LONGITUDE
ONE TWENTY°
ENGINEERING & DESIGN

Calculation Package for

Forest Ave Lot 3

Project no: S201120

March 1, 2022

(206) 790 9502
L120Engineering.com

Project Number:	Plan Name:	Sheet Number:
xxx	**Forest Ave Lot 3**	**DC**
Engineer:	Specifics:	Date:
xxx	**Design Criteria**	**5/12/2021**

GRAVITY DESIGN:

BLUE = Review and update as required - Typical Input

Code Reference: IBC 2015

ROOF ASSEMBLY		
Live Load:		
Snow	25.0	psf
Dead Load:		
Composite Roofing	2.0	psf
19/32" Plywood Sheathing	2.5	psf
Trusses at 24" o.c.	3.0	psf
Insulation	1.8	psf
(2) Layers 5/8" GWB	4.4	psf
Misc or Tile Roof	1.3	psf
Total	**15.0**	**psf**

FLOOR ASSEMBLY		
Live Load:		
Residential	40.0	psf
Dead Load:		
Flooring	3.0	psf
3/4" T & G Plywood	2.5	psf
Floor Joists at 16" o.c.	2.5	psf
Insulation	0.5	psf
(1) Layers 5/8" GWB	2.2	psf
Misc or Tile Flooring	1.3	psf
Total	**12.0**	**psf**

EXTERIOR WALL ASSEMBLY		
2x6 at 16" o.c.	1.7	psf
Insulation	1.0	psf
1/2" Plywood Sheathing	1.5	psf
(2) layers 5/8" GWB	4.4	psf
Misc or Brick Covered Wall	3.4	psf
Total	**12.0**	**psf**

INTERIOR WALL ASSEMBLY		
2x4 at 8" o.c. Staggered	1.1	psf
Insulation	0.5	psf
(2) Layers 5/8" GWB	4.4	psf
Misc	2.0	psf
Total	**8.0**	**psf**

SEISMIC DESIGN:

Code Reference: ASCE 7-10

R = **6.5** Bearing Wall System, Wood Structural Panel Walls

Mapped Spectral Acceleration, Ss = **1.444**

Mapped Spectral Acceleration, S1 = **0.554**

Soil Site Class = **D**

WIND DESIGN:

Code Reference: ASCE 7-10

Basic Wind Speed (3 second Gust) = **110** mph

Exposure : **C**

Kzt = **1.00**

SOIL PROPERTIES:

Soil Bearing Pressure = **1,500** psf competent native soil or structural fill

1/3 increase for short-term wind or seismic loading is acceptable

Frost Depth = **18** in

Lateral Wall Pressures:

Unrestrained Active Pressure = **35** pcf for cantilevered retaining wall design

Restrained Active Pressure = **50** pcf for tank wall design

Passive Pressure = **250** pcf

Soil Friction Coeff. = **0.35**

LONGITUDE
ONE TWENTY°
ENGINEERING & DESIGN

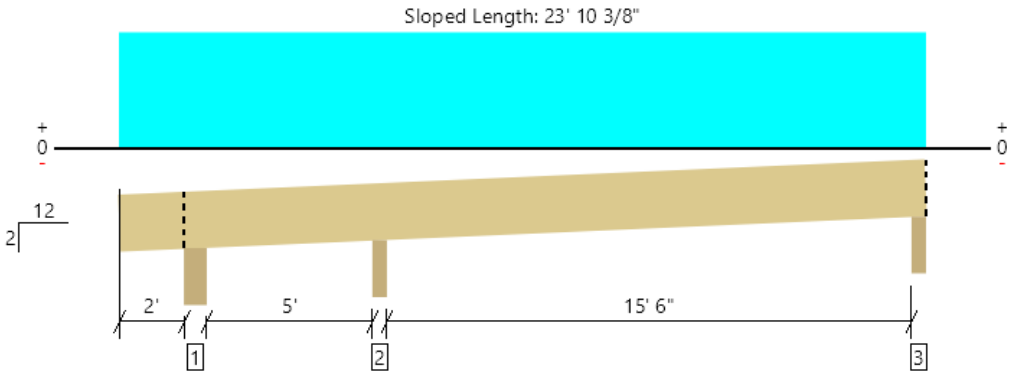
FRAMING CALCULATIONS

BEAM REFERENCE PER PLAN

(206) 790 9502
L120Engineering.com

Roof, RJ-1

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



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

Member Length : 24' 1/4"

System : Roof
Member Type : Joist
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD
Member Pitch : 2/12

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1300 @ 7' 7 1/4"	2156 (3.50")	Passed (60%)	--	1.0 D + 1.0 S (Adj Spans)
Shear (lbs)	668 @ 8' 8 1/8"	1941	Passed (34%)	1.15	1.0 D + 1.0 S (Adj Spans)
Moment (Ft-lbs)	-1910 @ 7' 7 1/4"	2964	Passed (64%)	1.15	1.0 D + 1.0 S (Adj Spans)
Live Load Defl. (in)	0.171 @ 16' 2 3/4"	0.797	Passed (L/999+)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.273 @ 16' 2 7/8"	1.063	Passed (L/702)	--	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 - SPF	5.50"	5.50"	1.50"	30	156/-20	186/-20	Blocking
2 - Beveled Plate - SPF	3.50"	3.50"	2.11"	486	813	1299	None
3 - Beveled Plate - SPF	3.50"	3.50"	1.50"	200	330	530	Blocking

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

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

•Maximum allowable bracing intervals based on applied load.

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 23' 6 1/2"	24"	15.0	25.0	ROOF

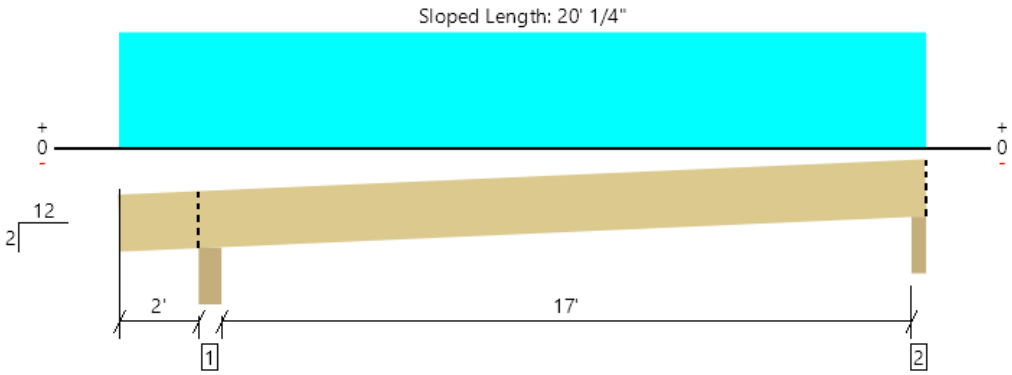
Weyerhaeuser Notes

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.

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 HF No.2 @ 24" OC



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

Member Length : 20' 2 1/8"

System : Roof
Member Type : Joist
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD
Member Pitch : 2/12

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	705 @ 19' 6 1/2"	2126 (3.50")	Passed (33%)	--	1.0 D + 1.0 S (Alt Spans)
Shear (lbs)	615 @ 3' 4 5/8"	1941	Passed (32%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	2944 @ 10' 11 13/16"	2964	Passed (99%)	1.15	1.0 D + 1.0 S (Alt Spans)
Live Load Defl. (in)	0.440 @ 10' 10 15/16"	0.878	Passed (L/479)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.702 @ 10' 11 1/16"	1.170	Passed (L/300)	--	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 - SPF	5.50"	5.50"	1.50"	335	551	886	Blocking
2 - Beveled Plate - SPF	3.50"	3.50"	1.50"	265	440	705	Blocking

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

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

•Maximum allowable bracing intervals based on applied load.

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 19' 9"	24"	15.0	25.0	ROOF

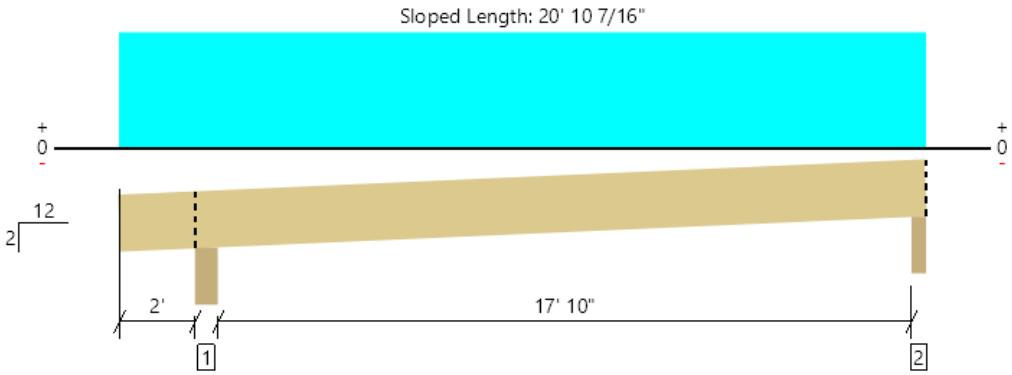
Weyerhaeuser Notes

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.

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

Roof, RJ-3

1 piece(s) 2 x 12 HF No.2 @ 19.2" OC



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

Member Length : 21' 5/16"

System : Roof
Member Type : Joist
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD
Member Pitch : 2/12

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	591 @ 20' 4 1/2"	2126 (3.50")	Passed (28%)	--	1.0 D + 1.0 S (Alt Spans)
Shear (lbs)	518 @ 3' 4 5/8"	1941	Passed (27%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	2593 @ 11' 4 3/4"	2964	Passed (87%)	1.15	1.0 D + 1.0 S (Alt Spans)
Live Load Defl. (in)	0.426 @ 11' 3 15/16"	0.920	Passed (L/519)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.680 @ 11' 4"	1.226	Passed (L/325)	--	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 - SPF	5.50"	5.50"	1.50"	278	458	736	Blocking
2 - Beveled Plate - SPF	3.50"	3.50"	1.50"	222	369	591	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	3' 5" o/c	
Bottom Edge (Lu)	20' 10" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 20' 7"	19.2"	15.0	25.0	ROOF

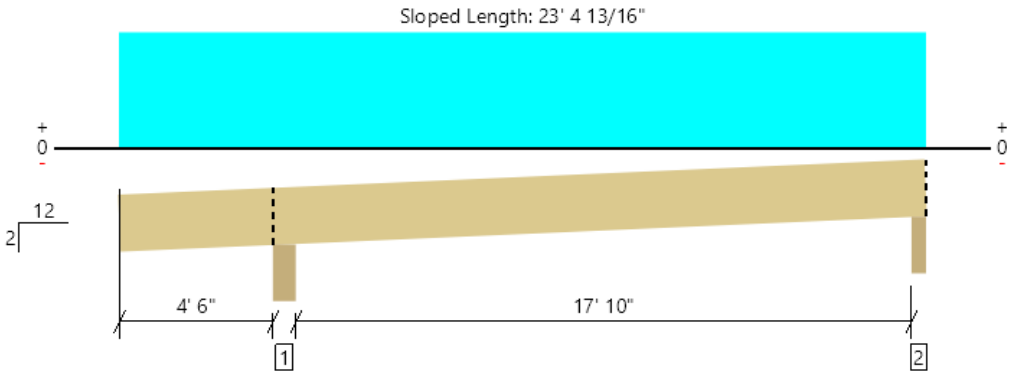
Weyerhaeuser Notes

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.

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

Roof, RJ-4

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



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

Member Length : 23' 6 11/16"

System : Roof
Member Type : Joist
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD
Member Pitch : 2/12

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1159 @ 4' 8 3/4"	3387 (5.50")	Passed (34%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	686 @ 5' 10 5/8"	1941	Passed (35%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	3007 @ 14' 2 3/4"	2964	Passed (101%)	1.15	1.0 D + 1.0 S (Alt Spans)
Live Load Defl. (in)	0.498 @ 13' 10 15/16"	0.920	Passed (L/444)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.774 @ 13' 11 1/2"	1.226	Passed (L/285)	--	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.
- Upward deflection on left cantilever exceeds 0.4".
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Beveled Plate - SPF	5.50"	5.50"	1.88"	439	721	1160	Blocking
2 - Beveled Plate - SPF	3.50"	3.50"	1.50"	264	449	713	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	6" o/c	
Bottom Edge (Lu)	14' 8" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 23' 1"	24"	15.0	25.0	ROOF

Weyerhaeuser Notes

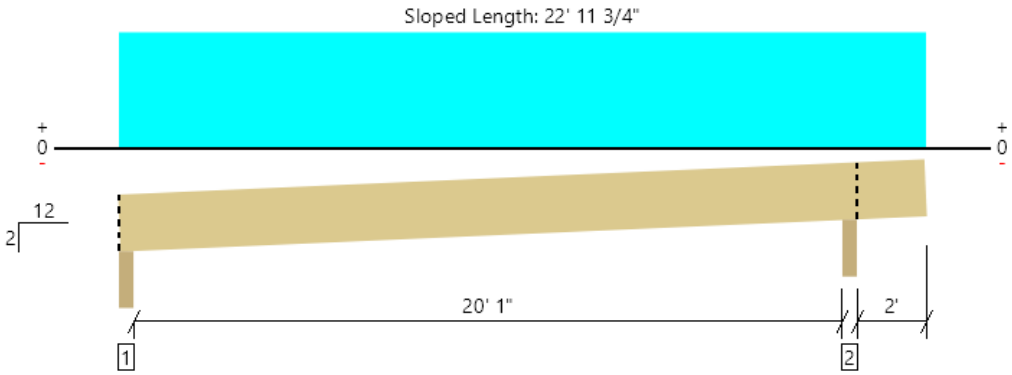
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional 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.

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

ForteWEB Software Operator	Job Notes
A P L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	

Roof, RJ-5

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



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

Member Length : 23' 1 5/8"

System : Roof
Member Type : Joist
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD
Member Pitch : 2/12

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	998 @ 20' 6 1/4"	4311 (3.50")	Passed (23%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	740 @ 19' 5 3/8"	3881	Passed (19%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	4084 @ 10' 3 7/16"	5928	Passed (69%)	1.15	1.0 D + 1.0 S (Alt Spans)
Live Load Defl. (in)	0.420 @ 10' 4 1/8"	1.030	Passed (L/589)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.671 @ 10' 4 1/16"	1.373	Passed (L/368)	--	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 - SPF	3.50"	3.50"	1.50"	312	515	827	Blocking
2 - Beveled Plate - SPF	3.50"	3.50"	1.50"	378	621	999	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' 11" o/c	
Bottom Edge (Lu)	23' o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 22' 8"	24"	15.0	25.0	ROOF

Weyerhaeuser Notes

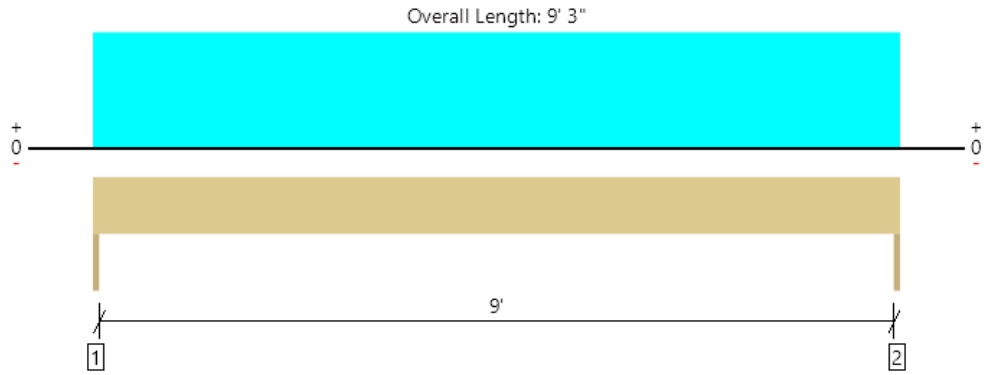
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional 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.

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

ForteWEB Software Operator	Job Notes
A P L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	

TH, TH-1

1 piece(s) 4 x 8 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)	402 @ 0	3281 (1.50")	Passed (12%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	338 @ 8 3/4"	3502	Passed (10%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	929 @ 4' 7 1/2"	3438	Passed (27%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.046 @ 4' 7 1/2"	0.308	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.080 @ 4' 7 1/2"	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/5/16").
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Trimmer - SPF	1.50"	1.50"	1.50"	170	231	401	None
2 - Trimmer - SPF	1.50"	1.50"	1.50"	170	231	401	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	9' 3" o/c	
Bottom Edge (Lu)	9' 3" 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 9' 3"	N/A	6.4	--	
1 - Uniform (PSF)	0 to 9' 3"	2'	15.2	25.0	Roof

Weyerhaeuser Notes

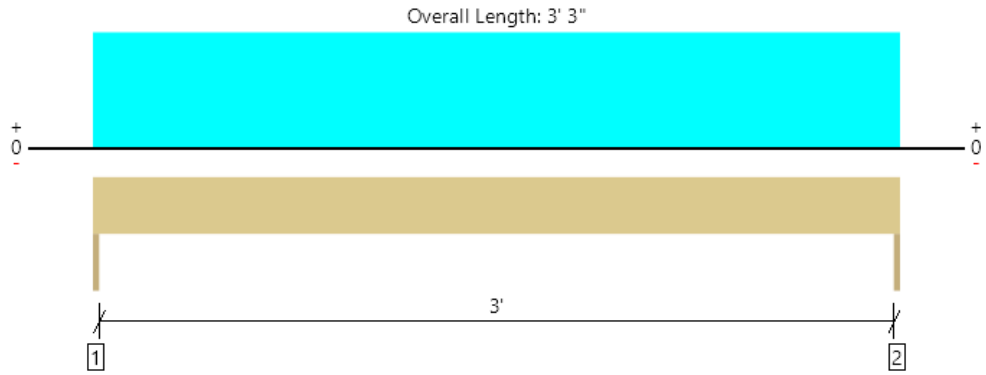
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional 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.

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

ForteWEB Software Operator	Job Notes
A P L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	

TH, TH-2

1 piece(s) 4 x 6 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)	555 @ 0	3281 (1.50")	Passed (17%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	356 @ 7"	2657	Passed (13%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	451 @ 1' 7 1/2"	1979	Passed (23%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.006 @ 1' 7 1/2"	0.108	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.011 @ 1' 7 1/2"	0.162	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	Floor Live	Snow	Total	
1 - Trimmer - SPF	1.50"	1.50"	1.50"	250	57	305	612	None
2 - Trimmer - SPF	1.50"	1.50"	1.50"	250	57	305	612	None

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 3' 3"	N/A	4.9	--	--	
1 - Uniform (PSF)	0 to 3' 3"	7' 6"	15.2	-	25.0	Roof
2 - Uniform (PSF)	0 to 3' 3"	3' 6"	10.0	10.0	-	clg

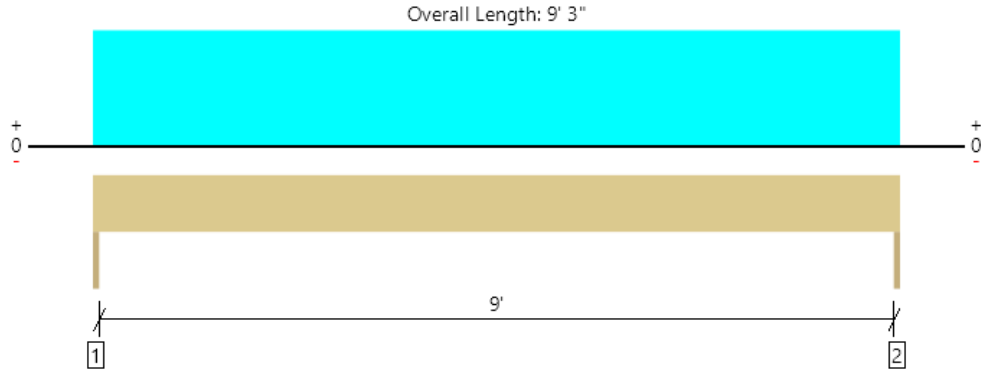
Weyerhaeuser Notes

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.

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

ForteWEB Software Operator	Job Notes
A P L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	

TH, TH-3
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)	1433 @ 0	3281 (1.50")	Passed (44%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1155 @ 10 3/4"	4468	Passed (26%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	3313 @ 4' 7 1/2"	5166	Passed (64%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.084 @ 4' 7 1/2"	0.308	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.138 @ 4' 7 1/2"	0.463	Passed (L/804)	--	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	Snow	Total	
1 - Trimmer - SPF	1.50"	1.50"	1.50"	565	867	1432	None
2 - Trimmer - SPF	1.50"	1.50"	1.50"	565	867	1432	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	9' 3" o/c	
Bottom Edge (Lu)	9' 3" 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 9' 3"	N/A	8.2	--	
1 - Uniform (PSF)	0 to 9' 3"	7' 6"	15.2	25.0	Roof

Weyerhaeuser Notes

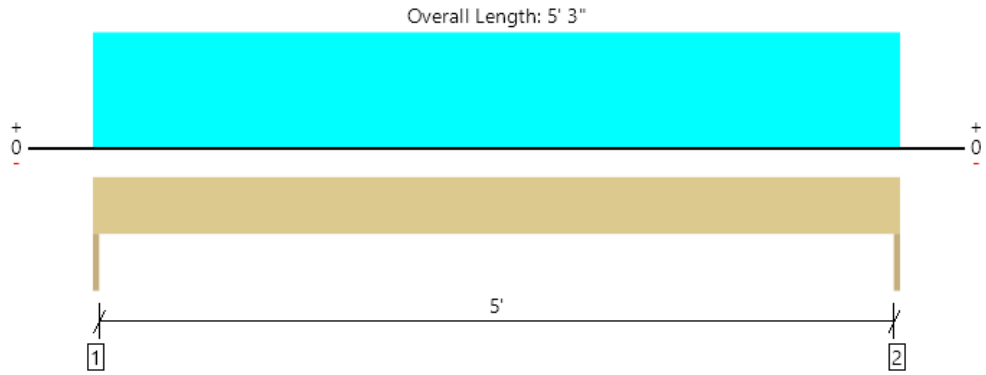
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional 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.

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

ForteWEB Software Operator	Job Notes
A P L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	

TH, TH-4

1 piece(s) 4 x 6 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)	884 @ 0	3281 (1.50")	Passed (27%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	687 @ 7"	2657	Passed (26%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	1160 @ 2' 7 1/2"	1979	Passed (59%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.045 @ 2' 7 1/2"	0.175	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.074 @ 2' 7 1/2"	0.262	Passed (L/850)	--	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	Snow	Total	
1 - Trimmer - SPF	1.50"	1.50"	1.50"	342	541	883	None
2 - Trimmer - SPF	1.50"	1.50"	1.50"	342	541	883	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	5' 3" o/c	
Bottom Edge (Lu)	5' 3" 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 5' 3"	N/A	4.9	--	
1 - Uniform (PSF)	0 to 5' 3"	8' 3"	15.2	25.0	Roof

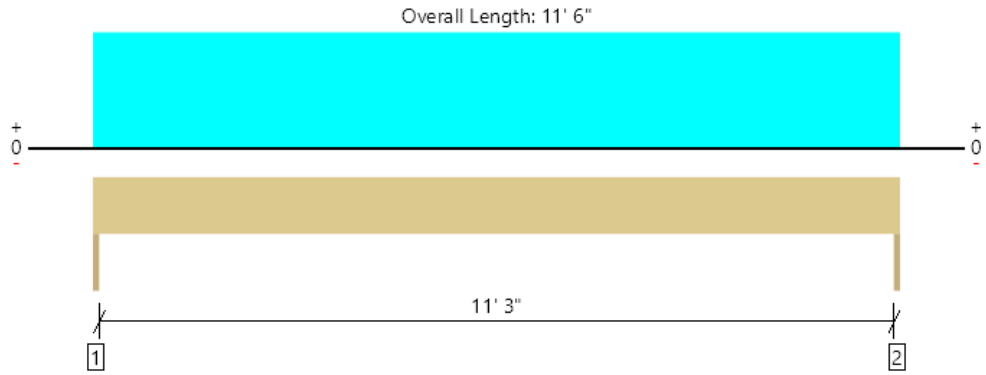
Weyerhaeuser Notes

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.

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

ForteWEB Software Operator	Job Notes
A P L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	

TH, TH-5
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)	741 @ 0	3281 (1.50")	Passed (23%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	625 @ 10 3/4"	4468	Passed (14%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	2130 @ 5' 9"	5166	Passed (41%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.080 @ 5' 9"	0.383	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.137 @ 5' 9"	0.575	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	Snow	Total	
1 - Trimmer - SPF	1.50"	1.50"	1.50"	309	431	740	None
2 - Trimmer - SPF	1.50"	1.50"	1.50"	309	431	740	None

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	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 11' 6"	N/A	8.2	--	
1 - Uniform (PSF)	0 to 11' 6"	3'	15.2	25.0	Roof

Weyerhaeuser Notes

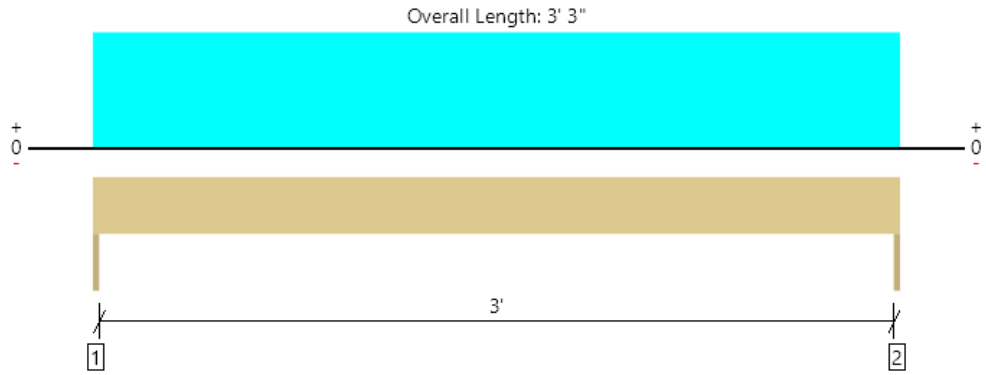
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional 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.

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

ForteWEB Software Operator	Job Notes
A P L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	

TH, TH-6

1 piece(s) 4 x 6 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)	792 @ 0	3281 (1.50")	Passed (24%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	508 @ 7"	2657	Passed (19%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	643 @ 1' 7 1/2"	1979	Passed (33%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.010 @ 1' 7 1/2"	0.108	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.016 @ 1' 7 1/2"	0.162	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	Snow	Total	
1 - Trimmer - SPF	1.50"	1.50"	1.50"	304	488	792	None
2 - Trimmer - SPF	1.50"	1.50"	1.50"	304	488	792	None

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 3' 3"	N/A	4.9	--	
1 - Uniform (PSF)	0 to 3' 3"	12'	15.2	25.0	Roof

Weyerhaeuser Notes

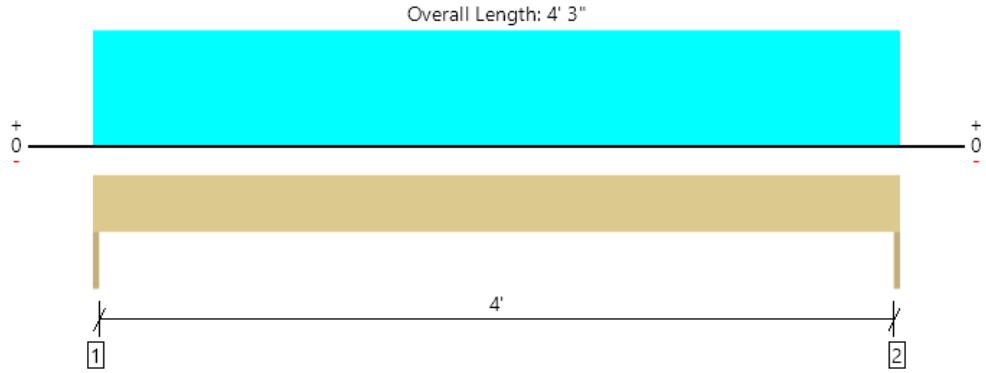
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional 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.

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

ForteWEB Software Operator	Job Notes
A P L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	

TH, TH-7

1 piece(s) 4 x 6 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)	181 @ 0	3281 (1.50")	Passed (6%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	131 @ 7"	2657	Passed (5%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	193 @ 2' 1 1/2"	1979	Passed (10%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.005 @ 2' 1 1/2"	0.142	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.008 @ 2' 1 1/2"	0.213	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	Snow	Total	
1 - Trimmer - SPF	1.50"	1.50"	1.50"	75	106	181	None
2 - Trimmer - SPF	1.50"	1.50"	1.50"	75	106	181	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	4' 3" o/c	
Bottom Edge (Lu)	4' 3" 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 4' 3"	N/A	4.9	--	
1 - Uniform (PSF)	0 to 4' 3"	2'	15.2	25.0	Roof

Weyerhaeuser Notes

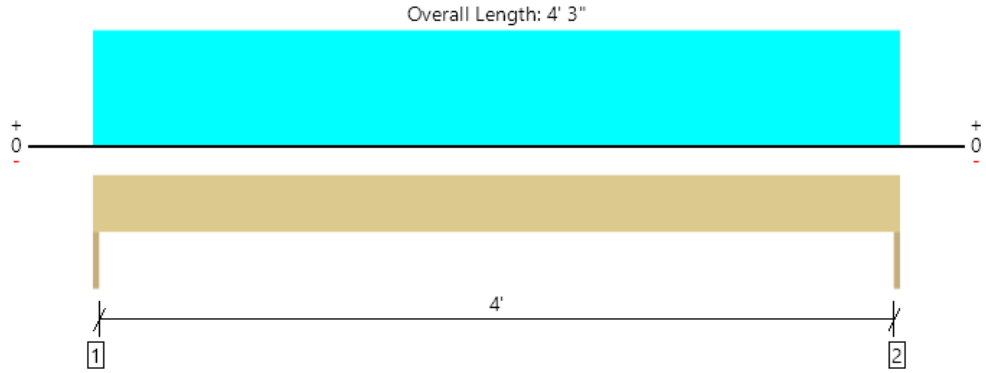
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional 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.

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

ForteWEB Software Operator	Job Notes
A P L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	

TH, TH-8

1 piece(s) 4 x 6 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)	779 @ 0	3281 (1.50")	Passed (24%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	565 @ 7"	2657	Passed (21%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	828 @ 2' 1 1/2"	1979	Passed (42%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.021 @ 2' 1 1/2"	0.142	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.035 @ 2' 1 1/2"	0.213	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	Snow	Total	
1 - Trimmer - SPF	1.50"	1.50"	1.50"	301	478	779	None
2 - Trimmer - SPF	1.50"	1.50"	1.50"	301	478	779	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	4' 3" o/c	
Bottom Edge (Lu)	4' 3" 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 4' 3"	N/A	4.9	--	
1 - Uniform (PSF)	0 to 4' 3"	9'	15.2	25.0	Roof

Weyerhaeuser Notes

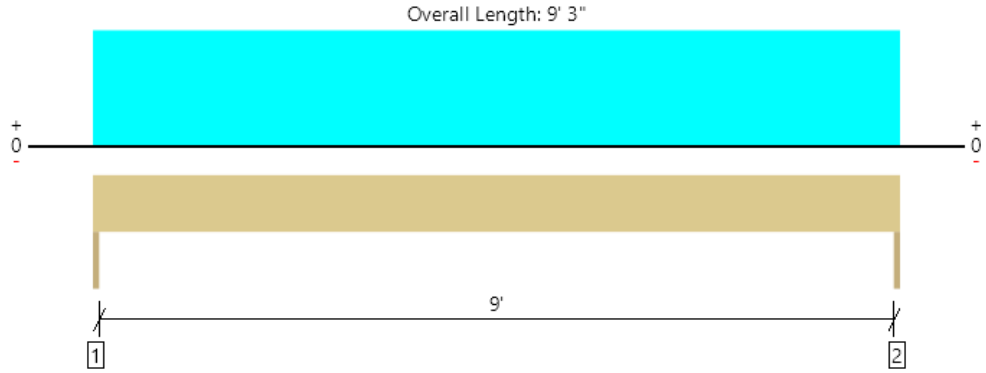
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional 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.

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

ForteWEB Software Operator	Job Notes
A P L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	

TH, TH-9

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)	1712 @ 0	3281 (1.50")	Passed (52%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1380 @ 10 3/4"	4468	Passed (31%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	3958 @ 4' 7 1/2"	5166	Passed (77%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.100 @ 4' 7 1/2"	0.308	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.165 @ 4' 7 1/2"	0.463	Passed (L/673)	--	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	Snow	Total	
1 - Trimmer - SPF	1.50"	1.50"	1.50"	671	1041	1712	None
2 - Trimmer - SPF	1.50"	1.50"	1.50"	671	1041	1712	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	9' 3" o/c	
Bottom Edge (Lu)	9' 3" 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 9' 3"	N/A	8.2	--	
1 - Uniform (PSF)	0 to 9' 3"	9'	15.2	25.0	Roof

Weyerhaeuser Notes

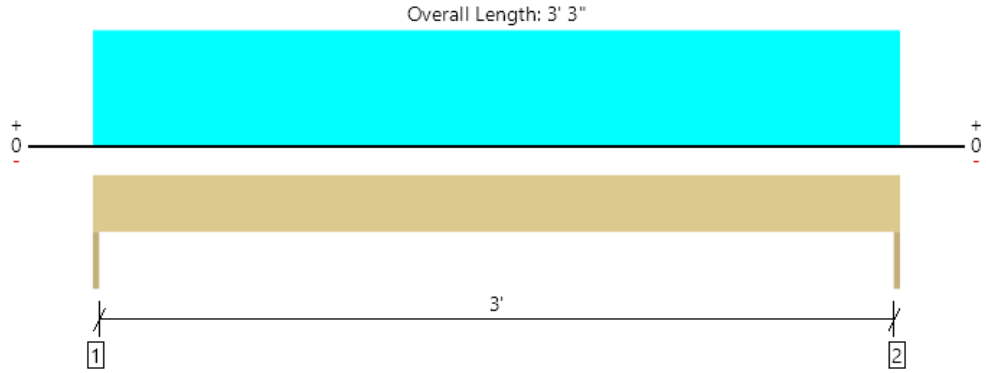
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional 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.

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

ForteWEB Software Operator	Job Notes
A P L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	

TH, TH-10

1 piece(s) 4 x 6 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)	139 @ 0	3281 (1.50")	Passed (4%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	89 @ 7"	2657	Passed (3%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	113 @ 1' 7 1/2"	1979	Passed (6%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.002 @ 1' 7 1/2"	0.108	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.003 @ 1' 7 1/2"	0.162	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	Snow	Total	
1 - Trimmer - SPF	1.50"	1.50"	1.50"	57	81	138	None
2 - Trimmer - SPF	1.50"	1.50"	1.50"	57	81	138	None

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 3' 3"	N/A	4.9	--	
1 - Uniform (PSF)	0 to 3' 3"	2'	15.2	25.0	Roof

Weyerhaeuser Notes

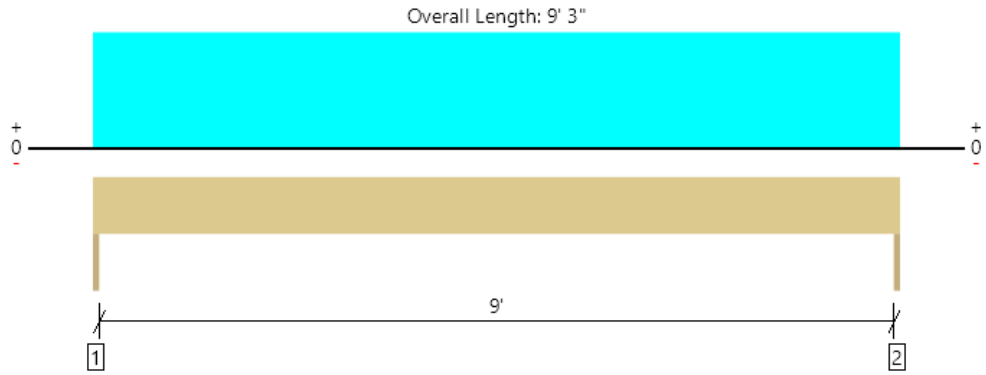
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional 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.

