

Harriott Valentine Engineers Inc.

## STRUCTURAL CALCULATIONS

**Project:**

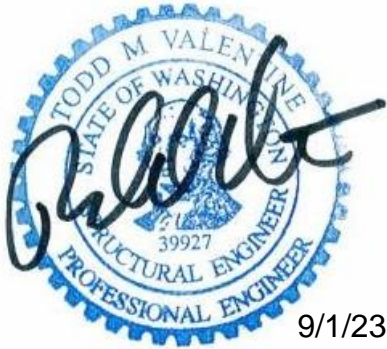
Garcia Residence  
4327 Forest Avenue Southeast  
Mercer Island, Washington 98040

**Architect:**

Capsule  
2366 Eastlake Avenue East, #403  
Seattle, Washington 98103

**Structural Engineer:**

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



9/1/23

**SECTION 1: GENERAL**

## CRITERIA

### Gravity

Deck	dead	2x decking	4.3	live deck	60.0 psf
		2x10 @ 16"oc	2.8		
		miscellaneous	1.9 21%		
			<u>9.0 psf</u>		
	total	dead + live			69.0 psf

### Lateral

Wind	wind importance factor	1.0		
	basic wind speed	97 mph		
	wind exposure	B		
Seismic	seismic importance factor	1.0		
	latitude	47.568 °		
	longitude	-122.233 °		
	mapped spectral response accel. at short periods (Ss)	1.430 g	(from SEAOC)	
	seismic design category	D		
	response modification factor (R)	1.5		

USGS web services were down for some period of time and as a result this tool wasn't operational, resulting in *timeout* error.  
USGS web services are now operational so this tool should work as expected.



# Garcia Residence

4327 Forest Ave SE, Mercer Island, WA 98040, USA

Latitude, Longitude: 47.5679413, -122.2327234



<b>Date</b>	8/9/2023, 7:40:19 AM
<b>Design Code Reference Document</b>	ASCE7-16
<b>Risk Category</b>	II
<b>Site Class</b>	D - Default (See Section 11.4.3)

Type	Value	Description
$S_S$	1.43	$MCE_R$ ground motion. (for 0.2 second period)
$S_1$	0.497	$MCE_R$ ground motion. (for 1.0s period)
$S_{MS}$	1.716	Site-modified spectral acceleration value
$S_{M1}$	null -See Section 11.4.8	Site-modified spectral acceleration value
$S_{DS}$	1.144	Numeric seismic design value at 0.2 second SA
$S_{D1}$	null -See Section 11.4.8	Numeric seismic design value at 1.0 second SA

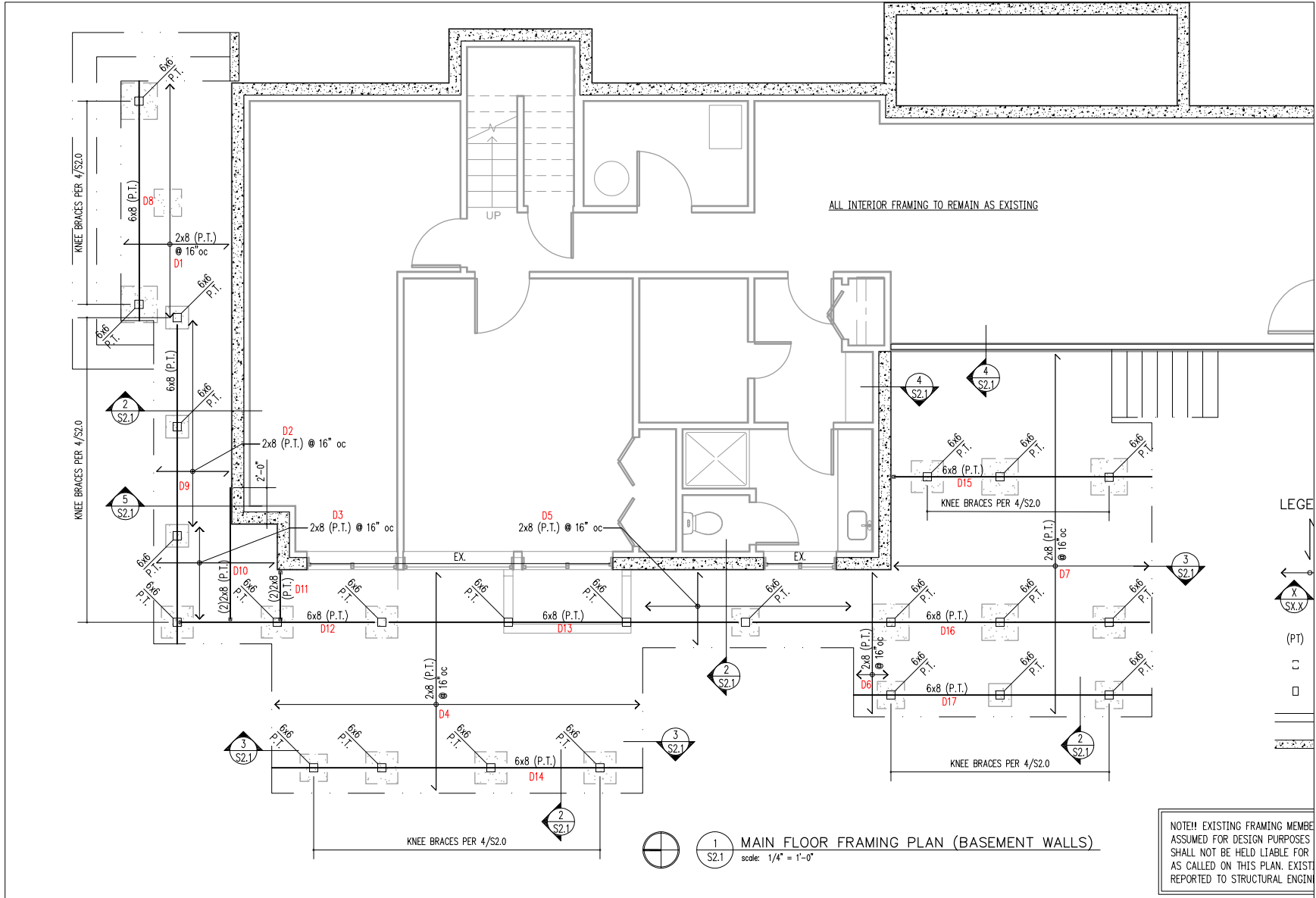
Type	Value	Description
SDC	null -See Section 11.4.8	Seismic design category
$F_a$	1.2	Site amplification factor at 0.2 second
$F_v$	null -See Section 11.4.8	Site amplification factor at 1.0 second
PGA	0.612	$MCE_G$ peak ground acceleration
$F_{PGA}$	1.2	Site amplification factor at PGA
$PGA_M$	0.735	Site modified peak ground acceleration
$T_L$	6	Long-period transition period in seconds
$S_{sRT}$	1.43	Probabilistic risk-targeted ground motion. (0.2 second)
$S_{sUH}$	1.585	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
$S_{sD}$	3.754	Factored deterministic acceleration value. (0.2 second)
$S_{1RT}$	0.497	Probabilistic risk-targeted ground motion. (1.0 second)
$S_{1UH}$	0.554	Factored uniform-hazard (2% probability of exceedance in 50 year
$S_{1D}$	1.488	Factored deterministic acceleration value. (1.0 second)

09/01/2023  
Page 4 of 37

Type	Value	Description
PGAd	1.273	Factored deterministic acceleration value. (Peak Ground Acceleration)
PGA <sub>UH</sub>	0.612	Uniform-hazard (2% probability of exceedance in 50 years) Peak Ground Acceleration
C <sub>RS</sub>	0.902	Mapped value of the risk coefficient at short periods
C <sub>R1</sub>	0.897	Mapped value of the risk coefficient at a period of 1 s
C <sub>V</sub>	1.386	Vertical coefficient

**SECTION 2: FRAMING**

DECK MEMBER ID



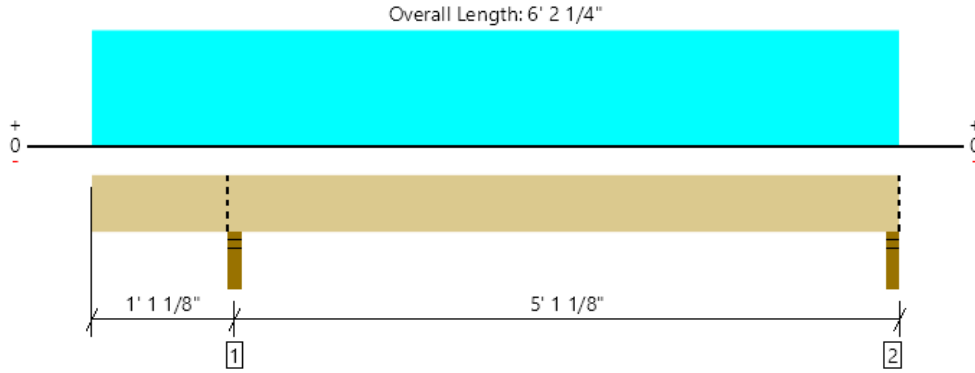
Deck			
Member Name	Results	Current Solution	Comments
D1	Passed	1 piece(s) 2 x 8 HF No.2 @ 16" OC	
D2	Passed	1 piece(s) 2 x 8 HF No.2 @ 16" OC	
D3	Passed	1 piece(s) 2 x 8 HF No.2 @ 16" OC	
D4	Passed	1 piece(s) 2 x 8 HF No.2 @ 16" OC	
D5	Passed	1 piece(s) 2 x 8 HF No.2 @ 16" OC	
D6	Passed	1 piece(s) 2 x 8 HF No.2 @ 16" OC	
D7	Passed	1 piece(s) 2 x 8 HF No.2 @ 16" OC	
D8	Passed	1 piece(s) 6 x 8 DF No.1	
D9	Passed	1 piece(s) 6 x 8 DF No.1	
D10	Passed	2 piece(s) 2 x 8 HF No.2	
D11	Passed	2 piece(s) 2 x 8 HF No.2	
D12	Passed	1 piece(s) 6 x 8 DF No.1	
D13	Passed	1 piece(s) 6 x 8 DF No.1	
D14	Passed	1 piece(s) 6 x 8 DF No.1	
D15	Passed	1 piece(s) 6 x 8 DF No.1	
D16	Passed	1 piece(s) 6 x 8 DF No.1	
D17	Passed	1 piece(s) 6 x 8 DF No.1	

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





Deck, D1  
1 piece(s) 2 x 8 HF No.2 @ 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)	338 @ 1' 1 1/8"	2126 (3.50")	Passed (16%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	169 @ 1' 10 1/8"	1088	Passed (16%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	276 @ 3' 6 7/8"	1284	Passed (21%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.017 @ 3' 6 11/16"	0.164	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.019 @ 3' 6 3/4"	0.246	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	N/A	N/A	N/A	--	N/A

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

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Stud wall - HF	3.50"	3.50"	1.50"	44	294	338	Blocking
2 - Stud wall - HF	3.00"	3.00"	1.50"	30	210/-10	241	Blocking

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

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

- Maximum allowable bracing intervals based on applied load.

