BYKONEN
CARTER
QUINN

STRUCTURAL
ENGINEERING

STRUCTURAL CALCULATIONS

Anderson & Goodejohn Residence
4224 94th Ave SE
Mercer Island, WA 98040

Whitney Architecture
1537 NW Ballard Way
Seattle, WA 98107

December 21, 2021

ANDERSON & GOODESOHN RESIDENCE

- 2-STORY ADDITION TO EXISTING 1-STORY RESIDENCE

LOADS

ROOF:

DL = 15 psf
SL = 25 psf

FLOOR:

DL = 15 psf
LL = 40 psf
LL = 60 psf (DECKS)

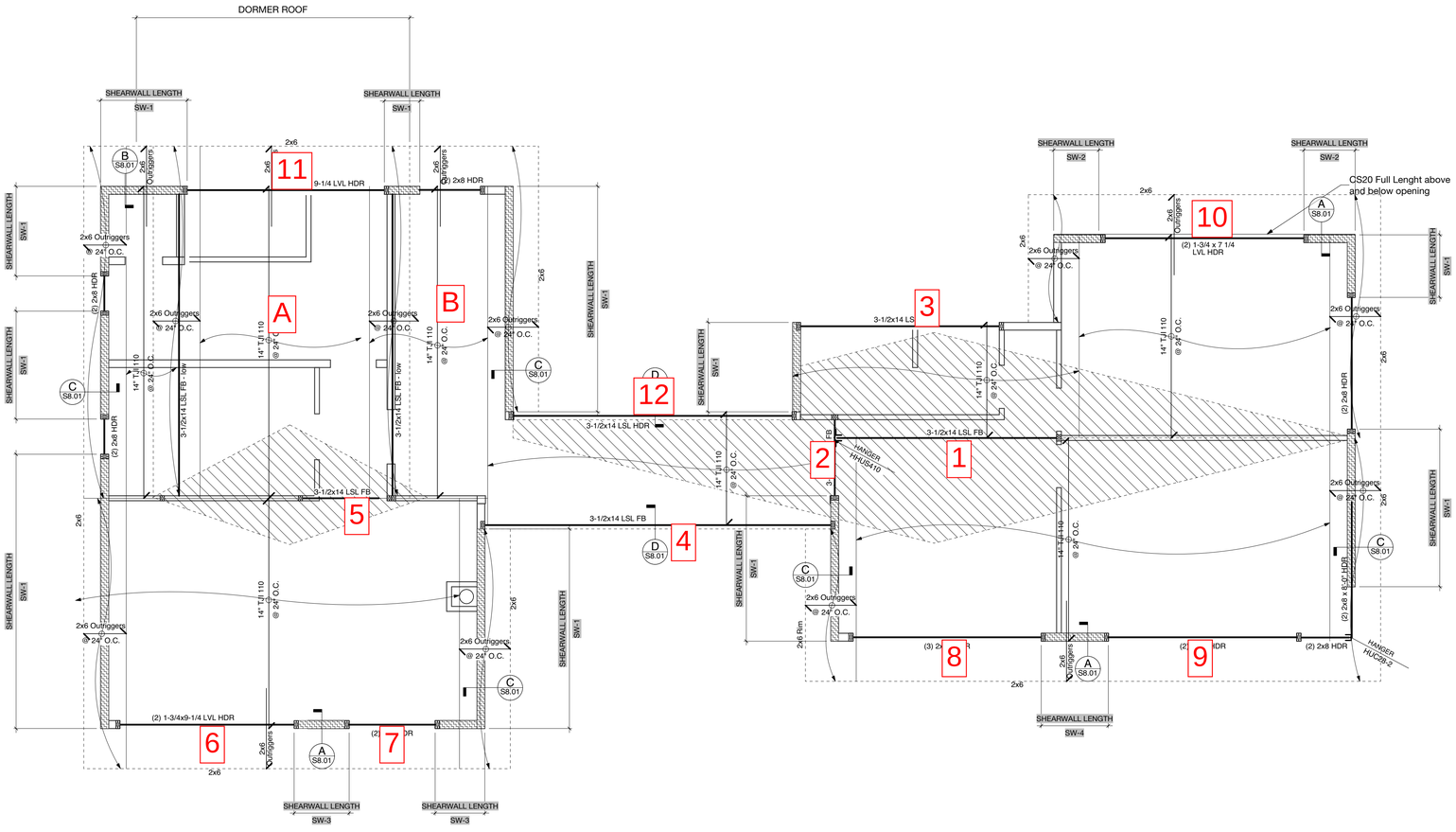
LATERAL PER ATTACHED

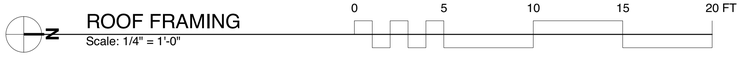
BYKONEN CARTER QUINN
STRUCTURAL ENGINEERING

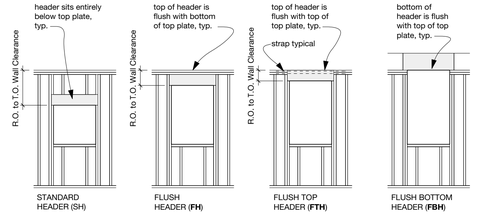
▶ 2033 Sixth Avenue #995 Seattle, WA 98121 206-264-7784 www.BCQ-SE.com

PROJECT: ANDERSON - GOODESOHN DATE: 8/3/21

DESIGNER: SN SHEET #:







HEADER LOCATION DIAGRAM
n.t.s.

LEXICON:

- LINE OF FOOTING BELOW GRADE
- AREA OF NEW REINFORCED CONCRETE
- EXISTING FOUNDATION WALL
- AREA OF NEW ROOF OVER FRAMING
- INDICATES JOIST DIRECTION
- INDICATES EXTENT OF FRAMING
- X / X0.00 — DETAIL REFERENCE, INDICATES DETAIL NUMBER & SHEET NUMBER
- HANGER HUA12 — INDICATES SIMPSON HANGER
- HOLDOWN HDU2 SDS2.5 — INDICATES SIMPSON HOLDOWN
- STRAP MST48 — INDICATES SIMPSON FRAMING STRAP
- SH — STANDARD HEADER. (See header location diagram).
- FH — FLUSH HEADER. (See header location diagram).
- FTH — FLUSH TOP HEADER. (See header location diagram).
- FBH — FLUSH BOTTOM HEADER (See header location diagram).
- FB — FLUSH BEAM (In plane with adjacent floor or roof framing)
- SW1 — SHEARWALL KEY - REFER TO SHEARWALL SCHEDULE

WHITNEY ARCHITECTURE

1537 NW Ballard Way Seattle WA 98107
WhitneyArchitecture.com
v. 206.789.3934 f. 206.789.1871

PROJECT:

Anderson + Goodejohn Residence

A remodel to an existing single family residence at:

4224 94th Ave SE
Mercer Island, WA 98040

ISSUE DATE:

Date	Mark	Issue Type
-		-

NOT FOR CONSTRUCTION

PLOTTED:
Thursday, December 16, 2021
4:44:47 PM

FILE NAME:
1519-Anderson+Goodejohn DESIGN OPT 7 VW:

PROJECT NUMBER
1519

DRAWN BY:
--

SHEET TITLE:
Permit

Roof Framing Framing Plan

Leave this space open for building deptartment stamps.

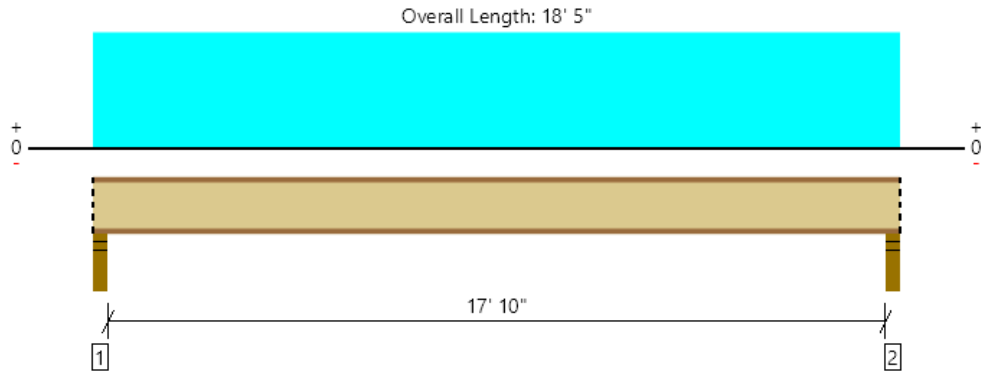
SHEET NUMBER:

S2.03

SHEET -- OF 10

Roof Framing, Joist A

1 piece(s) 14" TJI® 110 @ 24" 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)	737 @ 2 1/2"	1581 (3.50")	Passed (47%)	1.15	1.0 D + 1.0 S (All Spans)
Shear (lbs)	713 @ 3 1/2"	2139	Passed (33%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	3240 @ 9' 2 1/2"	4301	Passed (75%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.332 @ 9' 2 1/2"	0.600	Passed (L/650)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.531 @ 9' 2 1/2"	0.900	Passed (L/406)	--	1.0 D + 1.0 S (All Spans)

System : Roof
Member Type : Joist
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.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Stud wall - HF	3.50"	3.50"	1.75"	276	460	736	Blocking
2 - Stud wall - HF	3.50"	3.50"	1.75"	276	460	736	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)	3' 5" o/c	
Bottom Edge (Lu)	18' 5" o/c	

•TJI joists are only analyzed using Maximum Allowable bracing solutions.
•Maximum allowable bracing intervals based on applied load.

Vertical Load	Location	Spacing	Dead (0.90)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 18' 5"	24"	15.0	25.0	Default Load

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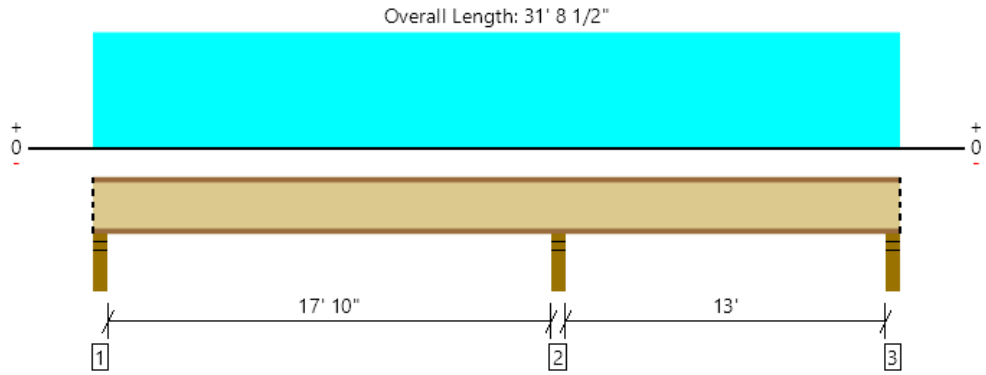
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Roof Framing, Joist B

1 piece(s) 14" TJI® 110 @ 24" 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)	1595 @ 18' 3 1/4"	2225 (3.50")	Passed (72%)	1.15	1.0 D + 1.0 S (All Spans)
Shear (lbs)	812 @ 18' 1 1/2"	2139	Passed (38%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	-2623 @ 18' 3 1/4"	4301	Passed (61%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.212 @ 8' 5 5/8"	0.602	Passed (L/999+)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.326 @ 8' 4 13/16"	0.903	Passed (L/664)	--	1.0 D + 1.0 S (Alt Spans)

System : Roof
Member Type : Joist
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.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Stud wall - HF	3.50"	3.50"	1.75"	223	384	607	Blocking
2 - Stud wall - HF	3.50"	3.50"	3.50"	598	997	1595	None
3 - Stud wall - HF	3.50"	3.50"	1.75"	130	262	392	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)	4' 3" o/c	
Bottom Edge (Lu)	3' 10" o/c	

•TJI joists are only analyzed using Maximum Allowable bracing solutions.
•Maximum allowable bracing intervals based on applied load.

Vertical Load	Location	Spacing	Dead (0.90)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 31' 8 1/2"	24"	15.0	25.0	Default Load

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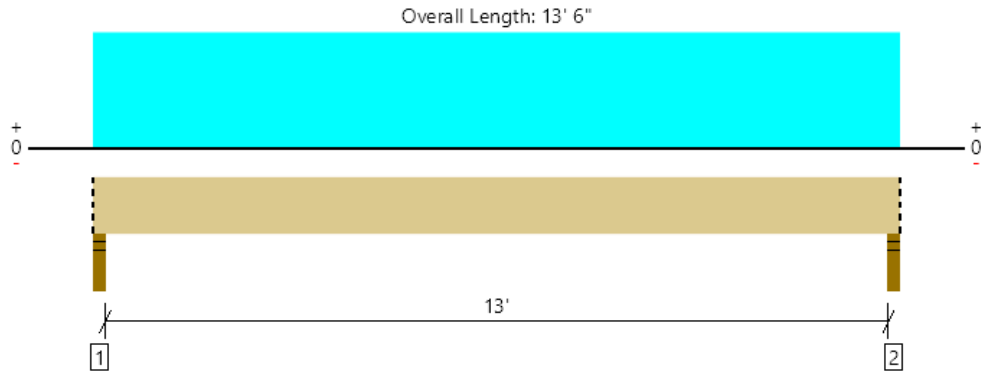
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Steven Nickolas Bykonen Carter Quinn (206) 264-7784 ssn@bcq-se.com	

Weyerhaeuser

Roof Framing, Beam 1

1 piece(s) 3 1/2" x 14" 1.55E TimberStrand® LSL



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)	2533 @ 1 1/2"	4253 (3.00")	Passed (60%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	2002 @ 1' 5"	11646	Passed (17%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	8236 @ 6' 9"	25116	Passed (33%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.141 @ 6' 9"	0.442	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.235 @ 6' 9"	0.663	Passed (L/677)	--	1.0 D + 1.0 S (All Spans)

- Deflection criteria: LL (L/360) and TL (L/240).

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Stud wall - HF	3.00"	3.00"	1.79"	1015	1519	2534	Blocking
2 - Stud wall - HF	3.00"	3.00"	1.79"	1015	1519	2534	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)	Continuous	
Bottom Edge (Lu)	All Bearing Points	

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 13' 6"	N/A	15.3	--	
1 - Uniform (PSF)	0 to 13' 6" (Front)	9'	15.0	25.0	Default Load

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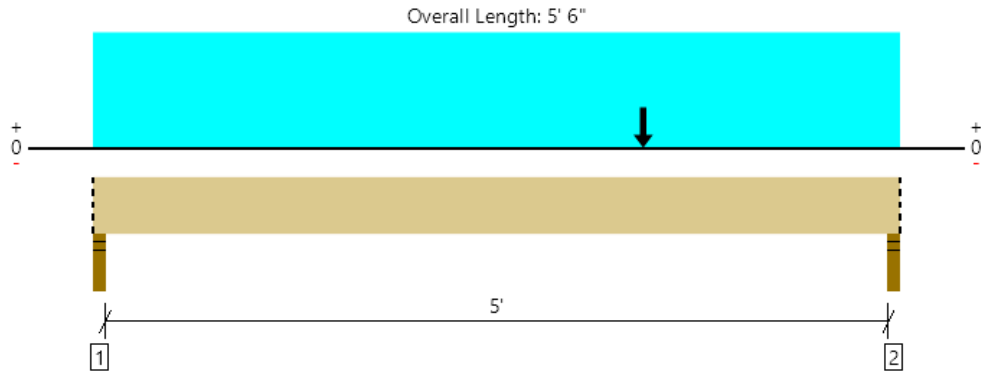
Roof Framing, Beam 2

1 piece(s) 3 1/2" x 14" 1.55E TimberStrand® LSL



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)	2012 @ 5' 4 1/2"	4253 (3.00")	Passed (47%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1877 @ 4' 1"	11646	Passed (16%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	3124 @ 3' 9"	25116	Passed (12%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.011 @ 3' 9"	0.175	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.018 @ 3' 9"	0.262	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)

- Deflection criteria: LL (L/360) and TL (L/240).

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Stud wall - HF	3.00"	3.00"	1.50"	439	608	1047	Blocking
2 - Stud wall - HF	3.00"	3.00"	1.50"	825	1186	2011	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)	Continuous	
Bottom Edge (Lu)	All Bearing Points	

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 5' 6"	N/A	15.3	--	
1 - Uniform (PSF)	0 to 5' 6" (Front)	2'	15.0	25.0	Default Load
2 - Point (lb)	3' 9" (Front)	N/A	1015	1519	Linked from: Beam 1, Support 1

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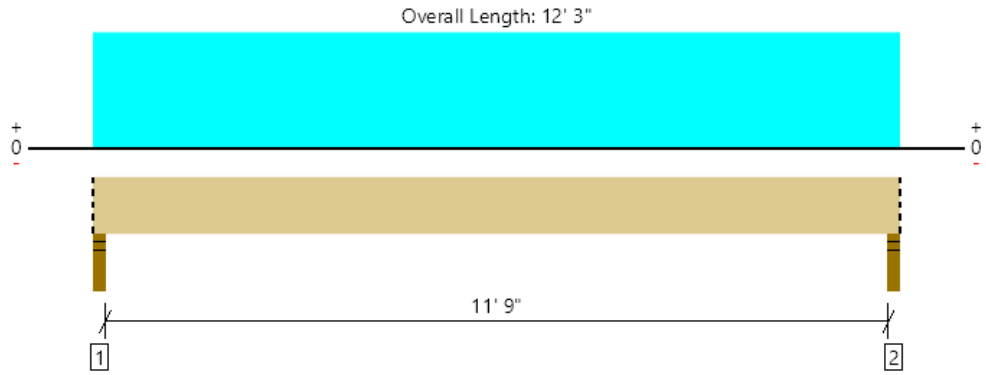
Roof Framing, Beam 3

1 piece(s) 3 1/2" x 14" 1.55E TimberStrand® LSL



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)	951 @ 1 1/2"	4253 (3.00")	Passed (22%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	731 @ 1' 5"	11646	Passed (6%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	2796 @ 6' 1 1/2"	25116	Passed (11%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.038 @ 6' 1 1/2"	0.400	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.067 @ 6' 1 1/2"	0.600	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)

- Deflection criteria: LL (L/360) and TL (L/240).

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Stud wall - HF	3.00"	3.00"	1.50"	415	536	951	Blocking
2 - Stud wall - HF	3.00"	3.00"	1.50"	415	536	951	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)	Continuous	
Bottom Edge (Lu)	All Bearing Points	

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 12' 3"	N/A	15.3	--	
1 - Uniform (PSF)	0 to 12' 3" (Front)	3' 6"	15.0	25.0	Default Load

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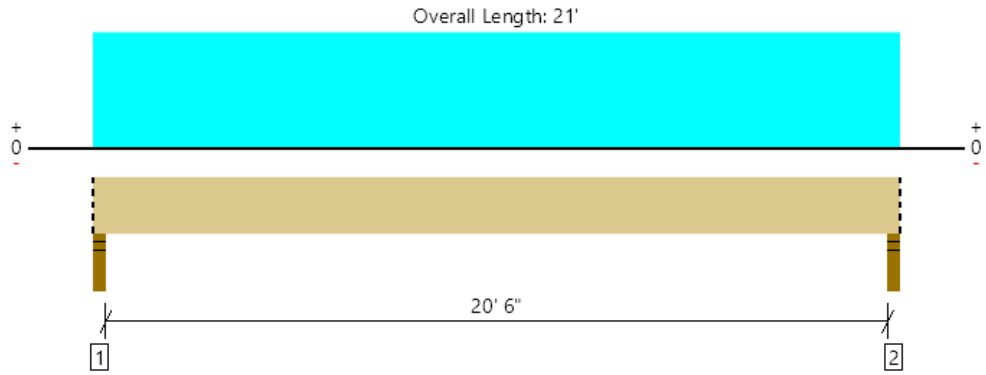
Roof Framing, Beam 4

1 piece(s) 3 1/2" x 14" 1.55E TimberStrand® LSL



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)	1946 @ 1 1/2"	4253 (3.00")	Passed (46%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1683 @ 1' 5"	11646	Passed (14%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	9974 @ 10' 6"	25116	Passed (40%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.375 @ 10' 6"	0.692	Passed (L/665)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.653 @ 10' 6"	1.038	Passed (L/381)	--	1.0 D + 1.0 S (All Spans)

- Deflection criteria: LL (L/360) and TL (L/240).

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Stud wall - HF	3.00"	3.00"	1.50"	830	1116	1946	Blocking
2 - Stud wall - HF	3.00"	3.00"	1.50"	830	1116	1946	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)	Continuous	
Bottom Edge (Lu)	All Bearing Points	

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 21'	N/A	15.3	--	
1 - Uniform (PSF)	0 to 21' (Front)	4' 3"	15.0	25.0	Default Load

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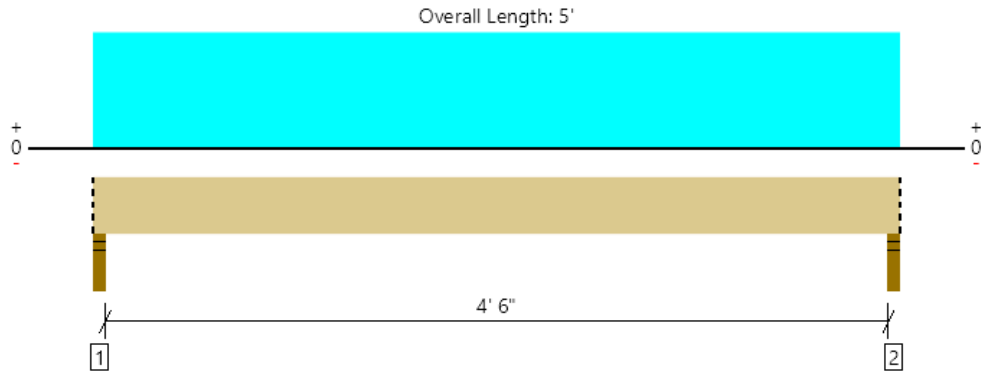
Roof Framing, Beam 5

1 piece(s) 3 1/2" x 14" 1.55E TimberStrand® LSL



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)	1613 @ 1 1/2"	4253 (3.00")	Passed (38%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	699 @ 1' 5"	11646	Passed (6%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	1820 @ 2' 6"	25116	Passed (7%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.007 @ 2' 6"	0.158	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.011 @ 2' 6"	0.237	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)

- Deflection criteria: LL (L/360) and TL (L/240).