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

ForteWEB Software Operator	Job Notes
A P L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	

TH, TH-11

1 piece(s) 4 x 8 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)	402 @ 0	3281 (1.50")	Passed (12%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	338 @ 8 3/4"	3502	Passed (10%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	929 @ 4' 7 1/2"	3438	Passed (27%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.046 @ 4' 7 1/2"	0.308	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.080 @ 4' 7 1/2"	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/5/16").
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Trimmer - SPF	1.50"	1.50"	1.50"	170	231	401	None
2 - Trimmer - SPF	1.50"	1.50"	1.50"	170	231	401	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	9' 3" o/c	
Bottom Edge (Lu)	9' 3" 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 9' 3"	N/A	6.4	--	
1 - Uniform (PSF)	0 to 9' 3"	2'	15.2	25.0	Roof

Weyerhaeuser Notes

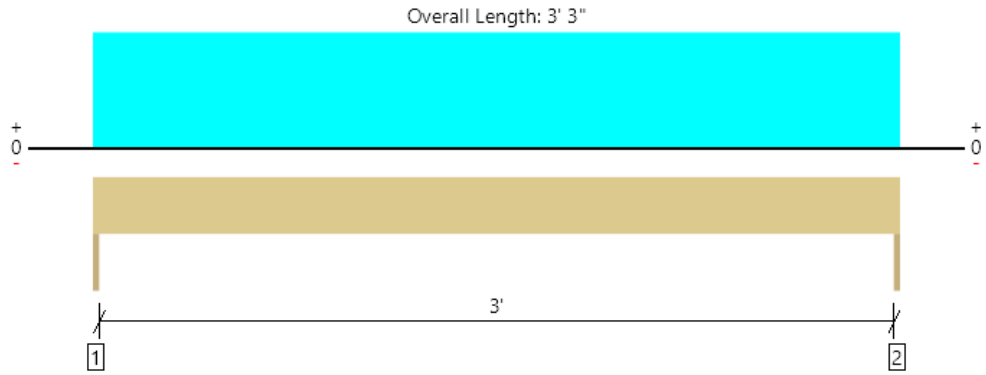
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional 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.

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

ForteWEB Software Operator	Job Notes
A P L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	

TH, TH-12

1 piece(s) 4 x 6 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)	139 @ 0	3281 (1.50")	Passed (4%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	89 @ 7"	2657	Passed (3%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	113 @ 1' 7 1/2"	1979	Passed (6%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.002 @ 1' 7 1/2"	0.108	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.003 @ 1' 7 1/2"	0.162	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	Snow	Total	
1 - Trimmer - SPF	1.50"	1.50"	1.50"	57	81	138	None
2 - Trimmer - SPF	1.50"	1.50"	1.50"	57	81	138	None

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 3' 3"	N/A	4.9	--	
1 - Uniform (PSF)	0 to 3' 3"	2'	15.2	25.0	Roof

Weyerhaeuser Notes

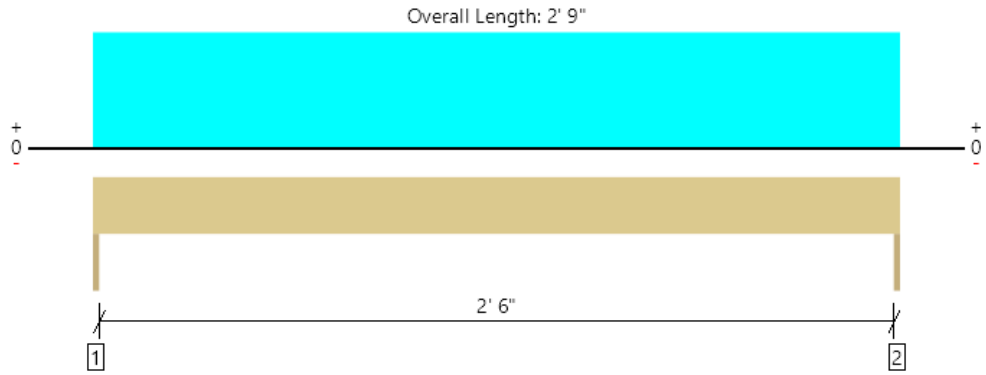
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional 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.

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

ForteWEB Software Operator	Job Notes
A P L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	

TH, TH-13

1 piece(s) 4 x 6 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)	213 @ 0	3281 (1.50")	Passed (6%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	123 @ 7"	2310	Passed (5%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	146 @ 1' 4 1/2"	1720	Passed (9%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.001 @ 1' 4 1/2"	0.092	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.003 @ 1' 4 1/2"	0.138	Passed (L/999+)	--	1.0 D + 1.0 L (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	Floor Live	Total	
1 - Trimmer - SPF	1.50"	1.50"	1.50"	110	103	213	None
2 - Trimmer - SPF	1.50"	1.50"	1.50"	110	103	213	None

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 2' 9"	N/A	4.9	--	
1 - Uniform (PSF)	0 to 2' 9"	7' 6"	10.0	10.0	clg

Weyerhaeuser Notes

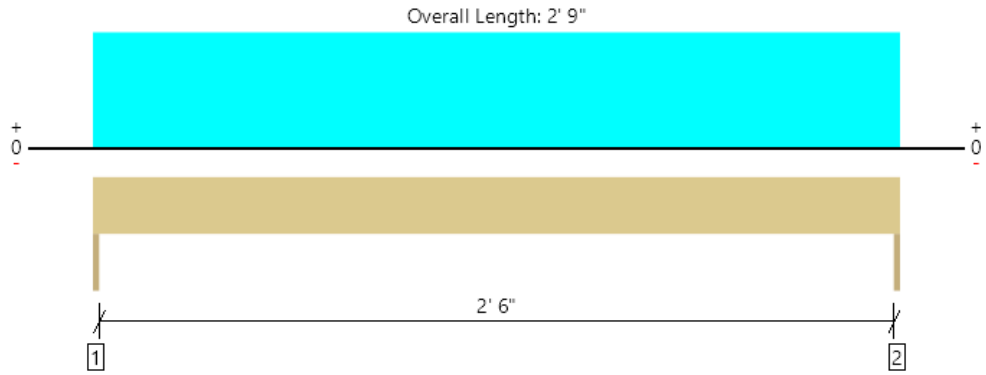
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional 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.

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

ForteWEB Software Operator	Job Notes
A P L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	

TH, TH-14

1 piece(s) 4 x 6 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)	725 @ 0	3281 (1.50")	Passed (22%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	418 @ 7"	2657	Passed (16%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	499 @ 1' 4 1/2"	1979	Passed (25%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.005 @ 1' 4 1/2"	0.092	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.009 @ 1' 4 1/2"	0.138	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	Snow	Total	
1 - Trimmer - SPF	1.50"	1.50"	1.50"	279	447	726	None
2 - Trimmer - SPF	1.50"	1.50"	1.50"	279	447	726	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	2' 9" o/c	
Bottom Edge (Lu)	2' 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 2' 9"	N/A	4.9	--	
1 - Uniform (PSF)	0 to 2' 9"	13'	15.2	25.0	Roof

Weyerhaeuser Notes

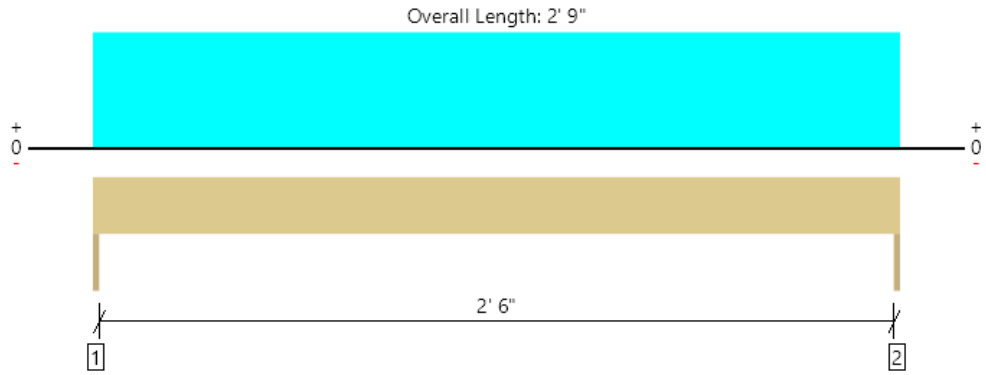
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional 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.

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

ForteWEB Software Operator	Job Notes
A P L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	

TH, TH-15

1 piece(s) 4 x 6 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)	1056 @ 0	3281 (1.50")	Passed (32%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	608 @ 7"	2657	Passed (23%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	726 @ 1' 4 1/2"	1979	Passed (37%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.007 @ 1' 4 1/2"	0.092	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.013 @ 1' 4 1/2"	0.138	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	Floor Live	Snow	Total	
1 - Trimmer - SPF	1.50"	1.50"	1.50"	489	138	567	1194	None
2 - Trimmer - SPF	1.50"	1.50"	1.50"	489	138	567	1194	None

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 2' 9"	N/A	4.9	--	--	
1 - Uniform (PSF)	0 to 2' 9"	16' 6"	15.2	-	25.0	Roof
2 - Uniform (PSF)	0 to 2' 9"	10'	10.0	10.0	-	CLG

Weyerhaeuser Notes

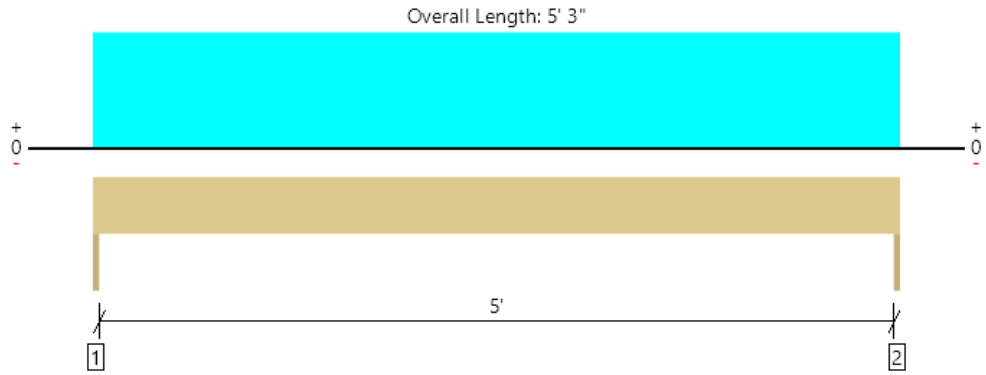
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional 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.

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

ForteWEB Software Operator	Job Notes
A P L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	

TH, TH-16

1 piece(s) 4 x 8 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)	2022 @ 0	3281 (1.50")	Passed (62%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1460 @ 8 3/4"	3502	Passed (42%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	2653 @ 2' 7 1/2"	3438	Passed (77%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.043 @ 2' 7 1/2"	0.175	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.074 @ 2' 7 1/2"	0.262	Passed (L/851)	--	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	Floor Live	Snow	Total	
1 - Trimmer - SPF	1.50"	1.50"	1.50"	840	105	1181	2126	None
2 - Trimmer - SPF	1.50"	1.50"	1.50"	840	105	1181	2126	None

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 5' 3"	N/A	6.4	--	--	
1 - Uniform (PSF)	0 to 5' 3"	18'	15.2	-	25.0	Roof
2 - Uniform (PSF)	0 to 5' 3"	4'	10.0	10.0	-	CLG

Weyerhaeuser Notes

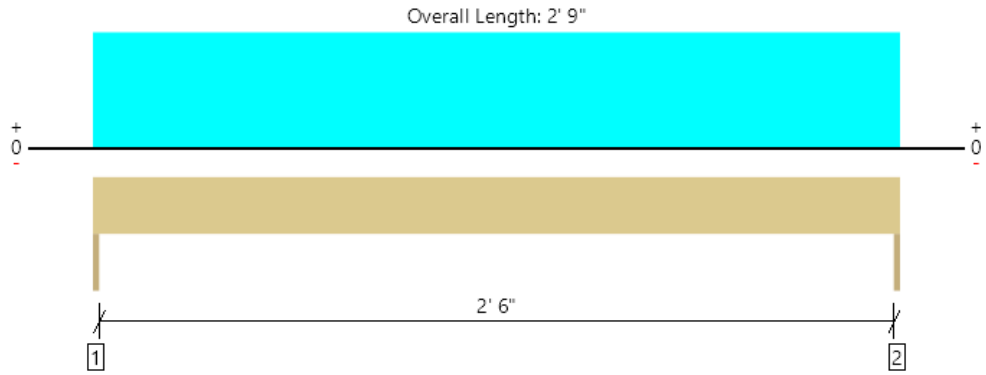
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional 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.

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

ForteWEB Software Operator	Job Notes
A P L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	

TH, TH-17

1 piece(s) 4 x 6 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)	649 @ 0	3281 (1.50")	Passed (20%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	374 @ 7"	2657	Passed (14%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	446 @ 1' 4 1/2"	1979	Passed (23%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.005 @ 1' 4 1/2"	0.092	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.008 @ 1' 4 1/2"	0.138	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	Floor Live	Snow	Total	
1 - Trimmer - SPF	1.50"	1.50"	1.50"	271	34	378	683	None
2 - Trimmer - SPF	1.50"	1.50"	1.50"	271	34	378	683	None

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 2' 9"	N/A	4.9	--	--	
1 - Uniform (PSF)	0 to 2' 9"	11'	15.2	-	25.0	Roof
2 - Uniform (PSF)	0 to 2' 9"	2' 6"	10.0	10.0	-	CLG

Weyerhaeuser Notes

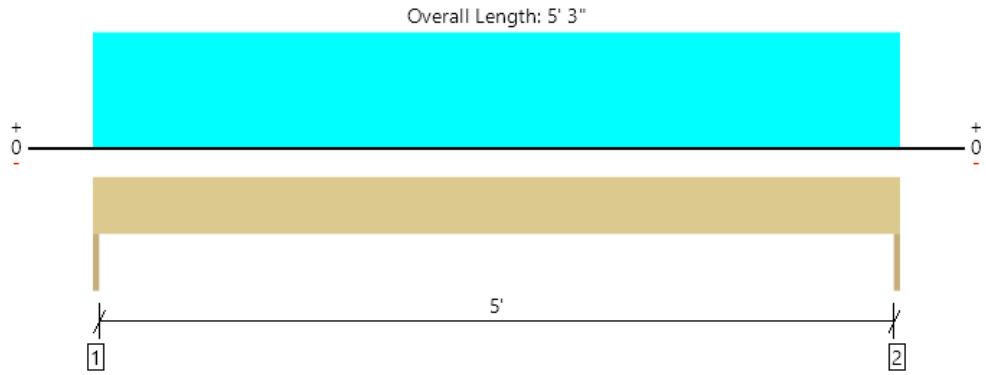
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional 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.

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

ForteWEB Software Operator	Job Notes
A P L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	

TH, TH-18

1 piece(s) 4 x 6 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)	1227 @ 0	3281 (1.50")	Passed (37%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	954 @ 7"	2657	Passed (36%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	1610 @ 2' 7 1/2"	1979	Passed (81%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.063 @ 2' 7 1/2"	0.175	Passed (L/995)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.103 @ 2' 7 1/2"	0.262	Passed (L/612)	--	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	Snow	Total	
1 - Trimmer - SPF	1.50"	1.50"	1.50"	472	755	1227	None
2 - Trimmer - SPF	1.50"	1.50"	1.50"	472	755	1227	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	5' 3" o/c	
Bottom Edge (Lu)	5' 3" 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 5' 3"	N/A	4.9	--	
1 - Uniform (PSF)	0 to 5' 3"	11' 6"	15.2	25.0	Roof

Weyerhaeuser Notes

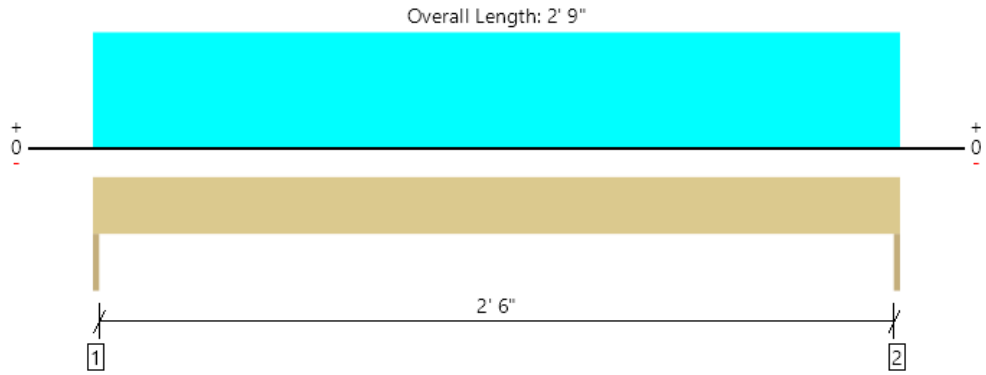
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional 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.

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

ForteWEB Software Operator	Job Notes
A P L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	

TH, TH-19

1 piece(s) 4 x 6 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)	394 @ 0	3281 (1.50")	Passed (12%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	227 @ 7"	2657	Passed (9%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	271 @ 1' 4 1/2"	1979	Passed (14%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.003 @ 1' 4 1/2"	0.092	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.005 @ 1' 4 1/2"	0.138	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	Snow	Total	
1 - Trimmer - SPF	1.50"	1.50"	1.50"	153	241	394	None
2 - Trimmer - SPF	1.50"	1.50"	1.50"	153	241	394	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	2' 9" o/c	
Bottom Edge (Lu)	2' 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 2' 9"	N/A	4.9	--	
1 - Uniform (PSF)	0 to 2' 9"	7'	15.2	25.0	Roof

Weyerhaeuser Notes

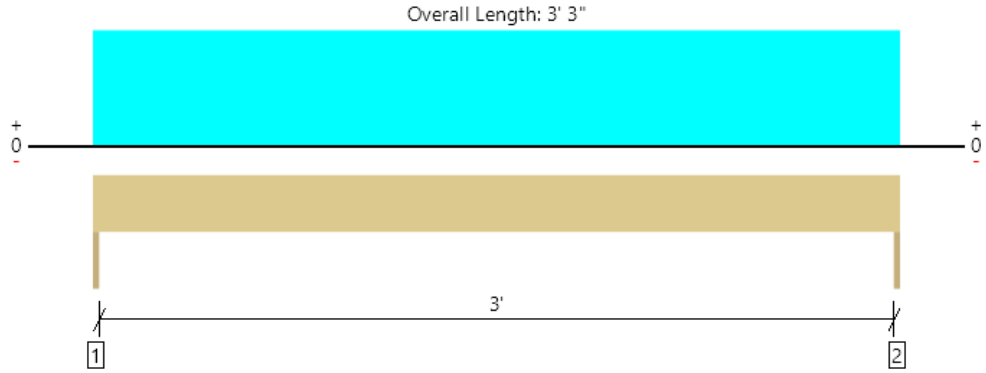
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional 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.

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

ForteWEB Software Operator	Job Notes
A P L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	

TH, TH-20

1 piece(s) 4 x 6 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)	531 @ 0	3281 (1.50")	Passed (16%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	340 @ 7"	2657	Passed (13%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	431 @ 1' 7 1/2"	1979	Passed (22%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.006 @ 1' 7 1/2"	0.108	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.011 @ 1' 7 1/2"	0.162	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	Snow	Total	
1 - Trimmer - SPF	1.50"	1.50"	1.50"	206	325	531	None
2 - Trimmer - SPF	1.50"	1.50"	1.50"	206	325	531	None

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 3' 3"	N/A	4.9	--	
1 - Uniform (PSF)	0 to 3' 3"	8'	15.2	25.0	Roof

Weyerhaeuser Notes

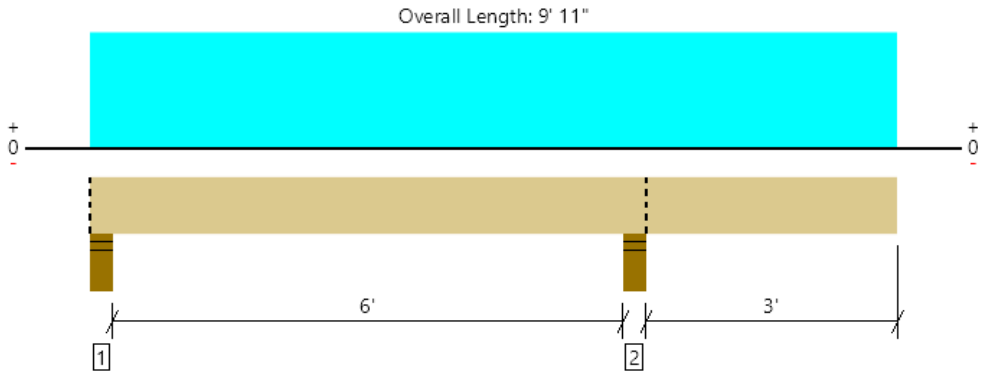
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional 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.

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

ForteWEB Software Operator	Job Notes
A P L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	

TH, TH-21

1 piece(s) 4 x 8 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)	2648 @ 6' 8 1/4"	8181 (5.50")	Passed (32%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1159 @ 5' 10 1/4"	3502	Passed (33%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	-1910 @ 6' 8 1/4"	3438	Passed (56%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.070 @ 9' 11"	0.200	Passed (2L/999+)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.090 @ 9' 11"	0.323	Passed (2L/860)	--	1.0 D + 1.0 S (Alt Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Overhang deflection criteria: LL (2L/0.2") and TL (2L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Stud wall - SPF	5.50"	5.50"	1.50"	380	698	1078	Blocking
2 - Stud wall - SPF	5.50"	5.50"	1.78"	1022	1626	2648	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	9' 11" o/c	
Bottom Edge (Lu)	9' 11" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 9' 11"	N/A	6.4	--	
1 - Uniform (PSF)	0 to 9' 11" (Front)	9'	15.0	25.0	ROOF

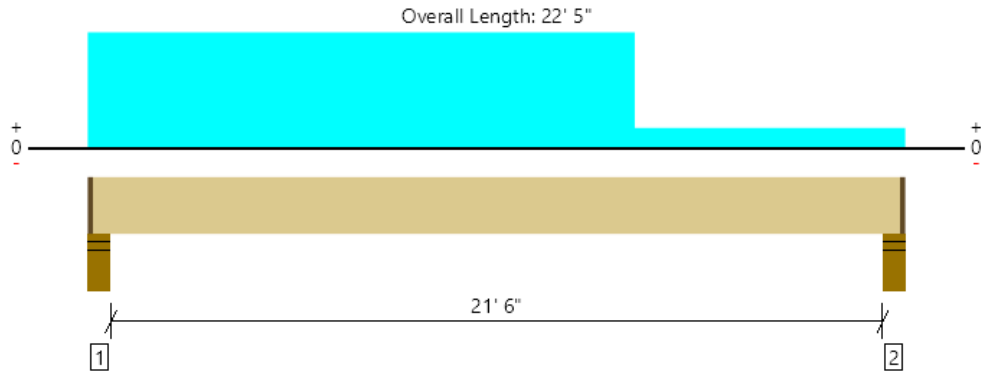
Weyerhaeuser Notes

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.

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

THIRD FLOOR, TB-1

1 piece(s) 5 1/4" x 18" 2.2E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	7618 @ 4"	9483 (4.25")	Passed (80%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	6225 @ 1' 11 1/2"	21011	Passed (30%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	36889 @ 10' 2 7/8"	75322	Passed (49%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.269 @ 10' 10 3/4"	0.544	Passed (L/969)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.582 @ 10' 10 13/16"	1.087	Passed (L/449)	--	1.0 D + 1.0 S (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - SPF	5.50"	4.25"	3.41"	4117	448	3577	8142	1 1/4" Rim Board
2 - Stud wall - SPF	5.50"	4.25"	2.00"	2431	448	2044	4923	1 1/4" Rim Board

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	22' 3" o/c	
Bottom Edge (Lu)	22' 3" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	1 1/4" to 22' 3 3/4"	N/A	29.5	--	--	
1 - Uniform (PSF)	0 to 22' 5" (Front)	1'	12.0	40.0	-	Default Load
2 - Uniform (PSF)	0 to 22' 5" (Front)	2'	15.0	-	25.0	Default Load
3 - Uniform (PSF)	0 to 15' (Front)	12'	15.0	-	25.0	ROOF
4 - Uniform (PSF)	0 to 15' (Front)	10'	15.0	-	-	Ext Wall

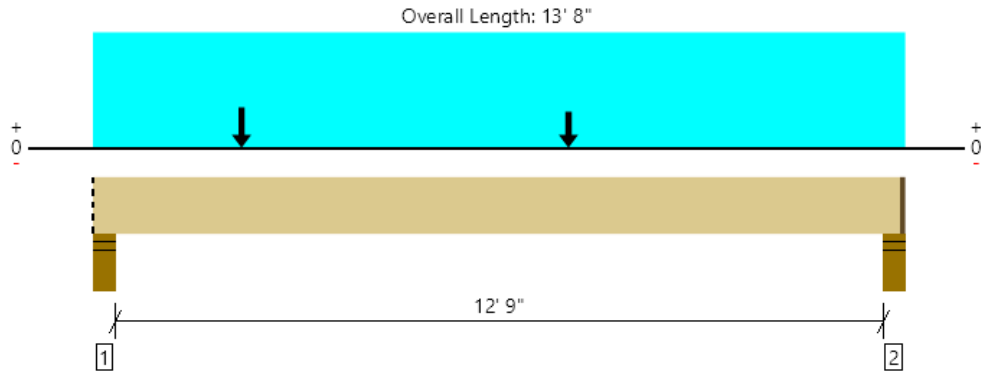
Weyerhaeuser Notes

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.

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

THIRD FLOOR, TB-2

1 piece(s) 5 1/4" x 18" 2.2E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	7949 @ 13' 4"	9483 (4.25")	Passed (84%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	7762 @ 1' 11 1/2"	18270	Passed (42%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	29150 @ 7' 7 1/2"	65497	Passed (45%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.113 @ 6' 9 7/8"	0.325	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.194 @ 6' 9 5/8"	0.650	Passed (L/802)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - SPF	5.50"	5.50"	4.47"	4335	5115	2390	11840	Blocking
2 - Stud wall - SPF	5.50"	4.25"	3.56"	3059	4977	1328	9364	1 1/4" Rim Board

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	13' 7" o/c	
Bottom Edge (Lu)	13' 7" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 13' 6 3/4"	N/A	29.5	--	--	
1 - Uniform (PSF)	0 to 13' 8" (Front)	16'	12.0	40.0	-	Default Load
2 - Point (lb)	2' 6" (Front)	N/A	2431	448	2044	Linked from: TB-1, Support 2
3 - Point (lb)	8' (Front)	N/A	1938	897	1674	Linked from: TB-6, Support 2

Weyerhaeuser Notes

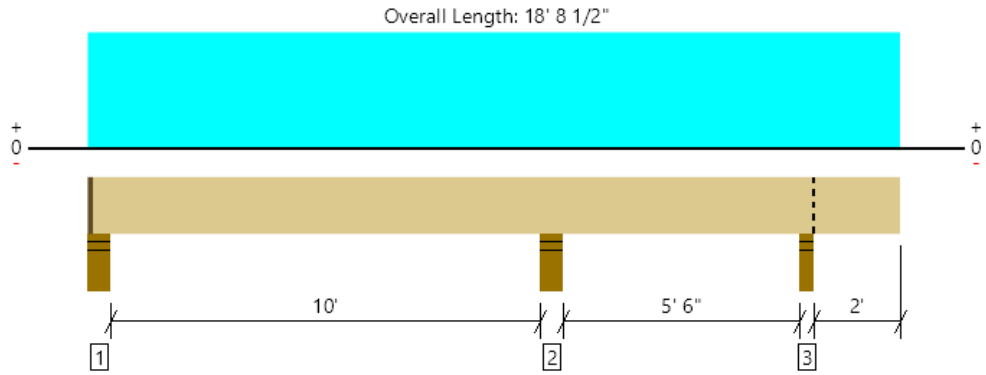
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional 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.

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

ForteWEB Software Operator	Job Notes
A P L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	

THIRD FLOOR, TB-3

1 piece(s) 3 1/2" x 18" 2.2E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	5765 @ 10' 8 1/4"	8181 (5.50")	Passed (70%)	--	1.0 D + 1.0 L (Adj Spans)
Shear (lbs)	2382 @ 8' 11 1/2"	12180	Passed (20%)	1.00	1.0 D + 1.0 L (Adj Spans)
Moment (Ft-lbs)	-5399 @ 10' 8 1/4"	43665	Passed (12%)	1.00	1.0 D + 1.0 L (Adj Spans)
Live Load Defl. (in)	0.027 @ 5' 1 11/16"	0.259	Passed (L/999+)	--	1.0 D + 1.0 L (Alt Spans)
Total Load Defl. (in)	0.035 @ 5' 1 3/8"	0.518	Passed (L/999+)	--	1.0 D + 1.0 L (Alt Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Overhang deflection criteria: LL (2L/480) and TL (2L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Total	
1 - Stud wall - HF	5.50"	4.25"	1.74"	637	1890/-19	2527/-19	1 1/4" Rim Board
2 - Stud wall - SPF	5.50"	5.50"	3.88"	1440	4325	5765	None
3 - Stud wall - SPF	3.50"	3.50"	1.78"	534	2112	2646	Blocking

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

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	1 1/4" to 18' 8 1/2"	N/A	19.7	--	
1 - Uniform (PSF)	0 to 18' 8 1/2" (Front)	10'	12.0	40.0	Default Load

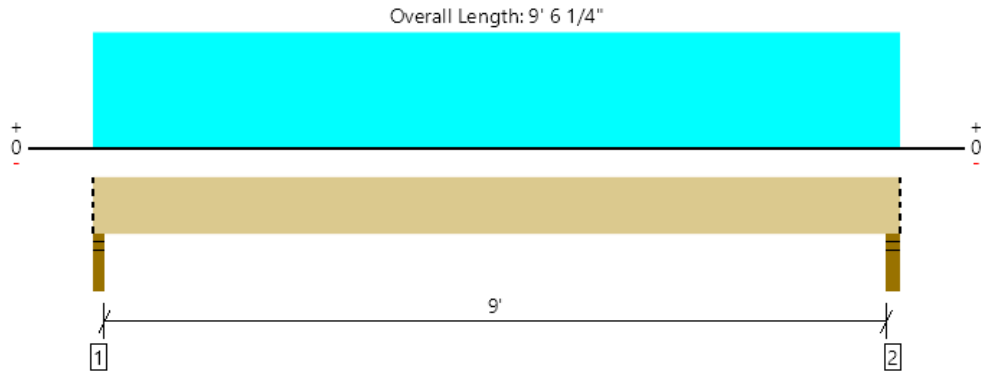
Weyerhaeuser Notes

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.

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

THIRD FLOOR, TB-4

1 piece(s) 3 1/2" x 18" 2.2E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	3011 @ 1 1/4"	3898 (2.75")	Passed (77%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1910 @ 1' 8 3/4"	14007	Passed (14%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	6810 @ 4' 8 3/4"	50215	Passed (14%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.020 @ 4' 8 3/4"	0.231	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.039 @ 4' 8 3/4"	0.463	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - HF	2.75"	2.75"	2.12"	1474	378	1537	3389	Blocking
2 - Stud wall - HF	3.50"	3.50"	2.15"	1494	383	1557	3434	Blocking

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

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 9' 6 1/4"	N/A	19.7	--	--	
1 - Uniform (PSF)	0 to 9' 6 1/4" (Front)	2'	12.0	40.0	-	Default Load
2 - Uniform (PSF)	0 to 9' 6 1/4" (Front)	14'	8.0	-	-	INT WALL
3 - Uniform (PSF)	0 to 9' 6 1/4" (Front)	13'	12.0	-	25.0	ROOF

Weyerhaeuser Notes

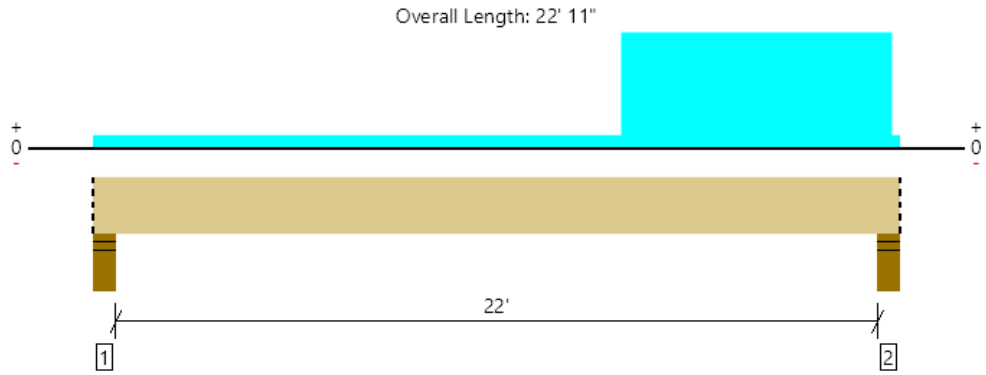
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional 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.

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

ForteWEB Software Operator	Job Notes
A P L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	

THIRD FLOOR, TB-5

1 piece(s) 3 1/2" x 18" 2.2E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	5949 @ 22' 7"	7796 (5.50")	Passed (76%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	4390 @ 20' 11 1/2"	14007	Passed (31%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	19743 @ 15' 8 1/4"	50215	Passed (39%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.248 @ 12' 3 3/16"	0.556	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.461 @ 12' 3 5/8"	1.112	Passed (L/580)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - HF	5.50"	5.50"	1.50"	955	917	646	2518	Blocking
2 - Stud wall - HF	5.50"	5.50"	4.20"	2752	917	3198	6867	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' 11" o/c	
Bottom Edge (Lu)	22' 11" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 22' 11"	N/A	19.7	--	--	
1 - Uniform (PSF)	0 to 22' 11" (Front)	2'	12.0	40.0	-	Default Load
2 - Uniform (PSF)	15' to 22' 8 1/4" (Front)	14'	8.0	-	-	INT WALL
3 - Uniform (PSF)	15' to 22' 8 1/4" (Front)	20'	12.0	-	25.0	ROOF

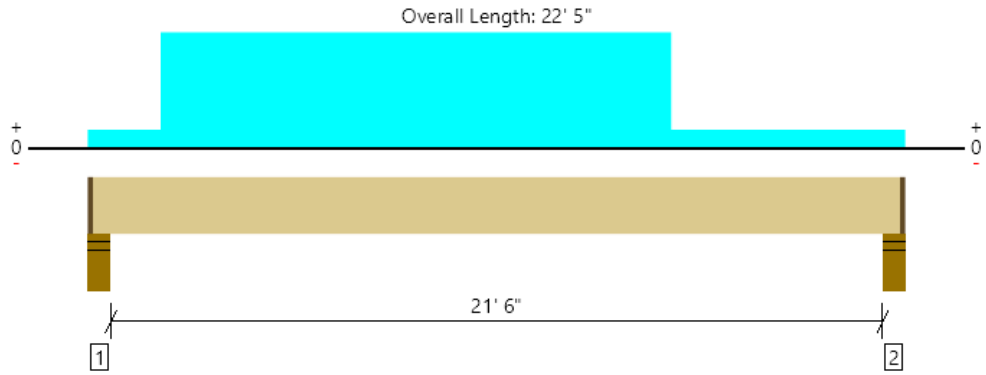
Weyerhaeuser Notes

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.

