - Point (lb)	4' 6"	N/A	40	81	Linked from: R2, Support 3
5 - Point (lb)	6' 6"	N/A	-122	-227	Linked from: R11, Support 2

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

ForteWEB Software Operator	Job Notes
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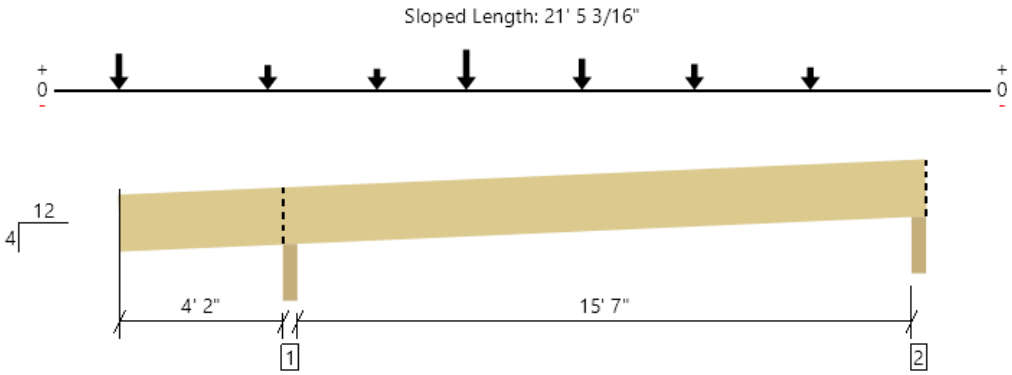
Weyerhaeuser

Roof, R13

3 piece(s) 1 3/4" x 5 1/2" 2.0E Microllam® LVL



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

Member Length : 21' 7 1/16"

System : Roof
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD
Member Pitch : 4/12

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1088 @ 4' 3 3/4"	8232 (3.50")	Passed (13%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	634 @ 4' 10 11/16"	6309	Passed (10%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	1937 @ 11' 8"	7333	Passed (26%)	1.15	1.0 D + 1.0 S (Alt Spans)
Live Load Defl. (in)	0.402 @ 12' 2 1/16"	0.557	Passed (L/499)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.618 @ 12' 3 5/8"	0.836	Passed (L/325)	--	1.0 D + 1.0 S (Alt Spans)

- Deflection criteria: LL (L/360) and TL (L/240).
- Overhang deflection criteria: LL (2L/360) and TL (2L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Beveled Plate - SPF	3.50"	3.50"	1.50"	462	626	1088	Blocking
2 - Beveled Plate - SPF	3.50"	3.50"	1.50"	152	213	365	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	21' 5" o/c	
Bottom Edge (Lu)	21' 5" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 20' 4"	N/A	8.4	--	
1 - Uniform (PSF)	0 to 20' 4"	1'	-	-	Default Load
2 - Point (lb)	11' 8"	N/A	70	145	
3 - Point (lb)	14' 6"	N/A	42	88	
4 - Point (lb)	17' 5"	N/A	26	54	
5 - Point (lb)	6' 6"	N/A	16	42	Linked from: R8, Support 3
6 - Point (lb)	3' 9"	N/A	40	77	Linked from: R9, Support 2
7 - Point (lb)	0	N/A	115	178	
8 - Point (lb)	8' 9"	N/A	124	229	Linked from: R12, Support 1

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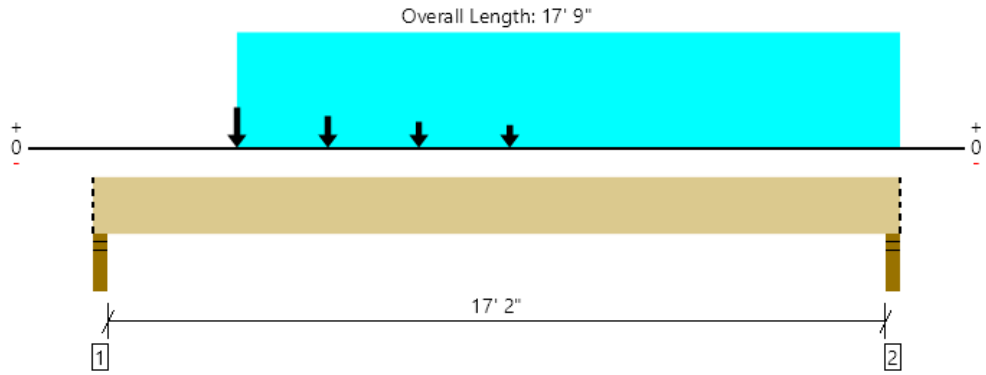
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Jacob Wachtendonk Harriott Valentine Engineers (425) 281-0788 jwachtendonk@harriottvalentine.com	

Weyerhaeuser

Roof, R14

1 piece(s) 3 1/2" x 11 7/8" 24F-V4 DF Glulam



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	2118 @ 17' 7"	4961 (3.50")	Passed (43%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1885 @ 1' 3 3/8"	8444	Passed (22%)	1.15	1.0 D + 1.0 S (All Spans)
Pos Moment (Ft-lbs)	9746 @ 8' 6 3/16"	18920	Passed (52%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.387 @ 8' 9 5/8"	0.581	Passed (L/540)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.601 @ 8' 9 5/8"	0.871	Passed (L/348)	--	1.0 D + 1.0 S (All Spans)

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

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Critical positive moment adjusted by a volume factor of 1.00 that was calculated using length L = 17' 5".
- The effects of positive or negative camber have not been accounted for when calculating deflection.
- The specified glulam is assumed to have its strong laminations at the bottom of the beam. Install with proper side up as indicated by the manufacturer.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Stud wall - HF	3.50"	3.50"	1.50"	691	1207	1898	Blocking
2 - Stud wall - HF	3.50"	3.50"	1.50"	756	1362	2118	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	17' 9" o/c	
Bottom Edge (Lu)	17' 9" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 17' 9"	N/A	10.1	--	
1 - Point (lb)	5' 2" (Front)	N/A	70	145	
2 - Point (lb)	7' 2" (Front)	N/A	42	88	
3 - Point (lb)	9' 2" (Front)	N/A	26	54	
4 - Point (lb)	3' 2" (Front)	N/A	7	2	Linked from: R12, Support 2
5 - Uniform (PLF)	3' 2" to 17' 9" (Back)	N/A	69.0	141.5	Linked from: R1, Support 2
6 - Point (lb)	3' 2" (Back)	N/A	116	216	Linked from: R7, Support 1

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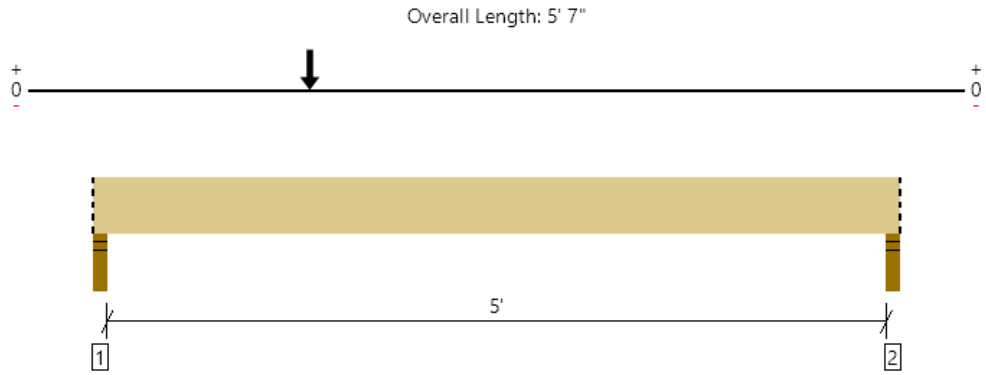
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Jacob Wachtendonk Harriott Valentine Engineers (425) 281-0788 jwachtendonk@harriottvalentine.com	

Weyerhaeuser

Roof, R15

1 piece(s) 4 x 6 HF No.1



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1430 @ 2"	4961 (3.50")	Passed (29%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1426 @ 9"	2214	Passed (64%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	1901 @ 1' 6"	2143	Passed (89%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.061 @ 2' 6 3/8"	0.262	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.097 @ 2' 6 7/16"	0.350	Passed (L/648)	--	1.0 D + 1.0 S (All Spans)

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

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Stud wall - HF	3.50"	3.50"	1.50"	529	900	1429	Blocking
2 - Stud wall - HF	3.50"	3.50"	1.50"	189	307	496	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	5' 7" o/c	
Bottom Edge (Lu)	5' 7" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 5' 7"	N/A	4.9	--	
1 - Point (lb)	1' 6" (Top)	N/A	691	1207	Linked from: R14, Support 1

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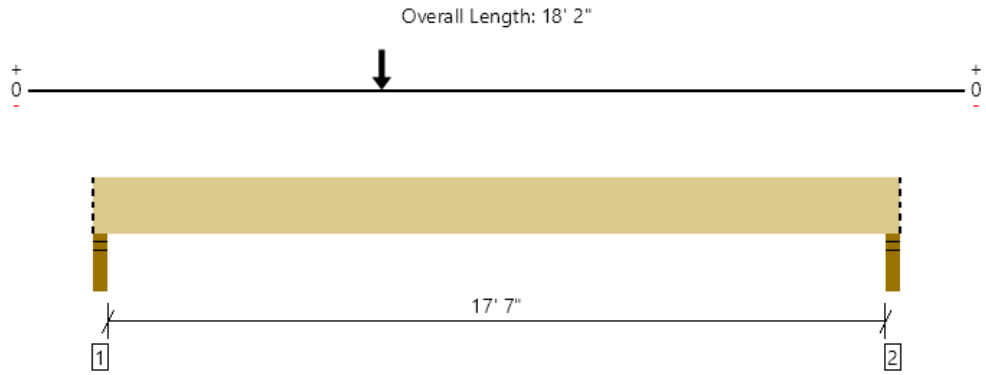
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Jacob Wachtendonk Harriott Valentine Engineers (425) 281-0788 jwachtendonk@harriottvalentine.com	

Weyerhaeuser

Roof, R16

1 piece(s) 5 1/4" x 11 7/8" 2.2E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	4430 @ 2"	7442 (3.50")	Passed (60%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	4405 @ 1' 3 3/8"	13861	Passed (32%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	27644 @ 6' 6"	34332	Passed (81%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.522 @ 8' 4 11/16"	0.892	Passed (L/410)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.813 @ 8' 5"	1.189	Passed (L/263)	--	1.0 D + 1.0 S (All Spans)

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

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Stud wall - HF	3.50"	3.50"	2.08"	1601	2829	4430	Blocking
2 - Stud wall - HF	3.50"	3.50"	1.50"	961	1558	2519	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	18' 2" o/c	
Bottom Edge (Lu)	18' 2" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 18' 2"	N/A	19.5	--	
1 - Point (lb)	6' 6" (Top)	N/A	1452	3025	
2 - Point (lb)	6' 6" (Top)	N/A	756	1362	Linked from: R14, Support 2

Weyerhaeuser Notes

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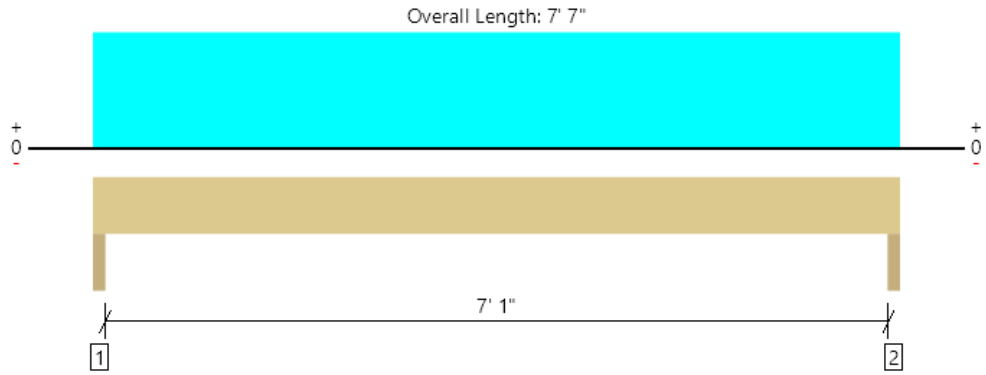
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Jacob Wachtendonk Harriott Valentine Engineers (425) 281-0788 jwachtendonk@harriottvalentine.com	

Weyerhaeuser

Roof, R17

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



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1992 @ 1 1/2"	7613 (3.00")	Passed (26%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1543 @ 10 1/4"	5544	Passed (28%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	3532 @ 3' 9 1/2"	8182	Passed (43%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.113 @ 3' 9 1/2"	0.244	Passed (L/778)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.170 @ 3' 9 1/2"	0.313	Passed (L/518)	--	1.0 D + 1.0 S (All Spans)

System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/5/16").
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Trimmer - HF	3.00"	3.00"	1.50"	665	1327	1992	None
2 - Trimmer - HF	3.00"	3.00"	1.50"	665	1327	1992	None

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 7' 7"	N/A	7.4	--	
1 - Uniform (PSF)	0 to 7' 7"	14'	12.0	25.0	Default Load

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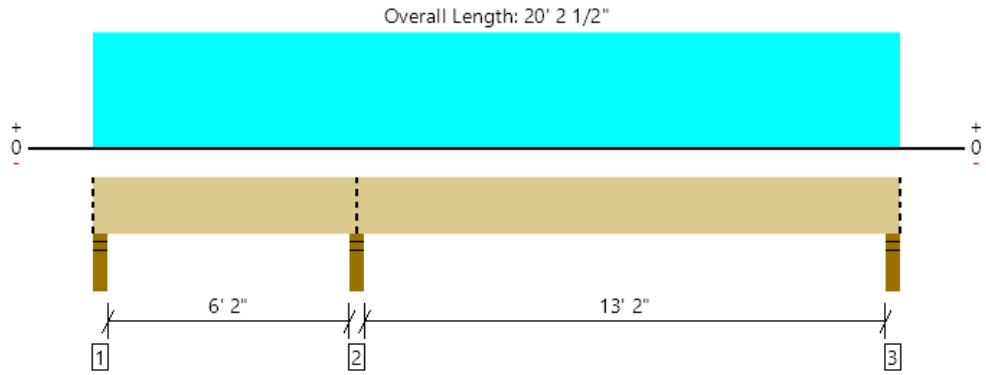
ForteWEB Software Operator	Job Notes
Jacob Wachtendonk Harriott Valentine Engineers (425) 281-0788 jwachtendonk@harriottvalentine.com	

Weyerhaeuser

Roof, R18

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



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	7368 @ 6' 7 1/4"	10413 (3.50")	Passed (71%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	3852 @ 7' 4 1/4"	11089	Passed (35%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	-9025 @ 6' 7 1/4"	16363	Passed (55%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.352 @ 13' 11 1/16"	0.448	Passed (L/458)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.529 @ 13' 11 1/4"	0.672	Passed (L/305)	--	1.0 D + 1.0 S (Alt Spans)

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

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Member should be side-loaded from both sides of the member or braced to prevent rotation.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Stud wall - HF	3.50"	3.50"	1.50"	138	679/-283	817/-283	Blocking
2 - Stud wall - SPF	3.50"	3.50"	2.48"	2528	4840	7368	Blocking
3 - Stud wall - HF	3.50"	3.50"	1.50"	1028	1991	3019	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	20' 3" o/c	
Bottom Edge (Lu)	20' 3" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 20' 2 1/2"	N/A	14.8	--	
1 - Uniform (PSF)	0 to 20' 2 1/2" (Top)	14'	12.0	25.0	Default Load

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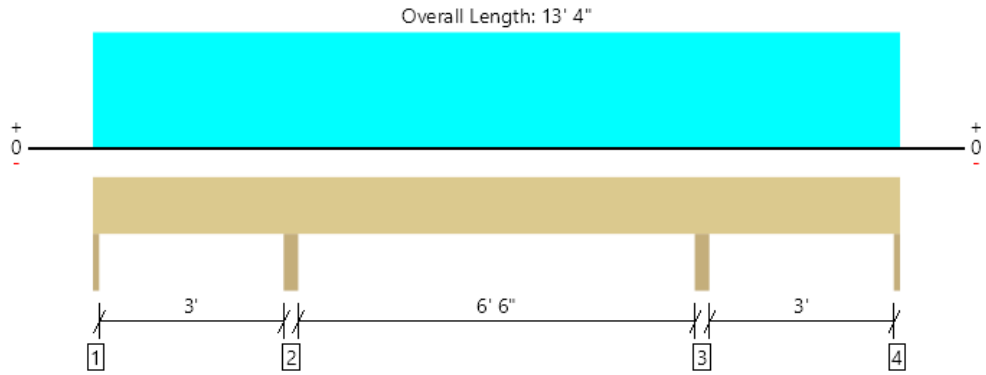
ForteWEB Software Operator	Job Notes
Jacob Wachtendonk Harriott Valentine Engineers (425) 281-0788 jwachtendonk@harriottvalentine.com	

Weyerhaeuser

Roof, R20

2 piece(s) 2 x 8 HF No.2



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1156 @ 3' 3 1/4"	4253 (3.50")	Passed (27%)	--	1.0 D + 1.0 S (Adj Spans)
Shear (lbs)	510 @ 4' 1/4"	2501	Passed (20%)	1.15	1.0 D + 1.0 S (Adj Spans)
Moment (Ft-lbs)	-627 @ 3' 3 1/4"	2569	Passed (24%)	1.15	1.0 D + 1.0 S (Adj Spans)
Live Load Defl. (in)	0.017 @ 6' 8"	0.226	Passed (L/999+)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.026 @ 6' 8"	0.313	Passed (L/999+)	--	1.0 D + 1.0 S (Alt Spans)

System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/5/16").
- 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 - Trimmer - HF	1.50"	1.50"	1.50"	42	136/-15	178/-15	None
2 - Trimmer - SPF	3.50"	3.50"	1.50"	394	762	1156	None
3 - Trimmer - SPF	3.50"	3.50"	1.50"	394	762	1156	None
4 - Trimmer - HF	1.50"	1.50"	1.50"	42	136/-15	178/-15	None

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 13' 4"	N/A	5.5	--	
1 - Uniform (PSF)	0 to 13' 4"	5'	12.0	25.0	Default Load

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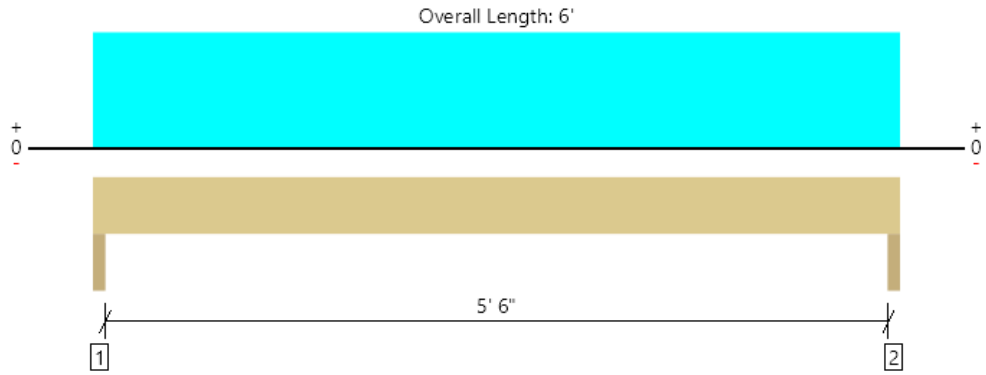
ForteWEB Software Operator	Job Notes
Jacob Wachtendonk Harriott Valentine Engineers (425) 281-0788 jwachtendonk@harriottvalentine.com	

Weyerhaeuser

Roof, R21

2 piece(s) 2 x 8 HF No.2



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	627 @ 1 1/2"	3645 (3.00")	Passed (17%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	449 @ 10 1/4"	2501	Passed (18%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	864 @ 3'	2569	Passed (34%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.027 @ 3'	0.192	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.042 @ 3'	0.287	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)

System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Trimmer - HF	3.00"	3.00"	1.50"	215	413	628	None
2 - Trimmer - HF	3.00"	3.00"	1.50"	215	413	628	None

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 6'	N/A	5.5	--	
1 - Uniform (PSF)	0 to 6'	5' 6"	12.0	25.0	Default Load

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ForteWEB Software Operator	Job Notes
Jacob Wachtendonk Harriott Valentine Engineers (425) 281-0788 jwachtendonk@harriottvalentine.com	

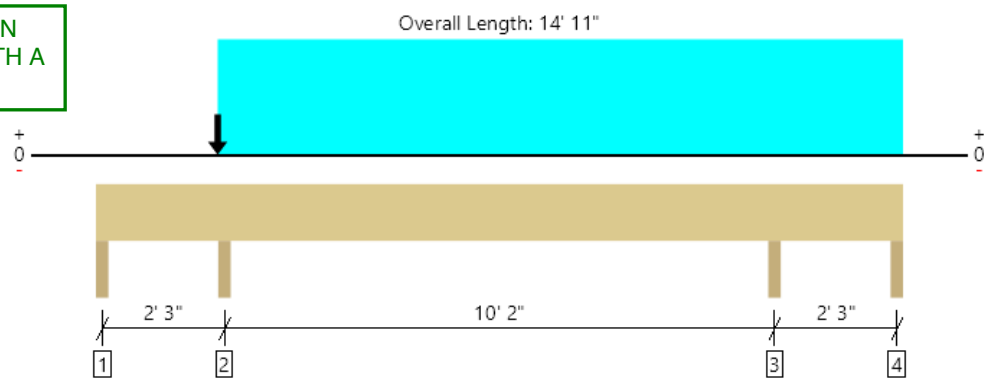
Weyerhaeuser

Roof, R22

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

An excessive uplift of -1130 lbs at support located at 1 1/2" failed this product.

