STRUCTURAL CALCULATIONS

Project:
Barber Residence
8174 W Mercer Way
Mercer Island, WA 98040

Architect:
Brandt Design Group
66 Bell Street, Unit 1
Seattle, WA 98121

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

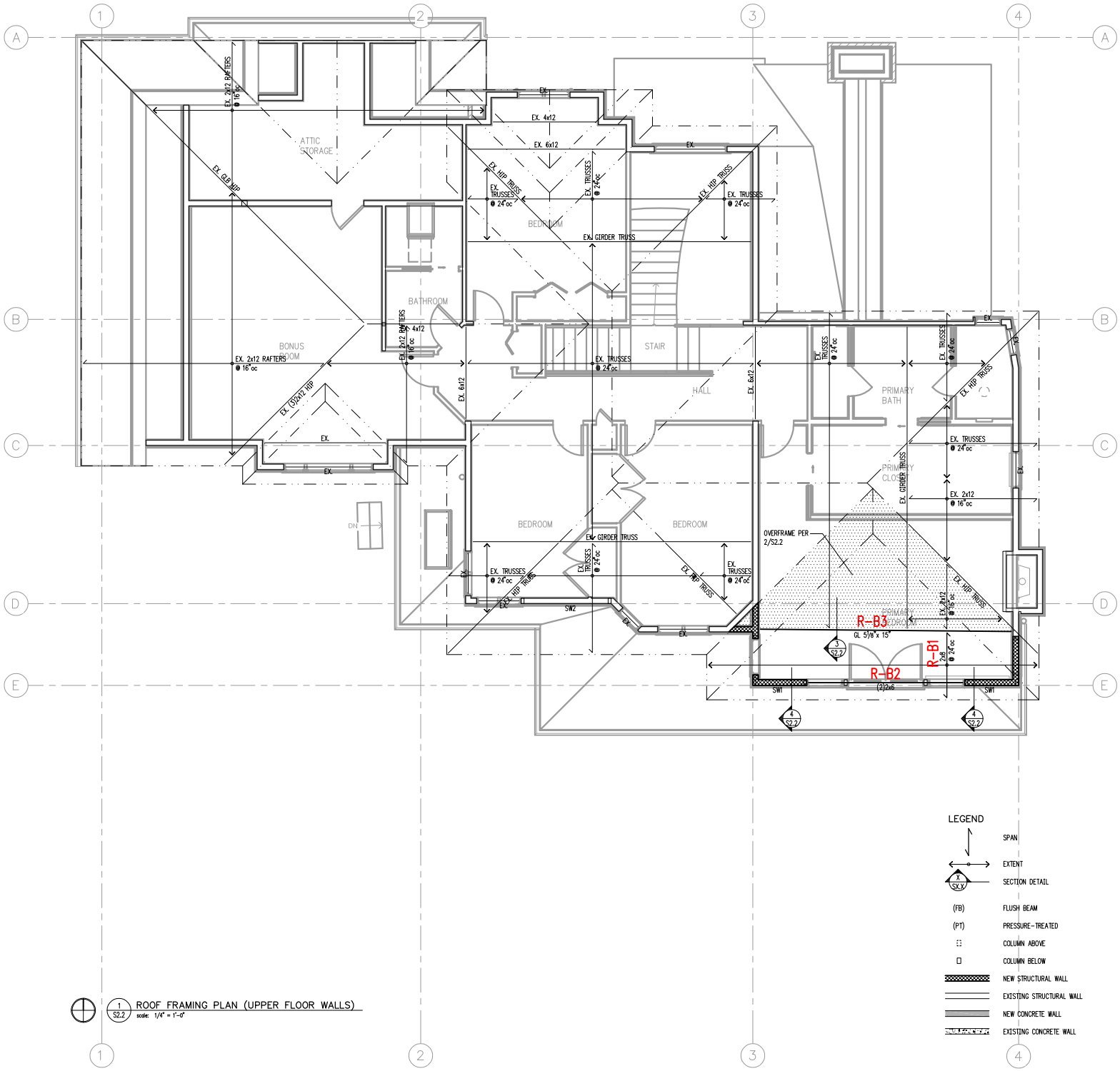
7/16/25

SECTION 1: FRAMING

CRITERIA

FRAMING

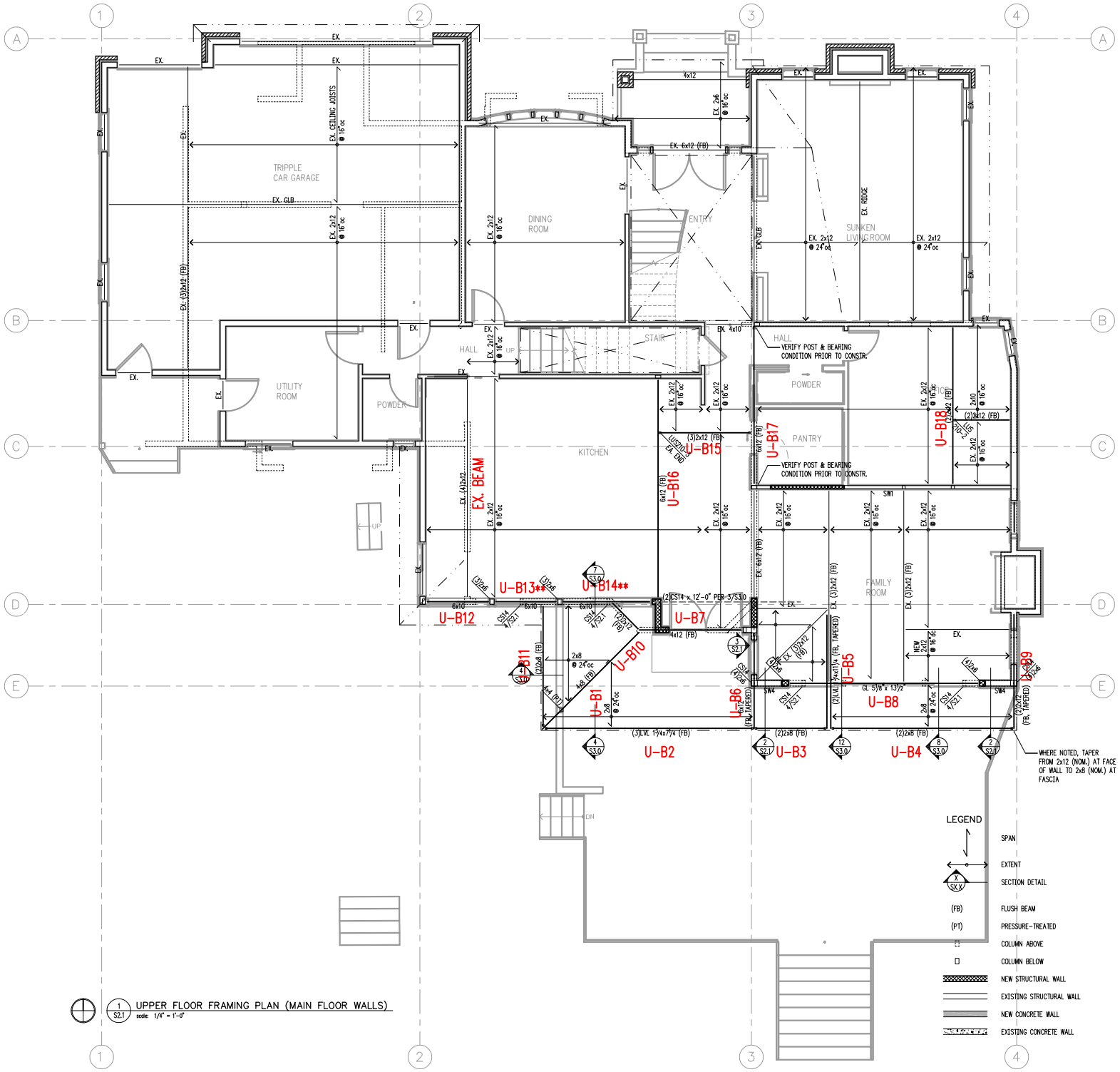
roof	dead	asphalt shingles	2.5	live	snow	25.0 psf
		1/2" plywood	1.5			
		R30 insulation	1.2			
		Pre-fab Trusses	5.0			
		5/8" gyp. wallboard	2.8			
		slope factor	0.3			
		miscellaneous	1.7 *11%*			
			15.0 psf			
	total	dead + live	40.0 psf			
floor	dead	3/4" hardwood	3.0	live	residential	40.0 psf
		3/4" plywood	2.3			
		2x12 @ 16"oc	3.3			
		acoustic insulatoin	1.0			
		1/2" gyp. wallboard	2.2			
		miscellaneous	3.2 *21%*			
			15.0 psf			
	total	dead + live	55.0 psf			
walls		hardie plank siding (7" exposure)	2.8			
		1/2" plywood	1.5			
		2x6 @ 16"oc	1.7			
		R21 insulation	0.8			
		1/2" gyp. wallboard	2.2			
		miscellaneous	1.0 *10%*			
			10.0 psf			



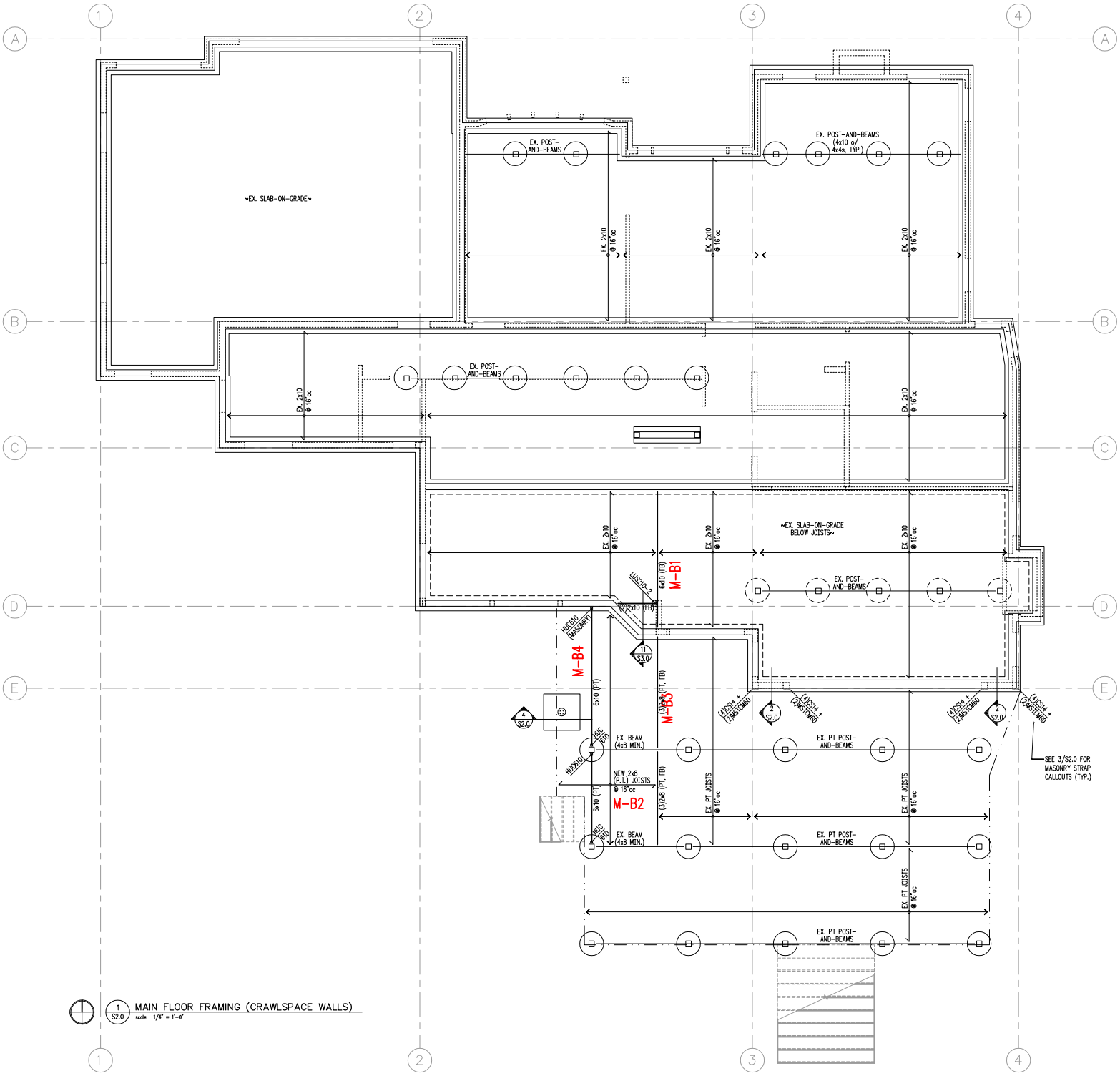
1/S2.2 ROOF FRAMING PLAN (UPPER FLOOR WALLS)
scale: 1/4" = 1'-0"

LEGEND

- SPAN
- EXTENT
- X/SX.X SECTION DETAIL
- (FB) FLUSH BEAM
- (PT) PRESSURE-TREATED
- COLUMN ABOVE
- COLUMN BELOW
- NEW STRUCTURAL WALL
- EXISTING STRUCTURAL WALL
- NEW CONCRETE WALL
- EXISTING CONCRETE WALL