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

THIRD FLOOR, TB-6

1 piece(s) 3 1/2" x 18" 2.2E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	5236 @ 4"	6322 (4.25")	Passed (83%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	5120 @ 1' 11 1/2"	14007	Passed (37%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	30289 @ 10' 5 3/4"	50215	Passed (60%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.351 @ 10' 11 3/8"	0.544	Passed (L/744)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.718 @ 10' 11 11/16"	1.087	Passed (L/363)	--	1.0 D + 1.0 S (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - SPF	5.50"	4.25"	3.52"	2677	897	2526	6100	1 1/4" Rim Board
2 - Stud wall - SPF	5.50"	4.25"	2.59"	1938	897	1674	4509	1 1/4" Rim Board

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	18' 10" o/c	
Bottom Edge (Lu)	22' 3" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	1 1/4" to 22' 3 3/4"	N/A	19.7	--	--	
1 - Uniform (PSF)	0 to 22' 5" (Front)	2'	12.0	40.0	-	Default Load
2 - Uniform (PSF)	2' to 16' (Front)	12'	15.0	-	25.0	ROOF
3 - Uniform (PSF)	2' to 16' (Front)	10'	8.0	-	-	INT Wall

Weyerhaeuser Notes

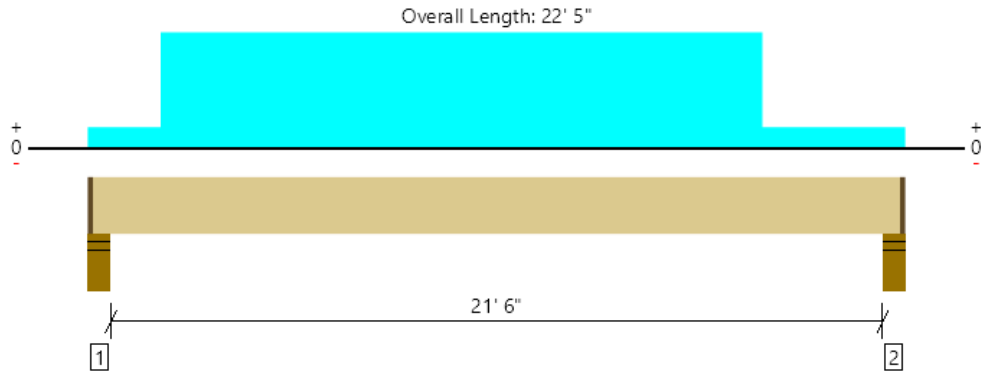
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional 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.

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

ForteWEB Software Operator	Job Notes
A P L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	

THIRD FLOOR, TB-7

1 piece(s) 3 1/2" x 18" 2.2E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	4899 @ 4"	6322 (4.25")	Passed (77%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	4713 @ 1' 11 1/2"	14007	Passed (34%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	29198 @ 11' 1/4"	50215	Passed (58%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.336 @ 11' 1 13/16"	0.544	Passed (L/776)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.706 @ 11' 1 3/4"	1.087	Passed (L/370)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - SPF	5.50"	4.25"	3.29"	2552	897	2244	5693	1 1/4" Rim Board
2 - Stud wall - SPF	5.50"	4.25"	2.89"	2218	897	1881	4996	1 1/4" Rim Board

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	19' 9" o/c	
Bottom Edge (Lu)	22' 3" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	1 1/4" to 22' 3 3/4"	N/A	19.7	--	--	
1 - Uniform (PSF)	0 to 22' 5" (Front)	2'	12.0	40.0	-	Default Load
2 - Uniform (PSF)	2' to 18' 6" (Front)	10'	15.0	-	25.0	ROOF
3 - Uniform (PSF)	2' to 18' 6" (Front)	10'	8.0	-	-	INT Wall

Weyerhaeuser Notes

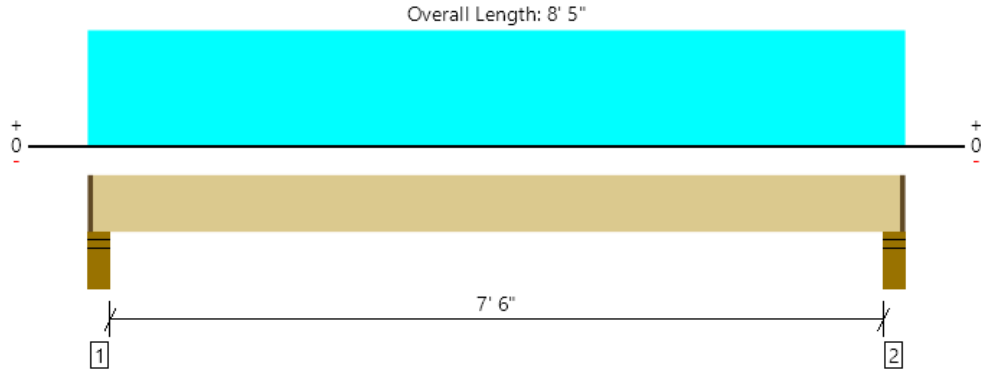
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional 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.

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

ForteWEB Software Operator	Job Notes
A P L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	

THIRD FLOOR, TB-8 (REACTION ONLY)

1 piece(s) 3 1/2" x 18" 2.2E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1723 @ 4"	6322 (4.25")	Passed (27%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	945 @ 1' 11 1/2"	14007	Passed (7%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	3153 @ 4' 2 1/2"	50215	Passed (6%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.007 @ 4' 2 1/2"	0.194	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.014 @ 4' 2 1/2"	0.387	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - SPF	5.50"	4.25"	1.50"	960	337	736	2033	1 1/4" Rim Board
2 - Stud wall - SPF	5.50"	4.25"	1.50"	960	337	736	2033	1 1/4" Rim Board

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	8' 3" o/c	
Bottom Edge (Lu)	8' 3" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	1 1/4" to 8' 3 3/4"	N/A	19.7	--	--	
1 - Uniform (PSF)	0 to 8' 5" (Front)	2'	12.0	40.0	-	Default Load
2 - Uniform (PSF)	0 to 8' 5" (Front)	7'	15.0	-	25.0	ROOF
3 - Uniform (PSF)	0 to 8' 5" (Front)	10'	8.0	-	-	INT Wall

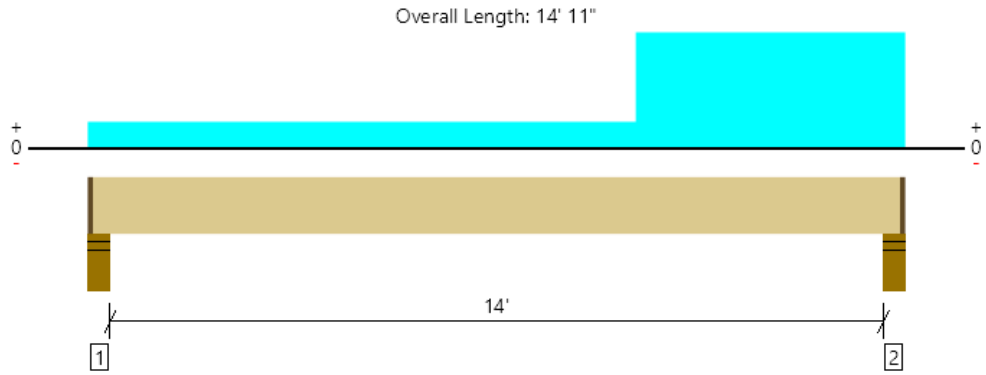
Weyerhaeuser Notes

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.

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

THIRD FLOOR, TB-9 (REACTION ONLY)

1 piece(s) 3 1/2" x 18" 2.2E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	2051 @ 14' 7"	6322 (4.25")	Passed (32%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	1273 @ 12' 11 1/2"	14007	Passed (9%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	4186 @ 8' 6 3/4"	43665	Passed (10%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.026 @ 7' 8 7/8"	0.356	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.051 @ 7' 9 11/16"	0.712	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - SPF	5.50"	4.25"	1.50"	460	597	129	1186	1 1/4" Rim Board
2 - Stud wall - SPF	5.50"	4.25"	1.50"	1097	597	731	2425	1 1/4" Rim Board

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	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)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	1 1/4" to 14' 9 3/4"	N/A	19.7	--	--	
1 - Uniform (PSF)	0 to 14' 11" (Front)	2'	12.0	40.0	-	Default Load
2 - Uniform (PSF)	10' to 14' 11" (Front)	7'	15.0	-	25.0	ROOF
3 - Uniform (PSF)	10' to 14' 11" (Front)	10'	8.0	-	-	INT Wall

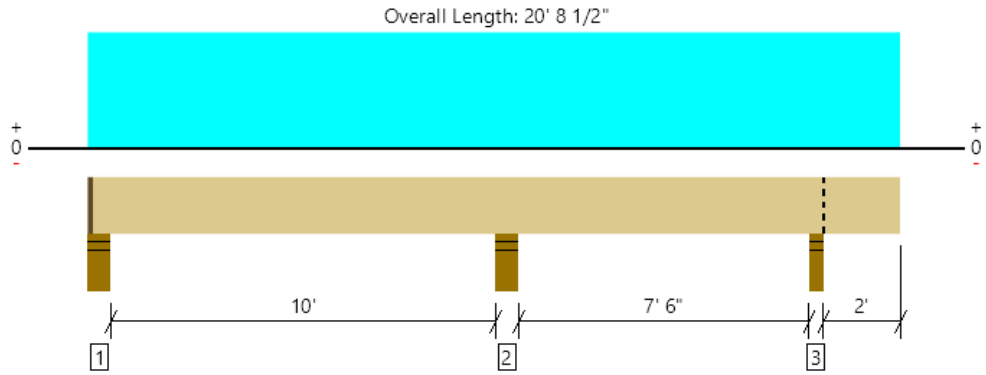
Weyerhaeuser Notes

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.

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

THIRD FLOOR, TB-10

1 piece(s) 3 1/2" x 18" 2.2E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	6536 @ 10' 8 1/4"	8181 (5.50")	Passed (80%)	--	1.0 D + 0.75 L + 0.75 S (Adj Spans)
Shear (lbs)	2393 @ 8' 11 1/2"	12180	Passed (20%)	1.00	1.0 D + 1.0 L (Adj Spans)
Moment (Ft-lbs)	-5694 @ 10' 8 1/4"	43665	Passed (13%)	1.00	1.0 D + 1.0 L (Adj Spans)
Live Load Defl. (in)	0.016 @ 5' 2"	0.259	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (Alt Spans)
Total Load Defl. (in)	0.036 @ 5' 3/4"	0.518	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (Alt Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Overhang deflection criteria: LL (2L/480) and TL (2L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - HF	5.50"	4.25"	1.84"	1504	965/-44	583	3052/-44	1 1/4" Rim Board
2 - Stud wall - SPF	5.50"	5.50"	4.39"	3736	2313	1420	7469	None
3 - Stud wall - SPF	3.50"	3.50"	2.09"	1689	1203	691	3583	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	20' 7" o/c	
Bottom Edge (Lu)	20' 7" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	1 1/4" to 20' 8 1/2"	N/A	19.7	--	--	
1 - Uniform (PSF)	0 to 20' 8 1/2" (Front)	5'	12.0	40.0	-	Default Load
2 - Uniform (PSF)	0 to 20' 8 1/2" (Front)	2'	15.0	-	25.0	ROOF
3 - Uniform (PSF)	0 to 20' 8 1/2" (Front)	12'	15.0	-	-	EXT WALL
4 - Uniform (PSF)	0 to 20' 8 1/2" (Front)	3'	15.0	-	25.0	ROOF

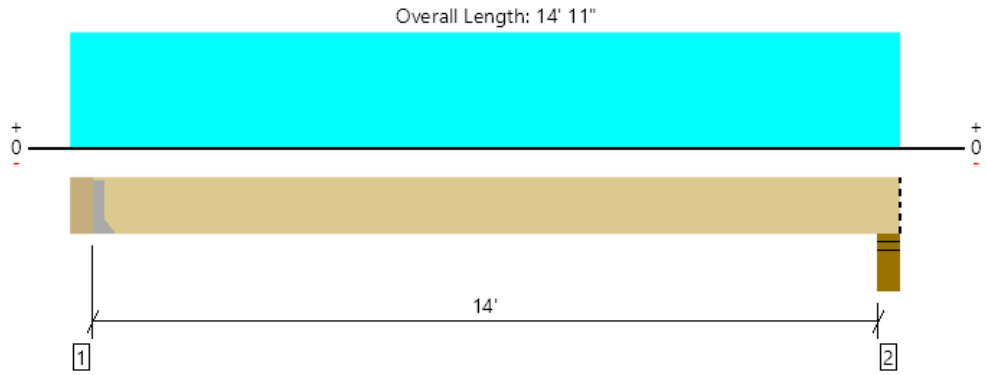
Weyerhaeuser Notes

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.

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

THIRD FLOOR, TB-11

1 piece(s) 3 1/2" x 18" 2.2E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	5934 @ 5 1/2"	5934 (2.71")	Passed (100%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	4674 @ 1' 11 1/2"	14007	Passed (33%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	20954 @ 7' 6 1/4"	50215	Passed (42%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.107 @ 7' 6 1/4"	0.353	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.236 @ 7' 6 1/4"	0.706	Passed (L/718)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Hanger on 18" HF beam	5.50"	Hanger[1]	2.71"	3433	1203	2632	7268	See note [1]
2 - Stud wall - SPF	5.50"	5.50"	4.18"	3385	1183	2589	7157	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	14' 6" o/c	
Bottom Edge (Lu)	14' 6" o/c	

•Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-Tie						
Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
1 - Face Mount Hanger	HGU3.63/11-SDS	5.25"	N/A	36-SDS25212	24-SDS25212	

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	5 1/2" to 14' 11"	N/A	19.7	--	--	
1 - Uniform (PSF)	0 to 14' 11" (Front)	4'	12.0	40.0	-	Default Load
2 - Uniform (PSF)	0 to 14' 11" (Front)	14'	15.0	-	25.0	ROOF
3 - Uniform (PSF)	0 to 14' 11" (Front)	12'	15.0	-	-	EXT WALL

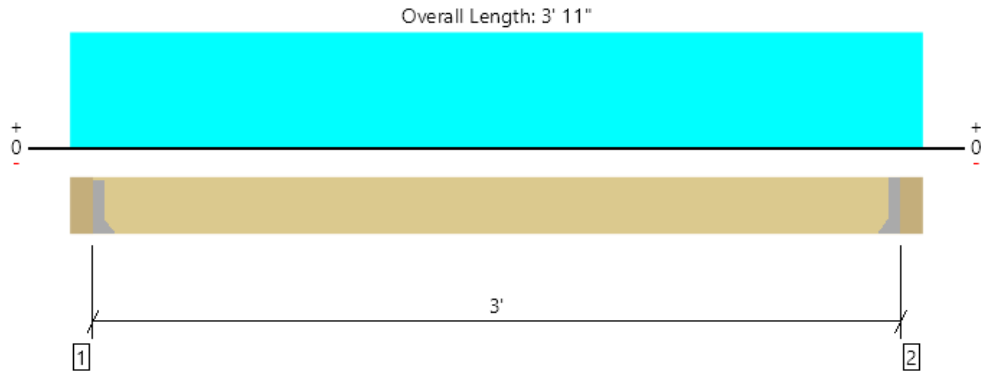
Weyerhaeuser Notes

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.

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

ForteWEB Software Operator	Job Notes
A P L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	

THIRD FLOOR, TB-12 (REACTION ONLY)
1 piece(s) 3 1/2" x 18" 2.2E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	978 @ 5 1/2"	3281 (1.50")	Passed (30%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	0 @ 1' 11 1/2"	14007	Passed (0%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	733 @ 1' 11 1/2"	50215	Passed (1%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.001 @ 1' 11 1/2"	0.075	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.002 @ 1' 11 1/2"	0.150	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Hanger on 18" HF beam	5.50"	Hanger[1]	1.50"	729	78	539	1346	See note [1]
2 - Hanger on 18" SPF beam	5.50"	Hanger[1]	1.50"	729	78	539	1346	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)	3' o/c	
Bottom Edge (Lu)	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	HGU3.63/11-SDS	5.25"	N/A	36-SDS25212	24-SDS25212	
2 - Face Mount Hanger	HGU3.63/11-SDS	5.25"	N/A	36-SDS25212	24-SDS25212	

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	5 1/2" to 3' 5 1/2"	N/A	19.7	--	--	
1 - Uniform (PSF)	0 to 3' 11" (Front)	1'	12.0	40.0	-	Default Load
2 - Uniform (PSF)	0 to 3' 11" (Front)	11'	15.0	-	25.0	ROOF
3 - Uniform (PSF)	0 to 3' 11" (Front)	12'	15.0	-	-	EXT WALL

Weyerhaeuser Notes

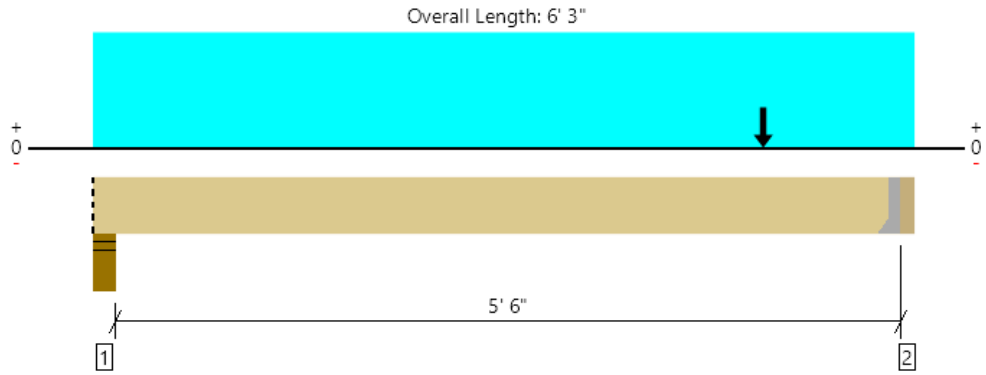
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional 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.

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

ForteWEB Software Operator	Job Notes
A P L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	

THIRD FLOOR, TB-13

1 piece(s) 5 1/4" x 18" 2.2E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	7333 @ 5' 11 1/2"	7333 (2.23")	Passed (100%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	4033 @ 4' 5 1/2"	21011	Passed (19%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	6847 @ 5'	75322	Passed (9%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.005 @ 3' 5 7/16"	0.141	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.012 @ 3' 5 1/16"	0.281	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - SPF	5.50"	5.50"	1.50"	1585	470	776	2831	Blocking
2 - Hanger on 18" SPF beam	3.50"	Hanger[1]	2.23"	4309	1311	2864	8484	See note [1]

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

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

•Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-Tie						
Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
2 - Face Mount Hanger	MGU5.50-SDS H=18	4.50"	N/A	24-SDS25212	16-SDS25212	

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 5' 11 1/2"	N/A	29.5	--	--	
1 - Uniform (PSF)	0 to 6' 3" (Front)	2'	12.0	40.0	-	Default Load
2 - Uniform (PSF)	0 to 6' 3" (Front)	3'	15.0	-	25.0	ROOF
3 - Uniform (PSF)	0 to 6' 3" (Front)	12'	15.0	-	-	EXT WALL
4 - Point (lb)	5' (Front)	N/A	3433	1203	2632	Linked from: TB-11, Support 1
5 - Point (lb)	5' (Front)	N/A	729	78	539	Linked from: TB-12 (REACTION ONLY), Support 2

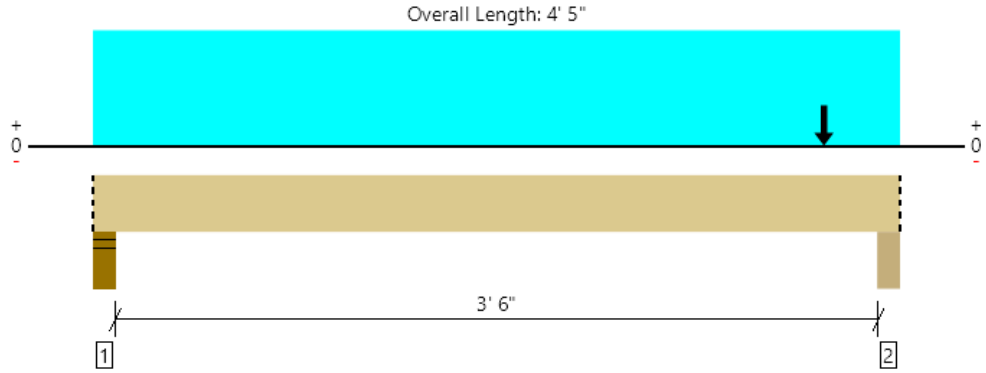
Weyerhaeuser Notes

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.

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

THIRD FLOOR, TB-14

1 piece(s) 3 1/2" x 18" 2.2E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	7669 @ 4' 1"	8181 (5.50")	Passed (94%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	31 @ 1' 11 1/2"	12180	Passed (0%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	217 @ 2' 2 1/2"	43665	Passed (0%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.000 @ 0	0.094	Passed (2L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.001 @ 2' 2 1/2"	0.188	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - SPF	5.50"	5.50"	1.50"	96	177	-	273	Blocking
2 - Beam - SPF	5.50"	5.50"	5.16"	4405	1488	2864	8757	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' 5" o/c	
Bottom Edge (Lu)	4' 5" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 4' 5"	N/A	19.7	--	--	
1 - Uniform (PSF)	0 to 4' 5" (Front)	2'	12.0	40.0	-	Default Load
2 - Point (lb)	4' (Front)	N/A	4309	1311	2864	Linked from: TB-13, Support 2

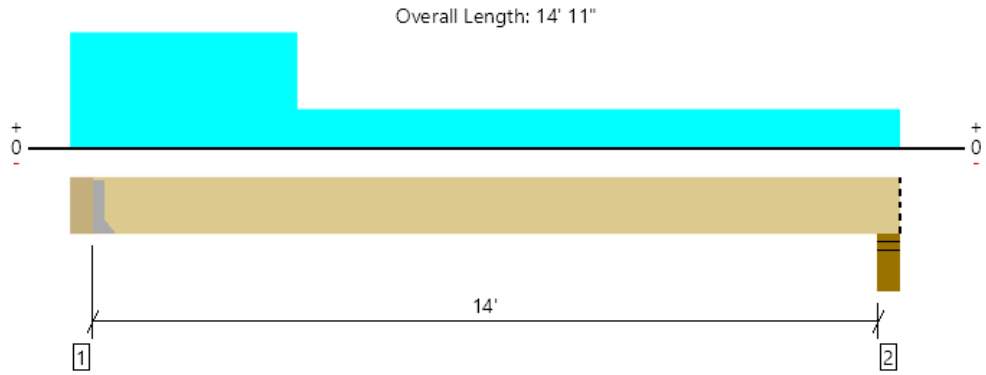
Weyerhaeuser Notes

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.

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

ForteWEB Software Operator	Job Notes
A P L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	

THIRD FLOOR, TB-15 (REACTION ONLY)
1 piece(s) 3 1/2" x 18" 2.2E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1518 @ 5 1/2"	3281 (1.50")	Passed (46%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	1020 @ 1' 11 1/2"	12180	Passed (8%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	3771 @ 6' 9 5/16"	43665	Passed (9%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.029 @ 7' 3 13/16"	0.353	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.043 @ 7' 4 1/8"	0.706	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Total	
1 - Hanger on 18" HF beam	5.50"	Hanger[1]	1.50"	490	1171	1661	See note [1]
2 - Stud wall - SPF	5.50"	5.50"	1.50"	344	663	1007	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	14' 6" o/c	
Bottom Edge (Lu)	14' 6" o/c	

•Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-Tie						
Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
1 - Face Mount Hanger	HGU3.63/11-SDS	5.25"	N/A	36-SDS25212	24-SDS25212	

- 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 14' 11"	N/A	19.7	--	
1 - Uniform (PSF)	0 to 14' 11" (Front)	2'	12.0	40.0	Default Load
2 - Uniform (PSF)	0 to 4' (Front)	4'	12.0	40.0	STAIR

Weyerhaeuser Notes

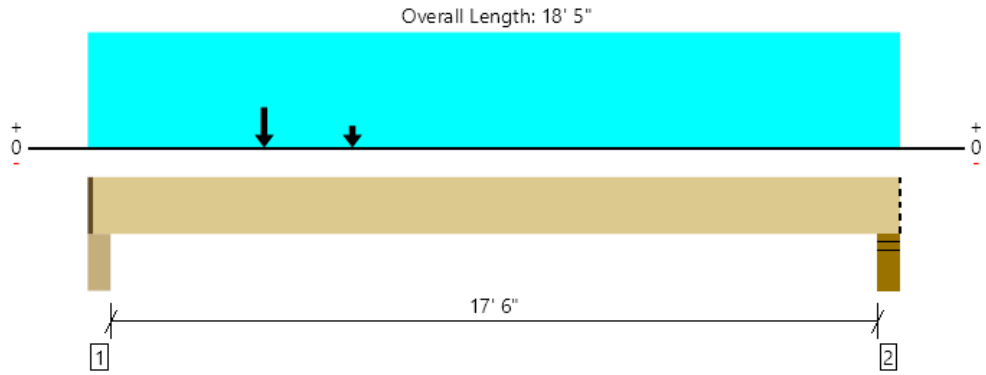
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional 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.

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

ForteWEB Software Operator	Job Notes
A P L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	

THIRD FLOOR, TB-16

1 piece(s) 3 1/2" x 18" 2.2E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	5084 @ 4"	6322 (4.25")	Passed (80%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	3789 @ 1' 11 1/2"	12180	Passed (31%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	18427 @ 8' 7 1/16"	43665	Passed (42%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.114 @ 9' 1/16"	0.444	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.342 @ 9' 9/16"	0.887	Passed (L/622)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Beam - SPF	5.50"	4.25"	3.42"	3392	1195	1118	5705	1 1/4" Rim Board
2 - Stud wall - SPF	5.50"	5.50"	2.92"	2932	1086	802	4820	Blocking

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

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	1 1/4" to 18' 5"	N/A	19.7	--	--	
1 - Uniform (PSF)	0 to 18' 5" (Front)	2'	12.0	40.0	-	Default Load
2 - Uniform (PSF)	0 to 18' 5" (Front)	3'	10.0	10.0	-	CEILING
3 - Uniform (PSF)	0 to 18' 5" (Front)	12'	15.0	-	-	EXT WALL
4 - Uniform (PSF)	0 to 18' 5" (Front)	3'	15.0	-	25.0	ROOF
5 - Point (lb)	4' (Front)	N/A	729	78	539	Linked from: TB-12 (REACTION ONLY), Support 1
6 - Point (lb)	6' (Front)	N/A	96	177	-	Linked from: TB-14, Support 1

Weyerhaeuser Notes

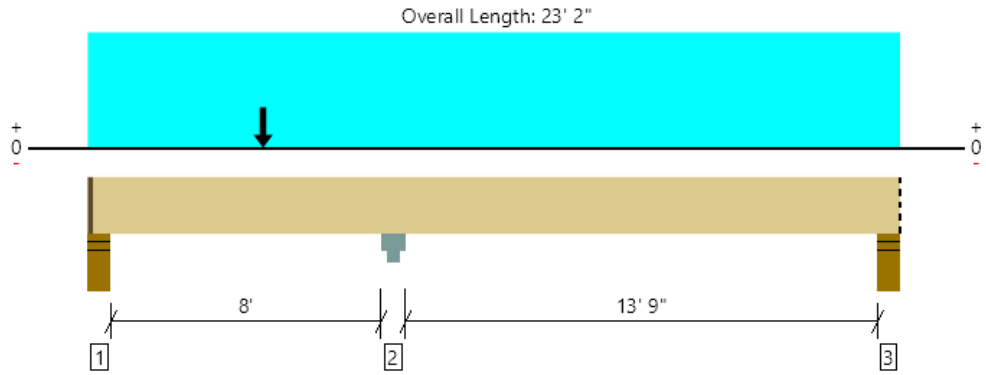
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional 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.

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

ForteWEB Software Operator	Job Notes
A P L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	

THIRD FLOOR, TB-17

1 piece(s) 3 1/2" x 18" 2.2E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	12142 @ 8' 8 1/2"	13125 (6.00")	Passed (93%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	5651 @ 6' 11 1/2"	14007	Passed (40%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	-14357 @ 8' 8 1/2"	50215	Passed (29%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.045 @ 16' 4 11/16"	0.353	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (Alt Spans)
Total Load Defl. (in)	0.100 @ 16' 7 3/16"	0.706	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (Alt Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - SPF	5.50"	4.25"	2.18"	1932	734/-141	1097	3763/-141	1 1/4" Rim Board
2 - Column Cap - steel	6.00"	6.00"	5.55"	7516	1917	4250	13683	None
3 - Stud wall - SPF	5.50"	5.50"	2.46"	2139	503/-65	1526	4168/-65	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	23' 1" o/c	
Bottom Edge (Lu)	23' 1" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	1 1/4" to 23' 2"	N/A	19.7	--	--	
1 - Uniform (PSF)	0 to 23' 2" (Front)	2'	12.0	40.0	-	Default Load
2 - Uniform (PSF)	0 to 23' 2" (Front)	10'	15.0	-	25.0	ROOF
3 - Uniform (PSF)	0 to 23' 2" (Front)	12'	15.0	-	-	EXT WALL
4 - Point (lb)	5' (Front)	N/A	2932	1086	802	Linked from: TB-16, Support 2

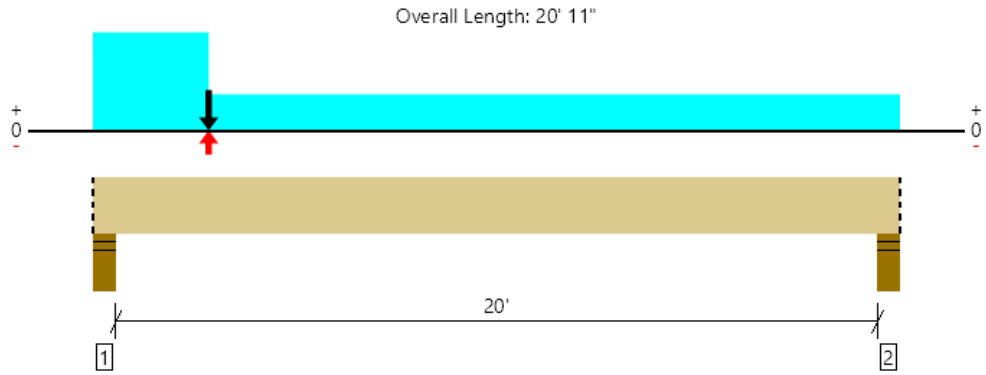
Weyerhaeuser Notes

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.

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

THIRD FLOOR, TB-18

1 piece(s) 3 1/2" x 18" 2.2E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern) [Group]
Member Reaction (lbs)	3309 @ 4"	8181 (5.50")	Passed (40%)	--	1.0 D + 0.75 L + 0.75 S (All Spans) [1]
Shear (lbs)	2708 @ 1' 11 1/2"	12180	Passed (22%)	1.00	1.0 D + 1.0 L (All Spans) [1]
Moment (Ft-lbs)	9235 @ 8' 4 3/8"	43665	Passed (21%)	1.00	1.0 D + 1.0 L (All Spans) [1]
Live Load Defl. (in)	0.124 @ 10' 5/8"	0.506	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans) [1]
Total Load Defl. (in)	0.201 @ 10'	1.013	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans) [1]

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - SPF	5.50"	5.50"	2.22"	1522	1781	603/-73	3906/-73	Blocking
2 - Stud wall - SPF	5.50"	5.50"	1.50"	573	980	91/-11	1644/-11	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' 11" o/c	
Bottom Edge (Lu)	20' 11" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 20' 11"	N/A	19.7	--	--	
1 - Uniform (PSF)	0 to 20' 11" (Front)	2'	12.0	40.0	-	Default Load
2 - Uniform (PSF)	0 to 3' (Front)	12'	15.0	-	-	EXT WALL
3 - Point (lb)	3' (Front)	N/A	641	1087/-637	694/-84	Linked from: TB-19, Support 1

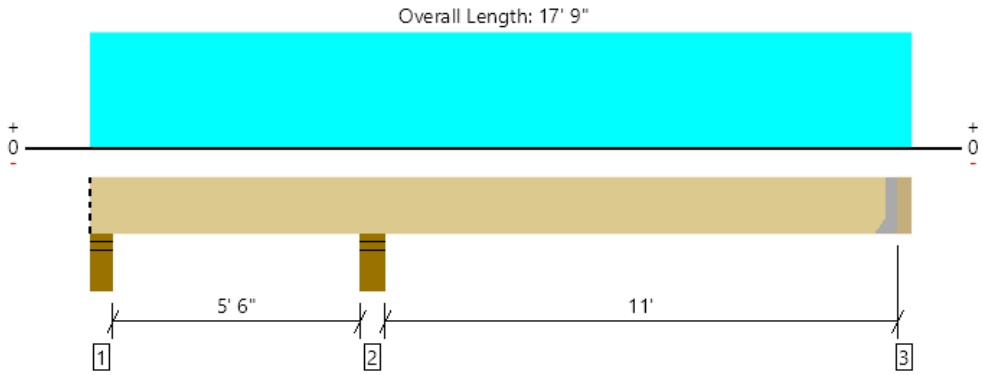
Weyerhaeuser Notes

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.

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

THIRD FLOOR, TB-19

1 piece(s) 5 1/4" x 18" 2.2E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	4741 @ 17' 5 1/2"	4922 (1.50")	Passed (96%)	--	1.0 D + 0.75 L + 0.75 S (Alt Spans)
Shear (lbs)	5060 @ 7' 11 1/2"	21011	Passed (24%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	-12185 @ 6' 2 1/2"	75322	Passed (16%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.029 @ 12' 3 1/2"	0.281	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (Alt Spans)
Total Load Defl. (in)	0.056 @ 12' 3 15/16"	0.563	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (Alt Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - SPF	5.50"	5.50"	1.50"	641	1087/-637	694/-84	2422/-721	Blocking
2 - Stud wall - SPF	6.00"	6.00"	5.35"	5965	4190	3783	13938	None
3 - Hanger on 18" PSL beam	3.50"	Hanger[1]	1.50"	2483	1797	1601	5881	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)	17' 6" o/c	
Bottom Edge (Lu)	17' 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
3 - Face Mount Hanger	HGUS5.50/14	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)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 17' 5 1/2"	N/A	29.5	--	--	
1 - Uniform (PSF)	0 to 17' 9" (Front)	9'	12.0	40.0	-	Default Load
2 - Uniform (PSF)	0 to 17' 9" (Front)	13'	15.0	-	25.0	ROOF
3 - Uniform (PSF)	0 to 17' 9" (Front)	12'	15.0	-	-	EXT WALL

Weyerhaeuser Notes

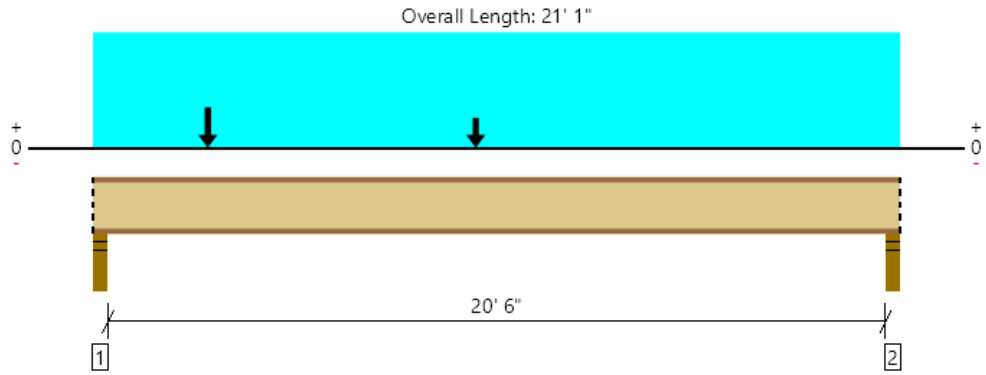
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional 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.

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

ForteWEB Software Operator	Job Notes
A P L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	

THIRD FLOOR, tj-1

1 piece(s) 18" TJI® 360 @ 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)	1520 @ 2 1/2"	1731 (3.50")	Passed (88%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	1504 @ 3 1/2"	2789	Passed (54%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	6932 @ 10'	10885	Passed (64%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.274 @ 10'	0.517	Passed (L/904)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.478 @ 10'	1.033	Passed (L/519)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
TJ-Pro™ Rating	51	40	Passed	--	--

System : Floor
Member Type : Joist
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

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

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - SPF	3.50"	3.50"	2.75"	664	562	579	1805	Blocking
2 - Stud wall - SPF	3.50"	3.50"	1.75"	366	562	221	1149	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' 5" o/c	
Bottom Edge (Lu)	21' 1" o/c	

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

Vertical Loads	Location	Spacing	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 21' 1"	16"	12.0	40.0	-	Default Load
2 - Point (PLF)	10'	16"	150.0	-	250.0	roof
3 - Point (PLF)	10'	16"	80.0	-	-	int wall
4 - Point (PLF)	3'	16"	210.0	-	350.0	roof
5 - Point (PLF)	3'	16"	80.0	-	-	int wall

Weyerhaeuser Notes

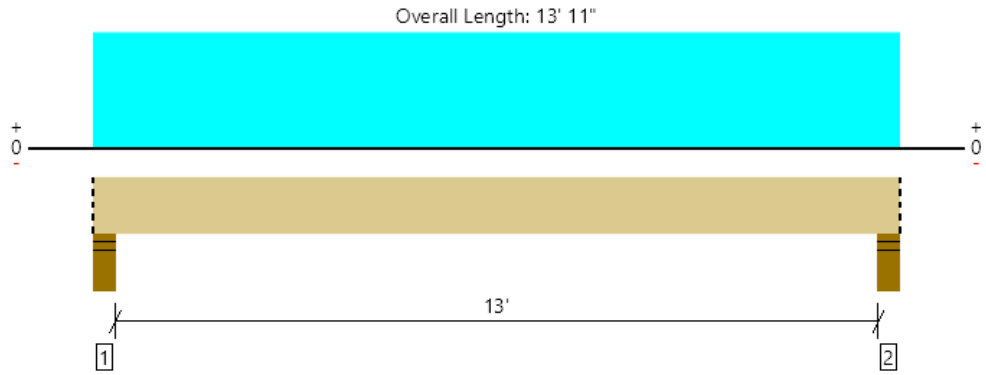
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional 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.