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Floor Live (1.00)	Comments
1 - Uniform (PSF)	0 to 6' 2 1/4"	16"	9.0	60.0	Deck

**Weyerhaeuser Notes**

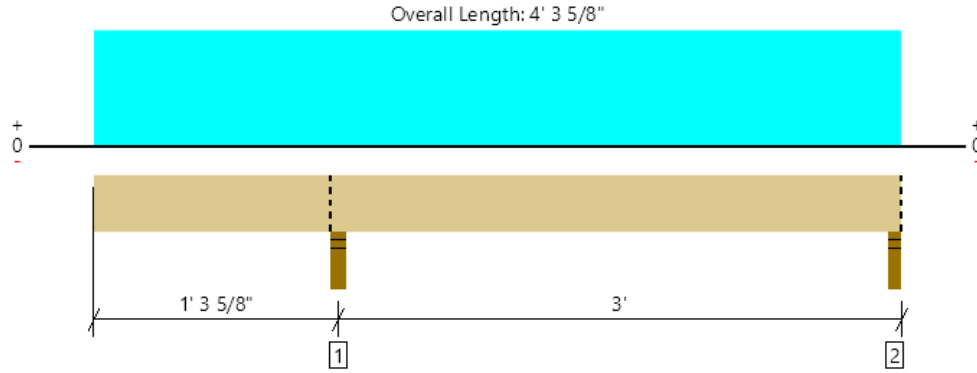
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional as determined by the authority having jurisdiction. The designer of record, builder or framer is responsible to assure that this calculation is compatible with the overall project. Accessories (Rim Board, Blocking Panels and Squash Blocks) are not designed by this software. Products manufactured at Weyerhaeuser facilities are third-party certified to sustainable forestry standards. Weyerhaeuser Engineered Lumber Products have been evaluated by ICC-ES under evaluation reports ESR-1153 and ESR-1387 and/or tested in accordance with applicable ASTM standards. For current code evaluation reports, Weyerhaeuser product literature and installation details refer to [www.weyerhaeuser.com/woodproducts/document-library](http://www.weyerhaeuser.com/woodproducts/document-library).

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

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



Deck, D2  
1 piece(s) 2 x 8 HF No.2 @ 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)	278 @ 1' 3 5/8"	2126 (3.50")	Passed (13%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	89 @ 2' 5/8"	1088	Passed (8%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	87 @ 2' 9 1/16"	1284	Passed (7%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.002 @ 2' 8 5/8"	0.094	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.003 @ 0	0.200	Passed (2L/999+)	--	1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	N/A	N/A	N/A	--	N/A

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

- Deflection criteria: LL (L/360) and TL (L/240).
- Overhang deflection criteria: LL (2L/360) and TL (0.2").
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A 15% increase in the moment capacity has been added to account for repetitive member usage.
- Applicable calculations are based on NDS.
- No composite action between deck and joist was considered in analysis.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Stud wall - HF	3.50"	3.50"	1.50"	36	241	278	Blocking
2 - Stud wall - HF	3.00"	3.00"	1.50"	15	127/-24	142/-9	Blocking

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

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

- Maximum allowable bracing intervals based on applied load.

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Floor Live (1.00)	Comments
1 - Uniform (PSF)	0 to 4' 3 5/8"	16"	9.0	60.0	Deck

**Weyerhaeuser Notes**

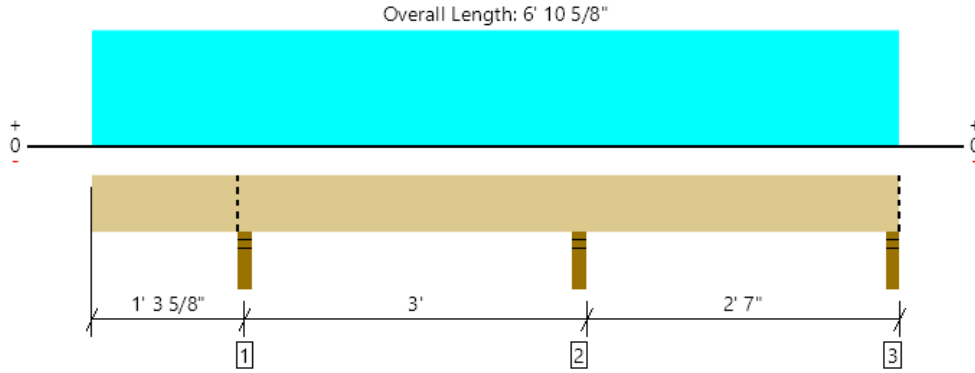
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional as determined by the authority having jurisdiction. The designer of record, builder or framer is responsible to assure that this calculation is compatible with the overall project. Accessories (Rim Board, Blocking Panels and Squash Blocks) are not designed by this software. Products manufactured at Weyerhaeuser facilities are third-party certified to sustainable forestry standards. Weyerhaeuser Engineered Lumber Products have been evaluated by ICC-ES under evaluation reports ESR-1153 and ESR-1387 and/or tested in accordance with applicable ASTM standards. For current code evaluation reports, Weyerhaeuser product literature and installation details refer to [www.weyerhaeuser.com/woodproducts/document-library](http://www.weyerhaeuser.com/woodproducts/document-library).

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

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



Deck, D3  
1 piece(s) 2 x 8 HF No.2 @ 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)	307 @ 4' 1 7/8"	2126 (3.50")	Passed (14%)	--	1.0 D + 1.0 L (Adj Spans)
Shear (lbs)	88 @ 3' 4 7/8"	1088	Passed (8%)	1.00	1.0 D + 1.0 L (Adj Spans)
Moment (Ft-lbs)	-82 @ 4' 1 7/8"	1284	Passed (6%)	1.00	1.0 D + 1.0 L (Adj Spans)
Live Load Defl. (in)	0.003 @ 0	0.200	Passed (2L/999+)	--	1.0 D + 1.0 L (Alt Spans)
Total Load Defl. (in)	0.004 @ 0	0.200	Passed (2L/999+)	--	1.0 D + 1.0 L (Alt Spans)
TJ-Pro™ Rating	N/A	N/A	N/A	--	N/A

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

- Deflection criteria: LL (L/360) and TL (L/240).
- Overhang deflection criteria: LL (0.2") and TL (0.2").
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A 15% increase in the moment capacity has been added to account for repetitive member usage.
- Applicable calculations are based on NDS.
- No composite action between deck and joist was considered in analysis.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Stud wall - HF	3.50"	3.50"	1.50"	33	233	267	Blocking
2 - Stud wall - SPF	3.50"	3.50"	1.50"	35	271	307	None
3 - Stud wall - HF	3.00"	3.00"	1.50"	14	111/-17	125/-3	Blocking

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

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

•Maximum allowable bracing intervals based on applied load.

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Floor Live (1.00)	Comments
1 - Uniform (PSF)	0 to 6' 10 5/8"	16"	9.0	60.0	Deck

**Weyerhaeuser Notes**

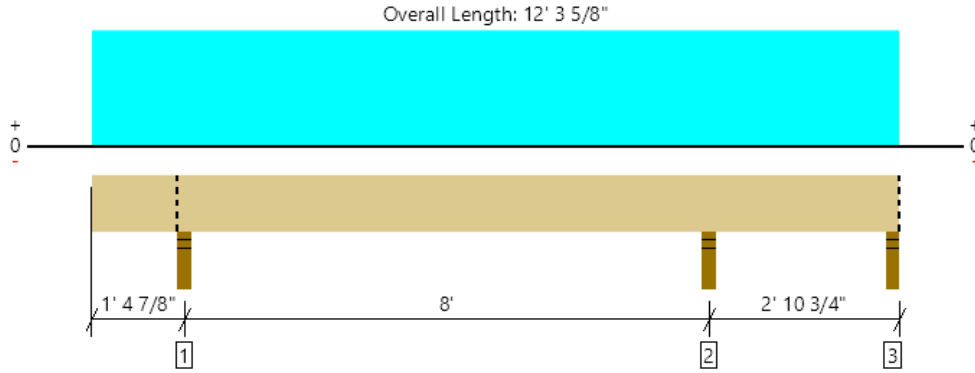
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional as determined by the authority having jurisdiction. The designer of record, builder or framer is responsible to assure that this calculation is compatible with the overall project. Accessories (Rim Board, Blocking Panels and Squash Blocks) are not designed by this software. Products manufactured at Weyerhaeuser facilities are third-party certified to sustainable forestry standards. Weyerhaeuser Engineered Lumber Products have been evaluated by ICC-ES under evaluation reports ESR-1153 and ESR-1387 and/or tested in accordance with applicable ASTM standards. For current code evaluation reports, Weyerhaeuser product literature and installation details refer to [www.woyehaeuser.com/woodproducts/document-library](http://www.woyehaeuser.com/woodproducts/document-library).