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Stud wall - HF	3.00"	3.00"	1.50"	629	984	1613	Blocking
2 - Stud wall - HF	3.00"	3.00"	1.50"	629	984	1613	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)	Continuous	
Bottom Edge (Lu)	All Bearing Points	

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 5'	N/A	15.3	--	
1 - Uniform (PSF)	0 to 5' (Front)	15' 9"	15.0	25.0	Default Load

Weyerhaeuser Notes

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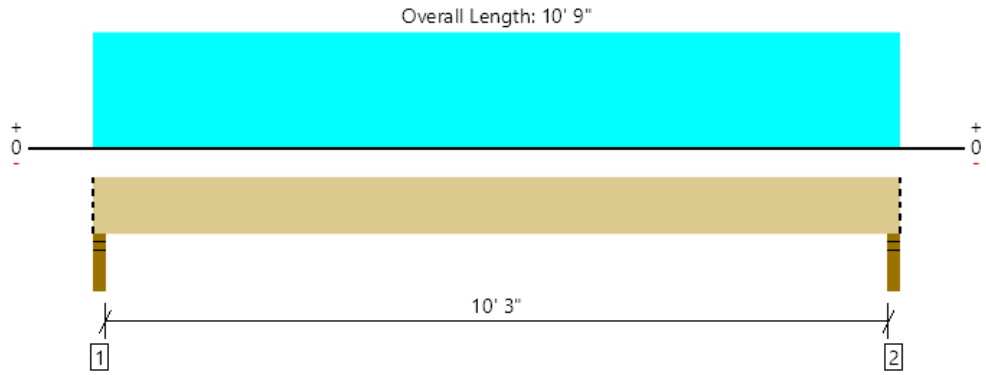
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Roof Framing, Beam 6

2 piece(s) 2 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)	1443 @ 1 1/2"	3645 (3.00")	Passed (40%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1125 @ 1' 2 1/4"	3881	Passed (29%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	3701 @ 5' 4 1/2"	5155	Passed (72%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.096 @ 5' 4 1/2"	0.350	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.159 @ 5' 4 1/2"	0.525	Passed (L/794)	--	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).
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Stud wall - HF	3.00"	3.00"	1.50"	570	873	1443	Blocking
2 - Stud wall - HF	3.00"	3.00"	1.50"	570	873	1443	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)	Continuous	
Bottom Edge (Lu)	All Bearing Points	

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 10' 9"	N/A	8.6	--	
1 - Uniform (PSF)	0 to 10' 9" (Front)	6' 6"	15.0	25.0	Default Load

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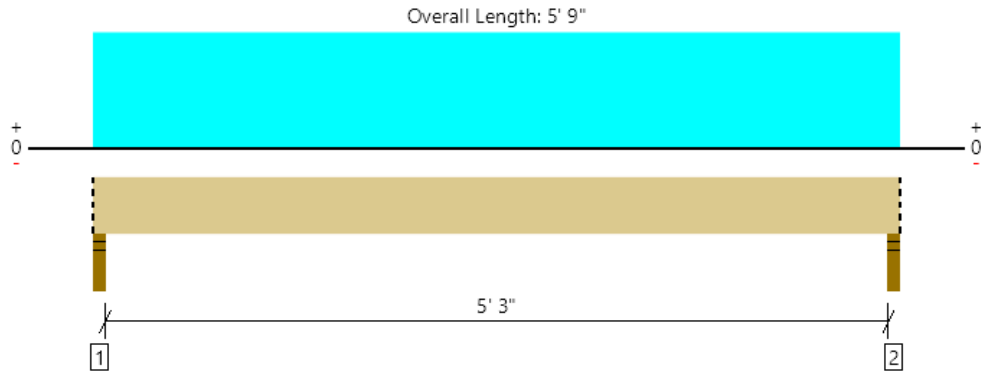
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Roof Framing, Beam 7
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)	763 @ 1 1/2"	3645 (3.00")	Passed (21%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	537 @ 10 1/4"	2501	Passed (21%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	1004 @ 2' 10 1/2"	2569	Passed (39%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.027 @ 2' 10 1/2"	0.183	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.044 @ 2' 10 1/2"	0.275	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).
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Stud wall - HF	3.00"	3.00"	1.50"	296	467	763	Blocking
2 - Stud wall - HF	3.00"	3.00"	1.50"	296	467	763	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)	Continuous	
Bottom Edge (Lu)	All Bearing Points	

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 5' 9"	N/A	5.5	--	
1 - Uniform (PSF)	0 to 5' 9" (Front)	6' 6"	15.0	25.0	Default Load

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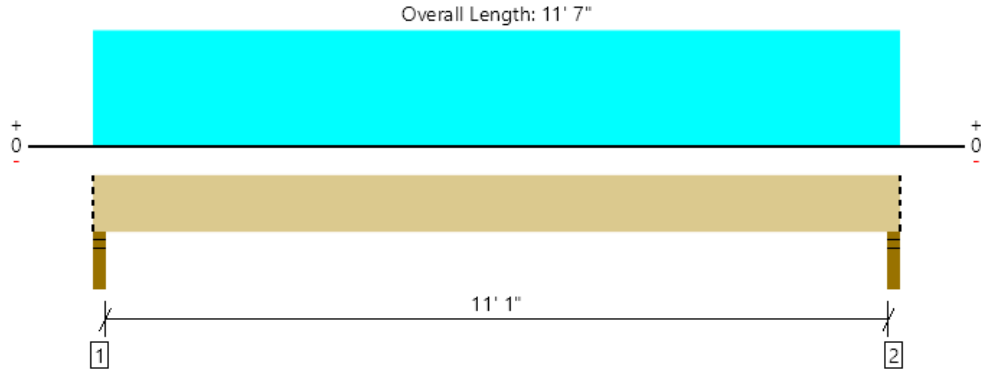
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Roof Framing, Beam 8

3 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)	1451 @ 1 1/2"	5468 (3.00")	Passed (27%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1195 @ 1' 1/4"	4787	Passed (25%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	4023 @ 5' 9 1/2"	5750	Passed (70%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.144 @ 5' 9 1/2"	0.378	Passed (L/942)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.241 @ 5' 9 1/2"	0.567	Passed (L/564)	--	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).
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Stud wall - HF	3.00"	3.00"	1.50"	582	869	1451	Blocking
2 - Stud wall - HF	3.00"	3.00"	1.50"	582	869	1451	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)	Continuous	
Bottom Edge (Lu)	All Bearing Points	

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 11' 7"	N/A	10.6	--	
1 - Uniform (PSF)	0 to 11' 7" (Front)	6'	15.0	25.0	Default Load

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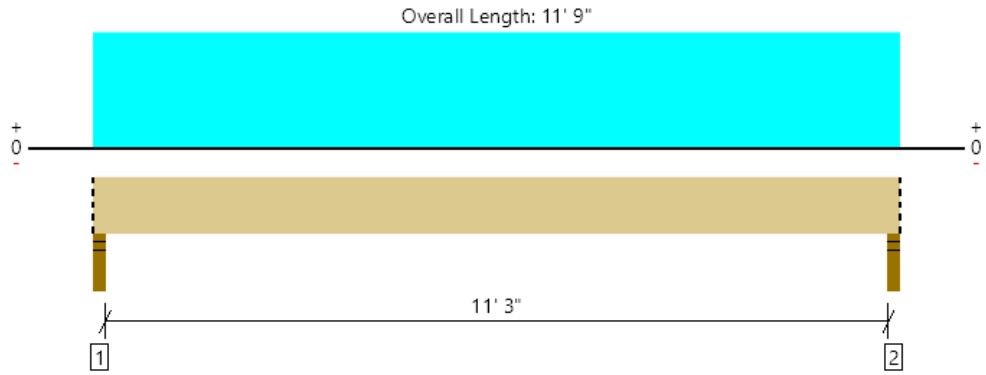
Roof Framing, Beam 9

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)	1453 @ 1 1/2"	4253 (3.00")	Passed (34%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1242 @ 10 1/4"	5544	Passed (22%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	4090 @ 5' 10 1/2"	8182	Passed (50%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.277 @ 5' 10 1/2"	0.383	Passed (L/499)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.457 @ 5' 10 1/2"	0.575	Passed (L/302)	--	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).

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Stud wall - HF	3.00"	3.00"	1.50"	572	881	1453	Blocking
2 - Stud wall - HF	3.00"	3.00"	1.50"	572	881	1453	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)	Continuous	
Bottom Edge (Lu)	All Bearing Points	

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 11' 9"	N/A	7.4	--	
1 - Uniform (PSF)	0 to 11' 9" (Front)	6'	15.0	25.0	Default Load

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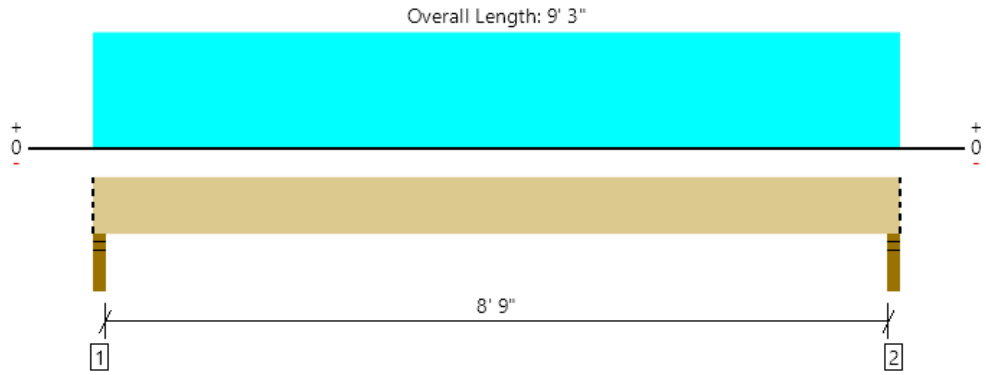
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Roof Framing, Beam 10

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)	1422 @ 1 1/2"	4253 (3.00")	Passed (33%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1159 @ 10 1/4"	5544	Passed (21%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	3112 @ 4' 7 1/2"	8182	Passed (38%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.133 @ 4' 7 1/2"	0.300	Passed (L/811)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.218 @ 4' 7 1/2"	0.450	Passed (L/495)	--	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).

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Stud wall - HF	3.00"	3.00"	1.50"	555	867	1422	Blocking
2 - Stud wall - HF	3.00"	3.00"	1.50"	555	867	1422	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)	Continuous	
Bottom Edge (Lu)	All Bearing Points	

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 9' 3"	N/A	7.4	--	
1 - Uniform (PSF)	0 to 9' 3" (Front)	7' 6"	15.0	25.0	Default Load

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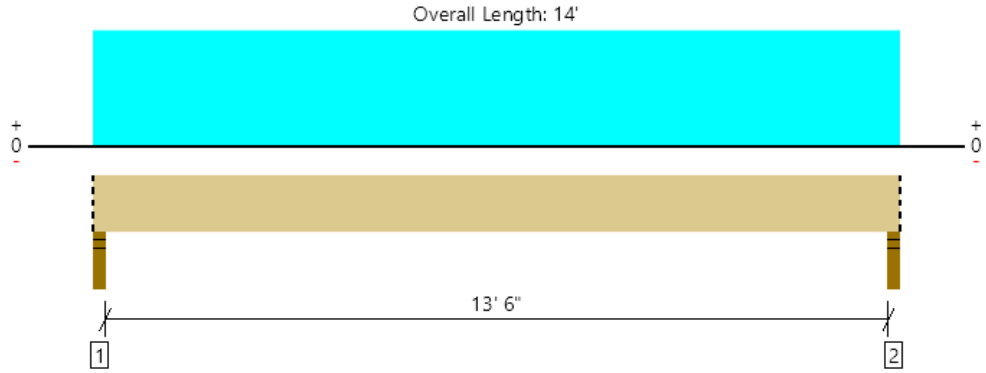
Roof Framing, Beam 11

3 piece(s) 1 3/4" x 9 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)	3039 @ 1 1/2"	6379 (3.00")	Passed (48%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	2596 @ 1' 1/4"	10611	Passed (24%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	10261 @ 7'	19327	Passed (53%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.320 @ 7'	0.458	Passed (L/516)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.529 @ 7'	0.688	Passed (L/312)	--	1.0 D + 1.0 S (All Spans)

- Deflection criteria: LL (L/360) and TL (L/240).

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Stud wall - HF	3.00"	3.00"	1.50"	1202	1838	3040	Blocking
2 - Stud wall - HF	3.00"	3.00"	1.50"	1202	1838	3040	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)	Continuous	
Bottom Edge (Lu)	All Bearing Points	

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 14'	N/A	14.2	--	
1 - Uniform (PSF)	0 to 14' (Front)	10' 6"	15.0	25.0	Default Load

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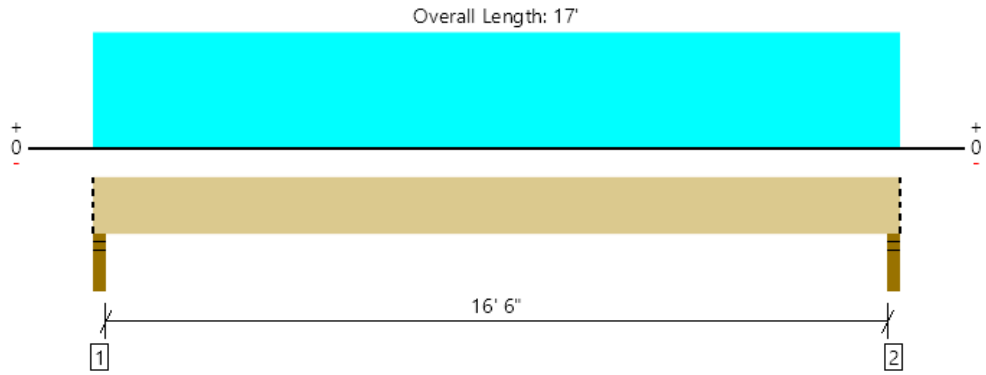
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Roof Framing, Beam 12

1 piece(s) 3 1/2" x 14" 1.55E TimberStrand® LSL



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)	1065 @ 1 1/2"	4253 (3.00")	Passed (25%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	888 @ 1' 5"	11646	Passed (8%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	4395 @ 8' 6"	25116	Passed (17%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.105 @ 8' 6"	0.558	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.192 @ 8' 6"	0.837	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)

- Deflection criteria: LL (L/360) and TL (L/240).

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Stud wall - HF	3.00"	3.00"	1.50"	481	584	1065	Blocking
2 - Stud wall - HF	3.00"	3.00"	1.50"	481	584	1065	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)	Continuous	
Bottom Edge (Lu)	All Bearing Points	

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 17'	N/A	15.3	--	
1 - Uniform (PSF)	0 to 17' (Front)	2' 9"	15.0	25.0	Default Load

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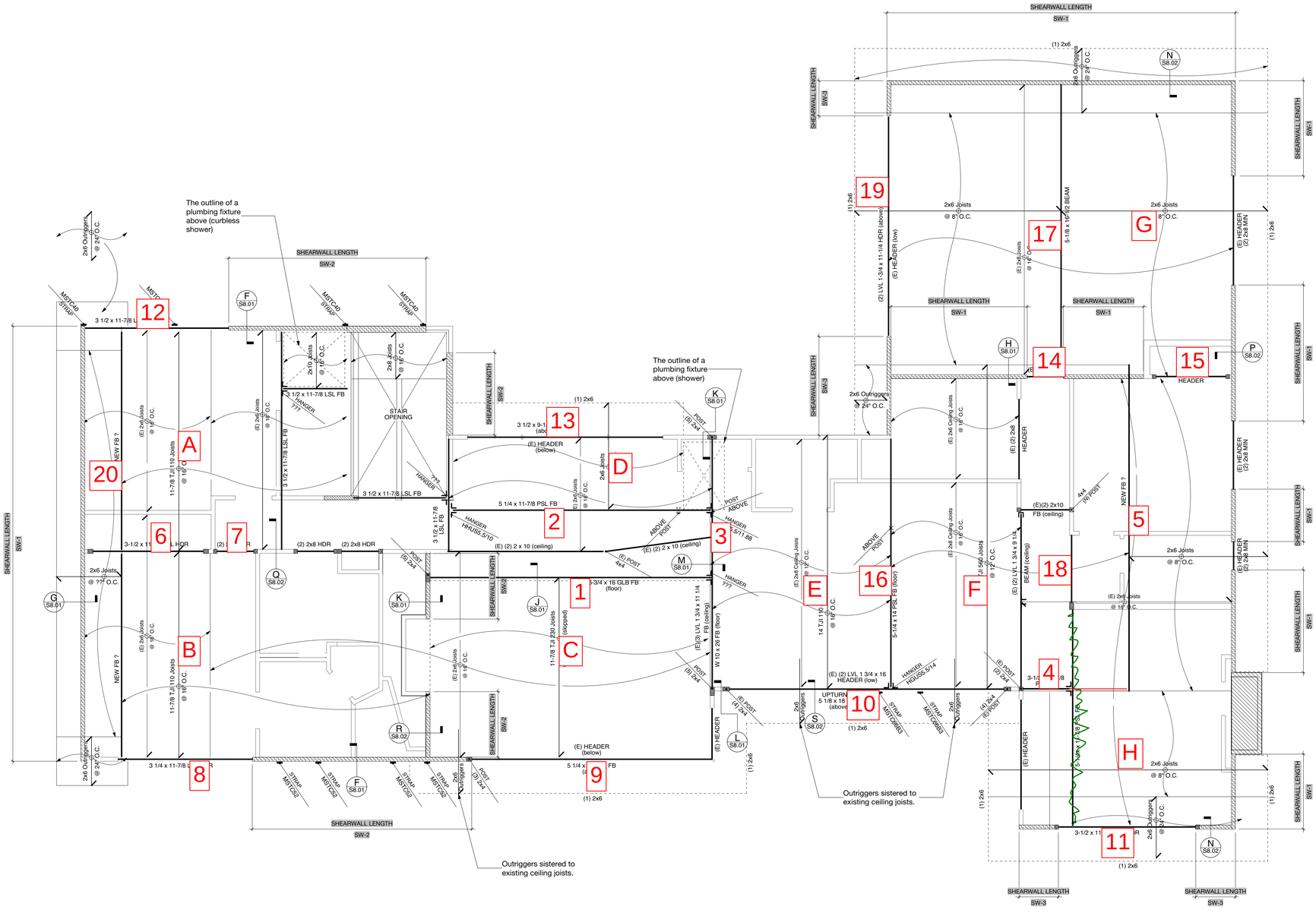
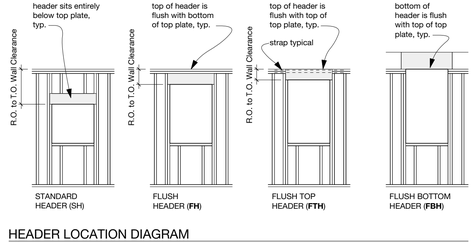


UPPER FLOOR
FLOOR FRAMING PLAN
Scale: 1/4" = 1'-0"

0 5 10 15 20 FT



HEADER LOCATION DIAGRAM
n.t.s.

LEXICON:

- LINE OF FOOTING BELOW GRADE
- AREA OF NEW REINFORCED CONCRETE
- EXISTING FOUNDATION WALL
- AREA OF NEW ROOF OVER FRAMING
- INDICATES JOIST DIRECTION
- INDICATES EXTENT OF FRAMING
- X0.00 — DETAIL REFERENCE, INDICATES DETAIL NUMBER & SHEET NUMBER
- HANGER HUA12 — INDICATES SIMPSON HANGER
- HOLDOWN HDU2 SDS2.5 — INDICATES SIMPSON HOLDOWN
- STRAP MST48 — INDICATES SIMPSON FRAMING STRAP
- SH — STANDARD HEADER. (See header location diagram).
- FH — FLUSH HEADER. (See header location diagram).
- FTH — FLUSH TOP HEADER. (See header location diagram).
- FBH — FLUSH BOTTOM HEADER (See header location diagram).
- FB — FLUSH BEAM (In plane with adjacent floor or roof framing)
- SW1 — SHEARWALL KEY - REFER TO SHEARWALL SCHEDULE

WHITNEY ARCHITECTURE

1537 NW Ballard Way Seattle WA 98107
WhitneyArchitecture.com
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PROJECT:

Anderson + Goodejohn Residence

A remodel to an existing single family residence at:

4224 94th Ave SE
Mercer Island, WA 98040

ISSUE DATE:

Date	Mark	Issue Type
-		-

NOT FOR CONSTRUCTION

PLOTTED:
Thursday, December 16, 2021
4:44:47 PM

FILE NAME:
1519-Anderson+Goodejohn DESIGN OPT 7 VW:

PROJECT NUMBER
1519

DRAWN BY:
LL

SHEET TITLE:
Permit

Upper Floor Framing Plan

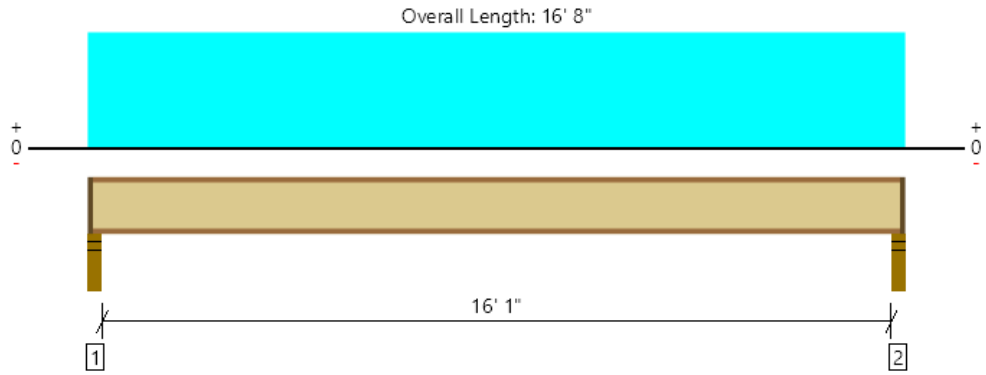
Leave this space open for building deptartment stamps.

SHEET NUMBER:

S2.02

SHEET 9 OF 10

Upper Floor Framing, Joist A
1 piece(s) 11 7/8" TJI® 110 @ 16" 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)	603 @ 2 1/2"	1041 (2.25")	Passed (58%)	1.00	1.0 D + 1.0 L (All Spans)
Shear (lbs)	590 @ 3 1/2"	1560	Passed (38%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	2421 @ 8' 4"	3160	Passed (77%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.281 @ 8' 4"	0.406	Passed (L/694)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.386 @ 8' 4"	0.813	Passed (L/505)	--	1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	42	40	Passed	--	--

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

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A structural analysis of the deck has not been performed.
- Deflection analysis is based on composite action with a single layer of 23/32" Weyerhaeuser Edge™ Panel (24" Span Rating) that is glued and nailed down.
- Additional considerations for the TJ-Pro™ Rating include: None.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Total	
1 - Stud wall - HF	3.50"	2.25"	1.75"	167	444	611	1 1/4" Rim Board
2 - Stud wall - HF	3.50"	2.25"	1.75"	167	444	611	1 1/4" Rim Board

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	3' 7" o/c	
Bottom Edge (Lu)	16' 6" o/c	

•TJI joists are only analyzed using Maximum Allowable bracing solutions.
•Maximum allowable bracing intervals based on applied load.

