March 07, 2022

STRUCTURAL CALCULATIONS
(Permit Submittal)

BRINDLEY RES.
Parcel# 320600050, 79th Ave. SE
Mercer Island, WA, 98040.

Quantum Job Number: 21482.01

Prepared for:
Stuart Silk Architects
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Brindley Res.
Parcel # 320600050, 79th Ave. SE, Mercer Is., WA

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BRINDLEY RESIDENCE
PARCEL# 320600050, 79TH AVE SE,
MERCER ISLAND, WA, 98040

QUANTUM JOB NUMBER: 21482.01

DESIGN CRITERIA
AND
CALCULATIONS

QUANTUM | CONSULTING ENGINEERS

STRUCTURAL DESIGN CRITERIA

BRINDLEY RESIDENCE
79TH AVE SE,
MERCER IS, WA, 98040.

QUANTUM JOB NUMBER: 21482.01

CODE CRITERIA:

BUILDING CODE ..... 2018 INTERNATIONAL BUILDING CODE
BUILDING DEPARTMENT ..... MERCER ISLAND
WIND CRITERIA ..... 98 MPH; EXPOSURE "C"
..... RISK CATEGORY = II
..... K_{ZT} = 1.90

SEISMIC ZONE ..... SDC = D
..... SITE CLASS = D
..... R = 6.5
..... I_E = 1.0
..... S_S = 1.47, S_1 = 0.51
..... S_{DS} = 1.18, S_{D1} = 0.61

ROOF SNOW LOAD ..... 25 PSF
FLAT ROOF SNOW LOAD ..... 30 PSF
LIVE LOAD ....40 PSF

SOILS CRITERIA:

ALLOWABLE BEARING PRESSURE ..... 2,500 PSF
MINIMUM FOOTING WIDTH ..... CONTINUOUS: 16" MIN., ISOLATED: 24" MIN.
FROST DEPTH ..... 18" MIN.
PASSIVE SOIL PRESSURE ..... 300 PCF
COEFFICIENT OF FRICTION ..... 0.50 PCF

MATERIALS CRITERIA:

CONCRETE (28 DAY STRENGTH):

FOUNDATION/S.O.G ..... F'C=2,500 PSI

REINFORCING STEEL:

GRADE 60 (#5 BAR OR LARGER) ..... FY=60,000 PSI
GRADE 40 (#4 BAR) ..... FY=40,000 PSI

WOOD FRAMING:

2X, 3X, & 4X FRAMING MBRS ..... HF#2 OR DF#2
6X FRAMING MBRS ..... DF#1
PARALLAM BEAMS ..... 2.2E WS PARALLAM PSL
LSL MEMBERS – BEAMS & HEADERS ..... 1.55E LSL
WOOD SHTG ..... APA RATED

STRUCTURAL DESIGN CRITERIA

BRINDLEY RESIDENCE
79TH AVE SE,
MERCER IS, WA, 98040.

QUANTUM JOB NUMBER: 21482.01

ASSEMBLY WEIGHTS

SLOPED ROOF LOADS		GRAVITY	SEISMIC	**COMMENTS**
CERAMIC TILE ROOF		12.0 PSF	11.0 PSF	
23/32" PLYWOOD SHEATHING		2.3 PSF	2.3 PSF	
ROOF TRUSSES PER MFR @ 24" O.C.		3.5 PSF	3.5 PSF	
INSULATION		1.2 PSF	1.2 PSF	
LIGHTS, DUCTS		1.2 PSF	1.2 PSF	
5/8" GWB		2.8 PSF	2.8 PSF	
MISCELLANEOUS		1.0 PSF	0.0 PSF	
	ROOF DL	24.0 PSF	23.0 PSF	SL = 25 PSF

FLAT ROOF LOADS		GRAVITY	SEISMIC	**COMMENTS**
STD MEMBRANE ROOF		3.0 PSF	3.0 PSF	
23/32" PLYWOOD SHEATHING		2.3 PSF	2.3 PSF	
TJI ROOF JOISTS @ 24" O.C.		3.5 PSF	3.5 PSF	
INSULATION		1.2 PSF	1.2 PSF	
LIGHTS, DUCTS		1.2 PSF	1.2 PSF	
5/8" GWB		2.8 PSF	2.8 PSF	
MISCELLANEOUS		1.0 PSF	0.0 PSF	
PV SOLAR PANELS		4.0 PSF	4.0 PSF	
	ROOF DL	19.0 PSF	18.0 PSF	SL = 30 PSF

EXT. WALL LOAD W/SIDING			
STUCCO SIDING		10.0 PSF	10.0 PSF
15/32"PLYWOOD SHEATHING		1.6 PSF	1.7 PSF
2X6 STUDS @ 16"O.C.		1.6 PSF	1.7 PSF
5/8" GWB		2.8 PSF	2.8 PSF
INSULATION		1.0 PSF	1.0 PSF
MISCELLANEOUS		1.0 PSF	0.0 PSF
	FLOOR DL	18.0 PSF	17.0PSF

INTERIOR PARTITIONS 8.0 PSF

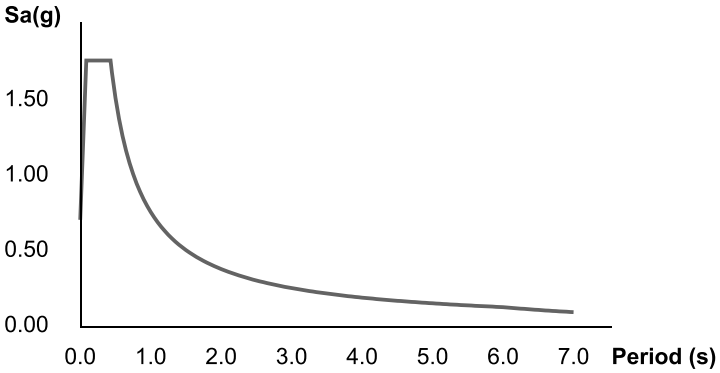
EXTERIOR GLAZING 8.0 PSF

Hazards by Location

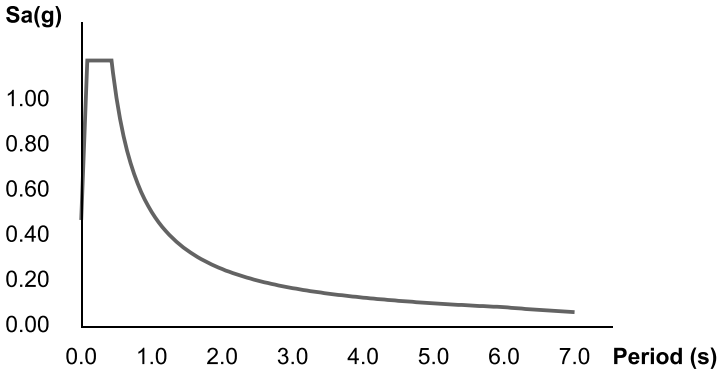
Search Information

Address:	79th Ave SE, Mercer Island, WA 98040, USA
Coordinates:	47.5384611, -122.2337563
Elevation:	281 ft
Timestamp:	2021-11-15T22:20:16.701Z
Hazard Type:	Seismic
Reference Document:	ASCE7-16
Risk Category:	II
Site Class:	C

MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	1.47	MCE_R ground motion (period=0.2s)
S_1	0.508	MCE_R ground motion (period=1.0s)
S_{MS}	1.764	Site-modified spectral acceleration value
S_{M1}	0.758	Site-modified spectral acceleration value
S_{DS}	1.176	Numeric seismic design value at 0.2s SA
S_{D1}	0.505	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	D	Seismic design category
F_a	1.2	Site amplification factor at 0.2s
F_v	1.492	Site amplification factor at 1.0s

TABLE R301.2(1)
CLIMATIC AND GEOGRAPHIC DESIGN CRITERIA

ROOF SNOW LOAD[a] (psf)	WIND DESIGN				SEISMIC DESIGN CATEGORY	SUBJECT TO DAMAGE FROM			OUTDOOR DESIGN TEMP (F) - Heat/Cool	ICE BARRIER UNDERLAYMENT REQUIRED	FLOOD HAZARD[e]	AIR FREZING INDEX	MEAN ANNUAL TEMP
	Speed[b] (mph)	Topographic effects[c]	Special wind region	Windborne debris zone		Weathering[d]	Frost line depth	Termite					
25	110	Yes	No	No	D2	Moderate	12”	Slight to Moderate	83/24	No	N.A.	113	53

MANUAL J DESIGN CRITERIA							
Elevation	Latitude	Winter heating	Summer cooling	Altitude correction factor	Indoor design temperature	Design temperature cooling	Heating temperature difference
338 feet	47°34’39’’	72°F max	75°F min	0.99	72°F	75°F	48°F
Cooling temperature difference	Wind velocity heating	Wind velocity cooling	Coincident wet bulb	Daily range	Winter humidity	Summer humidity	
8°F	N.A.	N.A.	66	Medium	75%	68%	

a. This is the minimum roof snow load. When using this snow load it will be left to the engineer’s judgment whether to consider drift or sliding snow. However, rain on snow surcharge of 5 psf must be considered for roof slopes less than 5 degrees.

b. The 110 mph Ultimate Design Wind Speed (3-second gust) as adopted by the 2018 IRC/ASCE 7-10 (or if using the IBC for structural design, the 98 mph Basic Design Wind Speed as adopted by the 2018 IBC/ASCE 7-16 may be used).

c. Wind exposure category and Topographic effects (Wind Speed-up Kzt factor) shall be determined on a site-specific basis by the Engineer of Record (components and cladding need not consider topographic effects unless otherwise determined by the engineer of record).

d. Weathering may require a higher strength concrete or grade of masonry than necessary to satisfy the structural requirements of this code. The grade of masonry units shall be determined from ASTM C 34, C 55, C 62, C 73, C 90, C 129, C 145, C 216 or C 652.

e. The City of Mercer Island participates in the National Flood Insurance Program (NFIP); Regular Program (No Special Flood Hazard Area). Further NFIP participation information: CID 530083, Initial FHBM Identified 06/28/74, Initial FIRM Identified 05/16/95, Current Effective Map Date (NSFHA), Reg-Emer Date 06/30/97, 53033C0654G effective 8/19/2020.

Mercer Island Wind Exposure and Wind Speed-Up (Topographic Effect)

by Development Services Group (DSG), City of Mercer Island
April 2009

6

0 0.5 1 Kilometers

1:12,000

0 0.5 1 Miles

T N

WIND EXPOSURE CATEGORIES & WIND SPEED-UP FACTORS
(ICC Section 1609 & ASCE 7-05 Chapter 6)

It is the responsibility of the Owner (or their Design Professional) to review site conditions and determine the Kzt factor to be utilized for each specific project. The Kzt factors and wind exposure categories indicated on this map are the minimum values accepted by the City of Mercer Island without requiring the design professional to submit additional calculations and supporting topographic documentation (to verify the values utilized in their wind load determination).

Please note – The Kzt values indicated on this map are approximations based upon periodic calculations of representative samplings around Mercer Island. These values are intended for City of Mercer Island's plan review purposes only.

WIND EXPOSURE CATEGORIES:

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

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

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

GENERAL NOTES FOR WIND EXPOSURE AND WIND SPEED-UP MAP

This map is the Wind Exposure Category and Wind Speed-up (Topographic Effects) Map for the City of Mercer island. This map shows the minimum wind exposure category and the minimum wind speed-up, "K_zt" factor, which will be accepted without site specific documentation and calculation.

Other wind speed phenomena may occur on Mercer Island that is not specifically indentified on this map. It is the responsibility of the Owner (or their Design Professional) to review site conditions and determine the appropriate design wind speed and exposure category for their specific project and location.

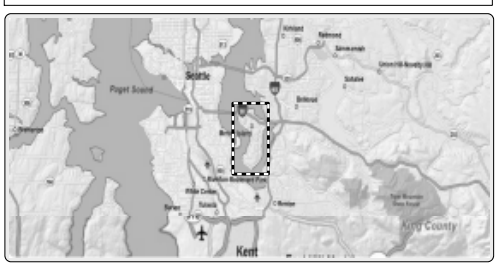
This map is for the sole use of the staff of the City of Mercer Island's Development Services Group (DSG) for the purposes of permit application evaluation. This map provides DSG staff a general assessment of Wind Exposure Category and Wind Speed-up (Topographic Effects). All areas have not been specifically evaluated and there may be locations that are not correctly represented on this map. It is the responsibility of individual property owners and map users to evaluate risk associated with their proposed development. No site-specific assessment of risk is implied or otherwise indicated by the City of Mercer Island with this map.

Information about data used for the map, references, and data limitation are all described the associated "Read Me" document. The digital version of this map is accompanied by a meta data file containing pertinent information about map construction. This data map is available on the City of Mercer Island website.

The City of Mercer Island is using guidance provided within ICC Section 1609 & ASCE 7-05 Chapter 6 regarding definitions used when creating this map.

DEFINITIONS:

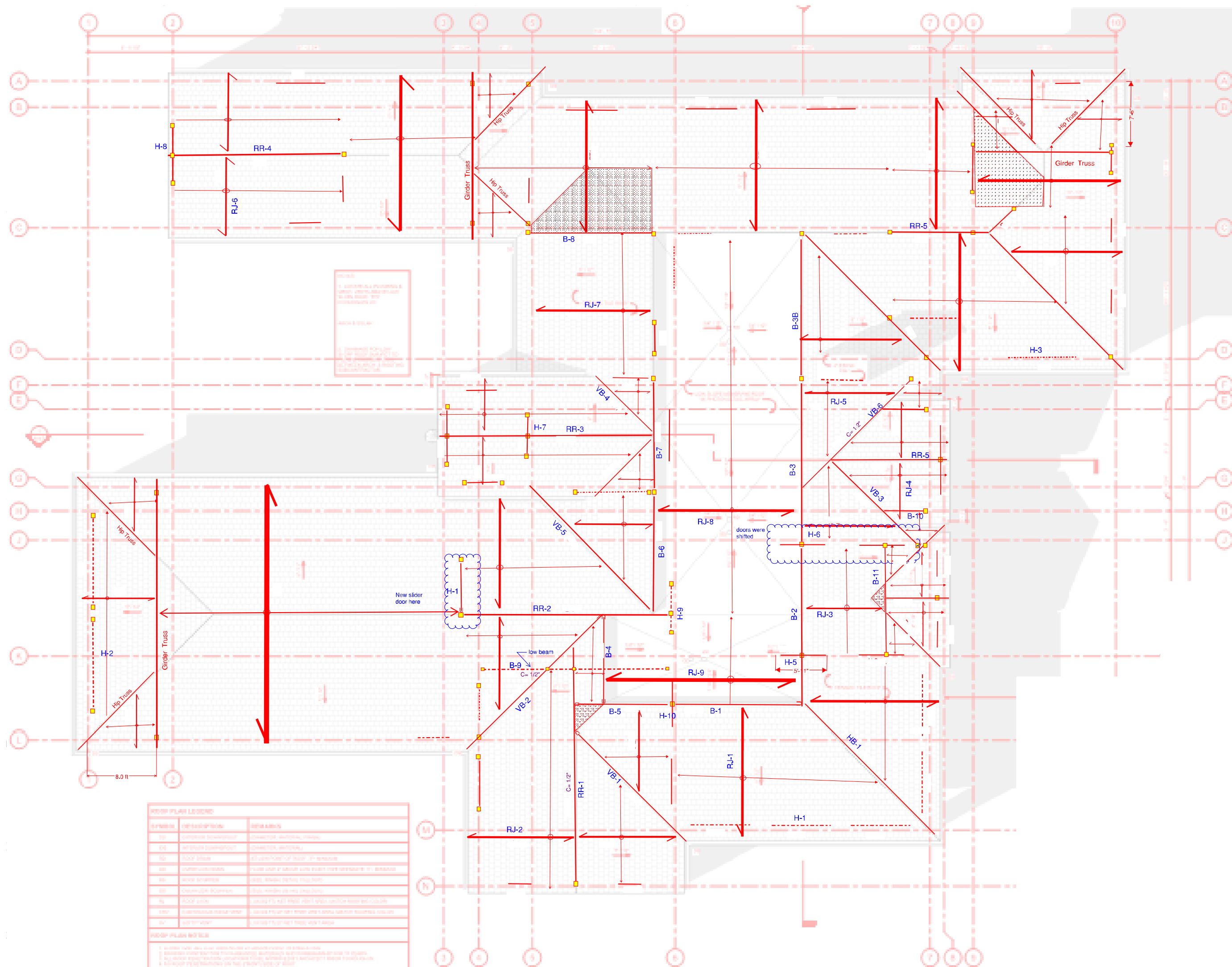
K_zt factor:	The topographic effect of wind speed-up at isolated hills, ridges, and escarpments constituting abrupt changes in the general topography, located in any exposure category, that meet all of the conditions noted in ASCE 7-05 Minimum Design Loads for Buildings and Other Structures, Section 6.5.7.
Exposure B:	The wind exposure category that applies where the site in question is located a minimum of 1500 feet from the shoreline and the mean roof height is less than or equal to 30 feet per IBC 2006 section 1609.4.3.
Exposure C:	The wind exposure category that applies where the site in question is located within 1500 feet from the shoreline per IBC 2006 section 1609.4.3.
Wind Speed:	Minimum 85 mph 3-second gust per IRC Figure R301.2(4)



BRINDLEY RESIDENCE
PARCEL# 320600050, 79TH AVE SE,
MERCER ISLAND, WA, 98040

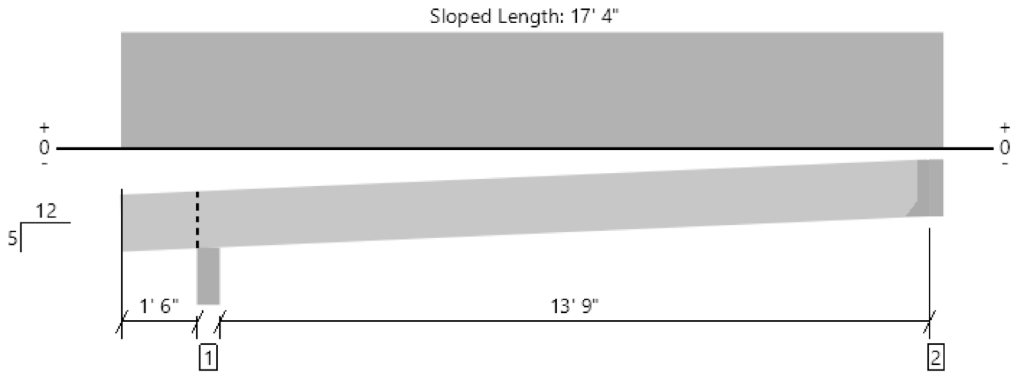
QUANTUM JOB NUMBER: 21482.01

GRAVITY DESIGN


H-8
RR-4
RJ-6
Girder Truss
Hip Truss
Hip Truss
B-8
RJ-7
RR-5
Hip Truss
Hip Truss
Girder Truss
B-3B
H-3
RJ-5
VB-6
VB-4
H-7
RR-3
B-7
RR-5
B-3
VB-3
RJ-4
B-10
RJ-8
doors were shifted
H-6
Hip Truss
VB-5
B-6
H-1
New slider door here
RR-2
H-9
B-11
B-2
RJ-3
H-2
Girder Truss
Hip Truss
low beam
B-9
B-4
RJ-9
H-5
VB-2
B-5
H-10
B-1
HB-1
RJ-1
VB-1
RR-1
RJ-2
H-1

Roof, RJ-1

1 piece(s) 2 x 12 DF No.2 @ 16" OC



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

Member Length : 17' 4 7/8"

System : Roof
Member Type : Joist
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD
Member Pitch : 5/12

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	470 @ 15' 8 1/2"	1406 (1.50")	Passed (33%)	--	1.0 D + 1.0 S (Alt Spans)
Shear (lbs)	411 @ 14' 10 1/8"	2329	Passed (18%)	1.15	1.0 D + 1.0 S (Alt Spans)
Moment (Ft-lbs)	1623 @ 8' 9 5/8"	3138	Passed (52%)	1.15	1.0 D + 1.0 S (Alt Spans)
Live Load Defl. (in)	0.116 @ 8' 8 13/16"	0.757	Passed (L/999+)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.234 @ 8' 8 15/16"	1.010	Passed (L/776)	--	1.0 D + 1.0 S (Alt Spans)

- Deflection criteria: LL (L/240) and TL (L/180).
- Overhang deflection criteria: LL (2L/240) and TL (2L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A 15% increase in the moment capacity has been added to account for repetitive member usage.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Beveled Plate - HF	5.50"	5.50"	1.50"	306	294	600	Blocking
2 - Hanger on 11 1/4" HF beam	3.50"	Hanger[1]	1.50"	248	241	489	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)	9' 3" o/c	
Bottom Edge (Lu)	17' 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	LRU28Z	1.94"	N/A	6-10dx1.5	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 16'	16"	24.0	25.0	roof dead and snow load

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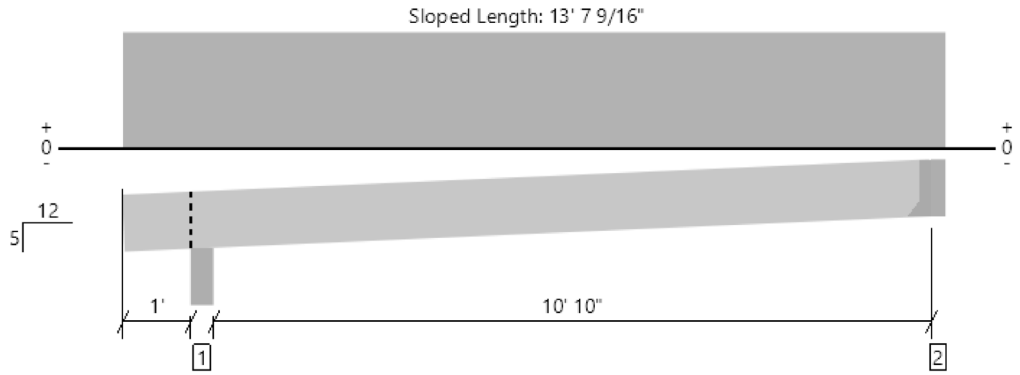
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Roof, RJ-2

1 piece(s) 2 x 12 DF No.2 @ 24" OC



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

Member Length : 13' 8 1/2"

System : Roof
Member Type : Joist
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD
Member Pitch : 5/12

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	559 @ 12' 3 1/2"	1406 (1.50")	Passed (40%)	--	1.0 D + 1.0 S (Alt Spans)
Shear (lbs)	471 @ 11' 5 1/8"	2329	Passed (20%)	1.15	1.0 D + 1.0 S (Alt Spans)
Moment (Ft-lbs)	1531 @ 6' 9 3/4"	3138	Passed (49%)	1.15	1.0 D + 1.0 S (Alt Spans)
Live Load Defl. (in)	0.068 @ 6' 9 1/4"	0.599	Passed (L/999+)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.138 @ 6' 9 5/16"	0.799	Passed (L/999+)	--	1.0 D + 1.0 S (Alt Spans)

- Deflection criteria: LL (L/240) and TL (L/180).
- Overhang deflection criteria: LL (2L/240) and TL (2L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A 15% increase in the moment capacity has been added to account for repetitive member usage.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Beveled Plate - HF	5.50"	5.50"	1.50"	355	341	696	Blocking
2 - Hanger on 11 1/4" HF beam	3.50"	Hanger[1]	1.50"	298	289	587	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)	10' o/c	
Bottom Edge (Lu)	13' 4" 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	LRU28Z	1.94"	N/A	6-10dx1.5	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 12' 7"	24"	24.0	25.0	roof dead and snow load

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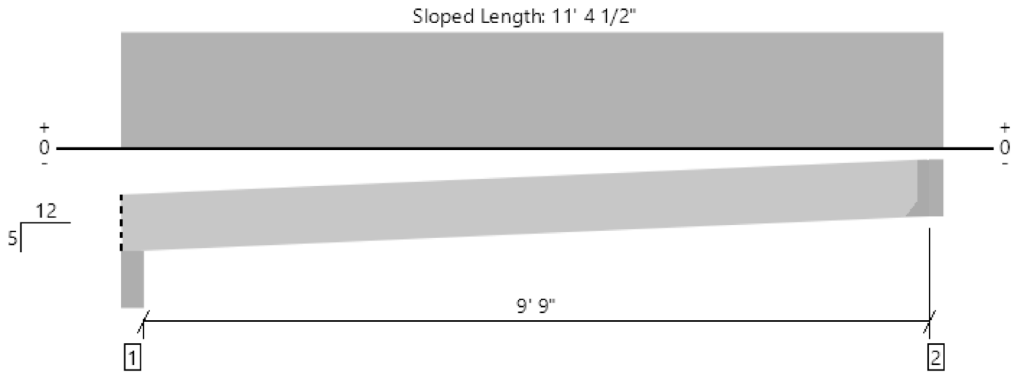
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Mario D. Alvarado Jr. Quantum Consulting Engineers (206) 957-3904 malvarado@quantumce.com	

Weyerhaeuser

Roof, RJ-3

1 piece(s) 2 x 12 DF No.2 @ 24" OC



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

Member Length : 11' 5 3/8"

System : Roof
Member Type : Joist
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD
Member Pitch : 5/12

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	502 @ 10' 2 1/2"	1406 (1.50")	Passed (36%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	413 @ 9' 4 1/8"	2329	Passed (18%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	1233 @ 5' 3 1/2"	3138	Passed (39%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.043 @ 5' 3 1/2"	0.533	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.088 @ 5' 3 1/2"	0.710	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)

- 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	Total	
1 - Beveled Plate - HF	5.50"	5.50"	1.50"	275	265	540	Blocking
2 - Hanger on 11 1/4" HF beam	3.50"	Hanger[1]	1.50"	270	260	530	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)	11' 1" o/c	
Bottom Edge (Lu)	11' 1" 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	LRU28Z	1.94"	N/A	6-10dx1.5	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 10' 6"	24"	24.0	25.0	roof dead and snow load

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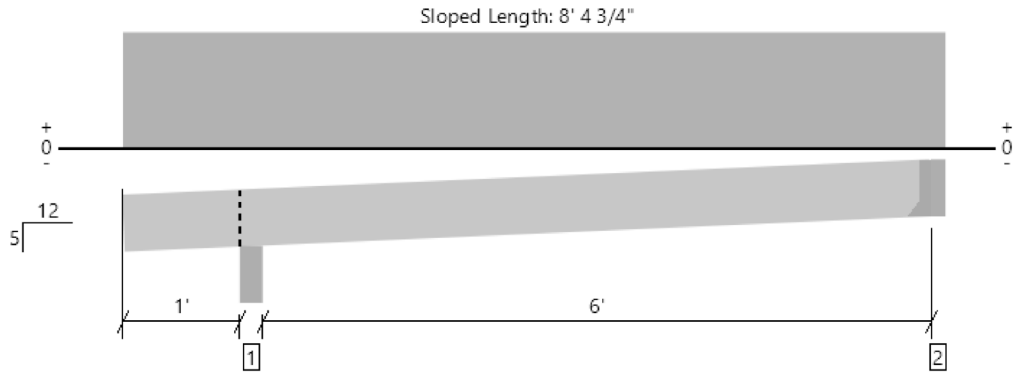
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Mario D. Alvarado Jr. Quantum Consulting Engineers (206) 957-3904 malvarado@quantumce.com	

Weyerhaeuser

Roof, RJ-4

1 piece(s) 2 x 12 DF No.2 @ 24" OC



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

Member Length : 8' 5 5/8"

System : Roof
Member Type : Joist
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD
Member Pitch : 5/12

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	308 @ 7' 5 1/2"	1406 (1.50")	Passed (22%)	--	1.0 D + 1.0 S (Alt Spans)
Shear (lbs)	220 @ 6' 7 1/8"	2329	Passed (9%)	1.15	1.0 D + 1.0 S (Alt Spans)
Moment (Ft-lbs)	466 @ 4' 5 1/4"	3138	Passed (15%)	1.15	1.0 D + 1.0 S (Alt Spans)
Live Load Defl. (in)	0.007 @ 4' 4 3/8"	0.337	Passed (L/999+)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.013 @ 4' 4 9/16"	0.450	Passed (L/999+)	--	1.0 D + 1.0 S (Alt Spans)

- Deflection criteria: LL (L/240) and TL (L/180).
- Overhang deflection criteria: LL (2L/240) and TL (2L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A 15% increase in the moment capacity has been added to account for repetitive member usage.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Beveled Plate - HF	5.50"	5.50"	1.50"	232	223	455	Blocking
2 - Hanger on 11 1/4" HF beam	3.50"	Hanger[1]	1.50"	170	167	337	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' 1" o/c	
Bottom Edge (Lu)	8' 1" 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	LRU28Z	1.94"	N/A	6-10dx1.5	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 7' 9"	24"	24.0	25.0	roof dead and snow load

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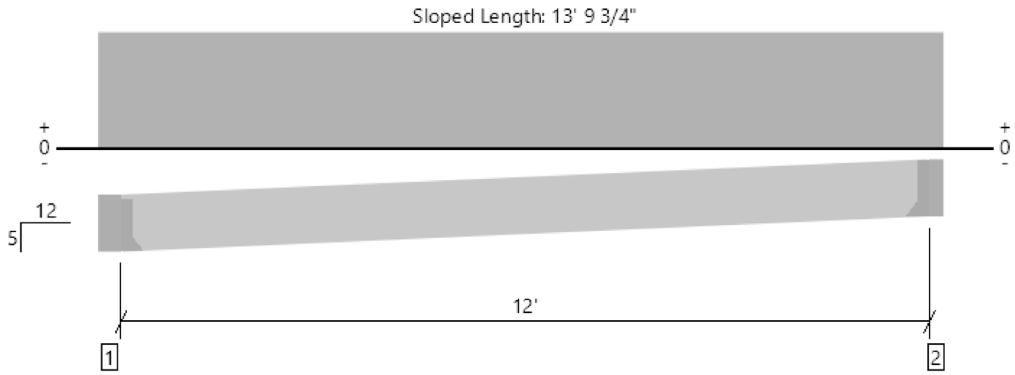
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Mario D. Alvarado Jr. Quantum Consulting Engineers (206) 957-3904 malvarado@quantumce.com	