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

ForteWEB Software Operator	Job Notes
A P L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	

THIRD FLOOR, TB-20

1 piece(s) 3 1/2" x 18" 2.2E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1859 @ 4"	8181 (5.50")	Passed (23%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	1248 @ 1' 11 1/2"	12180	Passed (10%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	5479 @ 6' 11 1/2"	43665	Passed (13%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.022 @ 6' 11 1/2"	0.331	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.059 @ 6' 11 1/2"	0.663	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - SPF	5.50"	5.50"	1.50"	1181	557	348	2086	Blocking
2 - Stud wall - SPF	5.50"	5.50"	1.50"	1181	557	348	2086	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' 11" o/c	
Bottom Edge (Lu)	13' 11" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 13' 11"	N/A	19.7	--	--	
1 - Uniform (PSF)	0 to 13' 11" (Front)	2'	12.0	40.0	-	Default Load
2 - Uniform (PSF)	0 to 13' 11" (Front)	12'	8.0	-	-	INT WALL
3 - Uniform (PSF)	0 to 13' 11" (Front)	2'	15.0	-	25.0	ROOF

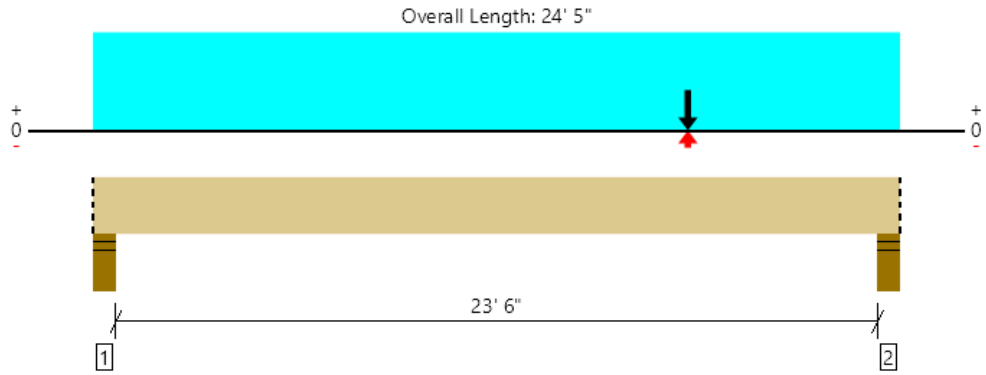
Weyerhaeuser Notes

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.

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

THIRD FLOOR, TB-21

1 piece(s) 7" x 18" 2.2E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern) [Group]
Member Reaction (lbs)	10233 @ 24' 1"	16363 (5.50")	Passed (63%)	--	1.0 D + 0.75 L + 0.75 S (All Spans) [1]
Shear (lbs)	8693 @ 22' 5 1/2"	24360	Passed (36%)	1.00	1.0 D + 1.0 L (All Spans) [1]
Moment (Ft-lbs)	56681 @ 12' 9"	87330	Passed (65%)	1.00	1.0 D + 1.0 L (All Spans) [1]
Live Load Defl. (in)	0.485 @ 12' 3 3/4"	0.594	Passed (L/587)	--	1.0 D + 0.75 L + 0.75 S (All Spans) [1]
Total Load Defl. (in)	0.831 @ 12' 3 3/4"	1.188	Passed (L/343)	--	1.0 D + 0.75 L + 0.75 S (All Spans) [1]

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Member should be side-loaded from both sides of the member or braced to prevent rotation.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - SPF	5.50"	5.50"	3.21"	3979	5397	2047	11423	Blocking
2 - Stud wall - SPF	5.50"	5.50"	3.44"	4258	5875	2091	12224	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' 5" o/c	
Bottom Edge (Lu)	24' 5" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 24' 5"	N/A	39.4	--	--	
1 - Uniform (PLF)	0 to 24' 5" (Front)	N/A	274.5	421.5	165.8	Linked from: tj-1, Support 2
2 - Point (lb)	18' (Front)	N/A	573	980	91/-11	Linked from: TB-18, Support 2

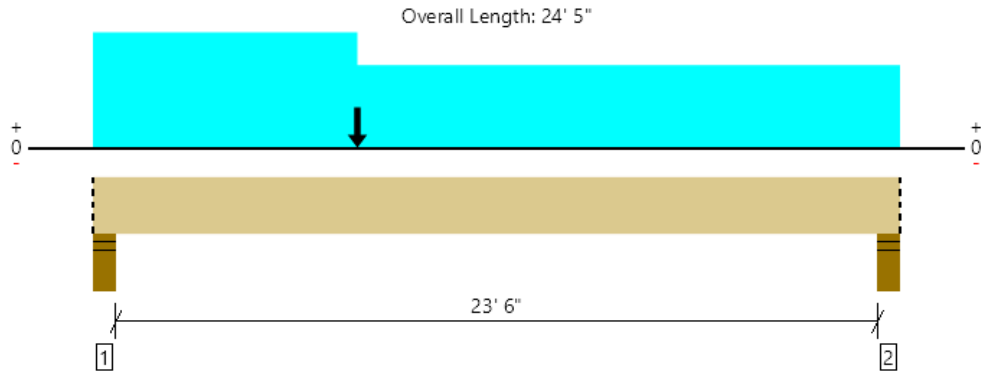
Weyerhaeuser Notes

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.

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

THIRD FLOOR, TB-22

1 piece(s) 7" x 18" 2.2E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	13342 @ 4"	16363 (5.50")	Passed (82%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	11147 @ 1' 11 1/2"	28014	Passed (40%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	70312 @ 11' 1/2"	100429	Passed (70%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.492 @ 11' 11 3/4"	0.594	Passed (L/580)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	1.015 @ 12'	1.188	Passed (L/281)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Member should be side-loaded from both sides of the member or braced to prevent rotation.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - SPF	5.50"	5.50"	4.48"	6610	3247	5729	15586	Blocking
2 - Stud wall - SPF	5.50"	5.50"	3.81"	5727	1503	5606	12836	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' 5" o/c	
Bottom Edge (Lu)	24' 5" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 24' 5"	N/A	39.4	--	--	
1 - Uniform (PSF)	0 to 24' 5" (Front)	2'	12.0	40.0	-	Default Load
2 - Uniform (PSF)	0 to 24' 5" (Front)	12'	8.0	-	-	INT WALL
3 - Uniform (PSF)	0 to 24' 5" (Front)	18'	15.0	-	25.0	ROOF
4 - Uniform (PSF)	0 to 8' (Front)	7'	12.0	40.0	-	Default Load
5 - Point (lb)	8' (Front)	N/A	1181	557	348	Linked from: TB-20, Support 1

Weyerhaeuser Notes

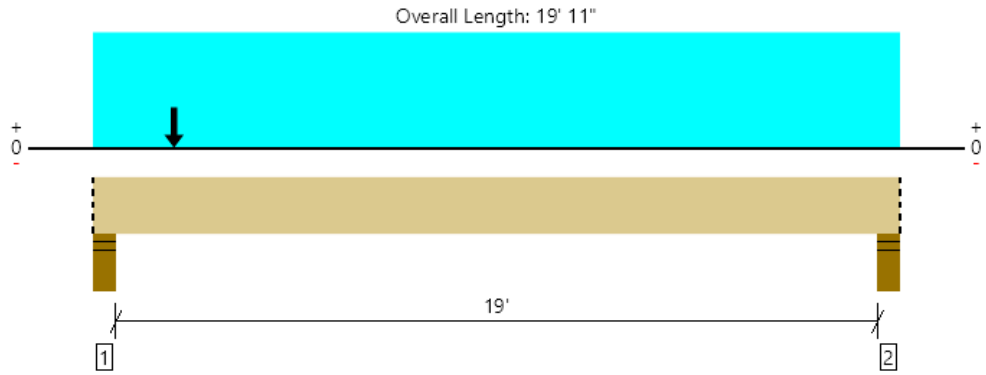
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional 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.

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

ForteWEB Software Operator	Job Notes
A P L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	

THIRD FLOOR, TB-23

1 piece(s) 3 1/2" x 14" 2.2E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	7333 @ 4"	8181 (5.50")	Passed (90%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	6886 @ 1' 7 1/2"	10894	Passed (63%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	15300 @ 8' 5 1/2"	27162	Passed (56%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.227 @ 9' 4 1/8"	0.481	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.709 @ 9' 7"	0.962	Passed (L/326)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - SPF	5.50"	5.50"	4.93"	4333	2040	1960	8333	Blocking
2 - Stud wall - SPF	5.50"	5.50"	2.13"	2279	554	637	3470	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	19' 11" o/c	
Bottom Edge (Lu)	19' 11" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 19' 11"	N/A	15.3	--	--	
1 - Uniform (PSF)	0 to 19' 11" (Front)	1'	12.0	40.0	-	FLOOR
2 - Uniform (PSF)	0 to 19' 11" (Front)	10'	15.0	-	-	EXT WALL
3 - Uniform (PSF)	0 to 19' 11" (Front)	2'	15.0	-	25.0	ROOF
4 - Point (lb)	2' (Front)	N/A	2483	1797	1601	Linked from: TB-19, Support 3

Weyerhaeuser Notes

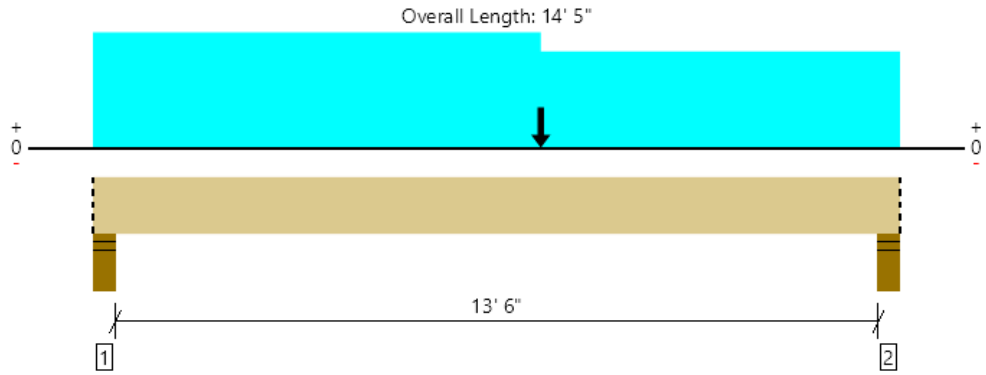
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional 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.

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

ForteWEB Software Operator	Job Notes
A P L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	

THIRD FLOOR, TB-24

1 piece(s) 3 1/2" x 18" 2.2E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	5618 @ 4"	8181 (5.50")	Passed (69%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	4311 @ 1' 11 1/2"	12180	Passed (35%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	21744 @ 8'	43665	Passed (50%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.085 @ 7' 2 7/16"	0.344	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.233 @ 7' 3 5/16"	0.688	Passed (L/707)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - SPF	5.50"	5.50"	3.78"	3263	2356	585	6204	Blocking
2 - Stud wall - SPF	5.50"	5.50"	3.74"	3626	1078	1496	6200	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	14' 5" o/c	
Bottom Edge (Lu)	14' 5" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 14' 5"	N/A	19.7	--	--	
1 - Uniform (PSF)	0 to 8' (Front)	9'	12.0	40.0	-	FLOOR
2 - Uniform (PSF)	0 to 14' 5" (Front)	12'	15.0	-	-	EXT WALL
3 - Uniform (PSF)	8' to 14' 5" (Front)	9'	15.0	-	25.0	ROOF
4 - Point (lb)	8' (Front)	N/A	2279	554	637	Linked from: TB-23, Support 2

Weyerhaeuser Notes

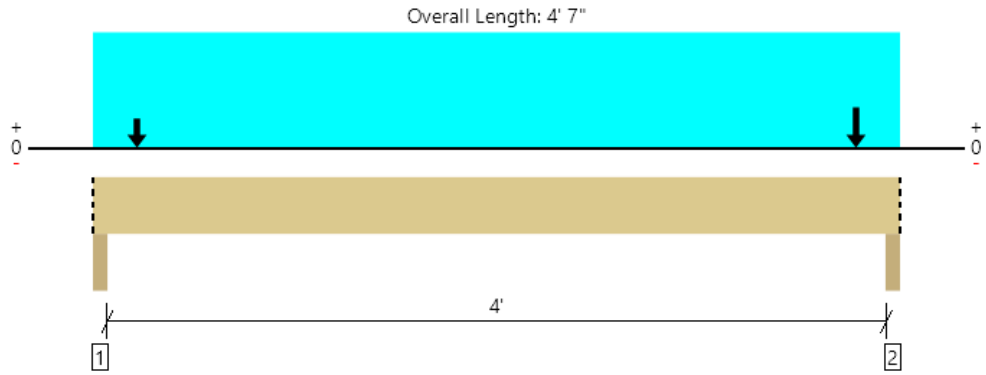
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional 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.

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

ForteWEB Software Operator	Job Notes
A P L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	

THIRD FLOOR, TB-25

1 piece(s) 7" x 18" 2.2E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	13625 @ 4' 5"	15313 (3.50")	Passed (89%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	72 @ 1' 9 1/2"	24360	Passed (0%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	324 @ 2' 3 1/2"	87330	Passed (0%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.000 @ 0	0.106	Passed (2L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.000 @ 2' 3 1/2"	0.213	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Member should be side-loaded from both sides of the member or braced to prevent rotation.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Column - SPF	3.50"	3.50"	2.25"	4124	5580	2047	11751	Blocking
2 - Column - SPF	3.50"	3.50"	3.11"	6755	3430	5729	15914	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' 7" o/c	
Bottom Edge (Lu)	4' 7" o/c	

•Maximum allowable bracing intervals based on applied load.

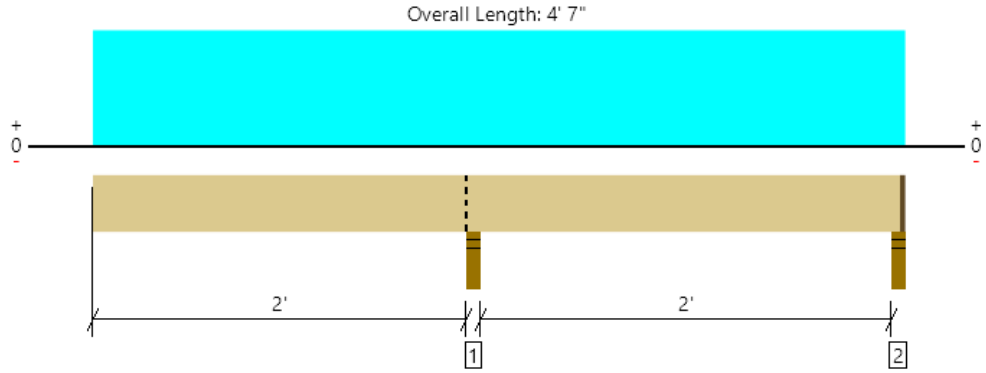
Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 4' 7"	N/A	39.4	--	--	
1 - Uniform (PSF)	0 to 4' 7" (Front)	2'	12.0	40.0	-	Default Load
2 - Point (lb)	4' 4" (Front)	N/A	6610	3247	5729	Linked from: TB-22, Support 1
3 - Point (lb)	3" (Front)	N/A	3979	5397	2047	Linked from: TB-21, 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.

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

THIRD FLOOR, TJ-low roof rafter
1 piece(s) 2 x 6 HF No.2 @ 24" OC



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	343 @ 2' 1 3/4"	2126 (3.50")	Passed (16%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	123 @ 2' 9"	949	Passed (13%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	-184 @ 2' 1 3/4"	921	Passed (20%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.019 @ 0	0.200	Passed (2L/999+)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.029 @ 0	0.215	Passed (2L/999+)	--	1.0 D + 1.0 S (Alt Spans)
TJ-Pro™ Rating	N/A	N/A	N/A	--	N/A

System : Floor
Member Type : Joist
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Overhang deflection criteria: LL (2L/0.2") and TL (2L/240).
- Left cantilever length exceeds 1/3 member length or 1/2 back span length. Additional bracing should be considered.
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A 15% increase in the moment capacity has been added to account for repetitive member usage.
- Applicable calculations are based on NDS.
- No composite action between deck and joist was considered in analysis.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Stud wall - SPF	3.50"	3.50"	1.50"	129	215	344	Blocking
2 - Stud wall - SPF	3.50"	2.25"	1.50"	9	40/-16	49/-16	1 1/4" Rim Board

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

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

•Maximum allowable bracing intervals based on applied load.

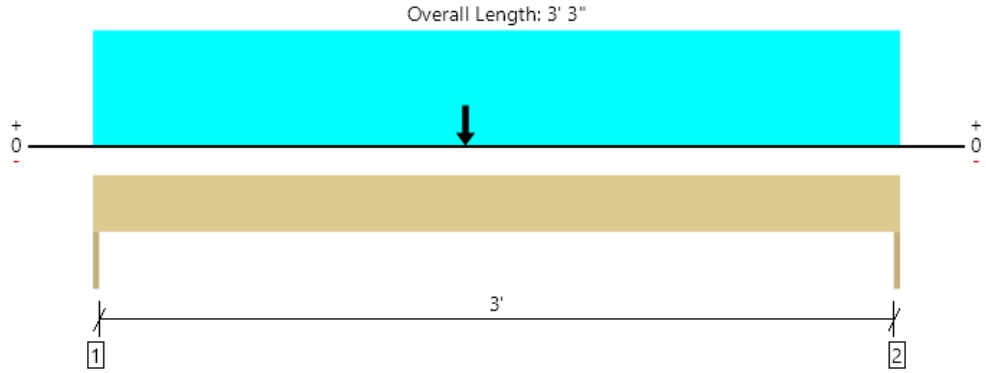
Vertical Load	Location (Side)	Spacing	Dead (0.90)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 4' 7"	24"	15.0	25.0	roof

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.

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

sh, SH-1
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)	2910 @ 0	3281 (1.50")	Passed (89%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	2451 @ 10 3/4"	4468	Passed (55%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	3788 @ 1' 6"	5166	Passed (73%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.008 @ 1' 7 7/16"	0.108	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.016 @ 1' 7 3/8"	0.162	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 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	Floor Live	Snow	Total	
1 - Trimmer - SPF	1.50"	1.50"	1.50"	1355	1283	790	3428	None
2 - Trimmer - SPF	1.50"	1.50"	1.50"	1197	1211	677	3085	None

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 3' 3"	N/A	8.2	--	--	
1 - Uniform (PSF)	0 to 3' 3"	12'	12.0	40.0	-	Default Load
2 - Point (lb)	1' 6"	N/A	960	337	736	Linked from: TB-8 (REACTION ONLY), Support 1
3 - Point (lb)	1' 6"	N/A	1097	597	731	Linked from: TB-9 (REACTION ONLY), Support 2

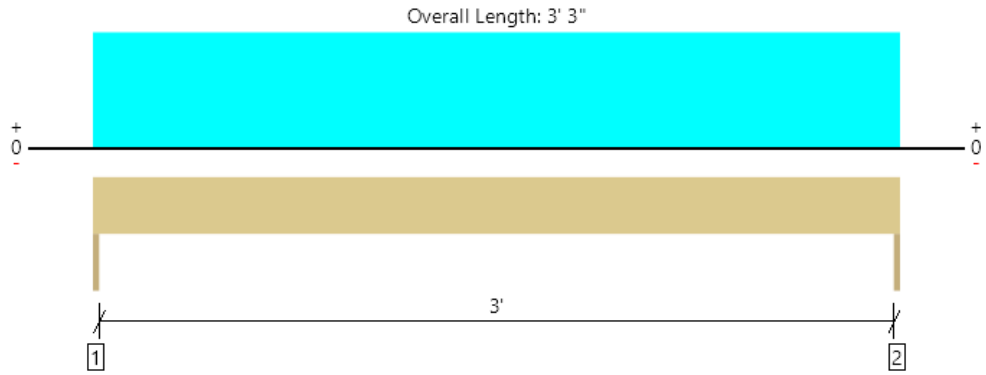
Weyerhaeuser Notes

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.

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

sh, SH-2

1 piece(s) 4 x 6 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)	1022 @ 0	3281 (1.50")	Passed (31%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	655 @ 7"	2310	Passed (28%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	830 @ 1' 7 1/2"	1720	Passed (48%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.016 @ 1' 7 1/2"	0.108	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.020 @ 1' 7 1/2"	0.162	Passed (L/999+)	--	1.0 D + 1.0 L (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	Floor Live	Total	
1 - Trimmer - SPF	1.50"	1.50"	1.50"	242	780	1022	None
2 - Trimmer - SPF	1.50"	1.50"	1.50"	242	780	1022	None

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 3' 3"	N/A	4.9	--	
1 - Uniform (PSF)	0 to 3' 3"	12'	12.0	40.0	Default Load

Weyerhaeuser Notes

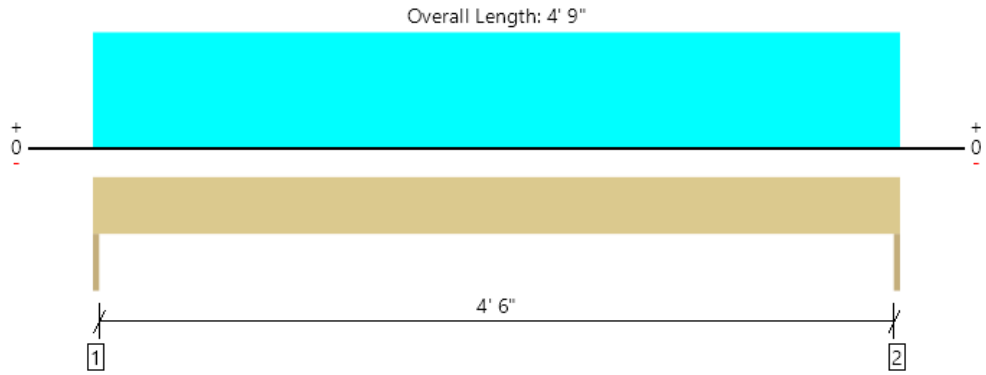
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional 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.

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

ForteWEB Software Operator	Job Notes
A P L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	

sh, SH-3

1 piece(s) 4 x 8 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)	1303 @ 0	3281 (1.50")	Passed (40%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	903 @ 8 3/4"	3502	Passed (26%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	1547 @ 2' 4 1/2"	3438	Passed (45%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.014 @ 2' 4 1/2"	0.158	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.035 @ 2' 4 1/2"	0.237	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 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	Floor Live	Snow	Total	
1 - Trimmer - SPF	1.50"	1.50"	1.50"	778	285	416	1479	None
2 - Trimmer - SPF	1.50"	1.50"	1.50"	778	285	416	1479	None

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 4' 9"	N/A	6.4	--	--	
1 - Uniform (PSF)	0 to 4' 9"	3'	12.0	40.0	-	Default Load
2 - Uniform (PSF)	0 to 4' 9"	7'	15.0	-	25.0	roof
3 - Uniform (PSF)	0 to 4' 9"	12'	15.0	-	-	wall

Weyerhaeuser Notes

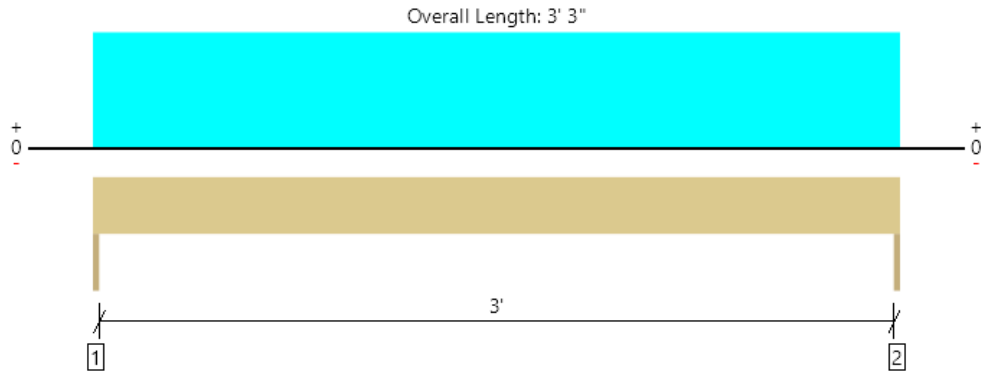
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional 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.

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

ForteWEB Software Operator	Job Notes
A P L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	

sh, SH-4

1 piece(s) 4 x 6 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)	1080 @ 0	3281 (1.50")	Passed (33%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	609 @ 7"	2310	Passed (26%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	772 @ 1' 7 1/2"	1720	Passed (45%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.012 @ 1' 7 1/2"	0.108	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.021 @ 1' 7 1/2"	0.162	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 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	Floor Live	Snow	Total	
1 - Trimmer - SPF	1.50"	1.50"	1.50"	495	455	325	1275	None
2 - Trimmer - SPF	1.50"	1.50"	1.50"	495	455	325	1275	None

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 3' 3"	N/A	4.9	--	--	
1 - Uniform (PSF)	0 to 3' 3"	7'	12.0	40.0	-	Default Load
2 - Uniform (PSF)	0 to 3' 3"	8'	15.0	-	25.0	roof
3 - Uniform (PSF)	0 to 3' 3"	12'	8.0	-	-	INT wall

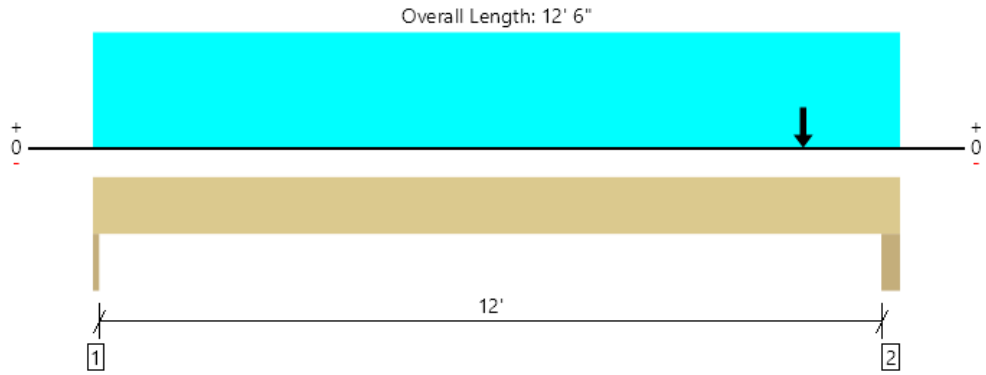
Weyerhaeuser Notes

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.

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

sh, SH-5

1 piece(s) 3 1/2" 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)	9843 @ 12' 3"	10238 (4.50")	Passed (96%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	8640 @ 10' 10 1/2"	9275	Passed (93%)	1.00	1.0 D + 1.0 L (All Spans)
Pos Moment (Ft-lbs)	12177 @ 11'	26250	Passed (46%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.090 @ 6' 9 1/16"	0.408	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.150 @ 6' 9 7/16"	0.613	Passed (L/982)	--	1.0 D + 1.0 L (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 = 12' 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	Floor Live	Snow	Total	
1 - Trimmer - SPF	1.50"	1.50"	1.50"	660	1089	213	1962	None
2 - Trimmer - SPF	4.50"	4.50"	4.33"	4058	5786	1878	11722	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	12' 6" o/c	
Bottom Edge (Lu)	12' 6" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 12' 6"	N/A	12.8	--	--	
1 - Uniform (PSF)	0 to 12' 6"	2'	12.0	40.0	-	Default Load
2 - Point (lb)	11'	N/A	4258	5875	2091	Linked from: TB-21, Support 2

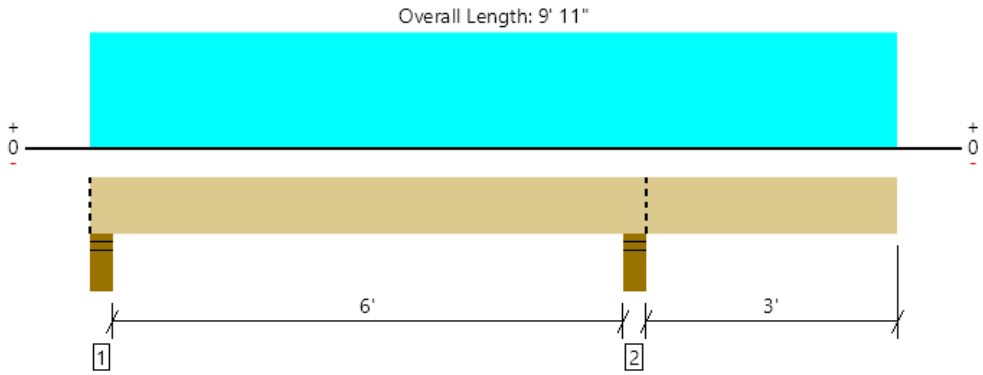
Weyerhaeuser Notes

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.

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

sh, SH-6

1 piece(s) 4 x 8 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)	2648 @ 6' 8 1/4"	8181 (5.50")	Passed (32%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1159 @ 5' 10 1/4"	3502	Passed (33%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	-1910 @ 6' 8 1/4"	3438	Passed (56%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.070 @ 9' 11"	0.200	Passed (2L/999+)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.090 @ 9' 11"	0.323	Passed (2L/860)	--	1.0 D + 1.0 S (Alt Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Overhang deflection criteria: LL (2L/0.2") and TL (2L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Stud wall - SPF	5.50"	5.50"	1.50"	380	698	1078	Blocking
2 - Stud wall - SPF	5.50"	5.50"	1.78"	1022	1626	2648	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	9' 11" o/c	
Bottom Edge (Lu)	9' 11" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 9' 11"	N/A	6.4	--	
1 - Uniform (PSF)	0 to 9' 11" (Front)	9'	15.0	25.0	ROOF

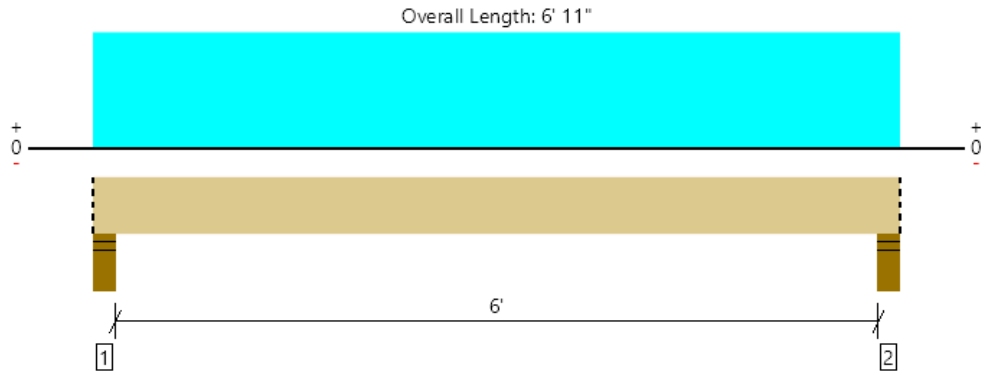
Weyerhaeuser Notes

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.

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

sh, SH-7

1 piece(s) 4 x 6 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)	570 @ 4"	8181 (5.50")	Passed (7%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	419 @ 11"	2657	Passed (16%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	805 @ 3' 5 1/2"	1979	Passed (41%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.044 @ 3' 5 1/2"	0.156	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.073 @ 3' 5 1/2"	0.313	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Stud wall - SPF	5.50"	5.50"	1.50"	224	346	570	Blocking
2 - Stud wall - SPF	5.50"	5.50"	1.50"	224	346	570	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 Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 6' 11"	N/A	4.9	--	
1 - Uniform (PSF)	0 to 6' 11" (Front)	4'	15.0	25.0	ROOF

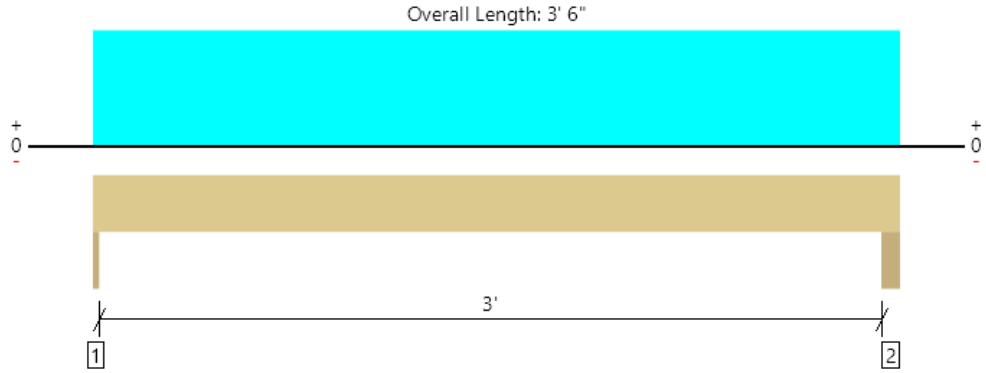
Weyerhaeuser Notes

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.

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

sh, SH-8

1 piece(s) 4 x 6 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)	1119 @ 0	3281 (1.50")	Passed (34%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	718 @ 7"	2657	Passed (27%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	910 @ 1' 7 1/2"	1979	Passed (46%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.010 @ 1' 7 1/2"	0.108	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.022 @ 1' 7 1/2"	0.162	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	Floor Live	Snow	Total	
1 - Trimmer - SPF	1.50"	1.50"	1.50"	632	130	488	1250	None
2 - Trimmer - SPF	4.50"	4.50"	1.50"	729	150	563	1442	None

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 3' 6"	N/A	4.9	--	--	
1 - Uniform (PSF)	0 to 3' 6"	2'	12.0	40.0	-	Default Load
2 - Uniform (PSF)	0 to 3' 6"	12'	15.0	-	-	EXT WALL
3 - Uniform (PSF)	0 to 3' 6"	12'	15.0	-	25.0	ROOF

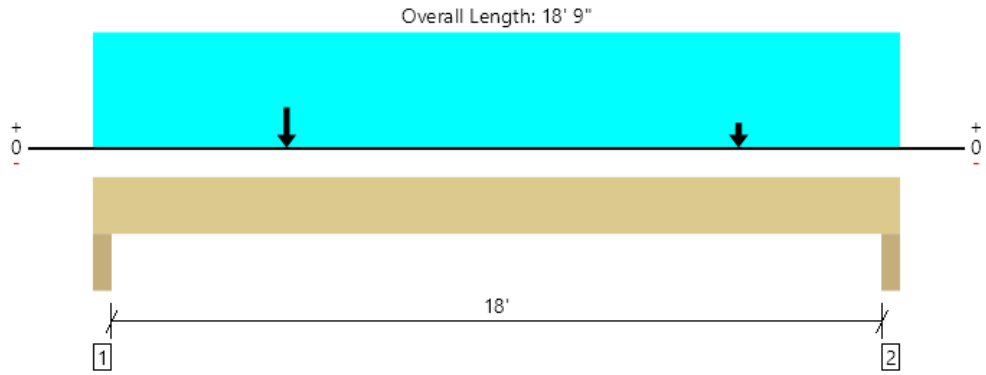
Weyerhaeuser Notes

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.