1 S2.1 UPPER FLOOR FRAMING PLAN (MAIN FLOOR WALLS)
scale: 1/4" = 1'-0"

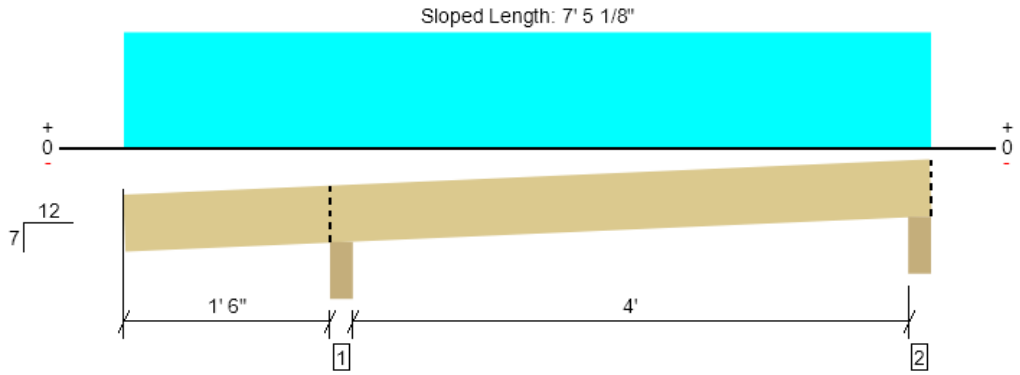


1 S2.0 MAIN FLOOR FRAMING (CRAWLSPACE WALLS)
scale: 1/4" = 1'-0"

Roof (S2.2)			
Member Name	**Results (Max UTIL %)**	**Current Solution**	**Comments**
R-B1	Passed (12% V)	1 piece(s) 2 x 8 HF No.2 @ 24" OC	
R-B2	Passed (36% M)	2 piece(s) 2 x 6 HF No.2	
R-B3	Passed (85% M+)	1 piece(s) 5 1/8" x 15" 24F-V4 DF Glulam	
Upper (S2.1)			
Member Name	**Results (Max UTIL %)**	**Current Solution**	**Comments**
U-B1	Passed (43% M)	1 piece(s) 2 x 8 HF No.2 @ 24" OC	
U-B2	Passed (86% ΔT)	3 piece(s) 1 3/4" x 7 1/4" 2.0E Microllam® LVL	
U-B3	Passed (66% M)	1 piece(s) 2 x 8 HF No.2	
U-B4	Passed (85% M)	2 piece(s) 2 x 8 HF No.2	
U-B5	Passed (73% ΔL)	2 piece(s) 2 x 12 HF No.2	
U-B7	Passed (52% M)	1 piece(s) 4 x 12 DF No.1	
U-B8	Failed (77% R)	1 piece(s) 5 1/8" x 13 1/2" 24F-V4 DF Glulam	Multiple Failures/Errors
U-B9	Passed (95% ΔT)	2 piece(s) 2 x 8 HF No.2	
U-B5 OUTRIGGER	Passed (85% ΔT)	2 piece(s) 1 3/4" x 7 1/4" 2.0E Microllam® LVL	
U-B6	Failed (49% M)	1 piece(s) 6 x 12 DF No.1	Multiple Failures/Errors
U-B10	Passed (81% M)	1 piece(s) 4 x 8 DF No.1	
U-B11	Passed (45% M)	2 piece(s) 2 x 8 HF No.2	
U-B12	Passed (83% M)	1 piece(s) 4 x 12 DF No.1	
U-B13**	Failed (44% M)	1 piece(s) 6 x 10 DF No.1	Multiple Failures/Errors
U-B14**	Failed (69% M)	1 piece(s) 6 x 10 DF No.1	Multiple Failures/Errors
U-B15	Passed (100% R)	3 piece(s) 2 x 12 HF No.2	
U-B16	Passed (81% M)	1 piece(s) 6 x 12 DF No.1	
U-B17	Passed (95% M)	1 piece(s) 6 x 12 DF No.1	
U-B18	Passed (86% M)	2 piece(s) 2 x 12 HF No.2	
Main (S2.0)			
Member Name	**Results (Max UTIL %)**	**Current Solution**	**Comments**
M-B1	Failed (74% M)	1 piece(s) 6 x 10 DF No.1	An excessive uplift of -1074 lbs at support located at 4" failed this product.
M-B2	Passed (33% ΔL)	1 piece(s) 2 x 8 HF No.2 @ 16" OC	
M-B3	Passed (75% M)	3 piece(s) 2 x 8 HF No.2	
M-B4	Passed (84% M)	1 piece(s) 6 x 10 DF No.1	
EX. DECK BEAM	Passed (100% M)	1 piece(s) 4 x 8 DF No.1	

Roof (S2.2), R-B1

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



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Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	359 @ 1' 8 3/4"	3868 (5.50")	Passed (9%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	148 @ 2' 5 3/4"	1251	Passed (12%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	155 @ 4' 1 9/16"	1477	Passed (10%)	1.15	1.0 D + 1.0 S (Alt Spans)
Live Load Defl. (in)	0.007 @ 3' 11 3/16"	0.250	Passed (L/999+)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.010 @ 3' 11 1/2"	0.333	Passed (L/999+)	--	1.0 D + 1.0 S (Alt Spans)

Member Length : 7' 9 3/8"
System : Roof
Member Type : Joist
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD
Member Pitch : 7/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Overhang deflection criteria: LL (2L/240) and TL (2L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- 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	Factored	
1 - Beveled Plate - HF	5.50"	5.50"	1.50"	147	212	359	Blocking
2 - Beveled Plate - HF	5.50"	5.50"	1.50"	76	118	194	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)	7' 5" o/c	
Bottom Edge (Lu)	7' 5" o/c	

•Maximum allowable bracing intervals based on applied load.

•Dimensions for lateral bracing intervals are measured along the length of the member for sloped conditions.

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 6' 5"	24"	15.0	25.0	Default Snow Load

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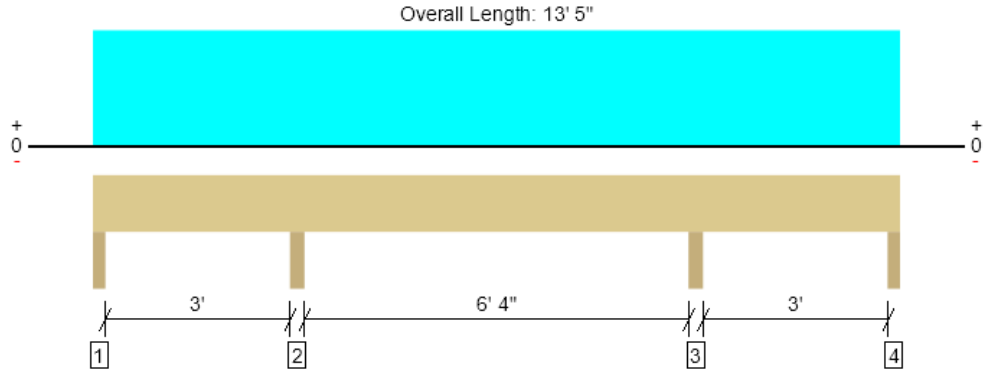
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Roof (S2.2), R-B2

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



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Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1090 @ 3' 4 3/4"	4253 (3.50")	Passed (26%)	--	1.0 D + 1.0 S (Adj Spans)
Shear (lbs)	503 @ 4'	1898	Passed (26%)	1.15	1.0 D + 1.0 S (Adj Spans)
Moment (Ft-lbs)	-575 @ 3' 4 3/4"	1602	Passed (36%)	1.15	1.0 D + 1.0 S (Adj Spans)
Live Load Defl. (in)	0.031 @ 6' 8 1/2"	0.221	Passed (L/999+)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.051 @ 6' 8 1/2"	0.313	Passed (L/999+)	--	1.0 D + 1.0 S (Alt Spans)

Member Length : 13' 5"
System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Trimmer - HF	3.00"	3.00"	1.50"	64	131/-1	195	None
2 - Trimmer - SPF	3.50"	3.50"	1.50"	458	632	1090	None
3 - Trimmer - SPF	3.50"	3.50"	1.50"	458	632	1090	None
4 - Trimmer - HF	3.00"	3.00"	1.50"	64	131/-1	195	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	13' 5" o/c	
Bottom Edge (Lu)	13' 5" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 13' 5"	N/A	4.2	--	
1 - Uniform (PLF)	0 to 13' 5"	N/A	73.5	106.0	Linked from: R-B1, Support 1

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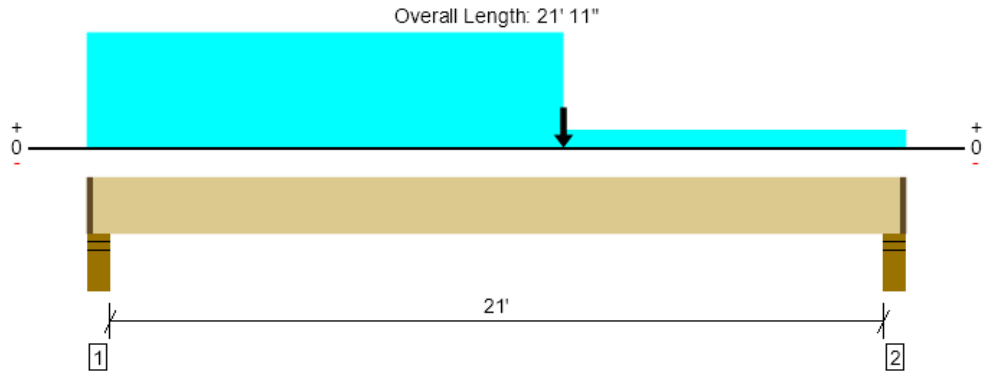
Roof (S2.2), R-B3

1 piece(s) 5 1/8" x 15" 24F-V4 DF Glulam



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Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	6979 @ 4"	8303 (4.00")	Passed (84%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	5973 @ 1' 8 1/2"	15618	Passed (38%)	1.15	1.0 D + 1.0 S (All Spans)
Pos Moment (Ft-lbs)	36875 @ 11' 1 1/4"	43177	Passed (85%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.648 @ 10' 9 1/4"	1.063	Passed (L/394)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	1.109 @ 10' 9 5/8"	1.417	Passed (L/230)	--	1.0 D + 1.0 S (All Spans)

Member Length : 21' 8"
System : Roof
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD
Member Pitch : 0/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Volume factor of 0.98 was calculated for positive bending using length L = 21' 3".
- 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	Roof Live	Snow	Factored	
1 - Stud wall - HF	5.50"	4.00"	3.36"	2862	149	4195	7057	1 1/2" Rim Board
2 - Stud wall - HF	5.50"	4.00"	2.22"	1979	209	2645	4624	1 1/2" Rim Board

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	21' 8" o/c	
Bottom Edge (Lu)	21' 8" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Roof Live (1.25)	Snow (1.15)	Comments
0 - Self Weight (PLF)	1 1/2" to 21' 9 1/2"	N/A	18.7	--	--	
1 - Uniform (PSF)	0 to 12' 9" (Front)	13'	15.0	--	25.0	Default Snow Load
2 - Point (lb)	12' 9" (Front)	N/A	1117	358	1403	Linked from: ex. girder truss, Support 1
3 - Uniform (PLF)	0 to 21' 11" (Front)	N/A	38.0	--	59.0	Linked from: R-B1, Support 2

• Side loads are assumed to not induce cross-grain tension.

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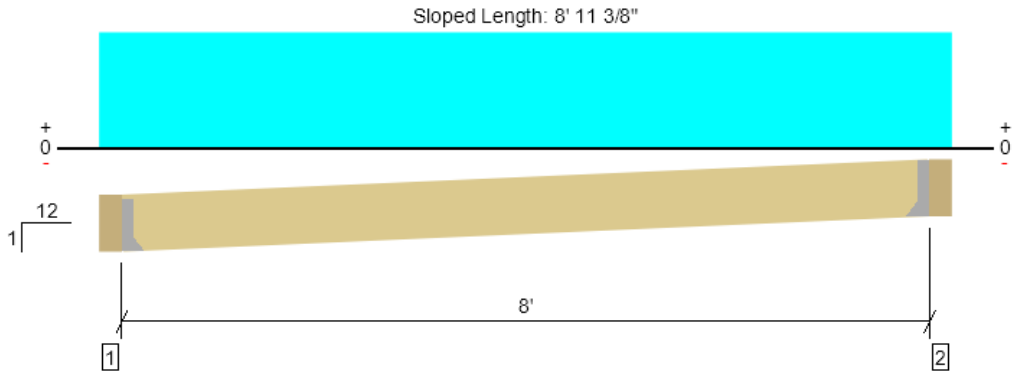
Upper (S2.1), U-B1

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



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Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	320 @ 5 1/2"	911 (1.50")	Passed (35%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	272 @ 1' 3/4"	1251	Passed (22%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	641 @ 4' 5 1/2"	1477	Passed (43%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.075 @ 4' 5 1/2"	0.401	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.120 @ 4' 5 1/2"	0.535	Passed (L/802)	--	1.0 D + 1.0 S (All Spans)

Member Length : 8' 15/16"
System : Roof
Member Type : Joist
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD
Member Pitch : 1/12

- Deflection criteria: LL (L/240) and TL (L/180).
- 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	Factored	
1 - Hanger on 7 1/4" HF beam	5.50"	Hanger[1]	1.50"	134	223	357	See note [1]
2 - Hanger on 7 1/4" HF beam	5.50"	Hanger[1]	1.50"	134	223	357	See note [1]

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

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

- Maximum allowable bracing intervals based on applied load.
- Dimensions for lateral bracing intervals are measured along the length of the member for sloped conditions.

Connector: Simpson Strong-Tie

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

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

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 8' 11"	24"	15.0	25.0	Default Snow Load

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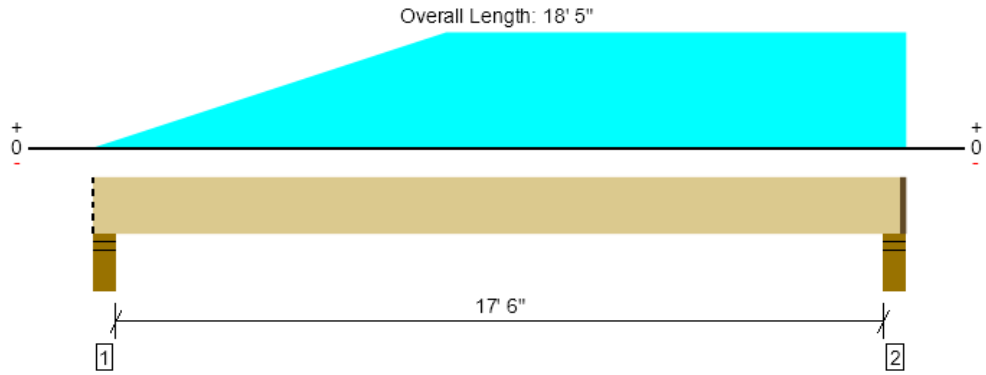
Upper (S2.1), U-B2

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



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Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1470 @ 18' 1"	8505 (4.00")	Passed (17%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1309 @ 17' 4 1/4"	8317	Passed (16%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	6008 @ 9' 8 7/16"	12273	Passed (49%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.592 @ 9' 4 5/16"	0.887	Passed (L/360)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	1.023 @ 9' 4 3/16"	1.183	Passed (L/208)	--	1.0 D + 1.0 S (All Spans)

Member Length : 18' 3 1/2"
System : Roof
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD
Member Pitch : 0/12

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Stud wall - HF	5.50"	5.50"	1.50"	446	574	1020	Blocking
2 - Stud wall - HF	5.50"	4.00"	1.50"	622	868	1490	1 1/2" Rim Board

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

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 18' 3 1/2"	N/A	11.1	--	
1 - Uniform (PSF)	8' to 18' 5" (Front)	4'	15.0	25.0	Default Snow Load
2 - Tapered (PSF)	0 to 8' (Front)	0 to 4'	15.0	25.0	Default Snow Load

- Side loads are assumed to not induce cross-grain tension.