Weyerhaeuser

Roof, RJ-5

1 piece(s) 2 x 12 DF No.2 @ 24" OC



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

Member Length : 13' 4 11/16"

System : Roof
Member Type : Joist
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD
Member Pitch : 5/12

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	612 @ 5 1/2"	1406 (1.50")	Passed (44%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	524 @ 1' 3 7/8"	2329	Passed (22%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	1836 @ 6' 5 1/2"	3138	Passed (59%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.096 @ 6' 5 1/2"	0.650	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.196 @ 6' 5 1/2"	0.867	Passed (L/795)	--	1.0 D + 1.0 S (All Spans)

- 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	Total	
1 - Hanger on 11 1/4" HF beam	5.50"	Hanger[1]	1.50"	334	323	657	See note [1]
2 - Hanger on 11 1/4" HF beam	3.50"	Hanger[1]	1.50"	326	315	641	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)	7' 10" o/c	
Bottom Edge (Lu)	13' 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	LRU28Z	1.94"	N/A	6-10dx1.5	5-10d	
2 - Face Mount Hanger	LRU28Z	1.94"	N/A	6-10dx1.5	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 12' 9"	24"	24.0	25.0	roof dead and snow load

Weyerhaeuser Notes

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ForteWEB Software Operator	Job Notes
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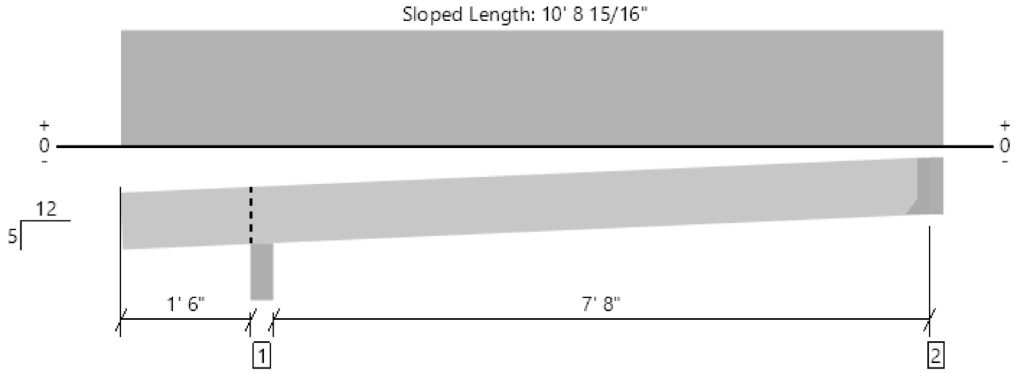
Weyerhaeuser

Roof, RJ-6

1 piece(s) 2 x 12 DF No.2 @ 24" OC



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

Member Length : 10' 9 13/16"

System : Roof
Member Type : Joist
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD
Member Pitch : 5/12

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	388 @ 9' 7 1/2"	1406 (1.50")	Passed (28%)	--	1.0 D + 1.0 S (Alt Spans)
Shear (lbs)	310 @ 2' 9 7/8"	2329	Passed (13%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	738 @ 5' 9 13/16"	3138	Passed (24%)	1.15	1.0 D + 1.0 S (Alt Spans)
Live Load Defl. (in)	0.017 @ 5' 8 1/2"	0.428	Passed (L/999+)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.034 @ 5' 8 11/16"	0.570	Passed (L/999+)	--	1.0 D + 1.0 S (Alt Spans)

- Deflection criteria: LL (L/240) and TL (L/180).
- Overhang deflection criteria: LL (2L/240) and TL (2L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A 15% increase in the moment capacity has been added to account for repetitive member usage.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Beveled Plate - HF	5.50"	5.50"	1.50"	305	293	598	Blocking
2 - Hanger on 11 1/4" HF beam	3.50"	Hanger[1]	1.50"	209	207	416	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)	10' 5" o/c	
Bottom Edge (Lu)	10' 5" 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	LRU28Z	1.94"	N/A	6-10dx1.5	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 9' 11"	24"	24.0	25.0	roof dead and snow load

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ForteWEB Software Operator	Job Notes
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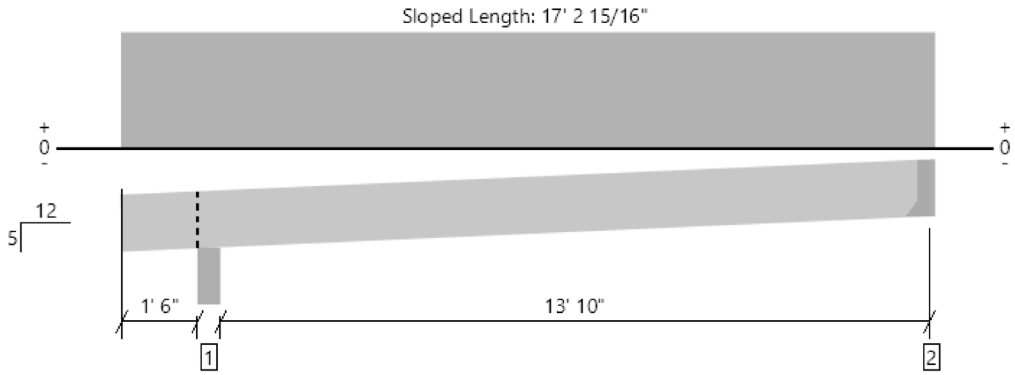
Weyerhaeuser

Roof, RJ-7

1 piece(s) 2 x 12 DF No.2 @ 16" OC



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

Member Length : 17' 6"

System : Roof
Member Type : Joist
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD
Member Pitch : 5/12

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	473 @ 15' 9 1/2"	1406 (1.50")	Passed (34%)	--	1.0 D + 1.0 S (Alt Spans)
Shear (lbs)	414 @ 14' 11 1/8"	2329	Passed (18%)	1.15	1.0 D + 1.0 S (Alt Spans)
Moment (Ft-lbs)	1643 @ 8' 10 1/16"	3138	Passed (52%)	1.15	1.0 D + 1.0 S (Alt Spans)
Live Load Defl. (in)	0.119 @ 8' 9 5/16"	0.762	Passed (L/999+)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.240 @ 8' 9 7/16"	1.016	Passed (L/762)	--	1.0 D + 1.0 S (Alt Spans)

- Deflection criteria: LL (L/240) and TL (L/180).
- Overhang deflection criteria: LL (2L/240) and TL (2L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A 15% increase in the moment capacity has been added to account for repetitive member usage.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Beveled Plate - HF	5.50"	5.50"	1.50"	307	296	603	Blocking
2 - Hanger on 11 1/4" HF beam	1.50"	Hanger[1]	1.50"	244	237	481	See note [1]

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	9' 1" o/c	
Bottom Edge (Lu)	17' 1" 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	LRU28Z	1.94"	N/A	6-10dx1.5	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 15' 11"	16"	24.0	25.0	roof dead and snow load

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ForteWEB Software Operator	Job Notes
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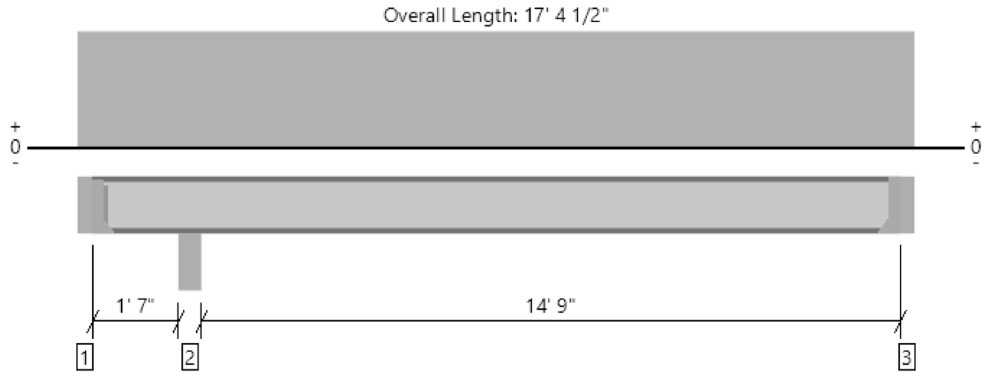
Weyerhaeuser

Roof, RJ-8

1 piece(s) 11 7/8" TJI® 210 @ 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)	1561 @ 2' 1 1/4"	2950 (5.25")	Passed (53%)	1.15	1.0 D + 1.0 S (All Spans)
Shear (lbs)	910 @ 1' 10 1/2"	1903	Passed (48%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	-1638 @ 2' 1 1/4"	4364	Passed (38%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.088 @ 10' 6 1/2"	0.749	Passed (L/999+)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.144 @ 10' 6 1/2"	0.999	Passed (L/999+)	--	1.0 D + 1.0 S (Alt Spans)

System : Roof
Member Type : Joist
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD
Member Pitch : 0.25/12

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Hanger on 11 7/8" GLB beam	3.50"	Hanger[1]	1.75" / 1.75" [2]	-320	-523	-843	See note [1]
2 - Beveled Plate - HF	5.50"	5.50"	3.50"	606	956	1562	None
3 - Hanger on 11 7/8" HF beam	3.50"	Hanger[1]	1.75" / 1.75" [2]	155	244	399	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.
- [2] Required Bearing Length / Required Bearing Length with Web Stiffeners

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	7' 1" o/c	
Bottom Edge (Lu)	5' 9" o/c	

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

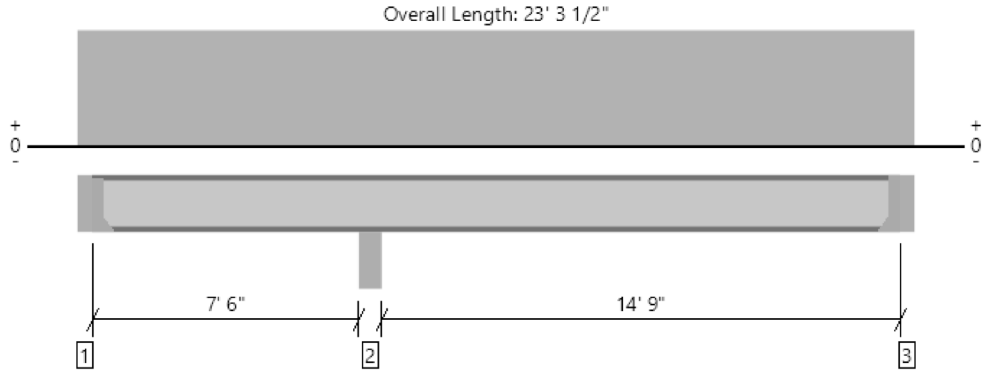
Connector: Simpson Strong-Tie						
Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
1 - Face Mount Hanger	HU2.1/9X SLU1	2.50"	N/A	18-10dx1.5	10-10dx1.5	Web Stiffeners
3 - Face Mount Hanger	IUS2.06/11.88	2.00"	N/A	10-10dx1.5	2-Strong-Grip	

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

Vertical Load	Location	Spacing	Dead (0.90)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 17' 4 1/2"	16"	19.0	30.0	flat roof dead and snow load

Roof, RJ-9

1 piece(s) 11 7/8" TJI® 210 @ 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)	401 @ 23'	1156 (1.75")	Passed (35%)	1.15	1.0 D + 1.0 S (Alt Spans)
Shear (lbs)	544 @ 8' 3"	1903	Passed (29%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	-1375 @ 8' 1/4"	4364	Passed (32%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.104 @ 16' 2"	0.749	Passed (L/999+)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.167 @ 16' 2 5/16"	0.999	Passed (L/999+)	--	1.0 D + 1.0 S (Alt Spans)

System : Roof
Member Type : Joist
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD
Member Pitch : 0.25/12

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Hanger on 11 7/8" GLB beam	3.50"	Hanger[1]	1.75" / 1.75" [2]	36	105/-13	141/-13	See note [1]
2 - Beveled Plate - HF	5.50"	5.50"	3.50"	392	619	1011	None
3 - Hanger on 11 7/8" HF beam	3.50"	Hanger[1]	1.75" / 1.75" [2]	162	258	420	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.
- [2] Required Bearing Length / Required Bearing Length with Web Stiffeners

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	6' 8" o/c	
Bottom Edge (Lu)	6' 4" o/c	

- TJI joists are only analyzed using Maximum Allowable bracing solutions.
- 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	IUS2.06/11.88	2.00"	N/A	10-10dx1.5	2-Strong-Grip	
3 - Face Mount Hanger	IUS2.06/11.88	2.00"	N/A	10-10dx1.5	2-Strong-Grip	

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

Vertical Load	Location	Spacing	Dead (0.90)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 23' 3 1/2"	16"	19.0	30.0	flat roof dead and snow load

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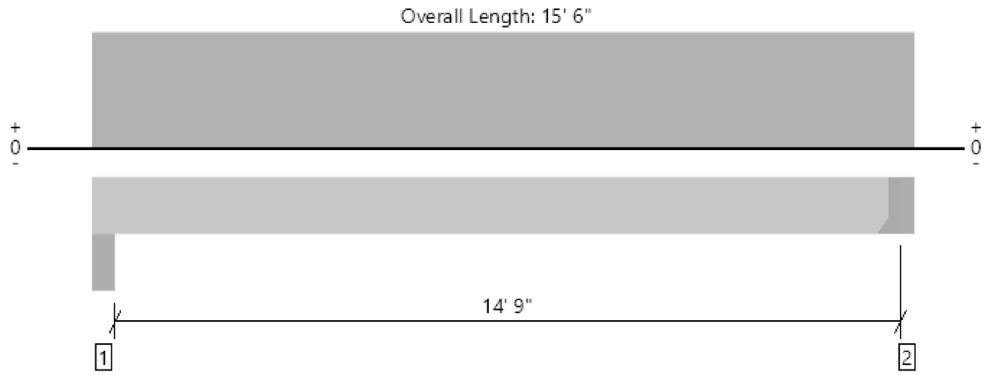
ForteWEB Software Operator	Job Notes
Mario D. Alvarado Jr. Quantum Consulting Engineers (206) 957-3904 malvarado@quantumce.com	

Weyerhaeuser

Roof, B-1

1 piece(s) 3 1/8" x 13 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)	3419 @ 15' 2 1/2"	3419 (1.68")	Passed (100%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	2902 @ 14' 1"	8571	Passed (34%)	1.15	1.0 D + 1.0 S (All Spans)
Pos Moment (Ft-lbs)	12714 @ 7' 9 1/4"	21832	Passed (58%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.204 @ 7' 9 1/4"	0.744	Passed (L/873)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.439 @ 7' 9 1/4"	0.992	Passed (L/407)	--	1.0 D + 1.0 S (All Spans)

System : Roof
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
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.
- Critical positive moment adjusted by a volume factor of 1.00 that was calculated using length L = 14' 10 1/2".
- 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 - Column - HF	5.50"	5.50"	1.76"	1908	1664	3572	None
2 - Hanger on 13 1/2" GLB beam	3.50"	Hanger[1]	1.68"	1895	1655	3550	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)	15' 3" o/c	
Bottom Edge (Lu)	15' 3" o/c	

•Maximum allowable bracing intervals based on applied load.

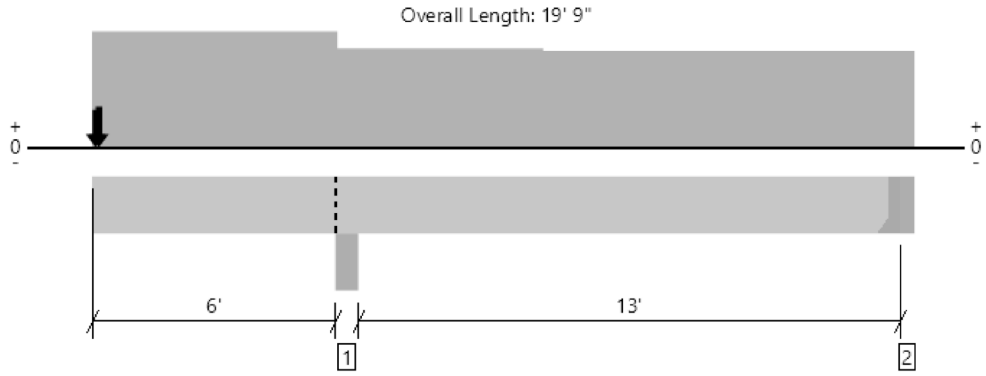
Connector: Simpson Strong-Tie						
Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
2 - Face Mount Hanger	HHUS210-2	3.00"	N/A	30-10d	10-10d	

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 15' 2 1/2"	N/A	10.3	--	
1 - Uniform (PSF)	0 to 15' 6" (Top)	2'	12.0	-	pony wall
2 - Uniform (PSF)	0 to 15' 6" (Front)	1' 4"	19.0	25.0	roof dead and snow load
3 - Uniform (PLF)	0 to 15' 6" (Front)	N/A	186.0	180.8	Linked from: RJ-1, Support 2

Roof, B-2

1 piece(s) 6 3/4" x 19 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)	19782 @ 6' 2 3/4"	24131 (5.50")	Passed (82%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	10078 @ 4' 4 1/2"	26742	Passed (38%)	1.15	1.0 D + 1.0 S (All Spans)
Pos Moment (Ft-lbs)	587 @ 18' 15/16"	98390	Passed (1%)	1.15	1.0 D + 1.0 S (Alt Spans)
Neg Moment (Ft-lbs)	-56163 @ 6' 2 3/4"	91879	Passed (61%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.223 @ 0	0.623	Passed (2L/672)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.447 @ 0	0.831	Passed (2L/334)	--	1.0 D + 1.0 S (Alt Spans)

System : Roof
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD
Member Pitch : 0/12

- 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.
- Critical positive moment adjusted by a volume factor of 1.00 that was calculated using length L = 2' 9 3/16".
- Critical negative moment adjusted by a volume factor of 0.93 that was calculated using length L = 19' 5 1/2".
- 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	Snow	Total	
1 - Column - HF	5.50"	5.50"	4.51"	10092	9690	19782	Blocking
2 - Hanger on 19 1/2" GLB beam	3.50"	Hanger[1]	1.50"	-134	1153/-905	1153/-1039	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)	19' 6" o/c	
Bottom Edge (Lu)	19' 6" o/c	

•Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-Tie

Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
2 - Face Mount Hanger	HGUS6.88/14	4.00"	N/A	66-10d	22-10d	

- 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 19' 5 1/2"	N/A	32.0	--	
1 - Uniform (PSF)	0 to 19' 9" (Top)	1' 6"	12.0	-	pony wall
2 - Uniform (PLF)	0 to 6' (Front)	N/A	186.0	180.8	Linked from: RJ-1, Support 2
3 - Uniform (PLF)	6' to 19' 9" (Front)	N/A	135.0	130.0	Linked from: RJ-3, Support 2
4 - Point (lb)	1" (Top)	N/A	1759	1568	Linked from: HB-1, Support 2
5 - Uniform (PLF)	11' to 19' 9" (Back)	N/A	116.3	183.0	Linked from: RJ-8, Support 3
6 - Uniform (PLF)	0 to 11' (Back)	N/A	121.5	193.5	Linked from: RJ-9, Support 3
7 - Point (lb)	2" (Back)	N/A	1895	1655	Linked from: B-1, Support 2

Weyerhaeuser Notes

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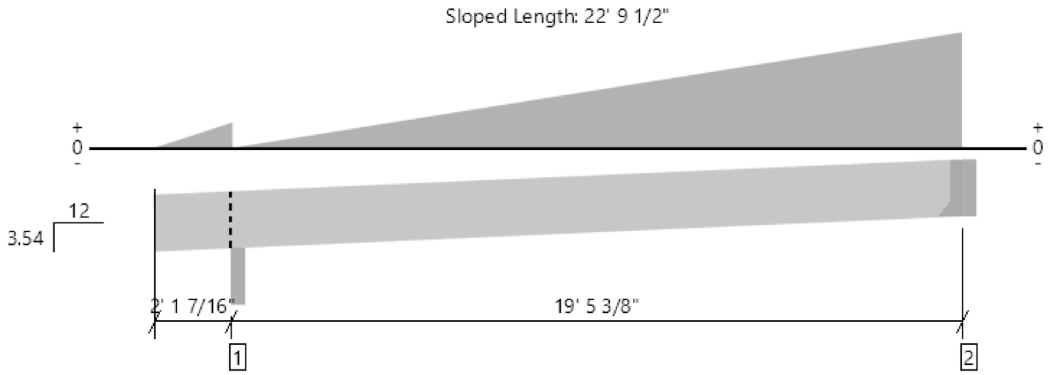
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Roof, HB-1

1 piece(s) 5 1/8" 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.

Member Length : 22' 9 3/8"

System : Roof
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD
Member Pitch : 3.54/12

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	3327 @ 21' 6 13/16"	4997 (1.50")	Passed (67%)	--	1.0 D + 1.0 S (Alt Spans)
Shear (lbs)	2851 @ 20' 7 5/16"	12495	Passed (23%)	1.15	1.0 D + 1.0 S (Alt Spans)
Pos Moment (Ft-lbs)	12518 @ 13' 4"	28290	Passed (44%)	1.15	1.0 D + 1.0 S (Alt Spans)
Neg Moment (Ft-lbs)	-138 @ 2' 3 3/16"	28290	Passed (0%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.313 @ 12' 3 3/8"	1.006	Passed (L/773)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.671 @ 12' 3 1/8"	1.341	Passed (L/360)	--	1.0 D + 1.0 S (Alt Spans)

- Deflection criteria: LL (L/240) and TL (L/180).
- Overhang deflection criteria: LL (2L/240) and TL (2L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Critical positive moment adjusted by a volume factor of 1.00 that was calculated using length L = 20' 5/8".
- Critical negative moment adjusted by a volume factor of 1.00 that was calculated using length L = 2' 5 5/16".
- 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	Snow	Total	
1 - Beveled Plate - HF	3.50"	3.50"	1.50"	1065	852	1917	Blocking
2 - Hanger on 12" HF beam	3.50"	Hanger[1]	1.50"	1759	1568	3327	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)	22' 6" o/c	
Bottom Edge (Lu)	22' 6" o/c	

•Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-Tie						
Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
2 - Face Mount Hanger	Connector not found	N/A	N/A	N/A	N/A	

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

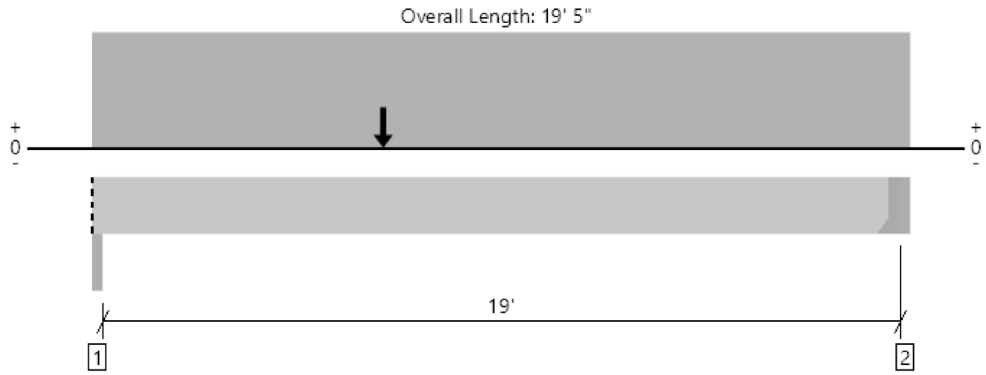
Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 21' 6 13/16"	N/A	14.9	--	
1 - Tapered (PLF)	0 to 2' 1 7/16"	N/A	0.0 to 52.9	0.0 to 53.0	Generated from Roof Geometry
2 - Tapered (PLF)	2' 1 7/16" to 21' 6 13/16"	N/A	0.0 to 239.6	0.0 to 243.1	Generated from Roof Geometry

ForteWEB Software Operator	Job Notes
Mario D. Alvarado Jr. Quantum Consulting Engineers (206) 957-3904 malvarado@quantumce.com	

Weyerhaeuser

Roof, B-3

1 piece(s) 6 3/4" x 19 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)	7608 @ 19' 2 1/2"	7608 (1.73")	Passed (100%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	7860 @ 1' 10"	26742	Passed (29%)	1.15	1.0 D + 1.0 S (All Spans)
Pos Moment (Ft-lbs)	47109 @ 7'	92038	Passed (51%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.195 @ 9' 4 5/8"	0.956	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.391 @ 9' 4 9/16"	1.275	Passed (L/587)	--	1.0 D + 1.0 S (All Spans)

System : Roof
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
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.
- Critical positive moment adjusted by a volume factor of 0.94 that was calculated using length L = 19' 1 1/2".
- 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	Snow	Total	
1 - Column - HF	2.50"	2.50"	2.05"	4495	4492	8987	Blocking
2 - Hanger on 19 1/2" GLB beam	2.50"	Hanger[1]	1.73"	3837	3893	7730	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)	19' 3" o/c	
Bottom Edge (Lu)	19' 3" o/c	

•Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-Tie

Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
2 - Face Mount Hanger	HGUS6.88/14	4.00"	N/A	66-10d	22-10d	

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

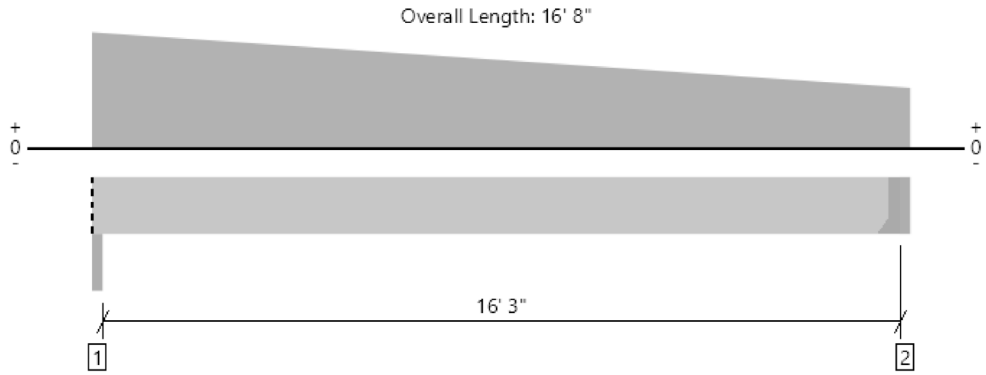
Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 19' 2 1/2"	N/A	32.0	--	
1 - Uniform (PSF)	0 to 19' 5" (Top)	1' 6"	12.0	-	pony wall
2 - Uniform (PLF)	0 to 19' 5" (Front)	N/A	135.0	130.0	Linked from: RJ-3, Support 2
3 - Uniform (PLF)	0 to 19' 5" (Front)	N/A	116.3	183.0	Linked from: RJ-8, Support 3
4 - Point (lb)	7' (Front)	N/A	2489	2307	Linked from: VB-6, Support 2

ForteWEB Software Operator	Job Notes
Mario D. Alvarado Jr. Quantum Consulting Engineers (206) 957-3904 malvarado@quantumce.com	

Weyerhaeuser

Roof, B-3B

1 piece(s) 6 3/4" x 12" 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)	3890 @ 16' 5 1/2"	6581 (1.50")	Passed (59%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	4013 @ 1' 2 1/2"	16457	Passed (24%)	1.15	1.0 D + 1.0 S (All Spans)
Pos Moment (Ft-lbs)	17792 @ 7' 10 1/4"	37161	Passed (48%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.256 @ 8' 2 3/16"	0.819	Passed (L/766)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.490 @ 8' 2 1/8"	1.092	Passed (L/401)	--	1.0 D + 1.0 S (All Spans)

System : Roof
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
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.
- Critical positive moment adjusted by a volume factor of 1.00 that was calculated using length L = 16' 4 1/2".
- 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 - Column - HF	2.50"	2.50"	1.50"	2318	2519	4837	Blocking
2 - Hanger on 12" GLB beam	2.50"	Hanger[1]	1.50"	1869	2094	3963	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)	16' 6" o/c	
Bottom Edge (Lu)	16' 6" o/c	

•Maximum allowable bracing intervals based on applied load.