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

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



Deck, D4  
1 piece(s) 2 x 8 HF No.2 @ 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)	770 @ 9' 4 7/8"	2126 (3.50")	Passed (36%)	--	1.0 D + 1.0 L (Adj Spans)
Shear (lbs)	368 @ 8' 7 7/8"	1088	Passed (34%)	1.00	1.0 D + 1.0 L (Adj Spans)
Moment (Ft-lbs)	-566 @ 9' 4 7/8"	1284	Passed (44%)	1.00	1.0 D + 1.0 L (Adj Spans)
Live Load Defl. (in)	0.067 @ 5' 5/8"	0.267	Passed (L/999+)	--	1.0 D + 1.0 L (Alt Spans)
Total Load Defl. (in)	0.075 @ 5' 5/8"	0.400	Passed (L/999+)	--	1.0 D + 1.0 L (Alt Spans)
TJ-Pro™ Rating	N/A	N/A	N/A	--	N/A

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

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Stud wall - HF	3.50"	3.50"	1.50"	58	386	444	Blocking
2 - Stud wall - SPF	3.50"	3.50"	1.50"	97	673	770	None
3 - Stud wall - HF	3.00"	3.00"	1.50"	-7	126/-175	119/-182	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	12' 4" o/c	
Bottom Edge (Lu)	12' 4" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Floor Live (1.00)	Comments
1 - Uniform (PSF)	0 to 12' 3 5/8"	16"	9.0	60.0	Deck

**Weyerhaeuser Notes**

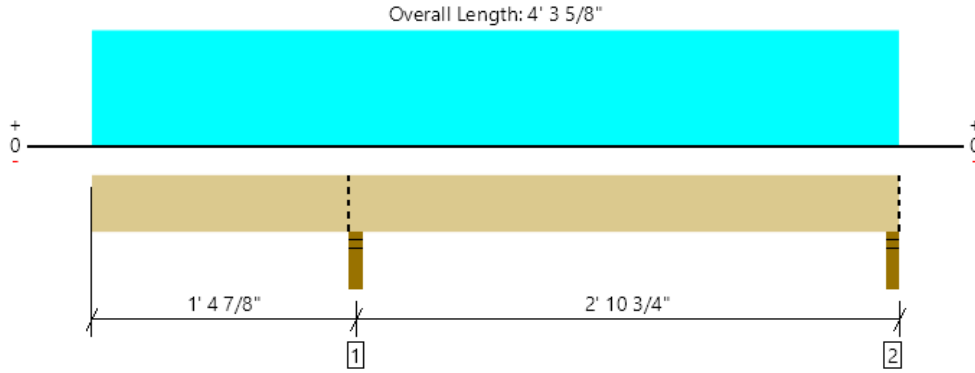
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional as determined by the authority having jurisdiction. The designer of record, builder or framer is responsible to assure that this calculation is compatible with the overall project. Accessories (Rim Board, Blocking Panels and Squash Blocks) are not designed by this software. Products manufactured at Weyerhaeuser facilities are third-party certified to sustainable forestry standards. Weyerhaeuser Engineered Lumber Products have been evaluated by ICC-ES under evaluation reports ESR-1153 and ESR-1387 and/or tested in accordance with applicable ASTM standards. For current code evaluation reports, Weyerhaeuser product literature and installation details refer to [www.weyerhaeuser.com/woodproducts/document-library](http://www.weyerhaeuser.com/woodproducts/document-library).

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

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



Deck, D5  
1 piece(s) 2 x 8 HF No.2 @ 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)	288 @ 1' 4 7/8"	2126 (3.50")	Passed (14%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	90 @ 2' 1 7/8"	1088	Passed (8%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	-91 @ 1' 4 7/8"	1284	Passed (7%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.004 @ 0	0.200	Passed (2L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.004 @ 0	0.200	Passed (2L/999+)	--	1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	N/A	N/A	N/A	--	N/A

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

- Deflection criteria: LL (L/360) and TL (L/240).
- Overhang deflection criteria: LL (0.2") and TL (0.2").
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A 15% increase in the moment capacity has been added to account for repetitive member usage.
- Applicable calculations are based on NDS.
- No composite action between deck and joist was considered in analysis.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Stud wall - HF	3.50"	3.50"	1.50"	38	251	288	Blocking
2 - Stud wall - HF	3.00"	3.00"	1.50"	14	123/-29	137/-15	Blocking

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

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

- Maximum allowable bracing intervals based on applied load.

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Floor Live (1.00)	Comments
1 - Uniform (PSF)	0 to 4' 3 5/8"	16"	9.0	60.0	Deck

**Weyerhaeuser Notes**

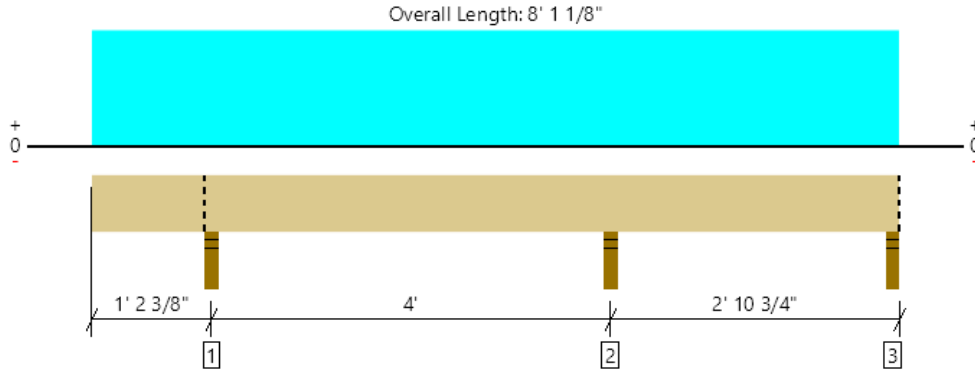
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional as determined by the authority having jurisdiction. The designer of record, builder or framer is responsible to assure that this calculation is compatible with the overall project. Accessories (Rim Board, Blocking Panels and Squash Blocks) are not designed by this software. Products manufactured at Weyerhaeuser facilities are third-party certified to sustainable forestry standards. Weyerhaeuser Engineered Lumber Products have been evaluated by ICC-ES under evaluation reports ESR-1153 and ESR-1387 and/or tested in accordance with applicable ASTM standards. For current code evaluation reports, Weyerhaeuser product literature and installation details refer to [www.weyerhaeuser.com/woodproducts/document-library](http://www.weyerhaeuser.com/woodproducts/document-library).

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

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



Deck, D6  
1 piece(s) 2 x 8 HF No.2 @ 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)	395 @ 5' 2 3/8"	2126 (3.50")	Passed (19%)	--	1.0 D + 1.0 L (Adj Spans)
Shear (lbs)	148 @ 4' 5 3/8"	1088	Passed (14%)	1.00	1.0 D + 1.0 L (Adj Spans)
Moment (Ft-lbs)	-142 @ 5' 2 3/8"	1284	Passed (11%)	1.00	1.0 D + 1.0 L (Adj Spans)
Live Load Defl. (in)	0.005 @ 3' 1 3/16"	0.133	Passed (L/999+)	--	1.0 D + 1.0 L (Alt Spans)
Total Load Defl. (in)	0.005 @ 3' 1 3/16"	0.200	Passed (L/999+)	--	1.0 D + 1.0 L (Alt Spans)
TJ-Pro™ Rating	N/A	N/A	N/A	--	N/A

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

- Deflection criteria: LL (L/360) and TL (L/240).
- Overhang deflection criteria: LL (2L/360) and TL (0.2").
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A 15% increase in the moment capacity has been added to account for repetitive member usage.
- Applicable calculations are based on NDS.
- No composite action between deck and joist was considered in analysis.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Stud wall - HF	3.50"	3.50"	1.50"	36	251	287	Blocking
2 - Stud wall - SPF	3.50"	3.50"	1.50"	48	346	395	None
3 - Stud wall - HF	3.00"	3.00"	1.50"	12	118/-35	130/-22	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)	8' 1" o/c	
Bottom Edge (Lu)	8' 1" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Floor Live (1.00)	Comments
1 - Uniform (PSF)	0 to 8' 1 1/8"	16"	9.0	60.0	Deck

**Weyerhaeuser Notes**

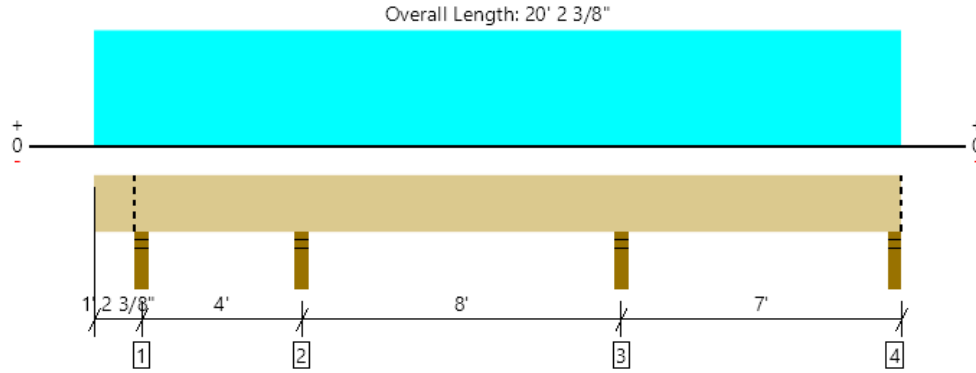
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional as determined by the authority having jurisdiction. The designer of record, builder or framer is responsible to assure that this calculation is compatible with the overall project. Accessories (Rim Board, Blocking Panels and Squash Blocks) are not designed by this software. Products manufactured at Weyerhaeuser facilities are third-party certified to sustainable forestry standards. Weyerhaeuser Engineered Lumber Products have been evaluated by ICC-ES under evaluation reports ESR-1153 and ESR-1387 and/or tested in accordance with applicable ASTM standards. For current code evaluation reports, Weyerhaeuser product literature and installation details refer to [www.weyerhaeuser.com/woodproducts/document-library](http://www.weyerhaeuser.com/woodproducts/document-library).