Vertical Load	Location	Spacing	Dead (0.90)	Floor Live (1.00)	Comments
1 - Uniform (PSF)	0 to 16' 8"	16"	15.0	40.0	Default Load

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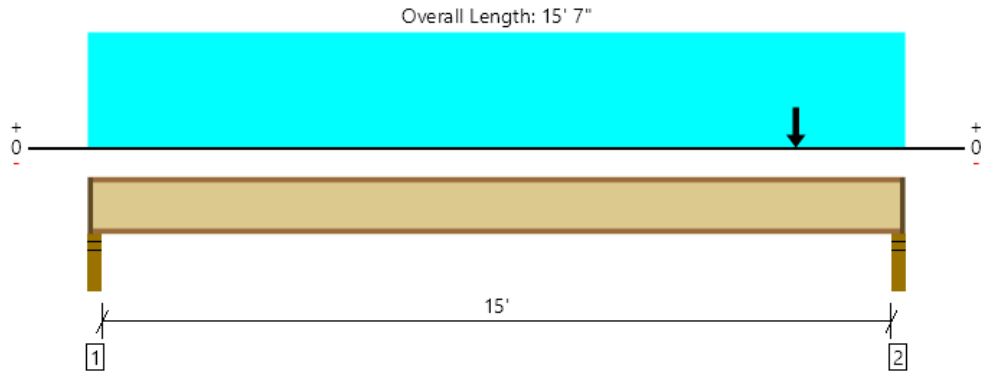
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Steven Nickolas Bykonen Carter Quinn (206) 264-7784 ssn@bcq-se.com	

Weyerhaeuser

Upper Floor Framing, Joist B
1 piece(s) 11 7/8" TJI® 110 @ 16" 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)	1088 @ 15' 4 1/2"	1198 (2.25")	Passed (91%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	1077 @ 15' 3 1/2"	1794	Passed (60%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	2419 @ 8' 4"	3160	Passed (77%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.223 @ 8' 7/8"	0.379	Passed (L/815)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.354 @ 8' 1 3/8"	0.758	Passed (L/514)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
TJ-Pro™ Rating	46	40	Passed	--	--

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

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A structural analysis of the deck has not been performed.
- Deflection analysis is based on composite action with a single layer of 23/32" Weyerhaeuser Edge™ Panel (24" Span Rating) that is glued and nailed down.
- Additional considerations for the TJ-Pro™ Rating include: None.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - HF	3.50"	2.25"	1.75"	195	416	65	676	1 1/4" Rim Board
2 - Stud wall - HF	3.50"	2.25"	1.89"	436	416	462	1314	1 1/4" Rim Board

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	3' 7" o/c	
Bottom Edge (Lu)	15' 5" o/c	

•TJI joists are only analyzed using Maximum Allowable bracing solutions.
•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Spacing	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 15' 7"	16"	15.0	40.0	-	Default Load
2 - Point (PLF)	13' 6"	16"	240.0	-	395.0	

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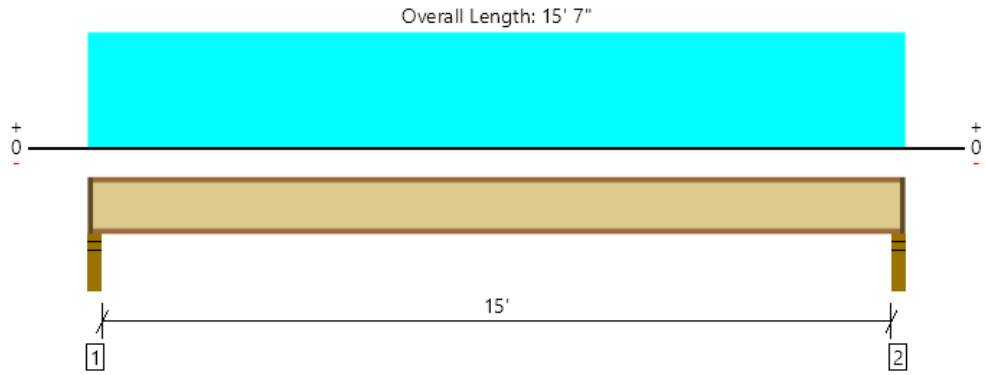
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Steven Nickolas Bykonen Carter Quinn (206) 264-7784 ssn@bcq-se.com	

Weyerhaeuser

Upper Floor Framing, Joist C
1 piece(s) 11 7/8" TJI® 230 @ 16" 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)	922 @ 2 1/2"	1183 (2.25")	Passed (78%)	1.00	1.0 D + 1.0 L (All Spans)
Shear (lbs)	900 @ 3 1/2"	1655	Passed (54%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	3450 @ 7' 9 1/2"	4215	Passed (82%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.267 @ 7' 9 1/2"	0.379	Passed (L/680)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.401 @ 7' 9 1/2"	0.758	Passed (L/454)	--	1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	49	40	Passed	--	--

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

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A structural analysis of the deck has not been performed.
- Deflection analysis is based on composite action with a single layer of 23/32" Weyerhaeuser Edge™ Panel (24" Span Rating) that is glued and nailed down.
- Additional considerations for the TJ-Pro™ Rating include: None.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Total	
1 - Stud wall - HF	3.50"	2.25"	1.75"	312	623	935	1 1/4" Rim Board
2 - Stud wall - HF	3.50"	2.25"	1.75"	312	623	935	1 1/4" Rim Board

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	4' 6" o/c	
Bottom Edge (Lu)	15' 5" o/c	

•TJI joists are only analyzed using Maximum Allowable bracing solutions.
•Maximum allowable bracing intervals based on applied load.

Vertical Load	Location	Spacing	Dead (0.90)	Floor Live (1.00)	Comments
1 - Uniform (PSF)	0 to 15' 7"	16"	30.0	60.0	Default Load

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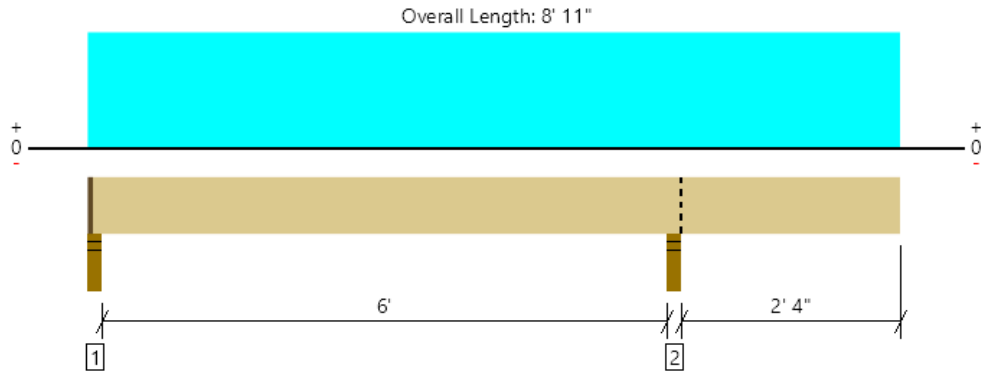
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Upper Floor Framing, Joist D
1 piece(s) 2 x 6 HF No.2 @ 24" 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)	487 @ 6' 5 1/4"	2126 (3.50")	Passed (23%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	240 @ 5' 10"	949	Passed (25%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	308 @ 2' 11 13/16"	921	Passed (33%)	1.15	1.0 D + 1.0 S (Alt Spans)
Live Load Defl. (in)	0.051 @ 3' 2 5/8"	0.156	Passed (L/999+)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.074 @ 3' 2 1/16"	0.311	Passed (L/999+)	--	1.0 D + 1.0 S (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/480) and TL (L/240).
- Overhang deflection criteria: LL (2L/480) and TL (2L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A 15% increase in the moment capacity has been added to account for repetitive member usage.
- Applicable calculations are based on NDS.
- No composite action between deck and joist was considered in analysis.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Stud wall - HF	3.50"	2.25"	1.50"	85	154	239	1 1/4" Rim Board
2 - Stud wall - HF	3.50"	3.50"	1.50"	183	304	487	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' 10" o/c	
Bottom Edge (Lu)	8' 10" 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 8' 11"	24"	15.0	25.0	Default Load

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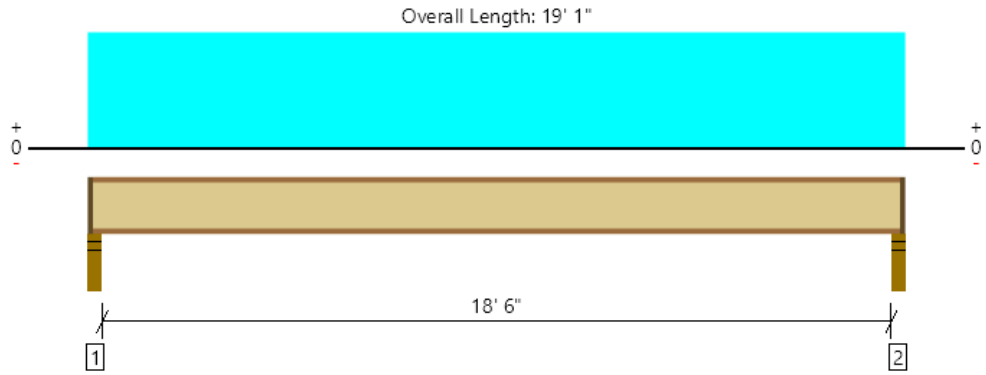
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Steven Nickolas Bykonen Carter Quinn (206) 264-7784 ssn@bcq-se.com	

Weyerhaeuser

Upper Floor Framing, Joist E
1 piece(s) 14" TJI® 110 @ 16" 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)	692 @ 2 1/2"	1041 (2.25")	Passed (66%)	1.00	1.0 D + 1.0 L (All Spans)
Shear (lbs)	678 @ 3 1/2"	1860	Passed (36%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	3194 @ 9' 6 1/2"	3740	Passed (85%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.334 @ 9' 6 1/2"	0.467	Passed (L/670)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.459 @ 9' 6 1/2"	0.933	Passed (L/488)	--	1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	42	40	Passed	--	--

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

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A structural analysis of the deck has not been performed.
- Deflection analysis is based on composite action with a single layer of 23/32" Weyerhaeuser Edge™ Panel (24" Span Rating) that is glued and nailed down.
- Additional considerations for the TJ-Pro™ Rating include: None.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Total	
1 - Stud wall - HF	3.50"	2.25"	1.75"	191	509	700	1 1/4" Rim Board
2 - Stud wall - HF	3.50"	2.25"	1.75"	191	509	700	1 1/4" Rim Board

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	3' 4" o/c	
Bottom Edge (Lu)	18' 11" o/c	

•TJI joists are only analyzed using Maximum Allowable bracing solutions.
•Maximum allowable bracing intervals based on applied load.

Vertical Load	Location	Spacing	Dead (0.90)	Floor Live (1.00)	Comments
1 - Uniform (PSF)	0 to 19' 1"	16"	15.0	40.0	Default Load

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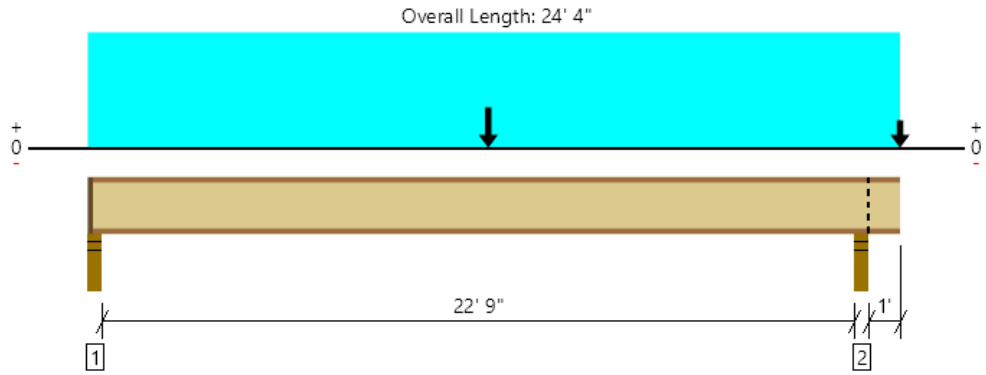
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Upper Floor Framing, Joist F
1 piece(s) 14" TJI® 560 @ 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)	718 @ 2 1/2"	1396 (2.25")	Passed (51%)	1.00	1.0 D + 1.0 L (Alt Spans)
Shear (lbs)	707 @ 3 1/2"	2390	Passed (30%)	1.00	1.0 D + 1.0 L (Alt Spans)
Moment (Ft-lbs)	4572 @ 12'	11275	Passed (41%)	1.00	1.0 D + 1.0 L (Alt Spans)
Live Load Defl. (in)	0.318 @ 12'	0.574	Passed (L/867)	--	1.0 D + 0.75 L + 0.75 S (Alt Spans)
Total Load Defl. (in)	0.505 @ 12'	1.149	Passed (L/546)	--	1.0 D + 0.75 L + 0.75 S (Alt Spans)
TJ-Pro™ Rating	45	40	Passed	--	--

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

- Deflection criteria: LL (L/480) and TL (L/240).
- Overhang deflection criteria: LL (2L/480) and TL (2L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A structural analysis of the deck has not been performed.
- Deflection analysis is based on composite action with a single layer of 23/32" Weyerhaeuser Edge™ Panel (24" Span Rating) that is glued and nailed down.
- Additional considerations for the TJ-Pro™ Rating include: None.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - HF	3.50"	2.25"	1.75"	256	468	140	864	1 1/4" Rim Board
2 - Stud wall - HF	3.50"	3.50"	3.50"	379	507	314	1200	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' 7" o/c	
Bottom Edge (Lu)	14' 7" o/c	

- TJI joists are only analyzed using Maximum Allowable bracing solutions.
- Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Spacing	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 24' 4"	12"	15.0	40.0	-	Default Load
2 - Point (PLF)	12'	12"	175.0	-	295.0	
3 - Point (PLF)	24' 4"	12"	95.0	-	155.0	

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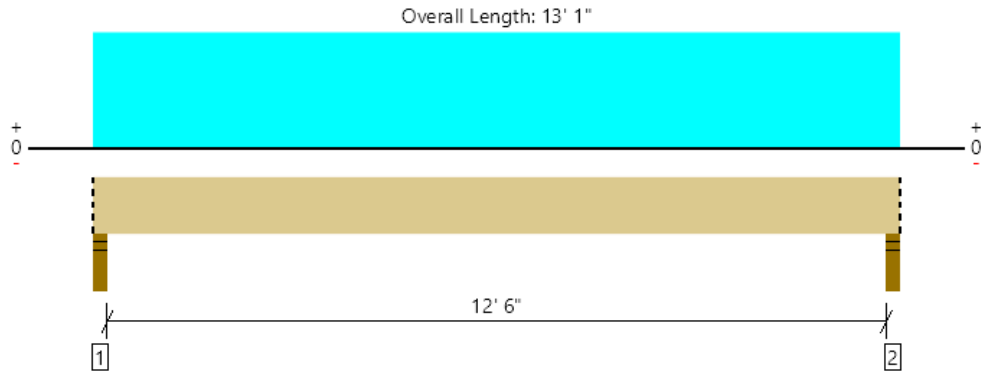
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Upper Floor Framing, Joist G
1 piece(s) 2 x 6 HF No.2 @ 8" 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)	174 @ 2 1/2"	2126 (3.50")	Passed (8%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	154 @ 9"	949	Passed (16%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	535 @ 6' 6 1/2"	921	Passed (58%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.357 @ 6' 6 1/2"	0.422	Passed (L/426)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.571 @ 6' 6 1/2"	0.633	Passed (L/266)	--	1.0 D + 1.0 S (All Spans)

System : Roof
Member Type : Joist
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.
- 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 - Stud wall - HF	3.50"	3.50"	1.50"	65	109	174	Blocking
2 - Stud wall - HF	3.50"	3.50"	1.50"	65	109	174	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)	11' 6" o/c	
Bottom Edge (Lu)	13' 1" 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 13' 1"	8"	15.0	25.0	Default Load

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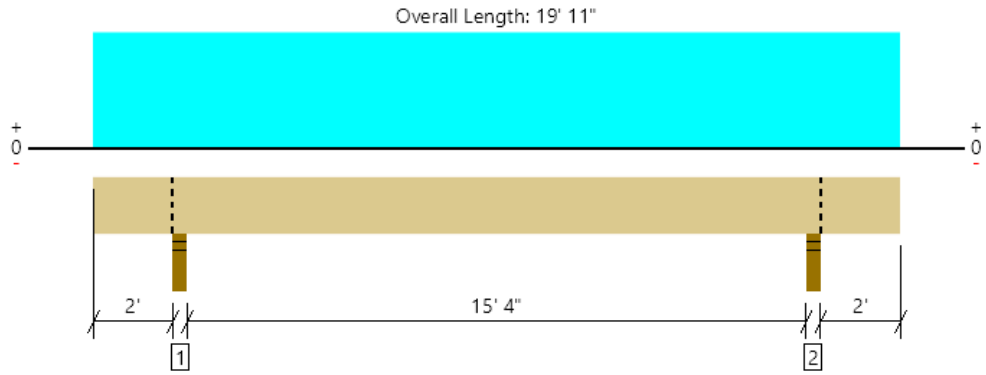
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Upper Floor Framing, Joist H
2 piece(s) 2 x 6 HF No.2 @ 10" 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)	333 @ 2' 1 3/4"	4253 (3.50")	Passed (8%)	--	1.0 D + 1.0 S (Adj Spans)
Shear (lbs)	242 @ 2' 9"	1898	Passed (13%)	1.15	1.0 D + 1.0 S (Adj Spans)
Moment (Ft-lbs)	964 @ 9' 11 1/2"	1842	Passed (52%)	1.15	1.0 D + 1.0 S (Alt Spans)
Live Load Defl. (in)	0.493 @ 9' 11 1/2"	0.521	Passed (L/380)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.775 @ 9' 11 1/2"	0.781	Passed (L/242)	--	1.0 D + 1.0 S (Alt Spans)

System : Roof
Member Type : Joist
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/360) and TL (2L/240). Upward deflection on left and right cantilevers 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 - Stud wall - HF	3.50"	3.50"	1.50"	124	209	333	Blocking
2 - Stud wall - HF	3.50"	3.50"	1.50"	124	209	333	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)	19' 11" o/c	
Bottom Edge (Lu)	19' 11" 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 19' 11"	10"	15.0	25.0	Default Load

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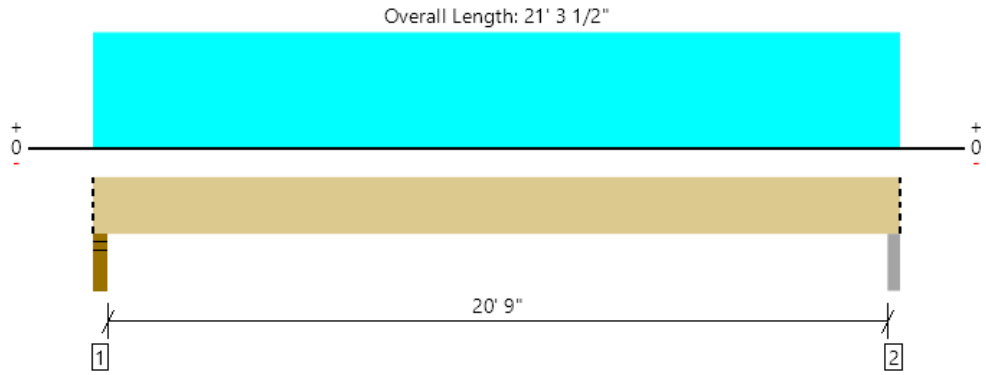
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Steven Nickolas Bykonen Carter Quinn (206) 264-7784 ssn@bcq-se.com	

Weyerhaeuser

Upper Floor Framing, Beam 1

1 piece(s) 6 3/4" x 16 1/2" 24F-V8 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)	8382 @ 2"	9568 (3.50")	Passed (88%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	7072 @ 1' 8"	19676	Passed (36%)	1.00	1.0 D + 1.0 L (All Spans)
Pos Moment (Ft-lbs)	43318 @ 10' 8"	57724	Passed (75%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.495 @ 10' 8"	0.525	Passed (L/509)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.756 @ 10' 8"	1.050	Passed (L/333)	--	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/480) and TL (L/240).
- Critical positive moment adjusted by a volume factor of 0.94 that was calculated using length L = 21'.
- The effects of positive or negative camber have not been accounted for when calculating deflection.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Total	
1 - Stud wall - HF	3.50"	3.50"	3.07"	2889	5493	8382	Blocking
2 - Plate - steel	3.00"	3.00"	1.90"	2877	5472	8349	Blocking

- Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.
- Steel plate supports are only used to determine the bearing length for supported member(s). Additional consideration is required to determine steel plate specifications.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	Continuous	
Bottom Edge (Lu)	Continuous	

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 21' 3 1/2"	N/A	27.1	--	
1 - Uniform (PSF)	0 to 21' 3 1/2" (Front)	6' 9"	30.0	60.0	Default Load
2 - Uniform (PSF)	0 to 21' 3 1/2" (Front)	2' 9"	15.0	40.0	Default Load

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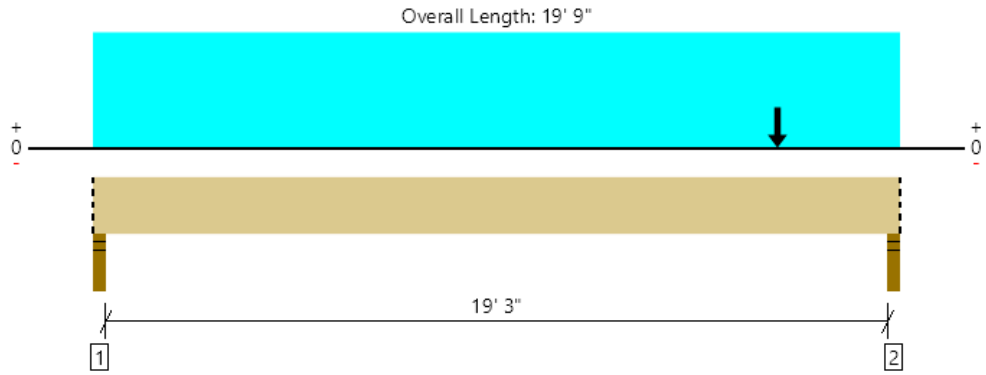
Upper Floor Framing, Beam 2

1 piece(s) 5 1/4" x 11 7/8" 2.0E 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)	3198 @ 19' 7 1/2"	6379 (3.00")	Passed (50%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	2895 @ 18' 6 1/8"	13861	Passed (21%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	12980 @ 10' 5 1/8"	34332	Passed (38%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.356 @ 10' 1/16"	0.488	Passed (L/658)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.639 @ 10' 5/16"	0.975	Passed (L/366)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

- Deflection criteria: LL (L/480) and TL (L/240).