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

sh, SH-9

1 piece(s) 5 1/2" x 18" 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)	11941 @ 3"	16088 (4.50")	Passed (74%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	9371 @ 1' 10 1/2"	17490	Passed (54%)	1.00	1.0 D + 1.0 L (All Spans)
Pos Moment (Ft-lbs)	45812 @ 8' 9 11/16"	57439	Passed (80%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.315 @ 9' 2 5/8"	0.608	Passed (L/695)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.623 @ 9' 2 7/16"	0.913	Passed (L/351)	--	1.0 D + 0.75 L + 0.75 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 0.97 that was calculated using length L = 18' 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	Floor Live	Snow	Total	
1 - Trimmer - SPF	4.50"	4.50"	3.34"	5950	4989	2999	13938	None
2 - Trimmer - SPF	4.50"	4.50"	2.92"	5108	5075	2048	12231	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	18' 9" o/c	
Bottom Edge (Lu)	18' 9" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 18' 9"	N/A	24.1	--	--	
1 - Uniform (PSF)	0 to 18' 9"	11'	12.0	40.0	-	Default Load
2 - Uniform (PSF)	0 to 18' 9"	12'	15.0	-	-	EXT WALL
3 - Uniform (PSF)	0 to 18' 9"	4'	15.0	-	25.0	ROOF
4 - Point (lb)	4' 6"	N/A	2677	897	2526	Linked from: TB-6, Support 1
5 - Point (lb)	15'	N/A	955	917	646	Linked from: TB-5, Support 1

Weyerhaeuser Notes

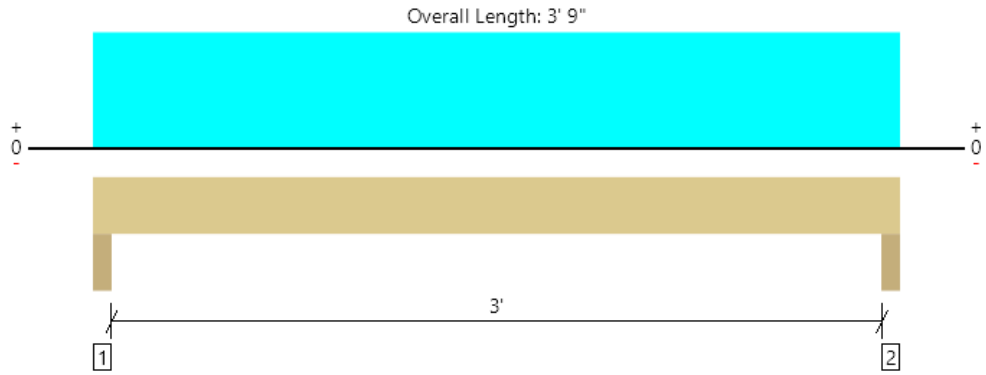
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional 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.

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

ForteWEB Software Operator	Job Notes
A P L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	

sh, SH-10

1 piece(s) 4 x 6 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)	440 @ 3"	9844 (4.50")	Passed (4%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	193 @ 10"	2079	Passed (9%)	0.90	1.0 D (All Spans)
Moment (Ft-lbs)	244 @ 1' 10 1/2"	1548	Passed (16%)	0.90	1.0 D (All Spans)
Live Load Defl. (in)	0.002 @ 1' 10 1/2"	0.108	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.008 @ 1' 10 1/2"	0.162	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	Snow	Total	
1 - Trimmer - SPF	4.50"	4.50"	1.50"	347	94	441	None
2 - Trimmer - SPF	4.50"	4.50"	1.50"	347	94	441	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	3' 9" o/c	
Bottom Edge (Lu)	3' 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 3' 9"	N/A	4.9	--	
1 - Uniform (PSF)	0 to 3' 9"	10'	15.0	-	EXT WALL
2 - Uniform (PSF)	0 to 3' 9"	2'	15.0	25.0	ROOF

Weyerhaeuser Notes

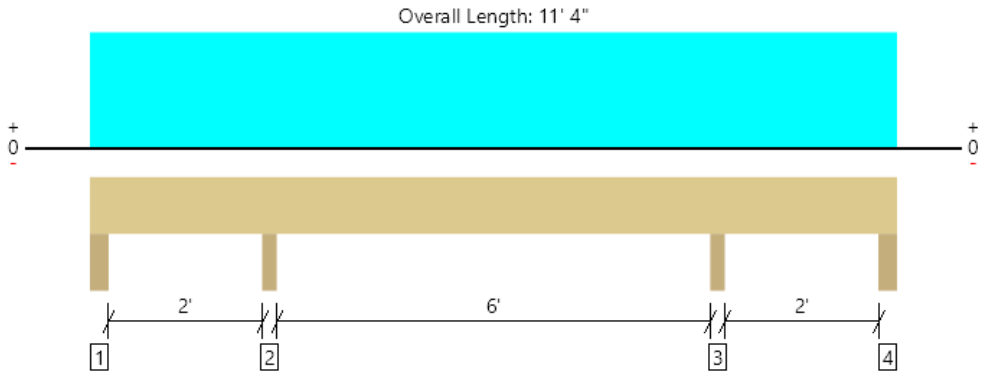
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional 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.

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

ForteWEB Software Operator	Job Notes
A P L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	

sh, SH-11

1 piece(s) 4 x 6 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)	939 @ 2' 6 1/4"	7656 (3.50")	Passed (12%)	--	1.0 D + 0.75 L + 0.75 S (Adj Spans)
Shear (lbs)	434 @ 3' 1 1/2"	2657	Passed (16%)	1.15	1.0 D + 0.75 L + 0.75 S (Adj Spans)
Moment (Ft-lbs)	-476 @ 2' 6 1/4"	1979	Passed (24%)	1.15	1.0 D + 0.75 L + 0.75 S (Adj Spans)
Live Load Defl. (in)	0.009 @ 5' 8"	0.210	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (Alt Spans)
Total Load Defl. (in)	0.026 @ 5' 8"	0.313	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (Alt Spans)

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

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

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Trimmer - SPF	4.50"	4.50"	1.50"	18	40/-35	37/-25	95/-60	None
2 - Trimmer - SPF	3.50"	3.50"	1.50"	605	167	277	1049	None
3 - Trimmer - SPF	3.50"	3.50"	1.50"	605	167	277	1049	None
4 - Trimmer - SPF	4.50"	4.50"	1.50"	18	40/-35	37/-25	95/-60	None

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 11' 4"	N/A	4.9	--	--	
1 - Uniform (PSF)	0 to 11' 4"	3'	10.0	10.0	-	CEILING
2 - Uniform (PSF)	0 to 11' 4"	3'	15.0	-	-	EXT WALL
3 - Uniform (PSF)	0 to 11' 4"	2'	15.0	-	25.0	ROOF

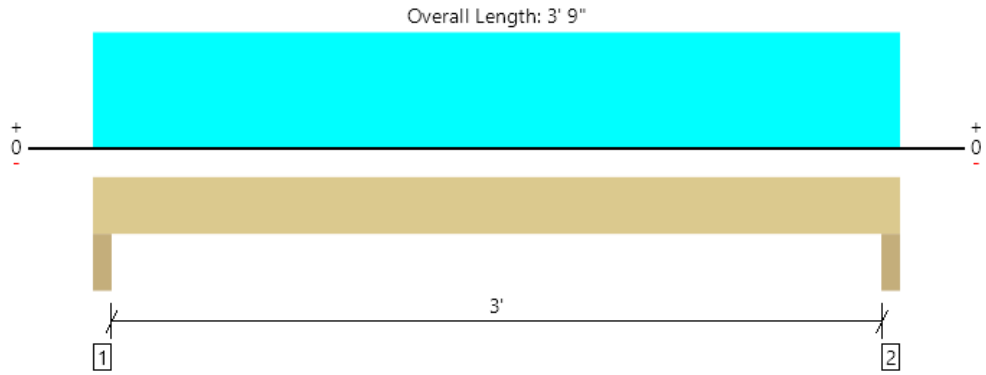
Weyerhaeuser Notes

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.

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

sh, SH-12

1 piece(s) 4 x 6 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)	497 @ 3"	9844 (4.50")	Passed (5%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	276 @ 10"	2310	Passed (12%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	350 @ 1' 10 1/2"	1720	Passed (20%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.006 @ 1' 10 1/2"	0.108	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.009 @ 1' 10 1/2"	0.162	Passed (L/999+)	--	1.0 D + 1.0 L (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	Floor Live	Total	
1 - Trimmer - SPF	4.50"	4.50"	1.50"	122	375	497	None
2 - Trimmer - SPF	4.50"	4.50"	1.50"	122	375	497	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	3' 9" o/c	
Bottom Edge (Lu)	3' 9" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 3' 9"	N/A	4.9	--	
1 - Uniform (PSF)	0 to 3' 9"	5'	12.0	40.0	FLOOR

Weyerhaeuser Notes

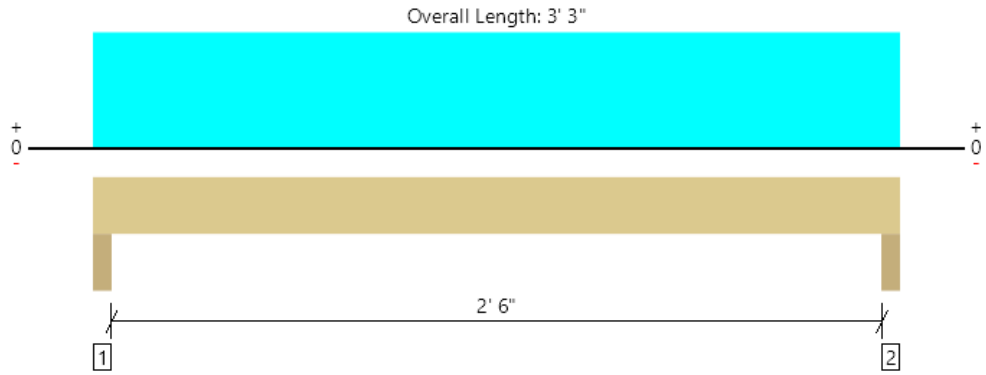
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional 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.

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

ForteWEB Software Operator	Job Notes
A P L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	

sh, SH-13

1 piece(s) 4 x 6 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)	203 @ 3"	9844 (4.50")	Passed (2%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	99 @ 10"	2657	Passed (4%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	118 @ 1' 7 1/2"	1979	Passed (6%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.001 @ 1' 7 1/2"	0.092	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.002 @ 1' 7 1/2"	0.138	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	Snow	Total	
1 - Trimmer - SPF	4.50"	4.50"	1.50"	81	122	203	None
2 - Trimmer - SPF	4.50"	4.50"	1.50"	81	122	203	None

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 3' 3"	N/A	4.9	--	
1 - Uniform (PSF)	0 to 3' 3"	3'	15.0	25.0	ROOF

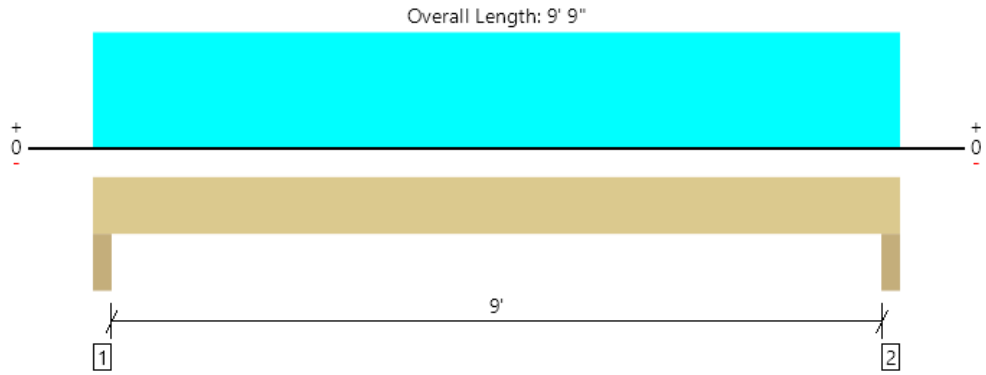
Weyerhaeuser Notes

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.

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

ForteWEB Software Operator	Job Notes
A P L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	

sh, SH-14
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)	625 @ 3"	9844 (4.50")	Passed (6%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	478 @ 1' 1 3/4"	4468	Passed (11%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	1371 @ 4' 10 1/2"	5166	Passed (27%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.033 @ 4' 10 1/2"	0.308	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.057 @ 4' 10 1/2"	0.463	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	Snow	Total	
1 - Trimmer - SPF	4.50"	4.50"	1.50"	259	366	625	None
2 - Trimmer - SPF	4.50"	4.50"	1.50"	259	366	625	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	9' 9" o/c	
Bottom Edge (Lu)	9' 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 9' 9"	N/A	8.2	--	
1 - Uniform (PSF)	0 to 9' 9"	3'	15.0	25.0	ROOF

Weyerhaeuser Notes

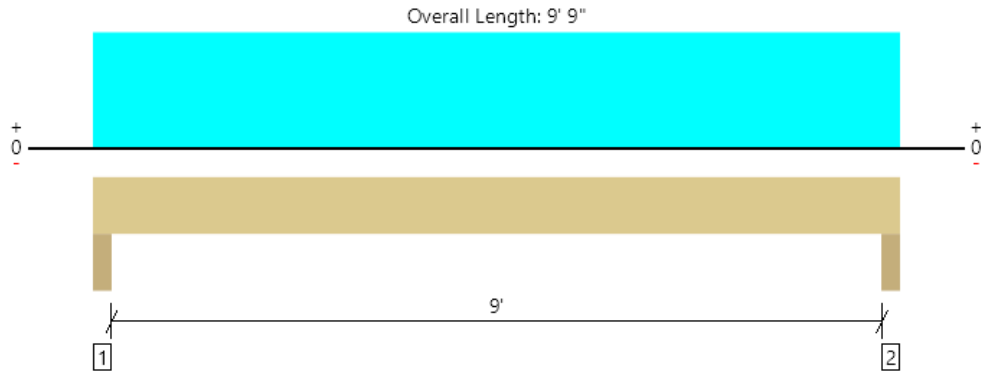
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional 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.

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

ForteWEB Software Operator	Job Notes
A P L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	

sh, SH-15

1 piece(s) 3 1/2" x 9" 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)	2543 @ 3"	10238 (4.50")	Passed (25%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	1956 @ 1' 1 1/2"	5565	Passed (35%)	1.00	1.0 D + 1.0 L (All Spans)
Pos Moment (Ft-lbs)	5579 @ 4' 10 1/2"	9450	Passed (59%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.121 @ 4' 10 1/2"	0.308	Passed (L/921)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.225 @ 4' 10 1/2"	0.463	Passed (L/494)	--	1.0 D + 1.0 L (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' 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	Floor Live	Total	
1 - Trimmer - SPF	4.50"	4.50"	1.50"	1178	1365	2543	None
2 - Trimmer - SPF	4.50"	4.50"	1.50"	1178	1365	2543	None

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 9' 9"	N/A	7.7	--	
1 - Uniform (PSF)	0 to 9' 9"	10'	15.0	-	EXT WALL
2 - Uniform (PSF)	0 to 9' 9"	7'	12.0	40.0	FLOOR

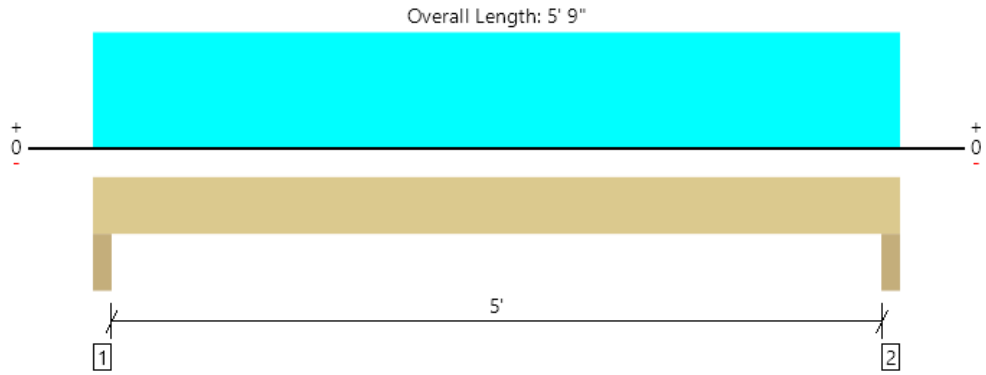
Weyerhaeuser Notes

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.

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

sh, SH-16

1 piece(s) 4 x 6 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)	445 @ 3"	9844 (4.50")	Passed (5%)	--	1.0 D (All Spans)
Shear (lbs)	316 @ 10"	2079	Passed (15%)	0.90	1.0 D (All Spans)
Moment (Ft-lbs)	534 @ 2' 10 1/2"	1548	Passed (34%)	0.90	1.0 D (All Spans)
Live Load Defl. (in)	0.000 @ 0	0.175	Passed (2L/999+)	--	1.0 D (All Spans)
Total Load Defl. (in)	0.034 @ 2' 10 1/2"	0.262	Passed (L/999+)	--	1.0 D (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	Total	
1 - Trimmer - SPF	4.50"	4.50"	1.50"	445	445	None
2 - Trimmer - SPF	4.50"	4.50"	1.50"	445	445	None

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Comments
0 - Self Weight (PLF)	0 to 5' 9"	N/A	4.9	
1 - Uniform (PSF)	0 to 5' 9"	10'	15.0	EXT WALL

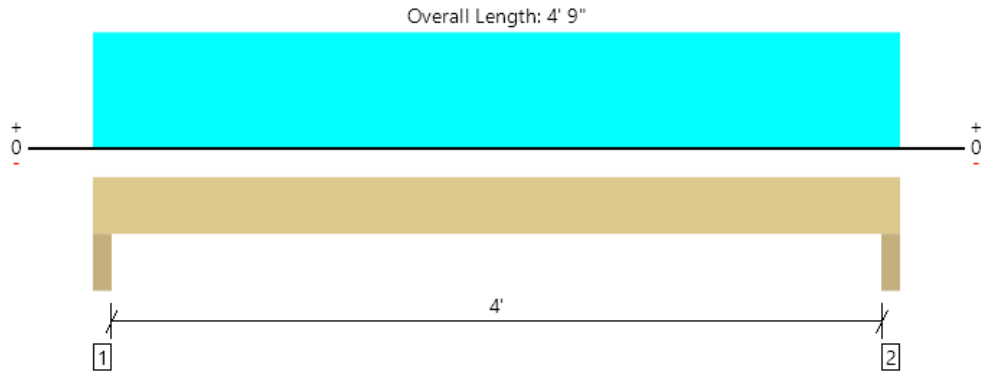
Weyerhaeuser Notes

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.

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

sh, SH-17

1 piece(s) 4 x 6 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)	297 @ 3"	9844 (4.50")	Passed (3%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	193 @ 10"	2657	Passed (7%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	282 @ 2' 4 1/2"	1979	Passed (14%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.007 @ 2' 4 1/2"	0.142	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.012 @ 2' 4 1/2"	0.213	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	Snow	Total	
1 - Trimmer - SPF	4.50"	4.50"	1.50"	118	178	296	None
2 - Trimmer - SPF	4.50"	4.50"	1.50"	118	178	296	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	4' 9" o/c	
Bottom Edge (Lu)	4' 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 4' 9"	N/A	4.9	--	
1 - Uniform (PSF)	0 to 4' 9"	3'	15.0	25.0	ROOF

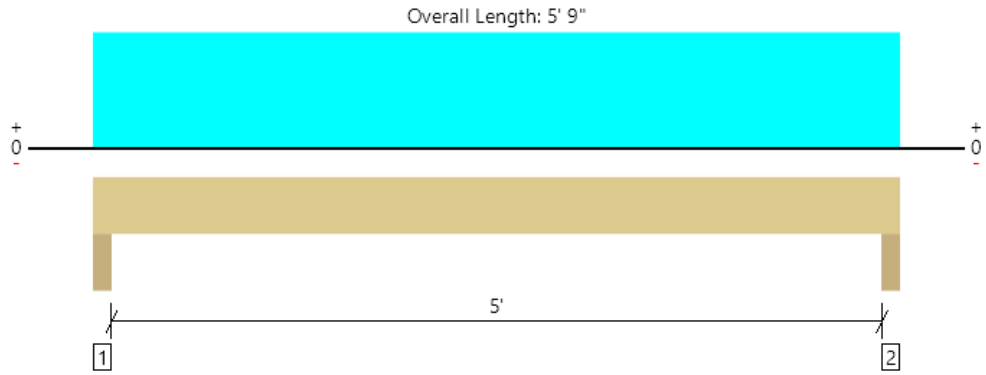
Weyerhaeuser Notes

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.

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

ForteWEB Software Operator	Job Notes
A P L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	

sh, SH-18
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)	3301 @ 3"	9844 (4.50")	Passed (34%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	1985 @ 1' 1 3/4"	4468	Passed (44%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	3955 @ 2' 10 1/2"	5166	Passed (77%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.030 @ 2' 10 1/2"	0.175	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.053 @ 2' 10 1/2"	0.262	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 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	Floor Live	Snow	Total	
1 - Trimmer - SPF	4.50"	4.50"	1.51"	1455	1212	1248	3915	None
2 - Trimmer - SPF	4.50"	4.50"	1.51"	1455	1212	1248	3915	None

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 5' 9"	N/A	8.2	--	--	
1 - Uniform (PLF)	0 to 5' 9"	N/A	498.0	421.5	434.3	Linked from: tj-1, Support 1

Weyerhaeuser Notes

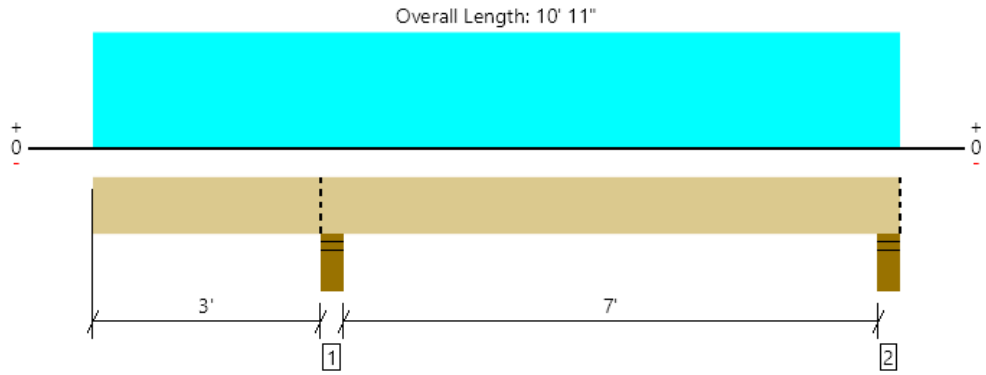
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional 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.

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

ForteWEB Software Operator	Job Notes
A P L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	

sh, SH-19

1 piece(s) 4 x 8 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)	2790 @ 3' 2 3/4"	8181 (5.50")	Passed (34%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1302 @ 4' 3/4"	3502	Passed (37%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	-1910 @ 3' 2 3/4"	3438	Passed (56%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.064 @ 7' 7/16"	0.184	Passed (L/999+)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.093 @ 7' 1 1/4"	0.368	Passed (L/953)	--	1.0 D + 1.0 S (Alt Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Overhang deflection criteria: LL (2L/480) and TL (2L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Stud wall - SPF	5.50"	5.50"	1.88"	1077	1713	2790	Blocking
2 - Stud wall - SPF	5.50"	5.50"	1.50"	467	823	1290	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)	10' 11" o/c	
Bottom Edge (Lu)	10' 11" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 10' 11"	N/A	6.4	--	
1 - Uniform (PSF)	0 to 10' 11" (Front)	9'	15.0	25.0	ROOF

Weyerhaeuser Notes

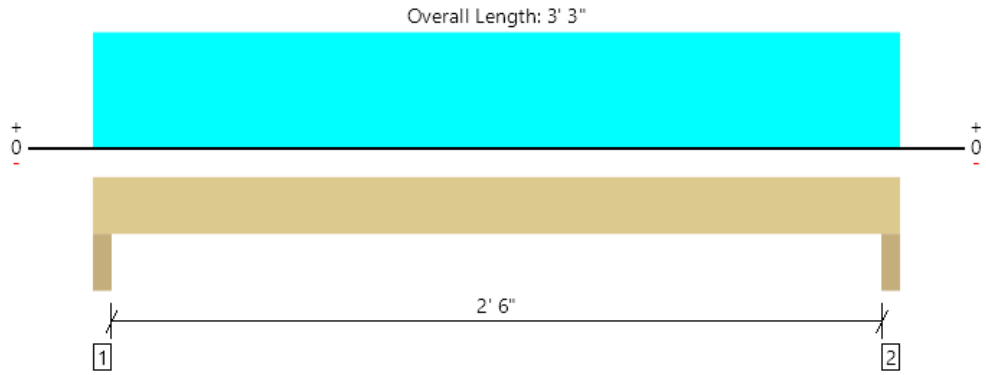
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional 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.

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

ForteWEB Software Operator	Job Notes
A P L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	

sh, SH-20

1 piece(s) 4 x 6 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)	1271 @ 3"	9844 (4.50")	Passed (13%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	619 @ 10"	2657	Passed (23%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	739 @ 1' 7 1/2"	1979	Passed (37%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.006 @ 1' 7 1/2"	0.092	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.013 @ 1' 7 1/2"	0.138	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 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	Floor Live	Snow	Total	
1 - Trimmer - SPF	4.50"	4.50"	1.50"	710	260	488	1458	None
2 - Trimmer - SPF	4.50"	4.50"	1.50"	710	260	488	1458	None

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 3' 3"	N/A	4.9	--	--	
1 - Uniform (PSF)	0 to 3' 3"	12'	15.0	-	25.0	ROOF
2 - Uniform (PSF)	0 to 3' 3"	12'	15.0	-	-	wall
3 - Uniform (PSF)	0 to 3' 3"	12'	5.0	10.0	-	ceiling
4 - Uniform (PSF)	0 to 3' 3"	1'	12.0	40.0	-	floor

Weyerhaeuser Notes

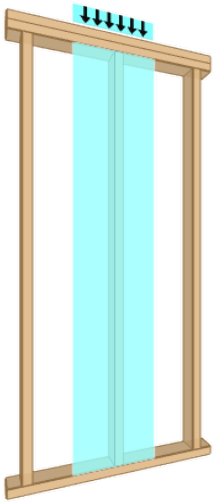
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional 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.

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

ForteWEB Software Operator	Job Notes
A P L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	

sh, baloon framed studs
1 piece(s) 2 x 6 DF No.2 @ 12" OC

Wall Height: 20' Member Height: 19' 7 1/2" O. C. Spacing: 12.00"



Drawing is Conceptual

Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	43	50	Passed (86%)	--	--
Compression (lbs)	420	2074	Passed (20%)	1.15	1.0 D + 1.0 S
Plate Bearing (lbs)	420	4177	Passed (10%)	--	1.0 D + 1.0 S
Lateral Reaction (lbs)	132	--	--	1.60	1.0 D + 0.6 W
Lateral Shear (lbs)	126	1584	Passed (8%)	1.60	1.0 D + 0.6 W
Lateral Moment (ft-lbs)	649 @ mid-span	1342	Passed (48%)	1.60	1.0 D + 0.6 W
Total Deflection (in)	0.96 @ mid-span	1.96	Passed (L/246)	--	1.0 D + 0.6 W
Bending/Compression	0.52	1	Passed (52%)	1.60	1.0 D + 0.6 W

- Lateral deflection criteria: Wind (L/120)
- Input axial load eccentricity for this design is 16.67% of applicable member side dimension.
- Applicable calculations are based on NDS.
- A bearing area factor of 1.25 has been applied to base plate bearing capacity.
- A 15% increase in the moment capacity has been added to account for repetitive member usage.

Supports	Type	Material
Top	Dbl 2X	Hem Fir
Base	2X	Hem Fir

System : Wall
Member Type : Stud
Building Code : IBC 2015
Design Methodology : ASD

Max Unbraced Length	Comments
1'	

Lateral Connections				
Supports	Connector	Type/Model	Quantity	Connector Nailing
Top	Nails	10d x 3" Box (End)	2	N/A
Base	Nails	10d x 3" Box (End)	2	N/A

- Nailed connection at the top of the member is assumed to be nailed through the bottom 2x plate prior to placement of the top 2x of the double top plate assembly.

Vertical Load	Spacing	Dead (0.90)	Snow (1.15)	Comments
1 - Point (PLF)	12.00"	120.0	300.0	roof

Lateral Load	Location	Spacing	Wind (1.60)	Comments
1 - Uniform (PSF)	Full Length	12.00"	22.5	

- ASCE/SEI 7 Sec. 30.4: Exposure Category (B), Mean Roof Height (33'), Topographic Factor (1.0), Wind Directionality Factor (0.85), Basic Wind Speed (115), Risk Category(II), Effective Wind Area determined using full member span and trib. width.
- IBC Table 1604.3, footnote f: Deflection checks are performed using 42% of this lateral wind load.

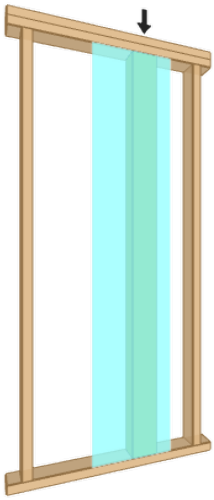
Weyerhaeuser Notes

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.

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

sh, 20' bundled studs
4 piece(s) 2 x 6 DF No.2

Wall Height: 20' Member Height: 19' 7 1/2" Tributary Width: 6'



Drawing is Conceptual

Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	43	50	Passed (86%)	--	--
Compression (lbs)	111	8295	Passed (1%)	1.15	1.0 D + 1.0 S
Plate Bearing (lbs)	111	14025	Passed (1%)	--	1.0 D + 1.0 S
Lateral Reaction (lbs)	794	--	--	1.60	1.0 D + 0.6 W
Lateral Shear (lbs)	756	6336	Passed (12%)	1.60	1.0 D + 0.6 W
Lateral Moment (ft-lbs)	3893 @ mid-span	4701	Passed (83%)	1.60	1.0 D + 0.6 W
Total Deflection (in)	1.42 @ mid-span	1.96	Passed (L/166)	--	1.0 D + 0.6 W
Bending/Compression	0.83	1	Passed (83%)	1.60	1.0 D + 0.6 W

- Lateral deflection criteria: Wind (L/120)
- Input axial load eccentricity for this design is 16.67% of applicable member side dimension.
- Applicable calculations are based on NDS.
- The column stability factor (Kf = 0.6) applied to this design assumes nailed built-up columns per NDS section 15.3.3. For Weyerhaeuser ELP products refer to the U.S. Wall Guide for multiple-member connection requirements.

Supports	Type	Material
Top	Dbl 2X	Spruce-Pine-Fir
Base	2X	Spruce-Pine-Fir

System : Wall
Member Type : Column
Building Code : IBC 2015
Design Methodology : ASD

Max Unbraced Length	Comments
8'	

Lateral Connections: Simpson Strong-Tie

Supports	Connector	Type/Model	Quantity	Connector Nailing
Top	Angle Connectors	A21	7	(4) - 10d x 1 1/2"
Base	Angle Connectors	A21	7	(4) - 10d x 1 1/2"

Vertical Load	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
1 - Point (lb)	N/A	36	75	roof

Lateral Load	Location	Tributary Width	Wind (1.60)	Comments
1 - Uniform (PSF)	Full Length	6'	22.5	

• ASCE/SEI 7 Sec. 30.4: Exposure Category (B), Mean Roof Height (33'), Topographic Factor (1.0), Wind Directionality Factor (0.85), Basic Wind Speed (115), Risk Category(II), Effective Wind Area determined using full member span and trib. width.
• IBC Table 1604.3, footnote f: Deflection checks are performed using 42% of this lateral wind load.

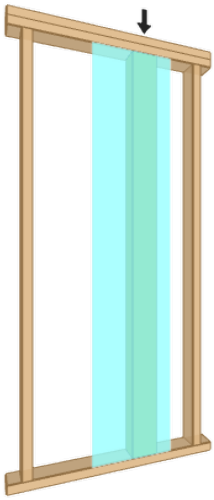
Weyerhaeuser Notes

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.

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

sh, 22'3" tall bundled studs
4 piece(s) 2 x 6 DF No.2

Wall Height: 22' 3" Member Height: 21' 10 1/2" Tributary Width: 6'



Drawing is Conceptual

Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	48	50	Passed (95%)	--	--
Compression (lbs)	111	6725	Passed (2%)	1.15	1.0 D + 1.0 S
Plate Bearing (lbs)	111	14025	Passed (1%)	--	1.0 D + 1.0 S
Lateral Reaction (lbs)	871	--	--	1.60	1.0 D + 0.6 W
Lateral Shear (lbs)	834	6336	Passed (13%)	1.60	1.0 D + 0.6 W
Lateral Moment (ft-lbs)	4763 @ mid-span	4701	Passed (101%)	1.60	1.0 D + 0.6 W
Total Deflection (in)	2.16 @ mid-span	2.19	Passed (L/122)	--	1.0 D + 0.6 W
Bending/Compression	1.02	1	Passed (102%)	1.60	1.0 D + 0.6 W

- Lateral deflection criteria: Wind (L/120)
- Input axial load eccentricity for this design is 16.67% of applicable member side dimension.
- Applicable calculations are based on NDS.
- The column stability factor (Kf = 0.6) applied to this design assumes nailed built-up columns per NDS section 15.3.3. For Weyerhaeuser ELP products refer to the U.S. Wall Guide for multiple-member connection requirements.

Supports	Type	Material
Top	Dbl 2X	Spruce-Pine-Fir
Base	2X	Spruce-Pine-Fir

System : Wall
Member Type : Column
Building Code : IBC 2015
Design Methodology : ASD

Max Unbraced Length	Comments
8'	

Lateral Connections: Simpson Strong-Tie				
Supports	Connector	Type/Model	Quantity	Connector Nailing
Top	Angle Connectors	A21	7	(4) - 10d x 1 1/2"
Base	Angle Connectors	A21	7	(4) - 10d x 1 1/2"

Vertical Load	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
1 - Point (lb)	N/A	36	75	roof

Lateral Load	Location	Tributary Width	Wind (1.60)	Comments
1 - Uniform (PSF)	Full Length	6'	22.1	

• ASCE/SEI 7 Sec. 30.4: Exposure Category (B), Mean Roof Height (33'), Topographic Factor (1.0), Wind Directionality Factor (0.85), Basic Wind Speed (115), Risk Category(II), Effective Wind Area determined using full member span and trib. width.
• IBC Table 1604.3, footnote f: Deflection checks are performed using 42% of this lateral wind load.

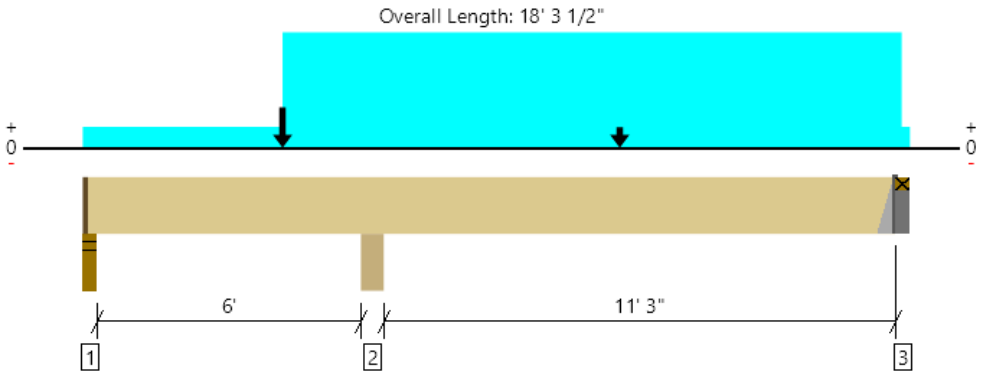
Weyerhaeuser Notes

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.