THIS UPLIFT HAS BEEN ACCOUNTED FOR WITH A CS16 STRAP



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	3309 @ 2' 4 1/2"	7613 (3.00")	Passed (43%)	--	1.0 D + 1.0 S (Adj Spans)
Shear (lbs)	1502 @ 11' 9 3/4"	5544	Passed (27%)	1.15	1.0 D + 1.0 S (Adj Spans)
Moment (Ft-lbs)	-2624 @ 12' 6 1/2"	8182	Passed (32%)	1.15	1.0 D + 1.0 S (Adj Spans)
Live Load Defl. (in)	0.086 @ 7' 5 3/8"	0.339	Passed (L/999+)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.132 @ 7' 5 3/8"	0.313	Passed (L/927)	--	1.0 D + 1.0 S (Alt Spans)

System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/5/16").
- Allowed moment does not reflect the adjustment for the beam stability factor.
- -870 lbs uplift at support located at 14' 9 1/2". Strapping or other restraint may be required.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Trimmer - HF	3.00"	3.00"	1.50"	-390	-741	-1131	None
2 - Trimmer - SPF	3.00"	3.00"	1.50"	1175	2134	3309	None
3 - Trimmer - SPF	3.00"	3.00"	1.50"	1158	2146	3304	None
4 - Trimmer - HF	3.00"	3.00"	1.50"	-258	-611	-869	None

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 14' 11"	N/A	7.4	--	
1 - Uniform (PLF)	2' 3" to 14' 11"	N/A	113.0	223.0	Linked from: R1, Support 1
2 - Point (lb)	2' 3"	N/A	144	234	Linked from: R7, Support 2

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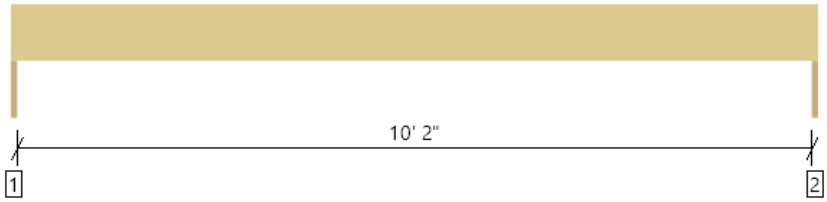
ForteWEB Software Operator	Job Notes
Jacob Wachtendonk Harriott Valentine Engineers (425) 281-0788 jwachtendonk@harriottvalentine.com	

Weyerhaeuser

Roof, R23

2 piece(s) 2 x 4 HF No.2

Overall Length: 10' 5"



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern) [Group]
Member Reaction (lbs)	14 @ 0	1823 (1.50")	Passed (1%)	--	1.0 D (All Spans) [1]
Shear (lbs)	13 @ 5"	945	Passed (1%)	0.90	1.0 D (All Spans) [1]
Moment (Ft-lbs)	36 @ 5' 2 1/2"	586	Passed (6%)	0.90	1.0 D (All Spans) [1]
Live Load Defl. (in)	0.000 @ 0	0.347	Passed (2L/999+)	--	1.0 D (All Spans) [1]
Total Load Defl. (in)	0.051 @ 5' 2 1/2"	0.313	Passed (L/999+)	--	1.0 D (All Spans) [1]

System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/5/16").
- 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	Total	
1 - Trimmer - HF	1.50"	1.50"	1.50"	14	14	None
2 - Trimmer - HF	1.50"	1.50"	1.50"	14	14	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	10' 5" o/c	
Bottom Edge (Lu)	10' 5" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Load	Location	Tributary Width	Dead (0.90)	Comments
0 - Self Weight (PLF)	0 to 10' 5"	N/A	2.7	

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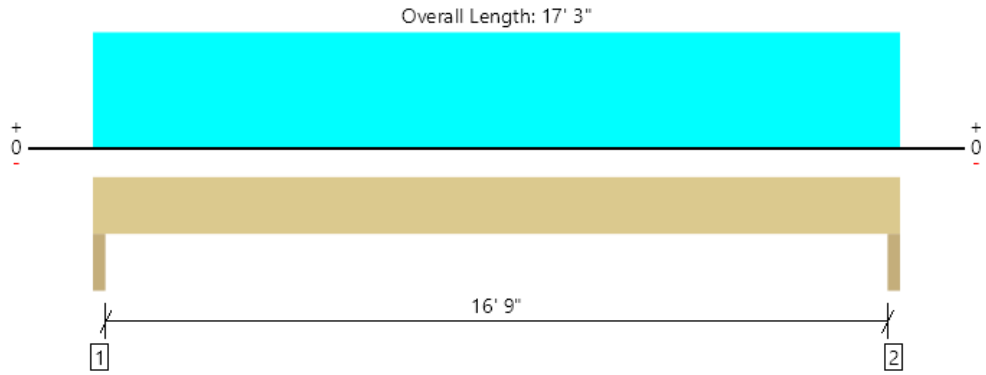
ForteWEB Software Operator	Job Notes
Jacob Wachtendonk Harriott Valentine Engineers (425) 281-0788 jwachtendonk@harriottvalentine.com	

Weyerhaeuser

Roof, R24

2 piece(s) 2 x 10 HF No.2



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	268 @ 1 1/2"	3645 (3.00")	Passed (7%)	--	1.0 D (All Spans)
Shear (lbs)	236 @ 1' 1/4"	2498	Passed (9%)	0.90	1.0 D (All Spans)
Moment (Ft-lbs)	1121 @ 8' 7 1/2"	3000	Passed (37%)	0.90	1.0 D (All Spans)
Live Load Defl. (in)	0.000 @ 0	0.567	Passed (2L/999+)	--	1.0 D (All Spans)
Total Load Defl. (in)	0.227 @ 8' 7 1/2"	0.850	Passed (L/900)	--	1.0 D (All Spans)

System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

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

Supports	Bearing Length			Loads to Supports (lbs)		Accessories
	Total	Available	Required	Dead	Total	
1 - Trimmer - HF	3.00"	3.00"	1.50"	268	268	None
2 - Trimmer - HF	3.00"	3.00"	1.50"	268	268	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	17' 3" o/c	
Bottom Edge (Lu)	17' 3" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Comments
0 - Self Weight (PLF)	0 to 17' 3"	N/A	7.0	
1 - Uniform (PSF)	0 to 17' 3"	8'	3.0	Default Load

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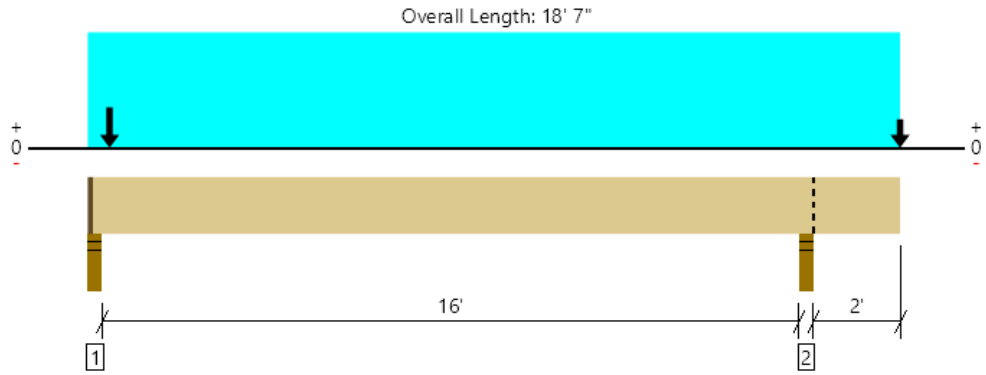
ForteWEB Software Operator	Job Notes
Jacob Wachtendonk Harriott Valentine Engineers (425) 281-0788 jwachtendonk@harriottvalentine.com	

Weyerhaeuser

Main Floor, M1

1 piece(s) 5 1/4" x 9 1/4" 2.2E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	4372 @ 2"	5020 (2.25")	Passed (87%)	--	1.0 D + 1.0 S (Alt Spans)
Shear (lbs)	2559 @ 17' 4 1/4"	10797	Passed (24%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	-5480 @ 16' 5 1/4"	21417	Passed (26%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.101 @ 18' 7"	0.200	Passed (2L/510)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.134 @ 18' 7"	0.215	Passed (2L/384)	--	1.0 D + 1.0 S (Alt Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Overhang deflection criteria: LL (2L/0.2") and TL (2L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - SPF	3.50"	2.25"	1.96"	1705	443/-2	2668	4816/-2	1 1/4" Rim Board
2 - Stud wall - SPF	3.50"	3.50"	1.50"	1459	556	1821	3836	Blocking

- Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.
- Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	18' 6" o/c	
Bottom Edge (Lu)	18' 6" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	1 1/4" to 18' 7"	N/A	15.2	--	--	
1 - Uniform (PSF)	0 to 18' 7" (Front)	8"	13.0	40.0	-	Default Load
2 - Uniform (PSF)	0 to 18' 7" (Back)	8"	13.0	40.0	-	Default Load
3 - Point (lb)	6" (Top)	N/A	1601	-	2829	Linked from: R16, Support 1
4 - Point (lb)	18' 7" (Top)	N/A	961	-	1558	Linked from: R16, Support 2

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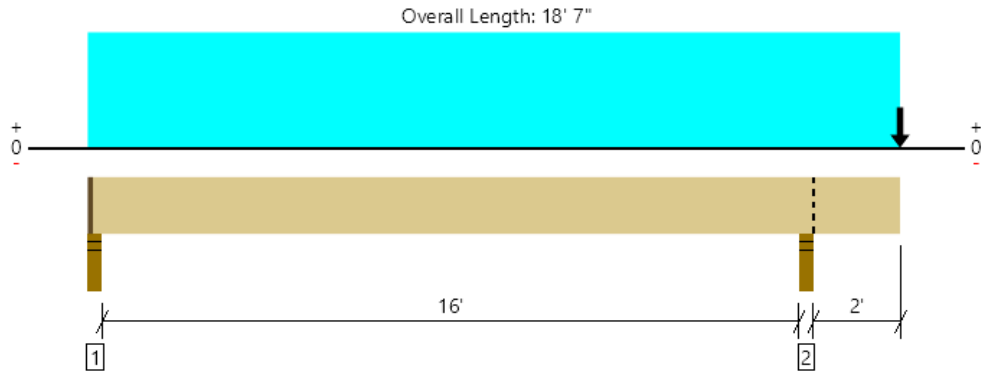
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Jacob Wachtendonk Harriott Valentine Engineers (425) 281-0788 jwachtendonk@harriottvalentine.com	

Weyerhaeuser

Main Floor, M2

1 piece(s) 5 1/4" x 9 1/2" 2.2E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	2709 @ 16' 5 1/4"	7809 (3.50")	Passed (35%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	2112 @ 17' 4 1/2"	11089	Passed (19%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	-4522 @ 16' 5 1/4"	22523	Passed (20%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.089 @ 18' 7"	0.200	Passed (2L/578)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.108 @ 18' 7"	0.215	Passed (2L/478)	--	1.0 D + 1.0 S (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Overhang deflection criteria: LL (2L/0.2") and TL (2L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - SPF	3.50"	2.25"	1.50"	178	443/-2	-185	621/-187	1 1/4" Rim Board
2 - Stud wall - SPF	3.50"	3.50"	1.50"	1104	556	1585	3245	Blocking

- Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.
- Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	18' 6" o/c	
Bottom Edge (Lu)	18' 6" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	1 1/4" to 18' 7"	N/A	15.6	--	--	
1 - Uniform (PSF)	0 to 18' 7" (Front)	8"	13.0	40.0	-	Default Load
2 - Uniform (PSF)	0 to 18' 7" (Back)	8"	13.0	40.0	-	Default Load
3 - Point (lb)	18' 7" (Front)	N/A	672	-	1400	

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

ForteWEB Software Operator	Job Notes
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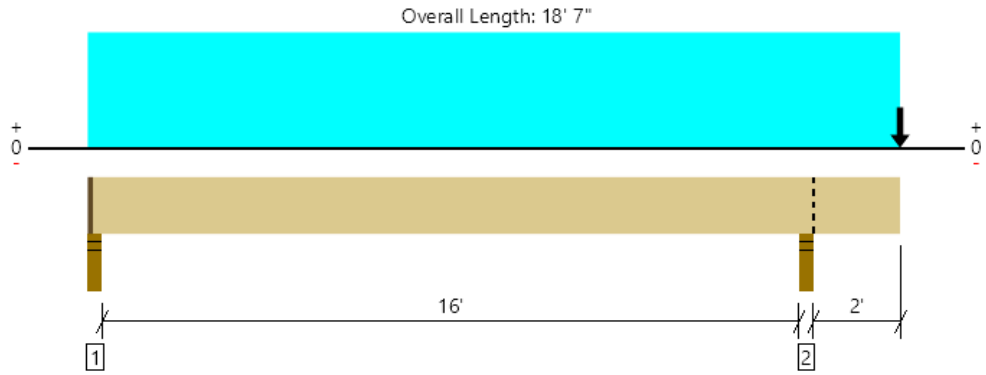
Weyerhaeuser

Main Floor, M3

1 piece(s) 5 1/4" x 9 1/4" 2.2E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	2635 @ 16' 5 1/4"	7809 (3.50")	Passed (34%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	2032 @ 17' 4 1/4"	10797	Passed (19%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	-4349 @ 16' 5 1/4"	21417	Passed (20%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.091 @ 18' 7"	0.200	Passed (2L/564)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.111 @ 18' 7"	0.215	Passed (2L/464)	--	1.0 D + 1.0 S (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Overhang deflection criteria: LL (2L/0.2") and TL (2L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - SPF	3.50"	2.25"	1.50"	176	443/-2	-175	619/-177	1 1/4" Rim Board
2 - Stud wall - SPF	3.50"	3.50"	1.50"	1092	556	1502	3150	Blocking

- Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.
- Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	18' 6" o/c	
Bottom Edge (Lu)	18' 6" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	1 1/4" to 18' 7"	N/A	15.2	--	--	
1 - Uniform (PSF)	0 to 18' 7" (Front)	8"	13.0	40.0	-	Default Load
2 - Uniform (PSF)	0 to 18' 7" (Back)	8"	13.0	40.0	-	Default Load
3 - Point (lb)	18' 7" (Top)	N/A	665	-	1327	Linked from: R17, Support 1

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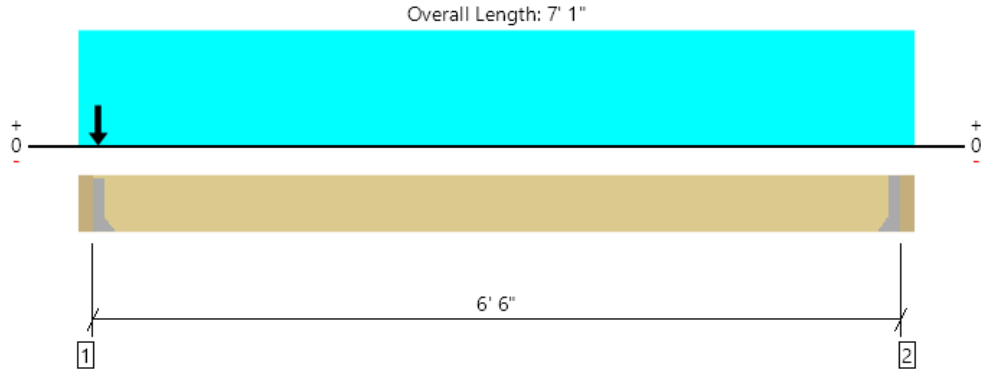
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Jacob Wachtendonk Harriott Valentine Engineers (425) 281-0788 jwachtendonk@harriottvalentine.com	

Weyerhaeuser

Main Floor, M4

1 piece(s) 2 x 10 HF No.2



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1820 @ 3 1/2"	1820 (3.00")	Passed (100%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	239 @ 1' 3/4"	1388	Passed (17%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	508 @ 3' 6 1/2"	1667	Passed (31%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.022 @ 3' 6 1/2"	0.217	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.030 @ 3' 6 1/2"	0.325	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

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

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Hanger on 9 1/4" SPF beam	3.50"	Hanger[1]	3.00"	689	248	1138	2075	See note [1]
2 - Hanger on 9 1/4" SPF beam	3.50"	Hanger[1]	1.50"	92	248	-	340	See note [1]

- At hanger supports, the Total Bearing dimension is equal to the width of the material that is supporting the hanger
- [1] See Connector grid below for additional information and/or requirements.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	6' 6" o/c	
Bottom Edge (Lu)	6' 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
1 - Face Mount Hanger	HUS28	3.00"	N/A	22-10dx1.5	8-10d	
2 - Face Mount Hanger	LUS28	1.75"	N/A	6-10dx1.5	3-10d	