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

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - HF	3.00"	3.00"	1.50"	1115	1086	827	3028	Blocking
2 - Stud wall - HF	3.00"	3.00"	1.50"	1454	1086	1239	3779	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)	Continuous	
Bottom Edge (Lu)	Continuous	

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 19' 9"	N/A	19.5	--	--	
1 - Uniform (PSF)	0 to 19' 9" (Front)	2' 9"	15.0	40.0	-	Default Load
2 - Uniform (PSF)	0 to 19' 9" (Front)	3'	15.0	-	25.0	Default Load
3 - Point (lb)	16' 9" (Front)	N/A	481	-	584	Linked from: Beam 12, Support 1

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

Project Title:
Engineer:
Project ID:
Project Descr:

Steel Beam

Lic. # : KW-06003456

BYKONEN CARTER QUINN

DESCRIPTION: Beam #3

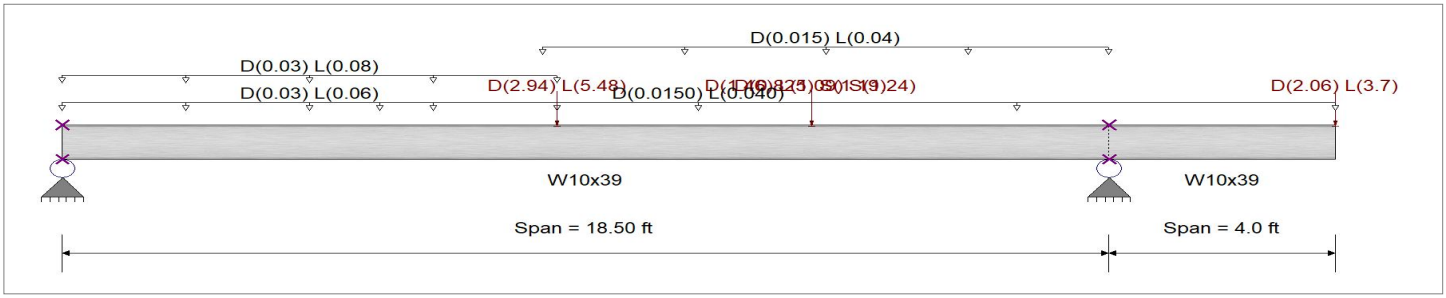
CODE REFERENCES

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : ASCE 7-16

Material Properties

Analysis Method : Allowable Strength Design
Beam Bracing : Completely Unbraced
Bending Axis : Major Axis Bending

Fy : Steel Yield : 50.0 ksi
E: Modulus : 29,000.0 ksi



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight calculated and added to loading
Loads on all spans...
Uniform Load on ALL spans : D = 0.0150, L = 0.040 k/ft

Load for Span Number 1
Uniform Load : D = 0.030, L = 0.060 ksf, Extent = 0.0 -->> 8.750 ft, Tributary Width = 1.0 ft

Uniform Load : D = 0.0150, L = 0.040 ksf, Extent = 0.0 -->> 8.750 ft, Tributary Width = 2.0 ft

Uniform Load : D = 0.0150, L = 0.040 ksf, Extent = 8.50 -->> 18.50 ft, Tributary Width = 1.0 ft

Point Load : D = 2.940, L = 5.480 k @ 8.750 ft

Point Load : D = 0.8250, S = 1.190 k @ 13.250 ft

Point Load : D = 1.460, L = 1.090, S = 1.240 k @ 13.250 ft

Load(s) for Span Number 2
Point Load : D = 2.060, L = 3.70 k @ 4.0 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.465 : 1	Maximum Shear Stress Ratio =	0.150 : 1
Section used for this span	W10x39	Section used for this span	W10x39
Ma : Applied	52.367 k-ft	Va : Applied	9.390 k
Mn / Omega : Allowable	112.637 k-ft	Vn/Omega : Allowable	62.496 k
Load Combination	+D+L+H, LL Comb Run (L*)	Load Combination	+D+0.750L+0.750S+H, LL Comb Run (LL)
Location of maximum on span	8.732 ft	Location of maximum on span	18.500 ft
Span # where maximum occurs	Span # 1	Span # where maximum occurs	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.129 in	Ratio =	743 >=480.
Max Upward Transient Deflection	-0.192 in	Ratio =	500 >=480.
Max Downward Total Deflection	0.456 in	Ratio =	487 >=240.
Max Upward Total Deflection	-0.266 in	Ratio =	361 >=240.

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	Summary of Moment Values Mmax +	Mmax -	Ma Max	Mnx	Mnx/Omega	Cb	Rm	Summary of Shear Values Va Max	Vnx	Vnx/Omega
+D+H													

Project Title:
Engineer:
Project ID:
Project Descr:

Steel Beam

File: Anderson & Goodejohn Residence.ec6

Lic. # : KW-06003456
BYKONEN CARTER QUINN

DESCRIPTION: Beam #3

Load Combination / Segment Length	Span #	Max Stress Ratios M	Max Stress Ratios V	Summary of Moment Values Mmax +	Mmax -	Ma Max	Mnx	Mnx/Omega	Cb	Rm	Summary of Shear Values Va Max	Vnx	Vnx/Omega
Dsgn. L = 18.50 ft	1	0.167	0.068	18.97	-8.67	18.97	189.28	113.34	1.29	1.00	4.23	93.74	62.50
Dsgn. L = 4.00 ft	2	0.074	0.036		-8.67	8.67	195.00	116.77	1.00	1.00	2.28	93.74	62.50
+D+L+H, LL Comb Run (*L)													
Dsgn. L = 18.50 ft	1	0.204	0.098	11.83	-23.79	23.79	195.00	116.77	2.31	1.00	6.14	93.74	62.50
Dsgn. L = 4.00 ft	2	0.204	0.098		-23.79	23.79	195.00	116.77	1.00	1.00	6.14	93.74	62.50
+D+L+H, LL Comb Run (L*)													
Dsgn. L = 18.50 ft	1	0.465	0.137	52.37	-8.67	52.37	188.10	112.64	1.28	1.00	8.55	93.74	62.50
Dsgn. L = 4.00 ft	2	0.074	0.036		-8.67	8.67	195.00	116.77	1.00	1.00	2.28	93.74	62.50
+D+L+H, LL Comb Run (LL)													
Dsgn. L = 18.50 ft	1	0.387	0.150	45.23	-23.79	45.23	195.00	116.77	1.35	1.00	9.37	93.74	62.50
Dsgn. L = 4.00 ft	2	0.204	0.098		-23.79	23.79	195.00	116.77	1.00	1.00	6.14	93.74	62.50
+D+Lr+H, LL Comb Run (*L)													
Dsgn. L = 18.50 ft	1	0.167	0.068	18.97	-8.67	18.97	189.28	113.34	1.29	1.00	4.23	93.74	62.50
Dsgn. L = 4.00 ft	2	0.074	0.036		-8.67	8.67	195.00	116.77	1.00	1.00	2.28	93.74	62.50
+D+Lr+H, LL Comb Run (L*)													
Dsgn. L = 18.50 ft	1	0.167	0.068	18.97	-8.67	18.97	189.28	113.34	1.29	1.00	4.23	93.74	62.50
Dsgn. L = 4.00 ft	2	0.074	0.036		-8.67	8.67	195.00	116.77	1.00	1.00	2.28	93.74	62.50
+D+Lr+H, LL Comb Run (LL)													
Dsgn. L = 18.50 ft	1	0.167	0.068	18.97	-8.67	18.97	189.28	113.34	1.29	1.00	4.23	93.74	62.50
Dsgn. L = 4.00 ft	2	0.074	0.036		-8.67	8.67	195.00	116.77	1.00	1.00	2.28	93.74	62.50
+D+S+H													
Dsgn. L = 18.50 ft	1	0.235	0.096	25.00	-8.67	25.00	177.83	106.48	1.21	1.00	5.97	93.74	62.50
Dsgn. L = 4.00 ft	2	0.074	0.036		-8.67	8.67	195.00	116.77	1.00	1.00	2.28	93.74	62.50
+D+0.750Lr+0.750L+H, LL Comb Run (*													
Dsgn. L = 18.50 ft	1	0.171	0.083	13.62	-20.01	20.01	195.00	116.77	1.93	1.00	5.17	93.74	62.50
Dsgn. L = 4.00 ft	2	0.171	0.083		-20.01	20.01	195.00	116.77	1.00	1.00	5.17	93.74	62.50
+D+0.750Lr+0.750L+H, LL Comb Run (L													
Dsgn. L = 18.50 ft	1	0.390	0.120	44.02	-8.67	44.02	188.25	112.73	1.28	1.00	7.47	93.74	62.50
Dsgn. L = 4.00 ft	2	0.074	0.036		-8.67	8.67	195.00	116.77	1.00	1.00	2.28	93.74	62.50
+D+0.750Lr+0.750L+H, LL Comb Run (L													
Dsgn. L = 18.50 ft	1	0.331	0.129	38.66	-20.01	38.66	195.00	116.77	1.35	1.00	8.09	93.74	62.50
Dsgn. L = 4.00 ft	2	0.171	0.083		-20.01	20.01	195.00	116.77	1.00	1.00	5.17	93.74	62.50
+D+0.750L+0.750S+H, LL Comb Run (*L													
Dsgn. L = 18.50 ft	1	0.171	0.098	18.13	-20.01	20.01	195.00	116.77	1.44	1.00	6.15	93.74	62.50
Dsgn. L = 4.00 ft	2	0.171	0.083		-20.01	20.01	195.00	116.77	1.00	1.00	5.17	93.74	62.50
+D+0.750L+0.750S+H, LL Comb Run (L*													
Dsgn. L = 18.50 ft	1	0.441	0.140	48.53	-8.67	48.53	183.70	110.00	1.25	1.00	8.78	93.74	62.50
Dsgn. L = 4.00 ft	2	0.074	0.036		-8.67	8.67	195.00	116.77	1.00	1.00	2.28	93.74	62.50
+D+0.750L+0.750S+H, LL Comb Run (LL													
Dsgn. L = 18.50 ft	1	0.377	0.150	43.18	-20.01	43.18	191.04	114.40	1.30	1.00	9.39	93.74	62.50
Dsgn. L = 4.00 ft	2	0.171	0.083		-20.01	20.01	195.00	116.77	1.00	1.00	5.17	93.74	62.50
+D+0.60W+H													
Dsgn. L = 18.50 ft	1	0.167	0.068	18.97	-8.67	18.97	189.28	113.34	1.29	1.00	4.23	93.74	62.50
Dsgn. L = 4.00 ft	2	0.074	0.036		-8.67	8.67	195.00	116.77	1.00	1.00	2.28	93.74	62.50
+D+0.750Lr+0.750L+0.450W+H, LL Con													
Dsgn. L = 18.50 ft	1	0.171	0.083	13.62	-20.01	20.01	195.00	116.77	1.93	1.00	5.17	93.74	62.50
Dsgn. L = 4.00 ft	2	0.171	0.083		-20.01	20.01	195.00	116.77	1.00	1.00	5.17	93.74	62.50
+D+0.750Lr+0.750L+0.450W+H, LL Con													
Dsgn. L = 18.50 ft	1	0.390	0.120	44.02	-8.67	44.02	188.25	112.73	1.28	1.00	7.47	93.74	62.50
Dsgn. L = 4.00 ft	2	0.074	0.036		-8.67	8.67	195.00	116.77	1.00	1.00	2.28	93.74	62.50
+D+0.750Lr+0.750L+0.450W+H, LL Con													
Dsgn. L = 18.50 ft	1	0.331	0.129	38.66	-20.01	38.66	195.00	116.77	1.35	1.00	8.09	93.74	62.50
Dsgn. L = 4.00 ft	2	0.171	0.083		-20.01	20.01	195.00	116.77	1.00	1.00	5.17	93.74	62.50
+D+0.750L+0.750S+0.450W+H, LL Com													
Dsgn. L = 18.50 ft	1	0.171	0.098	18.13	-20.01	20.01	195.00	116.77	1.44	1.00	6.15	93.74	62.50
Dsgn. L = 4.00 ft	2	0.171	0.083		-20.01	20.01	195.00	116.77	1.00	1.00	5.17	93.74	62.50
+D+0.750L+0.750S+0.450W+H, LL Com													
Dsgn. L = 18.50 ft	1	0.441	0.140	48.53	-8.67	48.53	183.70	110.00	1.25	1.00	8.78	93.74	62.50
Dsgn. L = 4.00 ft	2	0.074	0.036		-8.67	8.67	195.00	116.77	1.00	1.00	2.28	93.74	62.50
+D+0.750L+0.750S+0.450W+H, LL Com													
Dsgn. L = 18.50 ft	1	0.377	0.150	43.18	-20.01	43.18	191.04	114.40	1.30	1.00	9.39	93.74	62.50
Dsgn. L = 4.00 ft	2	0.171	0.083		-20.01	20.01	195.00	116.77	1.00	1.00	5.17	93.74	62.50
+0.60D+0.60W+0.60H													
Dsgn. L = 18.50 ft	1	0.100	0.041	11.38	-5.20	11.38	189.28	113.34	1.29	1.00	2.54	93.74	62.50
Dsgn. L = 4.00 ft	2	0.045	0.022		-5.20	5.20	195.00	116.77	1.00	1.00	1.37	93.74	62.50
+D+0.70E+0.60H													
Dsgn. L = 18.50 ft	1	0.167	0.068	18.97	-8.67	18.97	189.28	113.34	1.29	1.00	4.23	93.74	62.50
Dsgn. L = 4.00 ft	2	0.074	0.036		-8.67	8.67	195.00	116.77	1.00	1.00	2.28	93.74	62.50
+D+0.750L+0.750S+0.5250E+H, LL Con													

Project Title:
Engineer:
Project ID:
Project Descr:

Steel Beam

File: Anderson & Goodejohn Residence.ec6

Lic. # : KW-06003456
BYKONEN CARTER QUINN

DESCRIPTION: Beam #3

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	Summary of Moment Values Mmax +	Mmax -	Ma Max	Mnx	Mnx/Omega	Cb	Rm	Summary of Shear Values Va Max	Vnx	Vnx/Omega
Dsgn. L = 18.50 ft	1	0.171	0.098	18.13	-20.01	20.01	195.00	116.77	1.44	1.00	6.15	93.74	62.50
Dsgn. L = 4.00 ft	2	0.171	0.083		-20.01	20.01	195.00	116.77	1.00	1.00	5.17	93.74	62.50
+D+0.750L+0.750S+0.5250E+H, LL Con													
Dsgn. L = 18.50 ft	1	0.441	0.140	48.53	-8.67	48.53	183.70	110.00	1.25	1.00	8.78	93.74	62.50
Dsgn. L = 4.00 ft	2	0.074	0.036		-8.67	8.67	195.00	116.77	1.00	1.00	2.28	93.74	62.50
+D+0.750L+0.750S+0.5250E+H, LL Con													
Dsgn. L = 18.50 ft	1	0.377	0.150	43.18	-20.01	43.18	191.04	114.40	1.30	1.00	9.39	93.74	62.50
Dsgn. L = 4.00 ft	2	0.171	0.083		-20.01	20.01	195.00	116.77	1.00	1.00	5.17	93.74	62.50
+0.60D+0.70E+H													
Dsgn. L = 18.50 ft	1	0.100	0.041	11.38	-5.20	11.38	189.28	113.34	1.29	1.00	2.54	93.74	62.50
Dsgn. L = 4.00 ft	2	0.045	0.022		-5.20	5.20	195.00	116.77	1.00	1.00	1.37	93.74	62.50

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+L+H	1	0.4559	9.176		0.0000	0.000
	2	0.0000	9.176	+D+L+H	-0.2662	4.000

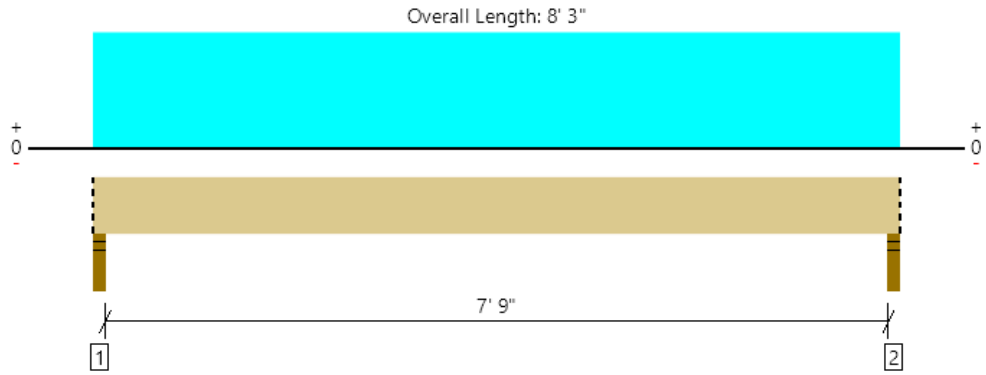
Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	Support 3
Overall MAXimum	7.281	15.506	
Overall MINimum	0.690	1.740	
+D+H	2.670	6.505	
+D+L+H, LL Comb Run (*L)	1.853	11.182	
+D+L+H, LL Comb Run (L*)	7.281	10.829	
+D+L+H, LL Comb Run (LL)	6.464	15.506	
+D+Lr+H, LL Comb Run (*L)	2.670	6.505	
+D+Lr+H, LL Comb Run (L*)	2.670	6.505	
+D+Lr+H, LL Comb Run (LL)	2.670	6.505	
+D+S+H	3.360	8.245	
+D+0.750Lr+0.750L+H, LL Comb Run (*	2.057	10.013	
+D+0.750Lr+0.750L+H, LL Comb Run (L	6.128	9.748	
+D+0.750Lr+0.750L+H, LL Comb Run (L	5.515	13.256	
+D+0.750L+0.750S+H, LL Comb Run (*L	2.574	11.318	
+D+0.750L+0.750S+H, LL Comb Run (L'	6.645	11.053	
+D+0.750L+0.750S+H, LL Comb Run (LI	6.032	14.561	
+D+0.60W+H	2.670	6.505	
+D+0.750Lr+0.750L+0.450W+H, LL Con	2.057	10.013	
+D+0.750Lr+0.750L+0.450W+H, LL Con	6.128	9.748	
+D+0.750Lr+0.750L+0.450W+H, LL Con	5.515	13.256	
+D+0.750L+0.750S+0.450W+H, LL Com	2.574	11.318	
+D+0.750L+0.750S+0.450W+H, LL Com	6.645	11.053	
+D+0.750L+0.750S+0.450W+H, LL Com	6.032	14.561	
+0.60D+0.60W+0.60H	1.602	3.903	
+D+0.70E+0.60H	2.670	6.505	
+D+0.750L+0.750S+0.5250E+H, LL Con	2.574	11.318	
+D+0.750L+0.750S+0.5250E+H, LL Con	6.645	11.053	
+D+0.750L+0.750S+0.5250E+H, LL Con	6.032	14.561	
+0.60D+0.70E+H	1.602	3.903	
D Only	2.670	6.505	
L Only, LL Comb Run (*L)	-0.817	4.677	
L Only, LL Comb Run (L*)	4.611	4.324	
L Only, LL Comb Run (LL)	3.794	9.001	
S Only	0.690	1.740	
H Only			

Upper Floor Framing, Beam 4

1 piece(s) 3 1/2" x 11 7/8" 1.55E TimberStrand® LSL



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)	3040 @ 1 1/2"	4253 (3.00")	Passed (71%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	2127 @ 1' 2 7/8"	8590	Passed (25%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	5896 @ 4' 1 1/2"	15953	Passed (37%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.070 @ 4' 1 1/2"	0.200	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.111 @ 4' 1 1/2"	0.400	Passed (L/866)	--	1.0 D + 1.0 L (All Spans)

- Deflection criteria: LL (L/480) and TL (L/240).