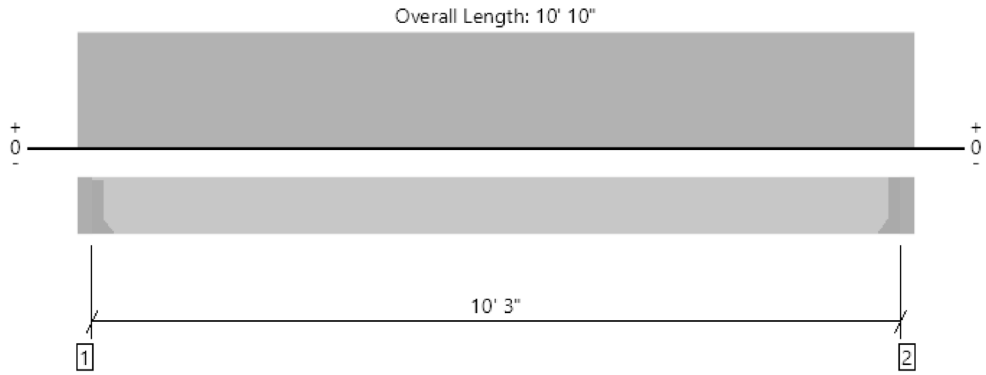
Connector: Simpson Strong-Tie						
Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
2 - Face Mount Hanger	HGUS6.88/10	4.00"	N/A	46-10d	16-10d	

- 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 16' 5 1/2"	N/A	19.7	--	
1 - Uniform (PSF)	0 to 16' 8" (Top)	1' 6"	12.0	-	pony wall
2 - Tapered (PSF)	0 to 16' 8" (Top)	7' to 6"	26.0	25.0	roof dead and snow load
3 - Uniform (PLF)	0 to 16' 8" (Front)	N/A	116.3	183.0	Linked from: RJ-8, Support 3

Roof, B-4

1 piece(s) 3 1/2" x 12" 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) [Group]
Member Reaction (lbs)	1240 @ 3 1/2"	3413 (1.50")	Passed (36%)	--	1.0 D + 1.0 S (All Spans) [1]
Shear (lbs)	998 @ 1' 3 1/2"	8533	Passed (12%)	1.15	1.0 D + 1.0 S (All Spans) [1]
Pos Moment (Ft-lbs)	3178 @ 5' 5"	19320	Passed (16%)	1.15	1.0 D + 1.0 S (All Spans) [1]
Live Load Defl. (in)	0.035 @ 5' 5"	0.512	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans) [1]
Total Load Defl. (in)	0.066 @ 5' 5"	0.683	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans) [1]

System : Roof
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
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.
- Critical positive moment adjusted by a volume factor of 1.00 that was calculated using length L = 10' 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	Snow	Total	
1 - Hanger on 12" HF beam	3.50"	Hanger[1]	1.50"	610	697	1307	See note [1]
2 - Hanger on 12" HF beam	3.50"	Hanger[1]	1.50"	610	697	1307	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)	10' 3" o/c	
Bottom Edge (Lu)	10' 3" o/c	

•Maximum allowable bracing intervals based on applied load.

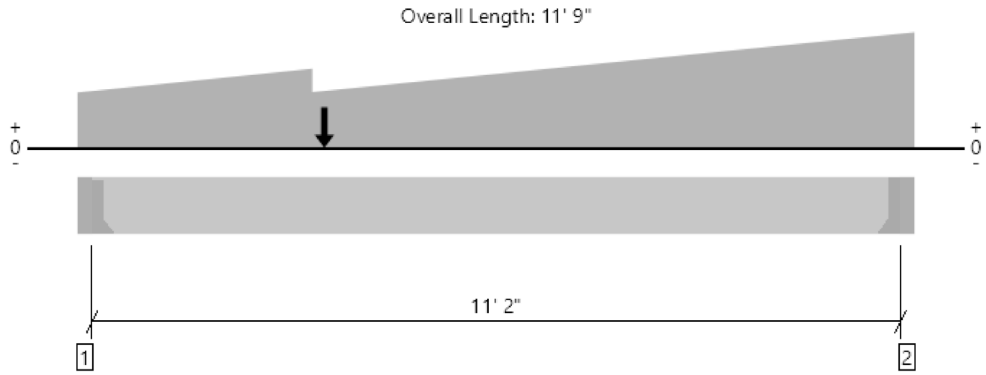
Connector: Simpson Strong-Tie						
Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
1 - Face Mount Hanger	LUS410	2.00"	N/A	8-10dx1.5	6-10d	
2 - Face Mount Hanger	LUS410	2.00"	N/A	8-10dx1.5	6-10d	

- 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)	3 1/2" to 10' 6 1/2"	N/A	10.2	--	
1 - Uniform (PSF)	0 to 10' 10" (Front)	2'	26.0	25.0	Default Load
2 - Uniform (PSF)	0 to 10' 10" (Top)	2'	12.0	-	pony wall
3 - Uniform (PLF)	0 to 10' 10" (Front)	N/A	27.0	78.8/-9.8	Linked from: RJ-9, Support 1

Roof, B-5

1 piece(s) 3 1/8" x 12" 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)	2294 @ 3 1/2"	3047 (1.50")	Passed (75%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	2088 @ 1' 3 1/2"	7619	Passed (27%)	1.15	1.0 D + 1.0 S (All Spans)
Pos Moment (Ft-lbs)	6386 @ 4' 8 3/8"	17250	Passed (37%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.083 @ 5' 8 3/8"	0.558	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.177 @ 5' 8 3/4"	0.744	Passed (L/756)	--	1.0 D + 1.0 S (All Spans)

System : Roof
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
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.
- Critical positive moment adjusted by a volume factor of 1.00 that was calculated using length L = 11' 2".
- 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 - Hanger on 12" HF beam	3.50"	Hanger[1]	1.50"	1213	1133	2346	See note [1]
2 - Hanger on 12" HF beam	3.50"	Hanger[1]	1.50"	1187	989	2176	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)	11' 2" o/c	
Bottom Edge (Lu)	11' 2" o/c	

•Maximum allowable bracing intervals based on applied load.

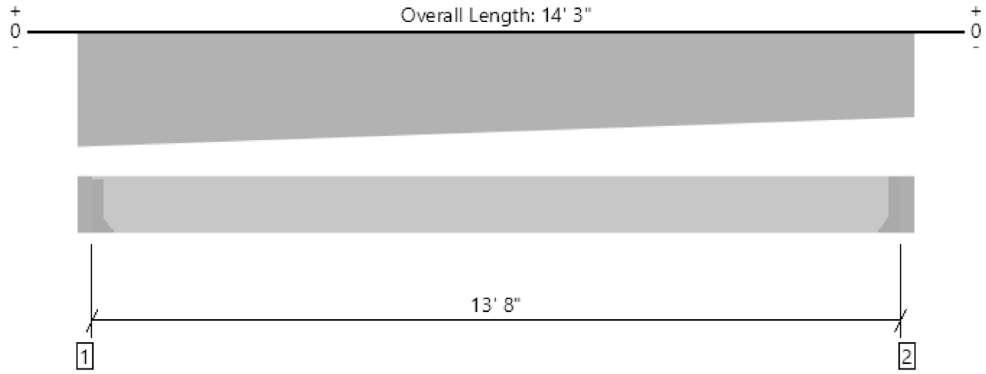
Connector: Simpson Strong-Tie						
Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
1 - Face Mount Hanger	HHUS28-2	3.00"	N/A	22-10d	4-10d	
2 - Face Mount Hanger	HHUS28-2	3.00"	N/A	22-10d	4-10d	

- 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)	3 1/2" to 11' 5 1/2"	N/A	9.1	--	
1 - Uniform (PSF)	3' 4" to 11' 9" (Top)	2'	13.0	-	pony wall
2 - Uniform (PSF)	0 to 3' 4" (Top)	2'	24.0	25.0	roof dead and snow load
3 - Tapered (PSF)	0 to 11' 9" (Top)	1' 7" to 7'	26.0	25.0	roof dead and snow load
4 - Point (lb)	3' 6" (Back)	N/A	610	697	Linked from: B-4, Support 1

Roof, B-6

1 piece(s) 3 1/2" x 13 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) [Group]
Member Reaction (lbs)	-3620 @ 3 1/2"	3413 (1.50")	Passed (106%)	--	1.0 D + 1.0 S (All Spans) [1]
Shear (lbs)	2974 @ 1' 5"	9600	Passed (31%)	1.15	1.0 D + 1.0 S (All Spans) [1]
Pos Moment (Ft-lbs)	0 @ N/A	N/A	Passed (N/A)	--	N/A
Neg Moment (Ft-lbs)	-11782 @ 6' 11 7/16"	18848	Passed (63%)	1.15	1.0 D + 1.0 S (All Spans) [1]
Live Load Defl. (in)	-0.211 @ 7' 1 1/8"	0.683	Passed (L/778)	--	1.0 D + 1.0 S (All Spans) [1]
Total Load Defl. (in)	-0.306 @ 7' 1"	0.911	Passed (L/535)	--	1.0 D + 1.0 S (All Spans) [1]

System : Roof
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
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.
- Critical negative moment adjusted by a volume factor of 1.00 that was calculated using length L = 13' 8".
- 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 - Hanger on 13 1/2" HF beam	3.50"	Hanger[1]	1.50"	-1226	-2570	-3796	See note [1]
2 - Hanger on 13 1/2" HF beam	3.50"	Hanger[1]	1.50"	-1025	-2400	-3425	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)	13' 8" o/c	
Bottom Edge (Lu)	13' 8" 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	HGUS410	4.00"	N/A	46-16d	16-16d	
2 - Face Mount Hanger	HGUS410	4.00"	N/A	46-10d	16-10d	

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

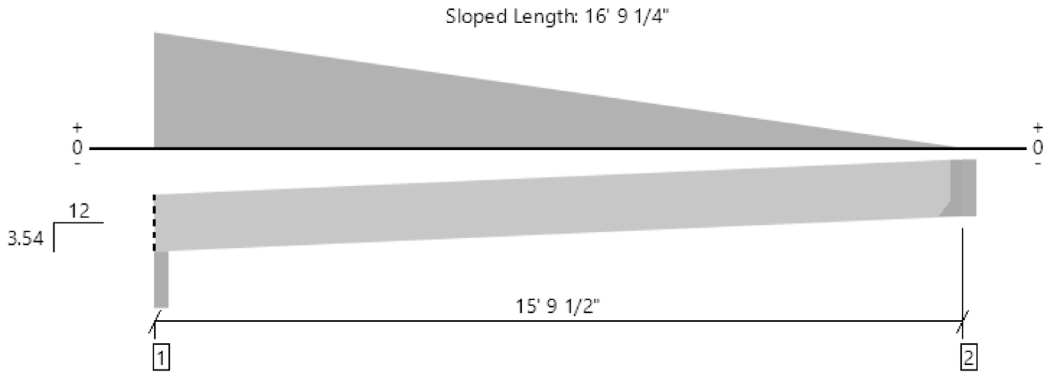
Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	3 1/2" to 13' 11 1/2"	N/A	11.5	--	
1 - Tapered (PSF)	0 to 14' 3" (Back)	6" to 6' 9"	13.0	12.5	roof dead and snow load
2 - Uniform (PSF)	0 to 14' 3" (Top)	2'	12.0	-	pony wall
3 - Uniform (PLF)	0 to 14' 3" (Front)	N/A	-240.0	-392.3	Linked from: RJ-8, Support 1

ForteWEB Software Operator	Job Notes
Mario D. Alvarado Jr. Quantum Consulting Engineers (206) 957-3904 malvarado@quantumce.com	

Weyerhaeuser

Roof, VB-1

1 piece(s) 3 1/2" 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.

Member Length : 16' 9 1/8"

System : Roof
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD
Member Pitch : 3.54/12

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	2227 @ 2"	5206 (3.50")	Passed (43%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1730 @ 1' 3"	8533	Passed (20%)	1.15	1.0 D + 1.0 S (All Spans)
Pos Moment (Ft-lbs)	6558 @ 6' 9 7/8"	19320	Passed (34%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.157 @ 7' 8 5/16"	0.815	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.338 @ 7' 8 7/16"	1.086	Passed (L/579)	--	1.0 D + 1.0 S (All Spans)

- Deflection criteria: LL (L/240) and TL (L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Critical positive moment adjusted by a volume factor of 1.00 that was calculated using length L = 16' 3 1/2".
- 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	Snow	Total	
1 - Beveled Plate - SPF	3.50"	3.50"	1.50"	1177	1050	2227	Blocking
2 - Hanger on 12" SPF beam	3.50"	Hanger[1]	1.50"	612	509	1121	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)	16' 6" o/c	
Bottom Edge (Lu)	16' 6" o/c	

•Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-Tie

Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
2 - Face Mount Hanger	LSSR410Z	1.88"	N/A	22-16dx2.5	18-16dx2.5	

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 15' 9 1/2"	N/A	10.2	--	
1 - Tapered (PLF)	0 to 15' 9 1/2"	N/A	196.9 to 0.0	197.4 to 0.0	Generated from Roof Geometry

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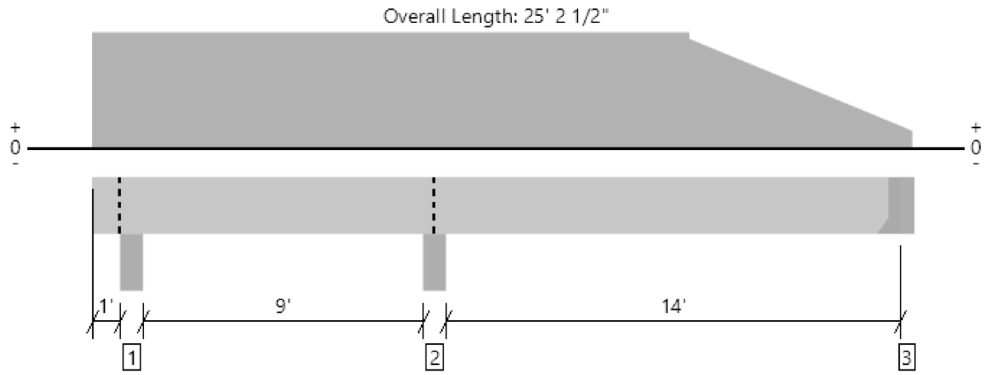
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Mario D. Alvarado Jr. Quantum Consulting Engineers (206) 957-3904 malvarado@quantumce.com	

Weyerhaeuser

Roof, RR-3

1 piece(s) 3 1/2" 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)	5028 @ 10' 8 1/4"	12513 (5.50")	Passed (40%)	--	1.0 D + 1.0 S (Adj Spans)
Shear (lbs)	2326 @ 11' 11"	8533	Passed (27%)	1.15	1.0 D + 1.0 S (Adj Spans)
Pos Moment (Ft-lbs)	4902 @ 18' 6 1/2"	19320	Passed (25%)	1.15	1.0 D + 1.0 S (Alt Spans)
Neg Moment (Ft-lbs)	-6184 @ 10' 8 1/4"	19320	Passed (32%)	1.15	1.0 D + 1.0 S (Adj Spans)
Live Load Defl. (in)	0.085 @ 18' 3"	0.711	Passed (L/999+)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.167 @ 18' 3 3/4"	0.949	Passed (L/999+)	--	1.0 D + 1.0 S (Alt Spans)

System : Roof
Member Type : Drop Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD
Member Pitch : 0/12

- 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.
- Critical positive moment adjusted by a volume factor of 1.00 that was calculated using length L = 11' 8 5/16".
- Critical negative moment adjusted by a volume factor of 1.00 that was calculated using length L = 6' 6 11/16".
- 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	Snow	Total	
1 - Column - DF	5.50"	5.50"	1.50"	750	813	1563	Blocking
2 - Column - DF	5.50"	5.50"	2.21"	2600	2427	5027	Blocking
3 - Hanger on 12" GLB beam	3.50"	Hanger[1]	1.50"	650	630	1280	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)	24' 11" o/c	
Bottom Edge (Lu)	24' 11" o/c	

•Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-Tie						
Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
3 - Face Mount Hanger	LUS410	2.00"	N/A	8-10dx1.5	6-10d	

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

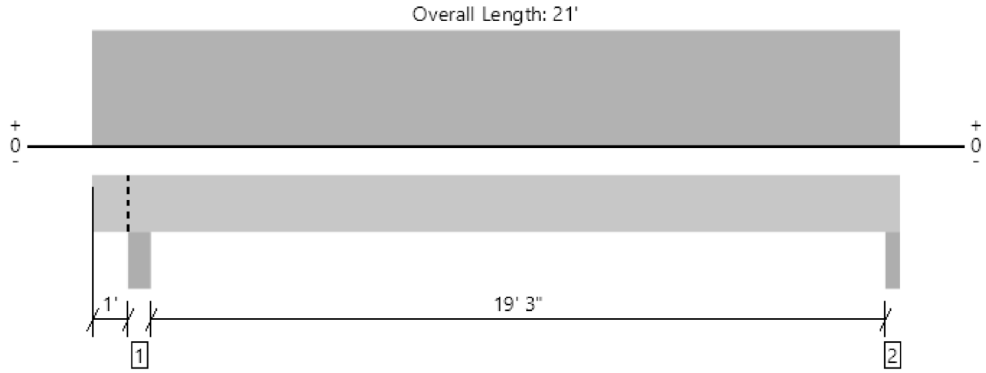
Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 24' 11"	N/A	10.2	--	
1 - Uniform (PLF)	0 to 18' 6" (Front)	N/A	85.0	83.5	Linked from: RJ-4, Support 2
2 - Uniform (PLF)	0 to 18' 6" (Back)	N/A	85.0	83.5	Linked from: RJ-4, Support 2
3 - Tapered (PSF)	18' 6" to 25' 2" (Front)	3' 3" to 6"	24.0	25.0	roof dead and snow load
4 - Tapered (PSF)	18' 6" to 25' 2" (Back)	3' 3" to 6"	24.0	25.0	roof dead and snow load

ForteWEB Software Operator	Job Notes
Mario D. Alvarado Jr. Quantum Consulting Engineers (206) 957-3904 malvarado@quantumce.com	

Weyerhaeuser

Roof, RR-4

1 piece(s) 5 1/8" 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)	4321 @ 20' 10"	11659 (3.50")	Passed (37%)	--	1.0 D + 1.0 S (Alt Spans)
Shear (lbs)	3650 @ 19' 5 1/2"	15618	Passed (23%)	1.15	1.0 D + 1.0 S (Alt Spans)
Pos Moment (Ft-lbs)	20758 @ 11' 3/4"	43539	Passed (48%)	1.15	1.0 D + 1.0 S (Alt Spans)
Neg Moment (Ft-lbs)	-328 @ 1' 2 3/4"	44203	Passed (1%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.264 @ 11' 7/16"	0.980	Passed (L/891)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.553 @ 11' 1/2"	1.307	Passed (L/426)	--	1.0 D + 1.0 S (Alt Spans)

System : Roof
Member Type : Drop Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD
Member Pitch : 0/12

- 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.
- Critical positive moment adjusted by a volume factor of 0.98 that was calculated using length L = 19' 6 9/16".
- Critical negative moment adjusted by a volume factor of 1.00 that was calculated using length L = 1' 3 11/16".
- 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	Snow	Total	
1 - Column - DF	5.50"	5.50"	1.50"	2520	2291	4811	Blocking
2 - Column - DF	3.50"	3.50"	1.50"	2261	2060	4321	None

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	21' o/c	
Bottom Edge (Lu)	21' 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 21'	N/A	18.7	--	
1 - Uniform (PLF)	0 to 21' (Front)	N/A	104.5	103.5	Linked from: RJ-6, Support 2
2 - Uniform (PLF)	0 to 21' (Back)	N/A	104.5	103.5	Linked from: RJ-6, Support 2

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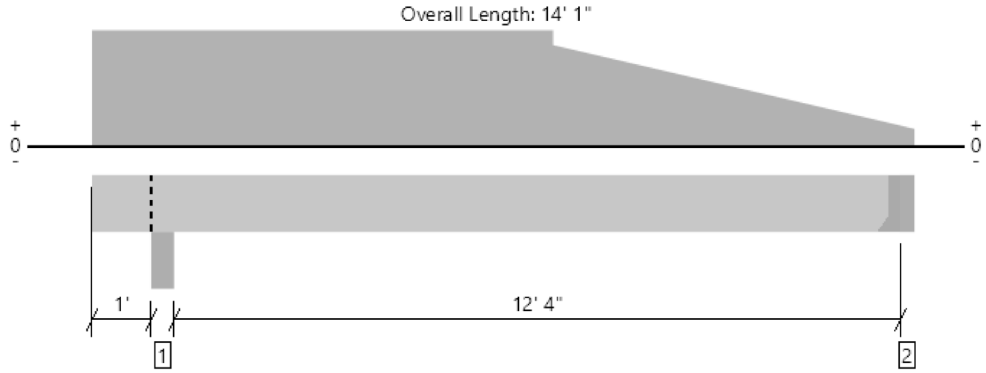
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Roof, RR-5

1 piece(s) 4 x 12 DF 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)	1430 @ 13' 9 1/2"	3281 (1.50")	Passed (44%)	--	1.0 D + 1.0 S (Alt Spans)
Shear (lbs)	1646 @ 2' 4 3/4"	5434	Passed (30%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	5832 @ 7' 1 1/2"	7004	Passed (83%)	1.15	1.0 D + 1.0 S (Alt Spans)
Live Load Defl. (in)	0.117 @ 7' 4 13/16"	0.628	Passed (L/999+)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.244 @ 7' 4 15/16"	0.837	Passed (L/617)	--	1.0 D + 1.0 S (Alt Spans)

System : Roof
Member Type : Drop Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD
Member Pitch : 0/12

- 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	Total	
1 - Column - DF	5.50"	5.50"	1.50"	1289	1189	2478	Blocking
2 - Hanger on 11 1/4" DF beam	3.50"	Hanger[1]	1.50"	764	686	1450	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)	13' 10" o/c	
Bottom Edge (Lu)	13' 10" o/c	

•Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-Tie

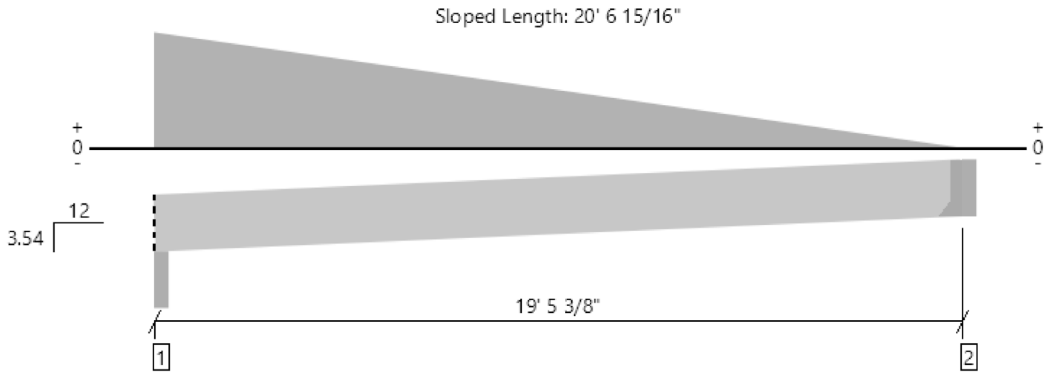
Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
2 - Face Mount Hanger	LUS410	2.00"	N/A	8-10dx1.5	6-10d	

- 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 13' 9 1/2"	N/A	10.0	--	
1 - Uniform (PLF)	0 to 8' (Front)	N/A	85.0	83.5	Linked from: RJ-4, Support 2
2 - Uniform (PLF)	0 to 8' (Back)	N/A	85.0	83.5	Linked from: RJ-4, Support 2
3 - Tapered (PSF)	8' to 14' 1" (Front)	3' to 6"	26.0	25.0	roof dead and snow load
4 - Tapered (PSF)	8' to 14' 1" (Back)	3' to 6"	26.0	25.0	roof dead and snow load

Roof, VB-5

1 piece(s) 5 1/8" 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.

Member Length : 20' 6 13/16"

System : Roof
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD
Member Pitch : 3.54/12

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	2775 @ 2"	7623 (3.50")	Passed (36%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	2270 @ 1' 3"	12495	Passed (18%)	1.15	1.0 D + 1.0 S (All Spans)
Pos Moment (Ft-lbs)	10189 @ 8' 4 15/16"	28290	Passed (36%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.307 @ 9' 5 5/16"	1.005	Passed (L/786)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.546 @ 9' 5 5/8"	1.340	Passed (L/442)	--	1.0 D + 1.0 S (All Spans)

- Deflection criteria: LL (L/240) and TL (L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Critical positive moment adjusted by a volume factor of 1.00 that was calculated using length L = 20' 1 3/16".
- 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	Snow	Total	
1 - Beveled Plate - SPF	3.50"	3.50"	1.50"	1186	1589	2775	Blocking
2 - Hanger on 12" SPF beam	3.50"	Hanger[1]	1.50"	654	774	1428	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)	20' 3" o/c	
Bottom Edge (Lu)	20' 3" o/c	

•Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-Tie

Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
2 - Face Mount Hanger	HUC310-2X SLD16	2.50"	N/A	14-10d	6-10d	

- 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 19' 5 3/8"	N/A	14.9	--	
1 - Tapered (PLF)	0 to 19' 5 3/8"	N/A	151.6 to 0.0	243.1 to 0.0	Generated from Roof Geometry

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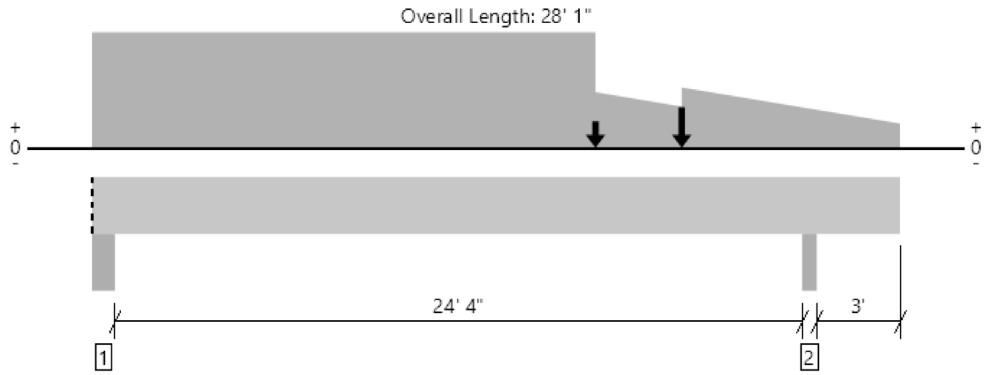
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Mario D. Alvarado Jr. Quantum Consulting Engineers (206) 957-3904 malvarado@quantumce.com	

Weyerhaeuser

Roof, RR-1-Alt

1 piece(s) 6 3/4" 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)	8874 @ 24' 11 1/4"	15356 (3.50")	Passed (58%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	7831 @ 23' 3 1/2"	24685	Passed (32%)	1.15	1.0 D + 1.0 S (All Spans)
Pos Moment (Ft-lbs)	51352 @ 13' 2 7/8"	77114	Passed (67%)	1.15	1.0 D + 1.0 S (Alt Spans)
Neg Moment (Ft-lbs)	-908 @ 24' 11 1/4"	83835	Passed (1%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.446 @ 12' 9 3/16"	1.230	Passed (L/662)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.952 @ 12' 9 1/8"	1.640	Passed (L/310)	--	1.0 D + 1.0 S (Alt Spans)

System : Roof
Member Type : Drop Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD
Member Pitch : 0/12

- 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.
- Critical positive moment adjusted by a volume factor of 0.92 that was calculated using length L = 24' 6 3/16".
- Critical negative moment adjusted by a volume factor of 1.00 that was calculated using length L = 3' 3 1/16".
- 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	Snow	Total	
1 - Column - DF	5.50"	5.50"	1.86"	4338	3824	8162	Blocking
2 - Beam - GLB	3.50"	3.50"	2.02"	4785	4089	8874	None

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

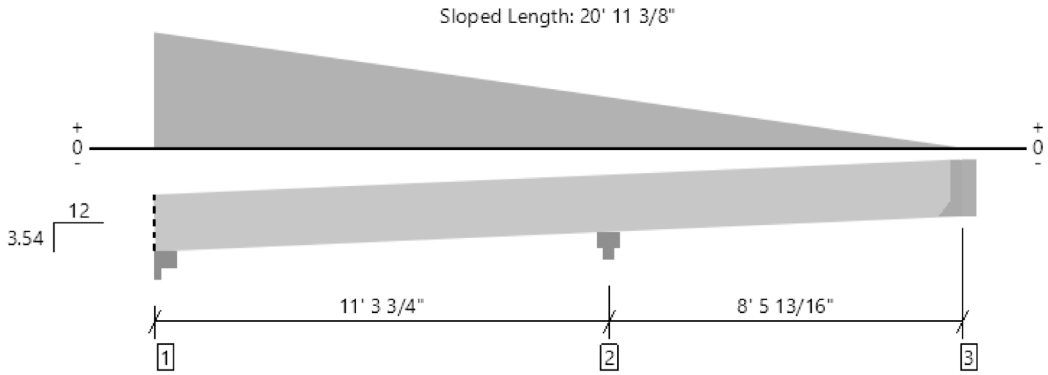
Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	28' 1" o/c	
Bottom Edge (Lu)	28' 1" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 28' 1"	N/A	29.5	--	
1 - Tapered (PSF)	17' 6" to 28' 1" (Front)	5' 9" to 6"	26.0	25.0	roof dead and snow load
2 - Uniform (PLF)	0 to 17' 6" (Front)	N/A	149.0	144.5	Linked from: RJ-2, Support 2
3 - Uniform (PLF)	0 to 17' 6" (Back)	N/A	149.0	144.5	Linked from: RJ-2, Support 2
4 - Point (lb)	17' 6" (Back)	N/A	612	509	Linked from: VB-1, Support 2
5 - Uniform (PSF)	20' 6" to 28' 1" (Back)	2'	26.0	25.0	roof dead and snow load
6 - Point (lb)	20' 6" (Back)	N/A	1213	1133	Linked from: B-5, Support 1

Roof, VB-2- Alt

1 piece(s) 3 1/8" 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.