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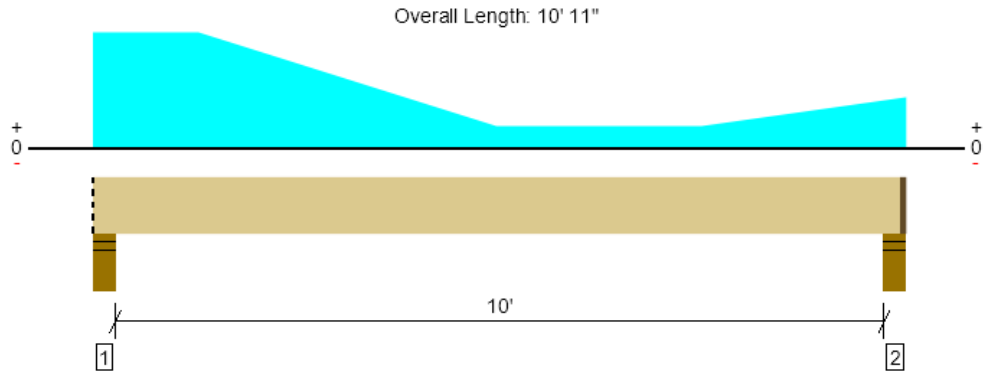
Upper (S2.1), U-B3

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



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	558 @ 4"	3341 (5.50")	Passed (17%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	385 @ 1' 3/4"	1251	Passed (31%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	846 @ 4' 2 3/8"	1284	Passed (66%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.152 @ 5' 2 1/2"	0.512	Passed (L/808)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.254 @ 5' 2 5/8"	0.683	Passed (L/483)	--	1.0 D + 1.0 S (All Spans)

Member Length : 10' 9 1/2"
System : Roof
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD
Member Pitch : 0/12

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Stud wall - HF	5.50"	5.50"	1.50"	218	339	558	Blocking
2 - Stud wall - HF	5.50"	4.00"	1.50"	121	177	299	1 1/2" Rim Board

- 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)	9' 4" o/c	
Bottom Edge (Lu)	10' 10" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 10' 9 1/2"	N/A	2.8	--	
1 - Uniform (PSF)	0 to 1' 5" (Front)	4'	15.0	25.0	Default Snow Load
2 - Tapered (PSF)	1' 5" to 5' 5" (Front)	4' to 9"	15.0	25.0	Default Snow Load
3 - Uniform (PSF)	5' 5" to 8' 2" (Front)	9"	15.0	25.0	Default Snow Load
4 - Tapered (PSF)	8' 2" to 10' 11" (Front)	9" to 1' 9"	15.0	25.0	Default Snow Load

- Side loads are assumed to not induce cross-grain tension.

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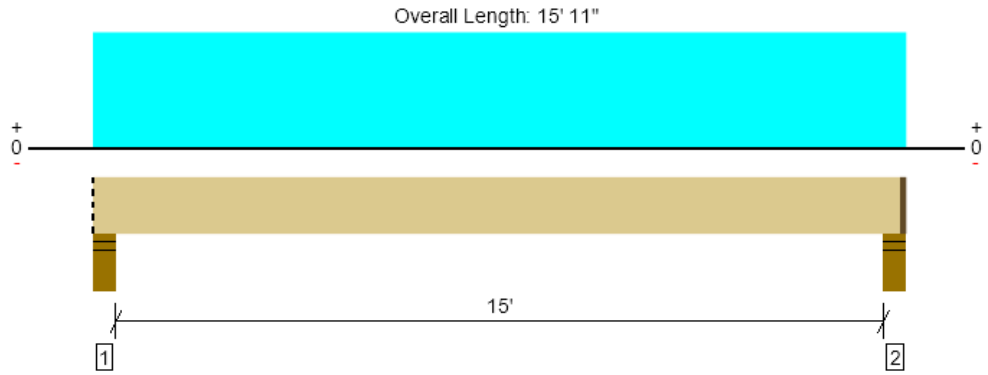
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Upper (S2.1), U-B4

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



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	591 @ 15' 7"	4860 (4.00")	Passed (12%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	521 @ 1' 3/4"	2501	Passed (21%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	2195 @ 7' 11 1/2"	2569	Passed (85%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.430 @ 7' 11 1/2"	0.762	Passed (L/426)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.742 @ 7' 11 1/2"	1.017	Passed (L/247)	--	1.0 D + 1.0 S (All Spans)

Member Length : 15' 9 1/2"
System : Roof
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD
Member Pitch : 0/12

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Stud wall - HF	5.50"	5.50"	1.50"	253	348	601	Blocking
2 - Stud wall - HF	5.50"	4.00"	1.50"	252	348	600	1 1/2" Rim Board

- 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)	9' 8" o/c	
Bottom Edge (Lu)	15' 10" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 15' 9 1/2"	N/A	5.5	--	
1 - Uniform (PSF)	0 to 15' 11" (Front)	1' 9"	15.0	25.0	Default Snow Load

- Side loads are assumed to not induce cross-grain tension.

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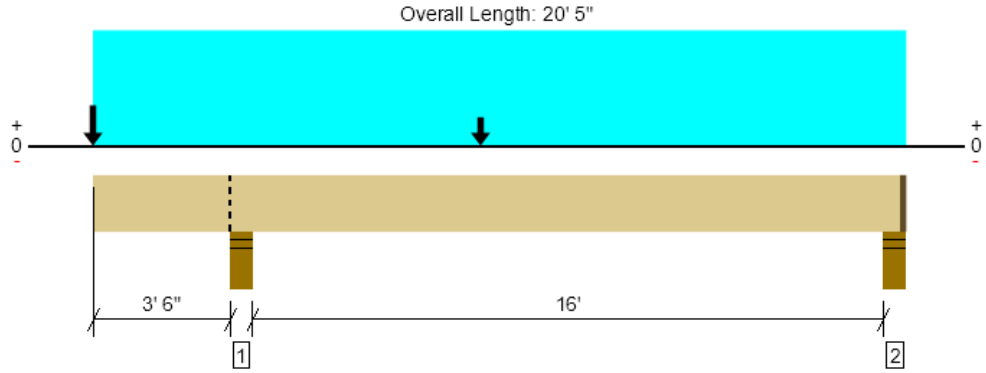
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Upper (S2.1), U-B5

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



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1746 @ 3' 8 3/4"	6683 (5.50")	Passed (26%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	947 @ 2' 6 3/4"	3881	Passed (24%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	-3482 @ 3' 8 3/4"	5155	Passed (68%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.183 @ 0	0.249	Passed (2L/490)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.236 @ 0	0.373	Passed (2L/378)	--	1.0 D + 1.0 S (All Spans)

Member Length : 20' 3 1/2"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

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

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Factored	
1 - Stud wall - HF	5.50"	5.50"	1.50"	797	620	645	1746	Blocking
2 - Stud wall - HF	5.50"	4.00"	1.50"	127	396/-8	-120	523	1 1/2" Rim Board

- 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)	13' 10" o/c	
Bottom Edge (Lu)	10' 10" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 20' 3 1/2"	N/A	8.6	--	--	
1 - Uniform (PSF)	0 to 20' 5" (Front)	8"	15.0	40.0	--	Default Floor Load
2 - Point (lb)	9' 8 3/4" (Front)	N/A	173	460	--	45 DEGREE BEAM
3 - Point (lb)	0 (Front)	N/A	253	--	348	Linked from: U-B4, Support 1
4 - Point (lb)	0 (Front)	N/A	121	--	177	Linked from: U-B3, Support 2

- Side loads are assumed to not induce cross-grain tension.

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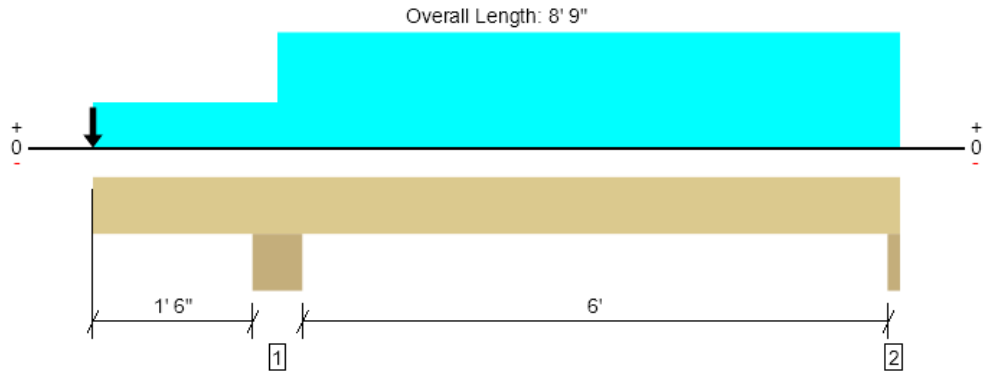
Upper (S2.1), U-B7

1 piece(s) 4 x 12 DF No.1



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	2492 @ 8' 7 1/2"	6563 (3.00")	Passed (38%)	--	1.0 D + 0.75 L + 0.75 S (Alt Spans)
Shear (lbs)	1775 @ 3' 5 1/4"	5434	Passed (33%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	3521 @ 5' 5 7/8"	6768	Passed (52%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.026 @ 5' 4 5/8"	0.221	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (Alt Spans)
Total Load Defl. (in)	0.039 @ 5' 5 1/8"	0.331	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (Alt Spans)

Member Length : 8' 9"
System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

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

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Factored	
1 - Trimmer - HF	12.00"	12.00"	1.93"	1708	1369	1982	4221	None
2 - Trimmer - HF	3.00"	3.00"	1.50"	916	1421	681	2492	None

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 8' 9"	N/A	10.0	--	--	
1 - Uniform (PSF)	0 to 8' 9"	5' 3"	15.0	--	25.0	Default Snow Load (ABV)
2 - Uniform (PSF)	0 to 8' 9"	4'	15.0	--	25.0	Default Snow Load
3 - Uniform (PSF)	2' to 8' 9"	10' 4"	15.0	40.0	--	Default Floor Load
4 - Point (lb)	0	N/A	276	--	525	Linked from: U-B10, Support 2

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

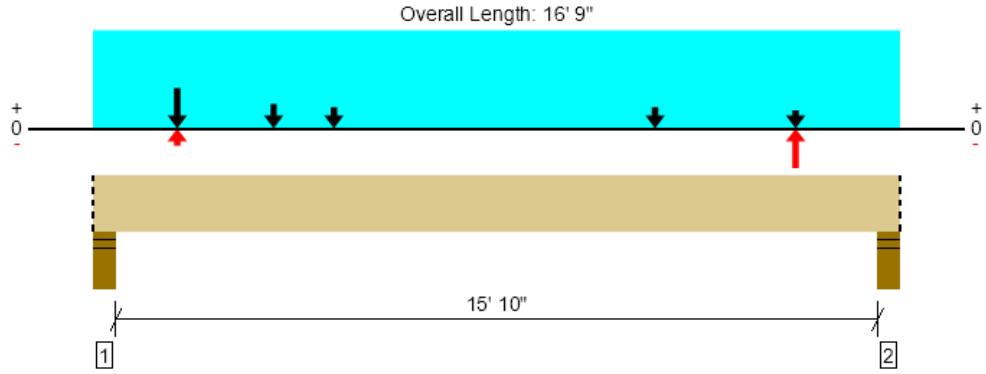
Upper (S2.1), U-B8

1 piece(s) 5 1/8" x 13 1/2" 24F-V4 DF Glulam

detailed as strapped header **PASSED**

An excessive uplift of -1981 lbs at support located at 4" failed this product.

An excessive uplift of -2261 lbs at support located at 16' 5" failed this product.



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern) [Group]
Member Reaction (lbs)	8833 @ 4"	11416 (5.50")	Passed (77%)	--	1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans) [1]
Shear (lbs)	8130 @ 1' 7"	19557	Passed (42%)	1.60	1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans) [1]
Pos Moment (Ft-lbs)	20513 @ 7' 9 3/16"	31134	Passed (66%)	1.00	1.0 D + 1.0 L (All Spans) [1]
Neg Moment (Ft-lbs)	-4374 @ 14' 7"	38399	Passed (11%)	1.60	0.6 D + 0.7 E (All Spans) [1]
Live Load Defl. (in)	0.329 @ 8' 2 7/8"	0.536	Passed (L/587)	--	1.0 D + 0.75 L + 0.75 S (All Spans) [1]
Total Load Defl. (in)	0.559 @ 8' 2 3/4"	0.804	Passed (L/345)	--	1.0 D + 0.75 L + 0.75 S (All Spans) [1]

Member Length : 16' 9"
System : Floor
Member Type : Drop Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Volume factor of 1.00 was calculated for positive bending using length L = 16' 1".
- Volume factor of 1.00 was calculated for negative bending using length L = 4' 3 13/16".
- 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	Floor Live	Snow	Seismic	Factored	
1 - Stud wall - HF	5.50"	5.50"	4.26"	2551	3168	1696	5017/-5017	8833/-1981	Blocking
2 - Stud wall - HF	5.50"	5.50"	3.76"	2084	2812	1312	5017/-5017	7811/-2261	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)	16' 9" o/c	
Bottom Edge (Lu)	16' 9" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Seismic (1.60)	Comments
0 - Self Weight (PLF)	0 to 16' 9"	N/A	16.8	--	--	--	
1 - Uniform (PSF)	0 to 16' 9" (Front)	8'	15.0	40.0	--	--	Default Floor Load
2 - Uniform (PSF)	0 to 16' 9" (Front)	2'	15.0	--	25.0	--	Default Snow Load
3 - Point (lb)	1' 9" (Front)	N/A	--	--	--	6287	R1 RXN (1.0rho, 2.5E)
4 - Point (lb)	14' 7" (Front)	N/A	--	--	--	-6287	R1 RXN (1.0rho, 2.5E)
5 - Point (lb)	3' 9" (Front)	N/A	797	620	645	--	Linked from: U-B5, Support 1
6 - Point (lb)	1' 9" (Front)	N/A	64	--	131/-1	--	Linked from: R-B2, Support 1
7 - Point (lb)	5' (Front)	N/A	458	--	632	--	Linked from: R-B2, Support 2
8 - Point (lb)	11' 8" (Front)	N/A	458	--	632	--	Linked from: R-B2, Support 3
9 - Point (lb)	14' 7" (Front)	N/A	64	--	131/-1	--	Linked from: R-B2, Support 4

• Side loads are assumed to not induce cross-grain tension.

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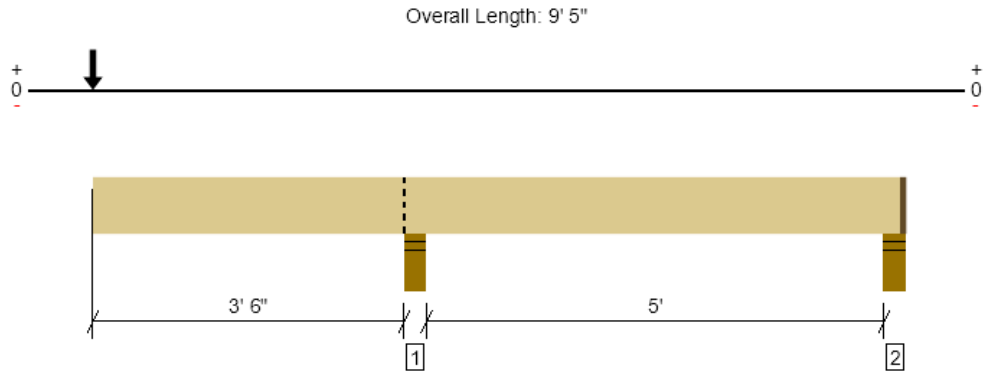
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Upper (S2.1), U-B9

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



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1060 @ 3' 8 3/4"	6683 (5.50")	Passed (16%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	616 @ 2' 10 3/4"	2501	Passed (25%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	-2276 @ 3' 8 3/4"	2569	Passed (89%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.204 @ 0	0.249	Passed (2L/438)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.356 @ 0	0.373	Passed (2L/252)	--	1.0 D + 1.0 S (All Spans)

Member Length : 9' 3 1/2"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Overhang deflection criteria: LL (2L/360) and TL (2L/240).
- Left cantilever length exceeds 1/3 member length or 1/2 back span length. Additional bracing should be considered.
- Allowed moment does not reflect the adjustment for the beam stability factor.
- -409 lbs uplift at support located at 9' 1". Strapping or other restraint may be required.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Stud wall - HF	5.50"	5.50"	1.50"	470	590	1060	Blocking
2 - Stud wall - HF	5.50"	4.00"	1.50"	-167	-242	-409	1 1/2" Rim Board

- 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)	9' 4" o/c	
Bottom Edge (Lu)	8' 9" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 9' 3 1/2"	N/A	5.5	--	
1 - Point (lb)	0 (Front)	N/A	252	348	Linked from: U-B4, Support 2

- Side loads are assumed to not induce cross-grain tension.