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

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - HF	3.00"	3.00"	2.14"	1110	1931	578	3619	Blocking
2 - Stud wall - HF	3.00"	3.00"	2.14"	1110	1931	578	3619	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)	Continuous	
Bottom Edge (Lu)	Continuous	

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 8' 3"	N/A	13.0	--	--	
1 - Uniform (PLF)	0 to 8' 3" (Front)	N/A	256.0	468.0	140.0	Linked from: Joist F, Support 1

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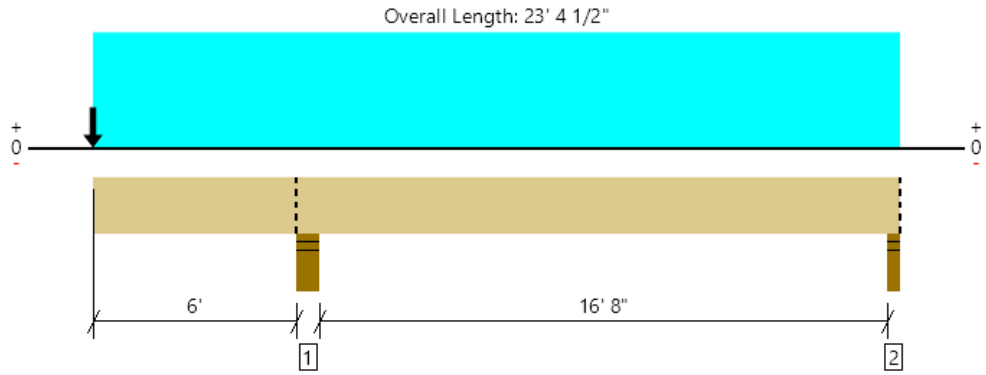
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Steven Nickolas Bykonen Carter Quinn (206) 264-7784 ssn@bcq-se.com	

Weyerhaeuser

Upper Floor Framing, Beam 5

1 piece(s) 6 3/4" x 15" 24F-V8 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)	6844 @ 6' 2 3/4"	15036 (5.50")	Passed (46%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	3556 @ 4' 9"	17888	Passed (20%)	1.00	1.0 D + 1.0 L (All Spans)
Pos Moment (Ft-lbs)	2144 @ 18' 4 3/4"	58219	Passed (4%)	1.15	1.0 D + 1.0 S (Alt Spans)
Neg Moment (Ft-lbs)	-21045 @ 6' 2 3/4"	47675	Passed (44%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.302 @ 0	0.311	Passed (2L/494)	--	1.0 D + 1.0 L (Alt Spans)
Total Load Defl. (in)	0.453 @ 0	0.623	Passed (2L/330)	--	1.0 D + 1.0 L (Alt Spans)

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

- Deflection criteria: LL (L/480) and TL (L/240).
- Overhang deflection criteria: LL (2L/480) and TL (2L/240).
- Moment capacity over cantilever support 1 has been reduced by 5.8% to lessen the effects of buckling.
- Critical positive moment adjusted by a volume factor of 1.00 that was calculated using length L = 9' 8 7/16".
- Critical negative moment adjusted by a volume factor of 0.94 that was calculated using length L = 23' 3".
- -473 lbs uplift at support located at 23' 3". Strapping or other restraint may be required.
- The effects of positive or negative camber have not been accounted for when calculating deflection.
- 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 - HF	5.50"	5.50"	2.50"	2919	2955	2278	8152	Blocking
2 - Stud wall - HF	3.00"	3.00"	1.50"	256	173/-729	650	1079/-729	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)	Continuous	
Bottom Edge (Lu)	Continuous	

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 23' 4 1/2"	N/A	24.6	--	--	
1 - Uniform (PSF)	0 to 23' 4 1/2" (Front)	6"	15.0	40.0	-	Default Load
2 - Uniform (PSF)	0 to 23' 4 1/2" (Front)	3' 9"	15.0	-	25.0	Default Load
3 - Point (lb)	0 (Front)	N/A	1110	1931	578	Linked from: Beam 4 (new), Support 2

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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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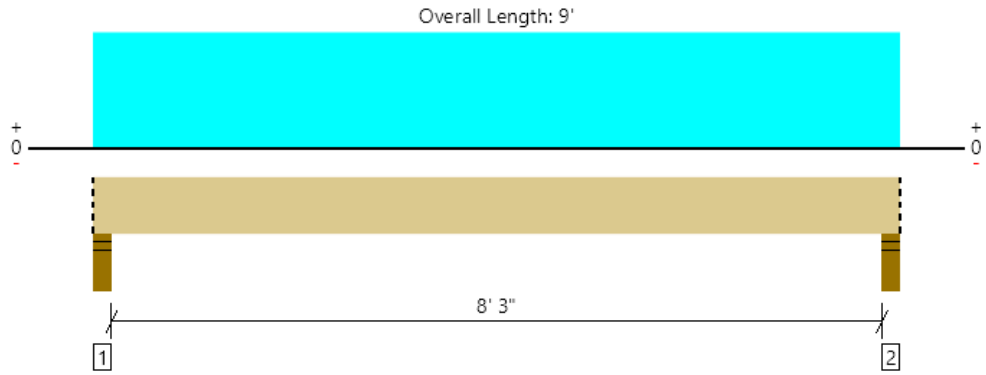
12/21/2021 6:16:36 PM UTC

ForteWEB v3.2, Engine: V8.2.0.17, Data: V8.1.0.16

File Name: Anderson-Goodejohn Residence

Upper Floor Framing, Beam 6

1 piece(s) 3 1/2" x 11 7/8" 1.55E TimberStrand® LSL



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)	5372 @ 3"	6379 (4.50")	Passed (84%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	3424 @ 1' 4 3/8"	8590	Passed (40%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	9862 @ 4' 6"	15953	Passed (62%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.138 @ 4' 6"	0.213	Passed (L/741)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.224 @ 4' 6"	0.425	Passed (L/456)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

- Deflection criteria: LL (L/480) and TL (L/240).

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

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - HF	4.50"	4.50"	3.79"	2070	2844	1559	6473	Blocking
2 - Stud wall - HF	4.50"	4.50"	3.79"	2070	2844	1559	6473	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)	Continuous	
Bottom Edge (Lu)	Continuous	

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 9'	N/A	13.0	--	--	
1 - Uniform (PSF)	0 to 9' (Front)	8'	15.0	40.0	-	Default Load
2 - Uniform (PLF)	0 to 9' (Front)	N/A	327.0	312.0	346.5	Linked from: Joist B, Support 2

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ForteWEB Software Operator	Job Notes
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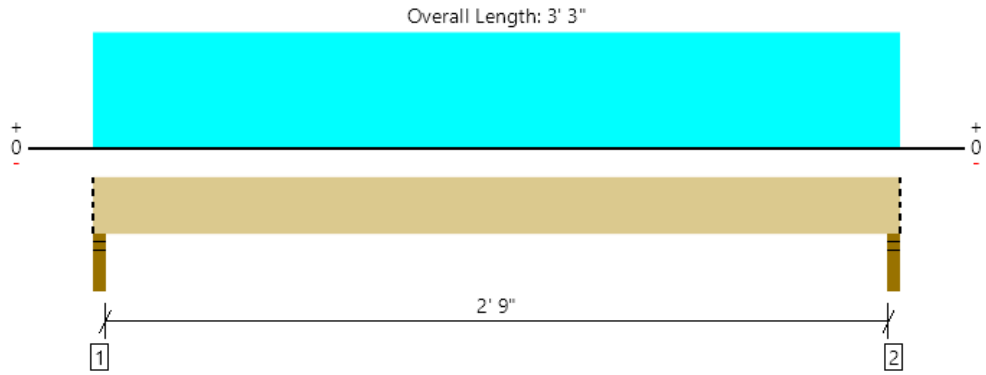
Upper Floor Framing, Beam 7
2 piece(s) 2 x 8 HF No.2



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Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1928 @ 1 1/2"	3645 (3.00")	Passed (53%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	836 @ 10 1/4"	2175	Passed (38%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	1220 @ 1' 7 1/2"	2234	Passed (55%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.011 @ 1' 7 1/2"	0.075	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.017 @ 1' 7 1/2"	0.150	Passed (L/999+)	--	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/480) and TL (L/240).
- 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 - HF	3.00"	3.00"	1.59"	735	1027	563	2325	Blocking
2 - Stud wall - HF	3.00"	3.00"	1.59"	735	1027	563	2325	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)	Continuous	
Bottom Edge (Lu)	Continuous	

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 3' 3"	N/A	5.5	--	--	
1 - Uniform (PSF)	0 to 3' 3" (Front)	8'	15.0	40.0	-	Default Load
2 - Uniform (PLF)	0 to 3' 3" (Front)	N/A	327.0	312.0	346.5	Linked from: Joist B, Support 2

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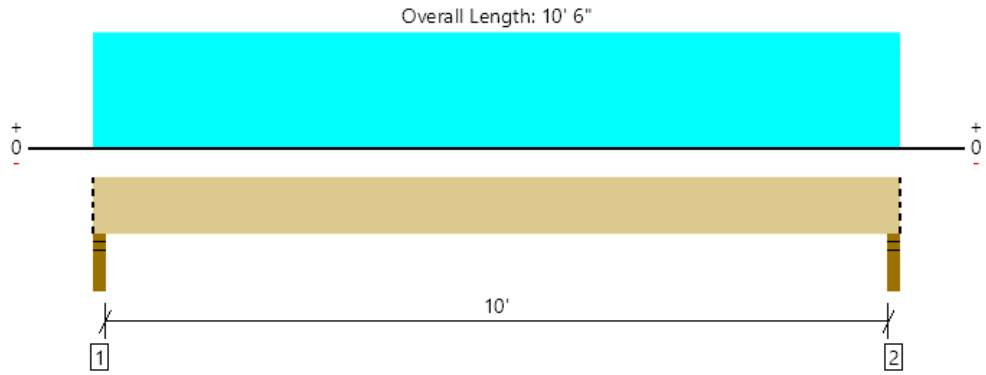
Upper Floor Framing, Beam 8

1 piece(s) 3 1/2" x 11 7/8" 1.55E TimberStrand® LSL



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)	2947 @ 1 1/2"	4253 (3.00")	Passed (69%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	2251 @ 1' 2 7/8"	8590	Passed (26%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	7371 @ 5' 3"	15953	Passed (46%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.117 @ 5' 3"	0.256	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.210 @ 5' 3"	0.512	Passed (L/584)	--	1.0 D + 1.0 L (All Spans)

- Deflection criteria: LL (L/480) and TL (L/240).

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

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - HF	3.00"	3.00"	2.08"	1309	1638	256	3203	Blocking
2 - Stud wall - HF	3.00"	3.00"	2.08"	1309	1638	256	3203	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)	Continuous	
Bottom Edge (Lu)	Continuous	

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 10' 6"	N/A	13.0	--	--	
1 - Uniform (PLF)	0 to 10' 6" (Front)	N/A	146.3	312.0	48.8	Linked from: Joist B, Support 1
2 - Uniform (PSF)	0 to 10' 6" (Front)	9'	10.0	-	-	

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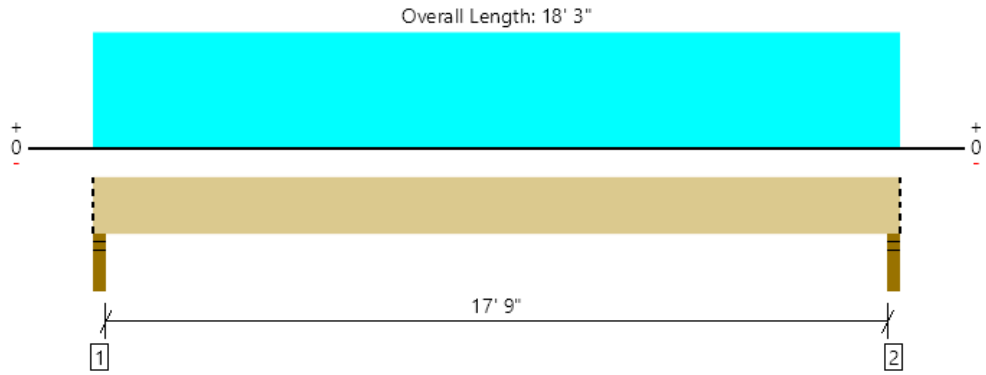
Upper Floor Framing, Beam 9

1 piece(s) 5 1/4" x 14" 2.0E 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)	5753 @ 1 1/2"	6379 (3.00")	Passed (90%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	4860 @ 1' 5"	14210	Passed (34%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	25535 @ 9' 1 1/2"	40743	Passed (63%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.424 @ 9' 1 1/2"	0.450	Passed (L/509)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.660 @ 9' 1 1/2"	0.900	Passed (L/327)	--	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/480) and TL (L/240).

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Total	
1 - Stud wall - HF	3.00"	3.00"	2.71"	2058	3696	5754	Blocking
2 - Stud wall - HF	3.00"	3.00"	2.71"	2058	3696	5754	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)	Continuous	
Bottom Edge (Lu)	Continuous	

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 18' 3"	N/A	23.0	--	
1 - Uniform (PSF)	0 to 18' 3" (Front)	6' 9"	30.0	60.0	

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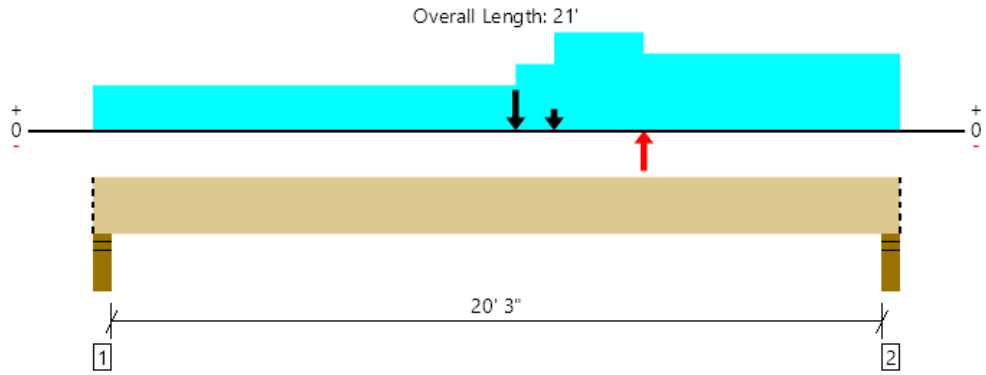
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Upper Floor Framing, Beam 10 (w/ overstrength)
1 piece(s) 5 1/8" x 18" 24F-V8 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)	8944 @ 20' 9"	9340 (4.50")	Passed (96%)	--	1.0 D - 0.525 E + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	6622 @ 19' 1 1/2"	16298	Passed (41%)	1.00	1.0 D + 1.0 L (All Spans)
Pos Moment (Ft-lbs)	39733 @ 12'	53279	Passed (75%)	1.00	1.0 D + 1.0 L (All Spans)
Neg Moment (Ft-lbs)	-3815 @ 11'	88560	Passed (4%)	1.60	0.6 D - 0.7 E (All Spans)
Live Load Defl. (in)	0.456 @ 10' 2 3/4"	0.512	Passed (L/539)	--	1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.709 @ 10' 4 15/16"	1.025	Passed (L/347)	--	1.0 D + 0.525 E + 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/480) and TL (L/240).
- Critical positive moment adjusted by a volume factor of 0.96 that was calculated using length L = 20' 6".
- Critical negative moment adjusted by a volume factor of 1.00 that was calculated using length L = 7' 11".
- The effects of positive or negative camber have not been accounted for when calculating deflection.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)					Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Seismic	Total	
1 - Stud wall - HF	4.50"	4.50"	3.38"	2354	4284	705	1748/-1748	9091/-1748	Blocking
2 - Stud wall - HF	4.50"	4.50"	4.31"	3146	4875	1632	1748/-1748	11401/-1748	Blocking

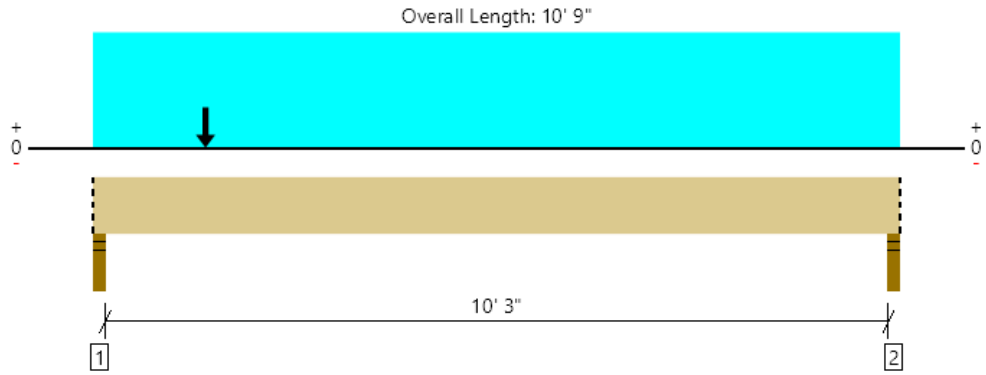
- Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	Continuous	
Bottom Edge (Lu)	Continuous	

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Seismic (1.60)	Comments
0 - Self Weight (PLF)	0 to 21'	N/A	22.4	--	--	--	
1 - Uniform (PSF)	0 to 12' (Front)	9' 3"	15.0	40.0	-	-	Default Load
2 - Uniform (PLF)	12' to 21' (Front)	N/A	256.0	468.0	140.0	-	Linked from: Joist F, Support 1
3 - Point (lb)	11' (Front)	N/A	-	-	-	10750	
4 - Point (lb)	14' 4" (Front)	N/A	-	-	-	-10750	
5 - Uniform (PSF)	11' to 14' 4" (Front)	6'	15.0	-	25.0	-	
6 - Point (lb)	12' (Front)	N/A	761	507	577	-	Linked from: Beam 16, Support 1

Upper Floor Framing, Beam 11

1 piece(s) 3 1/2" x 11 7/8" 1.55E TimberStrand® LSL



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)	3863 @ 1 1/2"	4253 (3.00")	Passed (91%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	3301 @ 1' 2 7/8"	8590	Passed (38%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	7423 @ 4' 10 13/16"	15953	Passed (47%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.156 @ 5' 3 1/4"	0.262	Passed (L/809)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.225 @ 5' 3 1/16"	0.525	Passed (L/560)	--	1.0 D + 1.0 L (All Spans)

- Deflection criteria: LL (L/480) and TL (L/240).

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

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - HF	3.00"	3.00"	2.72"	1248	2615	162	4025	Blocking
2 - Stud wall - HF	3.00"	3.00"	1.87"	795	1855	24	2674	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)	Continuous	
Bottom Edge (Lu)	Continuous	

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 10' 9"	N/A	13.0	--	--	
1 - Uniform (PSF)	0 to 10' 9" (Front)	8'	15.0	40.0	-	Default Load
2 - Point (lb)	1' 6" (Front)	N/A	613	1030	186	Linked from: Beam 5, Support 1

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

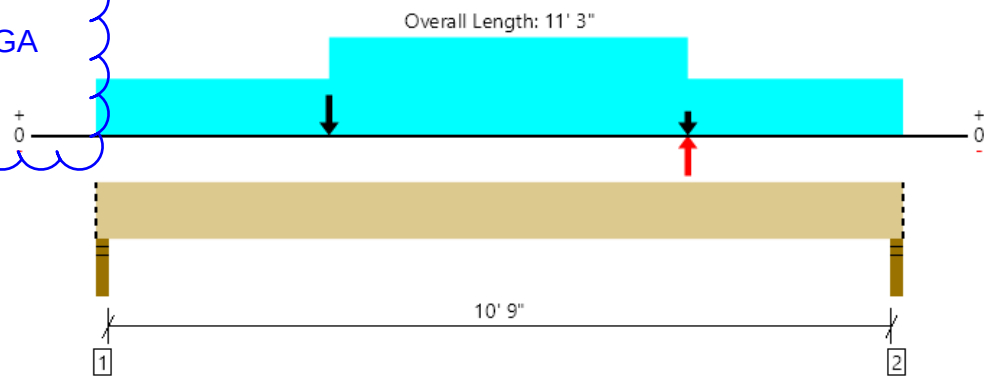
ForteWEB Software Operator	Job Notes
Steven Nickolas Bykonen Carter Quinn (206) 264-7784 ssn@bcq-se.com	

Weyerhaeuser

Upper Floor Framing, Beam 12 (w/ overstrength)
1 piece(s) 3 1/2" x 11 7/8" 2.0E Parallam® PSL

Support 2 failed reaction check due to insufficient bearing capacity.

BEARING FAILURE NOT CONSIDERED FOR BEAMS WITH OMEGA LEVEL HOLDOWN FORCES APPLIED



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)	7198 @ 11' 1 1/2"	6563 (3.00")	Failed (110%)	--	1.0 D - 0.525 E + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	6731 @ 10' 1/8"	12857	Passed (52%)	1.60	1.0 D - 0.525 E + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	19003 @ 8' 3"	31844	Passed (60%)	1.60	1.0 D - 0.525 E + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.213 @ 4' 7 3/4"	0.275	Passed (L/618)	--	1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.334 @ 5' 13/16"	0.550	Passed (L/395)	--	1.0 D + 0.525 E + 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/480) and TL (L/240).

Supports	Bearing Length			Loads to Supports (lbs)					Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Seismic	Total	
1 - Stud wall - DF	3.00"	3.00"	2.71"	1365	1819	974	4716/-4716	8874/-4716	Blocking
2 - Stud wall - DF	3.00"	3.00"	3.29"	1953	1819	1874	4716/-4716	10362/-4716	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)	Continuous	
Bottom Edge (Lu)	Continuous	

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Seismic (1.60)	Comments
0 - Self Weight (PLF)	0 to 11' 3"	N/A	13.0	--	--	--	
1 - Uniform (PSF)	0 to 11' 3" (Front)	8' 1"	15.0	40.0	-	-	Default Load
2 - Uniform (PSF)	3' 3" to 8' 3" (Front)	8' 1"	15.0	-	25.0	-	Default Load
3 - Point (lb)	8' 3" (Front)	N/A	1202	-	1838	-	Linked from: Beam 11, Support 1
4 - Point (lb)	3' 3" (Front)	N/A	-	-	-	10375	
5 - Point (lb)	8' 3" (Front)	N/A	-	-	-	-10375	

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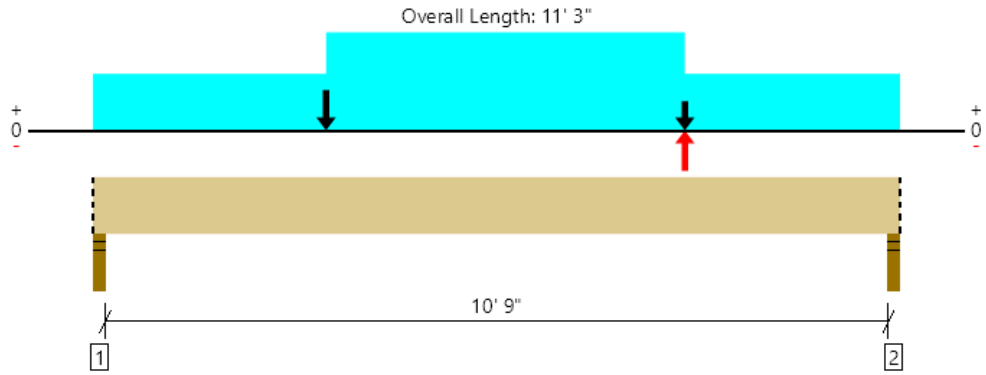
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Steven Nickolas Bykonen Carter Quinn (206) 264-7784 ssn@bcq-se.com	

Weyerhaeuser

12/21/2021 6:49:30 PM UTC
ForteWEB v3.2, Engine: V8.2.0.17, Data: V8.1.0.16
File Name: Anderson-Goodejohn Residence

Upper Floor Framing, Beam 12 (w/o overstrength)
1 piece(s) 3 1/2" x 11 7/8" 2.0E 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)	5713 @ 11' 1 1/2"	6563 (3.00")	Passed (87%)	--	1.0 D - 0.525 E + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	4256 @ 10' 1/8"	9241	Passed (46%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	12674 @ 6' 8 5/16"	22888	Passed (55%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.191 @ 5' 3 1/4"	0.275	Passed (L/690)	--	1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.318 @ 5' 5 15/16"	0.550	Passed (L/415)	--	1.0 D + 0.525 E + 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/480) and TL (L/240).
- -501 lbs uplift at support located at 1 1/2". Strapping or other restraint may be required.