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	3 1/2" to 6' 9 1/2"	N/A	3.5	--	--	
1 - Uniform (PSF)	0 to 7' 1" (Front)	1'	13.0	40.0	-	Default Load
2 - Uniform (PSF)	0 to 7' 1" (Back)	9"	13.0	40.0	-	Default Load
3 - Point (lb)	4" (Top)	N/A	597	-	1138	Linked from: R18, Support 1

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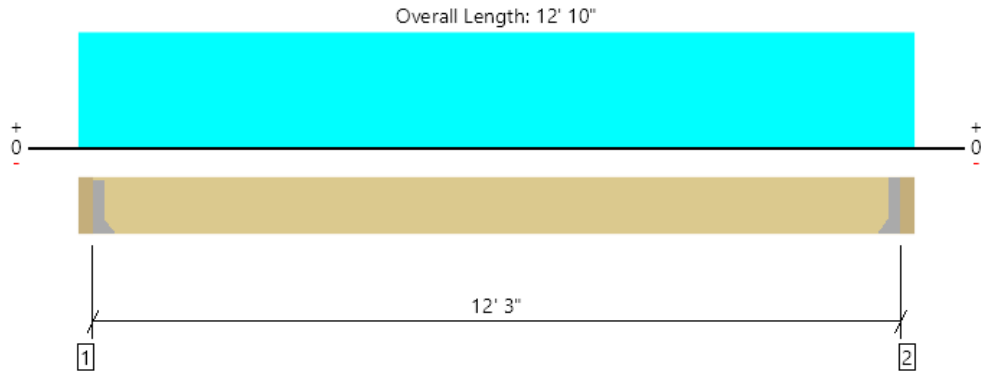
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Jacob Wachtendonk Harriott Valentine Engineers (425) 281-0788 jwachtendonk@harriottvalentine.com	

Weyerhaeuser

Main Floor, M5

2 piece(s) 2 x 10 HF No.2



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	611 @ 3 1/2"	1823 (1.50")	Passed (34%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	534 @ 1' 3/4"	2775	Passed (19%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	1872 @ 6' 5"	3333	Passed (56%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.138 @ 6' 5"	0.408	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.197 @ 6' 5"	0.613	Passed (L/748)	--	1.0 D + 1.0 L (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Total	
1 - Hanger on 9 1/4" SPF beam	3.50"	Hanger[1]	1.50"	189	449	638	See note [1]
2 - Hanger on 9 1/4" SPF beam	3.50"	Hanger[1]	1.50"	189	449	638	See note [1]

- 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)	12' 3" o/c	
Bottom Edge (Lu)	12' 3" 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
1 - Face Mount Hanger	LUS28-2	2.00"	N/A	6-10dx1.5	3-10d	
2 - Face Mount Hanger	LUS28-2	2.00"	N/A	6-10dx1.5	3-10d	

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	3 1/2" to 12' 6 1/2"	N/A	7.0	--	
1 - Uniform (PSF)	0 to 12' 10" (Front)	1'	13.0	40.0	Default Load
2 - Uniform (PSF)	0 to 12' 10" (Back)	9"	13.0	40.0	Default Load

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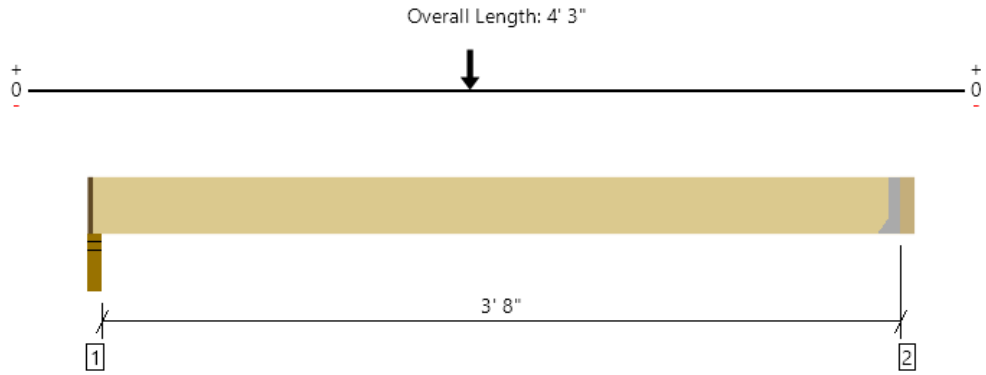
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Jacob Wachtendonk Harriott Valentine Engineers (425) 281-0788 jwachtendonk@harriottvalentine.com	

Weyerhaeuser

Main Floor, M6

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



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	2911 @ 2"	3347 (2.25")	Passed (87%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	2900 @ 1' 1"	7393	Passed (39%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	5317 @ 2'	15016	Passed (35%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.023 @ 2'	0.126	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.037 @ 2'	0.190	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

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

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - SPF	3.50"	2.25"	1.96"	1102	360	1808	3270	1 1/4" Rim Board
2 - Hanger on 9 1/2" SPF beam	3.50"	Hanger[1]	1.50"	1033	337	1693	3063	See note [1]

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	3' 10" o/c	
Bottom Edge (Lu)	3' 10" o/c	

•Maximum allowable bracing intervals based on applied load.

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

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	1 1/4" to 3' 11 1/2"	N/A	10.4	--	--	
1 - Point (lb)	2' (Back)	N/A	189	449	-	Linked from: M5, Support 1
2 - Point (lb)	2' (Front)	N/A	92	248	-	Linked from: M4, Support 2
3 - Point (lb)	2' (Top)	N/A	597	-	1138	Linked from: R18, Support 2
4 - Point (lb)	2' (Top)	N/A	1217	-	2363	Linked from: R19, Support 1

ForteWEB Software Operator	Job Notes
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Weyerhaeuser

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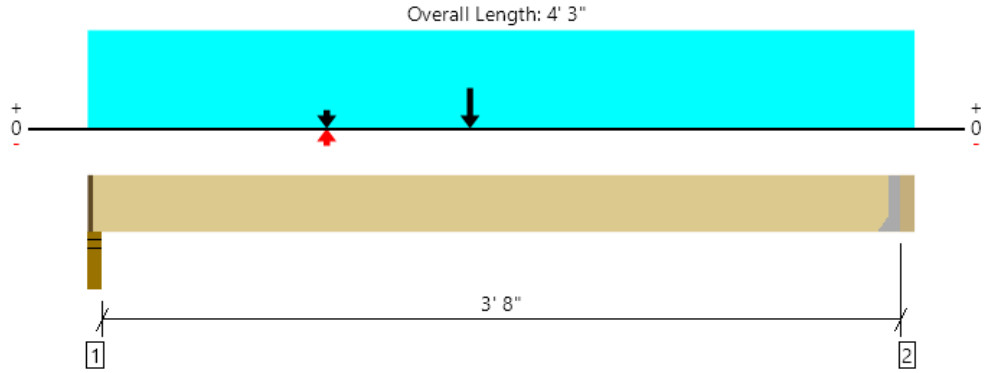
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Main Floor, M7

1 piece(s) 4 x 10 HF No.1



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern) [Group]
Member Reaction (lbs)	1810 @ 3' 11 1/2"	2126 (1.50")	Passed (85%)	--	1.0 D + 1.0 S (All Spans) [1]
Shear (lbs)	1991 @ 1' 3/4"	3723	Passed (53%)	1.15	1.0 D + 1.0 S (All Spans) [1]
Moment (Ft-lbs)	3516 @ 2'	5596	Passed (63%)	1.15	1.0 D + 1.0 S (All Spans) [1]
Live Load Defl. (in)	0.014 @ 2' 9/16"	0.126	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans) [1]
Total Load Defl. (in)	0.021 @ 2' 9/16"	0.190	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans) [1]

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

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

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - SPF	3.50"	2.25"	1.50"	688	41	1318	2047	1 1/4" Rim Board
2 - Hanger on 9 1/4" SPF beam	3.50"	Hanger[1]	1.50"	630	44	1181	1855	See note [1]

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	3' 10" o/c	
Bottom Edge (Lu)	3' 10" o/c	

•Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-Tie

Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
2 - Face Mount Hanger	LUS410	2.00"	N/A	8-16d	6-16d	

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	1 1/4" to 3' 11 1/2"	N/A	8.2	--	--	
1 - Uniform (PSF)	0 to 4' 3" (Front)	6"	13.0	40.0	-	
2 - Point (lb)	1' 3" (Top)	N/A	42	-	136/-15	Linked from: R20, Support 4
3 - Point (lb)	2' (Top)	N/A	1217	-	2363	Linked from: R19, Support 2

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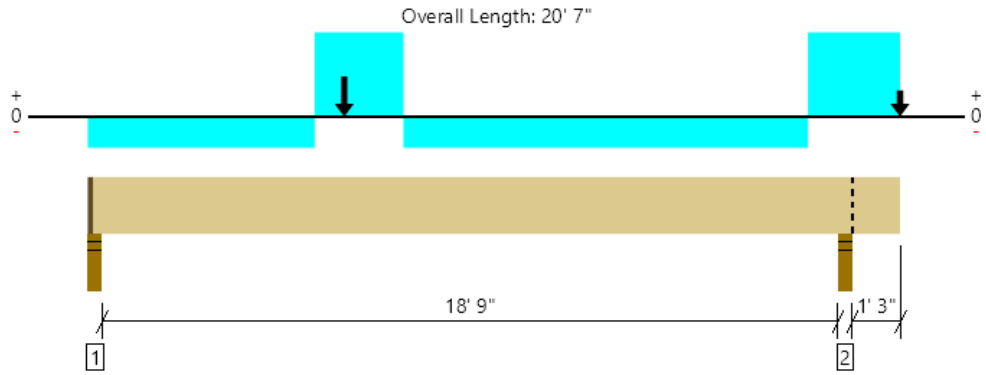
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Jacob Wachtendonk Harriott Valentine Engineers (425) 281-0788 jwachtendonk@harriottvalentine.com	

Weyerhaeuser

Main Floor, M8

1 piece(s) 5 1/4" x 11 7/8" 2.2E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern) [Group]
Member Reaction (lbs)	3996 @ 2"	5020 (2.25")	Passed (80%)	--	1.0 D + 0.75 L + 0.75 S (Alt Spans) [1]
Shear (lbs)	3482 @ 1' 3 3/8"	12053	Passed (29%)	1.00	1.0 D + 1.0 L (Alt Spans) [1]
Moment (Ft-lbs)	18494 @ 7' 9 1/2"	29854	Passed (62%)	1.00	1.0 D + 1.0 L (Alt Spans) [1]
Live Load Defl. (in)	0.548 @ 9' 3 7/8"	0.634	Passed (L/417)	--	1.0 D + 0.75 L + 0.75 S (Alt Spans) [1]
Total Load Defl. (in)	0.787 @ 9' 2 5/8"	0.951	Passed (L/290)	--	1.0 D + 0.75 L + 0.75 S (Alt Spans) [1]

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Overhang deflection criteria: LL (2L/360) and TL (2L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - SPF	3.50"	2.25"	1.79"	1236	2625/-294	1086	4947/-294	1 1/4" Rim Board
2 - Stud wall - SPF	3.50"	3.50"	2.40"	1832	2877/-421	1831	6540/-421	Blocking

- Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.
- Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	20' 6" o/c	
Bottom Edge (Lu)	20' 6" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	1 1/4" to 20' 7"	N/A	19.5	--	--	
1 - Uniform (PSF)	0 to 20' 7" (Front)	1' 3"	13.0	40.0	-	Default Load
2 - Uniform (PLF)	0 to 20' 7" (Back)	N/A	13.0	198.0/-103.0	-	Linked from: D1, Support 1
3 - Uniform (PSF)	5' 9" to 8' (Top)	8'	11.0	-	-	
4 - Uniform (PSF)	18' 3" to 20' 7" (Front)	8'	11.0	-	-	
5 - Point (lb)	6' 6" (Front)	N/A	1033	337	1693	Linked from: M6, Support 2
6 - Point (lb)	20' 7" (Front)	N/A	630	44	1181	Linked from: M7, Support 2

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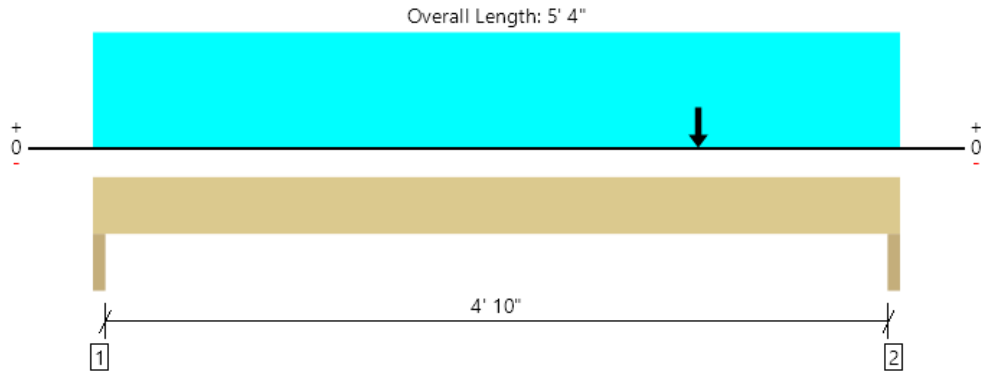
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Jacob Wachtendonk Harriott Valentine Engineers (425) 281-0788 jwachtendonk@harriottvalentine.com	

Weyerhaeuser

Main Floor, M11

2 piece(s) 1 3/4" x 11 7/8" 2.0E Microllam® LVL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	3245 @ 5' 2 1/2"	7613 (3.00")	Passed (43%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	2697 @ 4' 1 1/8"	9081	Passed (30%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	3531 @ 4'	20525	Passed (17%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.015 @ 2' 9 7/8"	0.169	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.024 @ 2' 9 15/16"	0.254	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

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

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Trimmer - HF	3.00"	3.00"	1.50"	641	1199	377	2217	None
2 - Trimmer - HF	3.00"	3.00"	1.50"	1221	1491	1208	3920	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	5' 4" o/c	
Bottom Edge (Lu)	5' 4" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 5' 4"	N/A	12.1	--	--	
1 - Uniform (PSF)	0 to 5' 4"	10'	13.0	40.0	-	Default Load
2 - Point (lb)	4'	N/A	1104	556	1585	Linked from: M2, Support 2

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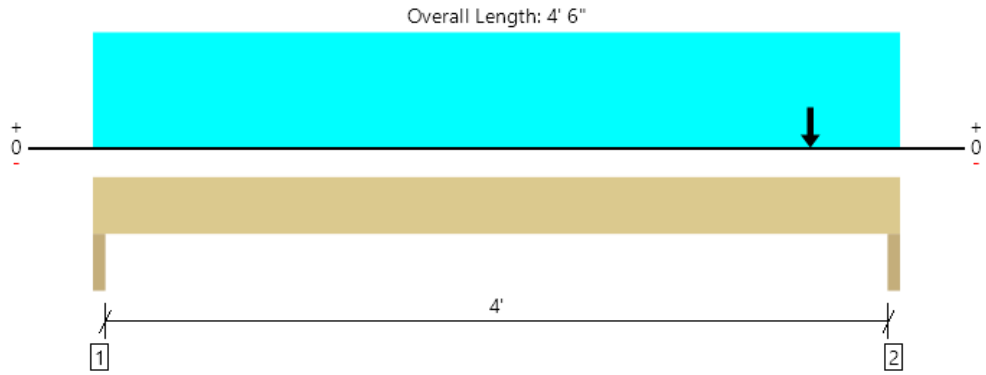
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Jacob Wachtendonk Harriott Valentine Engineers (425) 281-0788 jwachtendonk@harriottvalentine.com	

Weyerhaeuser

Main Floor, M12

2 piece(s) 2 x 8 HF No.2



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	3383 @ 4' 4 1/2"	3645 (3.00")	Passed (93%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	1284 @ 3' 7 3/4"	2175	Passed (59%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	1538 @ 2' 6 1/4"	2234	Passed (69%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.027 @ 2' 3 3/16"	0.142	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.041 @ 2' 3 9/16"	0.213	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)

System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

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

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Trimmer - HF	3.00"	3.00"	1.50"	401	949	133	1483	None
2 - Trimmer - HF	3.00"	3.00"	2.78"	1301	1407	1369	4077	None

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 4' 6"	N/A	5.5	--	--	
1 - Uniform (PSF)	0 to 4' 6"	10'	13.0	40.0	-	Default Load
2 - Point (lb)	4'	N/A	1092	556	1502	Linked from: M3, Support 2

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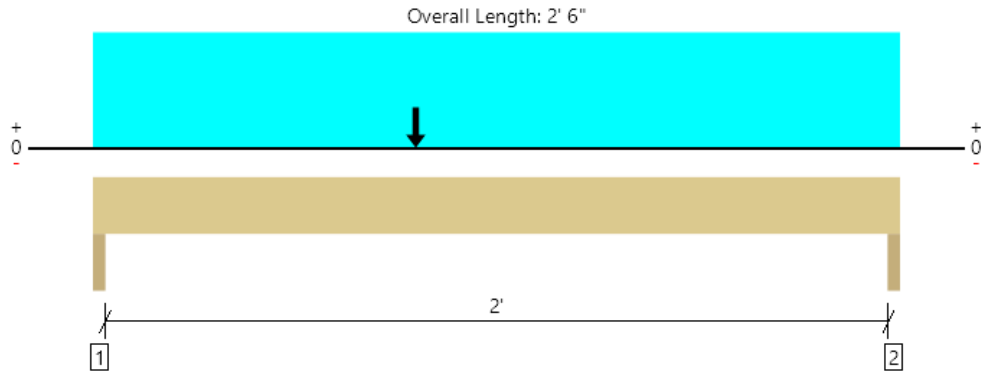
ForteWEB Software Operator	Job Notes
Jacob Wachtendonk Harriott Valentine Engineers (425) 281-0788 jwachtendonk@harriottvalentine.com	

Weyerhaeuser

Main Floor, M13

2 piece(s) 2 x 8 HF No.2



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	2211 @ 1 1/2"	3645 (3.00")	Passed (61%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	1840 @ 10 1/4"	2501	Passed (74%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	1721 @ 1'	2569	Passed (67%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.006 @ 1' 2 3/4"	0.075	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.010 @ 1' 2 3/4"	0.112	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

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

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Trimmer - HF	3.00"	3.00"	1.82"	843	720	1105	2668	None
2 - Trimmer - HF	3.00"	3.00"	1.50"	598	640	703	1941	None

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 2' 6"	N/A	5.5	--	--	
1 - Uniform (PSF)	0 to 2' 6"	10'	13.0	40.0	-	Default Load
2 - Point (lb)	1'	N/A	1102	360	1808	Linked from: M6, Support 1