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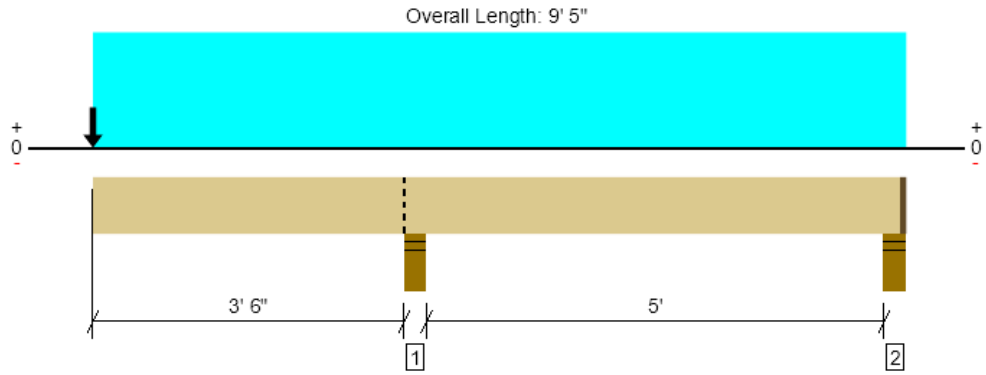
Upper (S2.1), U-B5 OUTRIGGER

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



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1659 @ 3' 8 3/4"	7796 (5.50")	Passed (21%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	949 @ 2' 10 3/4"	5544	Passed (17%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	-3474 @ 3' 8 3/4"	8182	Passed (42%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.181 @ 0	0.249	Passed (2L/496)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.316 @ 0	0.373	Passed (2L/282)	--	1.0 D + 1.0 S (All Spans)

Member Length : 9' 3 1/2"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Overhang deflection criteria: LL (2L/360) and TL (2L/240).
- Left cantilever length exceeds 1/3 member length or 1/2 back span length. Additional bracing should be considered.
- Allowed moment does not reflect the adjustment for the beam stability factor.
- -597 lbs uplift at support located at 9' 1". Strapping or other restraint may be required.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Factored	
1 - Stud wall - HF	5.50"	5.50"	1.50"	769	205	891	1659	Blocking
2 - Stud wall - HF	5.50"	4.00"	1.50"	-232	80/-31	-366	-597	1 1/2" Rim Board

- 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)	9' 4" o/c	
Bottom Edge (Lu)	9' 4" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 9' 3 1/2"	N/A	7.4	--	--	
1 - Uniform (PSF)	0 to 9' 5" (Front)	8"	15.0	40.0	--	Default Floor Load
2 - Point (lb)	0 (Front)	N/A	253	--	348	Linked from: U-B4, Support 1
3 - Point (lb)	0 (Front)	N/A	121	--	177	Linked from: U-B3, Support 2

- Side loads are assumed to not induce cross-grain tension.

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

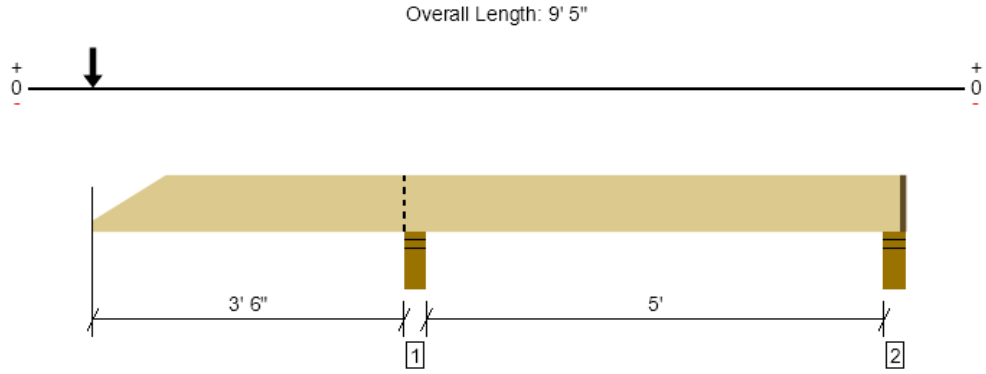
Upper (S2.1), U-B6

1 piece(s) 6 x 12 DF No.1

uplift capacity provided by splice plate detail **PASSED**

An excessive uplift of -1400 lbs at support located at 9' 1" failed this product.

This product group is not valid for a tapered end cut analysis.



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	3596 @ 3' 8 3/4"	12251 (5.50")	Passed (29%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	2088 @ 2' 6 1/2"	8244	Passed (25%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	-7745 @ 3' 8 3/4"	15684	Passed (49%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.079 @ 0	0.249	Passed (2L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.135 @ 0	0.373	Passed (2L/664)	--	1.0 D + 1.0 S (All Spans)

Member Length : 9' 3 1/2"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Overhang deflection criteria: LL (2L/360) and TL (2L/240).
- Left cantilever length exceeds 1/3 member length or 1/2 back span length. Additional bracing should be considered.
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Lumber grading provisions must be extended over the length of the member per NDS 4.2.5.5.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Stud wall - HF	5.50"	5.50"	1.61"	1549	2048	3596	Blocking
2 - Stud wall - HF	5.50"	4.00"	1.50"	-560	-841	-1400	1 1/2" Rim Board

- 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)	9' 4" o/c	
Bottom Edge (Lu)	9' 4" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 9' 3 1/2"	N/A	16.0	--	
1 - Point (lb)	0 (Front)	N/A	218	339	Linked from: U-B3, Support 1
2 - Point (lb)	0 (Front)	N/A	622	868	Linked from: Copy of U-B2, Support 2

- Side loads are assumed to not induce cross-grain tension.

Tapered End	Heel Height	Cut Length	Cut Slope	Location	Shear (lbs)			Comments
					Actual	Allowed	Result	
Left End	7 1/4"	--	--	--	--	--	See Error(s)	

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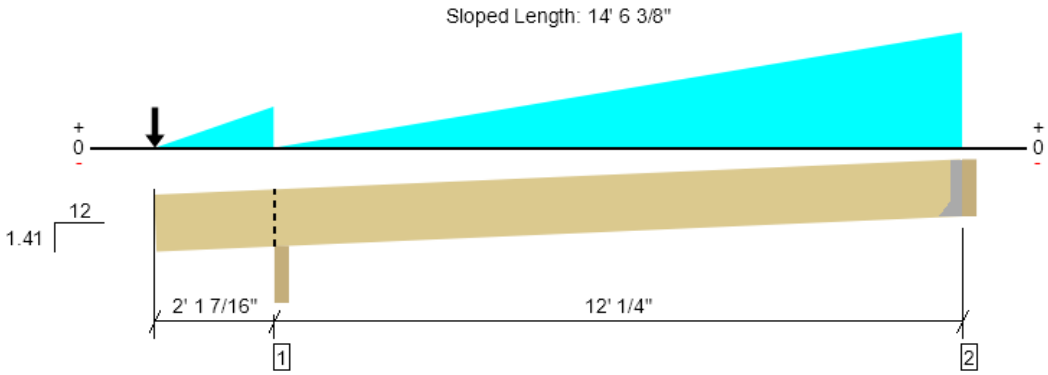
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Upper (S2.1), U-B10

1 piece(s) 4 x 8 DF No.1



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	2221 @ 2' 3 3/16"	5242 (3.50")	Passed (42%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1387 @ 1' 6 1/4"	3502	Passed (40%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	-3111 @ 2' 3 3/16"	3820	Passed (81%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.121 @ 0	0.228	Passed (2L/454)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.185 @ 0	0.304	Passed (2L/296)	--	1.0 D + 1.0 S (Alt Spans)

Member Length : 14' 3 3/4"
System : Roof
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD
Member Pitch : 1.41/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Overhang deflection criteria: LL (2L/240) and TL (2L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Beveled Plate - SPF	3.50"	3.50"	1.50"	963	1258	2221	Blocking
2 - Hanger on 7 1/4" SPF beam	3.50"	Hanger[1]	1.50"	276	525	801	See note [1]

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	14' 3" o/c	
Bottom Edge (Lu)	14' 3" o/c	

•Maximum allowable bracing intervals based on applied load.
•Dimensions for lateral bracing intervals are measured along the length of the member for sloped conditions.

Connector: Simpson Strong-Tie						
Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
2 - Face Mount Hanger	U46X SLD6	2.00"	N/A	8-10d	4-10d	

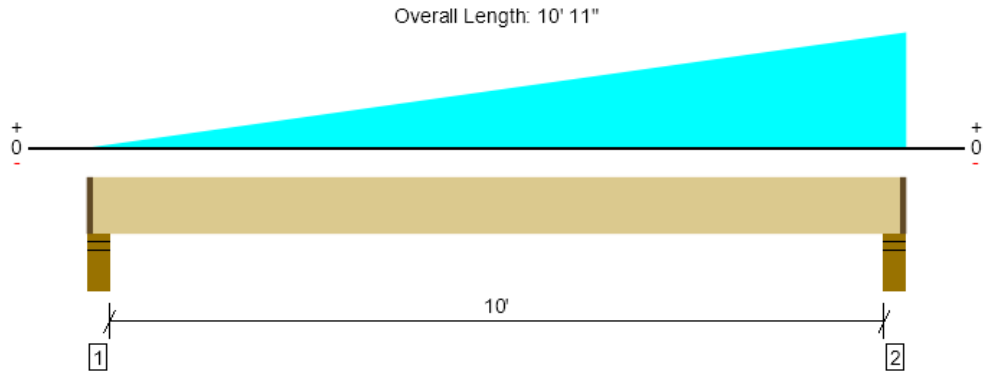
- Refer to manufacturer notes and instructions for proper installation and use of all connectors.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 14' 1 11/16"	N/A	6.4	--	
1 - Tapered (PLF)	0 to 2' 1 7/16"	N/A	0.0 to 32.0	0.0 to 53.0	Generated from Roof Geometry
2 - Tapered (PLF)	2' 1 7/16" to 14' 1 11/16"	N/A	0.0 to 87.9	0.0 to 150.3	Generated from Roof Geometry
3 - Point (lb)	0	N/A	135	176	Linked from: U-B11, Support 1
4 - Point (lb)	0	N/A	446	574	Linked from: U-B2, Support 1

- Side loads are assumed to not induce cross-grain tension.

Upper (S2.1), U-B11

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



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	601 @ 10' 7"	4860 (4.00")	Passed (12%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	453 @ 9' 10 1/4"	2501	Passed (18%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	1147 @ 6' 2"	2569	Passed (45%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.100 @ 5' 7 11/16"	0.512	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.172 @ 5' 7 9/16"	0.683	Passed (L/716)	--	1.0 D + 1.0 S (All Spans)

Member Length : 10' 8"
System : Roof
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD
Member Pitch : 0/12

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Stud wall - HF	5.50"	4.00"	1.50"	135	176	312	1 1/2" Rim Board
2 - Stud wall - HF	5.50"	4.00"	1.50"	251	369	620	1 1/2" Rim Board

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

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	1 1/2" to 10' 9 1/2"	N/A	5.5	--	
1 - Tapered (PSF)	0 to 10' 11" (Front)	0 to 4'	15.0	25.0	Default Snow Load

- Side loads are assumed to not induce cross-grain tension.

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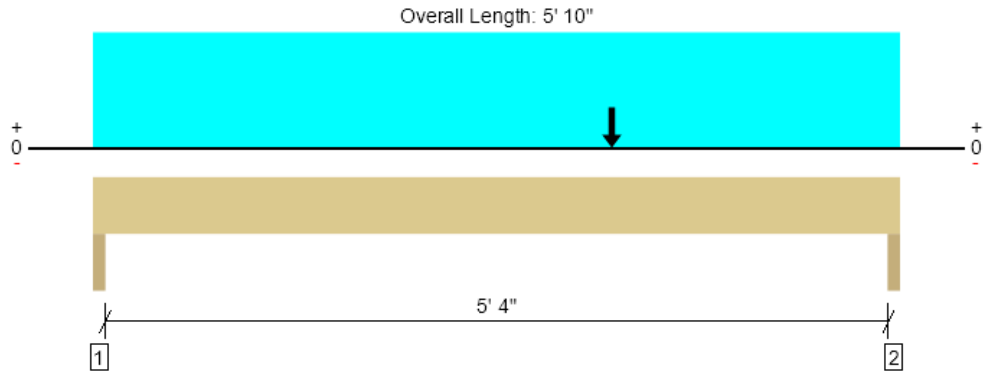
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Upper (S2.1), U-B12

1 piece(s) 4 x 12 DF No.1



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	3741 @ 5' 8 1/2"	6563 (3.00")	Passed (57%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	3249 @ 4' 7 3/4"	5434	Passed (60%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	6429 @ 3' 9"	7783	Passed (83%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.025 @ 3' 3/8"	0.186	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.043 @ 3' 7/16"	0.279	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

Member Length : 5' 10"
System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

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

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Factored	
1 - Trimmer - HF	3.00"	3.00"	1.50"	1062	1050	971	2578	None
2 - Trimmer - HF	3.00"	3.00"	1.71"	1606	1050	1796	3741	None

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 5' 10"	N/A	10.0	--	--	
1 - Uniform (PSF)	0 to 5' 10"	9'	15.0	40.0	--	Default Floor Load
2 - Point (lb)	3' 9"	N/A	1823	--	2767	Linked from: EX. (4)2X12, Support 2

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

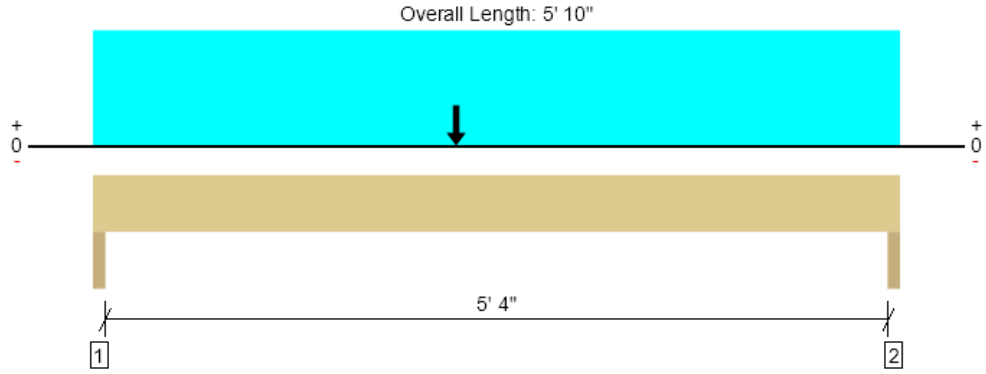
*Upper (S2.1), U-B13***

1 piece(s) 6 x 10 DF No.1

detailed as strapped header
PASSED

An excessive uplift of -1806 lbs at support located at 1 1/2" failed this product.