Supports	Bearing Length			Loads to Supports (lbs)					Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Seismic	Total	
1 - Stud wall - DF	3.00"	3.00"	2.03"	1365	1819	974	1886/-1886	6044/-1886	Blocking
2 - Stud wall - DF	3.00"	3.00"	2.61"	1953	1819	1874	1886/-1886	7532/-1886	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)	Continuous	
Bottom Edge (Lu)	Continuous	

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Seismic (1.60)	Comments
0 - Self Weight (PLF)	0 to 11' 3"	N/A	13.0	--	--	--	
1 - Uniform (PSF)	0 to 11' 3" (Front)	8' 1"	15.0	40.0	-	-	Default Load
2 - Uniform (PSF)	3' 3" to 8' 3" (Front)	8' 1"	15.0	-	25.0	-	Default Load
3 - Point (lb)	8' 3" (Front)	N/A	1202	-	1838	-	Linked from: Beam 11, Support 1
4 - Point (lb)	3' 3" (Front)	N/A	-	-	-	4150	
5 - Point (lb)	8' 3" (Front)	N/A	-	-	-	-4150	

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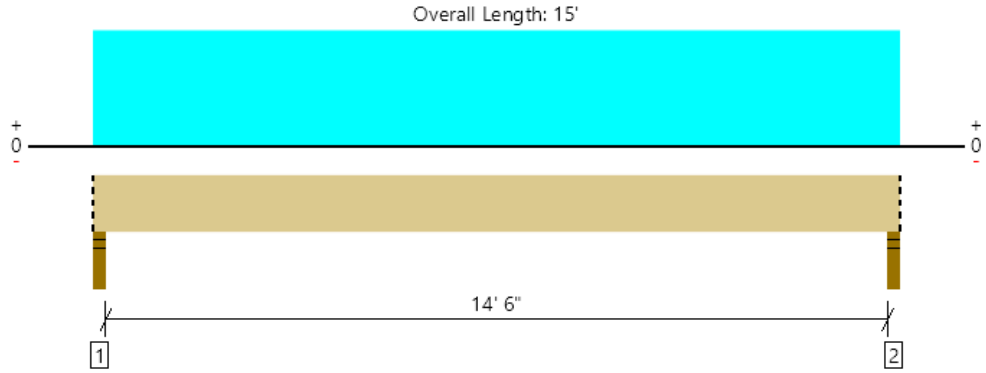
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Steven Nickolas Bykonen Carter Quinn (206) 264-7784 ssn@bcq-se.com	

Weyerhaeuser

Upper Floor Framing, Beam 13

1 piece(s) 3 1/2" x 9 1/2" 1.55E TimberStrand® LSL



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)	1353 @ 1 1/2"	4253 (3.00")	Passed (32%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1165 @ 1' 1/2"	7902	Passed (15%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	4906 @ 7' 6"	11985	Passed (41%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.305 @ 7' 6"	0.369	Passed (L/581)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.518 @ 7' 6"	0.738	Passed (L/342)	--	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/480) and TL (L/240).

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Stud wall - HF	3.00"	3.00"	1.50"	556	797	1353	Blocking
2 - Stud wall - HF	3.00"	3.00"	1.50"	556	797	1353	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)	Continuous	
Bottom Edge (Lu)	Continuous	

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 15'	N/A	10.4	--	
1 - Uniform (PSF)	0 to 15' (Front)	4' 3"	15.0	25.0	Default Load

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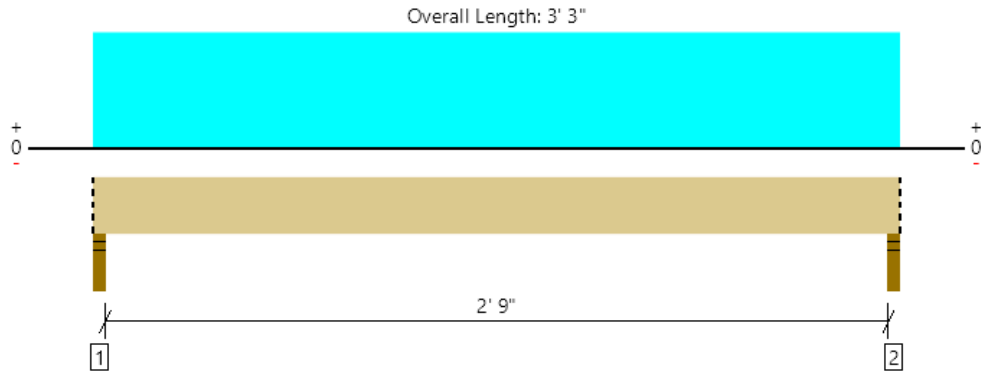
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Upper Floor Framing, Beam 14
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)	1625 @ 1 1/2"	3645 (3.00")	Passed (45%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	687 @ 10 1/4"	2175	Passed (32%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	1003 @ 1' 7 1/2"	2234	Passed (45%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.009 @ 1' 7 1/2"	0.075	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.015 @ 1' 7 1/2"	0.150	Passed (L/999+)	--	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/480) and TL (L/240).
- 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 - HF	3.00"	3.00"	1.50"	625	824	510	1959	Blocking
2 - Stud wall - HF	3.00"	3.00"	1.50"	625	824	510	1959	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)	Continuous	
Bottom Edge (Lu)	Continuous	

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 3' 3"	N/A	5.5	--	--	
1 - Uniform (PLF)	0 to 3' 3" (Front)	N/A	379.0	507.0	314.0	Linked from: Joist F, Support 2

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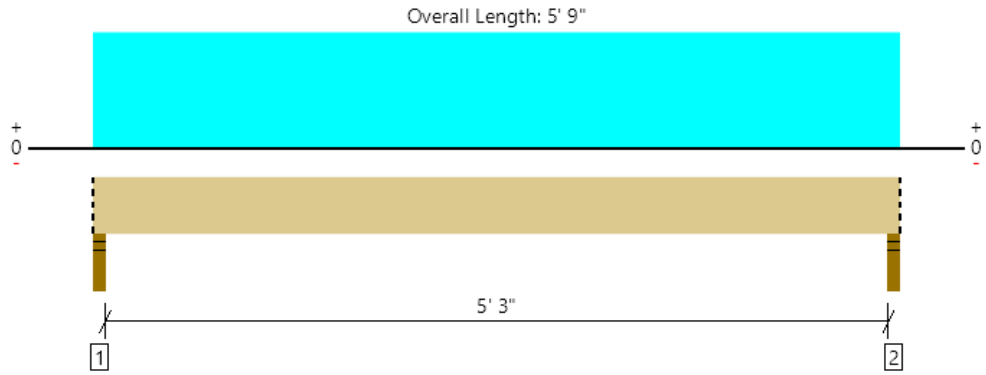
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Upper Floor Framing, Beam 15
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)	2131 @ 1 1/2"	3645 (3.00")	Passed (58%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	1374 @ 1' 1/4"	3191	Passed (43%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	2802 @ 2' 10 1/2"	3833	Passed (73%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.036 @ 2' 10 1/2"	0.138	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.059 @ 2' 10 1/2"	0.275	Passed (L/999+)	--	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/480) and TL (L/240).
- 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 - DF	3.00"	3.00"	1.75"	840	949	773	2562	Blocking
2 - Stud wall - DF	3.00"	3.00"	1.75"	840	949	773	2562	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)	Continuous	
Bottom Edge (Lu)	Continuous	

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 5' 9"	N/A	7.0	--	--	
1 - Uniform (PSF)	0 to 5' 9" (Front)	8' 3"	15.0	40.0	-	Default Load
2 - Uniform (PSF)	0 to 5' 9" (Front)	10' 9"	15.0	-	25.0	Default Load

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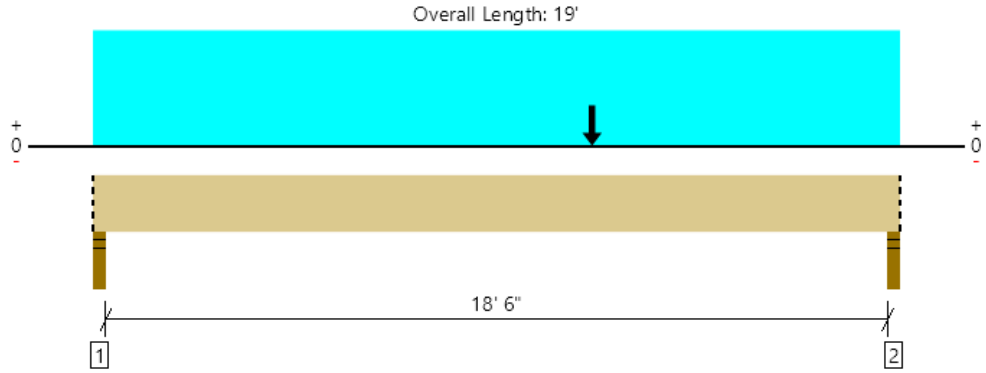
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Steven Nickolas Bykonen Carter Quinn (206) 264-7784 ssn@bcq-se.com	

Weyerhaeuser

Upper Floor Framing, Beam 16

1 piece(s) 5 1/4" x 11 7/8" 2.0E 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)	2091 @ 18' 10 1/2"	6379 (3.00")	Passed (33%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	1992 @ 17' 9 1/8"	13861	Passed (14%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	12830 @ 11' 9"	34332	Passed (37%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.258 @ 9' 11 5/16"	0.469	Passed (L/874)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.495 @ 9' 11 1/4"	0.938	Passed (L/455)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

- Deflection criteria: LL (L/480) and TL (L/240).

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

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - HF	3.00"	3.00"	1.50"	761	507	577	1845	Blocking
2 - Stud wall - HF	3.00"	3.00"	1.50"	1005	507	942	2454	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)	Continuous	
Bottom Edge (Lu)	Continuous	

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 19'	N/A	19.5	--	--	
1 - Uniform (PSF)	0 to 19' (Front)	1' 4"	15.0	40.0	-	Default Load
2 - Point (lb)	11' 9" (Front)	N/A	1015	-	1519	Linked from: Beam 1, Support 2

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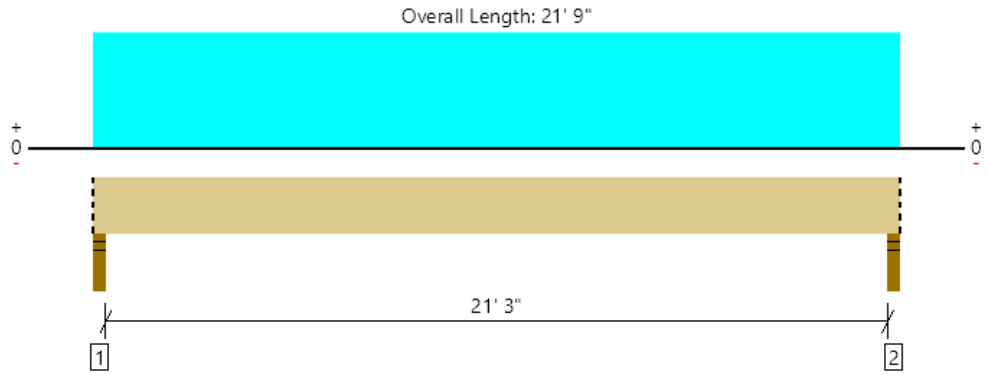
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Steven Nickolas Bykonen Carter Quinn (206) 264-7784 ssn@bcq-se.com	

Weyerhaeuser

Upper Floor Framing, Beam 17

1 piece(s) 5 1/8" x 16 1/2" 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)	5661 @ 1 1/2"	6227 (3.00")	Passed (91%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	4815 @ 1' 7 1/2"	17180	Passed (28%)	1.15	1.0 D + 1.0 S (All Spans)
Pos Moment (Ft-lbs)	30078 @ 10' 10 1/2"	51688	Passed (58%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.435 @ 10' 10 1/2"	0.717	Passed (L/593)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.725 @ 10' 10 1/2"	1.075	Passed (L/356)	--	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).
- Critical positive moment adjusted by a volume factor of 0.97 that was calculated using length L = 21' 6".
- 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	3.00"	3.00"	2.73"	2263	3398	5661	Blocking
2 - Stud wall - HF	3.00"	3.00"	2.73"	2263	3398	5661	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)	Continuous	
Bottom Edge (Lu)	All Bearing Points	

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 21' 9"	N/A	20.5	--	
1 - Uniform (PSF)	0 to 21' 9" (Front)	12' 6"	15.0	25.0	Default Load

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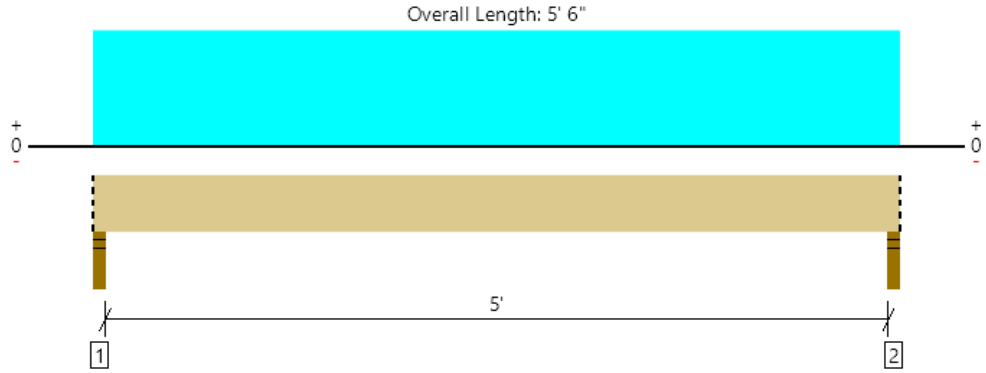
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Steven Nickolas Bykonen Carter Quinn (206) 264-7784 ssn@bcq-se.com	

Weyerhaeuser

Upper Floor Framing, Beam 18
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)	716 @ 1 1/2"	3645 (3.00")	Passed (20%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	494 @ 10 1/4"	2501	Passed (20%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	898 @ 2' 9"	2569	Passed (35%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.021 @ 2' 9"	0.131	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.036 @ 2' 9"	0.262	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/480) and TL (L/240).
- 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 - HF	3.00"	3.00"	1.50"	304	110	413	827	Blocking
2 - Stud wall - HF	3.00"	3.00"	1.50"	304	110	413	827	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)	Continuous	
Bottom Edge (Lu)	Continuous	

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 5' 6"	N/A	5.5	--	--	
1 - Uniform (PSF)	0 to 5' 6" (Front)	6'	15.0	-	25.0	Default Load
2 - Uniform (PSF)	0 to 5' 6" (Front)	1'	15.0	40.0	-	Default Load

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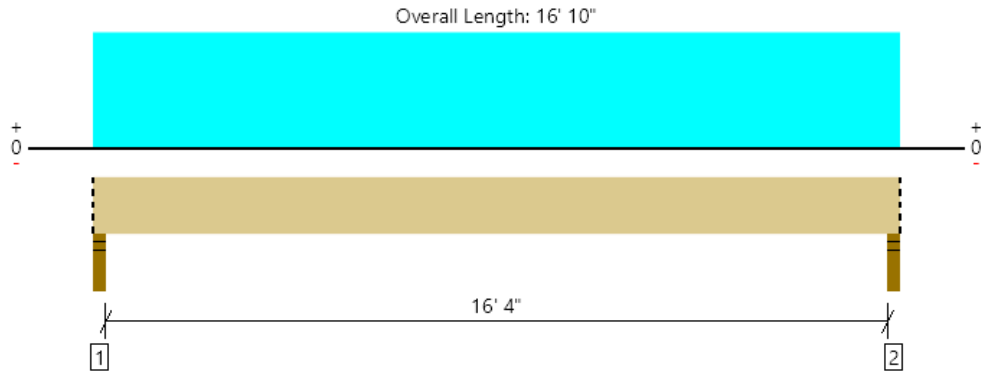
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Upper Floor Framing, Beam 19

2 piece(s) 1 3/4" x 11 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)	2285 @ 1 1/2"	4253 (3.00")	Passed (54%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1963 @ 1' 2 1/4"	8603	Passed (23%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	9333 @ 8' 5"	18558	Passed (50%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.349 @ 8' 5"	0.553	Passed (L/570)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.584 @ 8' 5"	0.829	Passed (L/341)	--	1.0 D + 1.0 S (All Spans)

- Deflection criteria: LL (L/360) and TL (L/240).

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Stud wall - HF	3.00"	3.00"	1.61"	917	1368	2285	Blocking
2 - Stud wall - HF	3.00"	3.00"	1.61"	917	1368	2285	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)	Continuous	
Bottom Edge (Lu)	All Bearing Points	

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 16' 10"	N/A	11.5	--	
1 - Uniform (PSF)	0 to 16' 10" (Front)	6' 6"	15.0	25.0	Default Load

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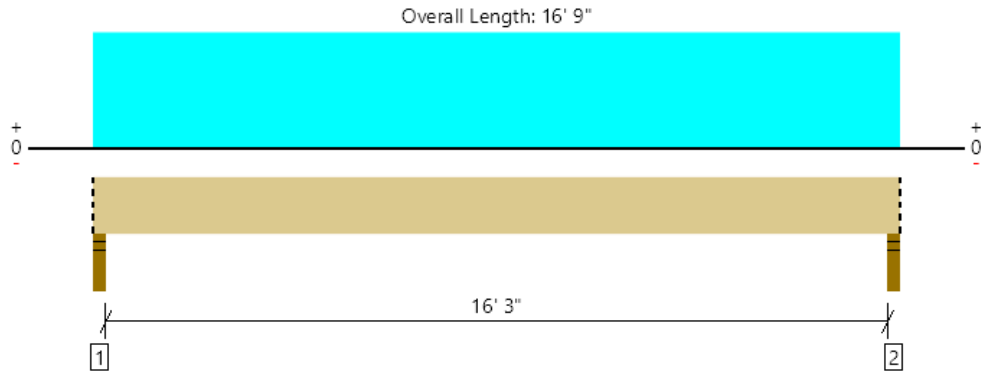
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Upper Floor Framing, Beam 20

1 piece(s) 3 1/2" x 11 7/8" 1.55E TimberStrand® LSL



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)	1585 @ 1 1/2"	4253 (3.00")	Passed (37%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	1350 @ 1' 2 7/8"	9878	Passed (14%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	6440 @ 8' 4 1/2"	18346	Passed (35%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.224 @ 8' 4 1/2"	0.412	Passed (L/885)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.440 @ 8' 4 1/2"	0.825	Passed (L/450)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

- Deflection criteria: LL (L/480) and TL (L/240).

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

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - HF	3.00"	3.00"	1.50"	779	447	628	1854	Blocking
2 - Stud wall - HF	3.00"	3.00"	1.50"	779	447	628	1854	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)	Continuous	
Bottom Edge (Lu)	Continuous	

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 16' 9"	N/A	13.0	--	--	
1 - Uniform (PSF)	0 to 16' 9" (Front)	1' 4"	15.0	40.0	-	Default Load
2 - Uniform (PSF)	0 to 16' 9" (Front)	3'	20.0	-	25.0	Default Load

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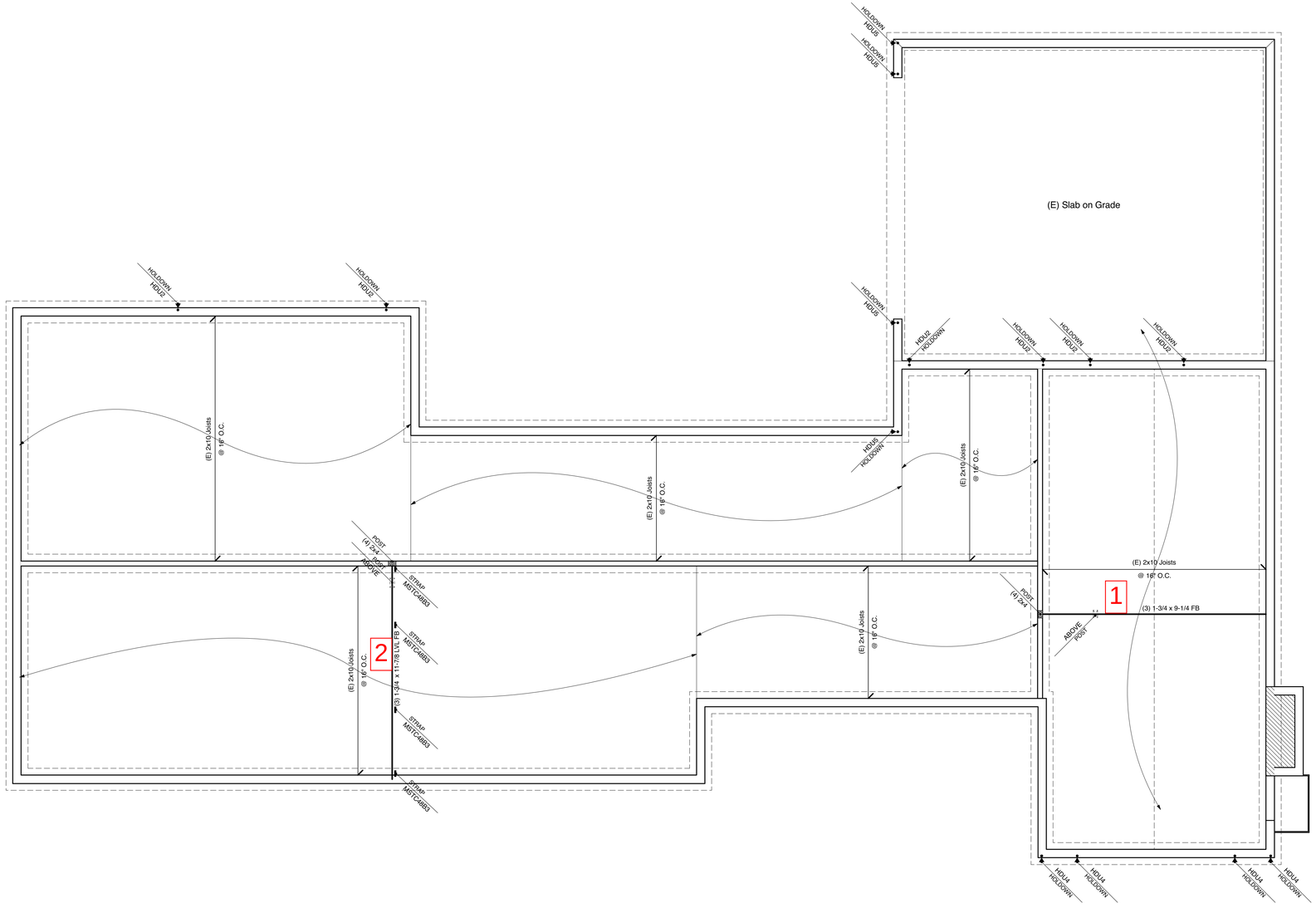
ForteWEB Software Operator	Job Notes
Steven Nickolas Bykonen Carter Quinn (206) 264-7784 ssn@bcq-se.com	

Weyerhaeuser



FOUNDATION / MAIN LEVEL FRAMING PLAN
Scale: 1/4" = 1'-0"

N

0 5 10 15 20 FT

LEXICON:

- LINE OF FOOTING BELOW GRADE
- AREA OF NEW REINFORCED CONCRETE
- EXISTING FOUNDATION WALL
- AREA OF NEW ROOF OVER FRAMING
- INDICATES JOIST DIRECTION
- INDICATES EXTENT OF FRAMING
- X0.00 — DETAIL REFERENCE, INDICATES DETAIL NUMBER & SHEET NUMBER
- HANGER HU412 — INDICATES SIMPSON HANGER
- HOLDOWN HDU2 SDS2.5 — INDICATES SIMPSON HOLDOWN
- STRAP MST48 — INDICATES SIMPSON FRAMING STRAP
- SH — STANDARD HEADER. (See header location diagram).
- FH — FLUSH HEADER. (See header location diagram).
- FTH — FLUSH TOP HEADER. (See header location diagram).
- FBH — FLUSH BOTTOM HEADER (See header location diagram).
- FB — FLUSH BEAM (In plane with adjacent floor or roof framing)
- SW1 — SHEARWALL KEY - REFER TO SHEARWALL SCHEDULE

WHITNEY ARCHITECTURE

1537 NW Ballard Way Seattle WA 98107
WhitneyArchitecture.com
v. 206.789.3934 f. 206.789.1871

PROJECT:

Anderson + Goodejohn Residence

A remodel to an existing single family residence at:

4224 94th Ave SE
Mercer Island, WA 98040

ISSUE DATE:

Date	Mark	Issue Type
-		-

NOT FOR CONSTRUCTION

PLOTTED:
Thursday, December 16, 2021
4:44:46 PM

FILE NAME:
1519-Anderson+Goodejohn DESIGN OPT 7 VW:

PROJECT NUMBER
1519

DRAWN BY:
PW

SHEET TITLE:
Permit

Foundation / Main Floor Framing Plan

Leave this space open for building deptartment stamps.