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

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



Deck, D7  
1 piece(s) 2 x 8 HF No.2 @ 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)	798 @ 13' 2 3/8"	2126 (3.50")	Passed (38%)	--	1.0 D + 1.0 L (Adj Spans)
Shear (lbs)	332 @ 12' 5 3/8"	1088	Passed (31%)	1.00	1.0 D + 1.0 L (Adj Spans)
Moment (Ft-lbs)	-563 @ 13' 2 3/8"	1284	Passed (44%)	1.00	1.0 D + 1.0 L (Adj Spans)
Live Load Defl. (in)	0.054 @ 9' 3 3/16"	0.267	Passed (L/999+)	--	1.0 D + 1.0 L (Alt Spans)
Total Load Defl. (in)	0.058 @ 9' 2 7/8"	0.400	Passed (L/999+)	--	1.0 D + 1.0 L (Alt Spans)
TJ-Pro™ Rating	N/A	N/A	N/A	--	N/A

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

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Stud wall - HF	3.50"	3.50"	1.50"	29	278	307	Blocking
2 - Stud wall - SPF	3.50"	3.50"	1.50"	78	601	679	None
3 - Stud wall - SPF	3.50"	3.50"	1.50"	103	695	798	None
4 - Stud wall - HF	3.00"	3.00"	1.50"	33	254/-37	287/-5	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	20' 2" o/c	
Bottom Edge (Lu)	14' 10" o/c	

- Maximum allowable bracing intervals based on applied load.

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Floor Live (1.00)	Comments
1 - Uniform (PSF)	0 to 20' 2 3/8"	16"	9.0	60.0	Deck

**Weyerhaeuser Notes**

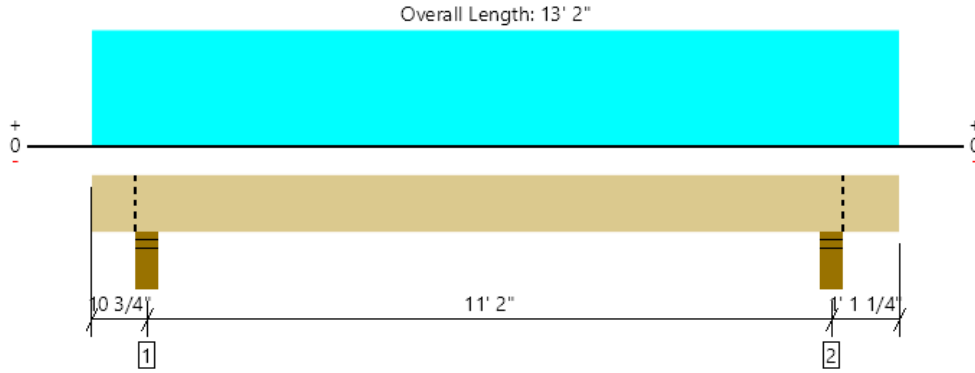
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional as determined by the authority having jurisdiction. The designer of record, builder or framer is responsible to assure that this calculation is compatible with the overall project. Accessories (Rim Board, Blocking Panels and Squash Blocks) are not designed by this software. Products manufactured at Weyerhaeuser facilities are third-party certified to sustainable forestry standards. Weyerhaeuser Engineered Lumber Products have been evaluated by ICC-ES under evaluation reports ESR-1153 and ESR-1387 and/or tested in accordance with applicable ASTM standards. For current code evaluation reports, Weyerhaeuser product literature and installation details refer to [www.woodyaehaeuser.com/woodproducts/document-library](http://www.woodyaehaeuser.com/woodproducts/document-library).

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

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



Deck, D8  
1 piece(s) 6 x 8 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)	1778 @ 12' 3/4"	12856 (5.50")	Passed (14%)	--	1.0 D + 1.0 L (Adj Spans)
Shear (lbs)	1261 @ 11' 2 1/2"	4675	Passed (27%)	1.00	1.0 D + 1.0 L (Adj Spans)
Moment (Ft-lbs)	4092 @ 6' 5 11/16"	5156	Passed (79%)	1.00	1.0 D + 1.0 L (Alt Spans)
Live Load Defl. (in)	0.249 @ 6' 5 3/4"	0.372	Passed (L/537)	--	1.0 D + 1.0 L (Alt Spans)
Total Load Defl. (in)	0.297 @ 6' 5 3/4"	0.558	Passed (L/452)	--	1.0 D + 1.0 L (Alt Spans)

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

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Stud wall - SPF	5.50"	5.50"	1.50"	281	1437	1717	Blocking
2 - Stud wall - SPF	5.50"	5.50"	1.50"	291	1487	1778	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)	13' 2" o/c	
Bottom Edge (Lu)	13' 2" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 13' 2"	N/A	10.4	--	
1 - Uniform (PLF)	0 to 13' 2" (Top)	N/A	33.0	220.5	Linked from: D1, Support 1

**Weyerhaeuser Notes**

Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional as determined by the authority having jurisdiction. The designer of record, builder or framer is responsible to assure that this calculation is compatible with the overall project. Accessories (Rim Board, Blocking Panels and Squash Blocks) are not designed by this software. Products manufactured at Weyerhaeuser facilities are third-party certified to sustainable forestry standards. Weyerhaeuser Engineered Lumber Products have been evaluated by ICC-ES under evaluation reports ESR-1153 and ESR-1387 and/or tested in accordance with applicable ASTM standards. For current code evaluation reports, Weyerhaeuser product literature and installation details refer to [www.weyerhaeuser.com/woodproducts/document-library](http://www.weyerhaeuser.com/woodproducts/document-library).

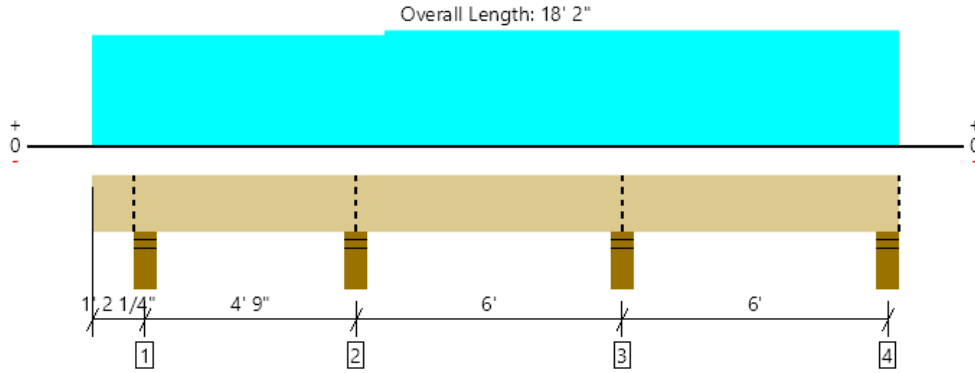
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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





Deck, D9  
1 piece(s) 6 x 8 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)	1544 @ 11' 11 1/4"	12856 (5.50")	Passed (12%)	--	1.0 D + 1.0 L (Adj Spans)
Shear (lbs)	607 @ 12' 9 1/2"	4675	Passed (13%)	1.00	1.0 D + 1.0 L (Adj Spans)
Moment (Ft-lbs)	-886 @ 11' 11 1/4"	5156	Passed (17%)	1.00	1.0 D + 1.0 L (Adj Spans)
Live Load Defl. (in)	0.012 @ 15' 7/16"	0.197	Passed (L/999+)	--	1.0 D + 1.0 L (Alt Spans)
Total Load Defl. (in)	0.013 @ 15' 13/16"	0.295	Passed (L/999+)	--	1.0 D + 1.0 L (Alt Spans)

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

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Stud wall - SPF	5.50"	5.50"	1.50"	111	630	741	Blocking
2 - Stud wall - SPF	5.50"	5.50"	1.50"	201	1136	1337	Blocking
3 - Stud wall - SPF	5.50"	5.50"	1.50"	255	1289	1544	Blocking
4 - Stud wall - SPF	5.50"	5.50"	1.50"	99	532/-55	631	Blocking

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

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

•Maximum allowable bracing intervals based on applied load.

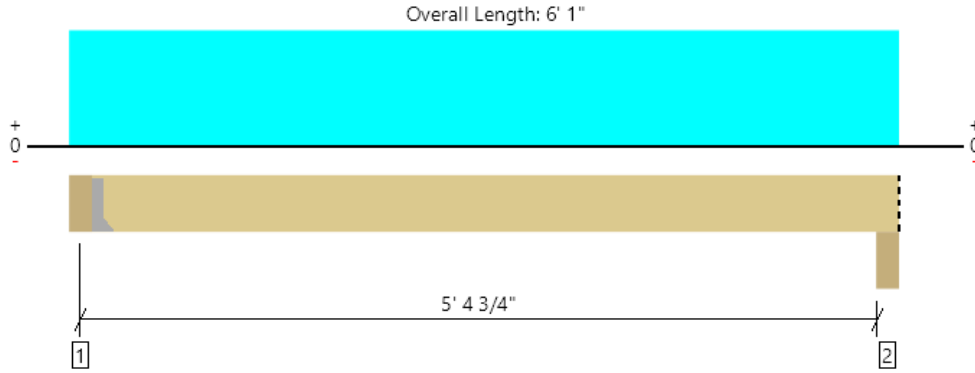
Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 18' 2"	N/A	10.4	--	
1 - Uniform (PLF)	6' 7" to 18' 2" (Top)	N/A	27.0	180.8	Linked from: D2, Support 1
2 - Uniform (PLF)	0 to 6' 7" (Top)	N/A	24.8	174.8	Linked from: D3, Support 1