An excessive uplift of -1385 lbs at support located at 5' 8 1/2" failed this product.



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	3478 @ 1 1/2"	10313 (3.00")	Passed (34%)	--	1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	2831 @ 1' 1/2"	9475	Passed (30%)	1.60	1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	6560 @ 2' 7 1/2"	14891	Passed (44%)	1.60	1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.013 @ 2' 11 1/16"	0.186	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.022 @ 2' 11 1/16"	0.279	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

Member Length : 5' 10"
System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

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

Supports	Bearing Length			Loads to Supports (lbs)					Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Seismic	Factored	
1 - Trimmer - HF	3.00"	3.00"	1.50"	695	1050	438	3175/-3175	3478/-1806	None
2 - Trimmer - HF	3.00"	3.00"	1.50"	695	1050	438	2575/-2575	3162/-1385	None

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Seismic (1.60)	Comments
0 - Self Weight (PLF)	0 to 5' 10"	N/A	13.2	--	--	--	
1 - Uniform (PSF)	0 to 5' 10"	9'	15.0	40.0	--	--	Default Floor Load
2 - Uniform (PSF)	0 to 5' 10"	6'	15.0	--	25.0	--	Default Snow Load
3 - Point (lb)	2' 7 1/2"	N/A	--	--	--	5750	R3 RXN (1.0rho, 2.5E)

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

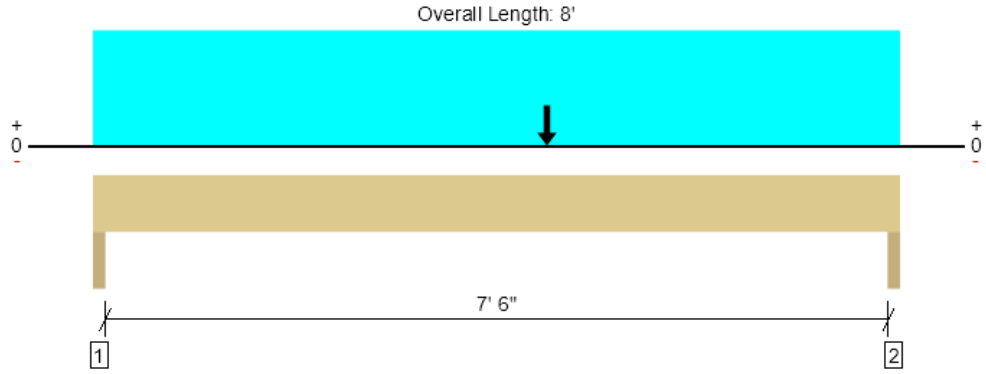
*Upper (S2.1), U-B14***

1 piece(s) 6 x 10 DF No.1

detailed as strapped header **PASSED**

An excessive uplift of -1181 lbs at support located at 1 1/2" failed this product.

An excessive uplift of -1700 lbs at support located at 7' 10 1/2" failed this product.



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	4187 @ 7' 10 1/2"	10313 (3.00")	Passed (41%)	--	1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	3540 @ 6' 11 1/2"	9475	Passed (37%)	1.60	1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	10334 @ 4' 6"	14891	Passed (69%)	1.60	1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.049 @ 3' 11 15/16"	0.258	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.080 @ 3' 11 15/16"	0.387	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

Member Length : 8'
System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

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

Supports	Bearing Length			Loads to Supports (lbs)					Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Seismic	Factored	
1 - Trimmer - HF	3.00"	3.00"	1.50"	953	1440	600	2504/-2504	3798/-1181	None
2 - Trimmer - HF	3.00"	3.00"	1.50"	953	1440	600	3246/-3246	4187/-1700	None

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Seismic (1.60)	Comments
0 - Self Weight (PLF)	0 to 8'	N/A	13.2	--	--	--	
1 - Uniform (PSF)	0 to 8'	9'	15.0	40.0	--	--	Default Floor Load
2 - Uniform (PSF)	0 to 8'	6'	15.0	--	25.0	--	Default Snow Load
3 - Point (lb)	4' 6"	N/A	--	--	--	5750	R3 RXN (1.0rho, 2.5E)

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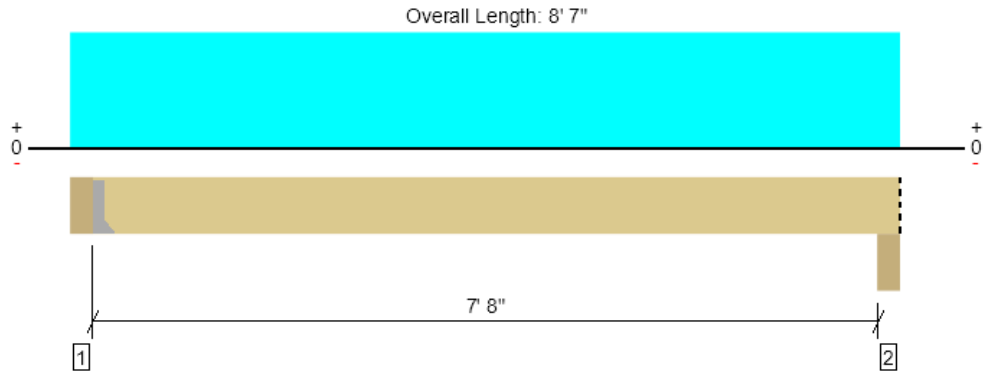
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Upper (S2.1), U-B15

3 piece(s) 2 x 12 HF No.2



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	2728 @ 5 1/2"	2734 (1.50")	Passed (100%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	2072 @ 1' 4 3/4"	5063	Passed (41%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	5315 @ 4' 4 1/4"	6724	Passed (79%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.060 @ 4' 4 1/4"	0.260	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.084 @ 4' 4 1/4"	0.390	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)

Member Length : 8' 1 1/2"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Hanger on 11 1/4" HF beam	5.50"	Hanger[1]	1.50"	866	2177	3043	See note [1]
2 - Beam - HF	5.50"	5.50"	1.63"	847	2115	2962	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	8' 2" o/c	
Bottom Edge (Lu)	8' 2" o/c	

•Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-Tie

Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
1 - Face Mount Hanger	HHUS210-3	3.00"	N/A	30-10d	10-10d	

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	5 1/2" to 8' 7"	N/A	12.8	--	
1 - Uniform (PSF)	0 to 8' 7" (Front)	12' 6"	15.0	40.0	Default Floor Load

- Side loads are assumed to not induce cross-grain tension.

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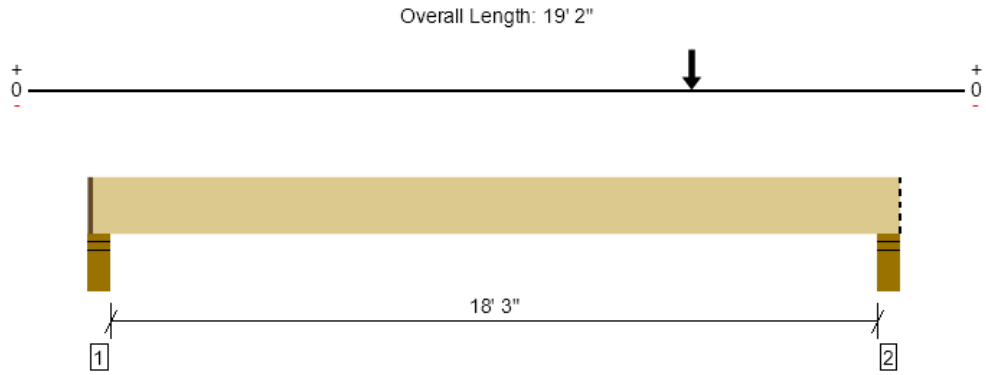
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Upper (S2.1), U-B16

1 piece(s) 6 x 12 DF No.1



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	2443 @ 18' 10"	12251 (5.50")	Passed (20%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	2420 @ 17' 9"	7168	Passed (34%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	11003 @ 14' 3"	13638	Passed (81%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.309 @ 10' 8 1/16"	0.617	Passed (L/719)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.469 @ 10' 6 15/16"	0.925	Passed (L/474)	--	1.0 D + 1.0 L (All Spans)

Member Length : 19' 3/4"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Stud wall - HF	5.50"	4.25"	1.50"	366	539	906	1 1/4" Rim Board
2 - Stud wall - HF	5.50"	5.50"	1.50"	805	1638	2443	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)	19' 1" o/c	
Bottom Edge (Lu)	19' 1" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	1 1/4" to 19' 2"	N/A	16.0	--	
1 - Point (lb)	14' 3" (Front)	N/A	866	2177	Linked from: U-B15, Support 1

- Side loads are assumed to not induce cross-grain tension.

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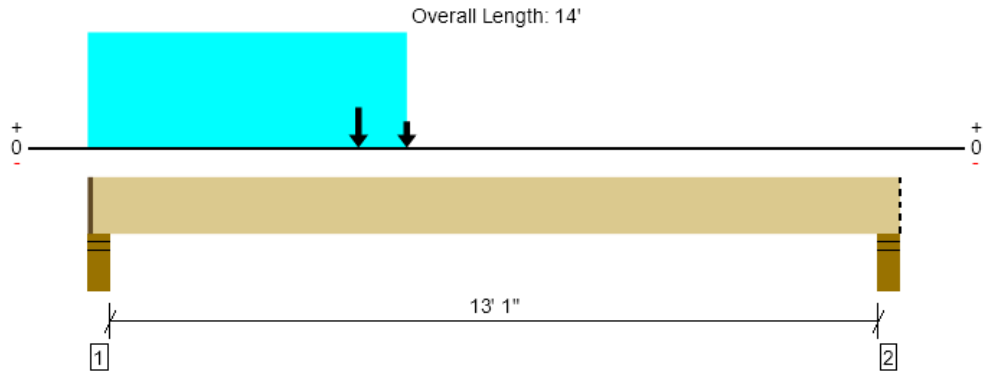
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Upper (S2.1), U-B17

1 piece(s) 6 x 12 DF No.1



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	4410 @ 4"	9467 (4.25")	Passed (47%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	3879 @ 1' 5"	8244	Passed (47%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	14934 @ 4' 11 15/16"	15684	Passed (95%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.210 @ 6' 5 9/16"	0.444	Passed (L/763)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.360 @ 6' 5 3/4"	0.667	Passed (L/444)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

Member Length : 13' 10 3/4"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

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

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Factored	
1 - Stud wall - HF	5.50"	4.25"	1.98"	1881	1428	1998	4450	1 1/4" Rim Board
2 - Stud wall - HF	5.50"	5.50"	1.50"	827	687	733	1893	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)	13' 11" o/c	
Bottom Edge (Lu)	13' 11" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	1 1/4" to 14'	N/A	16.0	--	--	
1 - Point (lb)	4' 8" (Front)	N/A	847	2115	--	Linked from: U-B15, Support 2
2 - Uniform (PSF)	0 to 5' 6" (Front)	11' 6"	15.0	--	25.0	Default Snow Load
3 - Point (lb)	5' 6" (Front)	N/A	690	--	1150	

- Side loads are assumed to not induce cross-grain tension.

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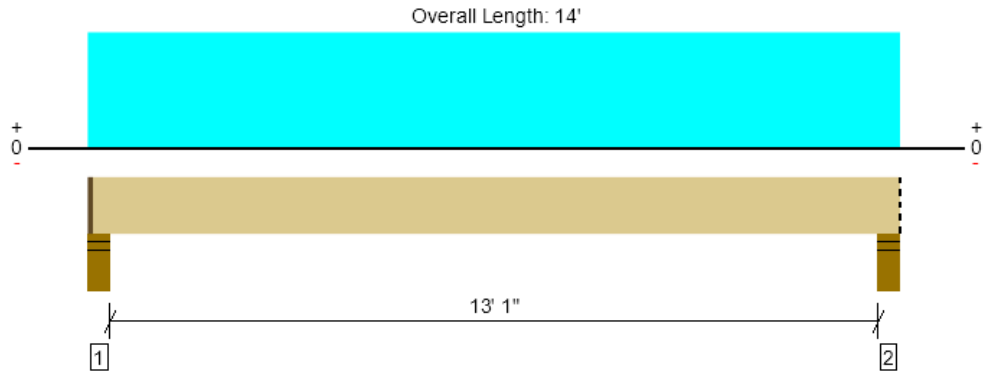
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Upper (S2.1), U-B18

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



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1197 @ 4"	5164 (4.25")	Passed (23%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	973 @ 1' 4 3/4"	3375	Passed (29%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	3857 @ 7'	4482	Passed (86%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.184 @ 7'	0.444	Passed (L/868)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.267 @ 7'	0.667	Passed (L/600)	--	1.0 D + 1.0 L (All Spans)

Member Length : 13' 10 3/4"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Stud wall - HF	5.50"	4.25"	1.50"	374	840	1214	1 1/4" Rim Board
2 - Stud wall - HF	5.50"	5.50"	1.50"	375	840	1215	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)	7' 10" o/c	
Bottom Edge (Lu)	13' 11" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	1 1/4" to 14'	N/A	8.6	--	
1 - Uniform (PSF)	0 to 14' (Front)	3'	15.0	40.0	Default Floor Load

- Side loads are assumed to not induce cross-grain tension.

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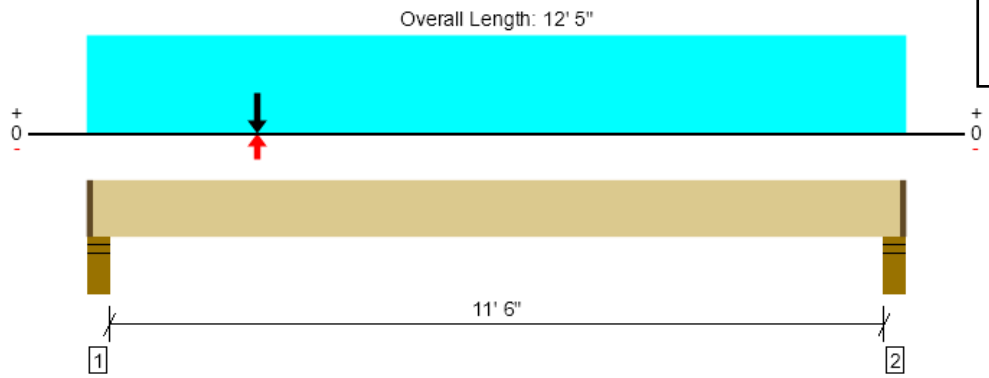
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Main (S2.0), M-B1

1 piece(s) 6 x 10 DF No.1

No net uplift when overstrength is removed **PASSED**

An excessive uplift of -1074 lbs at support located at 4" failed this product.