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

SB, SB-1

1 piece(s) 3 1/2" x 18" 2.2E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	11952 @ 6' 6 1/4"	12031 (5.50")	Passed (99%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	6953 @ 4' 9 1/2"	14007	Passed (50%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	-10654 @ 6' 6 1/4"	43665	Passed (24%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.048 @ 12' 8"	0.287	Passed (L/999+)	--	1.0 D + 1.0 L (Alt Spans)
Total Load Defl. (in)	0.061 @ 12' 9 13/16"	0.574	Passed (L/999+)	--	1.0 D + 1.0 L (Alt Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - SPF	3.50"	2.25"	1.50"	918	708/-858	710	2336/-858	1 1/4" Rim Board
2 - Column - SPF	5.50"	5.50"	5.46"	5466	6294	2354	14114	None
3 - Hanger on 3X HF plate	3.50"	Hanger[1]	1.50"	744	2399/-14	-80	3143/-94	See note [1]

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	17' 11" o/c	
Bottom Edge (Lu)	17' 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 - Top Mount Hanger	HWPH3.56/18	3.25"	4-16dx2.5	8-16dx2.5	12-10dx1.5	

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	1 1/4" to 18'	N/A	19.7	--	--	
1 - Uniform (PSF)	0 to 18' 3 1/2" (Front)	2'	12.0	40.0	-	Default Load
2 - Uniform (PSF)	4' 6" to 18' 1 1/2" (Front)	9'	12.0	40.0	-	Default Load
3 - Point (lb)	12' (Front)	N/A	460	597	129	Linked from: TB-9 (REACTION ONLY), Support 1
4 - Point (lb)	4' 6" (Front)	N/A	4405	1488	2864	Linked from: TB-14, Support 2

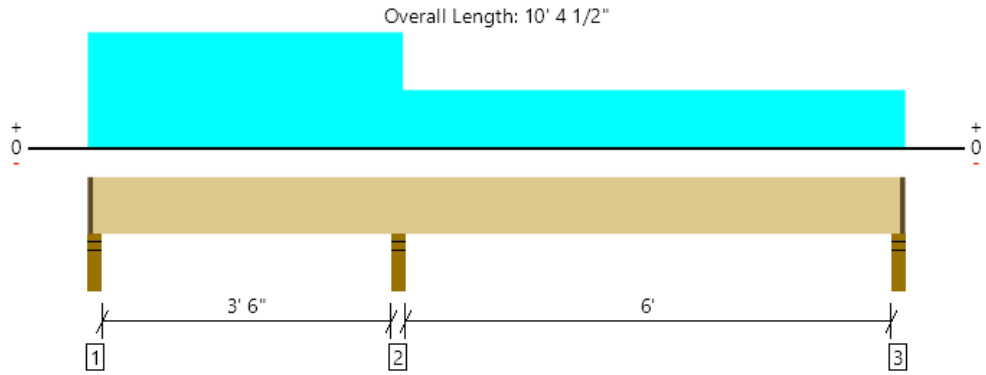
Weyerhaeuser Notes

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.

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

SB, SB-2 (REACTION ONLY)

1 piece(s) 3 1/2" x 18" 2.2E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1956 @ 3' 11 1/4"	5206 (3.50")	Passed (38%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	497 @ 5' 7"	12180	Passed (4%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	-990 @ 3' 11 1/4"	43665	Passed (2%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.002 @ 7' 3 3/4"	0.157	Passed (L/999+)	--	1.0 D + 1.0 L (Alt Spans)
Total Load Defl. (in)	0.003 @ 7' 4 3/16"	0.314	Passed (L/999+)	--	1.0 D + 1.0 L (Alt Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Total	
1 - Stud wall - SPF	3.50"	2.25"	1.50"	160	600/-97	760/-97	1 1/4" Rim Board
2 - Stud wall - SPF	3.50"	3.50"	1.50"	551	1404	1955	None
3 - Stud wall - SPF	3.50"	2.25"	1.50"	176	450/-17	626/-17	1 1/4" Rim Board

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

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	1 1/4" to 10' 3 1/4"	N/A	19.7	--	
1 - Uniform (PSF)	0 to 4' (Front)	4'	12.0	40.0	STAIR
2 - Uniform (PSF)	0 to 10' 4 1/2" (Front)	4'	12.0	40.0	Default Load

Weyerhaeuser Notes

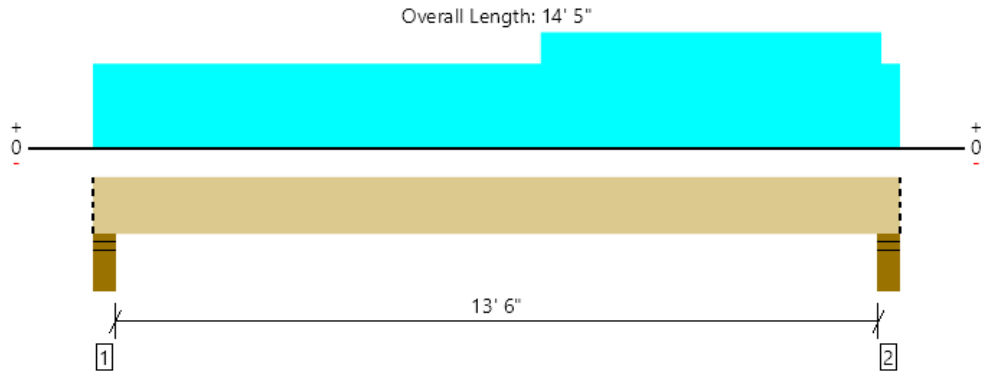
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional 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.

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

ForteWEB Software Operator	Job Notes
A P L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	

SB, SB-3

1 piece(s) 5 1/4" x 18" 2.2E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	7619 @ 14' 1"	12272 (5.50")	Passed (62%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	5450 @ 12' 5 1/2"	21011	Passed (26%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	23224 @ 7' 8"	75322	Passed (31%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.082 @ 7' 3 13/16"	0.344	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.167 @ 7' 3 7/16"	0.688	Passed (L/990)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - SPF	5.50"	5.50"	2.97"	3447	1530	2703	7680	Blocking
2 - Stud wall - SPF	5.50"	5.50"	3.41"	3732	2480	2703	8915	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	14' 5" o/c	
Bottom Edge (Lu)	14' 5" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 14' 5"	N/A	29.5	--	--	
1 - Uniform (PSF)	0 to 14' 5" (Front)	2'	12.0	40.0	-	Default Load
2 - Uniform (PSF)	0 to 14' 5" (Front)	2'	12.0	40.0	-	3RD FLOOR
3 - Uniform (PSF)	8' to 14' 1" (Front)	7'	12.0	40.0	-	3RD FLOOR
4 - Uniform (PSF)	0 to 14' 5" (Front)	15'	15.0	-	25.0	ROOF
5 - Uniform (PSF)	0 to 14' 5" (Front)	20'	8.0	-	-	INT WALL

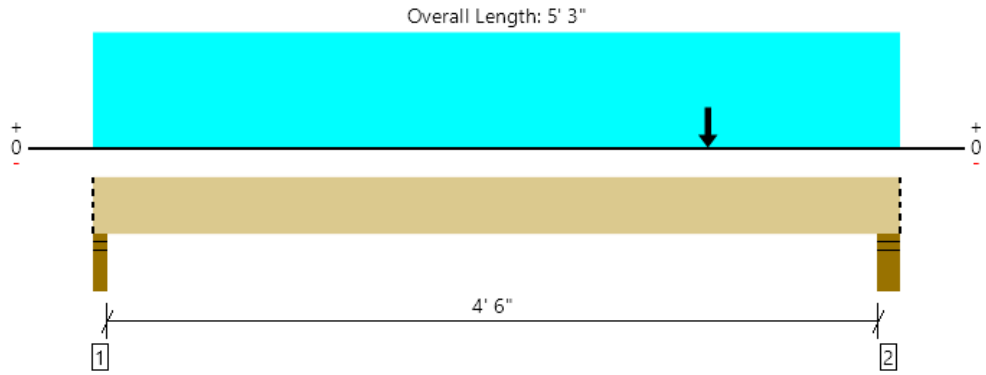
Weyerhaeuser Notes

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.

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

SB, SB-4

1 piece(s) 5 1/4" x 18" 2.2E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	11349 @ 4' 11"	12272 (5.50")	Passed (92%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	4571 @ 3' 3 1/2"	21011	Passed (22%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	10138 @ 4'	75322	Passed (13%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.007 @ 4'	0.119	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.015 @ 4'	0.237	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - SPF	3.50"	3.50"	1.53"	1638	1337	1021	3996	Blocking
2 - Stud wall - SPF	5.50"	5.50"	5.09"	5854	3056	4271	13181	Blocking

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

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 5' 3"	N/A	29.5	--	--	
1 - Uniform (PSF)	0 to 5' 3" (Front)	8'	12.0	40.0	-	Default Load
2 - Point (lb)	4' (Front)	N/A	3385	1183	2589	Linked from: TB-11, Support 2
3 - Point (lb)	4' (Front)	N/A	3447	1530	2703	Linked from: SB-3, Support 1

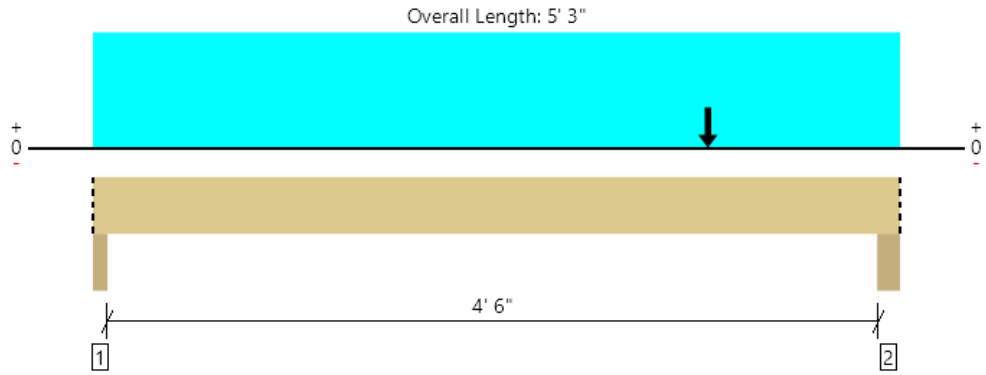
Weyerhaeuser Notes

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.

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

SB, SB-5

1 piece(s) 7" x 18" 2.2E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	18502 @ 4' 11"	24063 (5.50")	Passed (77%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	7488 @ 3' 3 1/2"	28014	Passed (27%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	16596 @ 4'	100429	Passed (17%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.010 @ 4'	0.119	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.018 @ 4'	0.237	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Member should be side-loaded from both sides of the member or braced to prevent rotation.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Column - SPF	3.50"	3.50"	1.50"	2459	2259	1627	6345	Blocking
2 - Column - SPF	5.50"	5.50"	4.23"	8927	5961	6805	21693	Blocking

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

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 5' 3"	N/A	39.4	--	--	
1 - Uniform (PSF)	0 to 5' 3" (Front)	11'	12.0	40.0	-	Default Load
2 - Point (lb)	4' (Front)	N/A	3732	2480	2703	Linked from: SB-3, Support 2
3 - Point (lb)	4' (Front)	N/A	6755	3430	5729	Linked from: TB-25, Support 2

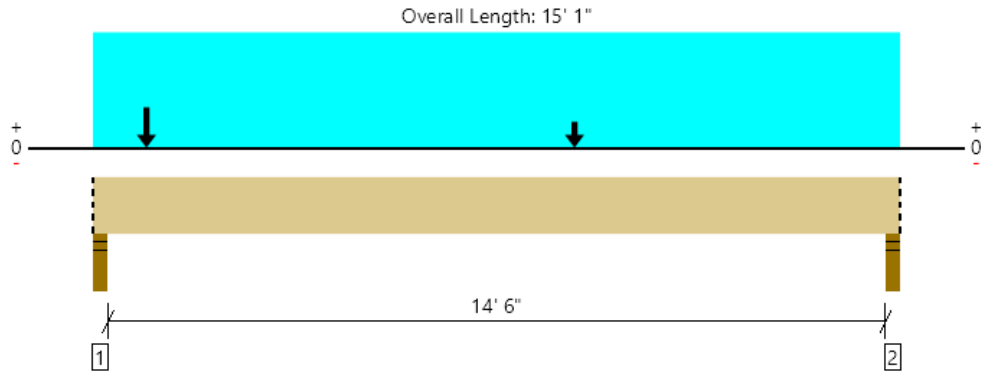
Weyerhaeuser Notes

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.

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

SB, SB-6

1 piece(s) 3 1/2" x 18" 2.2E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	5130 @ 2"	5206 (3.50")	Passed (99%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	2908 @ 1' 9 1/2"	14007	Passed (21%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	10252 @ 9'	50215	Passed (20%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.058 @ 7' 6 3/4"	0.369	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.117 @ 7' 6 7/8"	0.738	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - SPF	3.50"	3.50"	3.45"	2655	1620	1679	5954	Blocking
2 - Stud wall - SPF	3.50"	3.50"	1.50"	1021	858	524	2403	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)	15' 1" o/c	
Bottom Edge (Lu)	15' 1" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 15' 1"	N/A	19.7	--	--	
1 - Uniform (PSF)	0 to 15' 1" (Front)	2'	12.0	40.0	-	Default Load
2 - Point (lb)	9' (Front)	N/A	960	337	736	Linked from: TB-8 (REACTION ONLY), Support 2
3 - Point (lb)	1' (Front)	N/A	960	337	736	Linked from: TB-8 (REACTION ONLY), Support 1
4 - Point (lb)	1' (Front)	N/A	1097	597	731	Linked from: TB-9 (REACTION ONLY), Support 2

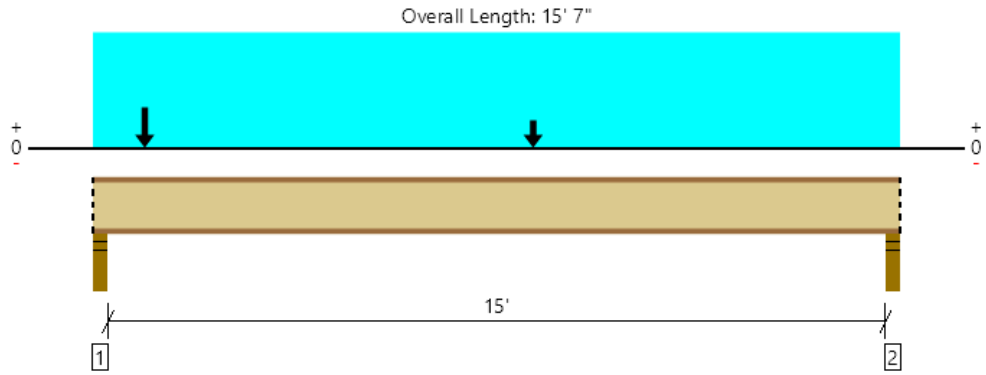
Weyerhaeuser Notes

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.

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

ForteWEB Software Operator	Job Notes
A P L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	

SB, SJ-1 (REACTION ONLY)
1 piece(s) 18" TJI® 360 @ 12" OC



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1175 @ 2 1/2"	1505 (3.50")	Passed (78%)	1.00	1.0 D + 1.0 L (All Spans)
Shear (lbs)	1160 @ 3 1/2"	2425	Passed (48%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	2993 @ 8' 6"	9465	Passed (32%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.090 @ 7' 9"	0.379	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.130 @ 7' 9 1/8"	0.758	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	64	40	Passed	--	--

System : Floor
Member Type : Joist
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Total	
1 - Stud wall - SPF	3.50"	3.50"	2.14"	356	819	1175	Blocking
2 - Stud wall - SPF	3.50"	3.50"	1.75"	181	444	625	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)	15' 7" o/c	

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

Vertical Loads	Location	Spacing	Dead (0.90)	Floor Live (1.00)	Comments
1 - Uniform (PSF)	0 to 15' 7"	12"	12.0	40.0	Default Load
2 - Point (PLF)	1'	12"	210.0	440.0	3RD FLOOR + INT WALL
3 - Point (PLF)	8' 6"	12"	140.0	200.0	3RD FLOOR + INT WALL

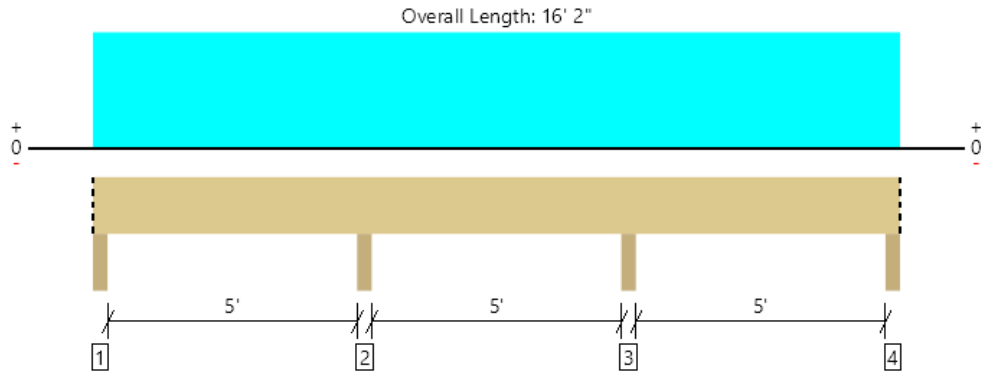
Weyerhaeuser Notes

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.

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

SB, SB-8

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)	4248 @ 5' 5 1/4"	7656 (3.50")	Passed (55%)	--	1.0 D + 1.0 L (Adj Spans)
Shear (lbs)	1584 @ 4' 6 1/4"	3885	Passed (41%)	1.00	1.0 D + 1.0 L (Adj Spans)
Moment (Ft-lbs)	-2148 @ 5' 5 1/4"	4492	Passed (48%)	1.00	1.0 D + 1.0 L (Adj Spans)
Live Load Defl. (in)	0.019 @ 2' 8 1/4"	0.132	Passed (L/999+)	--	1.0 D + 1.0 L (Alt Spans)
Total Load Defl. (in)	0.023 @ 2' 7 13/16"	0.264	Passed (L/999+)	--	1.0 D + 1.0 L (Alt Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Total	
1 - Column - SPF	3.50"	3.50"	1.50"	373	1320/-138	1693/-138	Blocking
2 - Column - SPF	3.50"	3.50"	1.94"	954	3294	4248	None
3 - Column - SPF	3.50"	3.50"	1.94"	954	3294	4248	None
4 - Column - SPF	3.50"	3.50"	1.50"	373	1320/-138	1693/-138	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' 2" o/c	
Bottom Edge (Lu)	16' 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 16' 2"	N/A	8.2	--	
1 - Uniform (PSF)	0 to 16' 2" (Front)	13'	12.0	40.0	Default Load

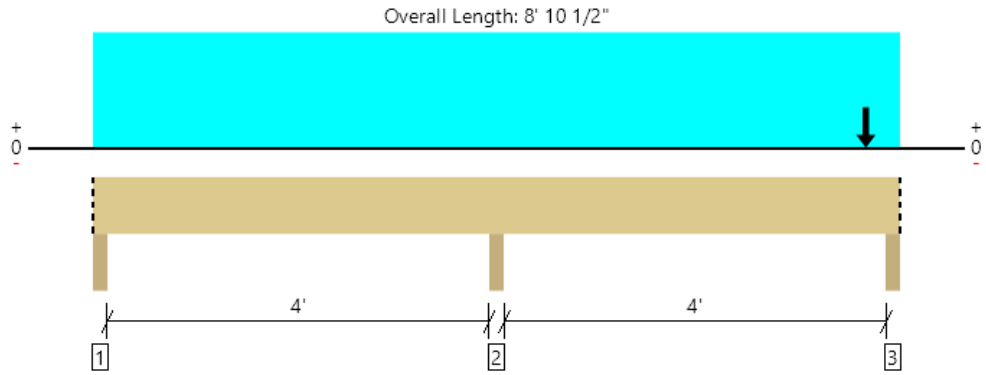
Weyerhaeuser Notes

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.

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

SB, SB-9

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)	7629 @ 4' 5 1/4"	7656 (3.50")	Passed (100%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	2334 @ 5' 4 1/4"	3885	Passed (60%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	-2964 @ 4' 5 1/4"	4492	Passed (66%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.012 @ 6' 8 1/2"	0.107	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (Alt Spans)
Total Load Defl. (in)	0.017 @ 6' 9 1/16"	0.214	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (Alt Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Column - SPF	3.50"	3.50"	1.50"	1016	1346/-202	826	3188/-202	Blocking
2 - Column - SPF	3.50"	3.50"	3.49"	3126	3686	2318	9130	None
3 - Column - SPF	3.50"	3.50"	2.22"	1524	3330/-177	826	5680/-177	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' 11" o/c	
Bottom Edge (Lu)	8' 11" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 8' 10 1/2"	N/A	8.2	--	--	
1 - Uniform (PSF)	0 to 8' 10 1/2" (Front)	6'	12.0	40.0	-	Default Load
2 - Point (lb)	8' 6" (Front)	N/A	534	2112	-	Linked from: TB-3, Support 3
3 - Uniform (PLF)	0 to 8' 10 1/2" (Front)	N/A	498.0	421.5	434.3	Linked from: tj-1, Support 1

Weyerhaeuser Notes

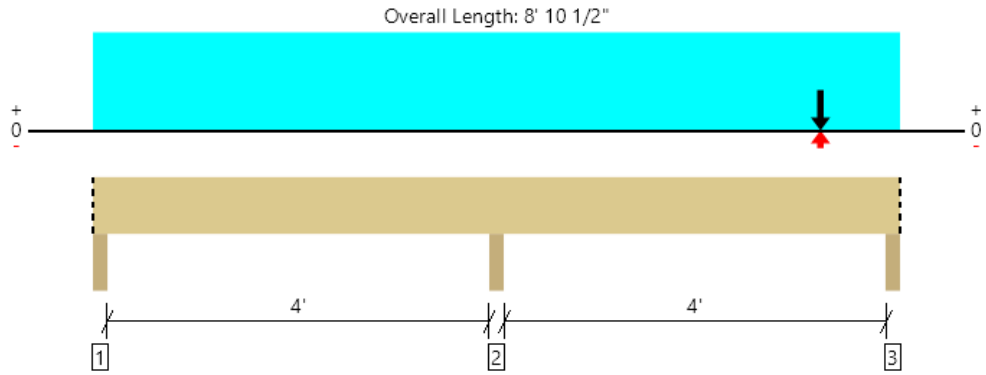
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional 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.

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

ForteWEB Software Operator	Job Notes
A P L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	

SB, SB-10

1 piece(s) 6 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) [Group]
Member Reaction (lbs)	9083 @ 4' 5 1/4"	12031 (3.50")	Passed (75%)	--	1.0 D + 0.75 L + 0.75 S (All Spans) [1]
Shear (lbs)	4317 @ 7' 9 1/2"	5922	Passed (73%)	1.00	1.0 D + 1.0 L (Alt Spans) [1]
Moment (Ft-lbs)	4708 @ 7' 11 7/8"	6032	Passed (78%)	1.00	1.0 D + 1.0 L (Alt Spans) [1]
Live Load Defl. (in)	0.014 @ 6' 10 1/4"	0.107	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (Alt Spans) [1]
Total Load Defl. (in)	0.025 @ 6' 10 13/16"	0.214	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (Alt Spans) [1]

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Lumber grading provisions must be extended over the length of the member per NDS 4.2.5.5.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Column - SPF	3.50"	3.50"	1.50"	902	1346/-297	813	3061/-297	Blocking
2 - Column - SPF	3.50"	3.50"	2.64"	3905	4267	2637	10809	None
3 - Column - SPF	3.50"	3.50"	2.26"	3580	3715/-177	1853	9148/-177	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' 11" o/c	
Bottom Edge (Lu)	8' 11" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 8' 10 1/2"	N/A	13.2	--	--	
1 - Uniform (PSF)	0 to 8' 10 1/2" (Front)	6'	12.0	40.0	-	Default Load
2 - Point (lb)	8' (Front)	N/A	1689	1203	691	Linked from: TB-10, Support 3
3 - Uniform (PLF)	0 to 8' 10 1/2" (Front)	N/A	498.0	421.5	434.3	Linked from: tj-1, Support 1
4 - Point (lb)	8' (Front)	N/A	1522	1781	603/-73	Linked from: TB-18, Support 1

Weyerhaeuser Notes

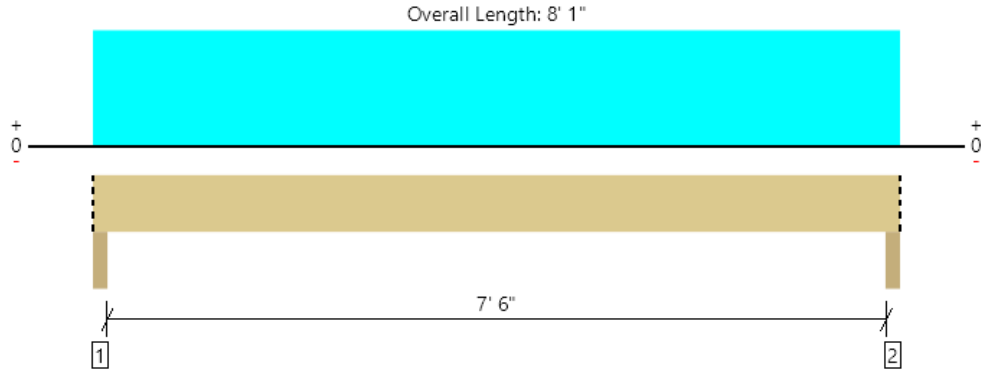
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional 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.

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

ForteWEB Software Operator	Job Notes
A P L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	

SB, SB-11

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)	1714 @ 2"	7656 (3.50")	Passed (22%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	1264 @ 1' 3/4"	3885	Passed (33%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	3185 @ 4' 1/2"	4492	Passed (71%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.070 @ 4' 1/2"	0.194	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.093 @ 4' 1/2"	0.387	Passed (L/998)	--	1.0 D + 1.0 L (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Total	
1 - Column - SPF	3.50"	3.50"	1.50"	421	1293	1714	Blocking
2 - Column - SPF	3.50"	3.50"	1.50"	421	1293	1714	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 Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 8' 1"	N/A	8.2	--	
1 - Uniform (PSF)	0 to 8' 1" (Front)	8'	12.0	40.0	Default Load

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.

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

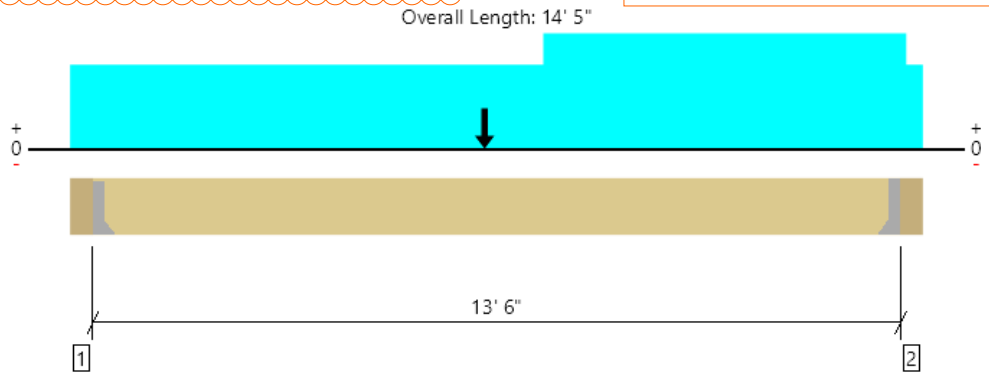
SB, SB-3 (OVERSTRENGTH)

1 piece(s) 5 1/4" x 18" 2.2E Paralla

NOT APPLICABLE FOR THIS CALCULATION. PLEASE SEE NEXT CALC FOR UPLIFT CALCULATION

An excessive uplift of -3220 lbs at support located at 5 1/2" failed this product.

An excessive uplift of -2730 lbs at support located at 13' 11 1/2" failed this product.



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)	10918 @ 13' 11 1/2"	10918 (3.33")	Passed (100%)	--	1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	9181 @ 12' 5 1/2"	29232	Passed (31%)	1.60	1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	48086 @ 7'	104796	Passed (46%)	1.60	1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.226 @ 7'	0.338	Passed (L/715)	--	1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.305 @ 7'	0.675	Passed (L/531)	--	1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)					Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Seismic	Total	
1 - Hanger on 18" PSL beam	5.50"	Hanger[1]	3.10"	3431	1521	2703	7541/-7541	15196/-7541	See note [1]
2 - Hanger on 18" PSL beam	5.50"	Hanger[1]	3.33"	3721	2489	2703	7089/-7089	16002/-7089	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' 6" o/c	
Bottom Edge (Lu)	13' 6" o/c	

•Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-Tie						
Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
1 - Face Mount Hanger	HGUS5.50/14	4.00"	N/A	66-10d	22-10d	
2 - Face Mount Hanger	HGUS5.50/14	4.00"	N/A	66-10d	22-10d	

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

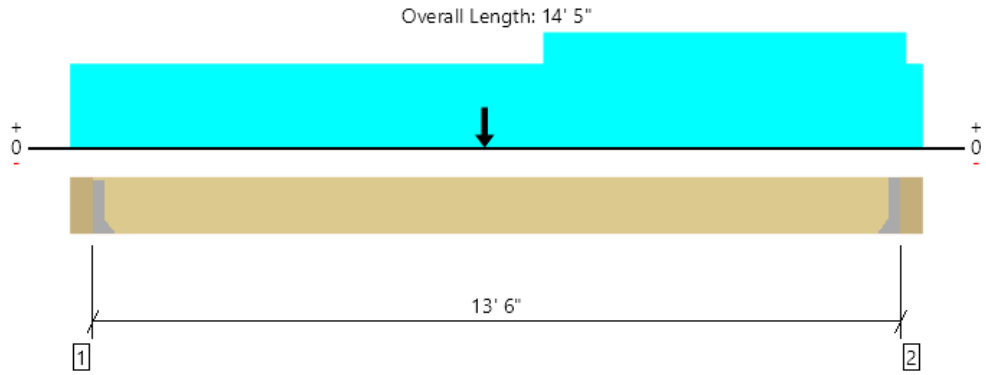
Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Seismic (1.60)	Comments
0 - Self Weight (PLF)	5 1/2" to 13' 11 1/2"	N/A	29.5	--	--	--	
1 - Uniform (PSF)	0 to 14' 5" (Front)	2'	12.0	40.0	-	-	Default Load
2 - Uniform (PSF)	0 to 14' 5" (Front)	2'	12.0	40.0	-	-	3RD FLOOR
3 - Uniform (PSF)	8' to 14' 1" (Front)	7'	12.0	40.0	-	-	3RD FLOOR
4 - Uniform (PSF)	0 to 14' 5" (Front)	15'	15.0	-	25.0	-	ROOF
5 - Uniform (PSF)	0 to 14' 5" (Front)	20'	8.0	-	-	-	INT WALL
6 - Point (lb)	7' (Front)	N/A	-	-	-	14630	HOLDOWN WITH OVERSTRENGTH (DOWN)

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.

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

SB, SB-3 (OVERSTRENGTH UPLIFT)
1 piece(s) 5 1/4" x 18" 2.2E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	7881 @ 5 1/2"	7881 (2.40")	Passed (100%)	--	1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	5459 @ 12' 5 1/2"	21011	Passed (26%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	33075 @ 7'	104796	Passed (32%)	1.60	1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.140 @ 7'	0.338	Passed (L/999+)	--	1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.218 @ 7'	0.675	Passed (L/743)	--	1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)					Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Seismic	Total	
1 - Hanger on 18" PSL beam	5.50"	Hanger[1]	2.40"	3431	1521	2703	3170/-3170	10825/-3170	See note [1]
2 - Hanger on 18" PSL beam	5.50"	Hanger[1]	2.67"	3721	2489	2703	2980/-2980	11893/-2980	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' 6" o/c	
Bottom Edge (Lu)	13' 6" o/c	

•Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-Tie						
Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
1 - Face Mount Hanger	HGUS5.50/14	4.00"	N/A	66-10d	22-10d	
2 - Face Mount Hanger	HGUS5.50/14	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)	Floor Live (1.00)	Snow (1.15)	Seismic (1.60)	Comments
0 - Self Weight (PLF)	5 1/2" to 13' 11 1/2"	N/A	29.5	--	--	--	
1 - Uniform (PSF)	0 to 14' 5" (Front)	2'	12.0	40.0	-	-	Default Load
2 - Uniform (PSF)	0 to 14' 5" (Front)	2'	12.0	40.0	-	-	3RD FLOOR
3 - Uniform (PSF)	8' to 14' 1" (Front)	7'	12.0	40.0	-	-	3RD FLOOR
4 - Uniform (PSF)	0 to 14' 5" (Front)	15'	15.0	-	25.0	-	ROOF
5 - Uniform (PSF)	0 to 14' 5" (Front)	20'	8.0	-	-	-	INT WALL
6 - Point (lb)	7' (Front)	N/A	-	-	-	6150	HOLDOWN WITH OVERSTRENGTH (UP LIMITED TO CAPACITY OF HOLDOWNS, NO OVERSTRENGTH)

ForteWEB Software Operator	Job Notes
A P L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	

Weyerhaeuser Notes

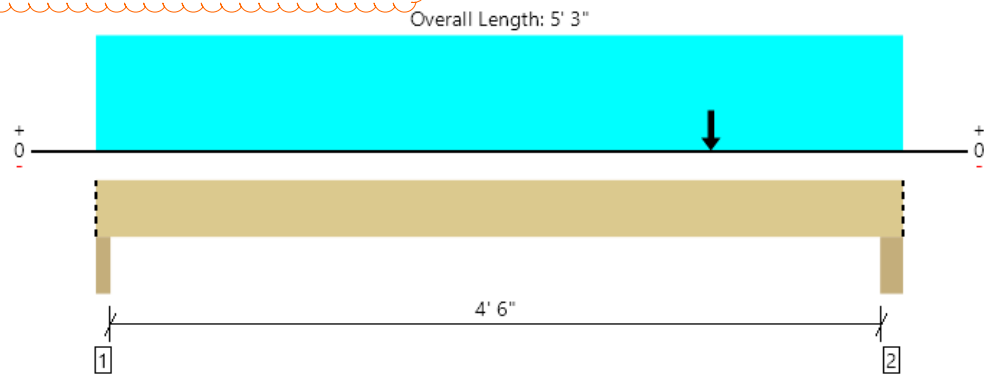
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional 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.weyerhaeuser.com/woodproducts/document-library.

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

SB, SB-5 (overstrength do
1 piece(s) 7" x 18" 2.2E Parall

NOT APPLICABLE FOR THIS CALCULATION. PLEASE SEE NEXT CALC FOR UPLIFT CALCULATION

An excessive uplift of -2552 lbs at support located at 4' 11" failed this product.



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)	24433 @ 4' 11"	24063 (5.50")	Passed (102%)	--	1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	7488 @ 3' 3 1/2"	28014	Passed (27%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	16596 @ 4'	100429	Passed (17%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.016 @ 4'	0.119	Passed (L/999+)	--	1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.024 @ 4'	0.237	Passed (L/999+)	--	1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- -416 lbs uplift at support located at 2". Strapping or other restraint may be required.
- Member should be side-loaded from both sides of the member or braced to prevent rotation.

Supports	Bearing Length			Loads to Supports (lbs)					Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Seismic	Total	
1 - Column - SPF	3.50"	3.50"	1.55"	2459	2259	1627	2702/-2702	9047/-2702	Blocking
2 - Column - SPF	5.50"	5.50"	5.58"	8927	5961	6805	11298/-11298	32991/-11298	Blocking

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

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Seismic (1.60)	Comments
0 - Self Weight (PLF)	0 to 5' 3"	N/A	39.4	--	--	--	
1 - Uniform (PSF)	0 to 5' 3" (Front)	11'	12.0	40.0	-	-	Default Load
2 - Point (lb)	4' (Front)	N/A	3732	2480	2703	-	Linked from: SB-3, Support 2
3 - Point (lb)	4' (Front)	N/A	-	-	-	14000	seismic with overstrength
4 - Point (lb)	4' (Front)	N/A	6755	3430	5729	-	Linked from: TB-25, Support 2

Weyerhaeuser Notes

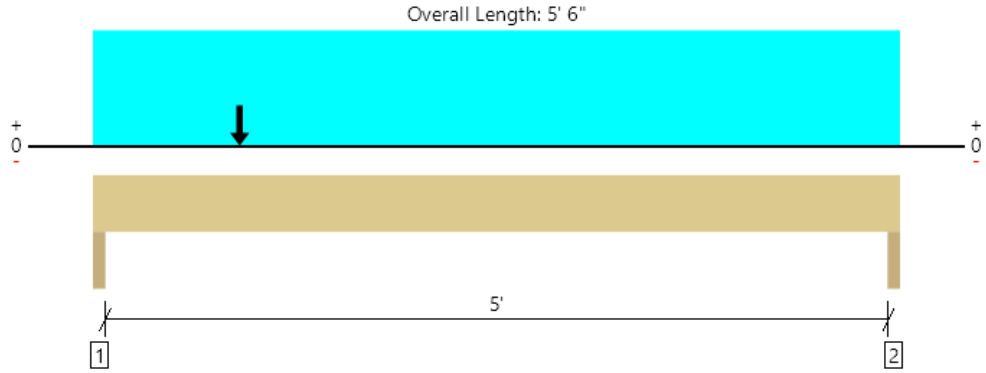
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional 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.