Member Length : 20' 11 1/4"

System : Roof
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD
Member Pitch : 3.54/12

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	3141 @ 11' 3 3/4"	11648 (5.50")	Passed (27%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1787 @ 10' 1 1/2"	7619	Passed (23%)	1.15	1.0 D + 1.0 S (All Spans)
Pos Moment (Ft-lbs)	4065 @ 4' 8 1/16"	17250	Passed (24%)	1.15	1.0 D + 1.0 S (Alt Spans)
Neg Moment (Ft-lbs)	-3521 @ 11' 3 3/4"	17250	Passed (20%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.050 @ 5' 4 3/16"	0.572	Passed (L/999+)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.102 @ 5' 3 15/16"	0.763	Passed (L/999+)	--	1.0 D + 1.0 S (Alt Spans)

- Deflection criteria: LL (L/240) and TL (L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Critical positive moment adjusted by a volume factor of 1.00 that was calculated using length L = 9' 6 3/16".
- Critical negative moment adjusted by a volume factor of 1.00 that was calculated using length L = 10' 10 1/16".
- 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	Snow	Total	
1 - Column Cap - steel	5.50"	5.50"	1.50"	1100	1025	2125	Blocking
2 - Column Cap - steel	5.50"	5.50"	1.50"	1659	1482	3141	None
3 - Hanger on 12" DF beam	3.50"	Hanger[1]	1.50"	-22	39/-109	39/-131	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)	20' 8" o/c	
Bottom Edge (Lu)	20' 8" 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
3 - Face Mount Hanger	LSSR210-2Z	1.88"	N/A	22-16dx2.5	18-16dx2.5	

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

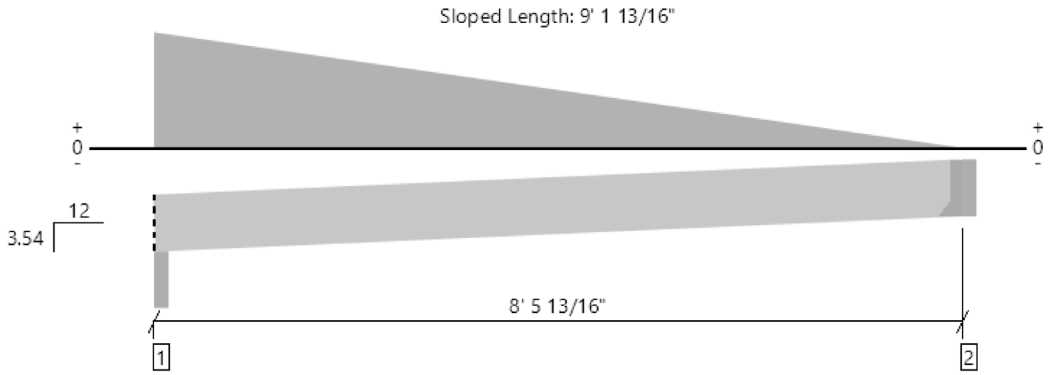
Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 19' 9 9/16"	N/A	9.1	--	
1 - Tapered (PLF)	0 to 19' 9 9/16"	N/A	246.9 to 0.0	247.5 to 0.0	Generated from Roof Geometry

ForteWEB Software Operator	Job Notes
Mario D. Alvarado Jr. Quantum Consulting Engineers (206) 957-3904 malvarado@quantumce.com	

Weyerhaeuser

Roof, VB-4

1 piece(s) 4 x 12 DF No.2



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

Member Length : 9' 1 1/2"

System : Roof
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD
Member Pitch : 3.54/12

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	669 @ 2"	5206 (3.50")	Passed (13%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	417 @ 1' 2 5/16"	5434	Passed (8%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	1030 @ 3' 8 13/16"	7004	Passed (15%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.009 @ 4' 2 1/4"	0.434	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.021 @ 4' 2 7/16"	0.578	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Beveled Plate - SPF	3.50"	3.50"	1.50"	363	306	669	Blocking
2 - Hanger on 11 1/4" SPF beam	3.50"	Hanger[1]	1.50"	193	144	337	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' 10" o/c	
Bottom Edge (Lu)	8' 10" o/c	

•Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-Tie

Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
2 - Face Mount Hanger	LSSR410Z	1.88"	N/A	22-16dx2.5	18-16dx2.5	

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 8' 5 13/16"	N/A	10.0	--	
1 - Tapered (PLF)	0 to 8' 5 13/16"	N/A	105.8 to 0.0	106.1 to 0.0	Generated from Roof Geometry

Weyerhaeuser Notes

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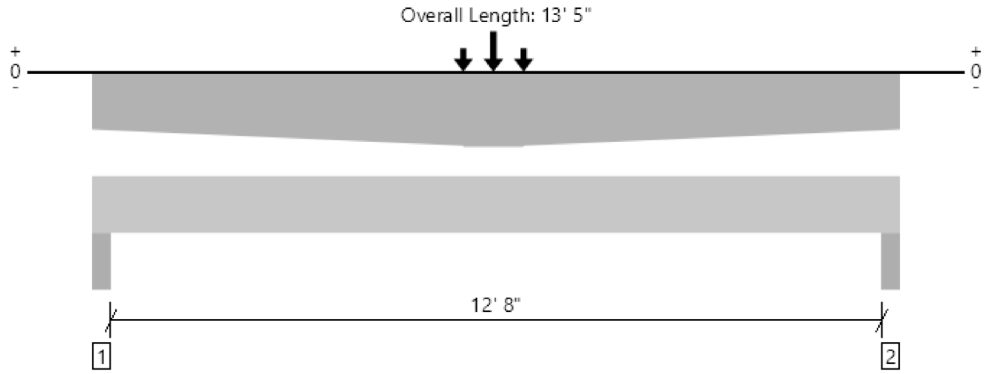
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Mario D. Alvarado Jr. Quantum Consulting Engineers (206) 957-3904 malvarado@quantumce.com	

Weyerhaeuser

Roof, B-7

1 piece(s) 3 1/2" x 13 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)	0 @ 13' 2"	10238 (4.50")	Passed (0%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1975 @ 11' 11"	9600	Passed (21%)	1.15	1.0 D + 1.0 S (All Spans)
Pos Moment (Ft-lbs)	0 @ N/A	N/A	Passed (N/A)	--	N/A
Neg Moment (Ft-lbs)	-6510 @ 8' 3 11/16"	24452	Passed (27%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	-0.123 @ 6' 8 9/16"	0.646	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	-0.160 @ 6' 8 5/8"	0.861	Passed (L/966)	--	1.0 D + 1.0 S (All Spans)

System : Roof
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
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.
- Critical negative moment adjusted by a volume factor of 1.00 that was calculated using length L = 12' 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	Snow	Total	
1 - Column - DF	4.50"	4.50"	1.50"	-776	-1924	-2700	None
2 - Column - DF	4.50"	4.50"	1.50"	-782	-1929	-2711	None

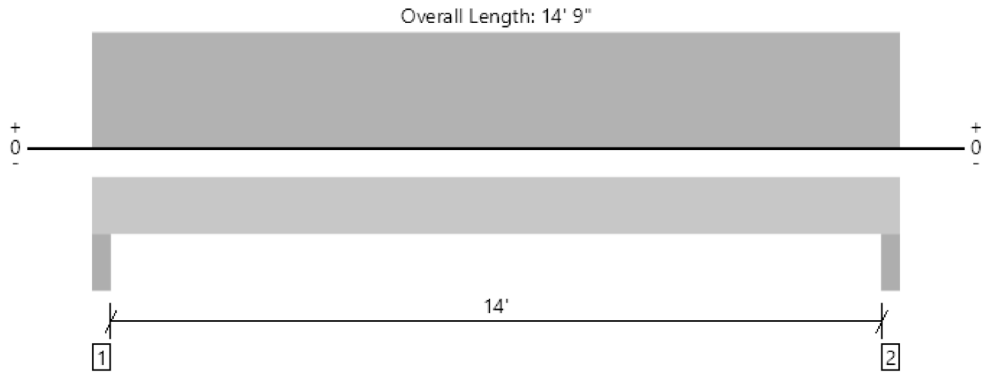
Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	13' 5" o/c	
Bottom Edge (Lu)	13' 5" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 13' 5"	N/A	11.5	--	
1 - Tapered (PSF)	0 to 6' 2" (Front)	3' to 2"	24.0	25.0	roof dead and snow load
2 - Uniform (PLF)	0 to 13' 5" (Back)	N/A	-240.0	-392.3	Linked from: RJ-8, Support 1
3 - Tapered (PSF)	7' 2" to 13' 5" (Front)	2" to 3'	24.0	25.0	roof dead and snow load
4 - Point (lb)	6' 2" (Front)	N/A	193	144	Linked from: VB-5, Support 2
5 - Point (lb)	7' 2" (Front)	N/A	193	144	Linked from: VB-5, Support 2
6 - Point (lb)	6' 8" (Front)	N/A	650	630	Linked from: RR-3, Support 3

Roof, B-8

1 piece(s) 5 1/8" 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)	3001 @ 3"	14991 (4.50")	Passed (20%)	--	1.0 D + 1.0 Lr (All Spans)
Shear (lbs)	2442 @ 1' 4 1/2"	13581	Passed (18%)	1.25	1.0 D + 1.0 Lr (All Spans)
Pos Moment (Ft-lbs)	10329 @ 7' 4 1/2"	30750	Passed (34%)	1.25	1.0 D + 1.0 Lr (All Spans)
Live Load Defl. (in)	0.140 @ 7' 4 1/2"	0.712	Passed (L/999+)	--	1.0 D + 1.0 Lr (All Spans)
Total Load Defl. (in)	0.284 @ 7' 4 1/2"	0.950	Passed (L/602)	--	1.0 D + 1.0 Lr (All Spans)

System : Roof
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
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.
- Critical positive moment adjusted by a volume factor of 1.00 that was calculated using length L = 14' 3".
- 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	Roof Live	Total	
1 - Trimmer - DF	4.50"	4.50"	1.50"	1526	1475	3001	None
2 - Trimmer - DF	4.50"	4.50"	1.50"	1526	1475	3001	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	14' 9" o/c	
Bottom Edge (Lu)	14' 9" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Roof Live (non-snow: 1.25)	Comments
0 - Self Weight (PLF)	0 to 14' 9"	N/A	14.9	--	
1 - Uniform (PSF)	0 to 14' 9" (Front)	1'	24.0	25.0	roof dead and snow load
2 - Uniform (PSF)	0 to 14' 9" (Back)	7'	24.0	25.0	roof dead and snow load

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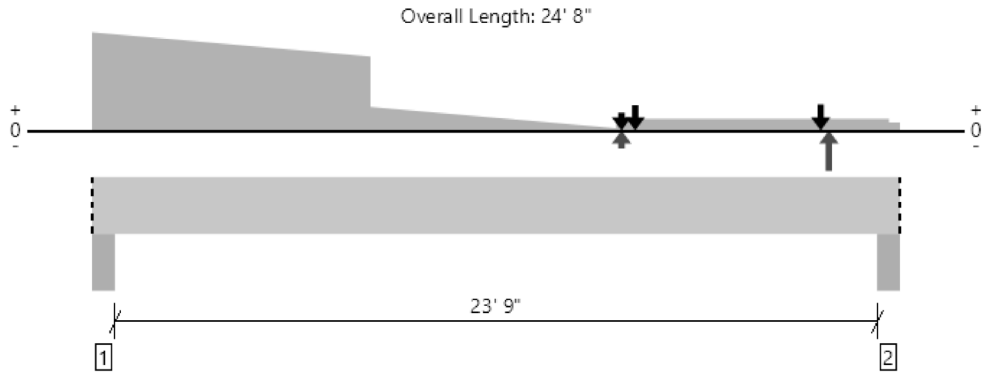
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Roof, RR-2 Alt

1 piece(s) 6 3/4" 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) [Group]
Member Reaction (lbs)	5599 @ 4"	24131 (5.50")	Passed (23%)	--	1.0 D + 1.0 S (All Spans) [1]
Shear (lbs)	4346 @ 22' 6"	24685	Passed (18%)	1.15	1.0 D + 1.0 S (All Spans) [1]
Pos Moment (Ft-lbs)	21160 @ 8' 9 1/4"	77278	Passed (27%)	1.15	1.0 D + 1.0 S (All Spans) [1]
Live Load Defl. (in)	0.156 @ 11' 6 3/8"	1.200	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans) [1]
Total Load Defl. (in)	0.366 @ 11' 8 7/8"	1.600	Passed (L/787)	--	1.0 D + 1.0 S (All Spans) [1]

System : Roof
Member Type : Drop Beam
Building Use : Residential
Building Code : IBC 2015
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.
- Critical positive moment adjusted by a volume factor of 0.92 that was calculated using length L = 24'.
- 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	Snow	Total	
1 - Column - DF	5.50"	5.50"	1.50"	3011	2589	5600	Blocking
2 - Column - DF	5.50"	5.50"	1.50"	1142	-454	1142/-454	Blocking

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

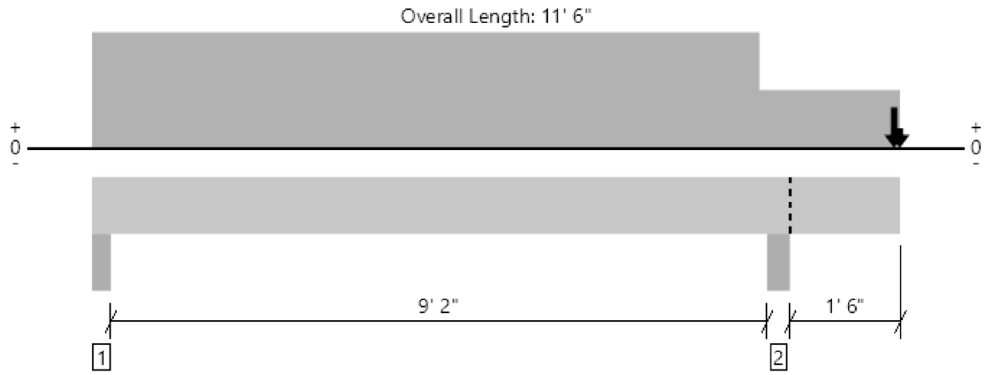
Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	24' 8" o/c	
Bottom Edge (Lu)	24' 8" o/c	

•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)	0 to 24' 8"	N/A	29.5	--	
1 - Uniform (PLF)	0 to 8' 6" (Back)	N/A	186.0	180.8	Linked from: RJ-1, Support 2
2 - Tapered (PSF)	0 to 16' (Front)	7' to 4"	24.0	25.0	roof dead and snow load
3 - Uniform (PSF)	16' to 24' 8" (Front)	1' 4"	19.0	25.0	roof dead and snow
4 - Uniform (PSF)	16' to 24' 4" (Top)	2'	12.0	-	pony wall
5 - Point (lb)	22' 6" (Back)	N/A	-1226	-2570	Linked from: B-6, Support 1
6 - Point (lb)	22' 3" (Back)	N/A	654	774	Linked from: VB-5, Support 2
7 - Point (lb)	16' 2" (Front)	N/A	-22	39/-109	Linked from: VB-2-Alt, Support 3
8 - Point (lb)	16' 7" (Front)	N/A	610	697	Linked from: B-4, Support 2

Roof, RR-5

1 piece(s) 5 1/8" 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)	8485 @ 9' 9 1/4"	18322 (5.50")	Passed (46%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	3855 @ 11'	12495	Passed (31%)	1.15	1.0 D + 1.0 S (All Spans)
Pos Moment (Ft-lbs)	6125 @ 4' 3 9/16"	28290	Passed (22%)	1.15	1.0 D + 1.0 S (Alt Spans)
Neg Moment (Ft-lbs)	-6629 @ 9' 9 1/4"	28290	Passed (23%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.039 @ 4' 9 7/8"	0.476	Passed (L/999+)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.067 @ 4' 8 1/16"	0.635	Passed (L/999+)	--	1.0 D + 1.0 S (Alt Spans)

System : Roof
Member Type : Drop Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD
Member Pitch : 0/12

- 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.
- Critical positive moment adjusted by a volume factor of 1.00 that was calculated using length L = 8' 1 1/8".
- Critical negative moment adjusted by a volume factor of 1.00 that was calculated using length L = 3' 7 1/8".
- 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	Snow	Total	
1 - Trimmer - DF	4.50"	4.50"	1.50"	1567	1648	3215	None
2 - Column - DF	5.50"	5.50"	2.55"	4463	4023	8486	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)	11' 6" 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 11' 6"	N/A	14.9	--	
1 - Uniform (PLF)	0 to 9' 6" (Back)	N/A	186.0	180.8	Linked from: RJ-1, Support 2
2 - Uniform (PLF)	0 to 11' 6" (Front)	N/A	186.0	180.8	Linked from: RJ-1, Support 2
3 - Point (lb)	11' 5" (Front)	N/A	1759	1568	Linked from: HB-1, Support 2
4 - Point (lb)	11' 6" (Back)	N/A	193	144	Linked from: VB-4, Support 2

Weyerhaeuser Notes

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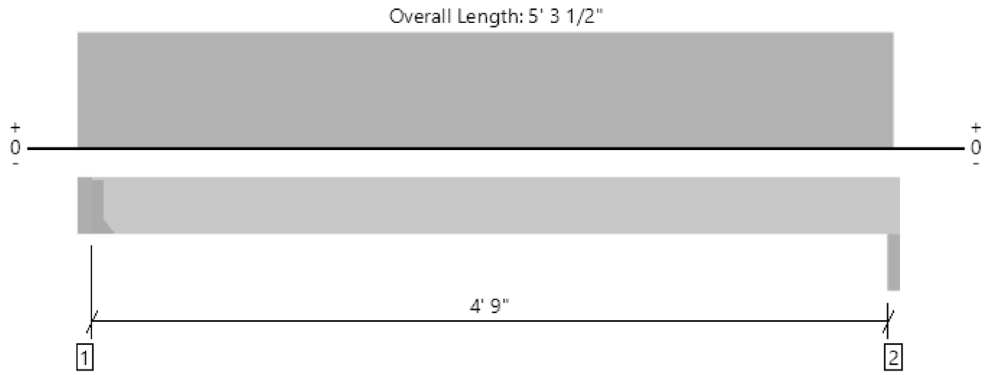
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Mario D. Alvarado Jr. Quantum Consulting Engineers (206) 957-3904 malvarado@quantumce.com	

Weyerhaeuser

Roof, B-10

1 piece(s) 4 x 12 DF 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)	579 @ 3 1/2"	3281 (1.50")	Passed (18%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	356 @ 1' 2 3/4"	5434	Passed (7%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	705 @ 2' 8 3/4"	7004	Passed (10%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.002 @ 2' 8 3/4"	0.244	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.005 @ 2' 8 3/4"	0.325	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)

System : Roof
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD
Member Pitch : 0/12

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Hanger on 11 1/4" DF beam	3.50"	Hanger[1]	1.50"	341	304	645	See note [1]
2 - Trimmer - DF	3.00"	3.00"	1.50"	318	281	599	None

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	5' o/c	
Bottom Edge (Lu)	5' 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	LUS48	2.00"	N/A	6-10dx1.5	4-10d	

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	3 1/2" to 5' 3 1/2"	N/A	10.0	--	
1 - Uniform (PLF)	0 to 5' 3" (Top)	N/A	116.0	111.5	Linked from: RJ-4, Support 1

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ForteWEB Software Operator	Job Notes
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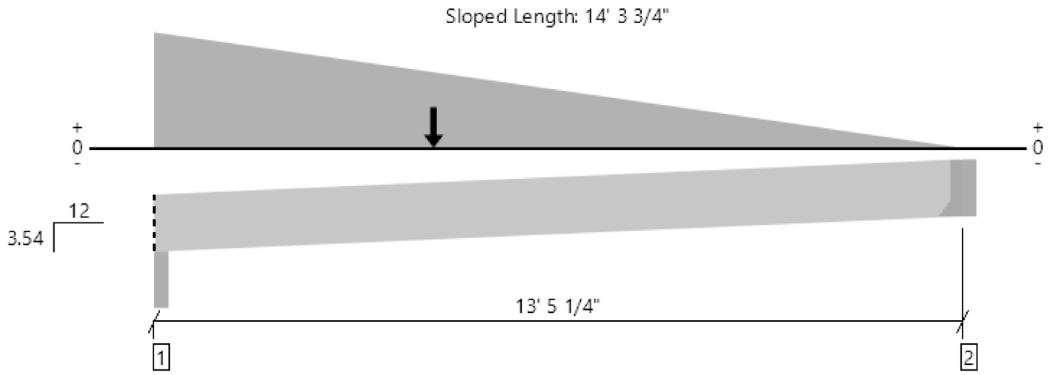
Weyerhaeuser

Roof, VB-3

1 piece(s) 4 x 12 DF No.2



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

Member Length : 14' 3 7/16"

System : Roof
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD
Member Pitch : 3.54/12

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	2046 @ 2"	5206 (3.50")	Passed (39%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1644 @ 1' 2 5/16"	5434	Passed (30%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	5857 @ 4' 9 5/8"	7004	Passed (84%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.131 @ 6' 5 5/8"	0.692	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.283 @ 6' 5 13/16"	0.922	Passed (L/586)	--	1.0 D + 1.0 S (All Spans)

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Beveled Plate - SPF	3.50"	3.50"	1.50"	1086	960	2046	Blocking
2 - Hanger on 11 1/4" SPF beam	3.50"	Hanger[1]	1.50"	568	472	1040	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' o/c	
Bottom Edge (Lu)	14' o/c	

•Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-Tie

Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
2 - Face Mount Hanger	LSSR410Z	1.88"	N/A	22-16dx2.5	18-16dx2.5	

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 13' 5 1/4"	N/A	10.0	--	
1 - Tapered (PLF)	0 to 13' 5 1/4"	N/A	167.5 to 0.0	167.9 to 0.0	Generated from Roof Geometry
2 - Point (lb)	4' 9"	N/A	341	304	Linked from: B-10, 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
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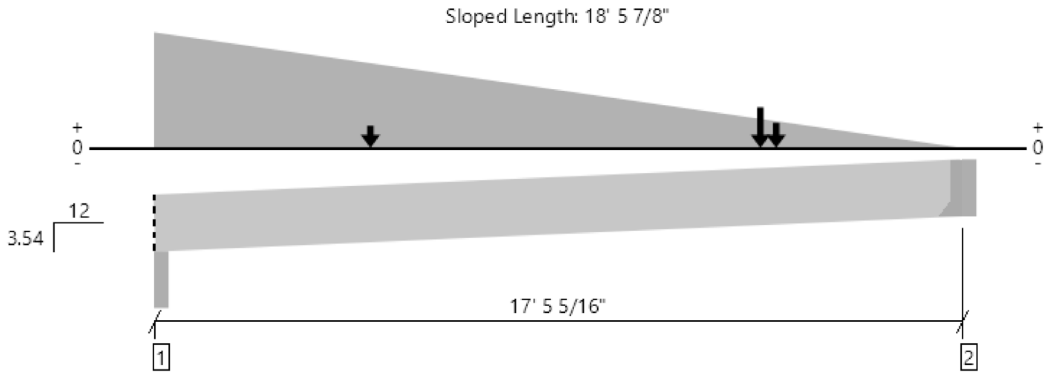
Weyerhaeuser

Roof, VB-6

1 piece(s) 5 1/8" 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.

Member Length : 18' 5 3/4"

System : Roof
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD
Member Pitch : 3.54/12

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	4796 @ 17' 5 5/16"	4997 (1.50")	Passed (96%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	4770 @ 16' 5 13/16"	12495	Passed (38%)	1.15	1.0 D + 1.0 S (All Spans)
Pos Moment (Ft-lbs)	19894 @ 11' 6 1/8"	28290	Passed (70%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.427 @ 9' 1 3/16"	0.901	Passed (L/506)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.892 @ 9' 1"	1.201	Passed (L/242)	--	1.0 D + 1.0 S (All Spans)

- Deflection criteria: LL (L/240) and TL (L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Critical positive moment adjusted by a volume factor of 1.00 that was calculated using length L = 18' 1/8".
- 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	Snow	Total	
1 - Beveled Plate - SPF	3.50"	3.50"	1.95"	2236	2019	4255	Blocking
2 - Hanger on 12" SPF beam	3.50"	Hanger[1]	1.50"	2489	2307	4796	See note [1]

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	18' 2" o/c	
Bottom Edge (Lu)	18' 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	Connector not found	N/A	N/A	N/A	N/A	

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

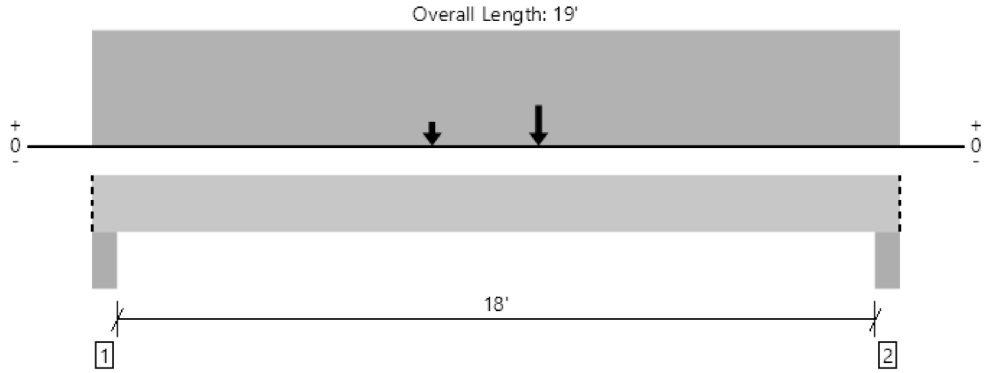
Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 17' 5 5/16"	N/A	14.9	--	
1 - Tapered (PLF)	0 to 17' 5 5/16"	N/A	217.5 to 0.0	218.0 to 0.0	Generated from Roof Geometry
2 - Point (lb)	4' 9"	N/A	341	304	Linked from: B-10, Support 1
3 - Point (lb)	13' 2"	N/A	1567	1648	Linked from: RR-5, Support 1
4 - Point (lb)	13' 6"	N/A	568	472	Linked from: VB-3, Support 2

ForteWEB Software Operator	Job Notes
Mario D. Alvarado Jr. Quantum Consulting Engineers (206) 957-3904 malvarado@quantumce.com	

Weyerhaeuser

Roof, B-9- Alt

1 piece(s) 6 3/4" 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)	6820 @ 18' 7 1/2"	26325 (6.00")	Passed (26%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	6697 @ 17'	24685	Passed (27%)	1.15	1.0 D + 1.0 S (All Spans)
Pos Moment (Ft-lbs)	53195 @ 10' 6"	79424	Passed (67%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.202 @ 9' 7 5/16"	0.913	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.461 @ 9' 7 5/16"	1.217	Passed (L/475)	--	1.0 D + 1.0 S (All Spans)

System : Roof
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD
Member Pitch : 0/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Critical positive moment adjusted by a volume factor of 0.95 that was calculated using length L = 18' 3".
- 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	Roof Live	Snow	Total	
1 - Column - DF	6.00"	6.00"	1.50"	3681	380	2683	6744	Blocking
2 - Column - DF	6.00"	6.00"	1.55"	3932	380	2888	7200	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)	End Bearing Points	
Bottom Edge (Lu)	End Bearing Points	

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Roof Live (non-snow: 1.25)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 19'	N/A	29.5	--	--	
1 - Uniform (PSF)	0 to 19' (Front)	4'	8.0	10.0	-	ceiling load
2 - Point (lb)	8' (Top)	N/A	1659	-	1482	Linked from: VB-2-Alt, Support 2
3 - Point (lb)	10' 6" (Top)	N/A	4785	-	4089	Linked from: RR-1-Alt, Support 2

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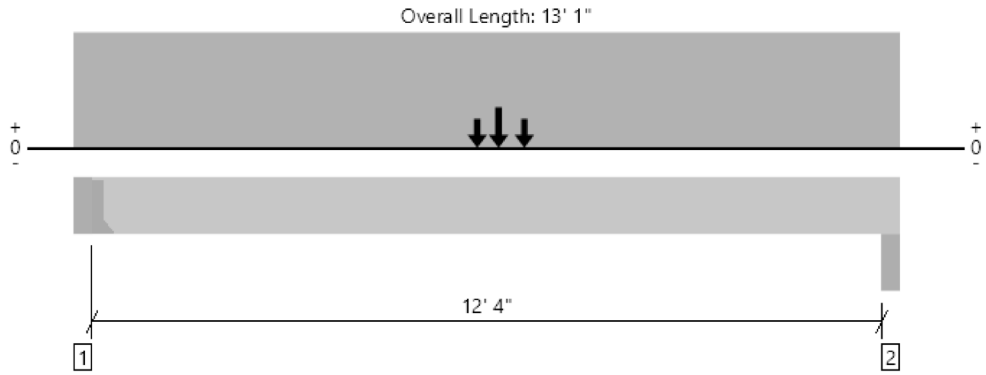
Roof, B-11

1 piece(s) 5 1/2" x 12" 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)	3452 @ 4 1/2"	5363 (1.50")	Passed (64%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	3181 @ 1' 4 1/2"	13409	Passed (24%)	1.15	1.0 D + 1.0 S (All Spans)
Pos Moment (Ft-lbs)	15863 @ 6' 7"	30360	Passed (52%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.127 @ 6' 7 1/4"	0.623	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.275 @ 6' 7 1/4"	0.831	Passed (L/544)	--	1.0 D + 1.0 S (All Spans)

System : Roof
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
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.
- Critical positive moment adjusted by a volume factor of 1.00 that was calculated using length L = 12' 5 1/2".
- 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 - Hanger on 12" DF beam	4.50"	Hanger[1]	1.50"	1908	1640	3548	See note [1]
2 - Trimmer - DF	4.50"	4.50"	1.50"	1897	1625	3522	None

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	12' 9" o/c	
Bottom Edge (Lu)	12' 9" o/c	

•Maximum allowable bracing intervals based on applied load.