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern) [Group]
Member Reaction (lbs)	4454 @ 4"	8910 (4.00")	Passed (50%)	--	1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans) [1]
Shear (lbs)	3096 @ 1' 3"	5922	Passed (52%)	1.00	1.0 D + 1.0 L (All Spans) [1]
Moment (Ft-lbs)	6925 @ 2' 7"	9307	Passed (74%)	1.00	1.0 D + 1.0 L (All Spans) [1]
Live Load Defl. (in)	0.138 @ 5' 7 3/4"	0.392	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans) [1]
Total Load Defl. (in)	0.229 @ 5' 7 11/16"	0.587	Passed (L/616)	--	1.0 D + 1.0 L (All Spans) [1]

Member Length : 12' 2"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

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

2624 lb / 2.5(omega) * 1.3 (rho) = -1365 upift w/o overstrength

Supports	Bearing Length			Loads to Supports (lbs)					Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Seismic	Factored	
1 - Stud wall - HF	5.50"	4.00"	2.00"	1271	1931	485	2624/-2624	4461/-1074	1 1/2" Rim Board
2 - Stud wall - HF	5.50"	4.00"	1.50"	457	710	115	622/-622	1402/-161	1 1/2" Rim Board

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

net uplift = 0.6*1271 - 0.7*1365 = -193

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	12' 2" o/c	
Bottom Edge (Lu)	12' 2" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Seismic (1.60)	Comments
0 - Self Weight (PLF)	1 1/2" to 12' 3 1/2"	N/A	13.2	--	--	--	
1 - Uniform (PSF)	0 to 12' 5" (Front)	1' 4"	15.0	40.0	--	--	Default Floor Load
2 - Point (lb)	2' 7" (Front)	N/A	366	539	--	--	Linked from: U-B16, Support 1
3 - Point (lb)	2' 7" (Front)	N/A	953	1440	600	3246/-3246	Linked from: U-B14**, Support 2

- Side loads are assumed to not induce cross-grain tension.

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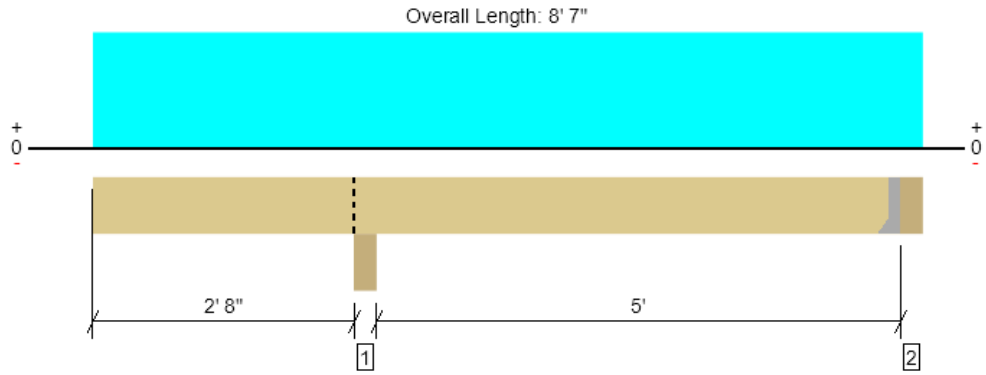
Main (S2.0), M-B2

1 piece(s) 2 x 8 HF No.2 @ 16" OC



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	229 @ 8' 1 1/2"	911 (1.50")	Passed (25%)	--	1.0 D + 1.0 L (Alt Spans)
Shear (lbs)	234 @ 3' 8 3/4"	1088	Passed (22%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	-380 @ 2' 10 3/4"	1284	Passed (30%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.067 @ 0	0.200	Passed (2L/999+)	--	1.0 D + 1.0 L (Alt Spans)
Total Load Defl. (in)	0.071 @ 0	0.290	Passed (2L/984)	--	1.0 D + 1.0 L (Alt Spans)
TJ-Pro™ Rating	N/A	N/A	N/A	--	N/A

Member Length : 8' 1 1/2"
System : Floor
Member Type : Joist
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Overhang deflection criteria: LL (0.2") 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	Floor Live	Factored	
1 - Beam - HF	5.50"	5.50"	1.50"	67	505	572	Blocking
2 - Hanger on 7 1/4" HF beam	5.50"	Hanger[1]	1.50"	24	246/-27	270/-3	See note [1]

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	8' 2" o/c	
Bottom Edge (Lu)	8' 2" o/c	

•Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-Tie						
Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
2 - Face Mount Hanger	LU26	1.50"	N/A	6-10dx1.5	4-10dx1.5	

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

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Floor Live (1.00)	Comments
1 - Uniform (PSF)	0 to 8' 7"	16"	8.0	60.0	Default Floor Load

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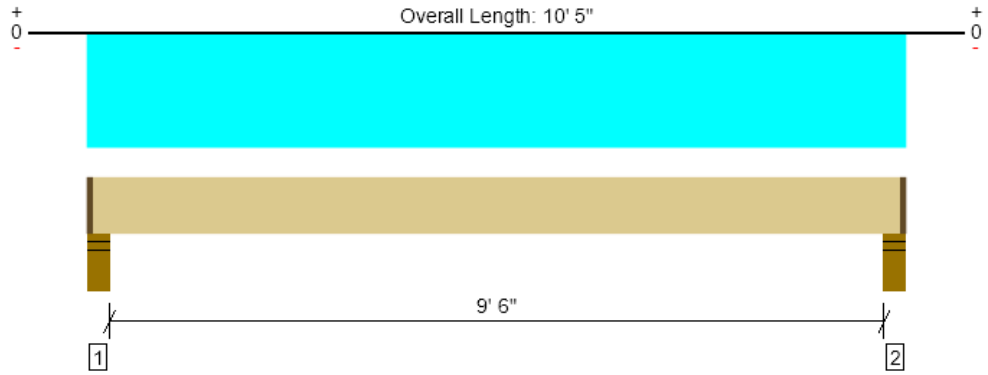
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Main (S2.0), M-B3

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



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern) [Group]
Member Reaction (lbs)	1071 @ 4"	7290 (4.00")	Passed (15%)	--	1.0 D + 1.0 L (All Spans) [1]
Shear (lbs)	874 @ 1' 3/4"	3263	Passed (27%)	1.00	1.0 D + 1.0 L (All Spans) [1]
Moment (Ft-lbs)	2504 @ 5' 2 1/2"	3351	Passed (75%)	1.00	1.0 D + 1.0 L (All Spans) [1]
Live Load Defl. (in)	0.202 @ 5' 2 1/2"	0.325	Passed (L/579)	--	1.0 D + 1.0 L (All Spans) [1]
Total Load Defl. (in)	0.231 @ 5' 2 1/2"	0.488	Passed (L/507)	--	1.0 D + 1.0 L (All Spans) [1]

Member Length : 10' 2"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Stud wall - HF	5.50"	4.00"	1.50"	136	961/-105	1097	1 1/2" Rim Board
2 - Stud wall - HF	5.50"	4.00"	1.50"	136	961/-105	1097	1 1/2" Rim Board

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	10' 2" o/c	
Bottom Edge (Lu)	10' 2" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	1 1/2" to 10' 3 1/2"	N/A	8.3	--	
1 - Uniform (PLF)	0 to 10' 5" (Front)	N/A	18.0	184.5/-20.3	Linked from: M-B2, Support 2

• Side loads are assumed to not induce cross-grain tension.

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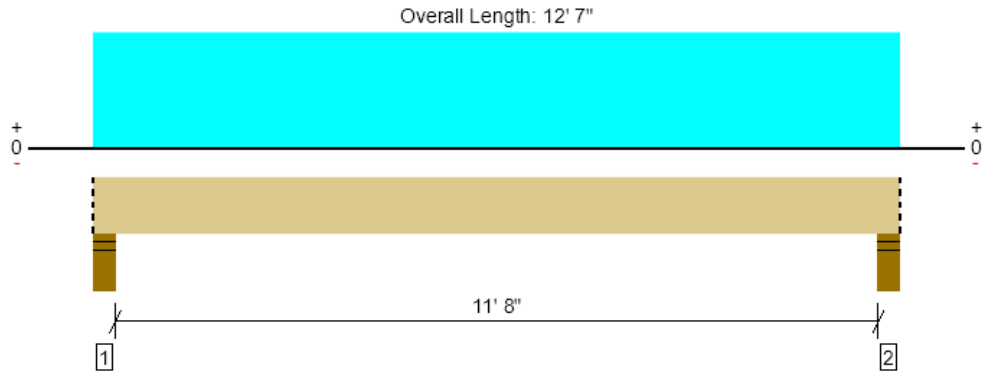
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Main (S2.0), M-B4

1 piece(s) 6 x 10 DF No.1



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	2782 @ 4"	12251 (5.50")	Passed (23%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	2230 @ 1' 3"	5922	Passed (38%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	7850 @ 6' 3 1/2"	9307	Passed (84%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.273 @ 6' 3 1/2"	0.397	Passed (L/523)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.319 @ 6' 3 1/2"	0.596	Passed (L/448)	--	1.0 D + 1.0 L (All Spans)

Member Length : 12' 7"
System : Floor
Member Type : Drop Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Stud wall - HF	5.50"	5.50"	1.50"	399	2383	2782	Blocking
2 - Stud wall - HF	5.50"	5.50"	1.50"	399	2383	2782	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)	12' 7" o/c	
Bottom Edge (Lu)	12' 7" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 12' 7"	N/A	13.2	--	
1 - Uniform (PLF)	0 to 12' 7" (Front)	N/A	50.3	378.8	Linked from: M-B2, Support 1

• Side loads are assumed to not induce cross-grain tension.

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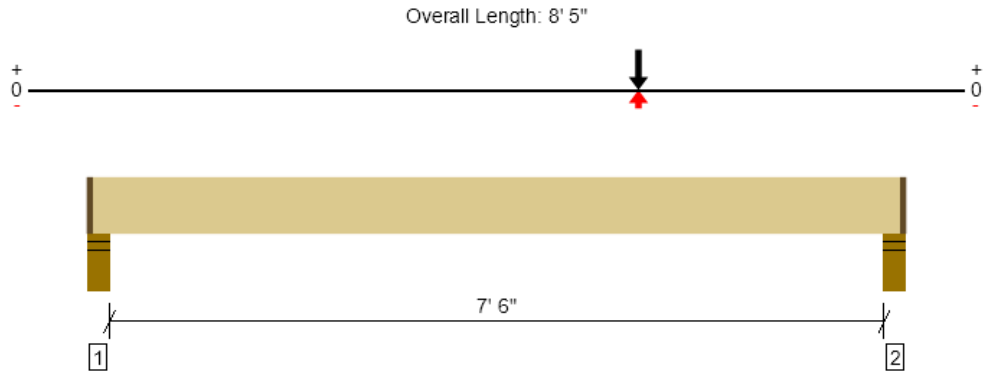
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Main (S2.0), EX. DECK BEAM

1 piece(s) 4 x 8 DF No.1



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern) [Group]
Member Reaction (lbs)	1387 @ 8' 1"	5670 (4.00")	Passed (24%)	--	1.0 D + 1.0 L (All Spans) [1]
Shear (lbs)	1381 @ 7' 4 1/4"	3045	Passed (45%)	1.00	1.0 D + 1.0 L (All Spans) [1]
Moment (Ft-lbs)	3329 @ 5' 8"	3322	Passed (100%)	1.00	1.0 D + 1.0 L (All Spans) [1]
Live Load Defl. (in)	0.126 @ 4' 6 11/16"	0.258	Passed (L/740)	--	1.0 D + 1.0 L (All Spans) [1]
Total Load Defl. (in)	0.147 @ 4' 6 5/8"	0.387	Passed (L/632)	--	1.0 D + 1.0 L (All Spans) [1]

Member Length : 8' 2"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Stud wall - HF	5.50"	4.00"	1.50"	106	537	643	1 1/2" Rim Board
2 - Stud wall - HF	5.50"	4.00"	1.50"	202	1184	1387	1 1/2" Rim Board

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	6" o/c	
Bottom Edge (Lu)	8' 2" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	1 1/2" to 8' 3 1/2"	N/A	6.4	--	
1 - Point (lb)	5' 8" (Front)	N/A	120	760	
2 - Point (lb)	5' 8" (Front)	N/A	136	961/-105	Linked from: M-B3, Support 1

- Side loads are assumed to not induce cross-grain tension.

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

SECTION 2: LATERAL

CRITERIA

LATERAL

wind	wind importance factor	1.0		
	basic wind speed	98	mph	
	wind exposure	B		
	topographical factor (Kzt)	1.38		
seismic	seismic importance factor	1.0		
	latitude	47.530	°	
	longitude	-122.231	°	
	accel. at short periods (Ss)	1.469	g	(from ASCE Hazard Tool)
	accel. at 1-sec period (S1)	0.506	g	
	seismic design category	D		
	response modification factor (R)	6.5	Shear Walls	

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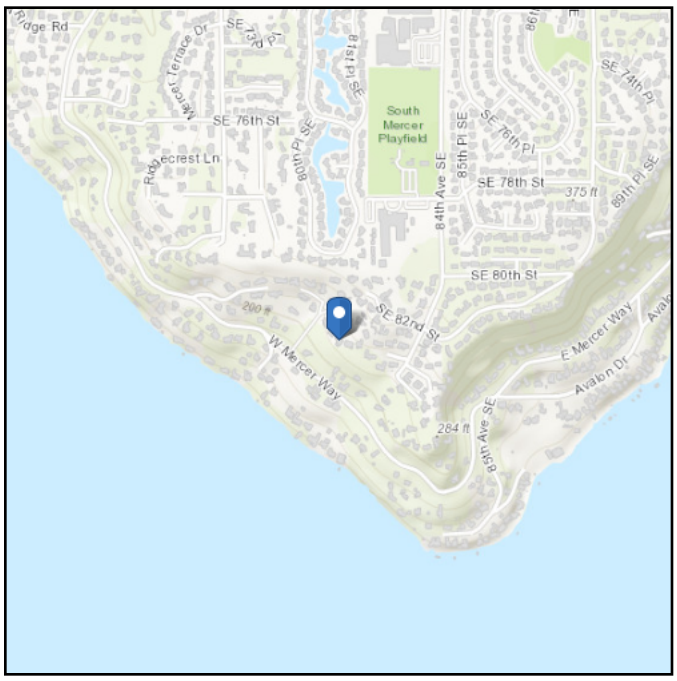
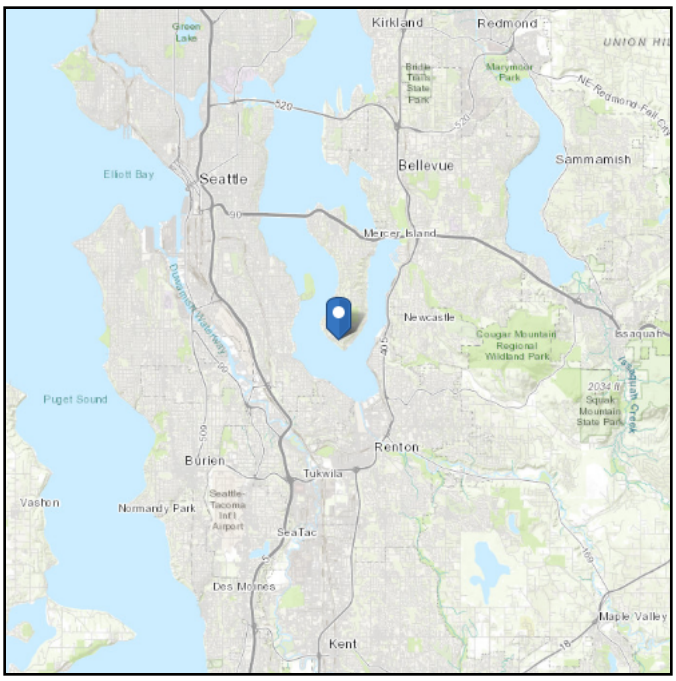
tel 206-624-4760 | fax 447-6971