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

ForteWEB Software Operator	Job Notes
A P L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	

FH, FH-1

1 piece(s) 3 1/2" x 9" 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)	4961 @ 1 1/2"	6825 (3.00")	Passed (73%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	3726 @ 1'	5565	Passed (67%)	1.00	1.0 D + 1.0 L (All Spans)
Pos Moment (Ft-lbs)	5116 @ 2' 5 15/16"	9450	Passed (54%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.044 @ 2' 8 11/16"	0.175	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.067 @ 2' 8 1/2"	0.262	Passed (L/933)	--	1.0 D + 1.0 L (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 = 5' 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	Floor Live	Snow	Total	
1 - Trimmer - SPF	3.00"	3.00"	2.18"	1884	3077	437	5398	None
2 - Trimmer - SPF	3.00"	3.00"	1.63"	1203	2505	87	3795	None

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 5' 6"	N/A	7.7	--	--	
1 - Uniform (PSF)	0 to 5' 6"	1'	12.0	40.0	-	Default Load
2 - Point (lb)	1'	N/A	1021	858	524	Linked from: SB-6, Support 2
3 - Uniform (PLF)	0 to 5' 6"	N/A	356.0	819.0	-	Linked from: SJ-1 (REACTION ONLY), Support 1

Weyerhaeuser Notes

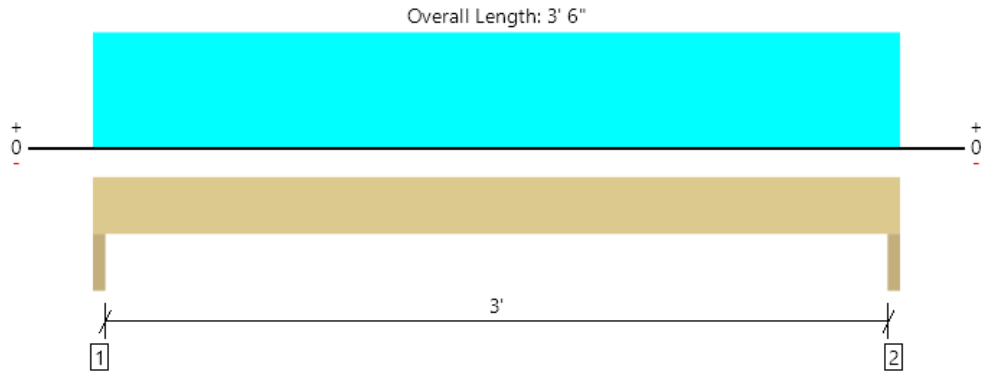
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional 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.

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

ForteWEB Software Operator	Job Notes
A P L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	

FH, FH-2

1 piece(s) 4 x 6 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)	919 @ 1 1/2"	6563 (3.00")	Passed (14%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	547 @ 8 1/2"	2310	Passed (24%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	693 @ 1' 9"	1720	Passed (40%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.013 @ 1' 9"	0.108	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.017 @ 1' 9"	0.162	Passed (L/999+)	--	1.0 D + 1.0 L (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	Floor Live	Total	
1 - Trimmer - SPF	3.00"	3.00"	1.50"	219	700	919	None
2 - Trimmer - SPF	3.00"	3.00"	1.50"	219	700	919	None

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 3' 6"	N/A	4.9	--	
1 - Uniform (PSF)	0 to 3' 6"	10'	12.0	40.0	Default Load

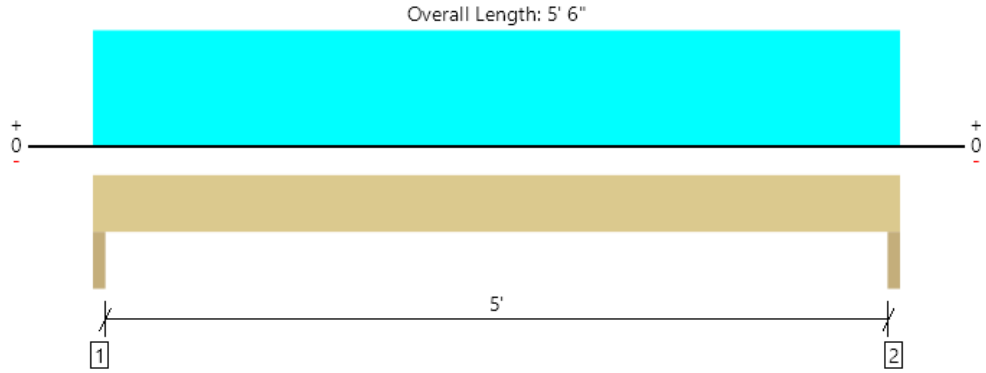
Weyerhaeuser Notes

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.

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

ForteWEB Software Operator	Job Notes
A P L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	

FH, FH-3
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)	1728 @ 1 1/2"	6563 (3.00")	Passed (26%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	1087 @ 1' 1/4"	4468	Passed (24%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	2165 @ 2' 9"	5166	Passed (42%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.009 @ 2' 9"	0.175	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.029 @ 2' 9"	0.262	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 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	Floor Live	Snow	Total	
1 - Trimmer - SPF	3.00"	3.00"	1.50"	1202	220	481	1903	None
2 - Trimmer - SPF	3.00"	3.00"	1.50"	1202	220	481	1903	None

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 5' 6"	N/A	8.2	--	--	
1 - Uniform (PSF)	0 to 5' 6"	1'	12.0	40.0	-	Default Load
2 - Uniform (PSF)	0 to 5' 6"	1'	12.0	40.0	-	3RD FLOOR
3 - Uniform (PSF)	0 to 5' 6"	20'	15.0	-	-	EXT WALL
4 - Uniform (PSF)	0 to 5' 6"	7'	15.0	-	25.0	ROOF

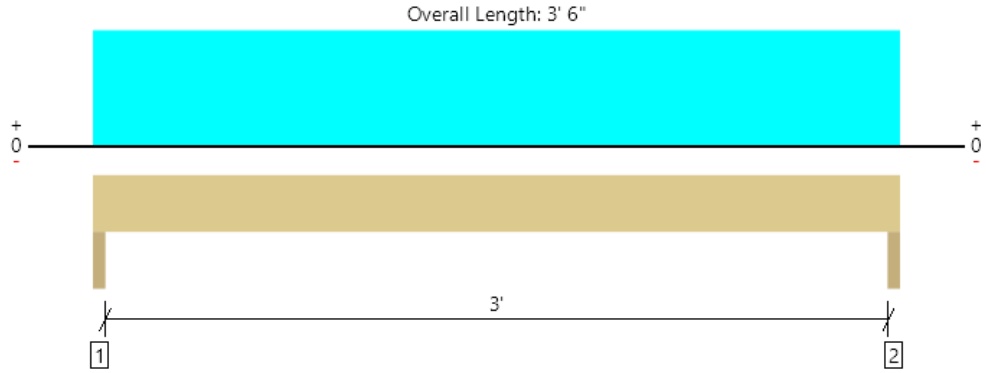
Weyerhaeuser Notes

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.

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

FH, FH-4

1 piece(s) 4 x 6 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)	919 @ 1 1/2"	6563 (3.00")	Passed (14%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	547 @ 8 1/2"	2310	Passed (24%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	693 @ 1' 9"	1720	Passed (40%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.013 @ 1' 9"	0.108	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.017 @ 1' 9"	0.162	Passed (L/999+)	--	1.0 D + 1.0 L (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	Floor Live	Total	
1 - Trimmer - SPF	3.00"	3.00"	1.50"	219	700	919	None
2 - Trimmer - SPF	3.00"	3.00"	1.50"	219	700	919	None

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 3' 6"	N/A	4.9	--	
1 - Uniform (PSF)	0 to 3' 6"	10'	12.0	40.0	Default Load

Weyerhaeuser Notes

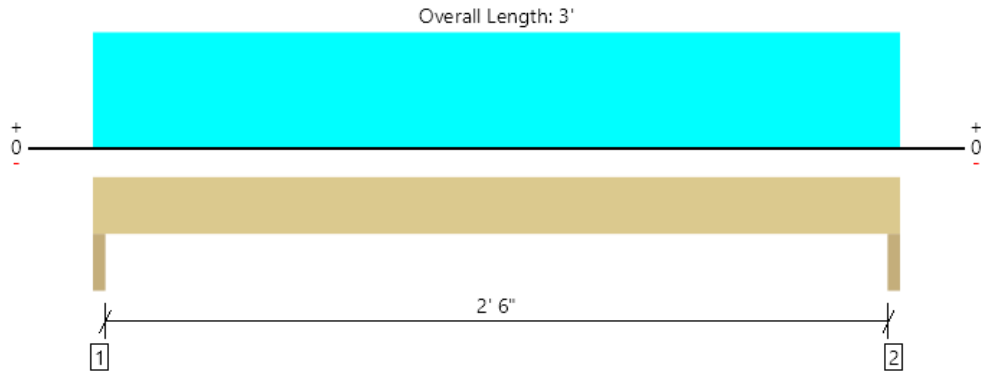
Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional 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.

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

ForteWEB Software Operator	Job Notes
A P L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	

FH, FH-5

1 piece(s) 4 x 6 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)	1657 @ 1 1/2"	6563 (3.00")	Passed (25%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	813 @ 8 1/2"	2310	Passed (35%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	971 @ 1' 6"	1720	Passed (56%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.009 @ 1' 6"	0.092	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.018 @ 1' 6"	0.138	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 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	Floor Live	Snow	Total	
1 - Trimmer - SPF	3.00"	3.00"	1.50"	880	660	375	1915	None
2 - Trimmer - SPF	3.00"	3.00"	1.50"	880	660	375	1915	None

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 3'	N/A	4.9	--	--	
1 - Uniform (PSF)	0 to 3'	11'	12.0	40.0	-	Default Load
2 - Uniform (PSF)	0 to 3'	20'	15.0	-	-	EXT WALL
3 - Uniform (PSF)	0 to 3'	10'	15.0	-	25.0	ROOF

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.

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

ForteWEB Software Operator	Job Notes
A P L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	

Level, 4x4 POST (10FT)
1 piece(s) 4 x 4 Douglas Fir-Larch No. 2

Post Height: 10'

Drawing is Conceptual

Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	34	50	Passed (69%)	--	--
Compression (lbs)	4500	4710	Passed (96%)	1.15	1.0 D + 1.0 S
Base Bearing (lbs)	4500	396900	Passed (1%)	--	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	Steel

Max Unbraced Length	Comments
Full Member Length	No bracing assumed.

Member Type : Free Standing Post
Building Code : IBC 2018
Design Methodology : ASD

Vertical Load	Dead (0.90)	Snow (1.15)	Comments
1 - Point (lb)	2000	2500	Default Load

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.

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

MEMBER REPORT

PASSED

Level, 4x4 POST (9FT)

1 piece(s) 4 x 4 Douglas Fir-Larch No. 2

Post Height: 9'

Drawing is Conceptual

Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	31	50	Passed (62%)	--	--
Compression (lbs)	5500	5727	Passed (96%)	1.15	1.0 D + 1.0 S
Base Bearing (lbs)	5500	396900	Passed (1%)	--	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	Steel

Max Unbraced Length	Comments
Full Member Length	No bracing assumed.

Member Type : Free Standing Post
Building Code : IBC 2018
Design Methodology : ASD

Vertical Load	Dead (0.90)	Snow (1.15)	Comments
1 - Point (lb)	2000	3500	Default Load

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.

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

Level, 4x6 POST (10FT)
1 piece(s) 4 x 6 Douglas Fir-Larch No. 2

Post Height: 10'

Drawing is Conceptual

Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	34	50	Passed (69%)	--	--
Compression (lbs)	7000	7380	Passed (95%)	1.15	1.0 D + 1.0 S
Base Bearing (lbs)	7000	623700	Passed (1%)	--	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	Steel

Max Unbraced Length	Comments
Full Member Length	No bracing assumed.

Member Type : Free Standing Post
Building Code : IBC 2018
Design Methodology : ASD

Vertical Load	Dead (0.90)	Snow (1.15)	Comments
1 - Point (lb)	3000	4000	Default Load

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.

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

Level, 4x6 POST (9FT)
1 piece(s) 4 x 6 Douglas Fir-Larch No. 2

Post Height: 9'

Drawing is Conceptual

Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	31	50	Passed (62%)	--	--
Compression (lbs)	8500	8966	Passed (95%)	1.15	1.0 D + 1.0 S
Base Bearing (lbs)	8500	623700	Passed (1%)	--	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	Steel

Max Unbraced Length	Comments
Full Member Length	No bracing assumed.

Member Type : Free Standing Post
Building Code : IBC 2018
Design Methodology : ASD

Vertical Load	Dead (0.90)	Snow (1.15)	Comments
1 - Point (lb)	4000	4500	Default Load

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.

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

PASSED

Level, 4x8 POST (10FT)

1 piece(s) 4 x 8 Douglas Fir-Larch No. 2

Post Height: 10'

Drawing is Conceptual

Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	34	50	Passed (69%)	--	--
Compression (lbs)	9500	9698	Passed (98%)	1.15	1.0 D + 1.0 S
Base Bearing (lbs)	9500	822150	Passed (1%)	--	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	Steel

Max Unbraced Length	Comments
Full Member Length	No bracing assumed.

Member Type : Free Standing Post
Building Code : IBC 2018
Design Methodology : ASD

Vertical Load	Dead (0.90)	Snow (1.15)	Comments
1 - Point (lb)	4500	5000	Default Load

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.

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

PASSED

Level, 4x8 POST (9FT)

1 piece(s) 4 x 8 Douglas Fir-Larch No. 2

Post Height: 9'

Drawing is Conceptual

Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	31	50	Passed (62%)	--	--
Compression (lbs)	11000	11769	Passed (93%)	1.15	1.0 D + 1.0 S
Base Bearing (lbs)	11000	822150	Passed (1%)	--	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	Steel

Max Unbraced Length	Comments
Full Member Length	No bracing assumed.

Member Type : Free Standing Post
Building Code : IBC 2018
Design Methodology : ASD

Vertical Load	Dead (0.90)	Snow (1.15)	Comments
1 - Point (lb)	5000	6000	Default Load

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.

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

PASSED

Level, 6x6 POST (10FT)

1 piece(s) 6 x 6 Douglas Fir-Larch No. 2

Post Height: 10'

Drawing is Conceptual

Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	22	50	Passed (44%)	--	--
Compression (lbs)	16500	16897	Passed (98%)	1.15	1.0 D + 1.0 S
Base Bearing (lbs)	16500	980100	Passed (2%)	--	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	Steel

Max Unbraced Length	Comments
Full Member Length	No bracing assumed.

Member Type : Free Standing Post
Building Code : IBC 2018
Design Methodology : ASD

Vertical Load	Dead (0.90)	Snow (1.15)	Comments
1 - Point (lb)	8000	8500	Default Load

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.

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

MEMBER REPORT

PASSED

Level, 6x6 POST (9FT)

1 piece(s) 6 x 6 Douglas Fir-Larch No. 2

Post Height: 9'

Drawing is Conceptual

Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	20	50	Passed (39%)	--	--
Compression (lbs)	18000	18529	Passed (97%)	1.15	1.0 D + 1.0 S
Base Bearing (lbs)	18000	980100	Passed (2%)	--	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	Steel

Max Unbraced Length	Comments
Full Member Length	No bracing assumed.

Member Type : Free Standing Post
Building Code : IBC 2018
Design Methodology : ASD

Vertical Load	Dead (0.90)	Snow (1.15)	Comments
1 - Point (lb)	9000	9000	Default Load

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.

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

MEMBER REPORT

PASSED

Level, 6x8 POST (10FT)

1 piece(s) 6 x 8 Douglas Fir-Larch No. 2

Post Height: 10'

Drawing is Conceptual

Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	22	50	Passed (44%)	--	--
Compression (lbs)	22000	23041	Passed (95%)	1.15	1.0 D + 1.0 S
Base Bearing (lbs)	22000	1336500	Passed (2%)	--	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	Steel

Max Unbraced Length	Comments
Full Member Length	No bracing assumed.

Member Type : Free Standing Post
Building Code : IBC 2018
Design Methodology : ASD

Vertical Load	Dead (0.90)	Snow (1.15)	Comments
1 - Point (lb)	11000	11000	Default Load

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.

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

PASSED

Level, 6x8 POST (9FT)

1 piece(s) 6 x 8 Douglas Fir-Larch No. 2

Post Height: 9'

Drawing is Conceptual

Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	20	50	Passed (39%)	--	--
Compression (lbs)	24000	25267	Passed (95%)	1.15	1.0 D + 1.0 S
Base Bearing (lbs)	24000	1336500	Passed (2%)	--	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	Steel

Max Unbraced Length	Comments
Full Member Length	No bracing assumed.

Member Type : Free Standing Post
Building Code : IBC 2018
Design Methodology : ASD

Vertical Load	Dead (0.90)	Snow (1.15)	Comments
1 - Point (lb)	11000	13000	Default Load

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.

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

PASSED

Level, 3.5X3.5 PSL (10FT)

1 piece(s) 3 1/2" x 3 1/2" 1.8E Parallam® PSL

Post Height: 10'

Drawing is Conceptual

Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	34	50	Passed (69%)	--	--
Compression (lbs)	7500	7626	Passed (98%)	1.15	1.0 D + 1.0 S
Base Bearing (lbs)	7500	396900	Passed (2%)	--	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	Steel

Max Unbraced Length	Comments
Full Member Length	No bracing assumed.

Member Type : Free Standing Post
Building Code : IBC 2018
Design Methodology : ASD

Vertical Load	Dead (0.90)	Snow (1.15)	Comments
1 - Point (lb)	3500	4000	Default Load

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.

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

PASSED

Level, 3.5X3.5 PSL (9FT)
1 piece(s) 3 1/2" x 3 1/2" 1.8E Parallam® PSL

Post Height: 9'

Drawing is Conceptual

Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	31	50	Passed (62%)	--	--
Compression (lbs)	9250	9338	Passed (99%)	1.15	1.0 D + 1.0 S
Base Bearing (lbs)	9250	396900	Passed (2%)	--	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	Steel

Max Unbraced Length	Comments
Full Member Length	No bracing assumed.

Member Type : Free Standing Post
Building Code : IBC 2018
Design Methodology : ASD

Vertical Load	Dead (0.90)	Snow (1.15)	Comments
1 - Point (lb)	4250	5000	Default Load

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.

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

FORTE WEB

MEMBER REPORT

PASSED

Level, 3.5X5.25 PSL (10FT)

1 piece(s) 3 1/2" x 5 1/4" 1.8E Parallam® PSL

Post Height: 10'

Drawing is Conceptual

Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	34	50	Passed (69%)	--	--
Compression (lbs)	11000	11439	Passed (96%)	1.15	1.0 D + 1.0 S
Base Bearing (lbs)	11000	595350	Passed (2%)	--	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	Steel

Max Unbraced Length	Comments
Full Member Length	No bracing assumed.

Member Type : Free Standing Post
Building Code : IBC 2018
Design Methodology : ASD

Vertical Load	Dead (0.90)	Snow (1.15)	Comments
1 - Point (lb)	5000	6000	Default Load

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.

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

MEMBER REPORT

PASSED

Level, 3.5X5.25 PSL (9FT)

1 piece(s) 3 1/2" x 5 1/4" 1.8E Parallam® PSL

Post Height: 9'

Drawing is Conceptual

Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	31	50	Passed (62%)	--	--
Compression (lbs)	14000	14007	Passed (100%)	1.15	1.0 D + 1.0 S
Base Bearing (lbs)	14000	595350	Passed (2%)	--	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	Steel

Max Unbraced Length	Comments
Full Member Length	No bracing assumed.

Member Type : Free Standing Post
Building Code : IBC 2018
Design Methodology : ASD

Vertical Load	Dead (0.90)	Snow (1.15)	Comments
1 - Point (lb)	6500	7500	Default Load

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.

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

MEMBER REPORT

PASSED

Level, 3.5X7PSL (10FT)

1 piece(s) 3 1/2" x 7" 1.8E Parallam® PSL

Post Height: 10'

Drawing is Conceptual

Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	34	50	Passed (69%)	--	--
Compression (lbs)	15000	15252	Passed (98%)	1.15	1.0 D + 1.0 S
Base Bearing (lbs)	15000	793800	Passed (2%)	--	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	Steel

Max Unbraced Length	Comments
Full Member Length	No bracing assumed.

Member Type : Free Standing Post
Building Code : IBC 2018
Design Methodology : ASD

Vertical Load	Dead (0.90)	Snow (1.15)	Comments
1 - Point (lb)	7000	8000	Default Load

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.

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

MEMBER REPORT

PASSED

Level, 3.5X7PSL (9FT)

1 piece(s) 3 1/2" x 7" 1.8E Parallam® PSL

Post Height: 9'

Drawing is Conceptual

Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	31	50	Passed (62%)	--	--
Compression (lbs)	18000	18677	Passed (96%)	1.15	1.0 D + 1.0 S
Base Bearing (lbs)	18000	793800	Passed (2%)	--	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	Steel

Max Unbraced Length	Comments
Full Member Length	No bracing assumed.

Member Type : Free Standing Post
Building Code : IBC 2018
Design Methodology : ASD

Vertical Load	Dead (0.90)	Snow (1.15)	Comments
1 - Point (lb)	8500	9500	Default Load

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.

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

PASSED

Level, 5.25X5.25 PSL (10FT)
1 piece(s) 5 1/4" x 5 1/4" 1.8E Parallam® PSL

Post Height: 10'

Drawing is Conceptual

Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	23	50	Passed (46%)	--	--
Compression (lbs)	35000	36546	Passed (96%)	1.15	1.0 D + 1.0 S
Base Bearing (lbs)	35000	893025	Passed (4%)	--	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	Steel

Max Unbraced Length	Comments
Full Member Length	No bracing assumed.

Member Type : Free Standing Post
Building Code : IBC 2018
Design Methodology : ASD

Vertical Load	Dead (0.90)	Snow (1.15)	Comments
1 - Point (lb)	15000	20000	Default Load

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.

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

MEMBER REPORT

PASSED

Level, 5.25X5.25 PSL (9FT)

1 piece(s) 5 1/4" x 5 1/4" 1.8E Parallam® PSL

Post Height: 9'

Drawing is Conceptual

Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	21	50	Passed (41%)	--	--
Compression (lbs)	42500	43634	Passed (97%)	1.15	1.0 D + 1.0 S
Base Bearing (lbs)	42500	893025	Passed (5%)	--	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	Steel

Max Unbraced Length	Comments
Full Member Length	No bracing assumed.

Member Type : Free Standing Post
Building Code : IBC 2018
Design Methodology : ASD

Vertical Load	Dead (0.90)	Snow (1.15)	Comments
1 - Point (lb)	20000	22500	Default Load

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.

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

MEMBER REPORT

PASSED

Level, 5.25X7 PSL (10FT)

1 piece(s) 5 1/4" x 7" 1.8E Parallam® PSL

Post Height: 10'

Drawing is Conceptual

Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	23	50	Passed (46%)	--	--
Compression (lbs)	47500	48728	Passed (97%)	1.15	1.0 D + 1.0 S
Base Bearing (lbs)	47500	1190700	Passed (4%)	--	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	Steel

Max Unbraced Length	Comments
Full Member Length	No bracing assumed.

Member Type : Free Standing Post
Building Code : IBC 2018
Design Methodology : ASD

Vertical Load	Dead (0.90)	Snow (1.15)	Comments
1 - Point (lb)	20000	27500	Default Load

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.

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

FORTE WEB

MEMBER REPORT

PASSED

Level, 5.25X7 PSL (9FT)

1 piece(s) 5 1/4" x 7" 1.8E Parallam® PSL

Post Height: 9'

Drawing is Conceptual

Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	21	50	Passed (41%)	--	--
Compression (lbs)	57500	58179	Passed (99%)	1.15	1.0 D + 1.0 S
Base Bearing (lbs)	57500	1190700	Passed (5%)	--	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	Steel

Max Unbraced Length	Comments
Full Member Length	No bracing assumed.

Member Type : Free Standing Post
Building Code : IBC 2018
Design Methodology : ASD

Vertical Load	Dead (0.90)	Snow (1.15)	Comments
1 - Point (lb)	25000	32500	Default Load

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.

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

FORTE WEB

MEMBER REPORT

PASSED

Level, 7X7 PSL (10FT)

1 piece(s) 7" x 7" 1.8E Parallam® PSL

Post Height: 10'

Drawing is Conceptual

Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	17	50	Passed (34%)	--	--
Compression (lbs)	100000	100441	Passed (100%)	1.15	1.0 D + 1.0 S
Base Bearing (lbs)	100000	1587600	Passed (6%)	--	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	Steel

Max Unbraced Length	Comments
Full Member Length	No bracing assumed.

Member Type : Free Standing Post
Building Code : IBC 2018
Design Methodology : ASD

Vertical Load	Dead (0.90)	Snow (1.15)	Comments
1 - Point (lb)	50000	50000	Default Load

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.

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

FORTE WEB

MEMBER REPORT

PASSED

Level, 7X7 PSL (9FT)

1 piece(s) 7" x 7" 1.8E Parallam® PSL

Post Height: 9'

Drawing is Conceptual

Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	15	50	Passed (31%)	--	--
Compression (lbs)	110000	111804	Passed (98%)	1.15	1.0 D + 1.0 S
Base Bearing (lbs)	110000	1587600	Passed (7%)	--	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	Steel

Max Unbraced Length	Comments
Full Member Length	No bracing assumed.

Member Type : Free Standing Post
Building Code : IBC 2018
Design Methodology : ASD

Vertical Load	Dead (0.90)	Snow (1.15)	Comments
1 - Point (lb)	50000	60000	Default Load

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.

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

MEMBER REPORT

PASSED

Level, 7X9.25 PSL (10FT)

1 piece(s) 7" x 9 1/4" 2.0E Parallam® PSL

Post Height: 10'

Drawing is Conceptual

Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	17	50	Passed (34%)	--	--
Compression (lbs)	125000	149992	Passed (83%)	1.15	1.0 D + 1.0 S
Base Bearing (lbs)	125000	2097900	Passed (6%)	--	1.0 D + 1.0 S
Bending/Compression	0.89	1	Passed (89%)	1.15	1.0 D + 1.0 S

- Input axial load eccentricity for the design is zero
- Applicable calculations are based on NDS.
- Initial eccentricity applied as per ESR-1387.

Supports	Type	Material
Base	Plate	Steel

Max Unbraced Length	Comments
Full Member Length	No bracing assumed.

Member Type : Free Standing Post
Building Code : IBC 2018
Design Methodology : ASD

Vertical Load	Dead (0.90)	Snow (1.15)	Comments
1 - Point (lb)	50000	75000	Default Load

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.

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

FORTE WEB

MEMBER REPORT

PASSED

Level, 7X9.25 PSL (9FT)

1 piece(s) 7" x 9 1/4" 2.0E Parallam® PSL

Post Height: 9'

Drawing is Conceptual

Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	15	50	Passed (31%)	--	--
Compression (lbs)	145000	168143	Passed (86%)	1.15	1.0 D + 1.0 S
Base Bearing (lbs)	145000	2097900	Passed (7%)	--	1.0 D + 1.0 S
Bending/Compression	0.91	1	Passed (91%)	1.15	1.0 D + 1.0 S

- Input axial load eccentricity for the design is zero
- Applicable calculations are based on NDS.
- Initial eccentricity applied as per ESR-1387.

Supports	Type	Material
Base	Plate	Steel

Max Unbraced Length	Comments
Full Member Length	No bracing assumed.

Member Type : Free Standing Post
Building Code : IBC 2018
Design Methodology : ASD

Vertical Load	Dead (0.90)	Snow (1.15)	Comments
1 - Point (lb)	65000	80000	Default Load

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.

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

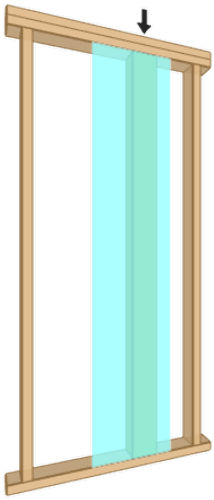
FORTE WEB

MEMBER REPORT

PASSED

SECOND FLOOR, (3) 2X6 (10FT)
3 piece(s) 2 x 6 HF No.2

Wall Height: 10' Member Height: 9' 7 1/2" Tributary Width: 1'



Drawing is Conceptual

Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	21	50	Passed (42%)	--	--
Compression (lbs)	8000	17973	Passed (45%)	1.00	1.0 D + 1.0 L
Plate Bearing (lbs)	8000	10519	Passed (76%)	--	1.0 D + 1.0 L
Lateral Reaction (lbs)	71	--	--	1.60	1.0 D + 0.6 W
Lateral Shear (lbs)	65	3960	Passed (2%)	1.60	1.0 D + 0.6 W
Lateral Moment (ft-lbs)	172 @ mid-span	3339	Passed (5%)	1.60	1.0 D + 0.6 W
Total Deflection (in)	0.02 @ mid-span	0.96	Passed (L/4671)	--	1.0 D + 0.6 W
Bending/Compression	0.18	1	Passed (18%)	1.60	1.0 D + 0.45 W + 0.75 L + 0.75 Lr

- Lateral deflection criteria: Wind (L/120)
- Input axial load eccentricity for the design is zero
- Applicable calculations are based on NDS.
- Bearing shall be on a metal plate or strap, or on other equivalently durable, rigid, homogeneous material with sufficient stiffness to distribute applied load.
- The column stability factor (Kf = 0.6) applied to this design assumes nailed built-up columns per NDS section 15.3.3. For Weyerhaeuser ELP products refer to the U.S. Wall Guide for multiple-member connection requirements.

Supports	Type	Material
Top	Dbl 2X	Spruce-Pine-Fir
Base	2X	Spruce-Pine-Fir

System : Wall
Member Type : Column
Building Code : IBC 2018
Design Methodology : ASD

Max Unbraced Length	Comments
1'	

Lateral Connections

Supports	Connector	Type/Model	Quantity	Connector Nailing
Top	Nails	8d x 2.5" Box (Toe)	1	N/A
Base	Nails	8d x 2.5" Box (Toe)	1	N/A

- Nailed connection at the top of the member is assumed to be nailed through the bottom 2x plate prior to placement of the top 2x of the double top plate assembly.

Vertical Load	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
1 - Point (lb)	N/A	4000	4000	Default Load

Lateral Load	Location	Tributary Width	Wind (1.60)	Comments
1 - Uniform (PSF)	Full Length	1'	24.7	

- ASCE/SEI 7 Sec. 30.4: Exposure Category (B), Mean Roof Height (33'), Topographic Factor (1.0), Wind Directionality Factor (0.85), Basic Wind Speed (115), Risk Category(II), Effective Wind Area determined using full member span and trib. width.
- IBC Table 1604.3, footnote f: Deflection checks are performed using 42% of this lateral wind load.

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.

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

ForteWEB Software Operator	Job Notes
Kenny Jones L120 Engineering (817) 727-2136 kjones@l120engineering.com	

Weyerhaeuser

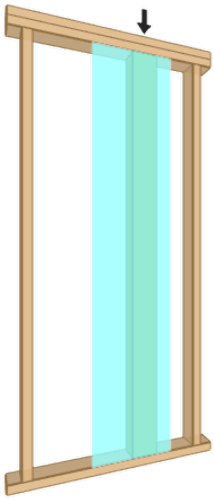
FORTE WEB

MEMBER REPORT

PASSED

SECOND FLOOR, (3) 2X6 (20FT)
3 piece(s) 2 x 6 HF No.2

Wall Height: 20' Member Height: 19' 7 1/2" Tributary Width: 1'



Drawing is Conceptual

Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	43	50	Passed (86%)	--	--
Compression (lbs)	4200	5071	Passed (83%)	1.15	1.0 D + 1.0 S
Plate Bearing (lbs)	4200	10519	Passed (40%)	--	1.0 D + 1.0 S
Lateral Reaction (lbs)	132	--	--	1.60	1.0 D + 0.6 W
Lateral Shear (lbs)	126	3960	Passed (3%)	1.60	1.0 D + 0.6 W
Lateral Moment (ft-lbs)	649 @ mid-span	3339	Passed (19%)	1.60	1.0 D + 0.6 W
Total Deflection (in)	0.39 @ mid-span	1.96	Passed (L/607)	--	1.0 D + 0.6 W
Bending/Compression	1.00	1	Passed (100%)	1.60	1.0 D + 0.45 W + 0.75 L + 0.75 S

- Lateral deflection criteria: Wind (L/120)
- Input axial load eccentricity for the design is zero
- Applicable calculations are based on NDS.
- The column stability factor (Kf = 0.6) applied to this design assumes nailed built-up columns per NDS section 15.3.3. For Weyerhaeuser ELP products refer to the U.S. Wall Guide for multiple-member connection requirements.

Supports	Type	Material
Top	Dbl 2X	Spruce-Pine-Fir
Base	2X	Spruce-Pine-Fir

System : Wall
Member Type : Column
Building Code : IBC 2018
Design Methodology : ASD

Max Unbraced Length	Comments
1'	

Lateral Connections

Supports	Connector	Type/Model	Quantity	Connector Nailing
Top	Nails	8d x 2.5" Box (Toe)	2	N/A
Base	Nails	8d x 2.5" Box (Toe)	2	N/A

- Nailed connection at the top of the member is assumed to be nailed through the bottom 2x plate prior to placement of the top 2x of the double top plate assembly.

Vertical Load	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
1 - Point (lb)	N/A	2000	2200	Default Load

Lateral Load	Location	Tributary Width	Wind (1.60)	Comments
1 - Uniform (PSF)	Full Length	1'	22.5	

- ASCE/SEI 7 Sec. 30.4: Exposure Category (B), Mean Roof Height (33'), Topographic Factor (1.0), Wind Directionality Factor (0.85), Basic Wind Speed (115), Risk Category(II), Effective Wind Area determined using full member span and trib. width.
- IBC Table 1604.3, footnote f: Deflection checks are performed using 42% of this lateral wind load.

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.

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

ForteWEB Software Operator	Job Notes
Kenny Jones L120 Engineering (817) 727-2136 kjones@l120engineering.com	

Weyerhaeuser

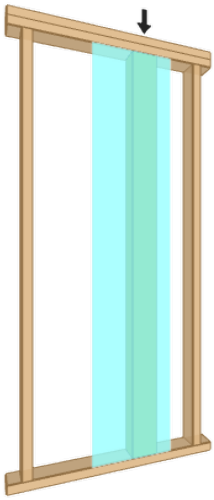
FORTE WEB

MEMBER REPORT

PASSED

SECOND FLOOR, (2) 2X6 (20FT)
2 piece(s) 2 x 6 HF No.2

Wall Height: 20' Member Height: 19' 7 1/2" Tributary Width: 1'



Drawing is Conceptual

Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	43	50	Passed (86%)	--	--
Compression (lbs)	2500	3381	Passed (74%)	1.15	1.0 D + 1.0 S
Plate Bearing (lbs)	2500	7013	Passed (36%)	--	1.0 D + 1.0 S
Lateral Reaction (lbs)	132	--	--	1.60	1.0 D + 0.6 W
Lateral Shear (lbs)	126	2640	Passed (5%)	1.60	1.0 D + 0.6 W
Lateral Moment (ft-lbs)	649 @ mid-span	2223	Passed (29%)	1.60	1.0 D + 0.6 W
Total Deflection (in)	0.58 @ mid-span	1.96	Passed (L/404)	--	1.0 D + 0.6 W
Bending/Compression	0.95	1	Passed (95%)	1.60	1.0 D + 0.45 W + 0.75 L + 0.75 S

- Lateral deflection criteria: Wind (L/120)
- Input axial load eccentricity for the design is zero
- Applicable calculations are based on NDS.
- The column stability factor (Kf = 0.6) applied to this design assumes nailed built-up columns per NDS section 15.3.3. For Weyerhaeuser ELP products refer to the U.S. Wall Guide for multiple-member connection requirements.

Supports	Type	Material
Top	Dbl 2X	Spruce-Pine-Fir
Base	2X	Spruce-Pine-Fir

System : Wall
Member Type : Column
Building Code : IBC 2018
Design Methodology : ASD

Max Unbraced Length	Comments
1'	

Lateral Connections

Supports	Connector	Type/Model	Quantity	Connector Nailing
Top	Nails	8d x 2.5" Box (Toe)	2	N/A
Base	Nails	8d x 2.5" Box (Toe)	2	N/A

- Nailed connection at the top of the member is assumed to be nailed through the bottom 2x plate prior to placement of the top 2x of the double top plate assembly.