**Weyerhaeuser Notes**  
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional as determined by the authority having jurisdiction. The designer of record, builder or framer is responsible to assure that this calculation is compatible with the overall project. Accessories (Rim Board, Blocking Panels and Squash Blocks) are not designed by this software. Products manufactured at Weyerhaeuser facilities are third-party certified to sustainable forestry standards. Weyerhaeuser Engineered Lumber Products have been evaluated by ICC-ES under evaluation reports ESR-1153 and ESR-1387 and/or tested in accordance with applicable ASTM standards. For current code evaluation reports, Weyerhaeuser product literature and installation details refer to [www.weyerhaeuser.com/woodproducts/document-library](http://www.weyerhaeuser.com/woodproducts/document-library).  
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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



Deck, D10  
2 piece(s) 2 x 8 HF No.2



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	622 @ 5' 1/2"	1823 (1.50")	Passed (34%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	480 @ 1' 3/4"	2175	Passed (22%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	823 @ 3' 1 1/4"	2234	Passed (37%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.029 @ 3' 1 1/4"	0.176	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.033 @ 3' 1 1/4"	0.265	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)

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

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Hanger on 7 1/4" SPF beam	5.50"	Hanger <sup>1</sup>	1.50"	96	631	727	See note <sup>1</sup>
2 - Ledger - SPF	5.50"	5.50"	1.50"	95	606	700	Blocking

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

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

- Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-Tie							
Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories	
1 - Face Mount Hanger	LUS26-2	2.00"	N/A	4-10dx1.5	4-10d		

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

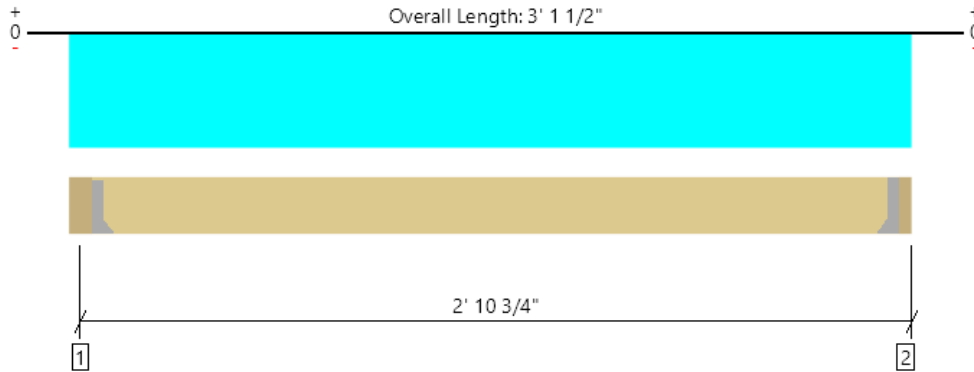
Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	5' 1/2" to 6' 1"	N/A	5.5	--	
1 - Uniform (PLF)	0 to 6' 1" (Top)	N/A	26.3	203.3	Linked from: D3, Support 2

**Weyerhaeuser Notes**  
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional as determined by the authority having jurisdiction. The designer of record, builder or framer is responsible to assure that this calculation is compatible with the overall project. Accessories (Rim Board, Blocking Panels and Squash Blocks) are not designed by this software. Products manufactured at Weyerhaeuser facilities are third-party certified to sustainable forestry standards. Weyerhaeuser Engineered Lumber Products have been evaluated by ICC-ES under evaluation reports ESR-1153 and ESR-1387 and/or tested in accordance with applicable ASTM standards. For current code evaluation reports, Weyerhaeuser product literature and installation details refer to [www.weyerhaeuser.com/woodproducts/document-library](http://www.weyerhaeuser.com/woodproducts/document-library).  
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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



Deck, D11  
2 piece(s) 2 x 8 HF No.2



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

Design Results	Actual @ Location	Allowed	Result	LDf	Load: Combination (Pattern) [Group]
Member Reaction (lbs)	120 @ 5 1/2"	1823 (1.50")	Passed (7%)	--	1.0 D + 1.0 L (All Spans) [1]
Shear (lbs)	60 @ 1' 3/4"	2175	Passed (3%)	1.00	1.0 D + 1.0 L (All Spans) [1]
Moment (Ft-lbs)	72 @ 1' 8"	2234	Passed (3%)	1.00	1.0 D + 1.0 L (All Spans) [1]
Live Load Defl. (in)	0.001 @ 1' 8"	0.081	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans) [1]
Total Load Defl. (in)	0.001 @ 1' 8"	0.121	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans) [1]

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

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Hanger on 7 1/4" SPF beam	5.50"	Hanger <sup>1</sup>	1.50"	24	139/-21	163	See note <sup>1</sup>
2 - Hanger on 7 1/4" SPF Ledger	3.00"	Hanger <sup>1</sup>	1.50"	22	121/-19	143	See note <sup>1</sup>

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

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

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	5 1/2" to 2' 10 1/2"	N/A	5.5	--	
1 - Uniform (PLF)	0 to 3' 1 1/2" (Top)	N/A	10.5	83.3/-12.8	Linked from: D3, Support 3

#### Weyerhaeuser Notes

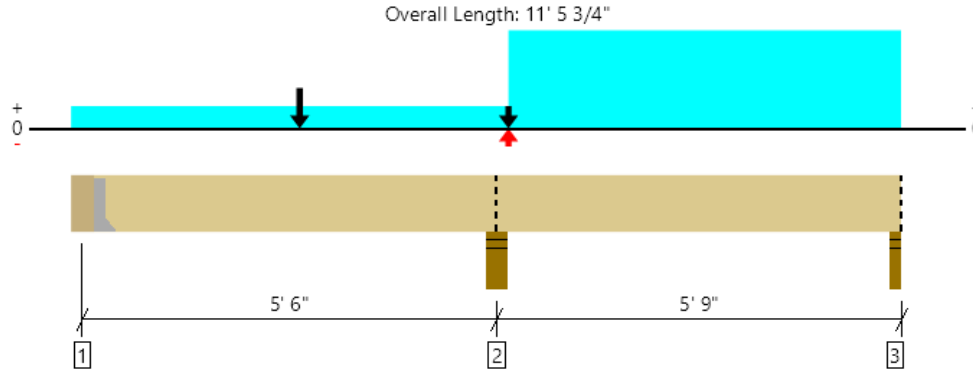
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional as determined by the authority having jurisdiction. The designer of record, builder or framer is responsible to assure that this calculation is compatible with the overall project. Accessories (Rim Board, Blocking Panels and Squash Blocks) are not designed by this software. Products manufactured at Weyerhaeuser facilities are third-party certified to sustainable forestry standards. Weyerhaeuser Engineered Lumber Products have been evaluated by ICC-ES under evaluation reports ESR-1153 and ESR-1387 and/or tested in accordance with applicable ASTM standards. For current code evaluation reports, Weyerhaeuser product literature and installation details refer to [www.weyerhaeuser.com/woodproducts/document-library](http://www.weyerhaeuser.com/woodproducts/document-library).

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

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



Deck, D12  
1 piece(s) 6 x 8 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) [Group]
Member Reaction (lbs)	3151 @ 5' 8 3/4"	12856 (5.50")	Passed (25%)	--	1.0 D + 1.0 L (All Spans) [1]
Shear (lbs)	1476 @ 6' 7"	4675	Passed (32%)	1.00	1.0 D + 1.0 L (All Spans) [1]
Moment (Ft-lbs)	-1794 @ 5' 8 3/4"	5156	Passed (35%)	1.00	1.0 D + 1.0 L (All Spans) [1]
Live Load Defl. (in)	0.026 @ 8' 8 5/8"	0.188	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans) [1]
Total Load Defl. (in)	0.029 @ 8' 8 13/16"	0.282	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans) [1]

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

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Hanger on 7 1/2" SPF beam	5.50"	Hanger <sup>1</sup>	1.50"	77	568/-145	645/-67	See note <sup>1</sup>
2 - Stud wall - SPF	5.50"	5.50"	1.50"	468	2683	3151	Blocking
3 - Stud wall - SPF	2.75"	2.75"	1.50"	197	1293/-87	1490	Blocking

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

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

•Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-Tie

Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
1 - Face Mount Hanger	U66	2.00"	N/A	8-10dx1.5	4-10d	

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	5 1/2" to 11' 5 3/4"	N/A	10.4	--	
1 - Uniform (PSF)	0 to 5' 10 3/4" (Top)	1' 10 3/4"	9.0	60.0	Default Load
2 - Uniform (PLF)	5' 10 3/4" to 11' 5 3/4" (Top)	N/A	72.8	504.8	Linked from: D4, Support 2
3 - Point (lb)	3' 1 3/4" (Front)	N/A	96	631	Linked from: D10, Support 1
4 - Point (lb)	5' 10 3/4" (Front)	N/A	24	139/-21	Linked from: D11, Support 1

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



## Weyerhaeuser Notes

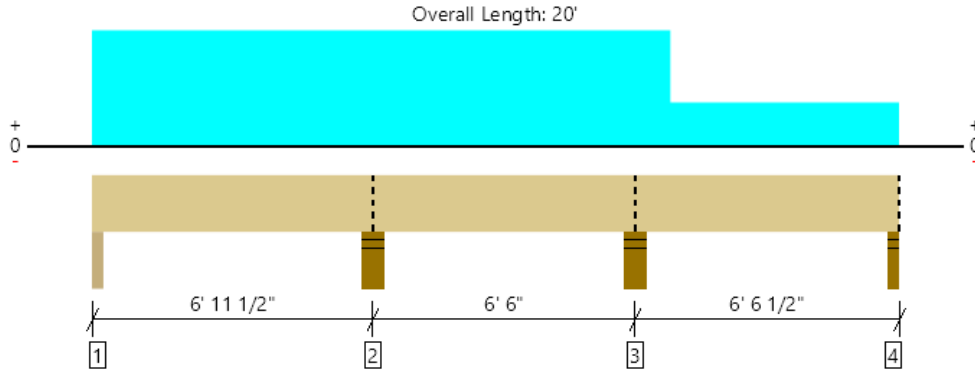
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional as determined by the authority having jurisdiction. The designer of record, builder or framer is responsible to assure that this calculation is compatible with the overall project. Accessories (Rim Board, Blocking Panels and Squash Blocks) are not designed by this software. Products manufactured at Weyerhaeuser facilities are third-party certified to sustainable forestry standards. Weyerhaeuser Engineered Lumber Products have been evaluated by ICC-ES under evaluation reports ESR-1153 and ESR-1387 and/or tested in accordance with applicable ASTM standards. For current code evaluation reports, Weyerhaeuser product literature and installation details refer to [www.eyerhaeuser.com/woodproducts/document-library](http://www.eyerhaeuser.com/woodproducts/document-library).