ASCE Hazards Report

Address:
8174 W Mercer Way
Mercer Island, Washington
98040

Standard:	ASCE/SEI 7-16	**Latitude:**	47.529566
Risk Category:	II	**Longitude:**	-122.230858
Soil Class:	D - Default (see Section 11.4.3)	**Elevation:**	249.53963109550418 ft (NAVD 88)





Wind

Results:

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

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

Date Accessed: Fri Jun 27 2025

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

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

Seismic

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

Results:

S_S :	1.469	S_{D1} :	N/A
S_1 :	0.506	T_L :	6
F_a :	1.2	PGA :	0.628
F_v :	N/A	PGA_M :	0.754
S_{MS} :	1.763	F_{PGA} :	1.2
S_{M1} :	N/A	I_e :	1
S_{DS} :	1.175	C_v :	1.394

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

Data Accessed: Fri Jun 27 2025

Date Source: USGS Seismic Design Maps

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SEISMIC DESIGN

ASCE 7-22

Chapter 12 - Equivalent Lateral Force Procedure

S_S =	1.47 g	Occupancy Cat. =	II Table 1-1
S_1 =	0.51 g	Seismic Design Cat. =	D Table 11.6-1
F_a =	1.20 Table 11.4-1	Importance Factor =	1.00 Table 11.5-1
F_v =	1.82 Table 11.4-2	Site Class =	D Table 20.3-1
C_t =	0.02 Table 12.8-2		
x =	0.75 Table 12.8-2		
h_n =	22.00 ft (height to top level)		

$S_{MS} = Fa*Ss$ =	1.7640 g (Eq. 11.4-1)	$T_a = C_t*h_n\text{^}x$ =	0.2032 g (Eq. 12.8-7)
$S_{M1} = Fv*S1$ =	0.9282 g (Eq. 11.4-2)	T_o =	0.1052 g (per § 11.4.6)
$S_{DS} = (2/3)*S_{MS}$ =	1.1760 g (Eq. 11.4-3)	T_S =	0.5262 g (per § 11.4.6)
$S_{D1} = (2/3)*S_{M1}$ =	0.6188 g (Eq. 11.4-4)	S_a =	1.1760 g (per § 11.4.6)

R =	6.5 Table 12.2-1	Cs =	0.1809 Eq. 12.8-2
Ωo =	3 Table 12.2-1	W, weight =	130,118 lb (per table below)
C_d =	4 Table 12.2-1	Q_E =	23,541 lb (Eq. 12.8-1)
Section 9.5.5 ok?	Yes Table 12.6-1		

Floor Weight Determination

Level	Hx	Floor Area	Floor DL	Floor Weight	Wall DL	Wall Length	Wall Height	Wall Weight	Total Weight
	(ft)	(ft2)	(psf)	(k)	(psf)	(ft)	(ft)	(k)	(k)
ex. Roof (West)	19.00	1096	13	14.248	10	98	4.5	4.41	18.658
ex. Roof (Cntr)	19.00	1244	13	16.172	10	109	4.5	4.905	21.077
ex. Roof (East)	19.00	746	13	9.698	10	66	4.5	2.97	12.668
ex. Garage	10.00	994	15	14.91	10	79	9.5	7.505	22.415
ex. Upper Floor	10.00	2458	15	36.87	10	194	9.5	18.43	55.3

Vertical Force Distribution (section 12.8.3)

k = 1.00

					[LRFD]	[ASD]
Level	Hx	Tot Wt	WxHx	Cvx	1.0 Q_E	0.7 Q_E
	(ft)	(k)	(k-ft)	(%)	(k)	(k)
ex. Roof (West)	19.00	18.658	354.502	19.9966	4.70748	3.29524
ex. Roof (Cntr)	19.00	21.077	400.463	22.5892	5.3178	3.72246
ex. Roof (East)	19.00	12.668	240.692	13.5769	3.19618	2.23733
ex. Garage	10.00	22.415	224.15	12.6438	2.97652	2.08356
ex. Upper Floor	10.00	55.3	553	31.1935	7.34336	5.14035
TOTAL		130.1	1772.8	100.0	23.5	16.5

WIND DESIGN

ASCE 7-22
Simplified Envelope Method (Chapter 28)

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

λ = adjustment factor = 1.00
I = importance factor = 1.00
K_{zt} = topographic factor = 1.38

Part of Figure 28.6-1 - Adjustment Factor for Building Height and Exposure, λ

Mean Roof Height	Exposure		
(ft)	B	**C**	D
15	1.00	**1.21**	1.47
16	1.00	**1.23**	1.49
17	1.00	**1.24**	1.50
18	1.00	**1.26**	1.52
19	1.00	**1.27**	1.53
20	1.00	**1.29**	1.55
21	1.00	**1.30**	1.56
22	1.00	**1.31**	1.57
23	1.00	**1.33**	1.59
24	1.00	**1.34**	1.60
25	1.00	**1.35**	1.61
26	1.00	**1.36**	1.62
27	1.00	**1.37**	1.63
28	1.00	**1.38**	1.64
29	1.00	**1.39**	1.65
30	1.00	**1.40**	1.66

Zone Computation

a = 10% of least horizontal dimension or 0.4 x h, whichever is smaller, but not less than either 4% of least horizontal dimension or 3 feet.

w = 27.00 ft x 0.1 = 2.70 ft
h = 27.00 ft x 0.4 = 10.80 ft
w = 27.00 ft x 0.04 = 1.08 ft

a = 3.00 ft
2a = **6.00** ft

Zone B - end zone of roof
Zone A - end zone of wall

Zone D - interior zone of roof
Zone C - interior zone of wall

Part of Figure 28.6-1 - Method 2
Design Wind Pressure, p_{s30}

Basic Speed	Roof Angle	Roof Pitch	Horizontal Pressures (psf)			
			A	B	C	D
98	0 to 5	flat	15.3	-7.9	10.1	-4.7
	10	2	17.2	-7.1	11.4	-4.1
	15	3	19.1	-6.4	12.8	-3.6
	20	4	21.1	-5.6	14.0	-3.1
	25	6	19.1	3.1	13.8	3.2
	30 to 45	7 to 12	17.1	11.7	13.6	9.4

Design Wind Pressure, p_s

Basic Speed	Roof Angle	Roof Pitch	Horizontal Pressures (psf)			
			A	B	C	D
98	0 to 5	flat	21.1	-10.9	13.9	-6.5
	10	2	23.7	-9.8	15.8	-5.7
	15	3	26.4	-8.8	17.6	-5.0
	20	4	29.1	-7.7	19.4	-4.3
	25	6	26.4	4.3	19.1	4.4
	30 to 45	7 to 12	**23.6**	**16.2**	**18.8**	**13.0**

Design Roof Angle: 30 to 45 degrees

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WIND DESIGN

ASCE 7-16
Simplified Envelope Method (Chapter 28)

Design 0.6W =	**14.2**	**9.7**	**11.3**	**7.8**	psf (adjusted per 28.5.4)

[A/C min = +16psf, B/D min = +8psf]

Roof Pressure Distribution at Roof (Hip)

Wall trib =	5 ft	A =	14.4 plf	(superimposed)	86 lb	
Roof Trib =	8.75 ft	B =	16.8 plf	(superimposed)	101 lb	
		C =	56.5 plf		187.3	
		D =	68.1 plf			
		tot =	124.6			

Wall Pressure at Upper Floor

Wall trib =	10 ft	A =	28.8 plf	(superimposed)	173 lb
		~~B =~~			
		C =	112.9 plf		
		~~D =~~			

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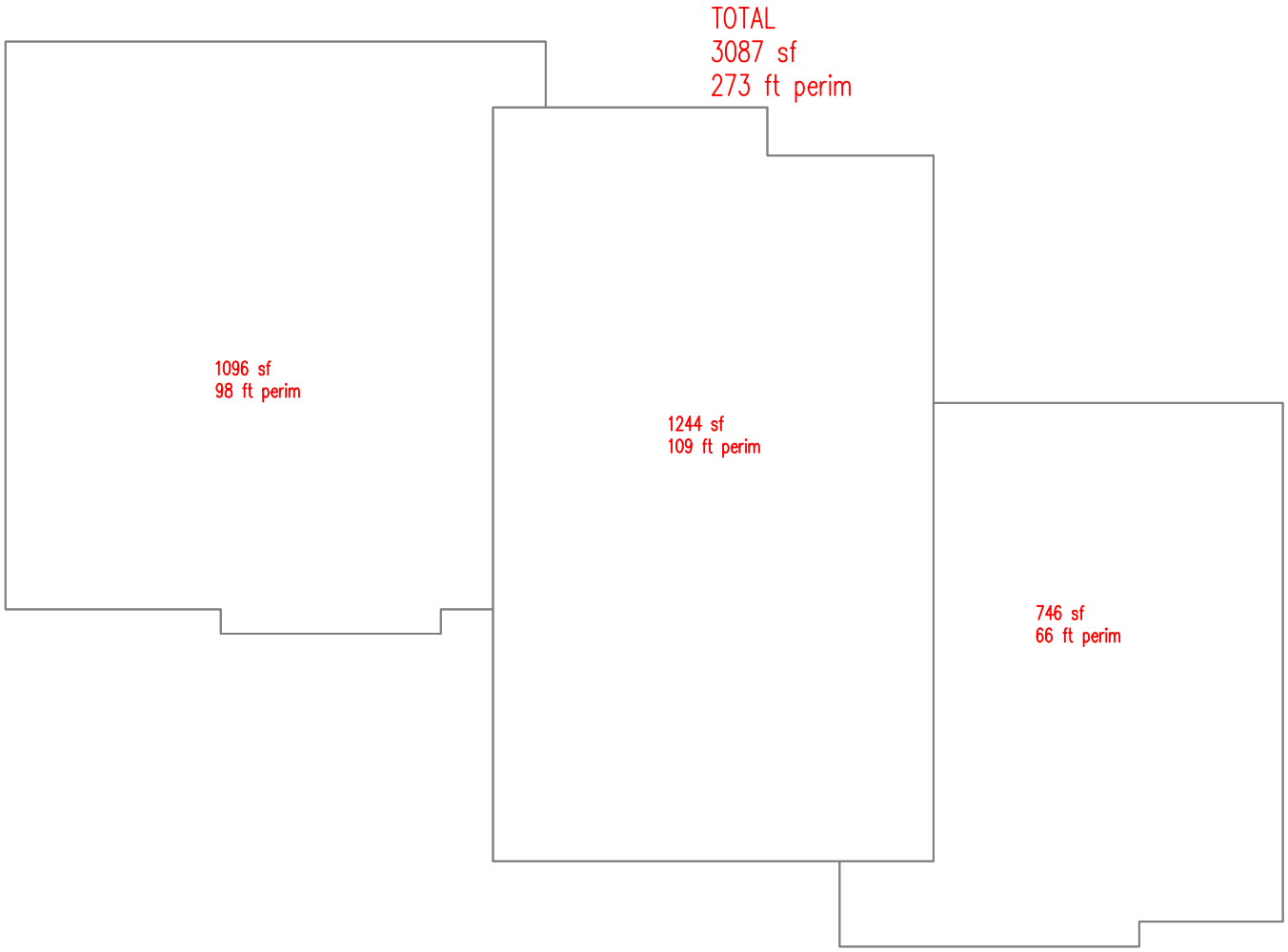
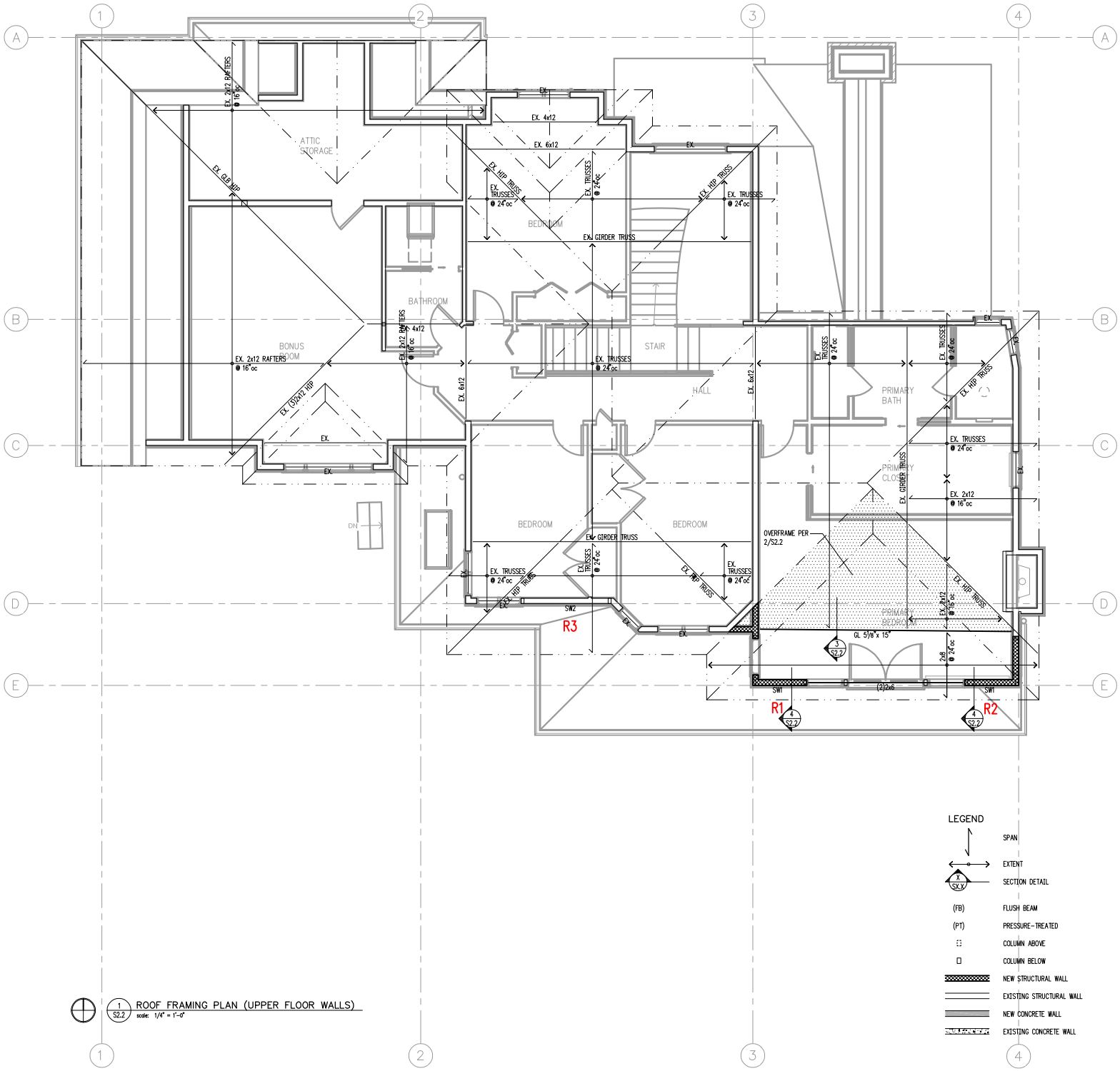