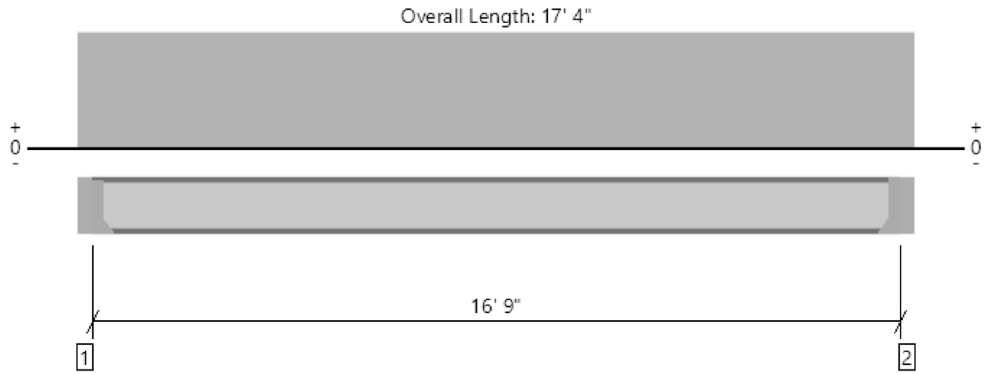
Connector: Simpson Strong-Tie						
Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
1 - Face Mount Hanger	HU612	2.50"	N/A	22-16d	8-16d	

- 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)	4 1/2" to 13' 1"	N/A	16.0	--	
1 - Uniform (PSF)	0 to 13' 1" (Top)	5'	26.0	25.0	roof dead and snow load
2 - Point (lb)	6' 3" (Front)	N/A	568	472	Linked from: VB-3, Support 2
3 - Point (lb)	7' (Front)	N/A	568	472	Linked from: VB-3, Support 2
4 - Point (lb)	6' 7" (Front)	N/A	764	686	Linked from: RR-5, Support 2

Roof, RJ-8B

1 piece(s) 11 7/8" TJI® 210 @ 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)	547 @ 3 1/2"	1156 (1.75")	Passed (47%)	1.15	1.0 D + 1.0 S (All Spans)
Shear (lbs)	547 @ 3 1/2"	1903	Passed (29%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	2291 @ 8' 8"	4364	Passed (53%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.250 @ 8' 8"	0.838	Passed (L/804)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.409 @ 8' 8"	1.117	Passed (L/492)	--	1.0 D + 1.0 S (All Spans)

System : Roof
Member Type : Joist
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD
Member Pitch : 0.25/12

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Hanger on 11 7/8" GLB beam	3.50"	Hanger[1]	1.75" / 1.75" [2]	220	347	567	See note [1]
2 - Hanger on 11 7/8" HF beam	3.50"	Hanger[1]	1.75" / 1.75" [2]	220	347	567	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.
- [2] Required Bearing Length / Required Bearing Length with Web Stiffeners

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	4' 10" o/c	
Bottom Edge (Lu)	16' 9" o/c	

- TJI joists are only analyzed using Maximum Allowable bracing solutions.
- 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	IUS2.06/11.88	2.00"	N/A	10-10dx1.5	2-Strong-Grip	
2 - Face Mount Hanger	IUS2.06/11.88	2.00"	N/A	10-10dx1.5	2-Strong-Grip	

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

Vertical Load	Location	Spacing	Dead (0.90)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 17' 4"	16"	19.0	30.0	flat roof dead and snow load

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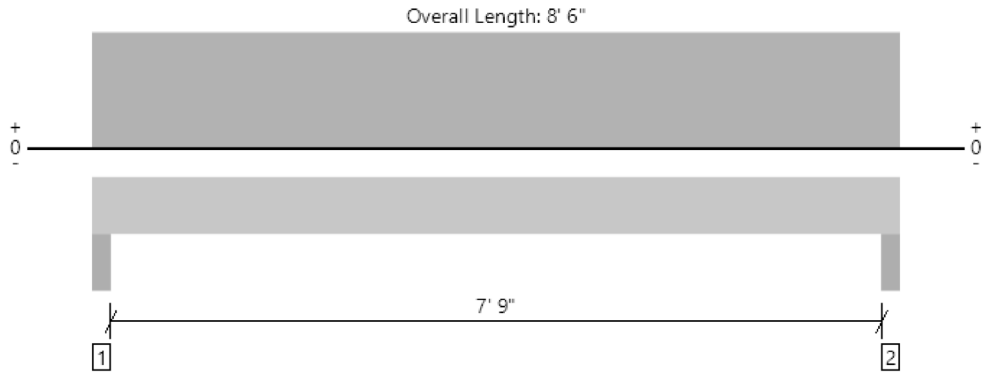
Mario D. Alvarado Jr. Quantum Consulting Engineers (206) 957-3904 malvarado@quantumce.com	

Weyerhaeuser

Headers, H-1

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



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	2084 @ 3"	15469 (4.50")	Passed (13%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1512 @ 1' 2"	6810	Passed (22%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	3922 @ 4' 3"	10703	Passed (37%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.032 @ 4' 3"	0.267	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.072 @ 4' 3"	0.400	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)

System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2015
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	Snow	Total	
1 - Trimmer - HF	4.50"	4.50"	1.50"	1146	937	2083	None
2 - Trimmer - HF	4.50"	4.50"	1.50"	1146	937	2083	None

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 8' 6"	N/A	13.2	--	
1 - Uniform (PSF)	0 to 8' 6"	1' 6"	18.0	-	ext. stucco wall
2 - Uniform (PLF)	0 to 8' 6"	N/A	229.5	220.5	Linked from: RJ-1, Support 1

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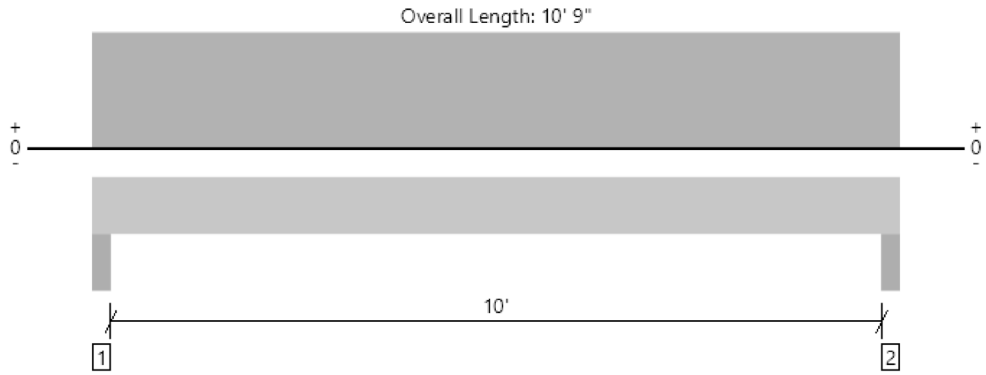
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Mario D. Alvarado Jr. Quantum Consulting Engineers (206) 957-3904 malvarado@quantumce.com	

Weyerhaeuser

Headers, H-2

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



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1797 @ 3"	15469 (4.50")	Passed (12%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1407 @ 1' 2"	6810	Passed (21%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	4389 @ 5' 4 1/2"	10703	Passed (41%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.059 @ 5' 4 1/2"	0.342	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.132 @ 5' 4 1/2"	0.512	Passed (L/932)	--	1.0 D + 1.0 S (All Spans)

System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2015
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	Snow	Total	
1 - Trimmer - HF	4.50"	4.50"	1.50"	990	806	1796	None
2 - Trimmer - HF	4.50"	4.50"	1.50"	990	806	1796	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	10' 9" o/c	
Bottom Edge (Lu)	10' 9" 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 10' 9"	N/A	13.2	--	
1 - Uniform (PSF)	0 to 10' 9"	1' 6"	18.0	-	ext. stucco wall
2 - Uniform (PSF)	0 to 10' 9"	6'	24.0	25.0	roof dead and snow load

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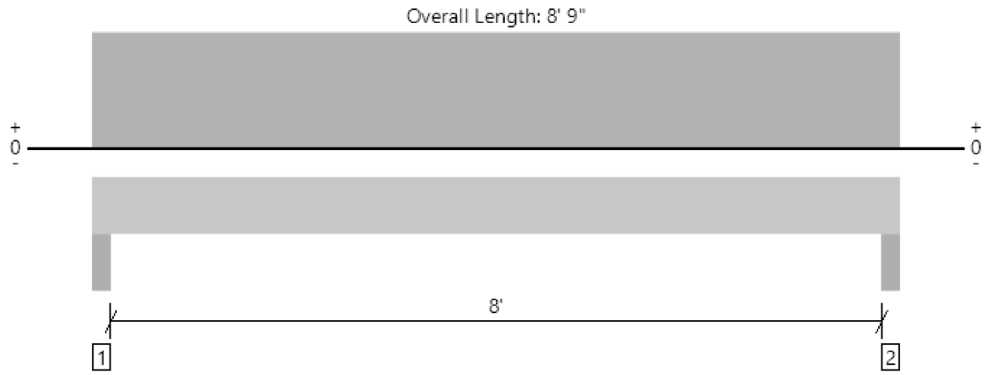
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Headers, H-3

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



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	2145 @ 3"	15469 (4.50")	Passed (14%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1573 @ 1' 2"	6810	Passed (23%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	4171 @ 4' 4 1/2"	10703	Passed (39%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.037 @ 4' 4 1/2"	0.275	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.081 @ 4' 4 1/2"	0.412	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)

System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2015
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	Snow	Total	
1 - Trimmer - HF	4.50"	4.50"	1.50"	1180	965	2145	None
2 - Trimmer - HF	4.50"	4.50"	1.50"	1180	965	2145	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)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 8' 9"	N/A	13.2	--	
1 - Uniform (PSF)	0 to 8' 9"	1' 6"	18.0	-	ext. stucco wall
2 - Uniform (PLF)	0 to 8' 9"	N/A	229.5	220.5	Linked from: RJ-1, Support 1

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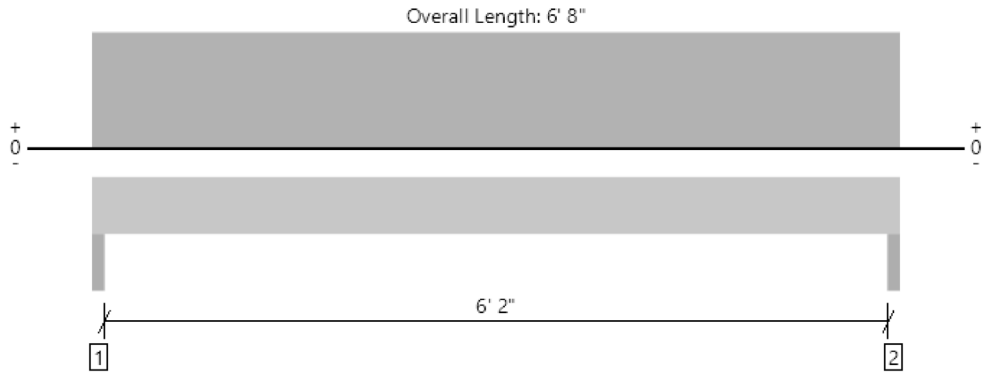
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Mario D. Alvarado Jr. Quantum Consulting Engineers (206) 957-3904 malvarado@quantumce.com	

Weyerhaeuser

Headers, H-4

1 piece(s) 4 x 10 DF 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)	961 @ 1 1/2"	6563 (3.00")	Passed (15%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	666 @ 1' 1/4"	4468	Passed (15%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	1483 @ 3' 4"	5166	Passed (29%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.010 @ 3' 4"	0.214	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.030 @ 3' 4"	0.321	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)

System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2015
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	Roof Live	Snow	Total	
1 - Trimmer - HF	3.00"	3.00"	1.50"	627	133	333	1093	None
2 - Trimmer - HF	3.00"	3.00"	1.50"	627	133	333	1093	None

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Roof Live (non-snow: 1.25)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 6' 8"	N/A	8.2	--	--	
1 - Uniform (PSF)	0 to 6' 8"	6'	8.0	-	-	pony wall
2 - Uniform (PSF)	0 to 6' 8"	4'	25.0	-	25.0	roof dead and snow load
3 - Uniform (PSF)	0 to 6' 8"	4'	8.0	10.0	-	ceiling load

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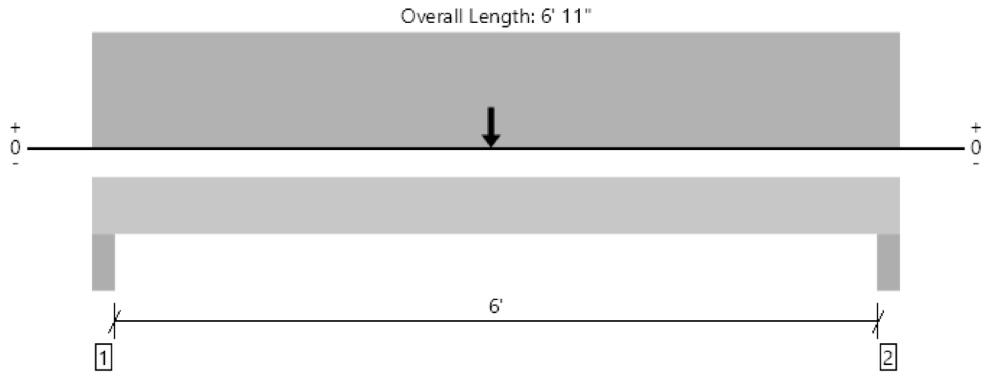
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Headers, H-5

1 piece(s) 6 3/4" x 15" 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)	10758 @ 4"	24131 (5.50")	Passed (45%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	10395 @ 1' 8 1/2"	20571	Passed (51%)	1.15	1.0 D + 1.0 S (All Spans)
Pos Moment (Ft-lbs)	31942 @ 3' 5"	58219	Passed (55%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.025 @ 3' 5 3/8"	0.208	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.053 @ 3' 5 3/8"	0.313	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)

System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Critical positive moment adjusted by a volume factor of 1.00 that was calculated using length L = 6' 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	Total	
1 - Trimmer - HF	5.50"	5.50"	2.45"	5849	346	4910	11105	None
2 - Trimmer - HF	5.50"	5.50"	2.39"	5714	346	4780	10840	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	6' 11" o/c	
Bottom Edge (Lu)	6' 11" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Roof Live (non-snow: 1.25)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 6' 11"	N/A	24.6	--	--	
1 - Uniform (PSF)	0 to 6' 11"	6'	18.0	-	-	ext stucco wall
2 - Uniform (PSF)	0 to 6' 11"	10'	8.0	10.0	-	ceiling joists
3 - Point (lb)	3' 5"	N/A	10092	-	9690	Linked from: B-2, Support 1

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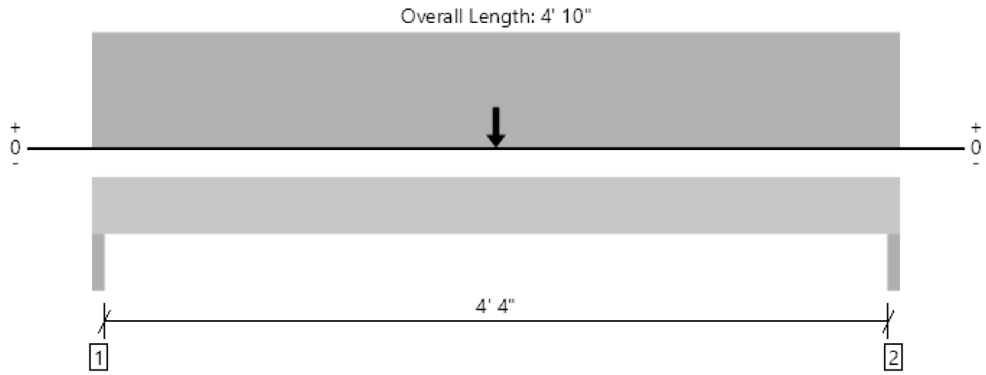
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Mario D. Alvarado Jr. Quantum Consulting Engineers (206) 957-3904 malvarado@quantumce.com	

Weyerhaeuser

Headers, H-7

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



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	3055 @ 1 1/2"	10313 (3.00")	Passed (30%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	2822 @ 1' 1/2"	6810	Passed (41%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	6349 @ 2' 5"	10703	Passed (59%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.014 @ 2' 5"	0.153	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.031 @ 2' 5"	0.229	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)

System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2015
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	Roof Live	Snow	Total	
1 - Trimmer - HF	3.00"	3.00"	1.50"	1691	97	1365	3153	None
2 - Trimmer - HF	3.00"	3.00"	1.50"	1691	97	1365	3153	None

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Roof Live (non-snow: 1.25)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 4' 10"	N/A	13.2	--	--	
1 - Uniform (PSF)	0 to 4' 10"	4' 6"	12.0	-	-	pony wall
2 - Uniform (PSF)	0 to 4' 10"	2' 6"	25.0	-	25.0	roof dead and snow load
3 - Point (lb)	2' 5"	N/A	2600	-	2427	Linked from: RR-3, Support 2
4 - Uniform (PSF)	0 to 4' 10"	4'	8.0	10.0	-	ceiling joists

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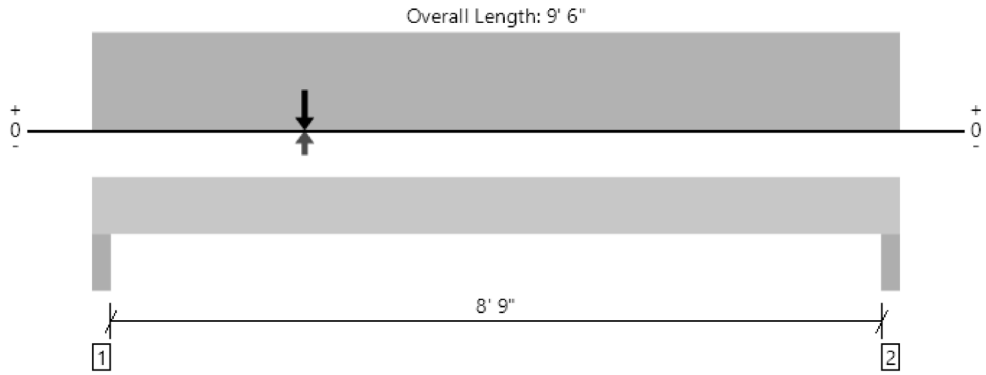
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Headers, H-9

1 piece(s) 5 1/8" x 12" 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)	5386 @ 3"	14991 (4.50")	Passed (36%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	3976 @ 1' 4 1/2"	12495	Passed (32%)	1.15	1.0 D + 1.0 S (All Spans)
Pos Moment (Ft-lbs)	11169 @ 4' 7"	28290	Passed (39%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.051 @ 4' 9 3/4"	0.300	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.123 @ 4' 8 5/8"	0.450	Passed (L/876)	--	1.0 D + 1.0 S (All Spans)

System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Critical positive moment adjusted by a volume factor of 1.00 that was calculated using length L = 9'.
- 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	Total	
1 - Trimmer - HF	4.50"	4.50"	1.62"	3284	475	2102	5861	None
2 - Trimmer - HF	4.50"	4.50"	1.51"	2713	475	2329	5517	None

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Roof Live (non-snow: 1.25)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 9' 6"	N/A	14.9	--	--	
1 - Uniform (PSF)	0 to 9' 6"	6'	12.0	-	-	pony wall
2 - Uniform (PSF)	0 to 9' 6"	2'	25.0	-	25.0	roof dead and snow load
3 - Uniform (PSF)	0 to 9' 6"	10'	8.0	10.0	-	ceiling joists
4 - Uniform (PLF)	0 to 9' 6"	N/A	294.0	-	464.3	Linked from: RJ-9, Support 2
5 - Point (lb)	2' 6"	N/A	1142	-	-454	Linked from: RR-2 Alt, 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
Mario D. Alvarado Jr. Quantum Consulting Engineers (206) 957-3904 malvarado@quantumce.com	

Weyerhaeuser

Posts, P-1

1 piece(s) 4 x 6 DF No.2

Post Height: 6'

Drawing is Conceptual

Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	21	50	Passed (41%)	--	--
Compression (lbs)	5748	17618	Passed (33%)	1.15	1.0 D + 1.0 S
Base Bearing (lbs)	5748	12513	Passed (46%)	--	1.0 D + 1.0 S
Bending/Compression	N/A	1	Passed (N/A)	--	N/A

- Input axial load eccentricity for the design is zero
- Applicable calculations are based on NDS.

Supports	Type	Material
Base	Beam	Glulam

Max Unbraced Length	Comments
Full Member Length	No bracing assumed.

Member Type : Free Standing Post
Building Code : IBC 2015
Design Methodology : ASD

Vertical Loads	Dead (0.90)	Snow (1.15)	Comments
1 - Point (lb)	1908	1664	Linked from: B-1, Support 1
2 - Point (lb)	1187	989	Linked from: B-5, Support 2

Member Notes

p-1 supporting B-1 & B-5

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

Posts, P-2

1 piece(s) 6 x 8 DF No.1

Post Height: 6'

Drawing is Conceptual

Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	13	50	Passed (26%)	--	--
Compression (lbs)	19782	42453	Passed (47%)	1.15	1.0 D + 1.0 S
Base Bearing (lbs)	19782	26813	Passed (74%)	--	1.0 D + 1.0 S
Bending/Compression	N/A	1	Passed (N/A)	--	N/A

- Input axial load eccentricity for the design is zero
- Applicable calculations are based on NDS.

Supports	Type	Material
Base	Beam	Glulam

Max Unbraced Length	Comments
Full Member Length	No bracing assumed.

Member Type : Free Standing Post
Building Code : IBC 2015
Design Methodology : ASD

Vertical Load	Dead (0.90)	Snow (1.15)	Comments
1 - Point (lb)	10092	9690	Linked from: B-2, Support 1

Member Notes

p-2 supporting B-2

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Posts, P-4

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

Post Height: 10' 6"

Drawing is Conceptual

Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	23	50	Passed (46%)	--	--
Compression (lbs)	6820	21040	Passed (32%)	1.15	1.0 D + 1.0 S
Base Bearing (lbs)	6820	18906	Passed (36%)	--	1.0 D + 1.0 S
Bending/Compression	N/A	1	Passed (N/A)	--	N/A

- Input axial load eccentricity for the design is zero
- Applicable calculations are based on NDS.

Supports	Type	Material
Base	Plate	Douglas Fir-Larch

Max Unbraced Length	Comments
Full Member Length	No bracing assumed.

Member Type : Free Standing Post
Building Code : IBC 2015
Design Methodology : ASD

Vertical Load	Dead (0.90)	Roof Live (non-snow: 1.25)	Snow (1.15)	Comments
1 - Point (lb)	3932	380	2888	Linked from: B-9- Alt, Support 2

Member Notes

p-4 supporting B-9 Alt.

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

ForteWEB Software Operator	Job Notes
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Weyerhaeuser

Posts, P-5

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

Post Height: 15'

Drawing is Conceptual

Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	33	50	Passed (65%)	--	--
Compression (lbs)	4811	12158	Passed (40%)	1.15	1.0 D + 1.0 S
Base Bearing (lbs)	4811	18906	Passed (25%)	--	1.0 D + 1.0 S
Bending/Compression	N/A	1	Passed (N/A)	--	N/A

- Input axial load eccentricity for the design is zero
- Applicable calculations are based on NDS.

Supports	Type	Material
Base	Plate	Douglas Fir-Larch

Max Unbraced Length	Comments
Full Member Length	No bracing assumed.

Member Type : Free Standing Post
Building Code : IBC 2015
Design Methodology : ASD

Vertical Load	Dead (0.90)	Snow (1.15)	Comments
1 - Point (lb)	2520	2291	Linked from: RR-4, Support 1

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General Footing

Project File: Brindley res..ec6

DESCRIPTION: F2.5 at B-9 alt

Code References

Calculations per ACI 318-14, IBC 2018, CBC 2019, ASCE 7-16
Load Combinations Used : ASCE 7-16

General Information

Material Properties

f'c : Concrete 28 day strength	=	2.50	ksi
fy : Rebar Yield	=	40.0	ksi
Ec : Concrete Elastic Modulus	=	2,850.0	ksi
Concrete Density	=	145.0	pcf
φ Values Flexure	=	0.90	
Shear	=	0.750	

Analysis Settings

Min Steel % Bending Reinf.	=	
Min Allow % Temp Reinf.	=	0.00180
Min. Overturning Safety Factor	=	1.0 : 1
Min. Sliding Safety Factor	=	1.0 : 1
Add Ftg Wt for Soil Pressure	:	Yes
Use ftg wt for stability, moments & shears	:	Yes
Add Pedestal Wt for Soil Pressure	:	Yes
Use Pedestal wt for stability, mom & shear	:	Yes

Soil Design Values

Allowable Soil Bearing	=	2.50	ksf
Soil Density	=	135.0	pcf
Increase Bearing By Footing Weight	=	No	
Soil Passive Resistance (for Sliding)	=	300.0	pcf
Soil/Concrete Friction Coeff.	=	0.50	

Increases based on footing Depth

Footing base depth below soil surface	=	1.50	ft
Allow press. increase per foot of depth	=		ksf
when footing base is below	=		ft

Increases based on footing plan dimension

Allowable pressure increase per foot of depth	=		ksf
when max. length or width is greater than	=		ft

Dimensions

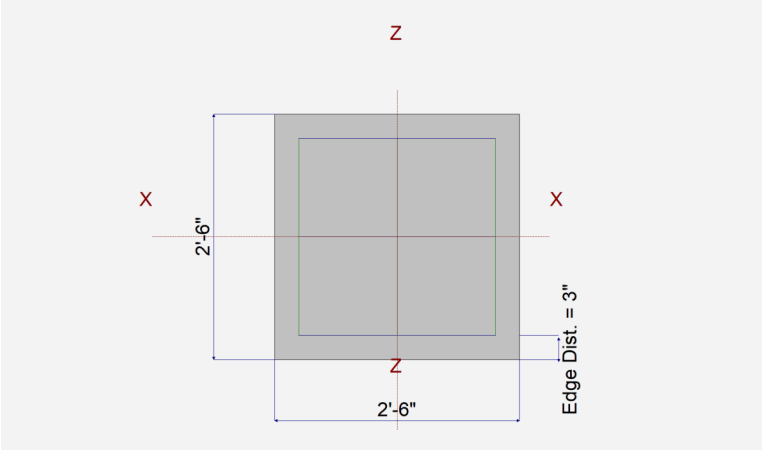
Width parallel to X-X Axis	=	2.50	ft
Length parallel to Z-Z Axis	=	2.50	ft
Footing Thickness	=	10.0	in

Pedestal dimensions...

px : parallel to X-X Axis	=	5.50	in
pz : parallel to Z-Z Axis	=	5.50	in
Height	=		in

Rebar Centerline to Edge of Concrete...

at Bottom of footing	=	3.0	in

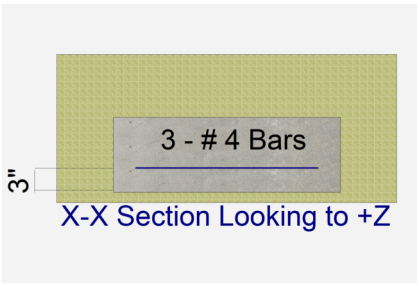


Reinforcing

Bars parallel to X-X Axis			
Number of Bars	=		3.0
Reinforcing Bar Size	=	#	4
Bars parallel to Z-Z Axis			
Number of Bars	=		3.0
Reinforcing Bar Size	=	#	4

Bandwidth Distribution Check (ACI 15.4.4.2)

Direction Requiring Closer Separation	n/a
# Bars required within zone	n/a
# Bars required on each side of zone	n/a



Applied Loads

		D	Lr	L	S	W	E	H	
P : Column Load	=	4.10	0.50		3.0				k
OB : Overburden	=	0.050							ksf
M-xx	=								k-ft
M-zz	=								k-ft
V-x	=								k
V-z	=								k

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General Footing

Project File: Brindley res..ec6

DESCRIPTION: F2.5 at B-9 alt

DESIGN SUMMARY

Design OK

	Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.5568	Soil Bearing	1.392 ksf	2.50 ksf	+D+S about Z-Z axis
PASS	n/a	Overturning - X-X	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Overturning - Z-Z	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Sliding - X-X	0.0 k	0.0 k	No Sliding
PASS	n/a	Sliding - Z-Z	0.0 k	0.0 k	No Sliding
PASS	n/a	Uplift	0.0 k	0.0 k	No Uplift
PASS	0.1646	Z Flexure (+X)	0.8074 k-ft/ft	4.904 k-ft/ft	+1.20D+1.60S
PASS	0.1646	Z Flexure (-X)	0.8074 k-ft/ft	4.904 k-ft/ft	+1.20D+1.60S
PASS	0.1646	X Flexure (+Z)	0.8074 k-ft/ft	4.904 k-ft/ft	+1.20D+1.60S
PASS	0.1646	X Flexure (-Z)	0.8074 k-ft/ft	4.904 k-ft/ft	+1.20D+1.60S
PASS	0.1107	1-way Shear (+X)	8.301 psi	75.0 psi	+1.20D+1.60S
PASS	0.1107	1-way Shear (-X)	8.301 psi	75.0 psi	+1.20D+1.60S
PASS	0.1107	1-way Shear (+Z)	8.301 psi	75.0 psi	+1.20D+1.60S
PASS	0.1107	1-way Shear (-Z)	8.301 psi	75.0 psi	+1.20D+1.60S
PASS	0.1519	2-way Punching	22.790 psi	150.0 psi	+1.20D+1.60S

Detailed Results

Soil Bearing

Rotation Axis & Load Combination...	Gross Allowable	Xecc (in)	Zecc (in)	Actual Soil Bearing Stress @ Location Bottom, -Z	Top, +Z	Left, -X	Right, +X	Actual / Allow Ratio
X-X, D Only	2.50	n/a	0.0	0.9121	0.9121	n/a	n/a	0.365
X-X, +D+Lr	2.50	n/a	0.0	0.9921	0.9921	n/a	n/a	0.397
X-X, +D+S	2.50	n/a	0.0	1.392	1.392	n/a	n/a	0.557
X-X, +D+0.750Lr	2.50	n/a	0.0	0.9721	0.9721	n/a	n/a	0.389
X-X, +D+0.750S	2.50	n/a	0.0	1.272	1.272	n/a	n/a	0.509
X-X, +0.60D	2.50	n/a	0.0	0.5473	0.5473	n/a	n/a	0.219
Z-Z, D Only	2.50	0.0	n/a	n/a	n/a	0.9121	0.9121	0.365
Z-Z, +D+Lr	2.50	0.0	n/a	n/a	n/a	0.9921	0.9921	0.397
Z-Z, +D+S	2.50	0.0	n/a	n/a	n/a	1.392	1.392	0.557
Z-Z, +D+0.750Lr	2.50	0.0	n/a	n/a	n/a	0.9721	0.9721	0.389
Z-Z, +D+0.750S	2.50	0.0	n/a	n/a	n/a	1.272	1.272	0.509
Z-Z, +0.60D	2.50	0.0	n/a	n/a	n/a	0.5473	0.5473	0.219