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

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



Deck, D13  
1 piece(s) 6 x 8 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)	4706 @ 6' 11 1/2"	12856 (5.50")	Passed (37%)	--	1.0 D + 1.0 L (Adj Spans)
Shear (lbs)	1960 @ 6' 1 1/4"	4675	Passed (42%)	1.00	1.0 D + 1.0 L (Adj Spans)
Moment (Ft-lbs)	-3065 @ 6' 11 1/2"	5156	Passed (59%)	1.00	1.0 D + 1.0 L (Adj Spans)
Live Load Defl. (in)	0.057 @ 3' 4"	0.228	Passed (L/999+)	--	1.0 D + 1.0 L (Alt Spans)
Total Load Defl. (in)	0.064 @ 3' 3 3/4"	0.343	Passed (L/999+)	--	1.0 D + 1.0 L (Alt Spans)

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

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Beam - SPF	2.75"	2.75"	1.50"	234	1566/-151	1800	None
2 - Stud wall - SPF	5.50"	5.50"	2.01"	644	4063	4706	Blocking
3 - Stud wall - SPF	5.50"	5.50"	1.50"	439	2877	3316	Blocking
4 - Stud wall - SPF	2.75"	2.75"	1.50"	97	619/-168	716/-71	Blocking

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

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 20'	N/A	10.4	--	
1 - Uniform (PLF)	0 to 14' 4" (Top)	N/A	72.8	504.8	Linked from: D4, Support 2
2 - Uniform (PLF)	14' 4" to 20' (Top)	N/A	28.5	188.3	Linked from: D5, Support 1

**Weyerhaeuser Notes**

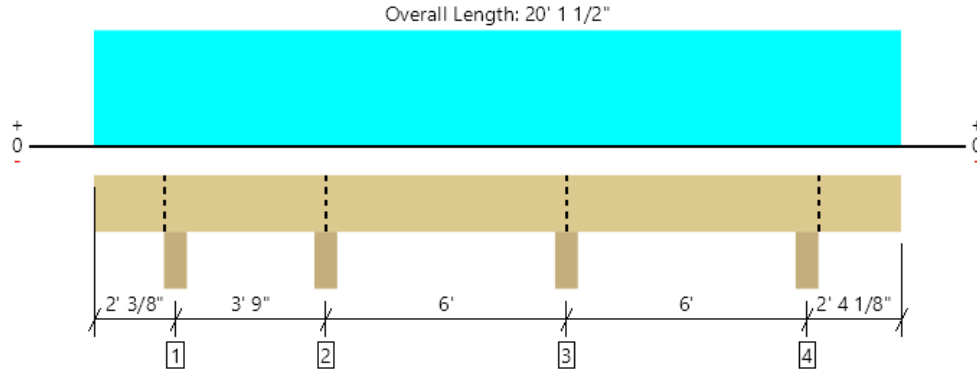
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional as determined by the authority having jurisdiction. The designer of record, builder or framer is responsible to assure that this calculation is compatible with the overall project. Accessories (Rim Board, Blocking Panels and Squash Blocks) are not designed by this software. Products manufactured at Weyerhaeuser facilities are third-party certified to sustainable forestry standards. Weyerhaeuser Engineered Lumber Products have been evaluated by ICC-ES under evaluation reports ESR-1153 and ESR-1387 and/or tested in accordance with applicable ASTM standards. For current code evaluation reports, Weyerhaeuser product literature and installation details refer to [www.woyehaeuser.com/woodproducts/document-library](http://www.woyehaeuser.com/woodproducts/document-library).

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

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



Deck, D14  
1 piece(s) 6 x 8 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)	4175 @ 11' 9 3/8"	18906 (5.50")	Passed (22%)	--	1.0 D + 1.0 L (Adj Spans)
Shear (lbs)	1625 @ 12' 7 5/8"	4675	Passed (35%)	1.00	1.0 D + 1.0 L (Adj Spans)
Moment (Ft-lbs)	-2411 @ 11' 9 3/8"	5156	Passed (47%)	1.00	1.0 D + 1.0 L (Adj Spans)
Live Load Defl. (in)	0.054 @ 20' 1 1/2"	0.200	Passed (2L/999+)	--	1.0 D + 1.0 L (Alt Spans)
Total Load Defl. (in)	0.055 @ 20' 1 1/2"	0.234	Passed (2L/999+)	--	1.0 D + 1.0 L (Alt Spans)

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

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Column - SPF	5.50"	5.50"	1.50"	326	2310	2635	Blocking
2 - Column - SPF	5.50"	5.50"	1.50"	387	3099	3486	Blocking
3 - Column - SPF	5.50"	5.50"	1.50"	525	3651	4175	Blocking
4 - Column - SPF	5.50"	5.50"	1.50"	437	2801	3238	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	20' 2" o/c	
Bottom Edge (Lu)	20' 2" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 20' 1 1/2"	N/A	10.4	--	
1 - Uniform (PLF)	0 to 20' 1 1/2" (Top)	N/A	72.8	504.8	Linked from: D4, Support 2

**Weyerhaeuser Notes**

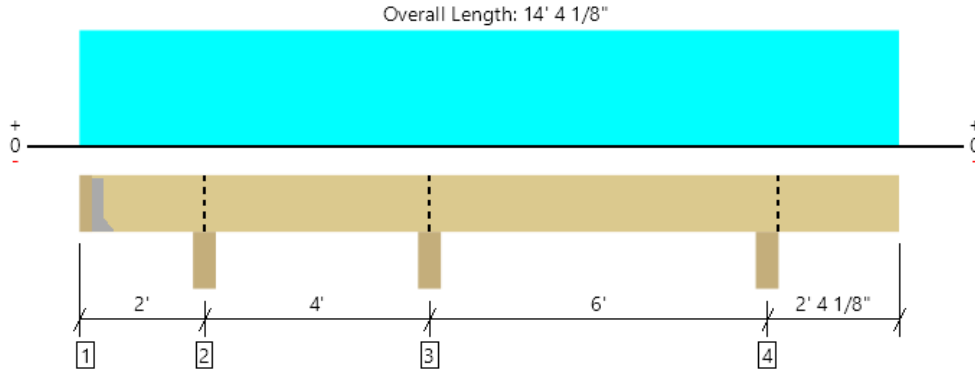
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional as determined by the authority having jurisdiction. The designer of record, builder or framer is responsible to assure that this calculation is compatible with the overall project. Accessories (Rim Board, Blocking Panels and Squash Blocks) are not designed by this software. Products manufactured at Weyerhaeuser facilities are third-party certified to sustainable forestry standards. Weyerhaeuser Engineered Lumber Products have been evaluated by ICC-ES under evaluation reports ESR-1153 and ESR-1387 and/or tested in accordance with applicable ASTM standards. For current code evaluation reports, Weyerhaeuser product literature and installation details refer to [www.eyerhaeuser.com/woodproducts/document-library](http://www.eyerhaeuser.com/woodproducts/document-library).

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

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



Deck, D15  
1 piece(s) 6 x 8 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)	3812 @ 6'	18906 (5.50")	Passed (20%)	--	1.0 D + 1.0 L (Adj Spans)
Shear (lbs)	1605 @ 6' 10 1/4"	4675	Passed (34%)	1.00	1.0 D + 1.0 L (Adj Spans)
Moment (Ft-lbs)	-2029 @ 6'	5156	Passed (39%)	1.00	1.0 D + 1.0 L (Adj Spans)
Live Load Defl. (in)	0.046 @ 14' 4 1/8"	0.200	Passed (2L/999+)	--	1.0 D + 1.0 L (Alt Spans)
Total Load Defl. (in)	0.047 @ 14' 4 1/8"	0.234	Passed (2L/999+)	--	1.0 D + 1.0 L (Alt Spans)

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

- Deflection criteria: LL (L/360) and TL (L/240).
- Overhang deflection criteria: LL (0.2") and TL (2L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- -253 lbs uplift at support located at 3". Strapping or other restraint may be required.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Hanger on 7 1/2" SPF beam	3.00"	Hanger <sup>1</sup>	1.50"	65	850/-318	915/-253	See note <sup>1</sup>
2 - Column - SPF	5.50"	5.50"	1.50"	241	2242/-297	2483/-56	Blocking
3 - Column - SPF	5.50"	5.50"	1.50"	478	3334	3812	Blocking
4 - Column - SPF	5.50"	5.50"	1.50"	471	2851	3323	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	14' 1" o/c	
Bottom Edge (Lu)	14' 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
1 - Face Mount Hanger	U66	2.00"	N/A	8-10d	4-10d	

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	3" to 14' 4 1/8"	N/A	10.4	--	
1 - Uniform (PLF)	0 to 14' 4 1/8" (Top)	N/A	77.3	521.3	Linked from: D7, Support 3

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





## Weyerhaeuser Notes

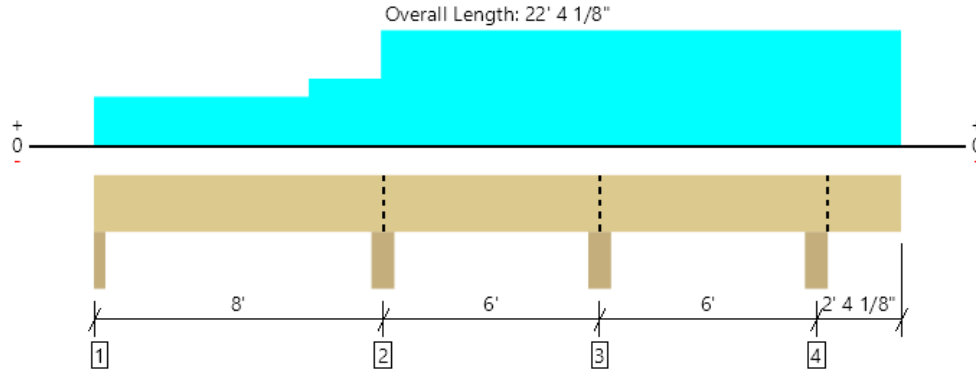
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional as determined by the authority having jurisdiction. The designer of record, builder or framer is responsible to assure that this calculation is compatible with the overall project. Accessories (Rim Board, Blocking Panels and Squash Blocks) are not designed by this software. Products manufactured at Weyerhaeuser facilities are third-party certified to sustainable forestry standards. Weyerhaeuser Engineered Lumber Products have been evaluated by ICC-ES under evaluation reports ESR-1153 and ESR-1387 and/or tested in accordance with applicable ASTM standards. For current code evaluation reports, Weyerhaeuser product literature and installation details refer to [www.eyerhaeuser.com/woodproducts/document-library](http://www.eyerhaeuser.com/woodproducts/document-library).