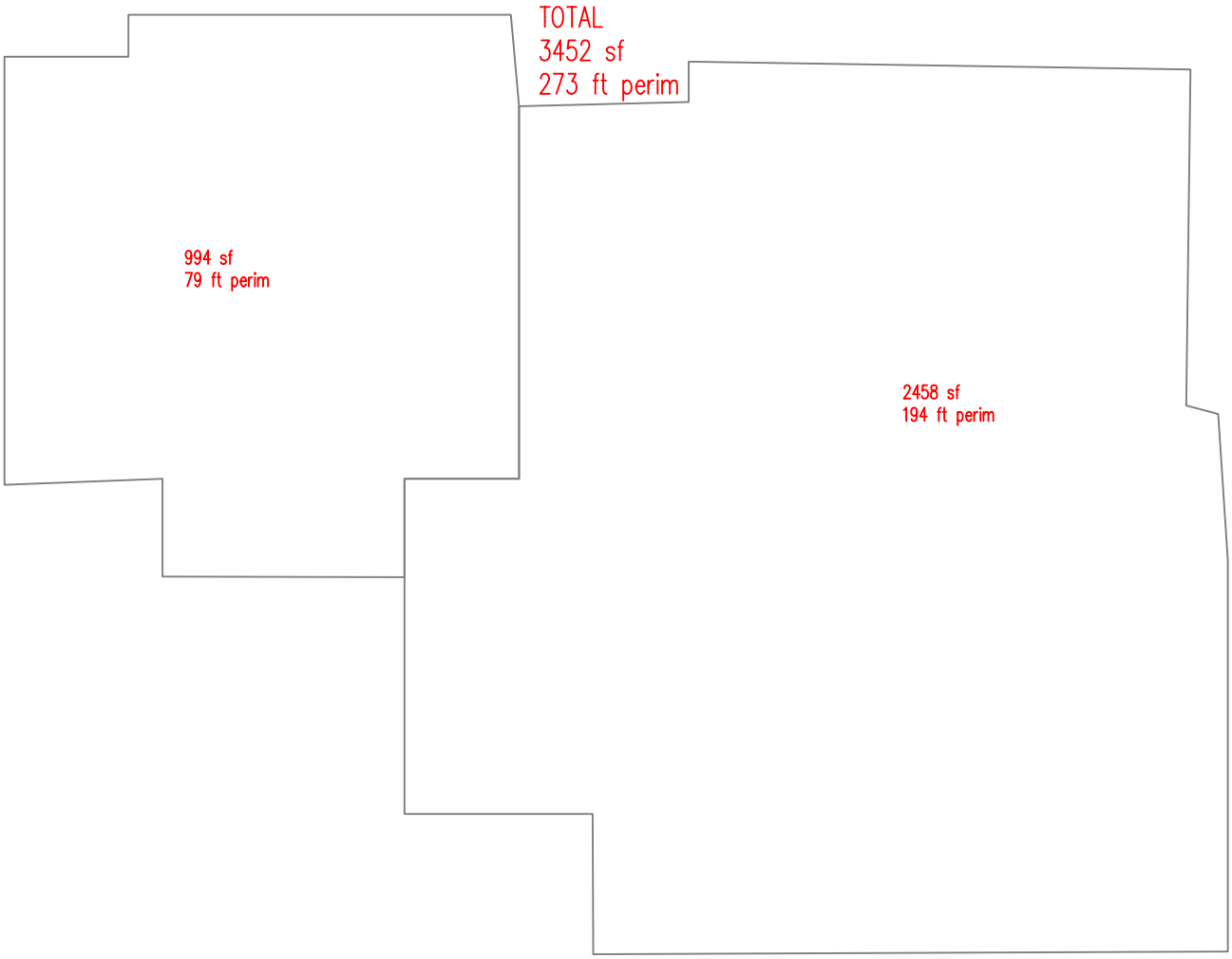
1 S2.2 ROOF FRAMING PLAN (UPPER FLOOR WALLS)
scale: 1/4" = 1'-0"



LEGEND

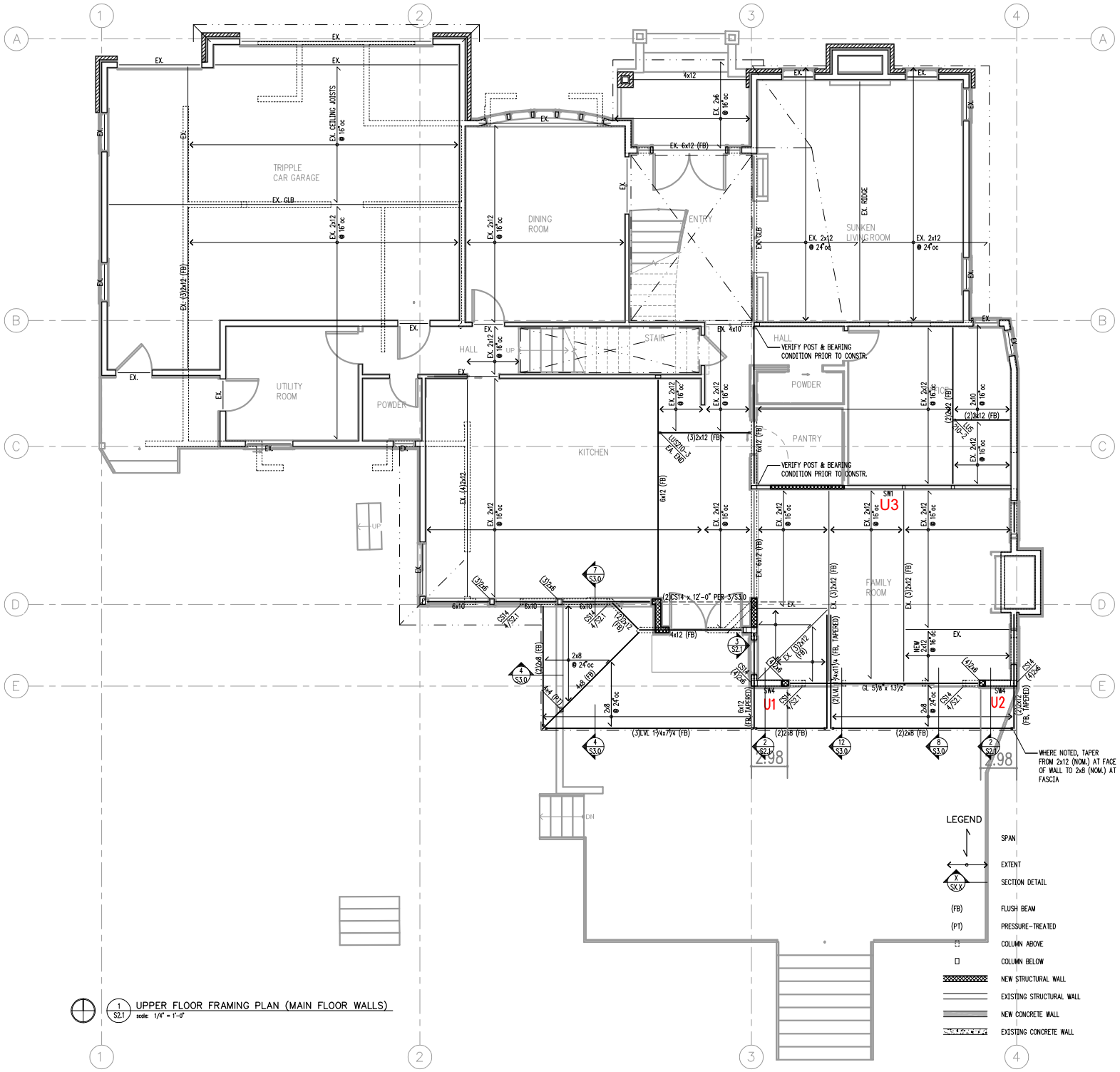
- SPAN
- EXTENT
- SECTION DETAIL (X / SX.X)
- (FB) FLUSH BEAM
- (PT) PRESSURE-TREATED
- COLUMN ABOVE
- COLUMN BELOW
- NEW STRUCTURAL WALL
- EXISTING STRUCTURAL WALL
- NEW CONCRETE WALL
- EXISTING CONCRETE WALL

1 / S2.2 ROOF FRAMING PLAN (UPPER FLOOR WALLS)
scale: 1/4" = 1'-0"



EX.

1 / S2.1 UPPER FLOOR FRAMING PLAN (MAIN FLOOR WALLS)
scale: 1/4" = 1'-0"



1 / S2.1 UPPER FLOOR FRAMING PLAN (MAIN FLOOR WALLS)
scale: 1/4" = 1'-0"

LATERAL FORCE DISTRIBUTION

Existing Roof (Cntr)

0.7E: 3.72 k
R = 6.5

*Includes Wind End-Zone effects

DIRECTION: E-W R = 6.5

	V (k)	L_{NS} (ft)	v (plf)
0.7E:	3.72	46.7	79.7
0.6W:	5.82	46.7	124.6

GRID	trib W (ft)	F (lb)	
A.2	23.35	**1,861**	(E)
		2,909	(W)
D	23.35	**1,861**	(E)
		2,909	(W)

N-S R = 6.5

	V (k)	L_{EW} (ft)	v (plf)
0.7E:	3.72	27.3	136.4
0.6W:	3.40	27.3	124.6

GRID	trib W (ft)	F (lb)	
2.2	13.65	**1,861**	(E)
		1,701	(W)
3	13.65	**1,861**	(E)
		1,701	(W)

Existing Roof (East)

0.7E: 2.24 k
R = 6.5

DIRECTION: E-W R = 6.5

	V (k)	L_{NS} (ft)	v (plf)
0.7E:	2.24	33.7	66.4
0.6W:	4.20	33.7	124.6

GRID	trib W (ft)	F (lb)	
B	16.85	**1,119**	(E)
		2,100	(W)
E	16.85	**1,119**	(E)
		2,287	(W)

N-S R = 6.5

	V (k)	L_{EW} (ft)	v (plf)
0.7E:	2.24	21.6	103.6
0.6W:	2.69	21.6	124.6

GRID	trib W (ft)	F (lb)	
3	10.8	**1,119**	(E)
		1,346	(W)
4	10.8	**1,119**	(E)
		1,533	(W)

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LATERAL FORCE DISTRIBUTION

Existing Upper Floor

0.7E: 5.14 k
R = 6.5

DIRECTION: E-W R = 6.5

	V (k)	L_{NS} (ft)	v (plf)
0.7E:	5.14	54.9	93.6
0.6W:	6.20	54.9	112.9

GRID	trib W (ft)	F (lb)	
A.1	17.65	**1,652**	(E)
		1,993	(W)
C.1	27.45	**2,570**	(E)
		3,099	(W)
E	10	**936**	(E)
		1,302	(W)

N-S R = 6.5

	V (k)	L_{EW} (ft)	v (plf)
0.7E:	5.14	51.2	100.4
0.6W:	5.78	51.2	112.9

GRID	trib W (ft)	F (lb)	
2	25.6	**2,570**	(E)
		2,890	(W)
4	25.6	**2,570**	(E)
		3,063	(W)

SHEAR WALL DESIGN

Per NDS SPDWS 2021

DIR: East-West
LEVEL: Walls Below Roof

rho = 1.30 per ASCE 7-16 12.3.4.2

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

DIMENSIONS:				SEISMIC (0.7E):						WIND (0.6W)						DESIGN SW:	OVERTURNING:									
WALL	h (ft)	L (ft)	h/l	F(EQ) (lb)	V (abv)	V (total)	v (plf)	SW	Cap (plf)	F(W) (lb)	V (abv)	V (total)	v (plf)	SW	Cap (plf)		M ot (lbft)	M ot (abv)	M ot (total)	OT (total)	C (lb)	POST	Cap (lb)	T (lb)	HD	Cap (lb)
R1	9.00	4.50	2.00	560	0	560	162	SW1	255	1144	0	1144	254	SW1	358	SW1	10292	0	10292	2287	2880	(2)2x6	6682	1932	CS14	2490
																		0	10292	2287	2641	(2)2x6	6682	2074	CS14	2490
R2	9.00	4.50	2.00	560	0	560	162	SW1	255	1144	0	1144	254	SW1	358	SW1	10292	0	10292	2287	2641	(2)2x6	6682	2074	CS14	2490
																		0	10292	2287	2880	(2)2x6	6682	1932	CS14	2490
R3	9.00	7.50	1.20	1861	0	1861	323	SW2	395	2909	0	2909	388	SW2	553	SW2	16749	0	16749	2233	3000	(2)2x6	6682	1773	CS14	2490
																		0	16749	2233	3000	(2)2x6	6682	1773	CS14	2490

DIR: East-West
LEVEL: Walls Below Roof

DIMENSIONS:				SEISMIC (0.7E):						WIND (0.6W)						DESIGN SW:	OVERTURNING:									
WALL	h (ft)	L (ft)	h/l	F(EQ) (lb)	V (abv)	V (total)	v (plf)	SW	Cap (plf)	F(W) (lb)	V (abv)	V (total)	v (plf)	SW	Cap (plf)		M ot (lbft)	M ot (abv)	M ot (total)	OT (total)	C (lb)	POST	Cap (lb)	T (lb)	HD	Cap (lb)
U1	9.00	3.08	2.92	468	900	1368	577	SW4	593	651	1541	2192	711	SW4	830	SW4	19732	10292	30023	9737	12460	N/A	N/A	8104	(2)MSTCM60	8440
																		10292	30023	9737	13792	N/A	N/A	8032	(2)MSTCM60	8440
U2	9.00	3.08	2.92	468	900	1368	577	SW4	593	651	1541	2192	711	SW4	830	SW4	12313	10292	22604	7331	10966	N/A	N/A	5906	(2)MSTCM60	8440
																		10292	22604	7331	7940	N/A	N/A	6966	(2)MSTCM60	8440
U3	9.00	21.50	0.42	2570	620	3190	193	SW1	255	3099	970	4069	189	SW1	358	SW1	28713	0	28713	1335	6424	N/A	N/A	-136	N/A	N/A
																		0	28713	1335	6424	N/A	N/A	-136	N/A	N/A

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