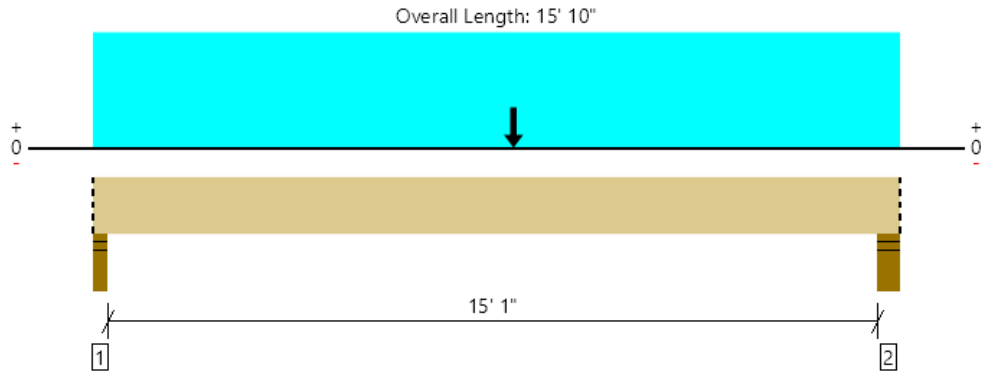
SHEET NUMBER:

S2.01

SHEET 8 OF 10

Main Floor Framing, Beam 1

1 piece(s) 6 3/4" x 12" 24F-V8 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)	3860 @ 2"	9568 (3.50")	Passed (40%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	3705 @ 14' 4 1/2"	14310	Passed (26%)	1.00	1.0 D + 1.0 L (All Spans)
Pos Moment (Ft-lbs)	25176 @ 8' 3"	32400	Passed (78%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.318 @ 7' 11 3/16"	0.383	Passed (L/578)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.562 @ 7' 11 3/16"	0.767	Passed (L/327)	--	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/480) and TL (L/240).
- Critical positive moment adjusted by a volume factor of 1.00 that was calculated using length L = 15' 4".
- The effects of positive or negative camber have not been accounted for when calculating deflection.
- 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 - HF	3.50"	3.50"	1.50"	1691	1815	1077	4583	Blocking
2 - Stud wall - HF	5.50"	5.50"	1.55"	1856	1984	1201	5041	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)	Continuous	
Bottom Edge (Lu)	Continuous	

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 15' 10"	N/A	19.7	--	--	
1 - Uniform (PSF)	0 to 15' 10" (Front)	1' 4"	15.0	40.0	-	Default Load
2 - Point (lb)	8' 3" (Front)	N/A	2919	2955	2278	Linked from: Beam 5 (new), Support 1

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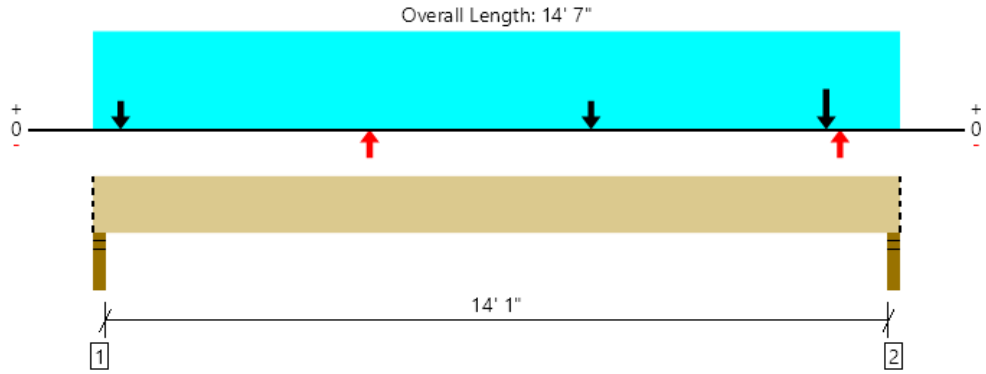
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Main Floor Framing, Beam 2

3 piece(s) 1 3/4" x 11 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)	8984 @ 14' 5 1/2"	9844 (3.00")	Passed (91%)	--	1.0 D - 0.525 E + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	8286 @ 13' 4 3/4"	11222	Passed (74%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	10062 @ 13' 3"	24206	Passed (42%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.170 @ 8' 13/16"	0.358	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.268 @ 8' 9/16"	0.717	Passed (L/642)	--	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/480) and TL (L/240).
- -809 lbs uplift at support located at 14' 5 1/2". Strapping or other restraint may be required.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Seismic	Total	
1 - Stud wall - DF	3.00"	3.00"	1.50"	520	852	3705/-3705	5077/-3705	Blocking
2 - Stud wall - DF	3.00"	3.00"	2.74"	2975	5419	3705/-3705	12099/-3705	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)	Continuous	
Bottom Edge (Lu)	Continuous	

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Seismic (1.60)	Comments
0 - Self Weight (PLF)	0 to 14' 7"	N/A	17.2	--	--	
1 - Uniform (PSF)	0 to 14' 7" (Front)	1' 4"	15.0	40.0	-	Default Load
2 - Point (lb)	13' 3" (Front)	N/A	2952	5493	-	Linked from: Beam 1, Support 1
3 - Point (lb)	6" (Front)	N/A	-	-	5900	
4 - Point (lb)	5' (Front)	N/A	-	-	-5900	
5 - Point (lb)	13' 6" (Front)	N/A	-	-	-5900	
6 - Point (lb)	9' (Front)	N/A	-	-	5900	

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
Steven Nickolas Bykonen Carter Quinn (206) 264-7784 ssn@bcq-se.com	

Weyerhaeuser

Hazards by Location

Search Information

Address: 4224 94th Ave SE, Mercer Island, WA 98040, USA

Coordinates: 47.5706808, -122.2136463

Elevation: 341 ft

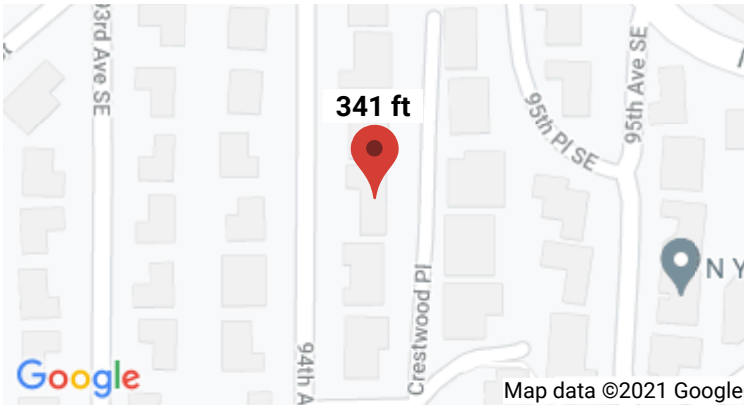
Timestamp: 2021-06-08T17:51:59.434Z

Hazard Type: Seismic

Reference Document: ASCE7-16

Risk Category: II

Site Class: D-default



Basic Parameters

Name	Value	Description
S_S	1.412	MCE_R ground motion (period=0.2s)
S_1	0.491	MCE_R ground motion (period=1.0s)
S_{MS}	1.695	Site-modified spectral acceleration value
S_{M1}	* null	Site-modified spectral acceleration value
S_{DS}	1.13	Numeric seismic design value at 0.2s SA
S_{D1}	* null	Numeric seismic design value at 1.0s SA

* See Section 11.4.8

Additional Information

Name	Value	Description
SDC	* null	Seismic design category
F_a	1.2	Site amplification factor at 0.2s
F_v	* null	Site amplification factor at 1.0s
CR_S	0.902	Coefficient of risk (0.2s)
CR_1	0.898	Coefficient of risk (1.0s)
PGA	0.604	MCE_G peak ground acceleration
F_{PGA}	1.2	Site amplification factor at PGA
PGA_M	0.725	Site modified peak ground acceleration

T_L	6	Long-period transition period (s)
SsRT	1.412	Probabilistic risk-targeted ground motion (0.2s)
SsUH	1.565	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	3.718	Factored deterministic acceleration value (0.2s)
S1RT	0.491	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.547	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.477	Factored deterministic acceleration value (1.0s)
PGAd	1.262	Factored deterministic acceleration value (PGA)

* See Section 11.4.8

The results indicated here DO NOT reflect any state or local amendments to the values or any delineation lines made during the building code adoption process. Users should confirm any output obtained from this tool with the local Authority Having Jurisdiction before proceeding with design.

Disclaimer

Hazard loads are provided by the U.S. Geological Survey Seismic Design Web Services.

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Hazards by Location

Search Information

Address: 4224 94th Ave SE, Mercer Island, WA 98040, USA

Coordinates: 47.5706808, -122.2136463

Elevation: 341 ft

Timestamp: 2021-06-08T17:50:05.854Z

Hazard Type: Wind

ASCE 7-16

MRI 10-Year	67 mph
MRI 25-Year	73 mph
MRI 50-Year	78 mph
MRI 100-Year	83 mph
Risk Category I	92 mph
Risk Category II	98 mph
Risk Category III	105 mph
Risk Category IV	108 mph

ASCE 7-10

MRI 10-Year	72 mph
MRI 25-Year	79 mph
MRI 50-Year	85 mph
MRI 100-Year	91 mph
Risk Category I	100 mph
Risk Category II	110 mph
Risk Category III-IV	115 mph

ASCE 7-05

ASCE 7-05 Wind Speed	85 mph

The results indicated here DO NOT reflect any state or local amendments to the values or any delineation lines made during the building code adoption process. Users should confirm any output obtained from this tool with the local Authority Having Jurisdiction before proceeding with design.

Disclaimer

Hazard loads are interpolated from data provided in ASCE 7 and rounded up to the nearest whole integer. Per ASCE 7, islands and coastal areas outside the last contour should use the last wind speed contour of the coastal area – in some cases, this website will extrapolate past the last wind speed contour and therefore, provide a wind speed that is slightly higher. NOTE: For queries near wind-borne debris region boundaries, the resulting determination is sensitive to rounding which may affect whether or not it is considered to be within a wind-borne debris region.

Mountainous terrain, gorges, ocean promontories, and special wind regions shall be examined for unusual wind conditions.

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Seismic

Project: Anderson-Goodejohn Residence

Seismic Design Parameters		
Site Class	D	
Risk Category	II	*Table 1.5-1*
Importance Factor	1	*Table 1.5-2*
Ss	1.412	*From USGS*
S1	0.491	
Fa	1.200	*Table 11.4-1*
Fv	1.809	*Table 11.4-2*
Sms	1.694	*Eq. 11.4-1*
Sm1	0.888	*Eq. 11.4-2*
Sds	1.130	*Eq. 11.4-3*
Sd1	0.592	*Eq. 11.4-4*
R	6.5	*Table 12.2-1*
C_s	0.174	*Eq. 12.8-2*
k	1	*12.8.3*
Seismic Design Category	D	*Table 11.6-1*

Seismic Weight

Areas (ft^2)	
Roof	1550
Upper Floor	2900

Loads	
DL-Floor (psf)	25

Seismic Base Shear		
$V_{ultimate}$ (k)	19.3	*Eq. 12.8-1*
$V_{allowable}$ (k)	13.5	

Level	Weight (k)	Height (ft)	$w_x f_x^k$	C_{vx}	F_x (ult.)	F_x (allow.)
Roof	38.75	18.25	707.2	0.51	9.8	6.9
Upper Floor	72.5	9.5	688.8	0.49	9.5	6.7
TOTAL	111.3	-	1395.9	1	19.3	13.5

All references are from ASCE 7-16: Minimum Design Loads and Associated Criteria for Buildings and Other Structures

Wind

Project: Anderson-Goodejohn Residence

Wind Load Parameters - Envelope Method		
Exposure	B	*Sec. 26.7*
Risk Category	II	*Table 1.5-1*
Mean Roof Height (ft)	18.25	
Roof Slope X/12	3	
Roof Angle (deg)	14.04	
a (ft)	3.225	*Figure 28.3-1 Note "a"*
K_d	0.85	*Table 26.6-1*
K_{zt}	1.9	
V (mph)	98	
K_z	0.70	*Table 26.10-1*
q_h (psf)	27.79	*Eq. 26.10-1*
Minimum Wind Pressure on Walls (psf)	16	*Sec. 28.3.4*
Minimum Wind Pressure on Roof (psf)	8	

Building Geometry

Level	Length Along Ridge (Parallel) (ft)	Length Perpendicular to Ridge (ft)	Roof trib (ft)	Wall trib (ft)
Roof	73.5	32.25	2	5.5
Upper Floor	85.2	55.1	-	9.2
	long	short		

Wind

Perpendicular to Ridge

Roof	
Roof Area (sf)	134.1
Roof Area (corners, sf)	12.9
Wall Area (sf)	368.775
Wall Area (corners, sf)	35.475
Roof Wind Shear (k)	8.10

Upper Floor	
Wall Area (sf)	724.5
Wall Area (corners, sf)	59.34
Upper Floor Wind Shear (k)	15.61

Parallel to Ridge

Roof	
Roof Area (sf)	51.6
Roof Area (corners, sf)	12.9
Wall Area (sf)	141.9
Wall Area (corners, sf)	35.475
Roof Wind Shear (k)	3.75

Upper Floor	
Wall Area (sf)	447.58
Wall Area (corners, sf)	59.34
Upper Floor Wind Shear (k)	10.30

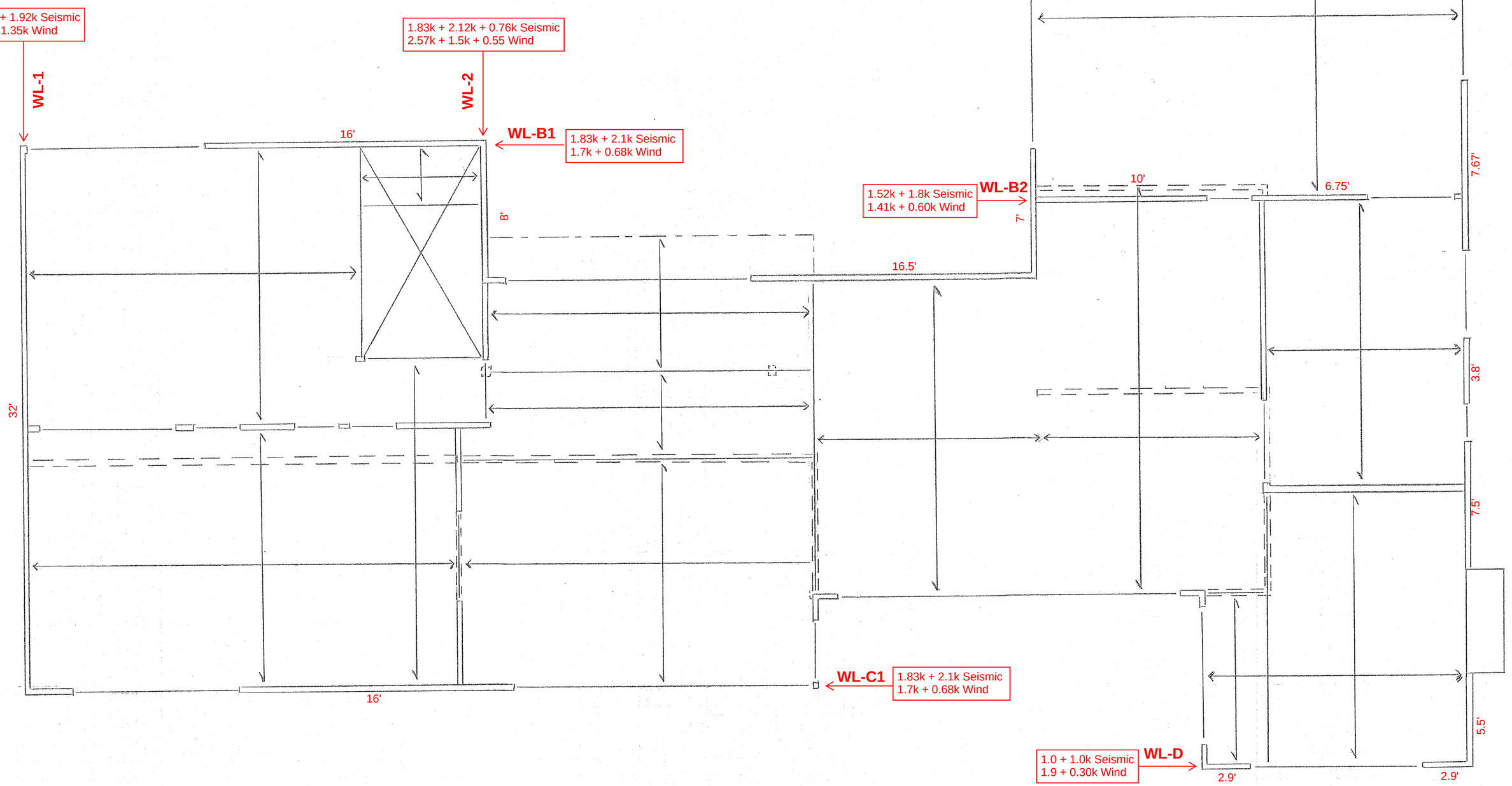
Check Minimum Pressure

Level	Calculated Perpendicular Pressure (psf)	Calculated Parallel Pressure (psf)	Minimum Ultimate Perpendicular Shear (k)	Minimum Parallel Ultimate Shear (k)
Roof	14.69	15.49	7.64	3.35
Upper Floor	19.91	20.32	12.54	8.11

Summary Table

Level	Perpendicular Wind Shear (ultimate, k)	Parallel Wind Shear (ultimate, k)	Perpendicular Wind Shear (allowable, k)	Parallel Wind Shear (allowable, k)
Roof	8.10	3.75	**4.86**	**2.25**
Upper Floor	15.61	10.30	**9.37**	**6.18**
Base Shear	23.71	14.05	**14.22**	**8.43**

All references are from ASCE 7-16: Minimum Design Loads and Associated Criteria for Buildings and Other Structures

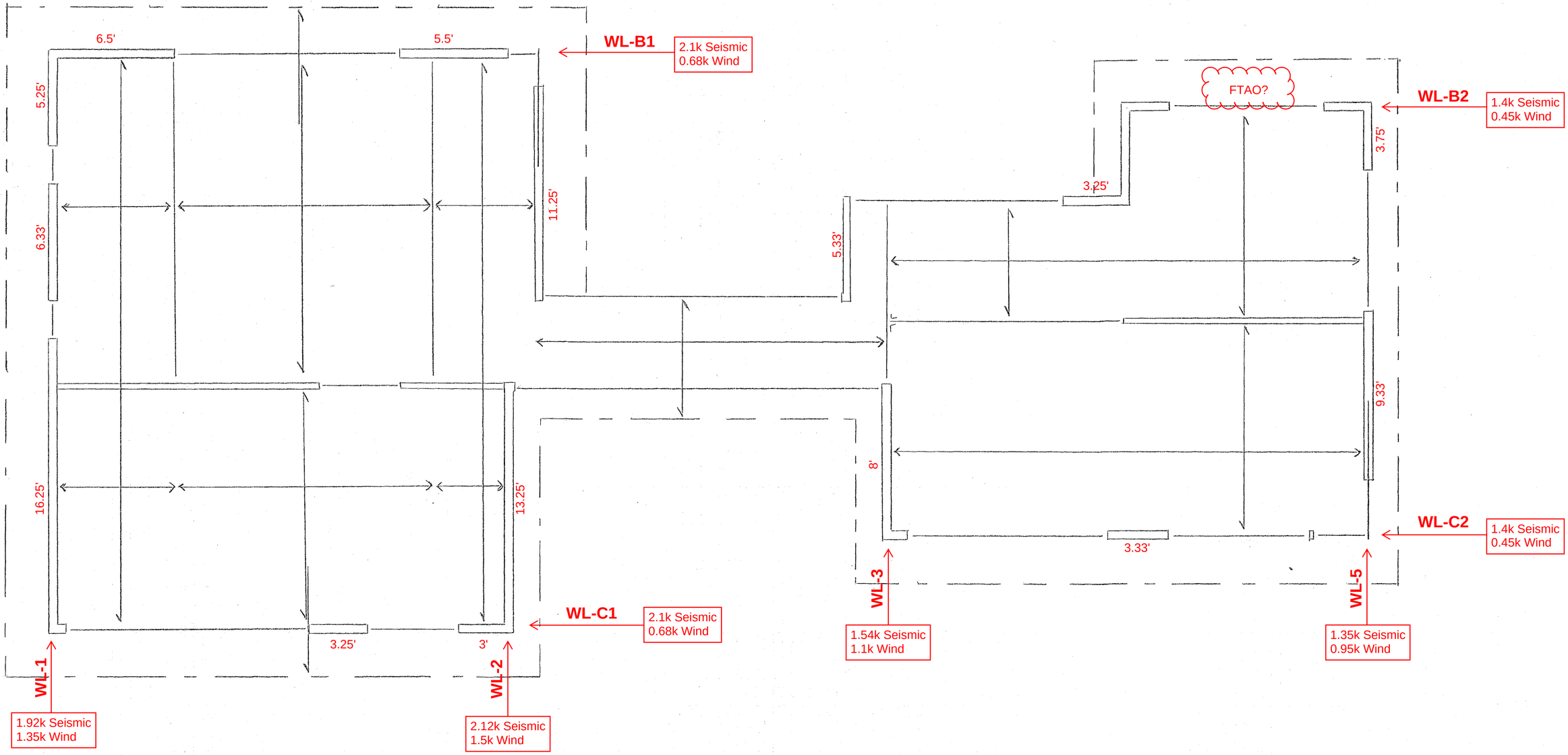


UPPER FLOOR FRAMING PLAN
1/4"=1'-0"