Overturning Stability

Rotation Axis & Load Combination...	Overturning Moment	Resisting Moment	Stability Ratio	Status
Footing Has NO Overturning				

All units k

Sliding Stability

Force Application Axis Load Combination...	Sliding Force	Resisting Force	Stability Ratio	Status
Footing Has NO Sliding				

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
X-X, +1.40D	0.4751	+Z	Bottom	0.2160	AsMin	0.240	4.904	OK
X-X, +1.40D	0.4751	-Z	Bottom	0.2160	AsMin	0.240	4.904	OK
X-X, +1.20D+0.50Lr	0.4281	+Z	Bottom	0.2160	AsMin	0.240	4.904	OK
X-X, +1.20D+0.50Lr	0.4281	-Z	Bottom	0.2160	AsMin	0.240	4.904	OK
X-X, +1.20D+0.50S	0.5323	+Z	Bottom	0.2160	AsMin	0.240	4.904	OK
X-X, +1.20D+0.50S	0.5323	-Z	Bottom	0.2160	AsMin	0.240	4.904	OK
X-X, +1.20D+1.60Lr	0.4739	+Z	Bottom	0.2160	AsMin	0.240	4.904	OK
X-X, +1.20D+1.60Lr	0.4739	-Z	Bottom	0.2160	AsMin	0.240	4.904	OK
X-X, +1.20D+1.60S	0.8074	+Z	Bottom	0.2160	AsMin	0.240	4.904	OK
X-X, +1.20D+1.60S	0.8074	-Z	Bottom	0.2160	AsMin	0.240	4.904	OK
X-X, +0.90D	0.3054	+Z	Bottom	0.2160	AsMin	0.240	4.904	OK
X-X, +0.90D	0.3054	-Z	Bottom	0.2160	AsMin	0.240	4.904	OK
X-X, +1.436D+0.20S	0.5373	+Z	Bottom	0.2160	AsMin	0.240	4.904	OK

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General Footing

Project File: Brindley res..ec6

DESCRIPTION: F2.5 at B-9 alt

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
X-X, +1.436D+0.20S	0.5373	-Z	Bottom	0.2160	AsMin	0.240	4.904	OK
X-X, +0.6640D	0.2253	+Z	Bottom	0.2160	AsMin	0.240	4.904	OK
X-X, +0.6640D	0.2253	-Z	Bottom	0.2160	AsMin	0.240	4.904	OK
Z-Z, +1.40D	0.4751	-X	Bottom	0.2160	AsMin	0.240	4.904	OK
Z-Z, +1.40D	0.4751	+X	Bottom	0.2160	AsMin	0.240	4.904	OK
Z-Z, +1.20D+0.50Lr	0.4281	-X	Bottom	0.2160	AsMin	0.240	4.904	OK
Z-Z, +1.20D+0.50Lr	0.4281	+X	Bottom	0.2160	AsMin	0.240	4.904	OK
Z-Z, +1.20D+0.50S	0.5323	-X	Bottom	0.2160	AsMin	0.240	4.904	OK
Z-Z, +1.20D+0.50S	0.5323	+X	Bottom	0.2160	AsMin	0.240	4.904	OK
Z-Z, +1.20D+1.60Lr	0.4739	-X	Bottom	0.2160	AsMin	0.240	4.904	OK
Z-Z, +1.20D+1.60Lr	0.4739	+X	Bottom	0.2160	AsMin	0.240	4.904	OK
Z-Z, +1.20D+1.60S	0.8074	-X	Bottom	0.2160	AsMin	0.240	4.904	OK
Z-Z, +1.20D+1.60S	0.8074	+X	Bottom	0.2160	AsMin	0.240	4.904	OK
Z-Z, +0.90D	0.3054	-X	Bottom	0.2160	AsMin	0.240	4.904	OK
Z-Z, +0.90D	0.3054	+X	Bottom	0.2160	AsMin	0.240	4.904	OK
Z-Z, +1.436D+0.20S	0.5373	-X	Bottom	0.2160	AsMin	0.240	4.904	OK
Z-Z, +1.436D+0.20S	0.5373	+X	Bottom	0.2160	AsMin	0.240	4.904	OK
Z-Z, +0.6640D	0.2253	-X	Bottom	0.2160	AsMin	0.240	4.904	OK
Z-Z, +0.6640D	0.2253	+X	Bottom	0.2160	AsMin	0.240	4.904	OK

One Way Shear

Load Combination...	Vu @ -X	Vu @ +X	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	4.89 psi	4.89 psi	4.89 psi	4.89 psi	4.89 psi	75.00 psi	0.07	OK
+1.20D+0.50Lr	4.40 psi	4.40 psi	4.40 psi	4.40 psi	4.40 psi	75.00 psi	0.06	OK
+1.20D+0.50S	5.47 psi	5.47 psi	5.47 psi	5.47 psi	5.47 psi	75.00 psi	0.07	OK
+1.20D+1.60Lr	4.87 psi	4.87 psi	4.87 psi	4.87 psi	4.87 psi	75.00 psi	0.06	OK
+1.20D+1.60S	8.30 psi	8.30 psi	8.30 psi	8.30 psi	8.30 psi	75.00 psi	0.11	OK
+0.90D	3.14 psi	3.14 psi	3.14 psi	3.14 psi	3.14 psi	75.00 psi	0.04	OK
+1.436D+0.20S	5.53 psi	5.53 psi	5.53 psi	5.53 psi	5.53 psi	75.00 psi	0.07	OK
+0.6640D	2.32 psi	2.32 psi	2.32 psi	2.32 psi	2.32 psi	75.00 psi	0.03	OK

Two-Way "Punching" Shear

All units k

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D	13.41 psi	150.00 psi	0.0894	OK
+1.20D+0.50Lr	12.08 psi	150.00 psi	0.08055	OK
+1.20D+0.50S	15.02 psi	150.00 psi	0.1002	OK
+1.20D+1.60Lr	13.38 psi	150.00 psi	0.08918	OK
+1.20D+1.60S	22.79 psi	150.00 psi	0.1519	OK
+0.90D	8.62 psi	150.00 psi	0.05747	OK
+1.436D+0.20S	15.17 psi	150.00 psi	0.1011	OK
+0.6640D	6.36 psi	150.00 psi	0.0424	OK

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General Footing

Project File: Brindley res..ec6

DESCRIPTION: F2.5 at H-1-covered terrace

Code References

Calculations per ACI 318-14, IBC 2018, CBC 2019, ASCE 7-16
Load Combinations Used : ASCE 7-16

General Information

Material Properties

f'c : Concrete 28 day strength	=	2.50	ksi
fy : Rebar Yield	=	40.0	ksi
Ec : Concrete Elastic Modulus	=	2,850.0	ksi
Concrete Density	=	145.0	pcf
φ Values Flexure	=	0.90	
Shear	=	0.750	

Analysis Settings

Min Steel % Bending Reinf.	=	
Min Allow % Temp Reinf.	=	0.00180
Min. Overturning Safety Factor	=	1.0 : 1
Min. Sliding Safety Factor	=	1.0 : 1
Add Ftg Wt for Soil Pressure	:	Yes
Use ftg wt for stability, moments & shears	:	Yes
Add Pedestal Wt for Soil Pressure	:	Yes
Use Pedestal wt for stability, mom & shear	:	Yes

Soil Design Values

Allowable Soil Bearing	=	2.50	ksf
Soil Density	=	135.0	pcf
Increase Bearing By Footing Weight	=	No	
Soil Passive Resistance (for Sliding)	=	300.0	pcf
Soil/Concrete Friction Coeff.	=	0.50	

Increases based on footing Depth

Footing base depth below soil surface	=	1.50	ft
Allow press. increase per foot of depth	=		ksf
when footing base is below	=		ft

Increases based on footing plan dimension

Allowable pressure increase per foot of depth	=		ksf
when max. length or width is greater than	=		ft

Dimensions

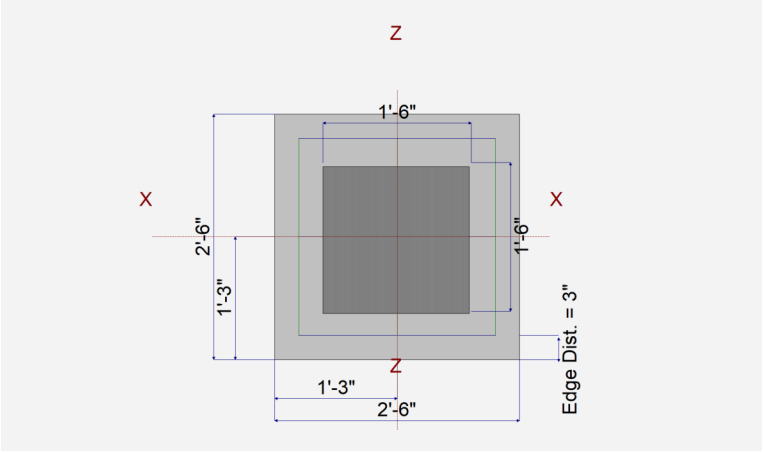
Width parallel to X-X Axis	=	2.50 ft
Length parallel to Z-Z Axis	=	2.50 ft
Footing Thickness	=	10.0 in

Pedestal dimensions...

px : parallel to X-X Axis	=	18.0 in
pz : parallel to Z-Z Axis	=	18.0 in
Height	=	20.0 in

Rebar Centerline to Edge of Concrete...

at Bottom of footing	=	3.0 in

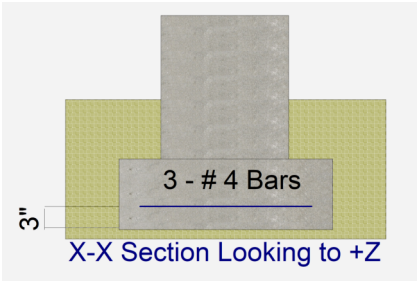


Reinforcing

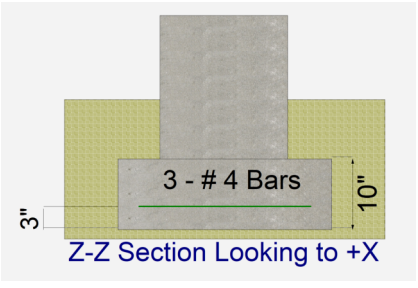
Bars parallel to X-X Axis			
Number of Bars	=		3.0
Reinforcing Bar Size	=	#	4
Bars parallel to Z-Z Axis			
Number of Bars	=		3.0
Reinforcing Bar Size	=	#	4

Bandwidth Distribution Check (ACI 15.4.4.2)

Direction Requiring Closer Separation	
	n/a
# Bars required within zone	n/a
# Bars required on each side of zone	n/a



X-X Section Looking to +Z



Z-Z Section Looking to +X

Applied Loads

		D	Lr	L	S	W	E	H	
P : Column Load	=	4.10			2.40				k
OB : Overburden	=	0.150							ksf
M-xx	=								k-ft
M-zz	=								k-ft
V-x	=								k
V-z	=								k

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General Footing

Project File: Brindley res..ec6

DESCRIPTION: F2.5 at H-1-covered terrace

DESIGN SUMMARY

Design OK

	Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.5604	Soil Bearing	1.401 ksf	2.50 ksf	+D+S about Z-Z axis
PASS	n/a	Overturning - X-X	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Overturning - Z-Z	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Sliding - X-X	0.0 k	0.0 k	No Sliding
PASS	n/a	Sliding - Z-Z	0.0 k	0.0 k	No Sliding
PASS	n/a	Uplift	0.0 k	0.0 k	No Uplift
PASS	0.03574	Z Flexure (+X)	0.1753 k-ft/ft	4.904 k-ft/ft	+1.20D+1.60S
PASS	0.03574	Z Flexure (-X)	0.1753 k-ft/ft	4.904 k-ft/ft	+1.20D+1.60S
PASS	0.03574	X Flexure (+Z)	0.1753 k-ft/ft	4.904 k-ft/ft	+1.20D+1.60S
PASS	0.03574	X Flexure (-Z)	0.1753 k-ft/ft	4.904 k-ft/ft	+1.20D+1.60S
PASS	n/a	1-way Shear (+X)	0.0 psi	75.0 psi	n/a
PASS	0.0	1-way Shear (-X)	0.0 psi	0.0 psi	n/a
PASS	n/a	1-way Shear (+Z)	0.0 psi	75.0 psi	n/a
PASS	n/a	1-way Shear (-Z)	0.0 psi	75.0 psi	n/a
PASS	n/a	2-way Punching	3.686 psi	75.0 psi	+1.20D+1.60S

Detailed Results

Soil Bearing

Rotation Axis & Load Combination...	Gross Allowable	Xecc (in)	Zecc (in)	Actual Soil Bearing Stress @ Location Bottom, -Z	Top, +Z	Left, -X	Right, +X	Actual / Allow Ratio
X-X, D Only	2.50	n/a	0.0	1.017	1.017	n/a	n/a	0.407
X-X, +D+S	2.50	n/a	0.0	1.401	1.401	n/a	n/a	0.560
X-X, +D+0.750S	2.50	n/a	0.0	1.305	1.305	n/a	n/a	0.522
X-X, +0.60D	2.50	n/a	0.0	0.6105	0.6105	n/a	n/a	0.244
Z-Z, D Only	2.50	0.0	n/a	n/a	n/a	1.017	1.017	0.407
Z-Z, +D+S	2.50	0.0	n/a	n/a	n/a	1.401	1.401	0.560
Z-Z, +D+0.750S	2.50	0.0	n/a	n/a	n/a	1.305	1.305	0.522
Z-Z, +0.60D	2.50	0.0	n/a	n/a	n/a	0.6105	0.6105	0.244

Overturning Stability

Rotation Axis & Load Combination...	Overturning Moment	Resisting Moment	Stability Ratio	Status
Footing Has NO Overturning				

Sliding Stability

All units k

Force Application Axis Load Combination...	Sliding Force	Resisting Force	Stability Ratio	Status
Footing Has NO Sliding				

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
X-X, +1.40D	0.1149	+Z	Bottom	0.2160	AsMin	0.240	4.904	OK
X-X, +1.40D	0.1149	-Z	Bottom	0.2160	AsMin	0.240	4.904	OK
X-X, +1.20D	0.09849	+Z	Bottom	0.2160	AsMin	0.240	4.904	OK
X-X, +1.20D	0.09849	-Z	Bottom	0.2160	AsMin	0.240	4.904	OK
X-X, +1.20D+0.50S	0.1225	+Z	Bottom	0.2160	AsMin	0.240	4.904	OK
X-X, +1.20D+0.50S	0.1225	-Z	Bottom	0.2160	AsMin	0.240	4.904	OK
X-X, +1.20D+1.60S	0.1753	+Z	Bottom	0.2160	AsMin	0.240	4.904	OK
X-X, +1.20D+1.60S	0.1753	-Z	Bottom	0.2160	AsMin	0.240	4.904	OK
X-X, +0.90D	0.07387	+Z	Bottom	0.2160	AsMin	0.240	4.904	OK
X-X, +0.90D	0.07387	-Z	Bottom	0.2160	AsMin	0.240	4.904	OK
X-X, +1.436D+0.20S	0.1275	+Z	Bottom	0.2160	AsMin	0.240	4.904	OK
X-X, +1.436D+0.20S	0.1275	-Z	Bottom	0.2160	AsMin	0.240	4.904	OK
X-X, +0.6640D	0.05450	+Z	Bottom	0.2160	AsMin	0.240	4.904	OK
X-X, +0.6640D	0.05450	-Z	Bottom	0.2160	AsMin	0.240	4.904	OK
Z-Z, +1.40D	0.1149	-X	Bottom	0.2160	AsMin	0.240	4.904	OK
Z-Z, +1.40D	0.1149	+X	Bottom	0.2160	AsMin	0.240	4.904	OK
Z-Z, +1.20D	0.09849	-X	Bottom	0.2160	AsMin	0.240	4.904	OK

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General Footing

Project File: Brindley res..ec6

DESCRIPTION: F2.5 at H-1-covered terrace

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
Z-Z, +1.20D	0.09849	+X	Bottom	0.2160	AsMin	0.240	4.904	OK
Z-Z, +1.20D+0.50S	0.1225	-X	Bottom	0.2160	AsMin	0.240	4.904	OK
Z-Z, +1.20D+0.50S	0.1225	+X	Bottom	0.2160	AsMin	0.240	4.904	OK
Z-Z, +1.20D+1.60S	0.1753	-X	Bottom	0.2160	AsMin	0.240	4.904	OK
Z-Z, +1.20D+1.60S	0.1753	+X	Bottom	0.2160	AsMin	0.240	4.904	OK
Z-Z, +0.90D	0.07387	-X	Bottom	0.2160	AsMin	0.240	4.904	OK
Z-Z, +0.90D	0.07387	+X	Bottom	0.2160	AsMin	0.240	4.904	OK
Z-Z, +1.436D+0.20S	0.1275	-X	Bottom	0.2160	AsMin	0.240	4.904	OK
Z-Z, +1.436D+0.20S	0.1275	+X	Bottom	0.2160	AsMin	0.240	4.904	OK
Z-Z, +0.6640D	0.05450	-X	Bottom	0.2160	AsMin	0.240	4.904	OK
Z-Z, +0.6640D	0.05450	+X	Bottom	0.2160	AsMin	0.240	4.904	OK

One Way Shear

Load Combination...	Vu @ -X	Vu @ +X	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	0.00 psi	0.00 psi	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK
+1.20D	0.00 psi	0.00 psi	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK
+1.20D+0.50S	0.00 psi	0.00 psi	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK
+1.20D+1.60S	0.00 psi	0.00 psi	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK
+0.90D	0.00 psi	0.00 psi	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK
+1.436D+0.20S	0.00 psi	0.00 psi	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK
+0.6640D	0.00 psi	0.00 psi	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK

Two-Way "Punching" Shear

All units k

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D	2.42 psi	150.00 psi	0.01611	OK
+1.20D	2.07 psi	150.00 psi	0.01381	OK
+1.20D+0.50S	2.58 psi	150.00 psi	0.01717	OK
+1.20D+1.60S	3.69 psi	150.00 psi	0.02457	OK
+0.90D	1.55 psi	150.00 psi	0.01036	OK
+1.436D+0.20S	2.68 psi	150.00 psi	0.01787	OK
+0.6640D	1.15 psi	150.00 psi	0.00764	OK

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General Footing

Project File: Brindley res..ec6

DESCRIPTION: F3.0 at B-3 & B-3B

Code References

Calculations per ACI 318-14, IBC 2018, CBC 2019, ASCE 7-16
Load Combinations Used : ASCE 7-16

General Information

Material Properties

f'c : Concrete 28 day strength	=	2.50	ksi
fy : Rebar Yield	=	40.0	ksi
Ec : Concrete Elastic Modulus	=	2,850.0	ksi
Concrete Density	=	145.0	pcf
φ Values Flexure	=	0.90	
Shear	=	0.750	

Analysis Settings

Min Steel % Bending Reinf.	=	
Min Allow % Temp Reinf.	=	0.00180
Min. Overturning Safety Factor	=	1.0 : 1
Min. Sliding Safety Factor	=	1.0 : 1
Add Ftg Wt for Soil Pressure	:	Yes
Use ftg wt for stability, moments & shears	:	Yes
Add Pedestal Wt for Soil Pressure	:	Yes
Use Pedestal wt for stability, mom & shear	:	Yes

Soil Design Values

Allowable Soil Bearing	=	2.50	ksf
Soil Density	=	135.0	pcf
Increase Bearing By Footing Weight	=	No	
Soil Passive Resistance (for Sliding)	=	300.0	pcf
Soil/Concrete Friction Coeff.	=	0.50	

Increases based on footing Depth

Footing base depth below soil surface	=	1.50	ft
Allow press. increase per foot of depth	=		ksf
when footing base is below	=		ft

Increases based on footing plan dimension

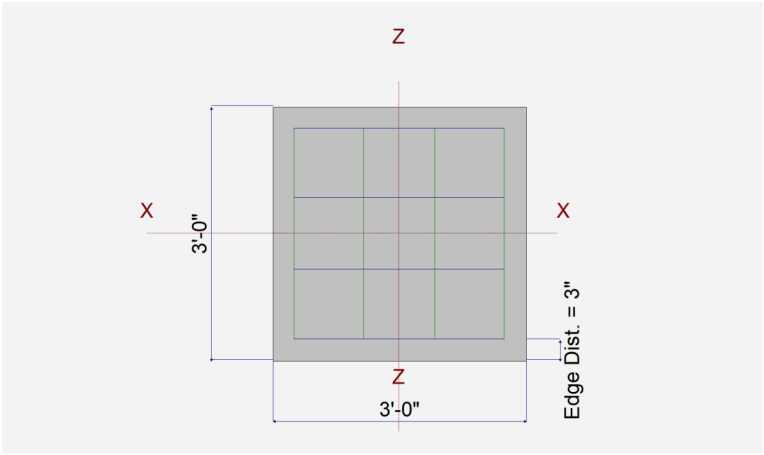
Allowable pressure increase per foot of depth	=		ksf
when max. length or width is greater than	=		ft

Dimensions

Width parallel to X-X Axis	=	3.0	ft
Length parallel to Z-Z Axis	=	3.0	ft
Footing Thickness	=	12.0	in

Pedestal dimensions...

px : parallel to X-X Axis	=	5.50	in
pz : parallel to Z-Z Axis	=	5.50	in
Height	=		in
Rebar Centerline to Edge of Concrete...			
at Bottom of footing	=	3.0	in

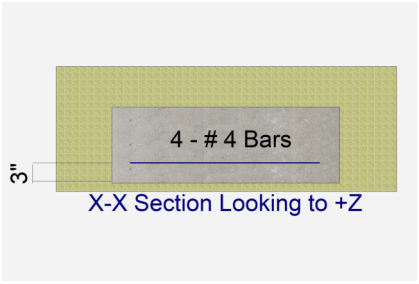


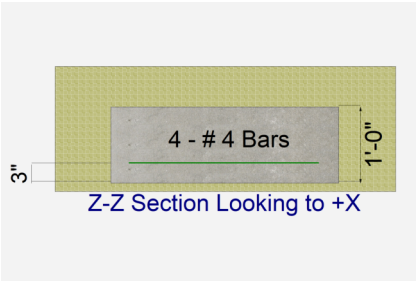
Reinforcing

Bars parallel to X-X Axis			
Number of Bars	=		4
Reinforcing Bar Size	=	#	4
Bars parallel to Z-Z Axis			
Number of Bars	=		4
Reinforcing Bar Size	=	#	4

Bandwidth Distribution Check (ACI 15.4.4.2)

Direction Requiring Closer Separation	n/a
# Bars required within zone	n/a
# Bars required on each side of zone	n/a





Applied Loads

		D	Lr	L	S	W	E	H	
P : Column Load	=	7.10			7.30				k
OB : Overburden	=	0.050							ksf
M-xx	=								k-ft
M-zz	=								k-ft
V-x	=								k
V-z	=								k

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General Footing

Project File: Brindley res..ec6

DESCRIPTION: F3.0 at B-3 & B-3B

DESIGN SUMMARY

Design OK

	Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.7440	Soil Bearing	1.860 ksf	2.50 ksf	+D+S about Z-Z axis
PASS	n/a	Overturning - X-X	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Overturning - Z-Z	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Sliding - X-X	0.0 k	0.0 k	No Sliding
PASS	n/a	Sliding - Z-Z	0.0 k	0.0 k	No Sliding
PASS	n/a	Uplift	0.0 k	0.0 k	No Uplift
PASS	0.2573	Z Flexure (+X)	1.810 k-ft/ft	7.033 k-ft/ft	+1.20D+1.60S
PASS	0.2573	Z Flexure (-X)	1.810 k-ft/ft	7.033 k-ft/ft	+1.20D+1.60S
PASS	0.2573	X Flexure (+Z)	1.810 k-ft/ft	7.033 k-ft/ft	+1.20D+1.60S
PASS	0.2573	X Flexure (-Z)	1.810 k-ft/ft	7.033 k-ft/ft	+1.20D+1.60S
PASS	0.1411	1-way Shear (+X)	10.583 psi	75.0 psi	+1.20D+1.60S
PASS	0.1411	1-way Shear (-X)	10.583 psi	75.0 psi	+1.20D+1.60S
PASS	0.1411	1-way Shear (+Z)	10.583 psi	75.0 psi	+1.20D+1.60S
PASS	0.1411	1-way Shear (-Z)	10.583 psi	75.0 psi	+1.20D+1.60S
PASS	0.2164	2-way Punching	32.458 psi	150.0 psi	+1.20D+1.60S

Detailed Results

Soil Bearing

Rotation Axis & Load Combination...	Gross Allowable	Xecc (in)	Zecc (in)	Actual Soil Bearing Stress @ Location Bottom, -Z	Top, +Z	Left, -X	Right, +X	Actual / Allow Ratio
X-X, D Only	2.50	n/a	0.0	1.049	1.049	n/a	n/a	0.420
X-X, +D+S	2.50	n/a	0.0	1.860	1.860	n/a	n/a	0.744
X-X, +D+0.750S	2.50	n/a	0.0	1.657	1.657	n/a	n/a	0.663
X-X, +0.60D	2.50	n/a	0.0	0.6292	0.6292	n/a	n/a	0.252
Z-Z, D Only	2.50	0.0	n/a	n/a	n/a	1.049	1.049	0.420
Z-Z, +D+S	2.50	0.0	n/a	n/a	n/a	1.860	1.860	0.744
Z-Z, +D+0.750S	2.50	0.0	n/a	n/a	n/a	1.657	1.657	0.663
Z-Z, +0.60D	2.50	0.0	n/a	n/a	n/a	0.6292	0.6292	0.252

Overturning Stability

Rotation Axis & Load Combination...	Overturning Moment	Resisting Moment	Stability Ratio	Status
Footing Has NO Overturning				

Sliding Stability

All units k

Force Application Axis Load Combination...	Sliding Force	Resisting Force	Stability Ratio	Status
Footing Has NO Sliding				

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
X-X, +1.40D	0.8887	+Z	Bottom	0.2592	AsMin	0.2667	7.033	OK
X-X, +1.40D	0.8887	-Z	Bottom	0.2592	AsMin	0.2667	7.033	OK
X-X, +1.20D	0.7617	+Z	Bottom	0.2592	AsMin	0.2667	7.033	OK
X-X, +1.20D	0.7617	-Z	Bottom	0.2592	AsMin	0.2667	7.033	OK
X-X, +1.20D+0.50S	1.089	+Z	Bottom	0.2592	AsMin	0.2667	7.033	OK
X-X, +1.20D+0.50S	1.089	-Z	Bottom	0.2592	AsMin	0.2667	7.033	OK
X-X, +1.20D+1.60S	1.810	+Z	Bottom	0.2592	AsMin	0.2667	7.033	OK
X-X, +1.20D+1.60S	1.810	-Z	Bottom	0.2592	AsMin	0.2667	7.033	OK
X-X, +0.90D	0.5713	+Z	Bottom	0.2592	AsMin	0.2667	7.033	OK
X-X, +0.90D	0.5713	-Z	Bottom	0.2592	AsMin	0.2667	7.033	OK
X-X, +1.436D+0.20S	1.043	+Z	Bottom	0.2592	AsMin	0.2667	7.033	OK
X-X, +1.436D+0.20S	1.043	-Z	Bottom	0.2592	AsMin	0.2667	7.033	OK
X-X, +0.6640D	0.4215	+Z	Bottom	0.2592	AsMin	0.2667	7.033	OK
X-X, +0.6640D	0.4215	-Z	Bottom	0.2592	AsMin	0.2667	7.033	OK
Z-Z, +1.40D	0.8887	-X	Bottom	0.2592	AsMin	0.2667	7.033	OK
Z-Z, +1.40D	0.8887	+X	Bottom	0.2592	AsMin	0.2667	7.033	OK
Z-Z, +1.20D	0.7617	-X	Bottom	0.2592	AsMin	0.2667	7.033	OK

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General Footing

Project File: Brindley res..ec6

DESCRIPTION: F3.0 at B-3 & B-3B

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
Z-Z, +1.20D	0.7617	+X	Bottom	0.2592	AsMin	0.2667	7.033	OK
Z-Z, +1.20D+0.50S	1.089	-X	Bottom	0.2592	AsMin	0.2667	7.033	OK
Z-Z, +1.20D+0.50S	1.089	+X	Bottom	0.2592	AsMin	0.2667	7.033	OK
Z-Z, +1.20D+1.60S	1.810	-X	Bottom	0.2592	AsMin	0.2667	7.033	OK
Z-Z, +1.20D+1.60S	1.810	+X	Bottom	0.2592	AsMin	0.2667	7.033	OK
Z-Z, +0.90D	0.5713	-X	Bottom	0.2592	AsMin	0.2667	7.033	OK
Z-Z, +0.90D	0.5713	+X	Bottom	0.2592	AsMin	0.2667	7.033	OK
Z-Z, +1.436D+0.20S	1.043	-X	Bottom	0.2592	AsMin	0.2667	7.033	OK
Z-Z, +1.436D+0.20S	1.043	+X	Bottom	0.2592	AsMin	0.2667	7.033	OK
Z-Z, +0.6640D	0.4215	-X	Bottom	0.2592	AsMin	0.2667	7.033	OK
Z-Z, +0.6640D	0.4215	+X	Bottom	0.2592	AsMin	0.2667	7.033	OK

One Way Shear

Load Combination...	Vu @ -X	Vu @ +X	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	5.20 psi	5.20 psi	5.20 psi	5.20 psi	5.20 psi	75.00 psi	0.07	OK
+1.20D	4.46 psi	4.46 psi	4.46 psi	4.46 psi	4.46 psi	75.00 psi	0.06	OK
+1.20D+0.50S	6.37 psi	6.37 psi	6.37 psi	6.37 psi	6.37 psi	75.00 psi	0.08	OK
+1.20D+1.60S	10.58 psi	10.58 psi	10.58 psi	10.58 psi	10.58 psi	75.00 psi	0.14	OK
+0.90D	3.34 psi	3.34 psi	3.34 psi	3.34 psi	3.34 psi	75.00 psi	0.04	OK
+1.436D+0.20S	6.10 psi	6.10 psi	6.10 psi	6.10 psi	6.10 psi	75.00 psi	0.08	OK
+0.6640D	2.47 psi	2.47 psi	2.47 psi	2.47 psi	2.47 psi	75.00 psi	0.03	OK

Two-Way "Punching" Shear

All units k

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D	15.94 psi	150.00 psi	0.1063	OK
+1.20D	13.66 psi	150.00 psi	0.09109	OK
+1.20D+0.50S	19.54 psi	150.00 psi	0.1302	OK
+1.20D+1.60S	32.46 psi	150.00 psi	0.2164	OK
+0.90D	10.25 psi	150.00 psi	0.06831	OK
+1.436D+0.20S	18.70 psi	150.00 psi	0.1247	OK
+0.6640D	7.56 psi	150.00 psi	0.0504	OK

BRINDLEY RESIDENCE
PARCEL# 320600050, 79TH AVE SE,
MERCER ISLAND, WA, 98040

QUANTUM JOB NUMBER: 21482.01

LATERAL DESIGN

Lateral Design

I - Generals

* Roof Max Elevation = 20'0" ; Roof Mean Height = 18'0"
* Bldg. short Dimension = 93'2" ; Bldg Long Dimension = 118'5"
* Wall Height = 11'3"

II - Wind Load Calcs

a) ASCE 7-16 Parameters

* Risk Category	II	Table 1.5-1
* Basic Windspeed	98 mph	Marcer Is. Jurisdiction
* Exposure Category	"C"	Marcer Is. Windmap
* Topographic Factor (kzt)	1.9	Marcer Is. Windmap.

b) Wind Pressure Calcs (LRFD)

From the ASCE 7-16, Chapter 27, "Directional Procedure", Buildings Less than 160 ft in Height, we obtain the following Results:

Item	Transverse Load (psf)	Longitudinal Load (psf)
Wall	36.9	35.4
Roof	33.7	33.7
OVH	47.5	47.5
	(E-W)	(N-S)

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www.quantumce.com

Brindley Res. (project)	11/12/2021 (date)	21482.01 (project no.)
	MDA (designer)	#1 (sheet)
Stuart Silk (client)	(checked by)	

C) Wind Shear Calcs.