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

ForteWEB Software Operator	Job Notes
Jacob Wachtendonk Harriott Valentine Engineers (425) 281-0788 <a href="mailto:jwachtendonk@harriottvalentine.com">jwachtendonk@harriottvalentine.com</a>	



Deck, D16  
1 piece(s) 6 x 8 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)	3667 @ 14'	18906 (5.50")	Passed (19%)	--	1.0 D + 1.0 L (Adj Spans)
Shear (lbs)	1435 @ 14' 10 1/4"	4675	Passed (31%)	1.00	1.0 D + 1.0 L (Adj Spans)
Moment (Ft-lbs)	-2108 @ 14'	5156	Passed (41%)	1.00	1.0 D + 1.0 L (Adj Spans)
Live Load Defl. (in)	0.049 @ 22' 4 1/8"	0.200	Passed (2L/999+)	--	1.0 D + 1.0 L (Alt Spans)
Total Load Defl. (in)	0.049 @ 22' 4 1/8"	0.234	Passed (2L/999+)	--	1.0 D + 1.0 L (Alt Spans)

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

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Beam - SPF	2.75"	2.75"	1.50"	125	691/-97	816	None
2 - Column - SPF	5.50"	5.50"	1.50"	421	2679	3100	Blocking
3 - Column - SPF	5.50"	5.50"	1.50"	402	3265	3667	Blocking
4 - Column - SPF	5.50"	5.50"	1.50"	367	2530	2898	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)	22' 4" o/c	
Bottom Edge (Lu)	22' 4" o/c	

- Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 22' 4 1/8"	N/A	10.4	--	
1 - Uniform (PLF)	0 to 5' 11 3/8" (Top)	N/A	28.5	188.3	Linked from: D5, Support 1
2 - Uniform (PLF)	5' 11 3/8" to 7' 11 3/8" (Top)	N/A	36.0	259.5	Linked from: D6, Support 2
3 - Uniform (PLF)	7' 11 3/8" to 22' 4 1/8" (Top)	N/A	58.5	450.8	Linked from: D7, Support 2

### Weyerhaeuser Notes

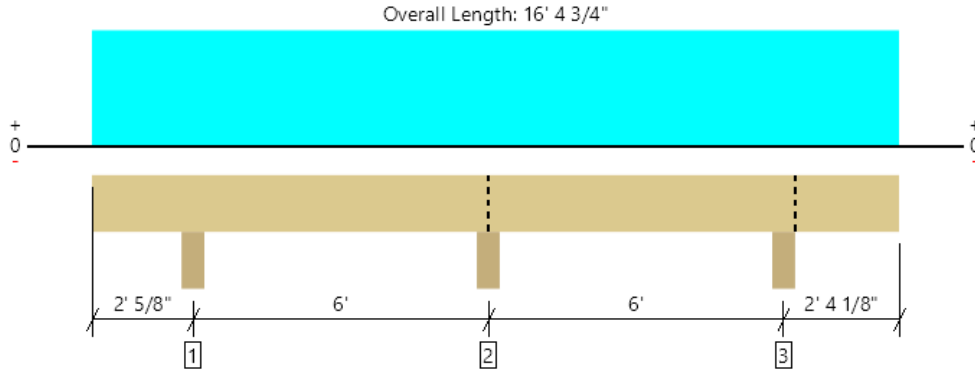
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional as determined by the authority having jurisdiction. The designer of record, builder or framer is responsible to assure that this calculation is compatible with the overall project. Accessories (Rim Board, Blocking Panels and Squash Blocks) are not designed by this software. Products manufactured at Weyerhaeuser facilities are third-party certified to sustainable forestry standards. Weyerhaeuser Engineered Lumber Products have been evaluated by ICC-ES under evaluation reports ESR-1153 and ESR-1387 and/or tested in accordance with applicable ASTM standards. For current code evaluation reports, Weyerhaeuser product literature and installation details refer to [www.weyerhaeuser.com/woodproducts/document-library](http://www.weyerhaeuser.com/woodproducts/document-library).

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

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



Deck, D17  
1 piece(s) 6 x 8 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)	1247 @ 2' 5/8"	12856 (5.50")	Passed (10%)	--	1.0 D + 1.0 L (Adj Spans)
Shear (lbs)	679 @ 7' 2 3/8"	4675	Passed (15%)	1.00	1.0 D + 1.0 L (Adj Spans)
Moment (Ft-lbs)	-1044 @ 8' 5/8"	5156	Passed (20%)	1.00	1.0 D + 1.0 L (Adj Spans)
Live Load Defl. (in)	0.024 @ 16' 4 3/4"	0.200	Passed (2L/999+)	--	1.0 D + 1.0 L (Alt Spans)
Total Load Defl. (in)	0.024 @ 16' 4 3/4"	0.234	Passed (2L/999+)	--	1.0 D + 1.0 L (Alt Spans)

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

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Beam - SPF	5.50"	5.50"	1.50"	156	1090	1247	None
2 - Column - SPF	5.50"	5.50"	1.50"	202	1564	1766	Blocking
3 - Column - SPF	5.50"	5.50"	1.50"	169	1174	1343	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	16' 5" o/c	
Bottom Edge (Lu)	16' 5" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 16' 4 3/4"	N/A	10.4	--	
1 - Uniform (PLF)	0 to 16' 4 3/4" (Top)	N/A	21.8	208.5	Linked from: D7, Support 1

**Weyerhaeuser Notes**

Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional as determined by the authority having jurisdiction. The designer of record, builder or framer is responsible to assure that this calculation is compatible with the overall project. Accessories (Rim Board, Blocking Panels and Squash Blocks) are not designed by this software. Products manufactured at Weyerhaeuser facilities are third-party certified to sustainable forestry standards. Weyerhaeuser Engineered Lumber Products have been evaluated by ICC-ES under evaluation reports ESR-1153 and ESR-1387 and/or tested in accordance with applicable ASTM standards. For current code evaluation reports, Weyerhaeuser product literature and installation details refer to [www.woyehaeuser.com/woodproducts/document-library](http://www.woyehaeuser.com/woodproducts/document-library).

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

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



# WOOD COLUMN

6x

## Capacity

Species: DF #1  
Size: 6x

Fc\* = 925 psi      Fc<sub>⊥</sub> = 405 psi      << sill plate is  
E = 1.60E+06 psi      Hem-Fir  
c' = 0.8  
d = 5.5 in  
KcE = 0.3

le	le	FcE	F'c	6x6 Pa	6x8 Pa	6x10 Pa
(ft)	(in)	(psi)	(psi)	(lb)	(lb)	(lb)
Pa (perp)				12251	16149	20604

8.00	96.00	1576	775	23443	30902	39426	<< crushing governs up to a height of 14'-8" w/ Hem-Fir (10'-8" if Doug-Fir)
8.50	102.00	1396	750	22701	29923	38178	
9.00	108.00	1245	724	21897	28864	36826	
9.50	114.00	1117	696	21041	27735	35386	
10.00	120.00	1008	666	20145	26555	33880	
10.50	126.00	915	636	19225	25342	32333	
11.00	132.00	833	605	18296	24117	30770	
11.50	138.00	762	574	17373	22901	29219	
12.00	144.00	700	544	16470	21710	27699	

## Guard Design

### Rail

P 200 lb

Section: HF No. 2 2x4

Vn 840 lb

Mn 530 lb-ft

EI 7.00E+06 lb-in<sup>2</sup>

L max. V n/a ft

L max. M 10.60 ft

L max. EI 5.69 ft

L control 5.69 ft

### Stanchion

H 39.75 in

P 200 lb

Vu 200 lb

Mu 7950 lb-in

Section HSS 1-1/2 x 1-1/2 x 3/16

b 1.5 in

t 0.1875 in

E 2.90E+07 psi

fy 50000 psi

I 0.288 in<sup>4</sup>

Z 0.385 in<sup>3</sup>

Vn 10105 lb OK

Mn 11513 lb-in OK

defl 0.50 in

### Fasteners

Stanchion to Rim

No. Screws 4 lag screws

Arm 4 in

Withdrawal 994 lb

d lag 5/8"