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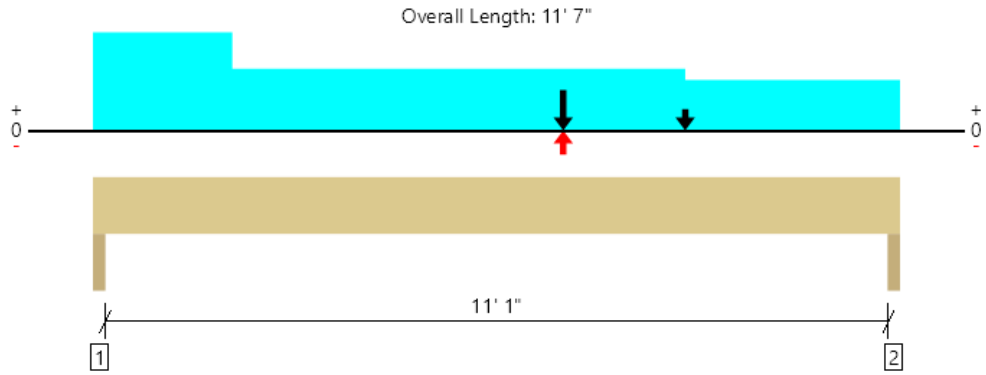
ForteWEB Software Operator	Job Notes
Jacob Wachtendonk Harriott Valentine Engineers (425) 281-0788 jwachtendonk@harriottvalentine.com	

Weyerhaeuser

Main Floor, M14

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



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern) [Group]
Member Reaction (lbs)	3863 @ 1 1/2"	6563 (3.00")	Passed (59%)	--	1.0 D + 1.0 L (All Spans) [1]
Shear (lbs)	3014 @ 1' 1/4"	6259	Passed (48%)	1.00	1.0 D + 1.0 L (All Spans) [1]
Moment (Ft-lbs)	10179 @ 6' 2 1/8"	12416	Passed (82%)	1.00	1.0 D + 1.0 L (All Spans) [1]
Live Load Defl. (in)	0.360 @ 5' 9 9/16"	0.378	Passed (L/378)	--	1.0 D + 1.0 L (All Spans) [1]
Total Load Defl. (in)	0.491 @ 5' 9 5/8"	0.567	Passed (L/277)	--	1.0 D + 1.0 L (All Spans) [1]

System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

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

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Trimmer - HF	3.00"	3.00"	1.77"	1008	2855	-77	3863/-77	None
2 - Trimmer - HF	3.00"	3.00"	1.50"	881	2407	-108	3288/-108	None

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 11' 7"	N/A	10.1	--	--	
1 - Uniform (PSF)	2' to 8' 6"	1' 9"	13.0	40.0	-	Default Load
2 - Point (lb)	6' 9"	N/A	178	443/-2	-185	Linked from: M2, Support 1
3 - Uniform (PSF)	0 to 11' 7"	8'	13.0	40.0	-	Default Load
4 - Point (lb)	8' 6"	N/A	46	58	-	Linked from: M15, Support 2
5 - Uniform (PSF)	0 to 2'	7' 6"	13.0	40.0	-	Default Load

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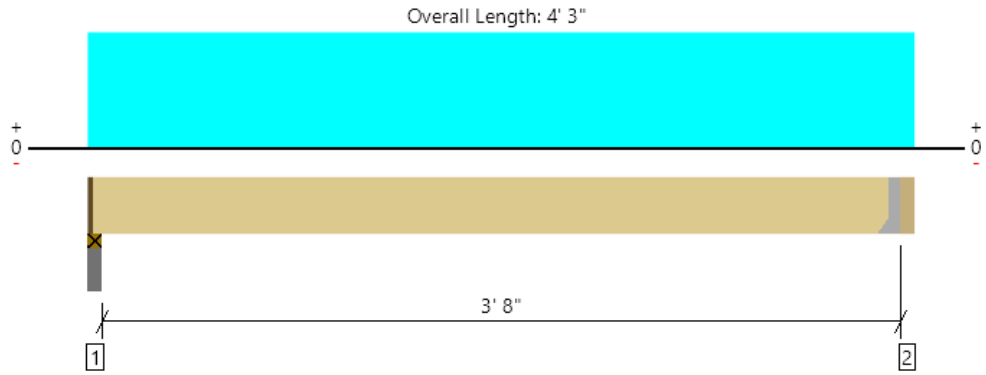
ForteWEB Software Operator	Job Notes
Jacob Wachtendonk Harriott Valentine Engineers (425) 281-0788 jwachtendonk@harriottvalentine.com	

Weyerhaeuser

Main Floor, M15

4 piece(s) 2 x 10 HF No.2



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	94 @ 3' 11 1/2"	3645 (1.50")	Passed (3%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	56 @ 3' 2 1/4"	5550	Passed (1%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	89 @ 2' 3/4"	6667	Passed (1%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.000 @ 2' 3/4"	0.126	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.000 @ 2' 3/4"	0.190	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Total	
1 - Plate on concrete - SPF	3.50"	2.25"	1.50"	45	55	100	1 1/4" Rim Board
2 - Hanger on 9 1/4" SPF beam	3.50"	Hanger[1]	1.50"	46	58	104	See note [1]

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	3' 10" o/c	
Bottom Edge (Lu)	3' 10" 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	U610R	2.00"	N/A	14-10dx1.5	6-16d	

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	1 1/4" to 3' 11 1/2"	N/A	14.1	--	
1 - Uniform (PSF)	0 to 4' 3" (Front)	8"	13.0	40.0	Default Load

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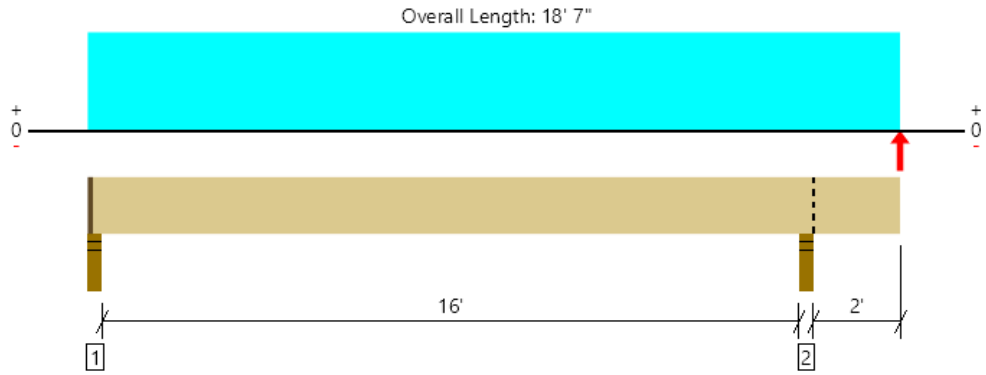
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Jacob Wachtendonk Harriott Valentine Engineers (425) 281-0788 jwachtendonk@harriottvalentine.com	

Weyerhaeuser

Main Floor, M16

2 piece(s) 2 x 10 HF No.2



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	668 @ 2"	2734 (2.25")	Passed (24%)	--	1.0 D + 1.0 L (Alt Spans)
Shear (lbs)	839 @ 17' 4 1/4"	3191	Passed (26%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	2826 @ 8' 8 3/8"	3333	Passed (85%)	1.00	1.0 D + 1.0 L (Alt Spans)
Live Load Defl. (in)	0.345 @ 8' 7 9/16"	0.542	Passed (L/566)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.550 @ 8' 7 1/2"	0.814	Passed (L/355)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Overhang deflection criteria: LL (2L/360) and TL (2L/240). Upward deflection on right cantilever exceeds overhang deflection criteria.
- Allowed moment does not reflect the adjustment for the beam stability factor.
- -730 lbs uplift at support located at 16' 5 1/4". Strapping or other restraint may be required.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - SPF	3.50"	2.25"	1.50"	232	443/-2	81	756/-2	1 1/4" Rim Board
2 - Stud wall - SPF	3.50"	3.50"	1.50"	-38	556	-692	556/-730	Blocking

- Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.
- Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	10' 7" o/c	
Bottom Edge (Lu)	18' 6" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	1 1/4" to 18' 7"	N/A	7.0	--	--	
1 - Uniform (PSF)	0 to 18' 7" (Front)	8"	13.0	40.0	-	Default Load
2 - Uniform (PSF)	0 to 18' 7" (Back)	8"	13.0	40.0	-	Default Load
3 - Point (lb)	18' 7" (Top)	N/A	-258	-	-611	Linked from: R22, Support 4

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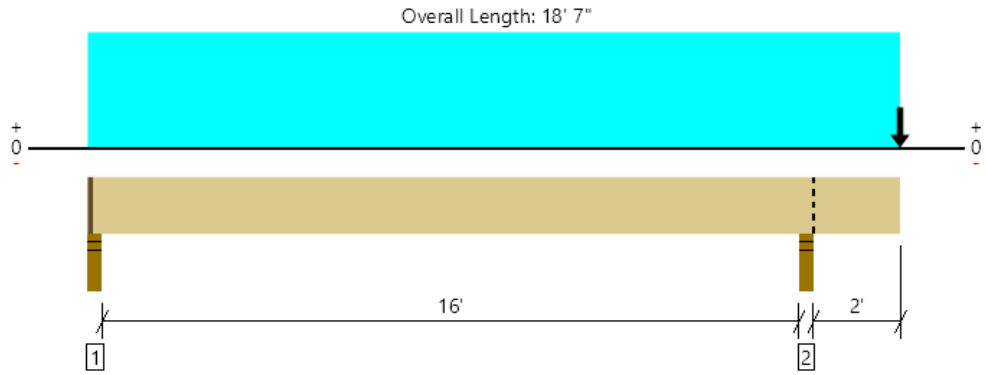
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Jacob Wachtendonk Harriott Valentine Engineers (425) 281-0788 jwachtendonk@harriottvalentine.com	

Weyerhaeuser

Main Floor, M17

1 piece(s) 5 1/4" x 9 1/4" 2.2E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	4079 @ 16' 5 1/4"	7809 (3.50")	Passed (52%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	3344 @ 17' 4 1/4"	10797	Passed (31%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	-7165 @ 16' 5 1/4"	21417	Passed (33%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.148 @ 18' 7"	0.200	Passed (2L/350)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.201 @ 18' 7"	0.215	Passed (2L/256)	--	1.0 D + 1.0 S (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Overhang deflection criteria: LL (2L/0.2") and TL (2L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - SPF	3.50"	2.25"	1.50"	111	443/-2	-283	554/-285	1 1/4" Rim Board
2 - Stud wall - SPF	3.50"	3.50"	1.83"	1650	556	2429	4635	Blocking

- Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.
- Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	18' 6" o/c	
Bottom Edge (Lu)	18' 6" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	1 1/4" to 18' 7"	N/A	15.2	--	--	
1 - Uniform (PSF)	0 to 18' 7" (Front)	8"	13.0	40.0	-	Default Load
2 - Uniform (PSF)	0 to 18' 7" (Back)	8"	13.0	40.0	-	Default Load
3 - Point (lb)	18' 7" (Top)	N/A	1158	-	2146	Linked from: R22, Support 3

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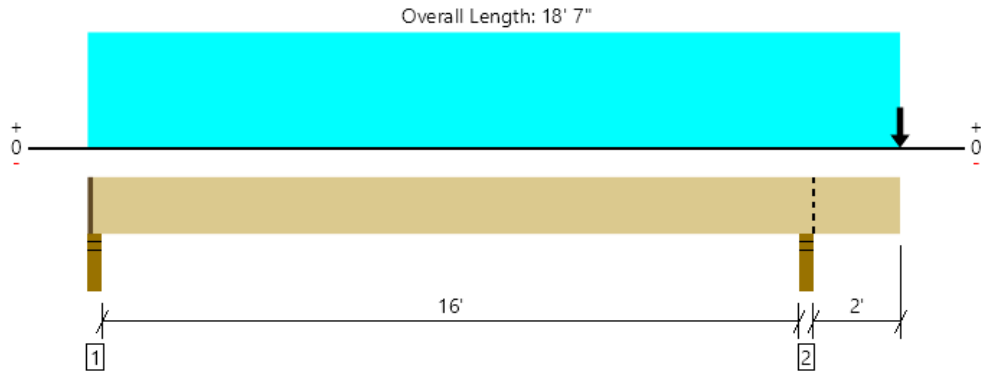
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Jacob Wachtendonk Harriott Valentine Engineers (425) 281-0788 jwachtendonk@harriottvalentine.com	

Weyerhaeuser

Main Floor, M18

1 piece(s) 5 1/4" x 9 1/4" 2.2E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	4084 @ 16' 5 1/4"	7809 (3.50")	Passed (52%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	3349 @ 17' 4 1/4"	10797	Passed (31%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	-7175 @ 16' 5 1/4"	21417	Passed (34%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.147 @ 18' 7"	0.200	Passed (2L/352)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.201 @ 18' 7"	0.215	Passed (2L/256)	--	1.0 D + 1.0 S (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Overhang deflection criteria: LL (2L/0.2") and TL (2L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - SPF	3.50"	2.25"	1.50"	109	443/-2	-281	552/-283	1 1/4" Rim Board
2 - Stud wall - SPF	3.50"	3.50"	1.83"	1669	556	2415	4640	Blocking

- Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.
- Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	18' 6" o/c	
Bottom Edge (Lu)	18' 6" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	1 1/4" to 18' 7"	N/A	15.2	--	--	
1 - Uniform (PSF)	0 to 18' 7" (Front)	8"	13.0	40.0	-	Default Load
2 - Uniform (PSF)	0 to 18' 7" (Back)	8"	13.0	40.0	-	Default Load
3 - Point (lb)	18' 7" (Top)	N/A	1175	-	2134	Linked from: R22, Support 2

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ForteWEB Software Operator	Job Notes
Jacob Wachtendonk Harriott Valentine Engineers (425) 281-0788 jwachtendonk@harriottvalentine.com	

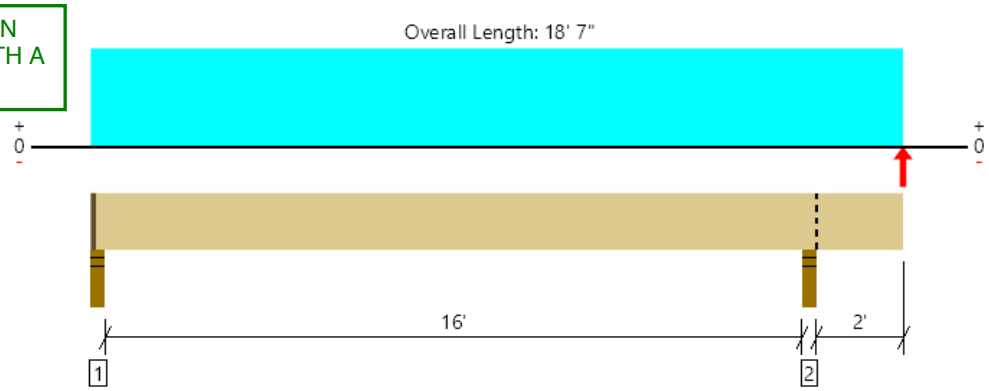
Weyerhaeuser

Main Floor, M19

2 piece(s) 2 x 10 HF No.2

An excessive uplift of -1026 lbs at support located at 16' 5 1/4" failed this product.

THIS UPLIFT HAS BEEN ACCOUNTED FOR WITH A CS20 STRAP



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	685 @ 2"	2734 (2.25")	Passed (25%)	--	1.0 D + 1.0 L (Alt Spans)
Shear (lbs)	1101 @ 17' 4 1/4"	3191	Passed (35%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	2976 @ 8' 11 1/16"	3333	Passed (89%)	1.00	1.0 D + 1.0 L (Alt Spans)
Live Load Defl. (in)	0.369 @ 8' 8 1/4"	0.542	Passed (L/530)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.605 @ 8' 8 7/16"	0.814	Passed (L/322)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Overhang deflection criteria: LL (2L/360) and TL (2L/240). Upward deflection on right cantilever exceeds overhang deflection criteria.
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - SPF	3.50"	2.25"	1.50"	250	443/-2	98	791/-2	1 1/4" Rim Board
2 - Stud wall - SPF	3.50"	3.50"	1.50"	-188	556	-839	556/-1027	Blocking

- Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.
- Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	8' 8" o/c	
Bottom Edge (Lu)	18' 6" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	1 1/4" to 18' 7"	N/A	7.0	--	--	
1 - Uniform (PSF)	0 to 18' 7" (Front)	8"	13.0	40.0	-	Default Load
2 - Uniform (PSF)	0 to 18' 7" (Back)	8"	13.0	40.0	-	Default Load
3 - Point (lb)	18' 7" (Top)	N/A	-390	-	-741	Linked from: R22, Support 1

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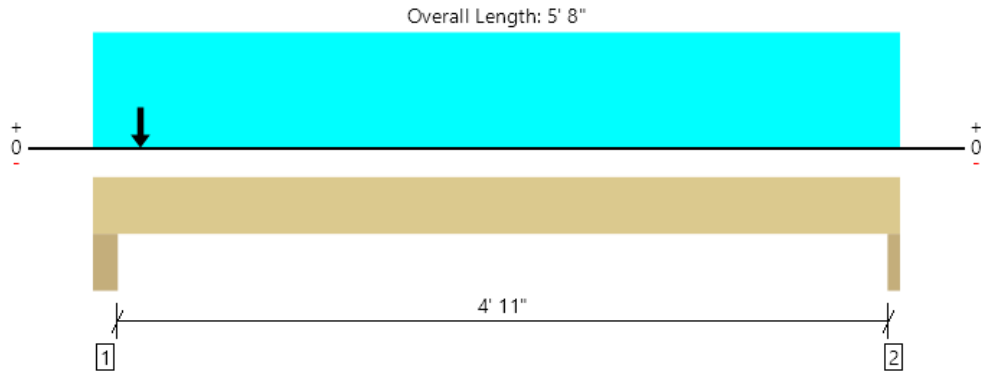
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Jacob Wachtendonk Harriott Valentine Engineers (425) 281-0788 jwachtendonk@harriottvalentine.com	

Weyerhaeuser

Main Floor, M20

2 piece(s) 2 x 8 HF No.2



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	5313 @ 4 1/2"	7290 (6.00")	Passed (73%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	1091 @ 1' 1 1/4"	2175	Passed (50%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	1964 @ 2' 11 1/2"	2234	Passed (88%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.057 @ 2' 11 1/2"	0.172	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.076 @ 2' 11 1/2"	0.258	Passed (L/814)	--	1.0 D + 1.0 L (All Spans)

System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

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

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Trimmer - HF	6.00"	6.00"	4.37"	2108	1858	2415	6381	None
2 - Trimmer - HF	3.00"	3.00"	1.50"	402	1192	-	1594	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	5' 8" o/c	
Bottom Edge (Lu)	5' 8" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 5' 8"	N/A	5.5	--	--	
1 - Uniform (PSF)	0 to 5' 8"	11'	13.0	40.0	-	Default Load
2 - Point (lb)	4"	N/A	1669	556	2415	Linked from: M18, Support 2