ANDERSON & GOODESOHN RESIDENCE

BCA

S2



ROOF FRAMING PLAN
1/4" = 1'-0"

ANDERSON & GOODESON
RESIDENCE
BCQ

S3

WL-A

Level	Total Wall Line Lengths (ft)	Seismic Forces (k)	Wind Forces (k)	Story Heights (ft)
Upper Floor	25.6	0.65	1.25	9

Max H/W Ratio [2] 3.5

UPPER FLOOR

Length (ft)	H/W Ratio	Increase [1]	Force in Wall Elements		Dead Loads		Seismic Overturning (k)	Wind Overturning (k)
			Seismic Shear (plf)	Wind Shear (plf)	Wall (lb)	Floor (lb)		
25.6	0.35	1.00	25	49	2304	256	-0.54	-0.33
		Shear Wall	SW-1			Holdown	Strap Tie/Holdown Not Required	

[1] Increase per 4.3.4.2 ANSI/AWC SDPWS-2015

[2] Per Table 4.3.4 ANSI/AWC SDPWS-2015

WL-B1

Level	Total Wall Line Lengths (ft)	Seismic Forces (k)	Wind Forces (k)	Story Heights (ft)
Roof	5.1	2.1	0.68	10.5
Upper Floor	16	3.93	2.38	9

Max H/W Ratio [2] 3.5

ROOF

Length (ft)	H/W Ratio	Increase [1]	Force in Wall Elements		Dead Loads		Seismic Overturning (k)	Wind Overturning (k)
			Seismic Shear (plf)	Wind Shear (plf)	Wall (lb)	Floor (lb)		
5.1	2.06	1.01	415	133	536	51	4.15	1.22
		Shear Wall	SW-3			Strap Tie	MSTC66	

UPPER FLOOR

Length (ft)	H/W Ratio	Increase [1]	Force in Wall Elements		Dead Loads		Seismic Overturning (k)	Wind Overturning (k)
			Seismic Shear (plf)	Wind Shear (plf)	Wall (lb)	Floor (lb)		
16	0.56	1.00	246	149	1440	160	1.73	0.86
		Shear Wall	SW-2			Holdown	HDU2 w/ (2) 2x	

[1] Increase per 4.3.4.2 ANSI/AWC SDPWS-2015

[2] Per Table 4.3.4 ANSI/AWC SDPWS-2015

WL-B2

Level	Total Wall Line Lengths (ft)	Seismic Forces (k)	Wind Forces (k)	Story Heights (ft)
Roof	-	1.4	0.45	10.5
Upper Floor	16.75	3.32	2.01	9

Max H/W Ratio [2] 3.5

ROOF

(REFER TO ATTACHED SHEETS FOR FORCE TRANSFER AROUND OPENING CALCULATION)

UPPER FLOOR

Length (ft)	H/W Ratio	Increase [1]	Force in Wall Elements		Dead Loads		Seismic Overturning (k)	Wind Overturning (k)
			Seismic Shear (plf)	Wind Shear (plf)	Wall (lb)	Floor (lb)		
10	0.90	1.00	198	120	900	100	1.48	0.78
6.75	1.33	1.00	198	120	608	68	1.58	0.88
		Shear Wall	SW-1			Holdown	HDU2 w/ (2) 2x	

[1] Increase per 4.3.4.2 ANSI/AWC SDPWS-2015

[2] Per Table 4.3.4 ANSI/AWC SDPWS-2015

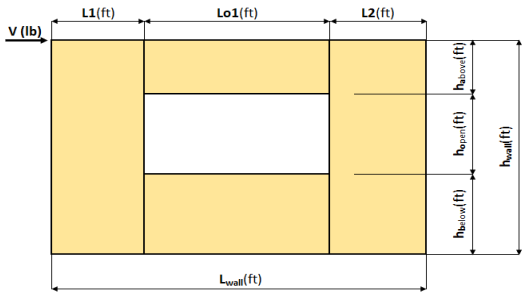
Force Transfer Around Openings Calculator

ONE OPENING

The force transfer around openings (FTAO) method of shear wall analysis is an approach that aims to reinforce the wall such that it performs as if there was no opening. This approach lends certain advantages over segmented shear walls: more versatility, because it allows for narrower wall segments while still meeting the height-to-width ratios and, often, fewer required hold-downs.

Project Information

Code:	IBC 2018	**Date:**	
Designer:	SN		
Client:			
Project:	Anderson-Goodejohn Residence		
Wall Line:	WL-B2		



Shear Wall Calculation Variables

V	1400 lbf	Opening 1	
L1	3.00 ft	ha1	0.75 ft
L2	2.67 ft	ho1	1.67 ft
h_{wall}	8.92 ft	hb1	6.50 ft
L_{wall}	17.42 ft	Lo1	11.75 ft

Adj. Factor Method = 1.25-0.125h/bs

Wall Pier Aspect Ratio		Adj. Factor
P1=ho1/L1=	0.56	N/A
P2=ho2/L2=	0.63	N/A

1. Hold-down forces: H = Vh_{wall}/L_{wall} 717 lbf

2. Unit shear above + below opening

First opening: va1 = vb1 = H/(ha1+hb1) = 99 plf

3. Total boundary force above + below openings

First opening: O1 = va1 x (Lo1) = 1162 lbf

4. Corner forces

F1 = O1(L1)/(L1+L2) = 615 lbf
F2 = O1(L2)/(L1+L2) = 547 lbf

5. Tributary length of openings

T1 = (L1*Lo1)/(L1+L2) = 6.22 ft
T2 = (L2*Lo1)/(L1+L2) = 5.53 ft

6. Unit shear beside opening

V1 = (V/L)(L1+T1)/L1 = 247 plf
V2 = (V/L)(T2+L2)/L2 = 247 plf
Check V1*L1+V2*L2=V? 1400 lbf **OK**

7. Resistance to corner forces

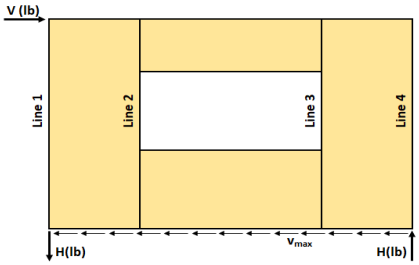
R1 = V1*L1 = 741 lbf
R2 = V2*L2 = 659 lbf

8. Difference corner force + resistance

R1-F1 = 126 lbf
R2-F2 = 112 lbf

9. Unit shear in corner zones

vc1 = (R1-F1)/L1 = 42 plf
vc2 = (R2-F2)/L2 = 42 plf



Check Summary of Shear Values for One Opening

Line 1: vc1(ha1+hb1)+V1(ho1)=H?		305	412	717 lbf
Line 2: va1(ha1+hb1)-vc1(ha1+hb1)-V1(ho1)=0?	717	305	412	0
Line 3: va1(ha1+hb1)-vc2(ha1+hb1)-V1(ho1)=0?	717	305	412	0
Line 4: vc2(ha1+hb1)+V2(ho1)=H?		305	412	717 lbf

Design Summary*

Req. Sheathing Capacity	247 plf	**4-Term Deflection**	0.413 in.	**3-Term Deflection**	0.457 in.
Req. Strap Force	615 lbf	**4-Term Story Drift %**	0.015 %	**3-Term Story Drift %**	0.017 %
Req. HD Force (H)	717 lbf		See Page 2		See Page 3
Req. Shear Wall Anchorage Force (v_{max})	80 plf				

*The Design Summary assumes that the shear wall is designed as blocked.

Project Information

Code:	IBC 2018	**Date:**	
Designer:	SN		
Client:			
Project:	Anderson-Goodejohn Residence		
Wall Line:	WL-B2		

Shear Wall Deflection Calculation Variables

Induced Shear Load $V_{induced}$: 1400 (lbf)

Sheathing:

Plywood	Sheathing Material
15/32	Performance Category
APA Rated Sheathing	Grade
	Gt Override
	Ga Overide

Wood End Post Values:

Species:			
E:	1.60E+06	(psi)	
	Qty	Stud Size	
Dimensions:	2	2x6	
A:	16.5	($in.^2$)	
A Override:		($in.^2$)	

Nail Type: 8d common (penny weight)

	Pier 1	Pier 2	
Nail Spacing:	4	4	(in.)
HD Capacity:	2200	2200	(lbf)
HD Deflection:	0.2	0.2	(in.)

Four-Term Equation Deflection Check

$$\Delta = \frac{8vh^3}{EAb} + \frac{vh}{Gt} + 0.75he_n + d_a\frac{h}{b} \qquad \text{(Equation 23-2)}$$

	Pier 1-L	Pier 1-R	Pier 2-L	Pier 2-R	
Sheathing:	15/32	15/32	15/32	15/32	
Nail:	8d common	8d common	8d common	8d common	
$v_{induced}$:	247	247	247	247	(plf)
E:	1.60E+06	1.60E+06	1.60E+06	1.60E+06	(psi)
h:	8.92	2.42	2.42	8.92	(ft)
A:	16.5	16.5	16.5	16.5	($in.^2$)
Gt:	27,000	27,000	27,000	27,000	(lbf/in.)
Nail Spacing:	4	4	4	4	(in.)
Vn:	82	82	82	82	(plf)
e_n:	0.0028	0.0028	0.0028	0.0028	(in.)
b:	3.00	3.00	2.67	2.67	(ft)
HD Capacity:	2200	2200	2200	2200	(lbf)
HD Defl:	0.2	0.2	0.2	0.2	(in.)

Check Total Deflection of Wall System

Pier 1 (left)				Pier 1 (right)			
Term 1 Bending	Term 2 Shear	Term 3 Fastener	Term 4 HD-1	Term 1 Bending	Term 2 Shear	Term 3 Fastener	Term 4 HD-2
0.018	0.082	0.018	0.595	0.000	0.022	0.005	0.044
		Sum	0.713			Sum	0.071
Pier 2 (left)				**Pier 2 (right)**			
Term 1 Bending	Term 2 Shear	Term 3 Fastener	Term 4 HD-1	Term 1 Bending	Term 2 Shear	Term 3 Fastener	Term 4 HD-2
0.000	0.022	0.005	0.049	0.020	0.082	0.018	0.669
		Sum	0.077			Sum	0.789

Total Defl.	
0.413	(in.)
0.0154	%drift

Project Information

Code:	IBC 2018	**Date:**	
Designer:	SN		
Client:			
Project:	Anderson-Goodejohn Residence		
Wall Line:	WL-B2		

Three-Term Equation Deflection Check

$$\delta_{sw} = \frac{8vh^3}{EAb} + \frac{vh}{1000G_a} + \frac{h\Delta_a}{b} \qquad (4.3\text{-}1)$$

	Pier 1-L	Pier 1-R	Pier 2-L	Pier 2-R	
Sheathing:	15/32	15/32	15/32	15/32	
Nail:	8d common	8d common	8d common	8d common	
$v_{induced}$:	247	247	247	247	(plf)
E:	1.60E+06	1.60E+06	1.60E+06	1.60E+06	(psi)
h:	8.92	2.42	2.42	8.92	(ft)
A:	16.5	16.5	16.5	16.5	($in.^2$)
Ga:	13.0	13.0	13.0	13.0	(kips/in.)
b:	3.00	3.00	2.67	2.67	(ft)
HD Capacity:	2200	2200	2200	2200	(lbf)
HD Defl:	0.2	0.2	0.2	0.2	(in.)

Check Total Deflection of Wall System

Pier 1 (left)			Pier 1 (right)		
Term 1 Bending	Term 2 Shear	Term 3 Fastener	Term 1 Bending	Term 2 Shear	Term 3 Fastener
0.018	0.169	0.595	0.000	0.046	0.044
	Sum	0.782		Sum	0.090
Pier 2 (left)			Pier 2 (right)		
Term 1 Bending	Term 2 Shear	Term 3 Fastener	Term 1 Bending	Term 2 Shear	Term 3 Fastener
0.000	0.046	0.049	0.020	0.169	0.669
	Sum	0.096		Sum	0.858

Total Defl.	
0.457	(in.)
0.0171	%drift

Comment: The 3-term equation is calibrated to be approximately equal to 4-term equation at 1.4*ASD capacity.

WL-C1

Level	Total Wall Line Lengths (ft)	Seismic Forces (k)	Wind Forces (k)	Story Heights (ft)
Roof	6.25	2.1	0.68	10.5
Upper Floor	16	3.93	2.38	9

Max H/W Ratio [2] 3.5

ROOF

Length (ft)	H/W Ratio	Increase [1]	Force in Wall Elements		Dead Loads		Seismic Overturning (k)	Wind Overturning (k)
			Seismic Shear (plf)	Wind Shear (plf)	Wall (lb)	Floor (lb)		
3	3.50	1.23	414	109	315	30	3.42	1.04
3.25	3.23	1.18	397	109	341	33	3.42	1.03
		Shear Wall	SW-3			Strap Tie	MSTC52	

UPPER FLOOR

Length (ft)	H/W Ratio	Increase [1]	Force in Wall Elements		Dead Loads		Seismic Overturning (k)	Wind Overturning (k)
			Seismic Shear (plf)	Wind Shear (plf)	Wall (lb)	Floor (lb)		
16	0.56	1.00	246	149	1440	160	1.73	0.86
		Shear Wall	SW-2			Holdown	HDU2 w/ (2) 2x	

[1] Increase per 4.3.4.2 ANSI/AWC SDPWS-2015

[2] Per Table 4.3.4 ANSI/AWC SDPWS-2015

WL-C2

Level	Total Wall Line Lengths (ft)	Seismic Forces (k)	Wind Forces (k)	Story Heights (ft)
Roof	3.33	1.4	0.45	10.5

Max H/W Ratio [2] 3.5

ROOF

Length (ft)	H/W Ratio	Increase [1]	Force in Wall Elements		Dead Loads		Seismic Overturning (k)	Wind Overturning (k)
			Seismic Shear (plf)	Wind Shear (plf)	Wall (lb)	Floor (lb)		
3.33	3.15	1.17	491	135	350	33	4.30	1.30
		Shear Wall	SW-4			Strap Tie	MSTC66	

[1] Increase per 4.3.4.2 ANSI/AWC SDPWS-2015

[2] Per Table 4.3.4 ANSI/AWC SDPWS-2015

WL-D

Level	Total Wall Line Lengths (ft)	Seismic Forces (k)	Wind Forces (k)	Story Heights (ft)
Upper Floor	5.8	2	2.2	7.73

Max H/W Ratio [2] 3.5

UPPER FLOOR

Length (ft)	H/W Ratio	Increase [1]	Force in Wall Elements		Dead Loads		Seismic Overturning (k)	Wind Overturning (k)
			Seismic Shear (plf)	Wind Shear (plf)	Wall (lb)	Floor (lb)		
2.9	2.67	1.09	376	379	224	218	2.53	2.80
2.9	2.67	1.09	376	379	224	218	2.53	2.80
		Shear Wall	SW-3			Holdown	HDU4 w/ (2) 2x	

[1] Increase per 4.3.4.2 ANSI/AWC SDPWS-2015

[2] Per Table 4.3.4 ANSI/AWC SDPWS-2015

WL-1

Level	Total Wall Line Lengths (ft)	Seismic Forces (k)	Wind Forces (k)	Story Heights (ft)
Roof	27.83	1.92	1.35	10.5
Upper Floor	32	2.94	2.78	9

Max H/W Ratio [2] 3.5

ROOF

Length (ft)	H/W Ratio	Increase [1]	Force in Wall Elements		Dead Loads		Seismic Overturning (k)	Wind Overturning (k)
			Seismic Shear (plf)	Wind Shear (plf)	Wall (lb)	Floor (lb)		
5.25	2.00	1.00	69	49	551	53	0.54	0.33
6.33	1.66	1.00	69	49	665	63	0.51	0.29
16.25	0.65	1.00	69	49	1706	163	0.16	-0.05
		Shear Wall	SW-1			Strap Tie	Strap Tie/Holdown Not Required	

UPPER FLOOR

Length (ft)	H/W Ratio	Increase [1]	Force in Wall Elements		Dead Loads		Seismic Overturning (k)	Wind Overturning (k)
			Seismic Shear (plf)	Wind Shear (plf)	Wall (lb)	Floor (lb)		
32	0.28	1.00	92	87	2880	320	-0.13	-0.18
		Shear Wall	SW-1			Holdown	Strap Tie/Holdown Not Required	

[1] Increase per 4.3.4.2 ANSI/AWC SDPWS-2015

[2] Per Table 4.3.4 ANSI/AWC SDPWS-2015

WL-2

Level	Total Wall Line Lengths (ft)	Seismic Forces (k)	Wind Forces (k)	Story Heights (ft)
Roof	24.5	2.12	1.5	10.5
Upper Floor	17	4.71	4.62	9

Max H/W Ratio [2] 3.5

ROOF

Length (ft)	H/W Ratio	Increase [1]	Force in Wall Elements		Dead Loads		Seismic Overturning (k)	Wind Overturning (k)
			Seismic Shear (plf)	Wind Shear (plf)	Wall (lb)	Floor (lb)		
11.25	0.93	1.00	87	61	1181	113	0.52	0.25
13.25	0.79	1.00	87	61	1391	133	0.45	0.19
		Shear Wall	SW-1			Strap Tie	Strap Tie/Holdown Not Required	

UPPER FLOOR

Length (ft)	H/W Ratio	Increase [1]	Force in Wall Elements		Dead Loads		Seismic Overturning (k)	Wind Overturning (k)
			Seismic Shear (plf)	Wind Shear (plf)	Wall (lb)	Floor (lb)		
8	1.13	1.00	277	272	720	80	2.25	2.21
4.5	2.00	1.00	277	272	405	45	2.36	2.31
4.5	2.00	1.00	277	272	405	45	2.36	2.31
		Shear Wall	SW-2			Holdown	HDU4 w/ (2) 2x	

[1] Increase per 4.3.4.2 ANSI/AWC SDPWS-2015

[2] Per Table 4.3.4 ANSI/AWC SDPWS-2015

WL-3

Level	Total Wall Line Lengths (ft)	Seismic Forces (k)	Wind Forces (k)	Story Heights (ft)
Roof	13.33	1.54	1.1	10

Max H/W Ratio [2] 3.5

ROOF

Length (ft)	H/W Ratio	Increase [1]	Force in Wall Elements		Dead Loads		Seismic Overturning (k)	Wind Overturning (k)
			Seismic Shear (plf)	Wind Shear (plf)	Wall (lb)	Floor (lb)		
8	1.25	1.00	116	83	800	80	0.89	0.56
5.33	1.88	1.00	116	83	533	53	0.98	0.65
		Shear Wall	SW-1			Strap Tie	Strap Tie/Holdown Not Required	

[1] Increase per 4.3.4.2 ANSI/AWC SDPWS-2015

[2] Per Table 4.3.4 ANSI/AWC SDPWS-2015

WL-4

Level	Total Wall Line Lengths (ft)	Seismic Forces (k)	Wind Forces (k)	Story Heights (ft)
Upper Floor	9.85	3.77	4.2	7.73

Max H/W Ratio [2] 3.5

UPPER FLOOR

Length (ft)	H/W Ratio	Increase [1]	Force in Wall Elements		Dead Loads		Seismic Overturning (k)	Wind Overturning (k)
			Seismic Shear (plf)	Wind Shear (plf)	Wall (lb)	Floor (lb)		
7.25	1.07	1.00	383	426	560	723	2.57	2.91
2.6	2.97	1.14	436	426	201	676	2.70	3.03
		Shear Wall	SW-3			Holdown	HDU4 w/ (2) 2x	

[1] Increase per 4.3.4.2 ANSI/AWC SDPWS-2015

[2] Per Table 4.3.4 ANSI/AWC SDPWS-2015

WL-5

Level	Total Wall Line Lengths (ft)	Seismic Forces (k)	Wind Forces (k)	Story Heights (ft)
Roof	13.08	1.35	0.95	10.5

Max H/W Ratio [2] 3.5

ROOF

Length (ft)	H/W Ratio	Increase [1]	Force in Wall Elements		Dead Loads		Seismic Overturning (k)	Wind Overturning (k)
			Seismic Shear (plf)	Wind Shear (plf)	Wall (lb)	Floor (lb)		
3.75	2.80	1.11	115	73	394	38	0.95	0.63
9.33	1.13	1.00	103	73	980	93	0.76	0.44
		Shear Wall	SW-1			Strap Tie	Strap Tie/Holdown Not Required	

[1] Increase per 4.3.4.2 ANSI/AWC SDPWS-2015

[2] Per Table 4.3.4 ANSI/AWC SDPWS-2015

WL-6

Level	Total Wall Line Lengths (ft)	Seismic Forces (k)	Wind Forces (k)	Story Heights (ft)
Upper Floor	31.47	2.2	2.63	9

Max H/W Ratio [2] 3.5

UPPER FLOOR

Length (ft)	H/W Ratio	Increase [1]	Force in Wall Elements		Dead Loads		Seismic Overturning (k)	Wind Overturning (k)
			Seismic Shear (plf)	Wind Shear (plf)	Wall (lb)	Floor (lb)		
7	1.29	1.00	70	84	630	70	0.42	0.54
7.67	1.17	1.00	70	84	690	77	0.40	0.52
3.8	2.37	1.05	73	84	342	38	0.52	0.64
7.5	1.20	1.00	70	84	675	75	0.40	0.53
5.5	1.64	1.00	70	84	495	55	0.46	0.59
		Shear Wall	SW-1			Holdown	Strap Tie/Holdown Not Required	

[1] Increase per 4.3.4.2 ANSI/AWC SDPWS-2015

[2] Per Table 4.3.4 ANSI/AWC SDPWS-2015