* (N-S) Direction: $[(33.7psf)(774sqf) + (35.4psf)(5.0')(118.5)]/1000$

(N-S) Direction; 47.1 k //

* (E-W) Direction: $[(33.7psf)(595sqf) + (36.9psf)(5.0')(93.2')]/1000$

(E-W) Direction: 37.3 k //

D) Wind Shear Summary – LRFD

Level	(N-S) k	(E-W) k
Roof	47.1	37.3

III – Seismic Load Calcs

a) S_{DS}, S_{D1} Parameters

From the ATC Hazards Website we obtain The following Seismic Parameters

* $S_S = 1.47$; $S_1 = 0.51$

* $S_{DS} = 1.18$; $S_{D1} = 0.61$

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Bradley Res. | project
02/11/2022 | date
21482.02 | project no.
MDA | designer
#2 | sheet
Stuart S. | client
checked by

b) Other ASCE 7-16 Parameters

* Risk Category	II	Table 1.5-1
* Importance Factor	1.0	Table 1.5-2
* Site Class	C	Geotech Report
* Response Modification (R) Coeff. factor	6 1/2	Table 12.2-1
* Long Period Transition (T_L)	6	Fig. 22-12

c) Seismic Base Shear Coefficient.

From the Equivalent Lateral Force Procedure Spreadsheet, we obtain the following:

Seismic Base Shear = $0.181\,W$ (LRFD) // ASCE 7-16 Eq. 12.8-1

Where W = seismic weight.

D) Seismic Weight.

Item	Description	(PSF) Load	(Ft) Height	(Ft) Length	(Ft²) Area	(k) Weight
1	Ceramic Tile Roof	24	—o—	—o—	6630	159.1
2	Memb. Roof w/PV Panels	18	—o—	—o—	992	17.9
3	Ext. Stucco Wall	18	5.0	394	1970+419	43.0
4	Ext. Glazing	8	5.0	132	660	5.3
5	Int. Partitions	8	5.0	445	2225	17.8
6	Chimney Stack	18	—o—	—o—	734	12.5
						255.6 k

Roof Seismic Weight = 255.6 k //

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Brindley Res — project
02/11/2022 — date
21482.02 — project no.
HDA — designer
#3 — sheet
Stuart Silk — client
checked by

E) Seismic Base Shear.

$V_E = 0.181\ W$ (LRFD)

$V_E = 0.181\ (255.6^k)$

$V_E = 46.3^k$ //

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www.quantumce.com

project: Brindley Res.	date: 02/11/2022	project no.: 21482.02	
	designer: MDA	sheet: #4	
client: Stuart Silk	checked by:		

Wind Loads Criteria

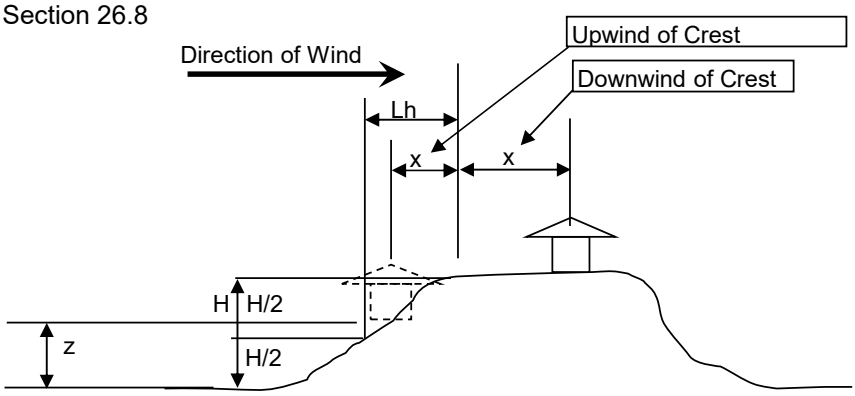
ASCE 7-16

Wind Load Criteria

Risk Category:	II	Table 1.5-1	Roof Type:	Hip Roof	
Basic Wind Speed:	98	Figure 26.5.1	Roof Slope:	5.0:12	22.6 DEG
Exposure Category:	C	Section 26.7.3	Mean Roof HT:	18.0 ft	UP TO 160FT
Ground Elevation:	281 ft		Parapet:	No	
Wall Ht:	10.0 ft			0.0 ft	UP TO 160FT

Wind Topographic Factor, K_{zt}:

per Section 26.8



Terrain Type:	Per Local Jurisdiction
Direction:	Upwind of Crest

L_h:	0 ft	*DIST UPWIND OF CREST TO HALF HT OF HILL OR ESCARP.*
H:	0 ft	*HT. OF HILL OR ESCARP. RELATIVE TO THE UPWIND TERRAIN*
x:	0 ft	*DIST. (UPWIND OR DOWNWIND) FROM THE CREST TO THE BUILDING*
z:	20 ft	*HEIGHT ABOVE GROUND SURFACE AT BUILDING SITE*

K_{zt}:	NA	*EQUATION 26.8-1*
K_{zt}:	1.90	*MANUALLY INPUT*

K_e: 0.990 ASCE 26.10.1

K_d: 0.85 ASCE 26.6

Wind Loads - Main Wind Force Resisting System

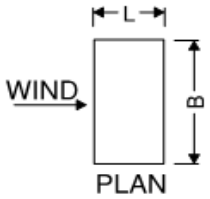
ASCE 7-16 Chapter 27.3 Part 1 - Enclosed Simple Diaphragm, h<160ft

Wind Load Criteria

Risk Category:	II	Table 1.5-1	K_e:	0.9899	Section 26.10.1
Basic Wind Speed:	98 mph	Figure 26.5.1	K_d:	0.85	Section 26.6
Exposure Category:	C	Section 26.7.3	G:	0.85	Section 26.11
K_{zt}:	1.90	Section 26.8	Wall Height:	10.0 ft	

L/B Ratio:

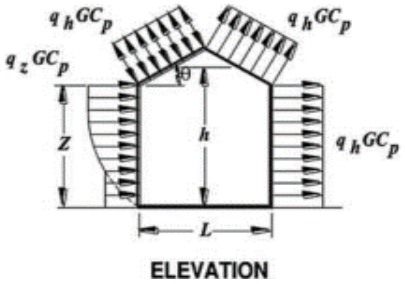
Short Dimension:	93.2 ft
Long Dimension:	118.5 ft
Transverse Wind L/B:	0.7864979
Longitudinal Wind L/B:	1.3



*NOTE: INTERNAL BUILDING PRESSURE CANCEL EACH OTHER OUT IN ENCLOSED BUILDING

Wall Pressures:

K_h & K_z:	0.850	At Top of Wall
K_z:	0.85	0 ft to 15 ft



	Transverse Wind Direction	Longitudinal Wind Direction	
Top of Wall:	**36.9 psf**	**35.4 psf**	ASCE EQ 27.3-1
0 ft to 15 ft Wall:	**36.9 psf**	**35.4 psf**	ASCE EQ 27.3-1

*Enveloped Leeward and Windward Pressure

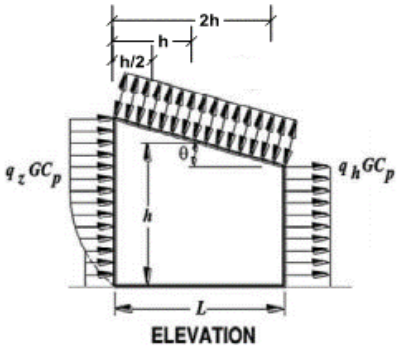
*All Values Ultimate (multiply x0.6 for ASD)

Wind Loads - Main Wind Force Resisting System (Cont.)

ASCE 7-16 Chapter 27.3 Part 1 - Enclosed Simple Diaphragm, h<160ft

Roof Pressure:

Slope: 5.0:12 = 22.6 DEGREES
Mean Roof HT: 18.0 ft
Building Length: **118.5 ft** Normal to Ridge
K_h & K_z: 0.882 At Mean Roof Ht



ELEVATION

Windward Pressure Parallel to Ridge

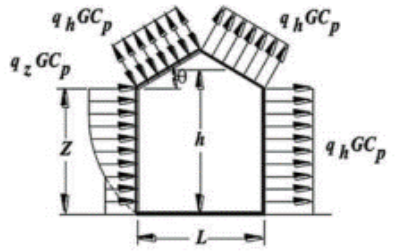
	LC 1	LC 2	LC 1	LC 2
0 to h/2	**-32.8 psf**	**0.9 psf**		
h/2 to h	**-32.8 psf**	**0.9 psf**		
h to 2h	**-21.0 psf**	**0.9 psf**		
>2h	**-15.1 psf**	**0.9 psf**		

Windward Pressure Normal to Ridge

13.7 psf ***Horizontal Projected Pressure:*** **5.3 psf**

Leeward Pressure Normal to Ridge

-23.9 psf ***Horizontal Projected Pressure:*** **-9.2 psf**



ELEVATION

*Negative indicates pressure away from surface
*Total horizontal shear shall not be less than that determined by neglecting roof wind forces
*All Values Ultimate (multiply x0.6 for ASD)

Roof Overhang (PSF)

P_{ovh}: -47.5 psf ***Horizontal Projected Pressure:*** **-18.3 psf**

Minimum Total Projected Horizontal Pressure (PSF) **8.0 psf** ASCE 27.1.5

Seismic Base Shear for the Equivalent Lateral Force Procedure

Per IBC 2018 & ASCE 7-16

Structure: **Brindley Res.**
Address: **79th Ave. SE, Mercer Is., WA**
Latitude: **47.5384** Longitude: **-122.2337**

Structure Classification

Risk Category : **II** per ASCE Table 1.5-1

Seismic Force-Resisting System: **Light-Framed Wood Walls Sheathed with Structural Panels**

R: **6 1/2** per ASCE Table 12.2-1
W_o: **3** per ASCE Table 12.2-1
C_d: **4** per ASCE Table 12.2-1
h_n (ft): **20.00** height above the base to the highest level of the structure

Site Ground Motion

Reg. Structure/5 Stories Max: **Yes** **Sds (max) = 1.0** Per ASCE 12.8.1.3
S_1 (g-sec): **0.51** S_S (g-sec): **1.47**
Site Class: **D** **Assumed Value** per ASCE 11.4.3

ASCE 11.4.8 Exception 2 Used

F_v **1.79** F_a **1.20**
1.2 Min Value where SC D Assumed

S_{M1} (g-sec): **0.91** S_{MS} (g-sec): **1.76** per ASCE 11.4.4
S_{D1} (g-sec): **0.61** S_{DS} (g-sec): **1.18** per ASCE 11.4.5
SDC: **D** per ASCE 11.6
I_E: **1.00** per ASCE Table 1.5-2

Fundamental Period per ASCE 12.8.2

Period Method: **Approximate Fundamental Period**
Structure Type: **All Other Structural Systems**
T_L (sec): **6.00** ASCE Figures 22-14 through 22-17
T_S: 0.52

Ta (sec): 0.19 Ct * hnx per ASCE Eq. 12.8-7

T_{use} (sec): **0.19** <= TL

Equivalent Lateral Force Procedure Design Base Shear per ASCE 12.8

C_s: 0.18 = S_{DS} / (R/I_E) per ASCE Eq. 12.8-2
$C_{s\text{-}max}$: 0.50 = S_{D1} / (T_a*R/I_E) for T <= T_L per ASCE Eq. 12.8-3
$C_{s\text{-}max}$: 16 = S_{D1}*T_L / (T_a^2*R/I_E) for T > T_L per ASCE Eq. 12.8-4
$C_{s\text{-}min}$: 0.05 per ASCE Eq. 12.8-5
$C_{s\text{-}min}$: -- = 0.5S_1 / (R/I_E) for S_1 => 0.6g per ASCE Eq. 12.8-6
$C_{s\text{-}use}$: 0.181

V : 0.181 W = $C_{S\text{-}use}$ * W per ASCE Eq. 12.8-1

Shearwall Load Distributior

Quantum Consulting Engineers
Brindley Res.
79 th Ave. SE
Mercer Is., WA

Blue cells indicate inputs!!

Quantum Job # 21482.01

Roof

Wind Load W =	47100	lb (N-S loading direction)
	37300	lb (E-W loading direction)
Seismic Load E =	46300	lb (N-S loading direction)
	46300	lb (E-W loading direction)

Total diaphragm area A = 7622 sf

(N-S) Direction

Shearwall lines	Trib. Area (sf)	Perc. %	Wind (lb)	Seismic (lb)
2	375	5	**2317**	**2278**
3	1572	21	**9714**	**9549**
4&5	1495	20	**9238**	**9081**
6	2207	29	**13638**	**13406**
7&8	1333	17	**8237**	**8097**
10	640	8	**3955**	**3888**
		0	**0**	**0**

(E-W) Direction

Shearwall lines	Trib. Area	Perc. %	Wind (lb)	Seismic (lb)
A	1250	16	**6117**	**7593**
C	1890	25	**9249**	**11481**
G	2307	30	**11290**	**14014**
L	1465	19	**7169**	**8899**
N	710	9	**3475**	**4313**
		0	**0**	**0**
		0	**0**	**0**

LIGHT FRAMED WOOD SHEATHED PANEL SHEAR WALL DESIGN

Per IBC 2018, ASCE 7-16, SDPWS 2018 & NDS 2018

Structure: **Brindley Res.**
Floor Level: **Roof (N-S)**

Sds = **1.18**
Depth of Floor Framing & Plates (Clearspan) at Interstory (in) = **0.00**

Shear Wall Line Information

SW Mark		L_{SW} (ft)	h_{SW} (ft)	h_{SW}/Lsw	Wall Framing Species	Specific Gravity G	Interstory of Base?
SW GRID	**2**	**10.50**	**-**	**-**	**-**	**-**	**-**
SW Segment	2.10	5.50	10.00	1.82	DF #2	0.50	Base
SW Segment	2.20	5.00	10.00	2.00	DF #2	0.50	Base
SW Segment				#DIV/0!	S-P-F #1/#2	0.42	Interstory
SW Segment				#DIV/0!	S-P-F #1/#2	0.42	Interstory
SW Segment				#DIV/0!	S-P-F #1/#2	0.42	Interstory
SW GRID	**3**	**37.30**	**-**	**-**	**-**	**-**	**-**
SW Segment	3.10	15.50	10.00	0.65	DF #2	0.50	Base
SW Segment	3.20	9.90	10.00	1.01	DF #2	0.50	Base
SW Segment	3.30	11.90	10.00	0.84	DF #2	0.50	Base
SW Segment				#DIV/0!	S-P-F #1/#2	0.42	Interstory
SW Segment				#DIV/0!	S-P-F #1/#2	0.42	Interstory
SW GRID	**4&5**	**31.70**	**-**	**-**	**-**	**-**	**-**
SW Segment	5.10	8.00	10.00	1.25	DF #2	0.50	Base
SW Segment	5.20	6.80	10.00	1.47	DF #2	0.50	Base
SW Segment	5.30	7.90	10.00	1.27	DF #2	0.50	Base
SW Segment	4.10	9.00	10.00	1.11	DF #2	0.50	Base
SW Segment				#DIV/0!	S-P-F #1/#2	0.42	Interstory
SW GRID	**6**	**46.70**	**-**	**-**	**-**	**-**	**-**
SW Segment	6.10	21.50	10.00	0.47	DF #2	0.50	Base
SW Segment	6.20	11.40	10.00	0.88	DF #2	0.50	Base
SW Segment	6.30	4.80	10.00	2.08	DF #2	0.50	Base
SW Segment	6.40	9.00	10.00	1.11	DF #2	0.50	Base
SW Segment				#DIV/0!	S-P-F #1/#2	0.42	Interstory

Shear Wall Loads and Summary

SW Mark		EQ (lb) Wall (ULT)	Wind (lb) Wall (ULT)	Wall DL (lb) Wall	Wall DL (lb) End 1	Wall DL (lb) End 2	Shear Wall Type	MIN. # of End Studs	Holdown
SW GRID	**2**	2278	2317	-	-	-	-	-	-
SW Segment	2.10	1193	1214	990			**SW-6**	**2**	**HDU2 (3075DF,2215HF)**
SW Segment	2.20	1085	1103	900			**SW-6**	**2**	**HDU2 (3075DF,2215HF)**
SW Segment		0	0				**2SW-2**		**No Strap**
SW Segment		0	0				**2SW-2**		**No Strap**
SW Segment		0	0				**2SW-2**		**No Strap**
SW GRID	**3**	9549	9714				-	-	-
SW Segment	3.10	3968	4037	1240			**SW-6**	**2**	**HDU2 (3075DF,2215HF)**
SW Segment	3.20	2534	2578	792			**SW-6**	**2**	**HDU2 (3075DF,2215HF)**
SW Segment	3.30	3046	3099	952			**SW-6**	**2**	**HDU2 (3075DF,2215HF)**
SW Segment		0	0				**2SW-2**		**No Strap**
SW Segment		0	0				**2SW-2**		**No Strap**
SW GRID	**4&5**	9081	9238				-	-	-
SW Segment	5.10	2292	2331	640			**SW-6**	**2**	**HDU2 (3075DF,2215HF)**
SW Segment	5.20	1948	1982	1224			**SW-6**	**2**	**HDU2 (3075DF,2215HF)**
SW Segment	5.30	2263	2302	1422			**SW-6**	**2**	**HDU2 (3075DF,2215HF)**
SW Segment	4.10	2578	2623	1620			**SW-6**	**2**	**HDU2 (3075DF,2215HF)**
SW Segment		0	0				**2SW-2**		**No Strap**
SW GRID	**6**	13406	13638				-	-	-
SW Segment	6.10	6172	6279	1720			**SW-6**	**2**	**HDU2 (3075DF,2215HF)**
SW Segment	6.20	3273	3329	912			**SW-6**	**2**	**HDU2 (3075DF,2215HF)**
SW Segment	6.30	1378	1402	864			**SW-6**	**2**	**HDU2 (3075DF,2215HF)**
SW Segment	6.40	2584	2628	1620			**SW-6**	**2**	**HDU2 (3075DF,2215HF)**
SW Segment		0	0				**2SW-2**		**No Strap**

LIGHT FRAMED WOOD SHEATHED PANEL SHEAR WALL DESIGN

Per IBC 2018, ASCE 7-16, SDPWS 2018 & NDS 2018

Structure: **Brindley Res.**
Floor Level: **Roof (N-S)**

Shear Wall Schedule (LRFD) ϕ_D = 0.8

Shear Wall Type	Sheathing Grade, Sheathing Thickness, & Nail Size	Panel Edge Nail Spacing (in)	Nominal Seismic SW Capacity (plf)	LRFD Seismic SW Capacity (plf)	Sheathing Shear Stiffness, G_a (lb/in)
SW-6	APA Rated, 15/32", 8d Common	6	520	416	10
SW-4	APA Rated, 15/32", 8d Common	4	760	608	13
SW-3	APA Rated, 15/32", 8d Common	3	980	784	15
SW-2	APA Rated, 15/32", 8d Common	2	1280	1024	20
2SW-4	APA Rated, 15/32", 8d Common	4	1520	1216	26
2SW-3	APA Rated, 15/32", 8d Common	3	1960	1568	30
2SW-2	APA Rated, 15/32", 8d Common	2	2560	2048	40

Determine Shear Wall Type (LRFD)

SW Segment Mark	Seismic Shear (plf)	Aspect Ratio Reduction	Adjusted Seismic Shear (plf)	Wind Shear (plf)	Adjusted Wind Shear (plf)	Req'd Shear (plf)	Shear Wall Type	Shear Wall Capacity (plf)	Check
2.10	217	1.00	217	221	158	217	SW-6	416	OK
2.20	217	1.00	217	221	158	217	SW-6	416	OK
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2SW-2	2048	#DIV/0!
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2SW-2	2048	#DIV/0!
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2SW-2	2048	#DIV/0!
3.10	256	1.00	256	260	186	256	SW-6	416	OK
3.20	256	1.00	256	260	186	256	SW-6	416	OK
3.30	256	1.00	256	260	186	256	SW-6	416	OK
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2SW-2	2048	#DIV/0!
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2SW-2	2048	#DIV/0!
5.10	286	1.00	286	291	208	286	SW-6	416	OK
5.20	286	1.00	286	291	208	286	SW-6	416	OK
5.30	286	1.00	286	291	208	286	SW-6	416	OK
4.10	286	1.00	286	291	208	286	SW-6	416	OK
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2SW-2	2048	#DIV/0!
6.10	287	1.00	287	292	209	287	SW-6	416	OK
6.20	287	1.00	287	292	209	287	SW-6	416	OK
6.30	287	0.99	290	292	211	290	SW-6	416	OK
6.40	287	1.00	287	292	209	287	SW-6	416	OK
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2SW-2	2048	#DIV/0!

Determine Shear Wall Overturning Moment Lever Arm

SW Segment Mark	Wall Length Lever Arm (ft)	Calculated Lever Arm (ft)	% Different	Override Wall Length	User Input M_{OT} Lever Arm (ft)
2.10	5.50	5.02	9.66%	No	
2.20	5.00	4.52	10.73%	No	
				No	
				No	
				No	
3.10	15.50	15.02	3.23%	No	
3.20	9.90	9.42	5.14%	No	
3.30	11.90	11.42	4.24%	No	
				No	
				No	
5.10	8.00	7.52	6.44%	No	
5.20	6.80	6.32	7.67%	No	
5.30	7.90	7.42	6.53%	No	
4.10	9.00	8.52	5.69%	No	
				No	
6.10	21.50	21.02	2.30%	No	
6.20	11.40	10.92	4.44%	No	
6.30	4.80	4.32	11.22%	No	
6.40	9.00	8.52	5.69%	No	
				No	

LIGHT FRAMED WOOD SHEATHED PANEL SHEAR WALL DESIGN

Per IBC 2018, ASCE 7-16, SDPWS 2018 & NDS 2018

Structure: **Brindley Res.**
Floor Level: **Roof (N-S)**

Shear Wall End Axial Load (ASD)

SW Segment Mark	Seismic Tension (lb)	ASD Seismic Tension Above (lb)	Seismic Tension Total (lb)	Wind Tension (lb)	ASD Wind Tension Above (lb)	Wind Tension Total (lb)	End 1 Dead (lb)	End 2 Dead (lb)
2.10	1519	**0**	1519	1324	**0**	1324	495	495
2.20	1519	**0**	1519	1324	**0**	1324	450	450
		0			**0**			
		0			**0**			
		0			**0**			
3.10	1792	**0**	1792	1563	**0**	1563	620	620
3.20	1792	**0**	1792	1563	**0**	1563	396	396
3.30	1792	**0**	1792	1563	**0**	1563	476	476
		0			**0**			
		0			**0**			
5.10	2005	**0**	2005	1749	**0**	1749	320	320
5.20	2005	**0**	2005	1749	**0**	1749	612	612
5.30	2005	**0**	2005	1749	**0**	1749	711	711
4.10	2005	**0**	2005	1749	**0**	1749	810	810
		0			**0**			
6.10	2009	**0**	2009	1752	**0**	1752	860	860
6.20	2009	**0**	2009	1752	**0**	1752	456	456
6.30	2009	**0**	2009	1752	**0**	1752	432	432
6.40	2009	**0**	2009	1752	**0**	1752	810	810
		0			**0**			

Determine Required Holdown (ASD)

SW Segment Mark	Wind End 1 Eq. 16-15	End 1 Eq. 16-16	End 2 Eq. 16-15	End 2 Eq. 16-16	Controlling Ten. Load (lb)	Holdown	Holdown Capacity (lb)	Status
2.10	-1027	-1303	-1027	-1303	**-1303**	**HDU2 (3075DF,2215HF)**	**-3075**	**OK**
2.20	-1054	-1323	-1054	-1323	**-1323**	**HDU2 (3075DF,2215HF)**	**-3075**	**OK**
						No Strap		
						No Strap		
						No Strap		
3.10	-1191	-1522	-1191	-1522	**-1522**	**HDU2 (3075DF,2215HF)**	**-3075**	**OK**
3.20	-1206	-1620	-1206	-1620	**-1620**	**HDU2 (3075DF,2215HF)**	**-3075**	**OK**
3.30	-1134	-1585	-1134	-1585	**-1585**	**HDU2 (3075DF,2215HF)**	**-3075**	**OK**
						No Strap		
						No Strap		
5.10	-1557	-1866	-1557	-1866	**-1866**	**HDU2 (3075DF,2215HF)**	**-3075**	**OK**
5.20	-1381	-1739	-1381	-1739	**-1739**	**HDU2 (3075DF,2215HF)**	**-3075**	**OK**
5.30	-1322	-1696	-1322	-1696	**-1696**	**HDU2 (3075DF,2215HF)**	**-3075**	**OK**
4.10	-1263	-1653	-1263	-1653	**-1653**	**HDU2 (3075DF,2215HF)**	**-3075**	**OK**
						No Strap		
6.10	-978	-1636	-978	-1636	**-1636**	**HDU2 (3075DF,2215HF)**	**-3075**	**OK**
6.20	-1479	-1811	-1479	-1811	**-1811**	**HDU2 (3075DF,2215HF)**	**-3075**	**OK**
6.30	-1493	-1822	-1493	-1822	**-1822**	**HDU2 (3075DF,2215HF)**	**-3075**	**OK**
6.40	-1266	-1657	-1266	-1657	**-1657**	**HDU2 (3075DF,2215HF)**	**-3075**	**OK**
						No Strap		

LIGHT FRAMED WOOD SHEATHED PANEL SHEAR WALL DESIGN

Per IBC 2018, ASCE 7-16, SDPWS 2018 & NDS 2018

Structure: **Brindley Res.**
Floor Level: **Roof (N-S)- continued**

Sds = **1.18**
Depth of Floor Framing & Plates (Clearspan) at Interstory (in) = **0.00**