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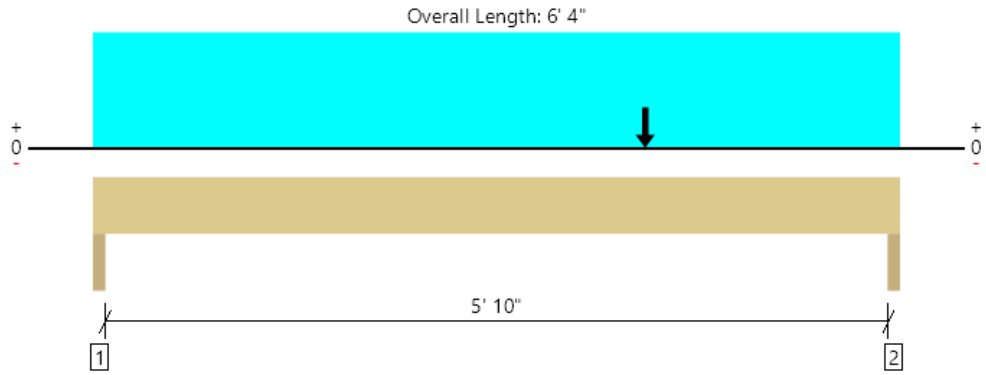
ForteWEB Software Operator	Job Notes
Jacob Wachtendonk Harriott Valentine Engineers (425) 281-0788 jwachtendonk@harriottvalentine.com	

Weyerhaeuser

Main Floor, M21

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



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	4211 @ 6' 2 1/2"	7613 (3.00")	Passed (55%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	3801 @ 5' 5 3/4"	5544	Passed (69%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	6939 @ 4' 4"	8182	Passed (85%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.129 @ 3' 3 13/16"	0.203	Passed (L/566)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.209 @ 3' 3 7/8"	0.304	Passed (L/349)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

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

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Trimmer - HF	3.00"	3.00"	1.50"	985	1565	749	3299	None
2 - Trimmer - HF	3.00"	3.00"	1.66"	1618	1778	1680	5076	None

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 6' 4"	N/A	7.4	--	--	
1 - Uniform (PSF)	0 to 6' 4"	11'	13.0	40.0	-	Default Load
2 - Point (lb)	4' 4"	N/A	1650	556	2429	Linked from: M17, Support 2

Weyerhaeuser Notes

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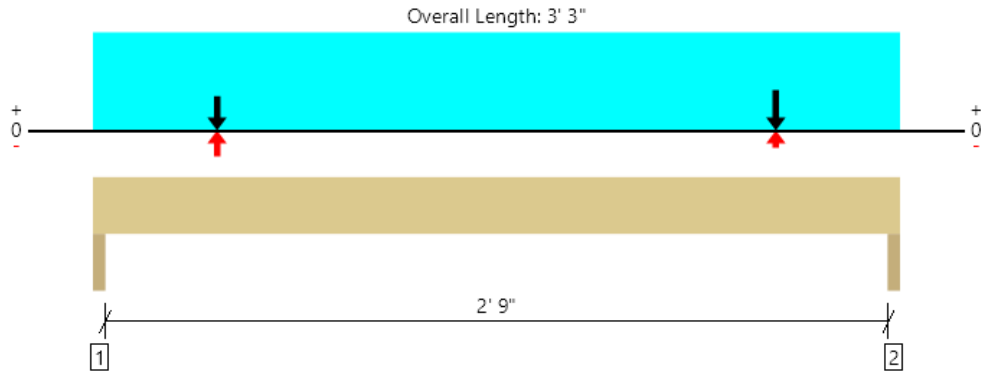
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Jacob Wachtendonk Harriott Valentine Engineers (425) 281-0788 jwachtendonk@harriottvalentine.com	

Weyerhaeuser

Main Floor, M22

2 piece(s) 2 x 6 HF No.2



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern) [Group]
Member Reaction (lbs)	1356 @ 3' 1 1/2"	3645 (3.00")	Passed (37%)	--	1.0 D + 1.0 L (All Spans) [1]
Shear (lbs)	746 @ 2' 6 1/2"	1650	Passed (45%)	1.00	1.0 D + 1.0 L (All Spans) [1]
Moment (Ft-lbs)	712 @ 1' 7 15/16"	1393	Passed (51%)	1.00	1.0 D + 1.0 L (All Spans) [1]
Live Load Defl. (in)	0.017 @ 1' 7 1/2"	0.100	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans) [1]
Total Load Defl. (in)	0.023 @ 1' 7 5/8"	0.150	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans) [1]

System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

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

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Trimmer - HF	3.00"	3.00"	1.50"	302	963	-238	1265/-238	None
2 - Trimmer - HF	3.00"	3.00"	1.50"	393	963	36	1392	None

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 3' 3"	N/A	4.2	--	--	
1 - Uniform (PSF)	0 to 3' 3"	8'	13.0	40.0	-	Default Load
2 - Point (lb)	6"	N/A	111	443/-2	-283	Linked from: M17, Support 1
3 - Point (lb)	2' 9"	N/A	232	443/-2	81	Linked from: M16, Support 1

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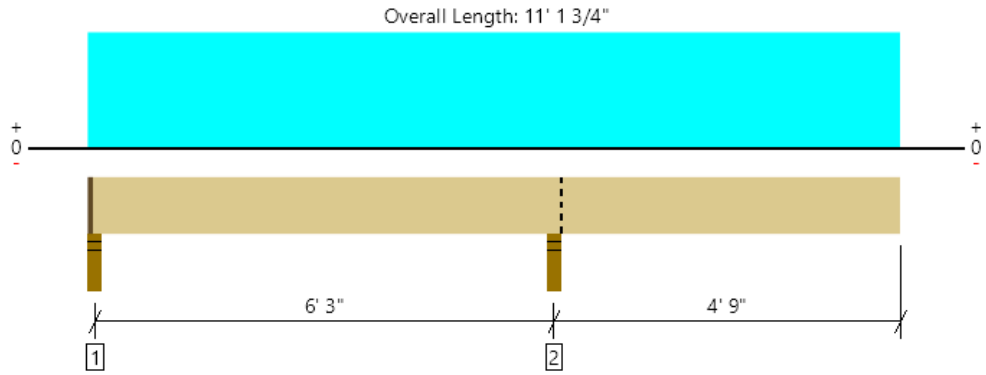
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Jacob Wachtendonk Harriott Valentine Engineers (425) 281-0788 jwachtendonk@harriottvalentine.com	

Weyerhaeuser

Deck, D1

1 piece(s) 2 x 8 HF No.2 @ 12" OC



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	667 @ 6' 4 3/4"	2126 (3.50")	Passed (31%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	288 @ 5' 7 3/4"	1088	Passed (26%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	-778 @ 6' 4 3/4"	1284	Passed (61%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.292 @ 11' 1 3/4"	0.317	Passed (2L/390)	--	1.0 D + 1.0 L (Alt Spans)
Total Load Defl. (in)	0.324 @ 11' 1 3/4"	0.475	Passed (2L/352)	--	1.0 D + 1.0 L (Alt Spans)
TJ-Pro™ Rating	N/A	N/A	N/A	--	N/A

System : Floor
Member Type : Joist
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Overhang deflection criteria: LL (2L/360) and TL (2L/240).
- Right cantilever length exceeds 1/3 member length or 1/2 back span length. Additional bracing should be considered.
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A 15% increase in the moment capacity has been added to account for repetitive member usage.
- Applicable calculations are based on NDS.
- No composite action between deck and joist was considered in analysis.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Total	
1 - Stud wall - HF	3.50"	2.25"	1.50"	13	198/-103	211/-103	1 1/4" Rim Board
2 - Stud wall - HF	3.50"	3.50"	1.50"	87	580	667	Blocking

- Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.
- Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	11' 1" o/c	
Bottom Edge (Lu)	10' 4" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Floor Live (1.00)	Comments
1 - Uniform (PSF)	0 to 11' 1 3/4"	12"	9.0	60.0	Default Load

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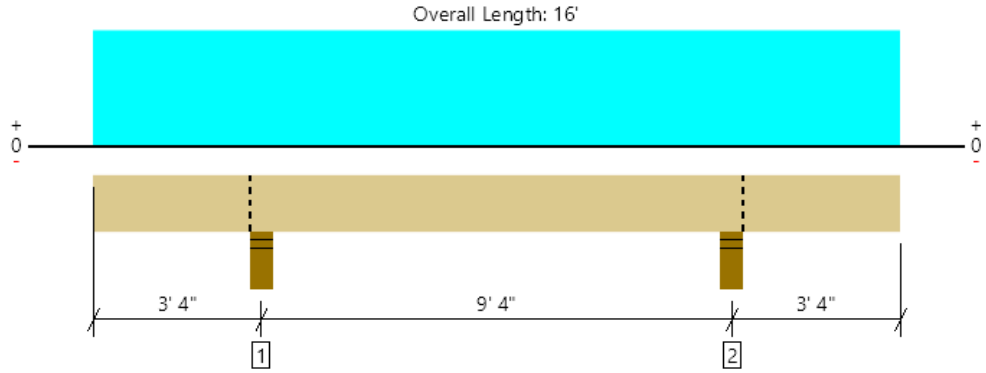
ForteWEB Software Operator	Job Notes
Jacob Wachtendonk Harriott Valentine Engineers (425) 281-0788 jwachtendonk@harriottvalentine.com	

Weyerhaeuser

Deck, D2

1 piece(s) 6 x 12 HF No.2



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	5809 @ 3' 4"	12251 (5.50")	Passed (47%)	--	1.0 D + 1.0 L (Adj Spans)
Shear (lbs)	2722 @ 4' 6 1/4"	5903	Passed (46%)	1.00	1.0 D + 1.0 L (Adj Spans)
Moment (Ft-lbs)	6865 @ 8'	6819	Passed (101%)	1.00	1.0 D + 1.0 L (Alt Spans)
Live Load Defl. (in)	0.133 @ 0	0.222	Passed (2L/600)	--	1.0 D + 1.0 L (Alt Spans)
Total Load Defl. (in)	0.131 @ 0	0.333	Passed (2L/612)	--	1.0 D + 1.0 L (Alt Spans)

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

- Deflection criteria: LL (L/360) and TL (L/240).
- Overhang deflection criteria: LL (2L/360) and TL (2L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Lumber grading provisions must be extended over the length of the member per NDS 4.2.5.5.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Total	
1 - Stud wall - SPF	5.50"	5.50"	2.61"	824	4985	5809	Blocking
2 - Stud wall - SPF	5.50"	5.50"	2.61"	824	4985	5809	Blocking

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

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 16'	N/A	16.0	--	
1 - Uniform (PLF)	0 to 16' (Top)	N/A	87.0	580.0	Linked from: D1, Support 2

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Sherland Steel Beams

M9

Vmax	5.95	k	
Mmax	15.83	k	
EI req	1.88E+09	lbin2	
V	41.4	k	OK
M	28.7	k	OK
EI	2.18E+09	lbin2	OK
Use	**W8x21**		

M10

Vmax	5.58	k	
Mmax	18.49	k	
EI req	2.19E+09	lbin2	
V	38.9	k	OK
M	41.2	k	OK
EI	2.40E+09	lbin2	OK
Use	**W8x24**		

Seismic Overstrength

Main Floor

Beam ID	Demand		Capacity		
M2	Vmax	13.17 k	Vr =	15.02 k	OK
	Mmax	26.10 k-ft	Mr =	29.80 k-ft	OK
			use	**PSL 5-1/4x 9-1/4**	
M3	Vmax	13.16 k	Vr =	15.02 k	OK
	Mmax	26.08 k-ft	Mr =	29.80 k-ft	OK
			use	**PSL 5-1/4x 9-1/4**	
M11	Vmax	11.60 k	Vr =	12.64 k	OK
	Mmax	9.51 k-ft	Mr =	28.56 k-ft	OK
			use	**(2) LVL 1-3/4x11-7/8**	
M14	Vmax	1.28 k	Vr =	10.02 k	OK
	Mmax	1.31 k-ft	Mr =	19.86 k-ft	OK
			use	**PSL 3-1/2x9-1/4**	

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WOOD COLUMN

4x

Capacity

Species:	DF #2			
Size:	4x			
Fc* =	1300 psi	Fc ⊥ =	405 psi	
E =	1.60E+06 psi			
c' =	0.8			
d =	3.5 in			
KcE =	0.3			

le (ft)	le (in)	FcE (psi)	F'c (psi)	4x4 Pa (lb)	4x6 Pa (lb)	4x8 Pa (lb)	4x10 Pa (lb)
Pa (perp)				4961	7796	10277	13112
8.00	96.00	638	555	6802	10688	14089	17976
8.50	102.00	565	502	6150	9664	12738	16252
9.00	108.00	504	455	5575	8760	11548	14734
9.50	114.00	452	414	5069	7966	10500	13397
10.00	120.00	408	377	4624	7266	9578	12220
10.50	126.00	370	345	4231	6649	8764	11182
11.00	132.00	337	317	3883	6103	8044	10263
11.50	138.00	309	292	3575	5618	7406	9449
12.00	144.00	284	269	3301	5187	6838	8724

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WOOD COLUMN

2x4 MULTI-STUD

Capacity

Species: HF stand.
Size: 2x4

Fc* = 1300 psi Fc ⊥ = 405 psi
E = 1.20E+06 psi
c' = 0.8
d = 3.5 in
KcE = 0.3

le (ft)	le (in)	FcE (psi)	F'c (psi)	(2)2x4 Pa (lb)	(3)2x4 Pa (lb)	(4)2x4 Pa (lb)	(5)2x4 Pa (lb)
Pa (perp)				4253	6379	8505	10631
8.00	96.00	479	435	4566	6848	9131	11414
8.50	102.00	424	390	4099	6148	8198	10247
9.00	108.00	378	352	3696	5543	7391	9239
9.50	114.00	339	319	3346	5019	6691	8364
10.00	120.00	306	290	3041	4562	6083	7603
10.50	126.00	278	264	2775	4163	5550	6938
11.00	132.00	253	242	2541	3812	5083	6353
11.50	138.00	232	222	2335	3503	4670	5838
12.00	144.00	213	205	2152	3229	4305	5381

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SECTION 3: LATERAL

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SEISMIC LOADS

Per ASCE 7-16
Equivalent Lateral Force Procedure

Occupancy Category	II		Table 1-1
Seismic Design Category	D		Table 11.6-1
Importance Factor	1.00		Table 11.5-1
Site Class	D		Table 20.3-1
S_S	1.46	g	(from SEAOC Design Tool)
S_1	0.50	g	(from SEAOC Design Tool)
F_a	1.20		Table 11.4-1
F_v	1.80		Table 11.4-2
C_t	0.02		Table 12.8-2
x	0.75		Table 12.8-2
h_n	19.00	feet	(height to highest level)

$S_{MS} = Fa*Ss$	1.7484		Eq. 11.4-1
$S_{M1} = Fv*S1$	0.9039		Eq. 11.4-2
$S_{DS} = (2/3)*S_{MS}$	1.1656	g	Eq. 11.4-3
$S_{D1} = (2/3)*S_{M1}$	0.6026	g	Eq. 11.4-4
Period $T_a = C_t*h_n^x$	0.1820	s	Eq. 12.8-7
T_o	0.1034	s	per section 11.4.5
T_S	0.5170	s	per section 11.4.5
S_a	1.1656	g	per section 11.4.5

R	6.5	Table 12.2-1
Ωo	3	Table 12.2-1
C_d	4	Table 12.2-1
Section 12.8 ok?	Yes	Table 12.6-1

Equivalent Lateral Force Procedure (section 12.8)

Cs	0.1793		Eq. 12.8-2
W, weight	84,654	lb	per table below
Q_E	15,180	lb	Eq. 12.8-1

Vertical Force Distribution (section 12.8.3)
k = 1.00

Level	Hx	Floor Area	Seismic Dead Ld	Floor Wt.	Wall Length	Wall Wt.	Total Wt.	WxHx	Cvx	(LRFD) Q_E	(ASD) $0.7Q_E$
	(ft)	(ft2)	(psf)	(k)	(ft)	(k)	(k)	(k-ft)	(%)	(k)	(k)
Roof	19.00	2731	13	35.5	156	7.8	43.3	822.7	68.9	10.45	7.32
Main Level	9.00	2412	13	31.4	100	10.0	41.4	372.2	31.1	4.73	3.31
							84.65	1194.90	100.00	15.18	**10.63**

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WIND LOADS

Per ASCE 7-16, Chapter 26
Directional Method

Exposure	B	(Ch. 26.7.3)	**Mean Roof Height**	19	ft
V	110	mph	**Max Roof Height**	21	ft
k_{zt}	1.6	(SDCI Wind Map)	**Length of Long Side**	65.5	ft
k_d	0.85	(Table 26.6-1)	**Length of Short Side**	50.5	ft
k_e	1	(Table 26.9-1)	**Roof Angle**	18	deg
$\pm(GC_{pi})$	0.18	(Table 26.13-1)			
G	0.85	(Section 26.11.1)			

h (ft)	kz	qz (psf)
9 - 21	0.6327	26.7
0 - 9	0.4967	20.9
	Table 26.10.1	Section 26.10.2

LONGITUDINAL WIND

N-S
h/L 0.29
L/b 1.297

Windward

C_p 0.8 (Figure 27.3-1)
(Section 23.3.1)

h (ft)	p (psf)
9-21	22.9
0-9	19.0

Leeward

C_p -0.44 (Figure 27.3-1)

p (psf)	-14.8

Roof

Windward

C_p -0.20

Horz psf	-3.0
Vert psf	-8.9

		15	18.434949	20
		2		3
0.25	1	-0.5		-0.3
0.2900763		-0.33969	-0.2022967	-0.1397
0.375	2	0		0.2

Leeward

C_p -0.57

Horz psf	-5.6
Vert psf	-16.8

		15.00	18.434949	20.00
		2		3
0.25	1	-0.50		-0.60
0.29		-0.5	-0.568699	-0.6
0.375	2	-0.5		-0.6

TRANSVERSE WIND

E-W
h/L 0.38
L/b 0.771

Windward

C_p 0.8

h (ft)	p (psf)
9-21	22.9
0-9	19.0

Leeward

C_p -0.50

p (psf)	-16.1

Roof

Windward

C_p 0.14

Horz psf	-0.5
Vert psf	-1.6

		15	18.434949	20
		2		3
0.375	2	0		0.2
0.3762376		0	0.1360376	0.19802
0.5	3	0		0

Leeward

C_p -0.56

Horz psf	-5.6
Vert psf	-16.7

		15.00	18.434949	20.00
		2		3
0.375	2	-0.50		-0.60
0.38		-0.49505	-0.5630683	-0.5941
0.5	3	0		0