W lag 715 lb/in embed

Min. embed 1.39 in

Detail (4) 5/8"x4" lag screws

Rim to Joists

Arm 5.625 in

Tension 1413 lb

Detail (2) DTT2Z with 5/8"x4" lag screws @ 48" oc

Blocking to Joists

Arm 16 in

Zu 497 lb

Cd 1.6

Zn 10d 102 lb

Zn' 163 lb

No. nails 4

**SECTION 3: LATERAL**

## SEISMIC LOADS

Per ASCE 7-16

Equivalent Lateral Force Procedure

Occupancy Category	<b>II</b>	Table 1-1
Seismic Design Category	<b>D</b>	Table 11.6-1
Importance Factor	<b>1.00</b>	Table 11.5-1
Site Class	<b>D</b>	Table 20.3-1
S <sub>s</sub>	<b>1.43 g</b>	(from SEAOC Design Tool)
S <sub>1</sub>	<b>0.50 g</b>	(from SEAOC Design Tool)
F <sub>a</sub>	<b>1.20</b>	Table 11.4-1
F <sub>v</sub>	<b>1.80</b>	Table 11.4-2
C <sub>t</sub>	<b>0.02</b>	Table 12.8-2
x	<b>0.75</b>	Table 12.8-2
h <sub>n</sub>	<b>12.00 feet</b>	(height to highest level)

S <sub>MS</sub> = F <sub>a</sub> *S <sub>s</sub>	1.7160	Eq. 11.4-1
S <sub>M1</sub> = F <sub>v</sub> *S <sub>1</sub>	0.8961	Eq. 11.4-2
S <sub>DS</sub> = (2/3)*S <sub>MS</sub>	1.1440 g	Eq. 11.4-3
S <sub>D1</sub> = (2/3)*S <sub>M1</sub>	0.5974 g	Eq. 11.4-4
Period T <sub>a</sub> = C <sub>t</sub> *h <sub>n</sub> <sup>x</sup>	0.1289 s	Eq. 12.8-7
T <sub>o</sub>	0.1044 s	per section 11.4.5
T <sub>s</sub>	0.5222 s	per section 11.4.5
S <sub>a</sub>	1.1440 g	per section 11.4.5

R	<b>1.5</b>	Table 12.2-1
Ω <sub>o</sub>	<b>1.5</b>	Table 12.2-1
C <sub>d</sub>	<b>1.5</b>	Table 12.2-1
Section 12.8 ok?	<b>Yes</b>	Table 12.6-1

Equivalent Lateral Force Procedure (section 12.8)

C <sub>s</sub>	0.7627	Eq. 12.8-2
W, weight	6,912 lb	per table below
Q <sub>E</sub>	5,272 lb	Eq. 12.8-1

Vertical Force Distribution (section 12.8.3)

k = 1.00

Level	Hx (ft)	Floor Area (ft <sup>2</sup> )	Seismic Dead Ld (psf)	Floor Wt. (k)	Wall Length (ft)	Wall Wt. (k)	Total Wt. (k)	WxHx (k-ft)	Cvx (%)	(LRFD) Q <sub>E</sub> (k)	(ASD) 0.7Q <sub>E</sub> (k)
Deck	<b>12.00</b>	<b>768</b>	<b>9</b>	6.9	<b>0</b>	0.0	6.91	82.94	100.00	5.27	<b>3.69</b>
							6.91	82.94	100.00	5.27	

## Knee Brace Design

Garcia Residence

0.7E Deck	3690 lb
Deck Area	768 ft <sup>2</sup>
Deck Height	12 ft

### North

North-South loads bear on house

Trib Area	172 ft <sup>2</sup>
Ratio	0.22
0.7E	826 lb

No. Braces	4 braces each direction (compression only)
Force	207 lb / brace
Brace Leg	1.875 ft
Brace Force	1870 lb / brace
L Brace	2.65 ft
Pn 4x4	7656 lb OK
Fasteners	2 7/8" thru-bolts
Z	1590 lb
Cd	1.6
Z'	2544
Z' tot	5088 lb OK



## Central

East-West loads bear on house

Trib Area	301	ft <sup>2</sup>
Ratio	0.39	
0.7E	1446	lb

No. Braces	3	braces each direction (compression only)
Force	482	lb / brace
Brace Leg	1.875	ft
Brace Force	4363	lb / brace
L Brace	2.65	ft
Pn 4x4	7656	lb OK
Fasteners	2 7/8"	thru-bolts
Z	1590	lb
Cd	1.6	
Z'	2544	
Z' tot	5088	lb OK

## South

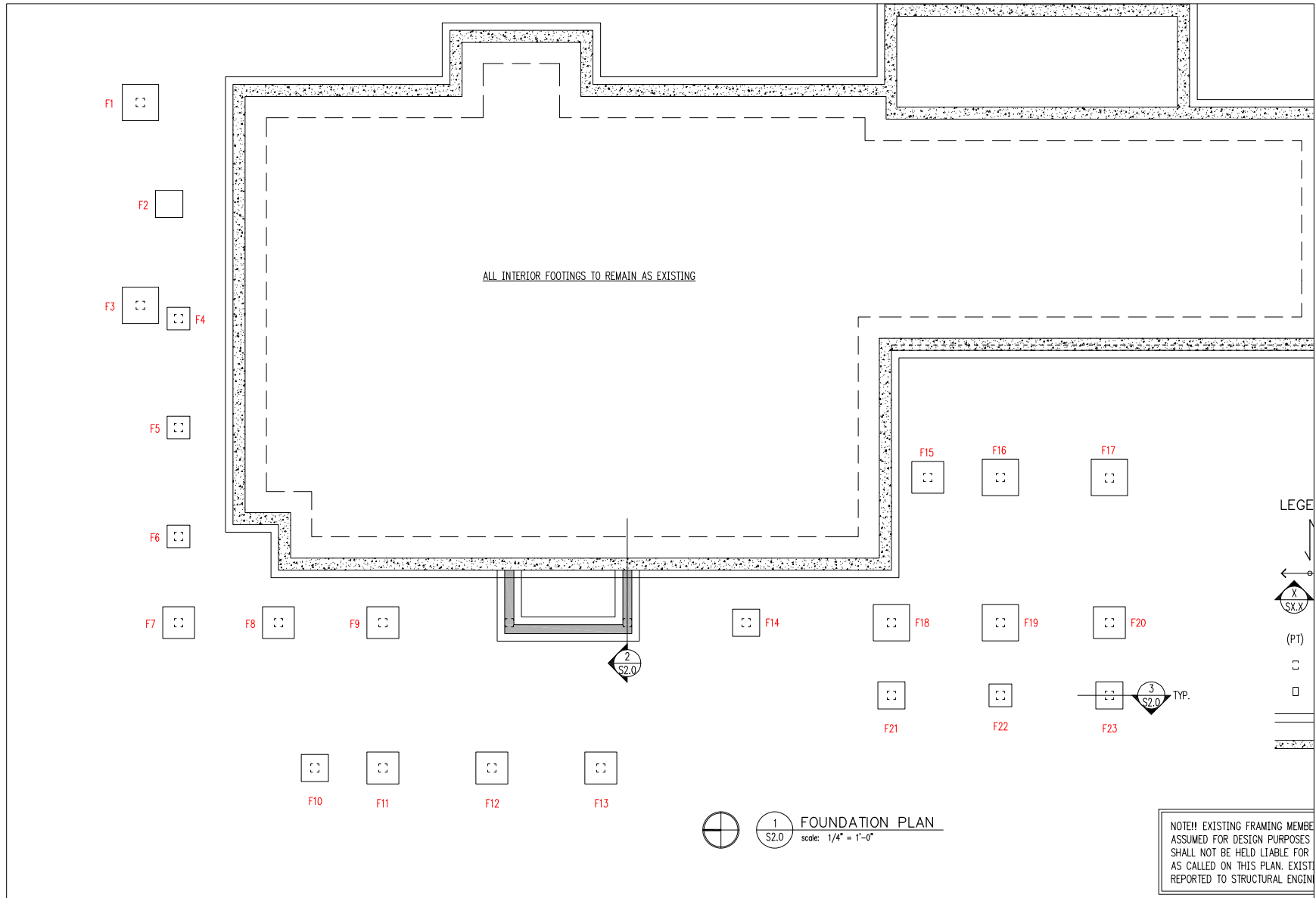
East-West loads bear on house

Trib Area	296	ft <sup>2</sup>
Ratio	0.39	
0.7E	1422	lb

No. Braces	4	braces each direction (compression only)
Force	356	lb / brace
Brace Leg	1.875	ft
Brace Force	3218	lb / brace
L Brace	2.65	ft
Pn 4x4	7656	lb OK
Fasteners	2 7/8"	thru-bolts
Z	1590	lb
Cd	1.6	
Z'	2544	
Z' tot	5088	lb OK

**SECTION 4: FOUNDATION**

FOOTING ID



## Existing Footings

Garcia

Footing ID	Footing Dim (in.)	Footing Area (ft2)	Force (lb)	Bearing Pressure (psf)
F1	24	4.00	1778	445
F2	18	2.25	0	0
F3	24	4.00	1717	429
F4	15	1.56	631	404
F5	15	1.56	1544	988
F6	15	1.56	1337	856
F7	21	3.06	1286	420
F8	21	3.06	3151	1029
F9	21	3.06	3290	1074
F10	18	2.25	2635	1171
F11	21	3.06	3486	1138
F12	21	3.06	4175	1363
F13	21	3.06	3238	1057
F14	18	2.25	1532	681
F15	21	3.06	2483	811
F16	24	4.00	3812	953
F17	24	4.00	3322	831
F18	24	4.00	3100	775
F19	24	4.00	3667	917
F20	21	3.06	2898	946
F21	18	2.25	1247	554
F22	15	1.56	1766	1130
F23	18	2.25	1343	597

Max. pressure = 1363 psf from footing F12

## Window Well Design

Spans N-S between orthogonal walls

L	6.5 ft	
L	78 in	
b min	4.875 in	
b use	6 in	OK
d	3 in	
detail	#4 @ 12" oc each way	
A bar	0.2 in <sup>2</sup>	
spacing	12 in	
As	0.2 in <sup>2</sup> / ft	
fy	60000 psi	
f'c	2500 psi	
a	0.47 in	
Mn	29859 lb-in	
W soil max.	39 lb/in	
W soil max.	471 lb/ft	
ρ soil	120 psf / ft	assumed
<b>h max</b>	<b>3.93 ft</b>	