Shear Wall Line Information

SW Mark		L_{SW} (ft)	h_{SW} (ft)	h_{SW}/Lsw	Wall Framing Species	Specific Gravity G	Interstory of Base?
SW GRID	**7&8**	**35.00**	**-**	**-**	**-**	**-**	**-**
SW Segment	7.10	23.70	10.00	0.42	DF #2	0.50	Base
SW Segment	7.20	5.90	10.00	1.69	DF #2	0.50	Base
SW Segment	8.10	5.40	10.00	1.85	DF #2	0.50	Base
SW Segment				#DIV/0!	S-P-F #1/#2	0.42	Interstory
SW Segment				#DIV/0!	S-P-F #1/#2	0.42	Interstory
SW GRID	**10**	**11.60**	**-**	**-**	**-**	**-**	**-**
SW Segment	10.10	6.30	10.00	1.59	DF #2	0.50	Base
SW Segment	10.20	5.30	10.00	1.89	DF #2	0.50	Base
SW Segment				#DIV/0!	S-P-F #1/#2	0.42	Interstory
SW Segment				#DIV/0!	S-P-F #1/#2	0.42	Interstory
SW Segment				#DIV/0!	S-P-F #1/#2	0.42	Interstory
SW GRID		**0.00**	**-**	**-**	**-**	**-**	**-**
SW Segment				#DIV/0!	S-P-F #1/#2	0.42	Interstory
SW Segment				#DIV/0!	S-P-F #1/#2	0.42	Interstory
SW Segment				#DIV/0!	S-P-F #1/#2	0.42	Interstory
SW Segment				#DIV/0!	S-P-F #1/#2	0.42	Interstory
SW Segment				#DIV/0!	S-P-F #1/#2	0.42	Interstory
SW GRID		**0.00**	**-**	**-**	**-**	**-**	**-**
SW Segment				#DIV/0!	S-P-F #1/#2	0.42	Interstory
SW Segment				#DIV/0!	S-P-F #1/#2	0.42	Interstory
SW Segment				#DIV/0!	S-P-F #1/#2	0.42	Interstory
SW Segment				#DIV/0!	S-P-F #1/#2	0.42	Interstory
SW Segment				#DIV/0!	S-P-F #1/#2	0.42	Interstory

Shear Wall Loads and Summary

SW Mark		EQ (lb) Wall (ULT)	Wind (lb) Wall (ULT)	Wall DL (lb) Wall	Wall DL (lb) End 1	Wall DL (lb) End 2	Shear Wall Type	MIN. # of End Studs	Holdown
SW GRID	**7&8**	8097	8237	-	-	-	-	-	-
SW Segment	7.10	5483	5578	1896			**SW-6**	**2**	**HDU2 (3075DF,2215HF)**
SW Segment	7.20	1365	1389	1062			**SW-6**	**2**	**HDU2 (3075DF,2215HF)**
SW Segment	8.10	1249	1271	972			**SW-6**	**2**	**HDU2 (3075DF,2215HF)**
SW Segment		0	0				**SW-6**		**No HD**
SW Segment		0	0				**2SW-2**		**No Strap**
SW GRID	**10**	3888	3955				-	-	-
SW Segment	10.10	2112	2148	1134			**SW-6**	**2**	**HDU2 (3075DF,2215HF)**
SW Segment	10.20	1776	1807	954			**SW-6**	**2**	**HDU2 (3075DF,2215HF)**
SW Segment		0	0				**2SW-2**		**No HD**
SW Segment		0	0				**2SW-2**		**No Strap**
SW Segment		0	0				**2SW-2**		**No Strap**
SW GRID							-	-	-
SW Segment		#DIV/0!	#DIV/0!				**2SW-2**		**No Strap**
SW Segment		#DIV/0!	#DIV/0!				**2SW-2**		**No Strap**
SW Segment		#DIV/0!	#DIV/0!				**2SW-2**		**No Strap**
SW Segment		#DIV/0!	#DIV/0!				**2SW-2**		**No Strap**
SW Segment		#DIV/0!	#DIV/0!				**2SW-2**		**No Strap**
SW GRID							-	-	-
SW Segment		#DIV/0!	#DIV/0!				**2SW-2**		**No Strap**
SW Segment		#DIV/0!	#DIV/0!				**2SW-2**		**No Strap**
SW Segment		#DIV/0!	#DIV/0!				**2SW-2**		**No Strap**
SW Segment		#DIV/0!	#DIV/0!				**2SW-2**		**No Strap**
SW Segment		#DIV/0!					**2SW-2**		**No Strap**

LIGHT FRAMED WOOD SHEATHED PANEL SHEAR WALL DESIGN

Per IBC 2018, ASCE 7-16, SDPWS 2018 & NDS 2018

Structure: **Brindley Res.**
Floor Level: **Roof (N-S)- continued**

Shear Wall Schedule (LRFD) ϕ_D = **0.8**

Shear Wall Type	Sheathing Grade, Sheathing Thickness, & Nail Size	Panel Edge Nail Spacing (in)	Nominal Seismic SW Capacity (plf)	LRFD Seismic SW Capacity (plf)	Sheathing Shear Stiffness, G_a (lb/in)
SW-6	APA Rated, 15/32", 8d Common	6	520	416	10
SW-4	APA Rated, 15/32", 8d Common	4	760	608	13
SW-3	APA Rated, 15/32", 8d Common	3	980	784	15
SW-2	APA Rated, 15/32", 8d Common	2	1280	1024	20
2SW-4	APA Rated, 15/32", 8d Common	4	1520	1216	26
2SW-3	APA Rated, 15/32", 8d Common	3	1960	1568	30
2SW-2	APA Rated, 15/32", 8d Common	2	2560	2048	40

Determine Shear Wall Type (LRFD)

SW Segment Mark	Seismic Shear (plf)	Aspect Ratio Reduction	Adjusted Seismic Shear (plf)	Wind Shear (plf)	Adjusted Wind Shear (plf)	Req'd Shear (plf)	Shear Wall Type	Shear Wall Capacity (plf)	Check
7.10	231	1.00	231	235	168	231	SW-6	416	OK
7.20	231	1.00	231	235	168	231	SW-6	416	OK
8.10	231	1.00	231	235	168	231	SW-6	416	OK
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	SW-6	416	#DIV/0!
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2SW-2	2048	#DIV/0!
10.10	335	1.00	335	341	244	335	SW-6	416	OK
10.20	335	1.00	335	341	244	335	SW-6	416	OK
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2SW-2	2048	#DIV/0!
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2SW-2	2048	#DIV/0!
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2SW-2	2048	#DIV/0!
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2SW-2	2048	#DIV/0!
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2SW-2	2048	#DIV/0!
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2SW-2	2048	#DIV/0!
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2SW-2	2048	#DIV/0!
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2SW-2	2048	#DIV/0!
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2SW-2	2048	#DIV/0!
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2SW-2	2048	#DIV/0!
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2SW-2	2048	#DIV/0!
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2SW-2	2048	#DIV/0!
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2SW-2	2048	#DIV/0!

Determine Shear Wall Overturning Moment Lever Arm

SW Segment Mark	Wall Length Lever Arm (ft)	Calculated Lever Arm (ft)	% Different	Override Wall Length	User Input M_{OT} Lever Arm (ft)
7.10	23.70	23.22	2.09%	No	
7.20	5.90	5.42	8.94%	No	
8.10	5.40	4.92	9.85%	No	
				No	
				No	
10.10	6.30	5.82	8.33%	No	
10.20	5.30	4.82	10.06%	No	
				No	
				No	
				No	
				No	
				No	
				No	
				No	
				No	
				No	
				No	
				No	
				No	
				No	

LIGHT FRAMED WOOD SHEATHED PANEL SHEAR WALL DESIGN

Per IBC 2018, ASCE 7-16, SDPWS 2018 & NDS 2018

Structure: **Brindley Res.**
Floor Level: **Roof (N-S)- continued**

Shear Wall End Axial Load (ASD)

SW Segment Mark	Seismic Tension (lb)	ASD Seismic Tension Above (lb)	Seismic Tension Total (lb)	Wind Tension (lb)	ASD Wind Tension Above (lb)	Wind Tension Total (lb)	End 1 Dead (lb)	End 2 Dead (lb)
7.10	1619	0	1619	1412	0	1412	948	948
7.20	1619	0	1619	1412	0	1412	531	531
8.10	1619	0	1619	1412	0	1412	486	486
		0			0			
		0			0			
10.10	2346	0	2346	2046	0	2046	567	567
10.20	2346	0	2346	2046	0	2046	477	477
		0			0			
		0			0			
		0			0			
		0			0			
		0			0			
		0			0			
		0			0			
		0			0			
		0			0			
		0			0			
		0			0			

Determine Required Holdown (ASD)

SW Segment Mark	Wind End 1 Eq. 16-15	End 1 Eq. 16-16	End 2 Eq. 16-15	End 2 Eq. 16-16	Controlling Ten. Load (lb)	Holdown	Holdown Capacity (lb)	Status
7.10	-843	-1207	-843	-1207	**-1207**	**HDU2 (3075DF,2215HF)**	**-3075**	**OK**
7.20	-1093	-1389	-1093	-1389	**-1389**	**HDU2 (3075DF,2215HF)**	**-3075**	**OK**
8.10	-1120	-1408	-1120	-1408	**-1408**	**HDU2 (3075DF,2215HF)**	**-3075**	**OK**
						No HD		
						No Strap		
10.10	-1705	-2100	-1705	-2100	**-2100**	**HDU2 (3075DF,2215HF)**	**-3075**	**OK**
10.20	-1616	-2139	-1616	-2139	**-2139**	**HDU2 (3075DF,2215HF)**	**-3075**	**OK**
						No HD		
						No Strap		
						No Strap		
						No Strap		
						No Strap		
						No Strap		
						No Strap		
						No Strap		
						No Strap		
						No Strap		
						No Strap		
						No Strap		

LIGHT FRAMED WOOD SHEATHED PANEL SHEAR WALL DESIGN

Per IBC 2018, ASCE 7-16, SDPWS 2018 & NDS 2018

Structure: **Brindley Res.**
Floor Level: **Roof (E-W)**

Sds = **1.18**
Depth of Floor Framing & Plates (Clearspan) at Interstory (in) = **0.00**

Shear Wall Line Information

SW Mark		L_{SW} (ft)	h_{SW} (ft)	h_{SW}/Lsw	Wall Framing Species	Specific Gravity G	Interstory of Base?
SW GRID	**A**	**59.20**	**-**	**-**	**-**	**-**	**-**
SW Segment	A.1	12.00	10.00	0.83	DF #2	0.50	Base
SW Segment	A.2	24.20	10.00	0.41	DF #2	0.50	Base
SW Segment	A.3	13.30	10.00	0.75	DF #2	0.50	Base
SW Segment	A.4	9.70	10.00	1.03	DF #2	0.50	Base
SW Segment				#DIV/0!	S-P-F #1/#2	0.42	Interstory
SW GRID	**C**	**61.00**	**-**	**-**	**-**	**-**	**-**
SW Segment	C.1	13.90	10.00	0.72	DF #2	0.50	Base
SW Segment	C.2	23.50	10.00	0.43	DF #2	0.50	Base
SW Segment	C.3	13.90	10.00	0.72	DF #2	0.50	Base
SW Segment	C.4	9.70	10.00	1.03	DF #2	0.50	Base
SW Segment				#DIV/0!	S-P-F #1/#2	0.42	Interstory
SW GRID	**G**	**51.30**	**-**	**-**	**-**	**-**	**-**
SW Segment	G.1	51.30	10.00	0.19	DF #2	0.50	Base
SW Segment				#DIV/0!	S-P-F #1/#2	0.42	Interstory
SW Segment				#DIV/0!	S-P-F #1/#2	0.42	Interstory
SW Segment				#DIV/0!	S-P-F #1/#2	0.42	Interstory
SW Segment				#DIV/0!	S-P-F #1/#2	0.42	Interstory
SW GRID	**L**	**38.10**	**-**	**-**	**-**	**-**	**-**
SW Segment	L.1	38.10	10.00	0.26	DF #2	0.50	Base
SW Segment				#DIV/0!	S-P-F #1/#2	0.42	Interstory
SW Segment				#DIV/0!	S-P-F #1/#2	0.42	Interstory
SW Segment				#DIV/0!	S-P-F #1/#2	0.42	Interstory
SW Segment				#DIV/0!	S-P-F #1/#2	0.42	Interstory

Shear Wall Loads and Summary

SW Mark		EQ (lb) Wall (ULT)	Wind (lb) Wall (ULT)	Wall DL (lb) Wall	Wall DL (lb) End 1	Wall DL (lb) End 2	Shear Wall Type	MIN. # of End Studs	Holdown
SW GRID	**A**	7593	6117	-	-	-	-	-	-
SW Segment	A.1	1539	1240	2160			**SW-6**	**2**	**HDU2 (3075DF,2215HF)**
SW Segment	A.2	3104	2501	4356			**SW-6**	**2**	**HDU2 (3075DF,2215HF)**
SW Segment	A.3	1706	1374	2394			**SW-6**	**2**	**HDU2 (3075DF,2215HF)**
SW Segment	A.4	1244	1002	1746			**SW-6**	**2**	**HDU2 (3075DF,2215HF)**
SW Segment		0	0				**2SW-2**		**No Strap**
SW GRID	**C**	11481	9249				-	-	-
SW Segment	C.1	2616	2108	2502			**SW-6**	**2**	**HDU2 (3075DF,2215HF)**
SW Segment	C.2	4423	3563	4230			**SW-6**	**2**	**HDU2 (3075DF,2215HF)**
SW Segment	C.3	2616	2108	1112			**SW-6**	**2**	**HDU2 (3075DF,2215HF)**
SW Segment	C.4	1826	1471	776			**SW-6**	**2**	**HDU2 (3075DF,2215HF)**
SW Segment		0	0				**2SW-2**		**No Strap**
SW GRID	**G**	14014	11290				-	-	-
SW Segment	G.1	14014	11290	9234			**SW-6**	**2**	**HDU2 (3075DF,2215HF)**
SW Segment		0	0				**2SW-2**		**No HD**
SW Segment		0	0				**2SW-2**		**No HD**
SW Segment		0	0				**2SW-2**		**No Strap**
SW Segment		0	0				**2SW-2**		**No Strap**
SW GRID	**L**	8899	7169				-	-	-
SW Segment	L.1	8899	7169	6858			**SW-6**	**2**	**HDU2 (3075DF,2215HF)**
SW Segment		0	0				**2SW-2**		**No HD**
SW Segment		0	0				**2SW-2**		**No Strap**
SW Segment		0	0				**2SW-2**		**No Strap**
SW Segment		0	0				**2SW-2**		**No Strap**

LIGHT FRAMED WOOD SHEATHED PANEL SHEAR WALL DESIGN

Per IBC 2018, ASCE 7-16, SDPWS 2018 & NDS 2018

Structure: **Brindley Res.**
Floor Level: **Roof (E-W)**

Shear Wall Schedule (LRFD) ϕ_D = 0.8

Shear Wall Type	Sheathing Grade, Sheathing Thickness, & Nail Size	Panel Edge Nail Spacing (in)	Nominal Seismic SW Capacity (plf)	LRFD Seismic SW Capacity (plf)	Sheathing Shear Stiffness, G_a (lb/in)
SW-6	APA Rated, 15/32", 8d Common	6	520	416	10
SW-4	APA Rated, 15/32", 8d Common	4	760	608	13
SW-3	APA Rated, 15/32", 8d Common	3	980	784	15
SW-2	APA Rated, 15/32", 8d Common	2	1280	1024	20
2SW-4	APA Rated, 15/32", 8d Common	4	1520	1216	26
2SW-3	APA Rated, 15/32", 8d Common	3	1960	1568	30
2SW-2	APA Rated, 15/32", 8d Common	2	2560	2048	40

Determine Shear Wall Type (LRFD)

SW Segment Mark	Seismic Shear (plf)	Aspect Ratio Reduction	Adjusted Seismic Shear (plf)	Wind Shear (plf)	Adjusted Wind Shear (plf)	Req'd Shear (plf)	Shear Wall Type	Shear Wall Capacity (plf)	Check
A.1	128	1.00	128	103	74	128	SW-6	416	OK
A.2	128	1.00	128	103	74	128	SW-6	416	OK
A.3	128	1.00	128	103	74	128	SW-6	416	OK
A.4	128	1.00	128	103	74	128	SW-6	416	OK
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2SW-2	2048	#DIV/0!
C.1	188	1.00	188	152	108	188	SW-6	416	OK
C.2	188	1.00	188	152	108	188	SW-6	416	OK
C.3	188	1.00	188	152	108	188	SW-6	416	OK
C.4	188	1.00	188	152	108	188	SW-6	416	OK
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2SW-2	2048	#DIV/0!
G.1	273	1.00	273	220	157	273	SW-6	416	OK
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2SW-2	2048	#DIV/0!
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2SW-2	2048	#DIV/0!
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2SW-2	2048	#DIV/0!
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2SW-2	2048	#DIV/0!
L.1	234	1.00	234	188	134	234	SW-6	416	OK
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2SW-2	2048	#DIV/0!
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2SW-2	2048	#DIV/0!
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2SW-2	2048	#DIV/0!
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2SW-2	2048	#DIV/0!

Determine Shear Wall Overturning Moment Lever Arm

SW Segment Mark	Wall Length Lever Arm (ft)	Calculated Lever Arm (ft)	% Different	Override Wall Length	User Input M_{OT} Lever Arm (ft)
A.1	12.00	11.52	4.21%	No	
A.2	24.20	23.72	2.04%	No	
A.3	13.30	12.82	3.78%	No	
A.4	9.70	9.22	5.26%	No	
				No	
C.1	13.90	13.42	3.61%	No	
C.2	23.50	23.02	2.10%	No	
C.3	13.90	13.42	3.61%	No	
C.4	9.70	9.22	5.26%	No	
				No	
G.1	51.30	50.82	0.95%	No	
				No	
				No	
				No	
				No	
L.1	38.10	37.62	1.29%	No	
				No	
				No	
				No	
				No	

LIGHT FRAMED WOOD SHEATHED PANEL SHEAR WALL DESIGN

Per IBC 2018, ASCE 7-16, SDPWS 2018 & NDS 2018

Structure: **Brindley Res.**
Floor Level: **Roof (E-W)**

Shear Wall End Axial Load (ASD)

SW Segment Mark	Seismic Tension (lb)	ASD Seismic Tension Above (lb)	Seismic Tension Total (lb)	Wind Tension (lb)	ASD Wind Tension Above (lb)	Wind Tension Total (lb)	End 1 Dead (lb)	End 2 Dead (lb)
A.1	898	**0**	898	620	**0**	620	1080	1080
A.2	898	**0**	898	620	**0**	620	2178	2178
A.3	898	**0**	898	620	**0**	620	1197	1197
A.4	898	**0**	898	620	**0**	620	873	873
		0			**0**			
C.1	1317	**0**	1317	910	**0**	910	1251	1251
C.2	1317	**0**	1317	910	**0**	910	2115	2115
C.3	1317	**0**	1317	910	**0**	910	556	556
C.4	1317	**0**	1317	910	**0**	910	388	388
		0			**0**			
G.1	1912	**0**	1912	1320	**0**	1320	4617	4617
		0			**0**			
		0			**0**			
		0			**0**			
		0			**0**			
L.1	1635	**0**	1635	1129	**0**	1129	3429	3429
		0			**0**			
		0			**0**			
		0			**0**			
		0			**0**			

Determine Required Holdown (ASD)

SW Segment Mark	Wind End 1 Eq. 16-15	End 1 Eq. 16-16	End 2 Eq. 16-15	End 2 Eq. 16-16	Controlling Ten. Load (lb)	Holdown	Holdown Capacity (lb)	Status
A.1	28	-428	28	-428	**-428**	**HDU2 (3075DF,2215HF)**	**-3075**	**OK**
A.2	687	49	687	49	**49**	**HDU2 (3075DF,2215HF)**	**-3075**	**OK**
A.3	98	-377	98	-377	**-377**	**HDU2 (3075DF,2215HF)**	**-3075**	**OK**
A.4	-96	-518	-96	-518	**-518**	**HDU2 (3075DF,2215HF)**	**-3075**	**OK**
						No Strap		
C.1	-159	-774	-159	-774	**-774**	**HDU2 (3075DF,2215HF)**	**-3075**	**OK**
C.2	994	-398	994	-398	**-398**	**HDU2 (3075DF,2215HF)**	**-3075**	**OK**
C.3	-409	-1076	-409	-1076	**-1076**	**HDU2 (3075DF,2215HF)**	**-3075**	**OK**
C.4	-677	-1149	-677	-1149	**-1149**	**HDU2 (3075DF,2215HF)**	**-3075**	**OK**
						No Strap		
G.1	1450	95	1450	95	**95**	**HDU2 (3075DF,2215HF)**	**-3075**	**OK**
						No HD		
						No HD		
						No Strap		
						No Strap		
L.1	1957	-144	1957	-144	**-144**	**HDU2 (3075DF,2215HF)**	**-3075**	**OK**
						No HD		
						No Strap		
						No Strap		
						No Strap		

LIGHT FRAMED WOOD SHEATHED PANEL SHEAR WALL DESIGN

Per IBC 2018, ASCE 7-16, SDPWS 2018 & NDS 2018

Structure: **Brindley Res.**
Floor Level: **Roof (E-W)-Continued**

Sds = **1.18**
Depth of Floor Framing & Plates (Clearspan) at Interstory (in) = **0.00**

Shear Wall Line Information

SW Mark		L_{SW} (ft)	h_{SW} (ft)	h_{SW}/Lsw	Wall Framing Species	Specific Gravity G	Interstory of Base?
SW GRID	**N**	**17.80**	**-**	**-**	**-**	**-**	**-**
SW Segment	N.1	10.20	10.00	0.98	DF #2	0.50	Base
SW Segment	N.2	3.80	10.00	2.63	DF #2	0.50	Base
SW Segment	N.3	3.80	10.00	2.63	DF #2	0.50	Base
SW Segment				#DIV/0!	S-P-F #1/#2	0.42	Interstory
SW Segment				#DIV/0!	S-P-F #1/#2	0.42	Interstory
SW GRID		**0.00**	**-**	**-**	**-**	**-**	**-**
SW Segment				#DIV/0!	DF #2	0.50	Interstory
SW Segment				#DIV/0!	DF #2	0.50	Interstory
SW Segment				#DIV/0!	S-P-F #1/#2	0.42	Interstory
SW Segment				#DIV/0!	S-P-F #1/#2	0.42	Interstory
SW Segment				#DIV/0!	S-P-F #1/#2	0.42	Interstory
SW GRID		**0.00**	**-**	**-**	**-**	**-**	**-**
SW Segment				#DIV/0!	S-P-F #1/#2	0.42	Interstory
SW Segment				#DIV/0!	S-P-F #1/#2	0.42	Interstory
SW Segment				#DIV/0!	S-P-F #1/#2	0.42	Interstory
SW Segment				#DIV/0!	S-P-F #1/#2	0.42	Interstory
SW Segment				#DIV/0!	S-P-F #1/#2	0.42	Interstory
SW GRID		**0.00**	**-**	**-**	**-**	**-**	**-**
SW Segment				#DIV/0!	S-P-F #1/#2	0.42	Interstory
SW Segment				#DIV/0!	S-P-F #1/#2	0.42	Interstory
SW Segment				#DIV/0!	S-P-F #1/#2	0.42	Interstory
SW Segment				#DIV/0!	S-P-F #1/#2	0.42	Interstory
SW Segment				#DIV/0!	S-P-F #1/#2	0.42	Interstory

Shear Wall Loads and Summary

SW Mark		EQ (lb) Wall (ULT)	Wind (lb) Wall (ULT)	Wall DL (lb) Wall	Wall DL (lb) End 1	Wall DL (lb) End 2	Shear Wall Type	MIN. # of End Studs	Holdown
SW GRID	**N**	4313	3475	-	-	-	-	-	-
SW Segment	N.1	2471	1991	1836			**SW-6**	**2**	**HDU2 (3075DF,2215HF)**
SW Segment	N.2	921	742	684			**SW-6**	**2**	**HDU2 (3075DF,2215HF)**
SW Segment	N.3	921	742	684			**SW-6**	**2**	**HDU2 (3075DF,2215HF)**
SW Segment		0	0				**2SW-2**		**No Strap**
SW Segment		0	0				**2SW-2**		**No Strap**
SW GRID							-	-	-
SW Segment		#DIV/0!	#DIV/0!				**SW-6**		**No Strap**
SW Segment		#DIV/0!	#DIV/0!				**SW-6**		**No Strap**
SW Segment		#DIV/0!	#DIV/0!				**2SW-2**		**No Strap**
SW Segment		#DIV/0!	#DIV/0!				**2SW-2**		**No Strap**
SW Segment		#DIV/0!	#DIV/0!				**2SW-2**		**No Strap**
SW GRID							-	-	-
SW Segment		#DIV/0!	#DIV/0!				**2SW-2**		**No Strap**
SW Segment		#DIV/0!	#DIV/0!				**2SW-2**		**No HD**
SW Segment		#DIV/0!	#DIV/0!				**2SW-2**		**No Strap**
SW Segment		#DIV/0!	#DIV/0!				**2SW-2**		**No Strap**
SW Segment		#DIV/0!	#DIV/0!				**2SW-2**		**No Strap**
SW GRID							-	-	-
SW Segment		#DIV/0!	#DIV/0!				**2SW-2**		**No HD**
SW Segment		#DIV/0!	#DIV/0!				**2SW-2**		**No HD**
SW Segment		#DIV/0!	#DIV/0!				**2SW-2**		**No Strap**
SW Segment		#DIV/0!	#DIV/0!				**2SW-2**		**No Strap**
SW Segment		#DIV/0!	#DIV/0!				**2SW-2**		**No Strap**

LIGHT FRAMED WOOD SHEATHED PANEL SHEAR WALL DESIGN

Per IBC 2018, ASCE 7-16, SDPWS 2018 & NDS 2018

Structure: **Brindley Res.**
Floor Level: **Roof (E-W)-Continued**

Shear Wall Schedule (LRFD) ϕ_D = 0.8

Shear Wall Type	Sheathing Grade, Sheathing Thickness, & Nail Size	Panel Edge Nail Spacing (in)	Nominal Seismic SW Capacity (plf)	LRFD Seismic SW Capacity (plf)	Sheathing Shear Stiffness, G_a (lb/in)
SW-6	APA Rated, 15/32", 8d Common	6	520	416	10
SW-4	APA Rated, 15/32", 8d Common	4	760	608	13
SW-3	APA Rated, 15/32", 8d Common	3	980	784	15
SW-2	APA Rated, 15/32", 8d Common	2	1280	1024	20
2SW-4	APA Rated, 15/32", 8d Common	4	1520	1216	26
2SW-3	APA Rated, 15/32", 8d Common	3	1960	1568	30
2SW-2	APA Rated, 15/32", 8d Common	2	2560	2048	40

Determine Shear Wall Type (LRFD)

SW Segment Mark	Seismic Shear (plf)	Aspect Ratio Reduction	Adjusted Seismic Shear (plf)	Wind Shear (plf)	Adjusted Wind Shear (plf)	Req'd Shear (plf)	Shear Wall Type	Shear Wall Capacity (plf)	Check
N.1	242	1.00	242	195	139	242	SW-6	416	OK
N.2	242	0.92	263	195	151	263	SW-6	416	OK
N.3	242	0.92	263	195	151	263	SW-6	416	OK
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2SW-2	2048	#DIV/0!
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2SW-2	2048	#DIV/0!
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	SW-6	416	#DIV/0!
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	SW-6	416	#DIV/0!
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2SW-2	2048	#DIV/0!
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2SW-2	2048	#DIV/0!
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2SW-2	2048	#DIV/0!
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2SW-2	2048	#DIV/0!
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2SW-2	2048	#DIV/0!
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2SW-2	2048	#DIV/0!
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2SW-2	2048	#DIV/0!
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2SW-2	2048	#DIV/0!
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2SW-2	2048	#DIV/0!
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2SW-2	2048	#DIV/0!
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2SW-2	2048	#DIV/0!
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2SW-2	2048	#DIV/0!
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2SW-2	2048	#DIV/0!

Determine Shear Wall Overturning Moment Lever Arm

SW Segment Mark	Wall Length Lever Arm (ft)	Calculated Lever Arm (ft)	% Different	Override Wall Length	User Input M_{OT} Lever Arm (ft)
N.1	10.20	9.72	4.99%	No	
N.2	3.80	3.32	14.61%	No	
N.3	3.80	3.32	14.61%	No	
				No	
				No	
				No	
				No	
				No	
				No	
				No	
				No	
				No	
				No	
				No	
				No	
				No	
				No	
				No	
				No	
				No	

LIGHT FRAMED WOOD SHEATHED PANEL SHEAR WALL DESIGN

Per IBC 2018, ASCE 7-16, SDPWS 2018 & NDS 2018

Structure: **Brindley Res.**
Floor Level: **Roof (E-W)-Continued**

Shear Wall End Axial Load (ASD)

SW Segment Mark	Seismic Tension (lb)	ASD Seismic Tension Above (lb)	Seismic Tension Total (lb)	Wind Tension (lb)	ASD Wind Tension Above (lb)	Wind Tension Total (lb)	End 1 Dead (lb)	End 2 Dead (lb)
N.1	1696	**0**	1696	1171	**0**	1171	918	918
N.2	1696	**0**	1696	1171	**0**	1171	342	342
N.3	1696	**0**	1696	1171	**0**	1171	342	342
		0			**0**			
		0			**0**			
		0			**0**			
		0			**0**			
		0			**0**			
		0			**0**			
		0			**0**			
		0			**0**			
		0			**0**			
		0			**0**			
		0			**0**			
		0			**0**			
		0			**0**			
		0			**0**			
		0			**0**			
		0			**0**			
		0			**0**			

Determine Required Holdown (ASD)

SW Segment Mark	Wind End 1 Eq. 16-15	End 1 Eq. 16-16	End 2 Eq. 16-15	End 2 Eq. 16-16	Controlling Ten. Load (lb)	Holdown	Holdown Capacity (lb)	Status
N.1	-621	-1297	-621	-1297	**-1297**	**HDU2 (3075DF,2215HF)**	**-3075**	**OK**
N.2	-966	-1547	-966	-1547	**-1547**	**HDU2 (3075DF,2215HF)**	**-3075**	**OK**
N.3	-966	-1547	-966	-1547	**-1547**	**HDU2 (3075DF,2215HF)**	**-3075**	**OK**
						No Strap		
						No Strap		
						No Strap		
						No Strap		
						No Strap		
						No Strap		
						No Strap		
						No Strap		
						No HD		
						No Strap		
						No Strap		
						No Strap		
						No HD		
						No HD		
						No Strap		
						No Strap		
						No Strap		