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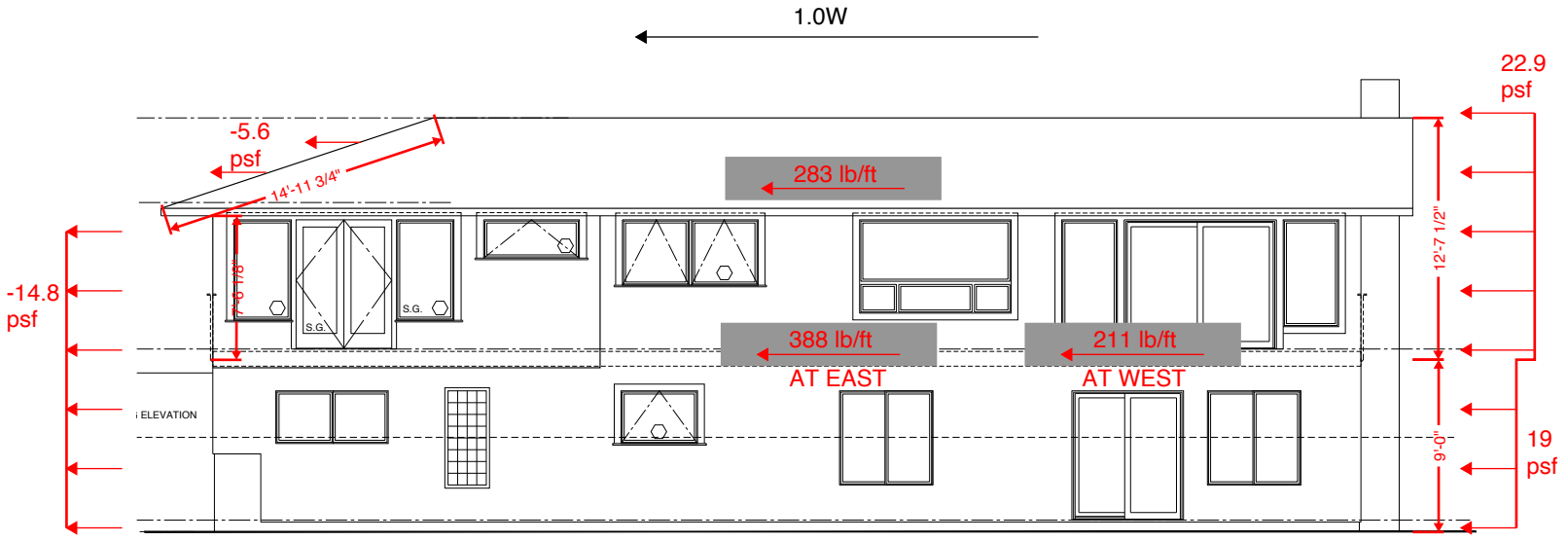
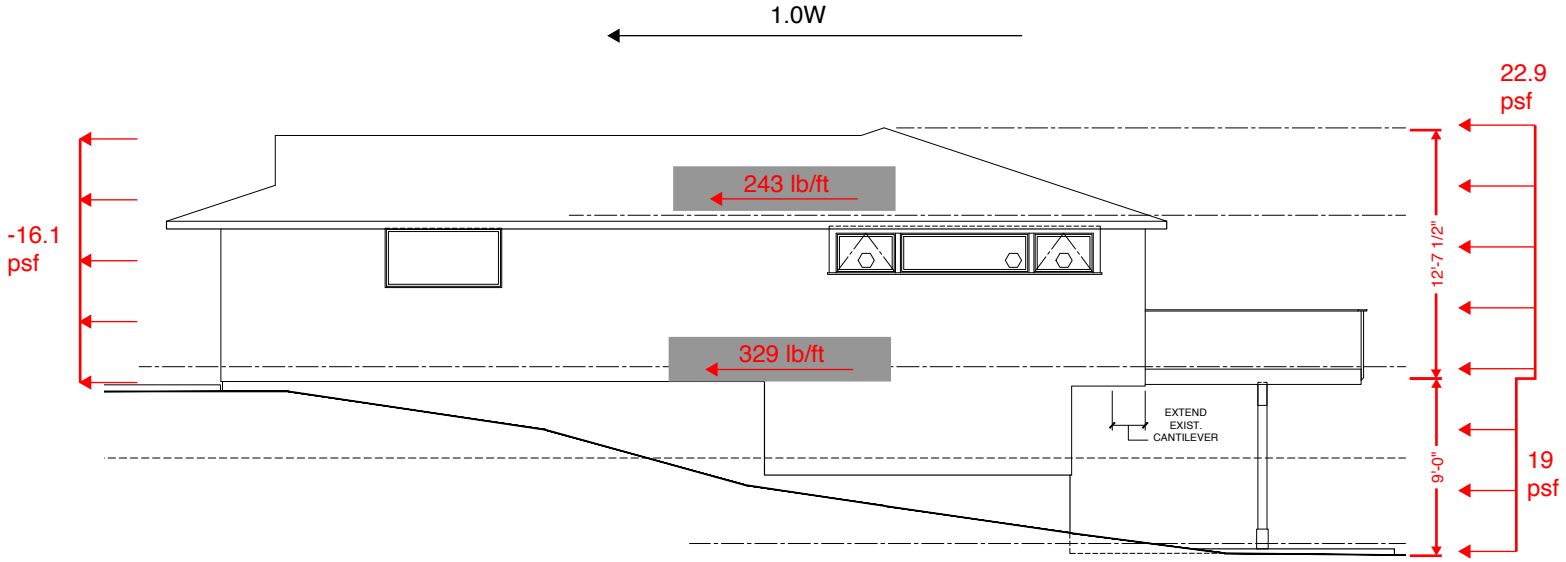
1.0W : NORTH-SOUTH

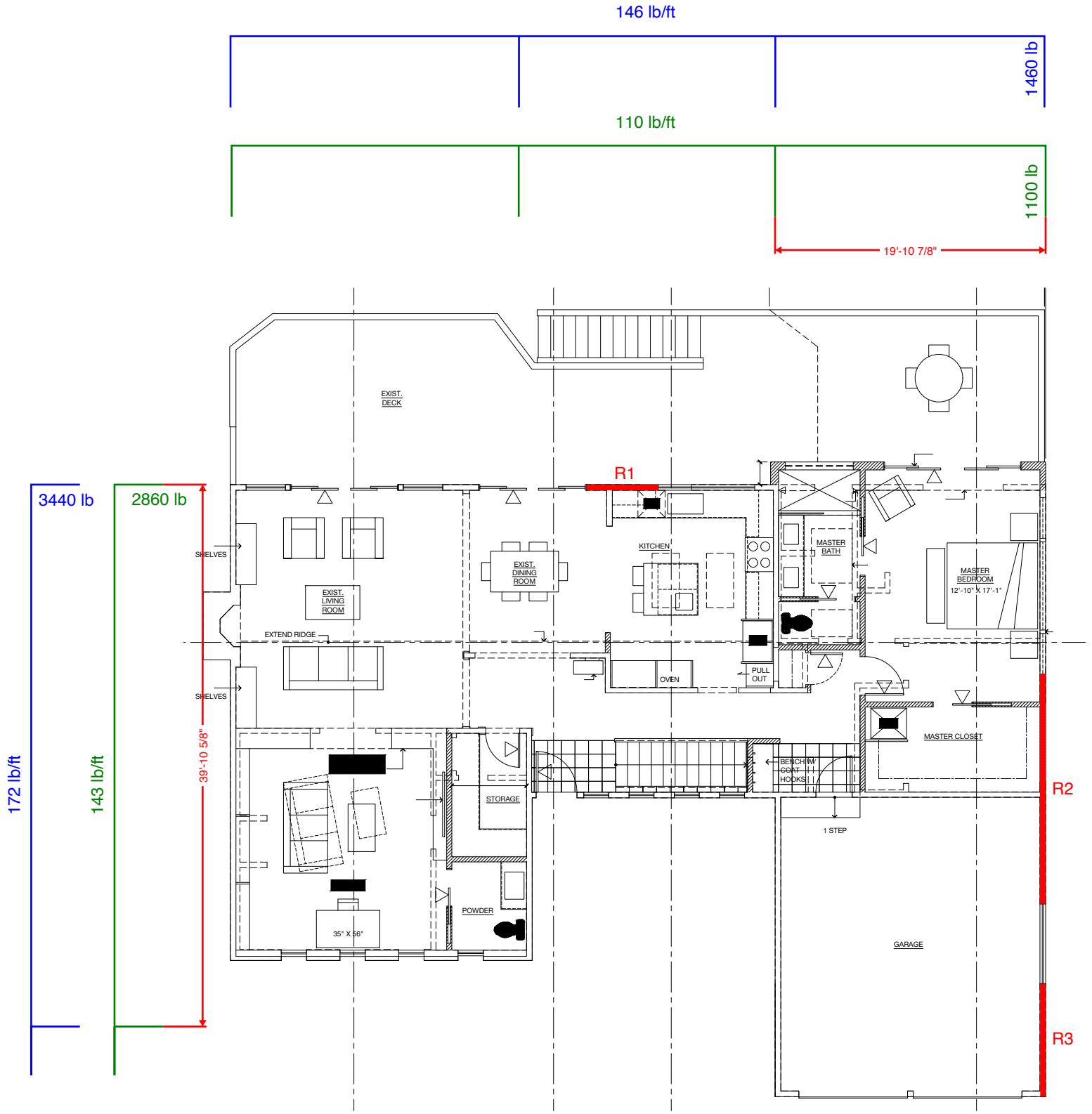
233 lb/ft



1.0W : EAST-WEST



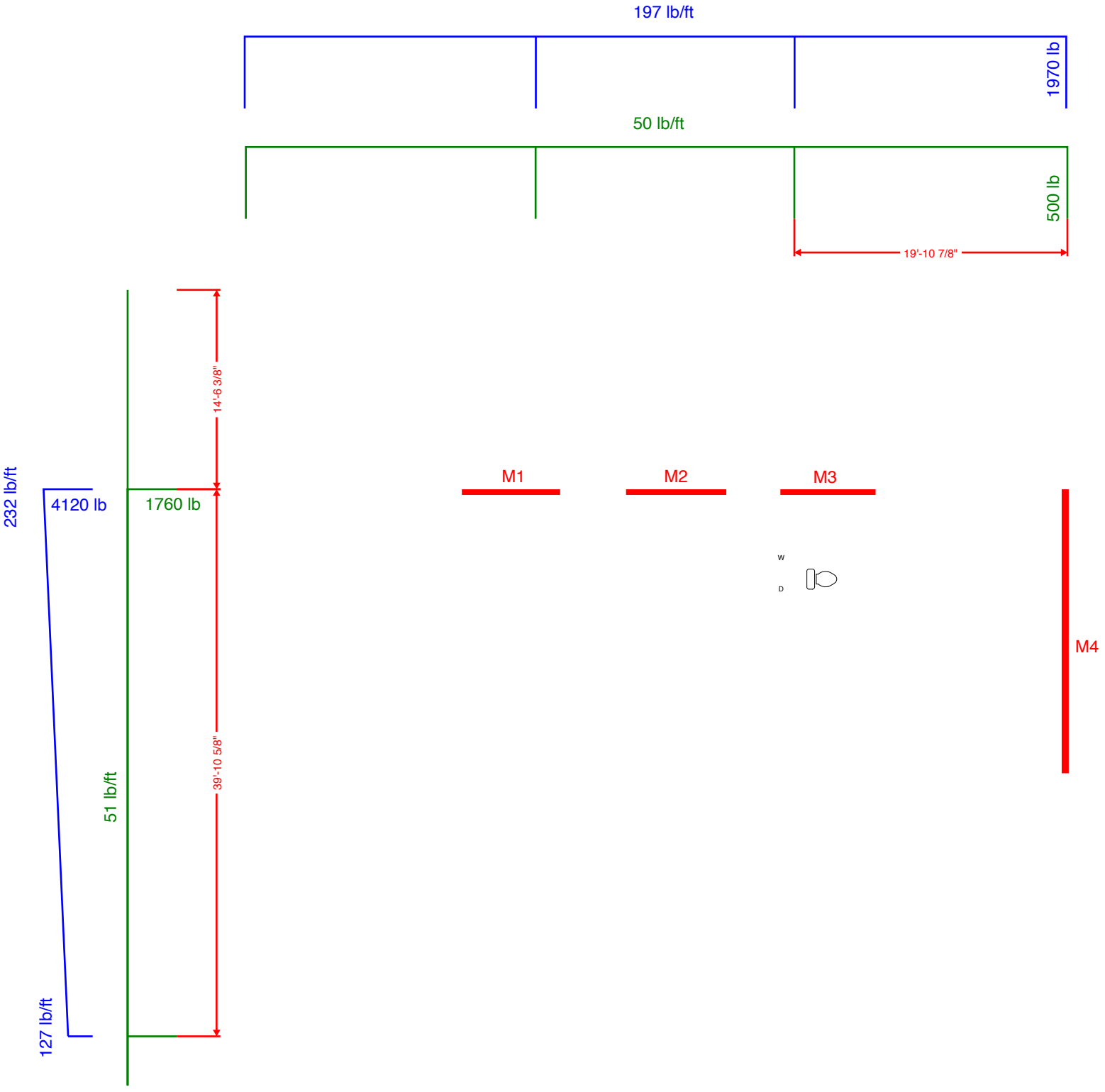
ROOF
0.7E
0.6W


146 lb/ft
1460 lb
110 lb/ft
1100 lb
19'-10 7/8"
3440 lb
2860 lb
172 lb/ft
143 lb/ft
39'-10 5/8"
R1
R2
R3
EXIST. DECK
SHELVES
EXIST. LIVING ROOM
EXTEND RIDGE
SHELVES
EXIST. DINING ROOM
KITCHEN
OVEN
PULL OUT
MASTER BATH
MASTER BEDROOM
12'-10" X 17'-1"
MASTER CLOSET
BENCH W/ COAT HOOKS
1 STEP
STORAGE
POWDER
35" X 56"
GARAGE

MAIN FLOOR

0.7E

0.6W



SHEAR WALL DESIGN

Sherland

Wall Weight	11	psf	rho q =	1.30
Floor Weight	12	psf	rho w =	1.0
Roof Weight	12	psf		

SEISMIC

ROOF
NORTH SOUTH

va' = allowable shear values multiplied by 1.25-0.125 h / L
for wall aspect ratios greater than 2:1

WALL	F Q (lb)	h (ft)	L (ft)	h/l	V (abv)	V (total)	v (plf)	SW	Capacity	M ot (lbft)	OT (lb)	OT (abv)	OT (total)	DL max (lb)	T (lb)	HD	Capacity	TL (lb)	C (lb)	POST	Capacity
R1	2860	7.67	5.33	1.44	0	3718	698	SW5	910.0	28517	5350	0	5350	538	4812	CMST14	6475	2297	7647	(4)2x4	8505
											5350	0	5350	528	4822	CMST14	6475	2217	7567	(4)2x4	8505

EAST WEST

WALL	F Q (lb)	h (ft)	L (ft)	h/l	V (abv)	V (total)	v (plf)	SW	Capacity	M ot (lbft)	OT (lb)	OT (abv)	OT (total)	DL max (lb)	T (lb)	HD	Capacity	TL (lb)	C (lb)	POST	Capacity
R2	736	7.67	16.83	0.46	0	957	57	SW1	241.0	7337	436	0	436	451	-15	none	n/a	888	1324	(2)2x4	4253
	\										436	0	436	696	-260	none	n/a	2098	2534	(2)2x4	4253
R3	364	7.67	8.33	0.92	0	473	57	SW1	241.0	3631	436	0	436	481	-45	none	n/a	1739	2175	(2)2x4	4253
											436	0	436	616	-180	none	n/a	2432	2868	(2)2x4	4253

UPPER FLOOR
NORTH SOUTH

va' = allowable shear values multiplied by 1.25-0.125 h / L
for wall aspect ratios greater than 2:1

WALL	F Q (lb)	h (ft)	L (ft)	h/l	V (abv)	V (total)	v (plf)	SW	Capacity	M ot (lbft)	OT (lb)	OT (abv)	OT (total)	DL max (lb)	T (lb)	HD	Capacity	TL (lb)	C (lb)	POST	Capacity
M1	573	9.00	7.00	1.29	1211	1955	279	SW2	353.0	17599	2514	0	2514	1042	1472	HDU2	2215	4187	6701	4x6	7791
											2514	-919	1595	577	1018	HDU2	2215	2538	4132	(3)2x4	5543
M2	614	9.00	7.50	1.20	1297	2095	279	SW2	353.0	18856	2514	4431	6945	922	6023	(4)MSTAM36	7480	4236	11181	4x10	13112
											2514	0	2514	406	2108	HDU2	2215	1576	4090	(3)2x4	5543
M3	573	9.00	7.00	1.29	1211	1955	279	SW2	353.0	17599	2514	0	2514	1016	1498	HDU2	2215	4652	7166	(4)2x4	7391
											2514	0	2514	718	1796	HDU2	2215	3022	5536	(3)2x4	5543

EAST WEST

WALL	F Q (lb)	h (ft)	L (ft)	h/l	V (abv)	V (total)	v (plf)	SW	Capacity	M ot (lbft)	OT (lb)	OT (abv)	OT (total)	DL max (lb)	T (lb)	HD	Capacity	TL (lb)	C (lb)	POST	Capacity
M4	500	9.00	20.25	0.44	478	1128	56	SW1	241.0	10154	501	0	501	1021	-519	none	n/a	3060	3562	(2)2x4	3696
											501	0	501	824	-323	none	n/a	2160	2661	(2)2x4	3696

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SHEAR WALL DESIGN

Sherland

Wall Weight	11	psf	rho q =	1.30
Floor Weight	12	psf	rho w =	1.0
Roof Weight	12	psf		

WIND

ROOF
NORTH SOUTH

va' = allowable shear values multiplied by 1.25-0.125 h / L
for wall aspect ratios greater than 2:1

WALL	F W (lb)	h (ft)	L (ft)	h/l	V (abv)	V (total)	v (plf)	SW	Capacity	M ot (lbft)	OT (lb)	OT (abv)	OT (total)	DL max (lb)	T (lb)	HD	Capacity	TL (lb)	C (lb)	POST	Capacity
R1	3440	7.67	5.33	1.44	0	3440	645	SW4	833.0	26385	4950	0	4950	538	4412	CMSTC16	4690	2297	7247	(4)2x4	8505
											4950	0	4950	528	4422	CMSTC16	4690	2217	7167	(4)2x4	8505

EAST WEST

WALL	F W (lb)	h (ft)	L (ft)	h/l	V (abv)	V (total)	v (plf)	SW	Capacity	M ot (lbft)	OT (lb)	OT (abv)	OT (total)	DL max (lb)	T (lb)	HD	Capacity	TL (lb)	C (lb)	POST	Capacity
R2	977	7.67	16.83	0.46	0	977	58	SW1	337.0	7491	445	0	445	451	-6	none	n/a	888	1333	(2)2x4	4253
											445	0	445	696	-251	none	n/a	2098	2543	(2)2x4	4253
R3	483	7.67	8.33	0.92	0	483	58	SW1	337.0	3708	445	0	445	481	-36	none	n/a	1739	2184	(2)2x4	4253
											445	0	445	616	-171	none	n/a	2432	2877	(2)2x4	4253

UPPER FLOOR
NORTH SOUTH

va' = allowable shear values multiplied by 1.25-0.125 h / L
for wall aspect ratios greater than 2:1

WALL	F W (lb)	h (ft)	L (ft)	h/l	V (abv)	V (total)	v (plf)	SW	Capacity	M ot (lbft)	OT (lb)	OT (abv)	OT (total)	DL max (lb)	T (lb)	HD	Capacity	TL (lb)	C (lb)	POST	Capacity
M1	1373	9.00	7.25	1.24	1147	2520	348	SW2	494.0	22680	3128	0	3128	1049	2079	HDU2	2215	4199	7327	4x6	7791
											3128	-851	2278	584	1693	HDU2	2215	2550	4827	(3)2x4	5543
M2	1421	9.00	7.50	1.20	1186	2607	348	SW2	494.0	23462	3128	4100	7228	922	6306	(4)MSTAM36	7480	4236	11464	4x10	13112
											3128	0	3128	406	2723	HDU4	3285	1576	4705	(3)2x4	5543
M3	1326	9.00	7.00	1.29	1107	2433	348	SW2	494.0	21898	3128	0	3128	1016	2112	HDU2	2215	4652	7780	(5)2x4	9239
											3128	0	3128	718	2410	HDU4	3285	3022	6150	(4)2x4	7391

EAST WEST

WALL	F W (lb)	h (ft)	L (ft)	h/l	V (abv)	V (total)	v (plf)	SW	Capacity	M ot (lbft)	OT (lb)	OT (abv)	OT (total)	DL max (lb)	T (lb)	HD	Capacity	TL (lb)	C (lb)	POST	Capacity
M4	1970	9.00	20.25	0.44	488	2458	121	SW1	337.0	22125	1093	0	1093	1021	72	HDU2	2215	3060	4153	(3)2x4	5543
					ROT						1093	0	1093	824	268	HDU2	2215	2160	3252	(2)2x4	3696

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SECTION 4: FOUNDATION

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SPREAD FOOTING DESIGN -- SQUARE

for 2000 psf Allowable Bearing Pressure

f'c =	2,500	psi						
fy =	40	ksi						
1'-6" square								
P =	4.50	k	one-way:					
Pu =	7.34	k	phi Vc =	7.09	k	Vu =	1.53 k	o.k.
p =	2,000	psf	(2) #4 each way					
h =	9.00	in	phi Mn =	6.05	k-ft	Mu =	1.38 k-ft	o.k.
d =	5.25	in						
b =	18.00	in	two-way:					
bo =	35.00	in	phi Vc =	31.24	k	Vu =	5.60 k	o.k.
2'-0" square								
P =	8.00	k	one-way:					
Pu =	13.04	k	phi Vc =	9.45	k	Vu =	3.67 k	o.k.
p =	2,000	psf	(3) #4 each way					
h =	9.00	in	phi Mn =	9.03	k-ft	Mu =	3.26 k-ft	o.k.
d =	5.25	in						
b =	24.00	in	two-way:					
bo =	35.00	in	phi Vc =	31.24	k	Vu =	11.31 k	o.k.
2'-6" square								
P =	12.50	k	one-way:					
Pu =	20.38	k	phi Vc =	11.81	k	Vu =	6.62 k	o.k.
p =	2,000	psf	(3) #4 each way					
h =	9.00	in	phi Mn =	9.11	k-ft	Mu =	6.37 k-ft	o.k.
d =	5.25	in						
b =	30.00	in	two-way:					
bo =	35.00	in	phi Vc =	31.24	k	Vu =	18.64 k	o.k.
3'-0" square								
P =	18.00	k	one-way:					
Pu =	29.34	k	phi Vc =	14.18	k	Vu =	10.39 k	o.k.
p =	2,000	psf	(5) #4 each way					
h =	9.00	in	phi Mn =	14.95	k-ft	Mu =	11.00 k-ft	o.k.
d =	5.25	in						
b =	36.00	in	two-way:					
bo =	35.00	in	phi Vc =	31.24	k	Vu =	27.61 k	o.k.

1.Project information

Customer company:
Customer contact name:
Customer e-mail:
Comment:

Project description: DTT2Z Anchor
ASD 608
LRFD 608
Location:
Fastening description:

2. Input Data & Anchor Parameters

General
Design method:ACI 318-14
Units: Imperial units

Anchor Information:
Anchor type: Bonded anchor
Material: F1554 Grade 36
Diameter (inch): 0.500
Effective Embedment depth, h_{ef} (inch): 6.000
Code report: ICC-ES ESR-2508
Anchor category: -
Anchor ductility: Yes
h_{min} (inch): 8.50
c_{ac} (inch): 14.89
C_{min} (inch): 1.75
S_{min} (inch): 3.00

Base Material
Concrete: Normal-weight
Concrete thickness, h (inch): 9.00
State: Cracked
Compressive strength, f'_c (psi): 2500
$\Psi_{c,V}$: 1.0
Reinforcement condition: A tension, A shear
Supplemental reinforcement: Not applicable
Reinforcement provided at corners: No
Ignore concrete breakout in tension: No
Ignore concrete breakout in shear: No
Hole condition: Dry concrete
Inspection: Periodic
Temperature range, Short/Long: 150/110°F
Ignore 6do requirement: Not applicable
Build-up grout pad: No

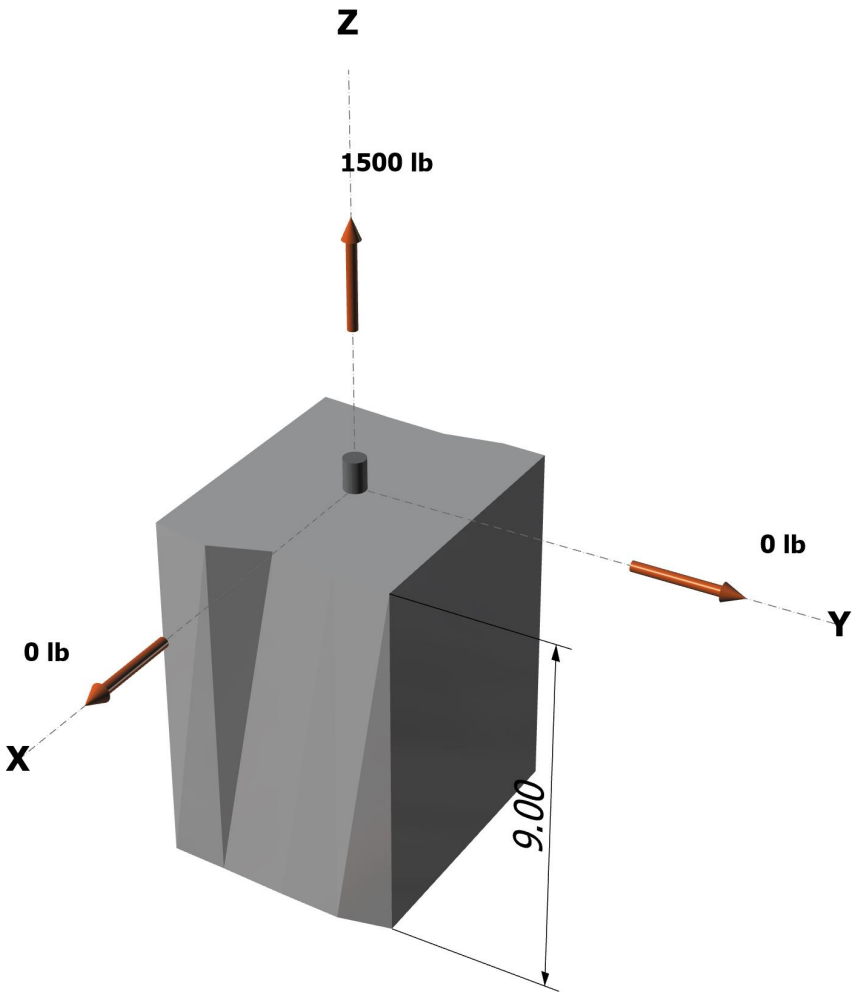
Recommended Anchor
Anchor Name: SET-XP® - SET-XP w/ 1/2"Ø F1554 Gr. 36
Code Report: ICC-ES ESR-2508

Load and Geometry
Load factor source: ACI 318 Section 5.3
Load combination: not set
Seismic design: No
Anchors subjected to sustained tension: No
Apply entire shear load at front row: No
Anchors only resisting wind and/or seismic loads: Yes

Strength level loads:

N_{ua} [lb]: 1500
V_{uax} [lb]: 0
V_{uay} [lb]: 0

<Figure 1>



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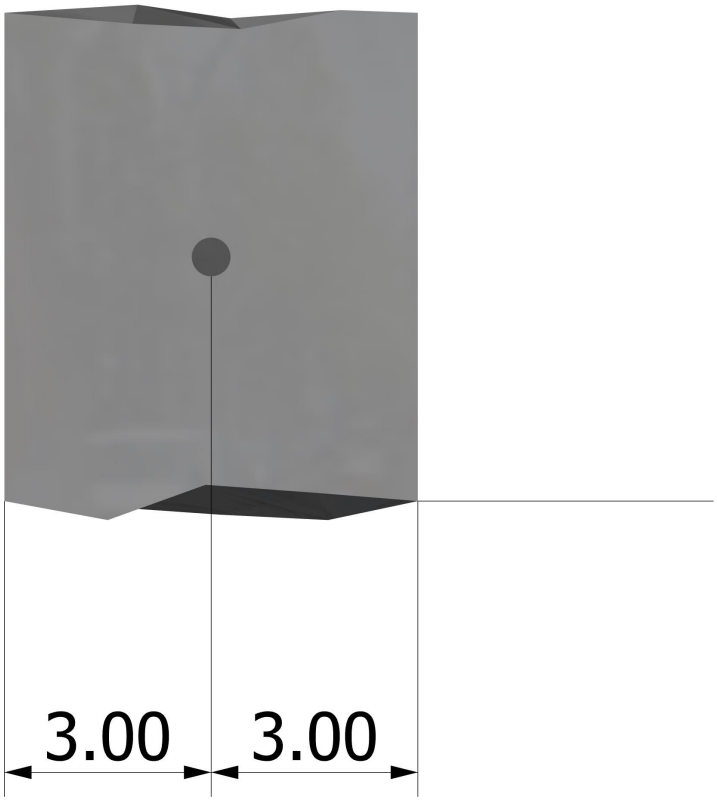


3. Resulting Anchor Forces

Anchor	Tension load, N_{ua} (lb)	Shear load x, V_{uax} (lb)	Shear load y, V_{uay} (lb)	Shear load combined, $\sqrt{(V_{uax})^2+(V_{uay})^2}$ (lb)
1	1500.0	0.0	0.0	0.0
Sum	1500.0	0.0	0.0	0.0

Maximum concrete compression strain (‰): 0.00
Maximum concrete compression stress (psi): 0
Resultant tension force (lb): 1500
Resultant compression force (lb): 0
Eccentricity of resultant tension forces in x-axis, e'_{Nx} (inch): 0.00
Eccentricity of resultant tension forces in y-axis, e'_{Ny} (inch): 0.00

4. Steel Strength of Anchor in Tension (Sec. 17.4.1)

N_{sa} (lb)	ϕ	ϕN_{sa} (lb)
8235	0.75	6176

5. Concrete Breakout Strength of Anchor in Tension (Sec. 17.4.2)

$N_b = k_c \lambda_a \sqrt{f'_c} h_{ef}^{1.5}$ (Eq. 17.4.2.2a)

k_c	λ_a	f'_c (psi)	h_{ef} (in)	N_b (lb)
17.0	1.00	2500	6.000	12492

$\phi N_{cb} = \phi (A_{Nc} / A_{Nco}) \Psi_{ed,N} \Psi_{c,N} \Psi_{cp,N} N_b$ (Sec. 17.3.1 & Eq. 17.4.2.1a)

A_{Nc} (in^2)	A_{Nco} (in^2)	$c_{a,min}$ (in)	$\Psi_{ed,N}$	$\Psi_{c,N}$	$\Psi_{cp,N}$	N_b (lb)	ϕ	ϕN_{cb} (lb)
108.00	324.00	3.00	0.800	1.00	1.000	12492	0.75	2498

6. Adhesive Strength of Anchor in Tension (Sec. 17.4.5)

$\tau_{k,cr} = \tau_{k,cr} f_{short\text{-}term} K_{sat}$

$\tau_{k,cr}$ (psi)	$f_{short\text{-}term}$	K_{sat}	$\tau_{k,cr}$ (psi)
510	1.72	1.00	877

$N_{ba} = \lambda_a \tau_{cr} \pi d_a h_{ef}$ (Eq. 17.4.5.2)

λ_a	τ_{cr} (psi)	d_a (in)	h_{ef} (in)	N_{ba} (lb)
1.00	877	0.50	6.000	8267

$\phi N_a = \phi (A_{Na} / A_{Na0}) \Psi_{ed,Na} \Psi_{cp,Na} N_{ba}$ (Sec. 17.3.1 & Eq. 17.4.5.1a)

A_{Na} (in^2)	A_{Na0} (in^2)	c_{Na} (in)	$c_{a,min}$ (in)	$\Psi_{ed,Na}$	$\Psi_{cp,Na}$	N_{ba} (lb)	ϕ	ϕN_a (lb)
80.46	179.82	6.70	3.00	0.834	1.000	8267	0.55	1697

11. Results

11. Interaction of Tensile and Shear Forces (Sec. D.7)?

Tension	Factored Load, N_{ua} (lb)	Design Strength, ϕN_n (lb)	Ratio	Status
Steel	1500	6176	0.24	Pass
Concrete breakout	1500	2498	0.60	Pass
Adhesive	**1500**	**1697**	**0.88**	**Pass (Governs)**

SET-XP w/ 1/2"Ø F1554 Gr. 36 with hef = 6.000 inch meets the selected design criteria.

12. Warnings

- When cracked concrete is selected, concrete compressive strength used in concrete breakout strength in tension, adhesive strength in tension and concrete pryout strength in shear for SET-XP adhesive anchor is limited to 2,500 psi per ICC-ES ESR-2508 Section 5.3.

- Minimum spacing and edge distance requirement of 6da per ACI 318 Sections 17.7.1 and 17.7.2 for torqued cast-in-place anchor is waived per designer option.

- Designer must exercise own judgement to determine if this design is suitable.

- Refer to manufacturer's product literature for hole cleaning and installation instructions.

Company:		Date:	11/11/2020
Engineer:		Page:	1/5
Project:	HDU2		
Address:			
Phone:			
E-mail:			

1.Project information

Customer company:
Customer contact name:
Customer e-mail:
Comment:

Project description: HDU2 Anchor
ASD 2112
LRFD 3520
Location:
Fastening description:

2. Input Data & Anchor Parameters

General
Design method:ACI 318-14
Units: Imperial units

Anchor Information:
Anchor type: Bonded anchor
Material: F1554 Grade 36
Diameter (inch): 0.500
Effective Embedment depth, h_{ef} (inch): 6.000
Code report: ICC-ES ESR-2508
Anchor category: -
Anchor ductility: Yes
h_{min} (inch): 8.50
c_{ac} (inch): 14.89
C_{min} (inch): 1.75
S_{min} (inch): 3.00

Base Material
Concrete: Normal-weight
Concrete thickness, h (inch): 9.00
State: Cracked
Compressive strength, f'_c (psi): 2500
$\Psi_{c,V}$: 1.0
Reinforcement condition: A tension, A shear
Supplemental reinforcement: Not applicable
Reinforcement provided at corners: No
Ignore concrete breakout in tension: No
Ignore concrete breakout in shear: No
Hole condition: Dry concrete
Inspection: Periodic
Temperature range, Short/Long: 150/110°F
Ignore 6do requirement: Not applicable
Build-up grout pad: No

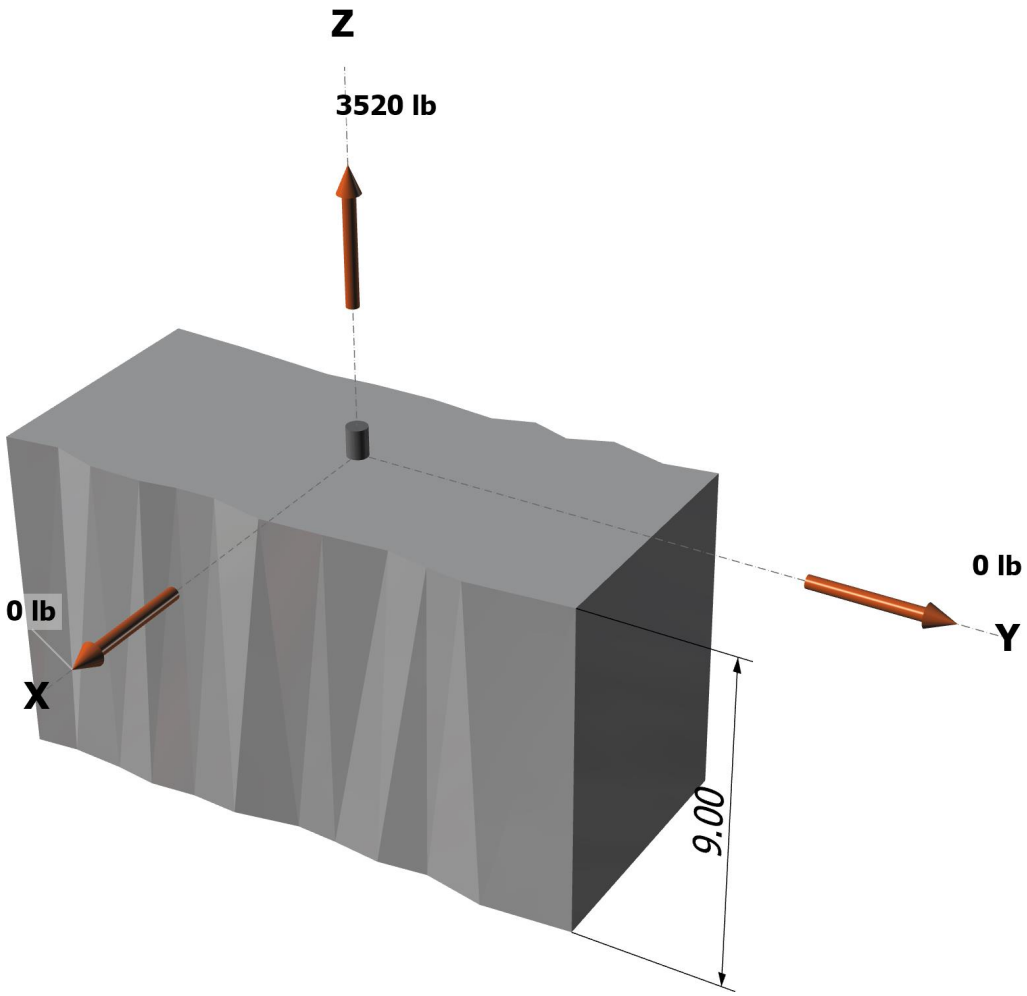
Recommended Anchor
Anchor Name: SET-XP® - SET-XP w/ 1/2"Ø F1554 Gr. 36
Code Report: ICC-ES ESR-2508

Load and Geometry
Load factor source: ACI 318 Section 5.3
Load combination: not set
Seismic design: No
Anchors subjected to sustained tension: No
Apply entire shear load at front row: No
Anchors only resisting wind and/or seismic loads: Yes

Strength level loads:

N_{ua} [lb]: 3520
V_{uax} [lb]: 0
V_{uay} [lb]: 0

<Figure 1>



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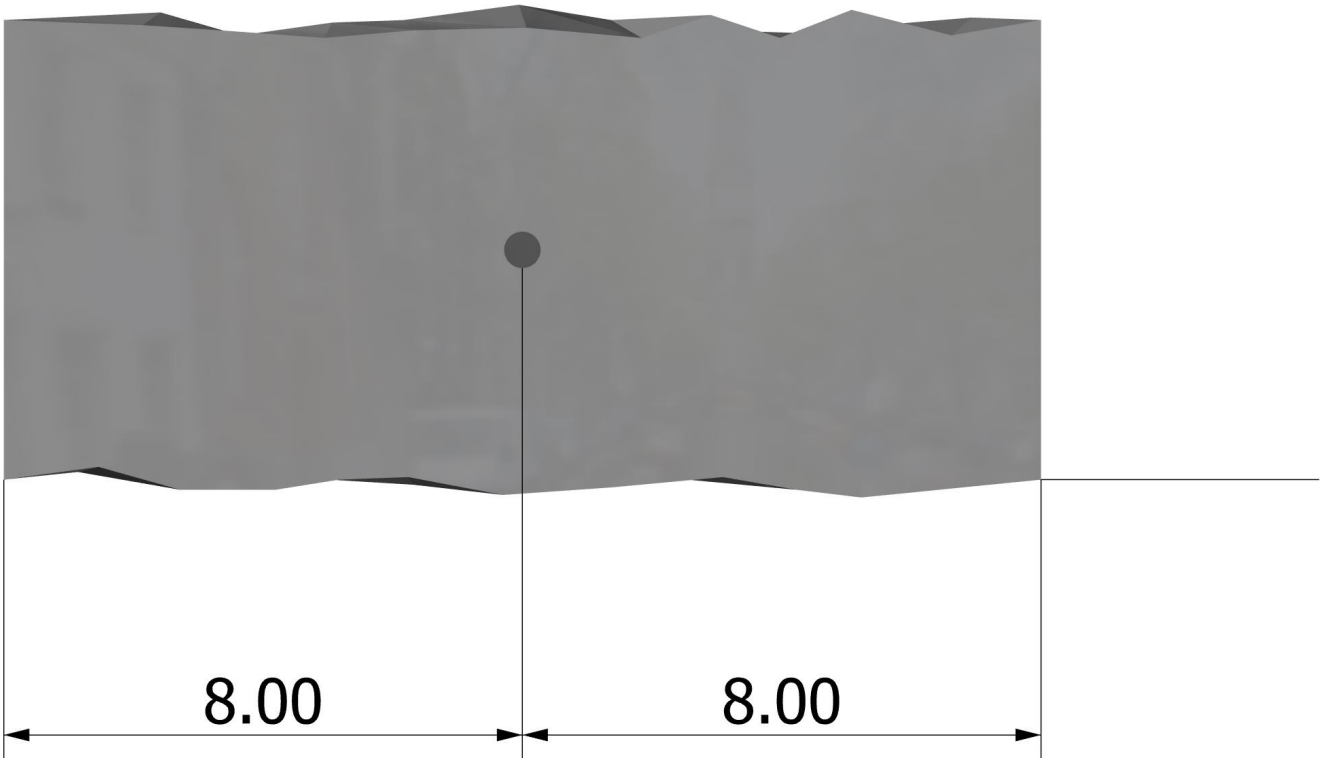


3. Resulting Anchor Forces

Anchor	Tension load, N_{ua} (lb)	Shear load x, V_{uax} (lb)	Shear load y, V_{uay} (lb)	Shear load combined, $\sqrt{(V_{uax})^2+(V_{uay})^2}$ (lb)
1	3520.0	0.0	0.0	0.0
Sum	3520.0	0.0	0.0	0.0

Maximum concrete compression strain (‰): 0.00
Maximum concrete compression stress (psi): 0
Resultant tension force (lb): 3520
Resultant compression force (lb): 0
Eccentricity of resultant tension forces in x-axis, e'_{Nx} (inch): 0.00
Eccentricity of resultant tension forces in y-axis, e'_{Ny} (inch): 0.00

4. Steel Strength of Anchor in Tension (Sec. 17.4.1)

N_{sa} (lb)	ϕ	ϕN_{sa} (lb)
8235	0.75	6176

5. Concrete Breakout Strength of Anchor in Tension (Sec. 17.4.2)

$N_b = k_c \lambda_a \sqrt{f'_c} h_{ef}^{1.5}$ (Eq. 17.4.2.2a)

k_c	λ_a	f'_c (psi)	h_{ef} (in)	N_b (lb)
17.0	1.00	2500	6.000	12492

$\phi N_{cb} = \phi (A_{Nc} / A_{Nco}) \Psi_{ed,N} \Psi_{c,N} \Psi_{cp,N} N_b$ (Sec. 17.3.1 & Eq. 17.4.2.1a)

A_{Nc} (in^2)	A_{Nco} (in^2)	$c_{a,min}$ (in)	$\Psi_{ed,N}$	$\Psi_{c,N}$	$\Psi_{cp,N}$	N_b (lb)	ϕ	ϕN_{cb} (lb)
288.00	324.00	8.00	0.967	1.00	1.000	12492	0.75	8051

6. Adhesive Strength of Anchor in Tension (Sec. 17.4.5)

$\tau_{k,cr} = \tau_{k,cr} f_{short\text{-}term} K_{sat}$

$\tau_{k,cr}$ (psi)	$f_{short\text{-}term}$	K_{sat}	$\tau_{k,cr}$ (psi)
510	1.72	1.00	877

$N_{ba} = \lambda_a \tau_{cr} \pi d_a h_{ef}$ (Eq. 17.4.5.2)

λ_a	τ_{cr} (psi)	d_a (in)	h_{ef} (in)	N_{ba} (lb)
1.00	877	0.50	6.000	8267

$\phi N_a = \phi (A_{Na} / A_{Na0}) \Psi_{ed,Na} \Psi_{cp,Na} N_{ba}$ (Sec. 17.3.1 & Eq. 17.4.5.1a)

A_{Na} (in^2)	A_{Na0} (in^2)	c_{Na} (in)	$c_{a,min}$ (in)	$\Psi_{ed,Na}$	$\Psi_{cp,Na}$	N_{ba} (lb)	ϕ	ϕN_a (lb)
179.82	179.82	6.70	8.00	1.000	1.000	8267	0.55	4547

11. Results

11. Interaction of Tensile and Shear Forces (Sec. D.7)?

Tension	Factored Load, N_{ua} (lb)	Design Strength, ϕN_n (lb)	Ratio	Status
Steel	3520	6176	0.57	Pass
Concrete breakout	3520	8051	0.44	Pass
Adhesive	**3520**	**4547**	**0.77**	**Pass (Governs)**

SET-XP w/ 1/2"Ø F1554 Gr. 36 with hef = 6.000 inch meets the selected design criteria.

12. Warnings

- When cracked concrete is selected, concrete compressive strength used in concrete breakout strength in tension, adhesive strength in tension and concrete pryout strength in shear for SET-XP adhesive anchor is limited to 2,500 psi per ICC-ES ESR-2508 Section 5.3.

- Minimum spacing and edge distance requirement of 6da per ACI 318 Sections 17.7.1 and 17.7.2 for torqued cast-in-place anchor is waived per designer option.

- Designer must exercise own judgement to determine if this design is suitable.

- Refer to manufacturer's product literature for hole cleaning and installation instructions.

1.Project information

Customer company:
Customer contact name:
Customer e-mail:
Comment:

Project description: HDU4 Anchor
ASD 2723
LRFD 4538
Location:
Fastening description:

2. Input Data & Anchor Parameters

General
Design method:ACI 318-14
Units: Imperial units

Anchor Information:
Anchor type: Bonded anchor
Material: F1554 Grade 36
Diameter (inch): 0.500
Effective Embedment depth, h_{ef} (inch): 6.000
Code report: ICC-ES ESR-2508
Anchor category: -
Anchor ductility: Yes
h_{min} (inch): 8.50
c_{ac} (inch): 14.89
C_{min} (inch): 1.75
S_{min} (inch): 3.00

Base Material
Concrete: Normal-weight
Concrete thickness, h (inch): 9.00
State: Cracked
Compressive strength, f'_c (psi): 2500
$\Psi_{c,V}$: 1.0
Reinforcement condition: A tension, A shear
Supplemental reinforcement: Not applicable
Reinforcement provided at corners: No
Ignore concrete breakout in tension: No
Ignore concrete breakout in shear: No
Hole condition: Dry concrete
Inspection: Periodic
Temperature range, Short/Long: 150/110°F
Ignore 6do requirement: Not applicable
Build-up grout pad: No

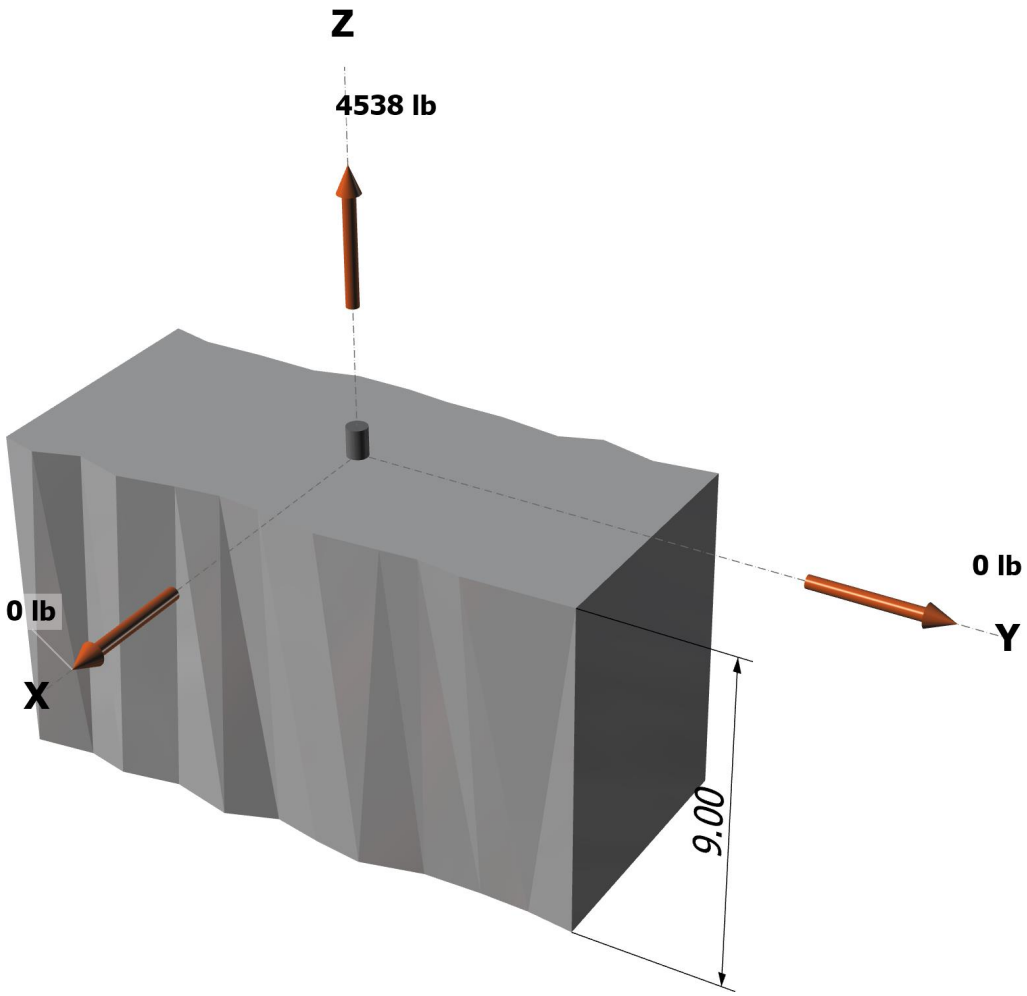
Recommended Anchor
Anchor Name: SET-XP® - SET-XP w/ 1/2"Ø F1554 Gr. 36
Code Report: ICC-ES ESR-2508

Load and Geometry
Load factor source: ACI 318 Section 5.3
Load combination: not set
Seismic design: No
Anchors subjected to sustained tension: No
Apply entire shear load at front row: No
Anchors only resisting wind and/or seismic loads: Yes

Strength level loads:

N_{ua} [lb]: 4538
V_{uax} [lb]: 0
V_{uay} [lb]: 0

<Figure 1>



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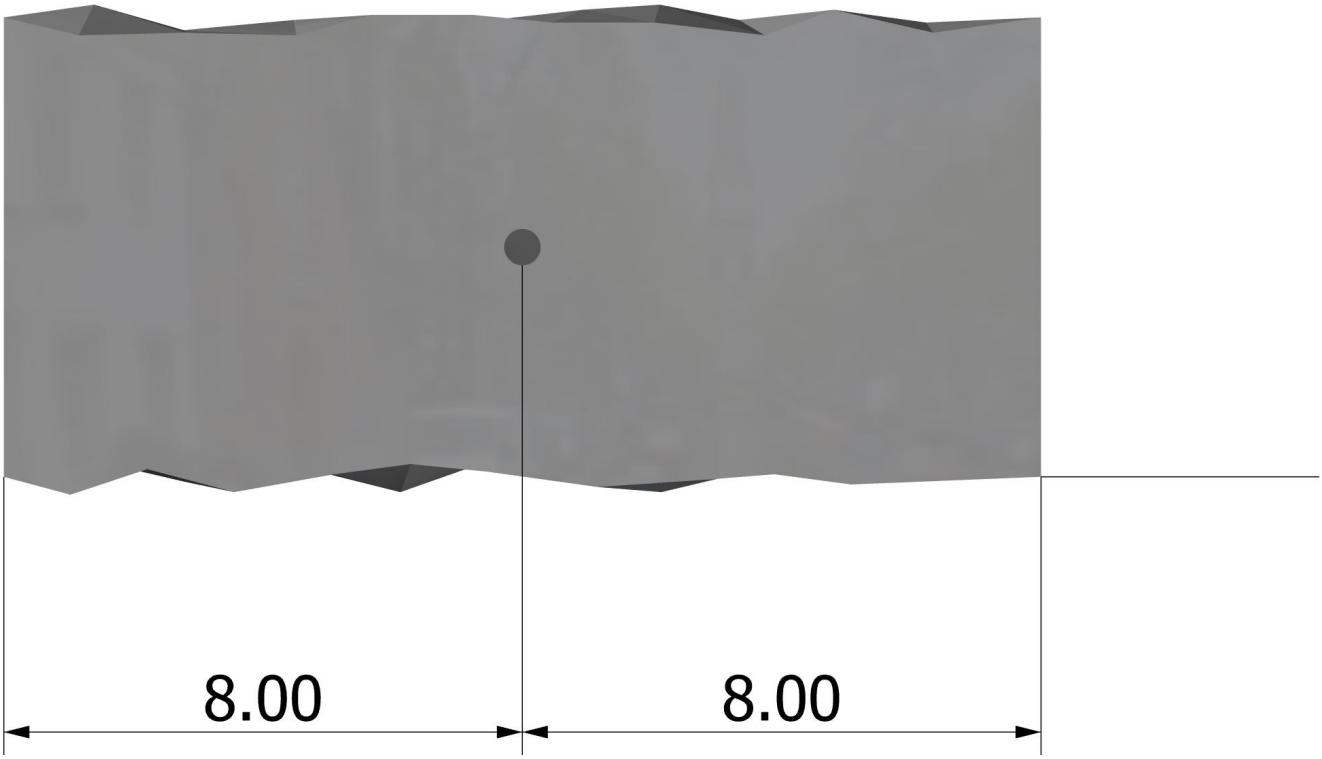

3. Resulting Anchor Forces

Anchor	Tension load, N_{ua} (lb)	Shear load x, V_{uax} (lb)	Shear load y, V_{uay} (lb)	Shear load combined, $\sqrt{(V_{uax})^2+(V_{uay})^2}$ (lb)
1	4538.0	0.0	0.0	0.0
Sum	4538.0	0.0	0.0	0.0

Maximum concrete compression strain (‰): 0.00
Maximum concrete compression stress (psi): 0
Resultant tension force (lb): 4538
Resultant compression force (lb): 0
Eccentricity of resultant tension forces in x-axis, e'_{Nx} (inch): 0.00
Eccentricity of resultant tension forces in y-axis, e'_{Ny} (inch): 0.00

4. Steel Strength of Anchor in Tension (Sec. 17.4.1)

N_{sa} (lb)	ϕ	ϕN_{sa} (lb)
8235	0.75	6176

5. Concrete Breakout Strength of Anchor in Tension (Sec. 17.4.2)

$N_b = k_c \lambda_a \sqrt{f'_c} h_{ef}^{1.5}$ (Eq. 17.4.2.2a)

k_c	λ_a	f'_c (psi)	h_{ef} (in)	N_b (lb)
17.0	1.00	2500	6.000	12492

$\phi N_{cb} = \phi (A_{Nc} / A_{Nco}) \Psi_{ed,N} \Psi_{c,N} \Psi_{cp,N} N_b$ (Sec. 17.3.1 & Eq. 17.4.2.1a)

A_{Nc} (in^2)	A_{Nco} (in^2)	$c_{a,min}$ (in)	$\Psi_{ed,N}$	$\Psi_{c,N}$	$\Psi_{cp,N}$	N_b (lb)	ϕ	ϕN_{cb} (lb)
288.00	324.00	8.00	0.967	1.00	1.000	12492	0.75	8051

6. Adhesive Strength of Anchor in Tension (Sec. 17.4.5)

$\tau_{k,cr} = \tau_{k,cr} f_{short\text{-}term} K_{sat}$

$\tau_{k,cr}$ (psi)	$f_{short\text{-}term}$	K_{sat}	$\tau_{k,cr}$ (psi)
510	1.72	1.00	877

$N_{ba} = \lambda_a \tau_{cr} \pi d_a h_{ef}$ (Eq. 17.4.5.2)

λ_a	τ_{cr} (psi)	d_a (in)	h_{ef} (in)	N_{ba} (lb)
1.00	877	0.50	6.000	8267

$\phi N_a = \phi (A_{Na} / A_{Na0}) \Psi_{ed,Na} \Psi_{cp,Na} N_{ba}$ (Sec. 17.3.1 & Eq. 17.4.5.1a)

A_{Na} (in^2)	A_{Na0} (in^2)	c_{Na} (in)	$c_{a,min}$ (in)	$\Psi_{ed,Na}$	$\Psi_{cp,Na}$	N_{ba} (lb)	ϕ	ϕN_a (lb)
179.82	179.82	6.70	8.00	1.000	1.000	8267	0.55	4547

11. Results

11. Interaction of Tensile and Shear Forces (Sec. D.7)?

Tension	Factored Load, N_{ua} (lb)	Design Strength, ϕN_n (lb)	Ratio	Status
Steel	4538	6176	0.73	Pass
Concrete breakout	4538	8051	0.56	Pass
Adhesive	**4538**	**4547**	**1.00**	**Pass (Governs)**

SET-XP w/ 1/2"Ø F1554 Gr. 36 with hef = 6.000 inch meets the selected design criteria.

12. Warnings

- When cracked concrete is selected, concrete compressive strength used in concrete breakout strength in tension, adhesive strength in tension and concrete pryout strength in shear for SET-XP adhesive anchor is limited to 2,500 psi per ICC-ES ESR-2508 Section 5.3.

- Minimum spacing and edge distance requirement of 6da per ACI 318 Sections 17.7.1 and 17.7.2 for torqued cast-in-place anchor is waived per designer option.

- Designer must exercise own judgement to determine if this design is suitable.

- Refer to manufacturer's product literature for hole cleaning and installation instructions.