Vertical Load	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
1 - Point (lb)	N/A	1000	1500	Default Load

Lateral Load	Location	Tributary Width	Wind (1.60)	Comments
1 - Uniform (PSF)	Full Length	1'	22.5	

- ASCE/SEI 7 Sec. 30.4: Exposure Category (B), Mean Roof Height (33'), Topographic Factor (1.0), Wind Directionality Factor (0.85), Basic Wind Speed (115), Risk Category(II), Effective Wind Area determined using full member span and trib. width.
- IBC Table 1604.3, footnote f: Deflection checks are performed using 42% of this lateral wind load.

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.

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

ForteWEB Software Operator	Job Notes
Kenny Jones L120 Engineering (817) 727-2136 kjones@l120engineering.com	

Weyerhaeuser

MEMBER REPORT

PASSED

SECOND FLOOR, 6X8 (10FT)

1 piece(s) 6 x 8 DF No.2

Post Height: 10'

Drawing is Conceptual

Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	22	50	Passed (44%)	--	--
Compression (lbs)	18000	21354	Passed (84%)	1.00	1.0 D + 1.0 L
Base Bearing (lbs)	18000	1225125	Passed (1%)	--	1.0 D + 1.0 L
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	Steel

Max Unbraced Length	Comments
Full Member Length	No bracing assumed.

Member Type : Free Standing Post
Building Code : IBC 2018
Design Methodology : ASD

Vertical Load	Dead (0.90)	Floor Live (1.00)	Comments
1 - Point (lb)	9000	9000	Default Load

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.

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

LONGITUDE
ONE TWENTY°
ENGINEERING & DESIGN

FOUNDATION CALCULATIONS

FOOTING REFERENCE PER PLAN

(206) 790 9502
L120Engineering.com

Wall Footing

Description : 1'-4" (16") Footing and Stem-wall (non retaining) - max loading

Code References

Calculations per ACI 318-14, IBC 2015, ASCE 7-10
Load Combinations Used : ASCE 7-10

General Information

Material Properties

f'c : Concrete 28 day strength	=	2.50 ksi
fy : Rebar Yield	=	40.0 ksi
Ec : Concrete Elastic Modulus	=	3,122.0 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
AutoCalc Footing Weight as DL	:	Yes

Soil Design Values

Allowable Soil Bearing	=	2.0 ksf
Increase Bearing By Footing Weight	=	No
Soil Passive Resistance (for Sliding)	=	250.0 pcf
Soil/Concrete Friction Coeff.	=	0.30

Increases based on footing Depth

Reference Depth below Surface	=	1.50 ft
Allow. Pressure Increase per foot of depth	=	ksf
when base footing is below	=	ft

Increases based on footing Width

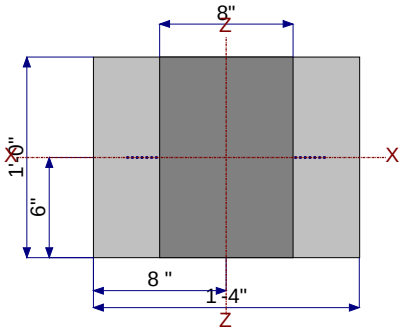
Allow. Pressure Increase per foot of width	=	ksf
when footing is wider than	=	ft

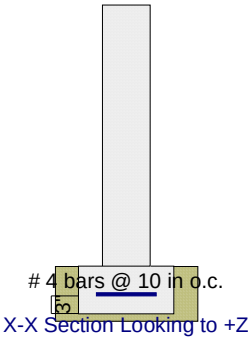
Adjusted Allowable Bearing Pressure = 2.0 ksf

Dimensions

Footing Width	=	1.333 ft	Footing Thickness	=	8.0 in	Bars along X-X Axis	
Wall Thickness	=	8.0 in	Rebar Centerline to Edge of Concrete...			Bar spacing	= 10.00
Wall center offset from center of footing	=	0 in	at Bottom of footing	=	3.0 in	Reinforcing Bar Size	= # 4

Reinforcing





X-X Section Looking to +Z

Applied Loads

		D	Lr	L	S	W	E	H	
P : Column Load	=	1.0		0.750	1.0				k
OB : Overburden	=								ksf
V-x	=								k
M-zz	=								k-ft
Vx applied	=	in above top of footing							

Wall Footing

File = W:\ENGINE~1\FOUNDA~1\FOUNDA~1.EC6
ENERCALC, INC. 1983-2016, Build:6.16.6.7, Ver:6.14.5.31

Description : 1'-4" (16") Footing and Stem-wall (non retaining) - max loading

DESIGN SUMMARY

Design OK

	Factor of Safety	Item	Applied	Capacity	Governing Load Combination
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	Uplift	0.0 k	0.0 k	No Uplift

	Utilization Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.9157	Soil Bearing	1.831 ksf	2.0 ksf	+D+0.750L+0.750S+0.5
PASS	0.04001	Z Flexure (+X)	0.1386 k-ft	3.464 k-ft	+1.20D+0.50L+1.60S+1
PASS	0.01221	Z Flexure (-X)	0.04229 k-ft	3.464 k-ft	+0.90D+E+0.90H
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

Detailed Results

Soil Bearing

Rotation Axis & Load Combination...	Gross Allowable	Xecc	Actual Soil Bearing Stress -X	Actual Soil Bearing Stress +X	Actual / Allowable Ratio
, +D+H	2.0 ksf	0.0 in	0.8469 ksf	0.8469 ksf	0.423
, +D+L+H	2.0 ksf	0.0 in	1.409 ksf	1.409 ksf	0.705
, +D+Lr+H	2.0 ksf	0.0 in	0.8469 ksf	0.8469 ksf	0.423
, +D+S+H	2.0 ksf	0.0 in	1.597 ksf	1.597 ksf	0.799
, +D+0.750Lr+0.750L+H	2.0 ksf	0.0 in	1.269 ksf	1.269 ksf	0.634
, +D+0.750L+0.750S+H	2.0 ksf	0.0 in	1.831 ksf	1.831 ksf	0.916
, +D+0.60W+H	2.0 ksf	0.0 in	0.8469 ksf	0.8469 ksf	0.423
, +D+0.70E+H	2.0 ksf	0.0 in	0.8469 ksf	0.8469 ksf	0.423
, +D+0.750Lr+0.750L+0.450W+H	2.0 ksf	0.0 in	1.269 ksf	1.269 ksf	0.634
, +D+0.750L+0.750S+0.450W+H	2.0 ksf	0.0 in	1.831 ksf	1.831 ksf	0.916
, +D+0.750L+0.750S+0.5250E+H	2.0 ksf	0.0 in	1.831 ksf	1.831 ksf	0.916
, +0.60D+0.60W+0.60H	2.0 ksf	0.0 in	0.5081 ksf	0.5081 ksf	0.254
, +0.60D+0.70E+0.60H	2.0 ksf	0.0 in	0.5081 ksf	0.5081 ksf	0.254

Overturning Stability

Units : k-ft

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

Sliding Stability

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

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Which Side ?	Tension @ Bot. or Top ?	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
, +1.40D+1.60H	0.06579	-X	Bottom	0.1728	Min Temp %	0.24	3.464	OK
, +1.40D+1.60H	0.06579	+X	Bottom	0.1728	Min Temp %	0.24	3.464	OK
, +1.20D+0.50Lr+1.60L+1.60H	0.1063	-X	Bottom	0.1728	Min Temp %	0.24	3.464	OK
, +1.20D+0.50Lr+1.60L+1.60H	0.1063	+X	Bottom	0.1728	Min Temp %	0.24	3.464	OK
, +1.20D+1.60L+0.50S+1.60H	0.1272	-X	Bottom	0.1728	Min Temp %	0.24	3.464	OK
, +1.20D+1.60L+0.50S+1.60H	0.1272	+X	Bottom	0.1728	Min Temp %	0.24	3.464	OK
, +1.20D+1.60Lr+0.50L+1.60H	0.072	-X	Bottom	0.1728	Min Temp %	0.24	3.464	OK
, +1.20D+1.60Lr+0.50L+1.60H	0.072	+X	Bottom	0.1728	Min Temp %	0.24	3.464	OK
, +1.20D+1.60Lr+0.50W+1.60H	0.05639	-X	Bottom	0.1728	Min Temp %	0.24	3.464	OK
, +1.20D+1.60Lr+0.50W+1.60H	0.05639	+X	Bottom	0.1728	Min Temp %	0.24	3.464	OK
, +1.20D+0.50L+1.60S+1.60H	0.1386	-X	Bottom	0.1728	Min Temp %	0.24	3.464	OK
, +1.20D+0.50L+1.60S+1.60H	0.1386	+X	Bottom	0.1728	Min Temp %	0.24	3.464	OK
, +1.20D+1.60S+0.50W+1.60H	0.123	-X	Bottom	0.1728	Min Temp %	0.24	3.464	OK
, +1.20D+1.60S+0.50W+1.60H	0.123	+X	Bottom	0.1728	Min Temp %	0.24	3.464	OK
, +1.20D+0.50Lr+0.50L+W+1.60H	0.072	-X	Bottom	0.1728	Min Temp %	0.24	3.464	OK
, +1.20D+0.50Lr+0.50L+W+1.60H	0.072	+X	Bottom	0.1728	Min Temp %	0.24	3.464	OK
, +1.20D+0.50L+0.50S+W+1.60H	0.09281	-X	Bottom	0.1728	Min Temp %	0.24	3.464	OK
, +1.20D+0.50L+0.50S+W+1.60H	0.09281	+X	Bottom	0.1728	Min Temp %	0.24	3.464	OK

Wall Footing

Description : 1'-4" (16") Footing and Stem-wall (non retaining) - max loading

, +1.20D+0.50L+0.20S+E+1.60H	0.08033	-X	Bottom	0.1728	Min Temp %	0.24	3.464	OK
, +1.20D+0.50L+0.20S+E+1.60H	0.08033	+X	Bottom	0.1728	Min Temp %	0.24	3.464	OK

Wall Footing

Description : 1'-4" (16") Footing and Stem-wall (non retaining) - max loading

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Which Side ?	Tension @ Bot. or Top ?	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
, +0.90D+W+0.90H	0.04229	-X	Bottom	0.1728	Min Temp %	0.24	3.464	OK
, +0.90D+W+0.90H	0.04229	+X	Bottom	0.1728	Min Temp %	0.24	3.464	OK
, +0.90D+E+0.90H	0.04229	-X	Bottom	0.1728	Min Temp %	0.24	3.464	OK
, +0.90D+E+0.90H	0.04229	+X	Bottom	0.1728	Min Temp %	0.24	3.464	OK

One Way Shear

Units : k

Load Combination...	Vu @ -X	Vu @ +X	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D+1.60H	0 psi	0 psi	0 psi	75 psi	0	OK
+1.20D+0.50Lr+1.60L+1.60H	0 psi	0 psi	0 psi	75 psi	0	OK
+1.20D+1.60L+0.50S+1.60H	0 psi	0 psi	0 psi	75 psi	0	OK
+1.20D+1.60Lr+0.50L+1.60H	0 psi	0 psi	0 psi	75 psi	0	OK
+1.20D+1.60Lr+0.50W+1.60H	0 psi	0 psi	0 psi	75 psi	0	OK
+1.20D+0.50L+1.60S+1.60H	0 psi	0 psi	0 psi	75 psi	0	OK
+1.20D+1.60S+0.50W+1.60H	0 psi	0 psi	0 psi	75 psi	0	OK
+1.20D+0.50Lr+0.50L+W+1.60H	0 psi	0 psi	0 psi	75 psi	0	OK
+1.20D+0.50L+0.50S+W+1.60H	0 psi	0 psi	0 psi	75 psi	0	OK
+1.20D+0.50L+0.20S+E+1.60H	0 psi	0 psi	0 psi	75 psi	0	OK
+0.90D+W+0.90H	0 psi	0 psi	0 psi	75 psi	0	OK
+0.90D+E+0.90H	0 psi	0 psi	0 psi	75 psi	0	OK

General Footing

Description : 2' SQ FTG - max loading

Code References

Calculations per ACI 318-14, IBC 2015, ASCE 7-10
Load Combinations Used : ASCE 7-10

General Information

Material Properties

f'c : Concrete 28 day strength	=	2.50	ksi
fy : Rebar Yield	=	40.0	ksi
Ec : Concrete Elastic Modulus	=	3,122.0	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	:	No	
Use Pedestal wt for stability, mom & shear	:	No	

Soil Design Values

Allowable Soil Bearing	=	2.0	ksf
Increase Bearing By Footing Weight	=	No	
Soil Passive Resistance (for Sliding)	=	250.0	pcf
Soil/Concrete Friction Coeff.	=	0.30	

Increases based on footing Depth

Footing base depth below soil surface	=	0.670	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

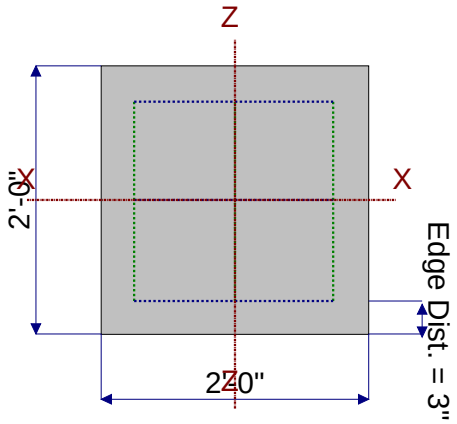
Width parallel to X-X Axis	=	2.0	ft
Length parallel to Z-Z Axis	=	2.0	ft
Footing Thickness	=	10.0	in

Pedestal dimensions...

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

Rebar Centerline to Edge of Concrete...

at Bottom of footing	=	3.0	in

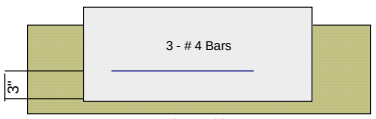


Reinforcing

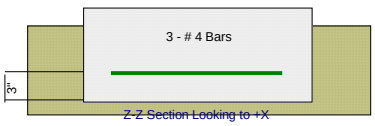
Bars parallel to X-X Axis			
Number of Bars	=		3.0
Reinforcing Bar Size	=	#	4
Bars parallel to Z-Z Axis			
Number of Bars	=		3.0
Reinforcing Bar Size	=	#	4

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



X-X Section Looking to +Z



Z-Z Section Looking to +X

Applied Loads

		D	Lr	L	S	W	E	H	
P : Column Load	=	2.50		5.0					k
OB : Overburden	=								ksf
M-xx	=								k-ft
M-zz	=								k-ft
V-x	=								k
V-z	=								k

General Footing

File = W:\ENGINE~1\FOUNDA~1\FOUNDA~1.EC6
ENERCALC, INC. 1983-2016, Build:6.16.6.7, Ver:6.14.5.31

Description : 2' SQ FTG - max loading

DESIGN SUMMARY

Design OK

	Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.9980	Soil Bearing	1.996 ksf	2.0 ksf	+D+L+H 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	Uplift	0.0 k	0.0 k	No Uplift
PASS	0.2258	Z Flexure (+X)	1.375 k-ft	6.088 k-ft	+1.20D+0.50Lr+1.60L+1.60H
PASS	0.2258	Z Flexure (-X)	1.375 k-ft	6.088 k-ft	+1.20D+0.50Lr+1.60L+1.60H
PASS	0.2258	X Flexure (+Z)	1.375 k-ft	6.088 k-ft	+1.20D+0.50Lr+1.60L+1.60H
PASS	0.2258	X Flexure (-Z)	1.375 k-ft	6.088 k-ft	+1.20D+0.50Lr+1.60L+1.60H
PASS	0.1892	1-way Shear (+X)	14.187 psi	75.0 psi	+1.20D+0.50Lr+1.60L+1.60H
PASS	0.1892	1-way Shear (-X)	14.187 psi	75.0 psi	+1.20D+0.50Lr+1.60L+1.60H
PASS	0.1892	1-way Shear (+Z)	14.187 psi	75.0 psi	+1.20D+0.50Lr+1.60L+1.60H
PASS	0.1892	1-way Shear (-Z)	14.187 psi	75.0 psi	+1.20D+0.50Lr+1.60L+1.60H
PASS	0.3405	2-way Punching	51.071 psi	150.0 psi	+1.20D+0.50Lr+1.60L+1.60H

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+H	2.0	n/a	0.0	0.7458	0.7458	n/a	n/a	0.373
X-X, +D+L+H	2.0	n/a	0.0	1.996	1.996	n/a	n/a	0.998
X-X, +D+Lr+H	2.0	n/a	0.0	0.7458	0.7458	n/a	n/a	0.373
X-X, +D+S+H	2.0	n/a	0.0	0.7458	0.7458	n/a	n/a	0.373
X-X, +D+0.750Lr+0.750L+H	2.0	n/a	0.0	1.683	1.683	n/a	n/a	0.842
X-X, +D+0.750L+0.750S+H	2.0	n/a	0.0	1.683	1.683	n/a	n/a	0.842
X-X, +D+0.60W+H	2.0	n/a	0.0	0.7458	0.7458	n/a	n/a	0.373
X-X, +D+0.70E+H	2.0	n/a	0.0	0.7458	0.7458	n/a	n/a	0.373
X-X, +D+0.750Lr+0.750L+0.450W+H	2.0	n/a	0.0	1.683	1.683	n/a	n/a	0.842
X-X, +D+0.750L+0.750S+0.450W+H	2.0	n/a	0.0	1.683	1.683	n/a	n/a	0.842
X-X, +D+0.750L+0.750S+0.5250E+H	2.0	n/a	0.0	1.683	1.683	n/a	n/a	0.842
X-X, +0.60D+0.60W+0.60H	2.0	n/a	0.0	0.4475	0.4475	n/a	n/a	0.224
X-X, +0.60D+0.70E+0.60H	2.0	n/a	0.0	0.4475	0.4475	n/a	n/a	0.224
Z-Z, +D+H	2.0	0.0	n/a	n/a	n/a	0.7458	0.7458	0.373
Z-Z, +D+L+H	2.0	0.0	n/a	n/a	n/a	1.996	1.996	0.998
Z-Z, +D+Lr+H	2.0	0.0	n/a	n/a	n/a	0.7458	0.7458	0.373
Z-Z, +D+S+H	2.0	0.0	n/a	n/a	n/a	0.7458	0.7458	0.373
Z-Z, +D+0.750Lr+0.750L+H	2.0	0.0	n/a	n/a	n/a	1.683	1.683	0.842
Z-Z, +D+0.750L+0.750S+H	2.0	0.0	n/a	n/a	n/a	1.683	1.683	0.842
Z-Z, +D+0.60W+H	2.0	0.0	n/a	n/a	n/a	0.7458	0.7458	0.373
Z-Z, +D+0.70E+H	2.0	0.0	n/a	n/a	n/a	0.7458	0.7458	0.373
Z-Z, +D+0.750Lr+0.750L+0.450W+H	2.0	0.0	n/a	n/a	n/a	1.683	1.683	0.842
Z-Z, +D+0.750L+0.750S+0.450W+H	2.0	0.0	n/a	n/a	n/a	1.683	1.683	0.842
Z-Z, +D+0.750L+0.750S+0.5250E+H	2.0	0.0	n/a	n/a	n/a	1.683	1.683	0.842
Z-Z, +0.60D+0.60W+0.60H	2.0	0.0	n/a	n/a	n/a	0.4475	0.4475	0.224
Z-Z, +0.60D+0.70E+0.60H	2.0	0.0	n/a	n/a	n/a	0.4475	0.4475	0.224

Overturning Stability

Rotation Axis & Load Combination...	Overturning Moment	Resisting Moment	Stability Ratio	Status

Footing Has NO Overturning

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+1.60H	0.4375	+Z	Bottom	0.216	Min Temp %	0.30	6.088	OK
X-X, +1.40D+1.60H	0.4375	-Z	Bottom	0.216	Min Temp %	0.30	6.088	OK
X-X, +1.20D+0.50Lr+1.60L+1.60H	1.375	+Z	Bottom	0.216	Min Temp %	0.30	6.088	OK
X-X, +1.20D+0.50Lr+1.60L+1.60H	1.375	-Z	Bottom	0.216	Min Temp %	0.30	6.088	OK

General Footing

Description : 2' SQ FTG - max loading

X-X, +1.20D+1.60L+0.50S+1.60H	1.375	+Z	Bottom	0.216	Min Temp %	0.30	6.088	OK

General Footing

Description : 2' SQ FTG - max loading

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, +1.20D+1.60L+0.50S+1.60H	1.375	-Z	Bottom	0.216	Min Temp %	0.30	6.088	OK
X-X, +1.20D+1.60Lr+0.50L+1.60H	0.6875	+Z	Bottom	0.216	Min Temp %	0.30	6.088	OK
X-X, +1.20D+1.60Lr+0.50L+1.60H	0.6875	-Z	Bottom	0.216	Min Temp %	0.30	6.088	OK
X-X, +1.20D+1.60Lr+0.50W+1.60H	0.3750	+Z	Bottom	0.216	Min Temp %	0.30	6.088	OK
X-X, +1.20D+1.60Lr+0.50W+1.60H	0.3750	-Z	Bottom	0.216	Min Temp %	0.30	6.088	OK
X-X, +1.20D+0.50L+1.60S+1.60H	0.6875	+Z	Bottom	0.216	Min Temp %	0.30	6.088	OK
X-X, +1.20D+0.50L+1.60S+1.60H	0.6875	-Z	Bottom	0.216	Min Temp %	0.30	6.088	OK
X-X, +1.20D+1.60S+0.50W+1.60H	0.3750	+Z	Bottom	0.216	Min Temp %	0.30	6.088	OK
X-X, +1.20D+1.60S+0.50W+1.60H	0.3750	-Z	Bottom	0.216	Min Temp %	0.30	6.088	OK
X-X, +1.20D+0.50Lr+0.50L+W+1.60H	0.6875	+Z	Bottom	0.216	Min Temp %	0.30	6.088	OK
X-X, +1.20D+0.50Lr+0.50L+W+1.60H	0.6875	-Z	Bottom	0.216	Min Temp %	0.30	6.088	OK
X-X, +1.20D+0.50L+0.50S+W+1.60H	0.6875	+Z	Bottom	0.216	Min Temp %	0.30	6.088	OK
X-X, +1.20D+0.50L+0.50S+W+1.60H	0.6875	-Z	Bottom	0.216	Min Temp %	0.30	6.088	OK
X-X, +1.20D+0.50L+0.20S+E+1.60H	0.6875	+Z	Bottom	0.216	Min Temp %	0.30	6.088	OK
X-X, +1.20D+0.50L+0.20S+E+1.60H	0.6875	-Z	Bottom	0.216	Min Temp %	0.30	6.088	OK
X-X, +0.90D+W+0.90H	0.2813	+Z	Bottom	0.216	Min Temp %	0.30	6.088	OK
X-X, +0.90D+W+0.90H	0.2813	-Z	Bottom	0.216	Min Temp %	0.30	6.088	OK
X-X, +0.90D+E+0.90H	0.2813	+Z	Bottom	0.216	Min Temp %	0.30	6.088	OK
X-X, +0.90D+E+0.90H	0.2813	-Z	Bottom	0.216	Min Temp %	0.30	6.088	OK
Z-Z, +1.40D+1.60H	0.4375	-X	Bottom	0.216	Min Temp %	0.30	6.088	OK
Z-Z, +1.40D+1.60H	0.4375	+X	Bottom	0.216	Min Temp %	0.30	6.088	OK
Z-Z, +1.20D+0.50Lr+1.60L+1.60H	1.375	-X	Bottom	0.216	Min Temp %	0.30	6.088	OK
Z-Z, +1.20D+0.50Lr+1.60L+1.60H	1.375	+X	Bottom	0.216	Min Temp %	0.30	6.088	OK
Z-Z, +1.20D+1.60L+0.50S+1.60H	1.375	-X	Bottom	0.216	Min Temp %	0.30	6.088	OK
Z-Z, +1.20D+1.60L+0.50S+1.60H	1.375	+X	Bottom	0.216	Min Temp %	0.30	6.088	OK
Z-Z, +1.20D+1.60Lr+0.50L+1.60H	0.6875	-X	Bottom	0.216	Min Temp %	0.30	6.088	OK
Z-Z, +1.20D+1.60Lr+0.50L+1.60H	0.6875	+X	Bottom	0.216	Min Temp %	0.30	6.088	OK
Z-Z, +1.20D+1.60Lr+0.50W+1.60H	0.3750	-X	Bottom	0.216	Min Temp %	0.30	6.088	OK
Z-Z, +1.20D+1.60Lr+0.50W+1.60H	0.3750	+X	Bottom	0.216	Min Temp %	0.30	6.088	OK
Z-Z, +1.20D+0.50L+1.60S+1.60H	0.6875	-X	Bottom	0.216	Min Temp %	0.30	6.088	OK
Z-Z, +1.20D+0.50L+1.60S+1.60H	0.6875	+X	Bottom	0.216	Min Temp %	0.30	6.088	OK
Z-Z, +1.20D+1.60S+0.50W+1.60H	0.3750	-X	Bottom	0.216	Min Temp %	0.30	6.088	OK
Z-Z, +1.20D+1.60S+0.50W+1.60H	0.3750	+X	Bottom	0.216	Min Temp %	0.30	6.088	OK
Z-Z, +1.20D+0.50Lr+0.50L+W+1.60H	0.6875	-X	Bottom	0.216	Min Temp %	0.30	6.088	OK
Z-Z, +1.20D+0.50Lr+0.50L+W+1.60H	0.6875	+X	Bottom	0.216	Min Temp %	0.30	6.088	OK
Z-Z, +1.20D+0.50L+0.50S+W+1.60H	0.6875	-X	Bottom	0.216	Min Temp %	0.30	6.088	OK
Z-Z, +1.20D+0.50L+0.50S+W+1.60H	0.6875	+X	Bottom	0.216	Min Temp %	0.30	6.088	OK
Z-Z, +1.20D+0.50L+0.20S+E+1.60H	0.6875	-X	Bottom	0.216	Min Temp %	0.30	6.088	OK
Z-Z, +1.20D+0.50L+0.20S+E+1.60H	0.6875	+X	Bottom	0.216	Min Temp %	0.30	6.088	OK
Z-Z, +0.90D+W+0.90H	0.2813	-X	Bottom	0.216	Min Temp %	0.30	6.088	OK
Z-Z, +0.90D+W+0.90H	0.2813	+X	Bottom	0.216	Min Temp %	0.30	6.088	OK
Z-Z, +0.90D+E+0.90H	0.2813	-X	Bottom	0.216	Min Temp %	0.30	6.088	OK
Z-Z, +0.90D+E+0.90H	0.2813	+X	Bottom	0.216	Min Temp %	0.30	6.088	OK

One Way Shear

Load Combination...	Vu @ -X	Vu @ +X	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D+1.60H	4.514 psi	4.514 psi	4.514 psi	4.514 psi	4.514 psi	75 psi	0.06019	OK
+1.20D+0.50Lr+1.60L+1.60H	14.187 psi	14.187 psi	14.187 psi	14.187 psi	14.187 psi	75 psi	0.1892	OK
+1.20D+1.60L+0.50S+1.60H	14.187 psi	14.187 psi	14.187 psi	14.187 psi	14.187 psi	75 psi	0.1892	OK
+1.20D+1.60Lr+0.50L+1.60H	7.093 psi	7.093 psi	7.093 psi	7.093 psi	7.093 psi	75 psi	0.09458	OK
+1.20D+1.60Lr+0.50W+1.60H	3.869 psi	3.869 psi	3.869 psi	3.869 psi	3.869 psi	75 psi	0.05159	OK
+1.20D+0.50L+1.60S+1.60H	7.093 psi	7.093 psi	7.093 psi	7.093 psi	7.093 psi	75 psi	0.09458	OK
+1.20D+1.60S+0.50W+1.60H	3.869 psi	3.869 psi	3.869 psi	3.869 psi	3.869 psi	75 psi	0.05159	OK
+1.20D+0.50Lr+0.50L+W+1.60H	7.093 psi	7.093 psi	7.093 psi	7.093 psi	7.093 psi	75 psi	0.09458	OK
+1.20D+0.50L+0.50S+W+1.60H	7.093 psi	7.093 psi	7.093 psi	7.093 psi	7.093 psi	75 psi	0.09458	OK
+1.20D+0.50L+0.20S+E+1.60H	7.093 psi	7.093 psi	7.093 psi	7.093 psi	7.093 psi	75 psi	0.09458	OK
+0.90D+W+0.90H	2.902 psi	2.902 psi	2.902 psi	2.902 psi	2.902 psi	75 psi	0.03869	OK
+0.90D+E+0.90H	2.902 psi	2.902 psi	2.902 psi	2.902 psi	2.902 psi	75 psi	0.03869	OK

Punching Shear

All units k

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D+1.60H	16.25 psi	150 psi	0.1083	OK
+1.20D+0.50Lr+1.60L+1.60H	51.071 psi	150 psi	0.3405	OK

General Footing

Description : 2' SQ FTG - max loading

Punching Shear

All units k

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.20D+1.60L+0.50S+1.60H	51.071 psi	150 psi	0.3405	OK
+1.20D+1.60Lr+0.50L+1.60H	25.536 psi	150 psi	0.1702	OK
+1.20D+1.60Lr+0.50W+1.60H	13.929 psi	150 psi	0.09286	OK
+1.20D+0.50L+1.60S+1.60H	25.536 psi	150 psi	0.1702	OK
+1.20D+1.60S+0.50W+1.60H	13.929 psi	150 psi	0.09286	OK
+1.20D+0.50Lr+0.50L+W+1.60H	25.536 psi	150 psi	0.1702	OK
+1.20D+0.50L+0.50S+W+1.60H	25.536 psi	150 psi	0.1702	OK
+1.20D+0.50L+0.20S+E+1.60H	25.536 psi	150 psi	0.1702	OK
+0.90D+W+0.90H	10.446 psi	150 psi	0.06964	OK
+0.90D+E+0.90H	10.446 psi	150 psi	0.06964	OK

General Footing

Description : 2.5' (30") SQ FTG @ Deck - max loading

Code References

Calculations per ACI 318-14, IBC 2015, ASCE 7-10
Load Combinations Used : ASCE 7-10

General Information

Material Properties

f'c : Concrete 28 day strength	=	3.0	ksi
fy : Rebar Yield	=	40.0	ksi
Ec : Concrete Elastic Modulus	=	3,122.0	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	:	No
Use Pedestal wt for stability, mom & shear	:	No

Soil Design Values

Allowable Soil Bearing	=	2.0	ksf
Increase Bearing By Footing Weight	=	No	
Soil Passive Resistance (for Sliding)	=	250.0	pcf
Soil/Concrete Friction Coeff.	=	0.30	

Increases based on footing Depth

Footing base depth below soil surface	=	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

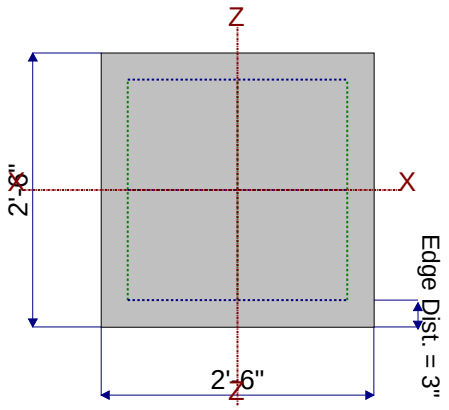
Width parallel to X-X Axis	=	2.50 ft
Length parallel to Z-Z Axis	=	2.50 ft
Footing Thickness	=	10.0 in

Pedestal dimensions...

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

Rebar Centerline to Edge of Concrete...

at Bottom of footing	=	3.0 in

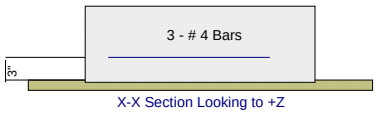


Reinforcing

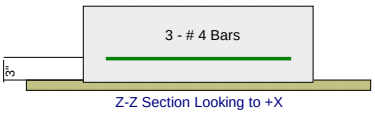
Bars parallel to X-X Axis			
Number of Bars	=		3.0
Reinforcing Bar Size	=	#	4
Bars parallel to Z-Z Axis			
Number of Bars	=		3.0
Reinforcing Bar Size	=	#	4

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



X-X Section Looking to +Z



Z-Z Section Looking to +X

Applied Loads

		D	Lr	L	S	W	E	H	
P : Column Load	=	4.0		6.0					k
OB : Overburden	=								ksf
M-xx	=								k-ft
M-zz	=								k-ft
V-x	=								k
V-z	=								k

General Footing

File = W:\ENGINE~1\FOUNDA~1\FOUNDA~1.EC6
ENERCALC, INC. 1983-2016, Build:6.16.6.7, Ver:6.14.5.31

Description : 2.5' (30") SQ FTG @ Deck - max loading

DESIGN SUMMARY

Design OK

	Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.8605	Soil Bearing	1.721 ksf	2.0 ksf	+D+L+H 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	0.3653	Z Flexure (+X)	1.80 k-ft	4.927 k-ft	+1.20D+1.60L+0.50S+1.60H
PASS	0.3653	Z Flexure (-X)	1.80 k-ft	4.927 k-ft	+1.20D+1.60L+0.50S+1.60H
PASS	0.3653	X Flexure (+Z)	1.80 k-ft	4.927 k-ft	+1.20D+1.60L+0.50S+1.60H
PASS	0.3653	X Flexure (-Z)	1.80 k-ft	4.927 k-ft	+1.20D+1.60L+0.50S+1.60H
PASS	0.2226	1-way Shear (+X)	18.286 psi	82.158 psi	+1.20D+0.50Lr+1.60L+1.60H
PASS	0.2226	1-way Shear (-X)	18.286 psi	82.158 psi	+1.20D+0.50Lr+1.60L+1.60H
PASS	0.2226	1-way Shear (+Z)	18.286 psi	82.158 psi	+1.20D+0.50Lr+1.60L+1.60H
PASS	0.2226	1-way Shear (-Z)	18.286 psi	82.158 psi	+1.20D+0.50Lr+1.60L+1.60H
PASS	0.4228	2-way Punching	69.469 psi	164.317 psi	+1.20D+0.50Lr+1.60L+1.60H

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+H	2.0	n/a	0.0	0.7608	0.7608	n/a	n/a	0.380
X-X, +D+L+H	2.0	n/a	0.0	1.721	1.721	n/a	n/a	0.861
X-X, +D+Lr+H	2.0	n/a	0.0	0.7608	0.7608	n/a	n/a	0.380
X-X, +D+S+H	2.0	n/a	0.0	0.7608	0.7608	n/a	n/a	0.380
X-X, +D+0.750Lr+0.750L+H	2.0	n/a	0.0	1.481	1.481	n/a	n/a	0.741
X-X, +D+0.750L+0.750S+H	2.0	n/a	0.0	1.481	1.481	n/a	n/a	0.741
X-X, +D+0.60W+H	2.0	n/a	0.0	0.7608	0.7608	n/a	n/a	0.380
X-X, +D+0.70E+H	2.0	n/a	0.0	0.7608	0.7608	n/a	n/a	0.380
X-X, +D+0.750Lr+0.750L+0.450W+H	2.0	n/a	0.0	1.481	1.481	n/a	n/a	0.741
X-X, +D+0.750L+0.750S+0.450W+H	2.0	n/a	0.0	1.481	1.481	n/a	n/a	0.741
X-X, +D+0.750L+0.750S+0.5250E+H	2.0	n/a	0.0	1.481	1.481	n/a	n/a	0.741
X-X, +0.60D+0.60W+0.60H	2.0	n/a	0.0	0.4565	0.4565	n/a	n/a	0.228
X-X, +0.60D+0.70E+0.60H	2.0	n/a	0.0	0.4565	0.4565	n/a	n/a	0.228
Z-Z, +D+H	2.0	0.0	n/a	n/a	n/a	0.7608	0.7608	0.380
Z-Z, +D+L+H	2.0	0.0	n/a	n/a	n/a	1.721	1.721	0.861
Z-Z, +D+Lr+H	2.0	0.0	n/a	n/a	n/a	0.7608	0.7608	0.380
Z-Z, +D+S+H	2.0	0.0	n/a	n/a	n/a	0.7608	0.7608	0.380
Z-Z, +D+0.750Lr+0.750L+H	2.0	0.0	n/a	n/a	n/a	1.481	1.481	0.741
Z-Z, +D+0.750L+0.750S+H	2.0	0.0	n/a	n/a	n/a	1.481	1.481	0.741
Z-Z, +D+0.60W+H	2.0	0.0	n/a	n/a	n/a	0.7608	0.7608	0.380
Z-Z, +D+0.70E+H	2.0	0.0	n/a	n/a	n/a	0.7608	0.7608	0.380
Z-Z, +D+0.750Lr+0.750L+0.450W+H	2.0	0.0	n/a	n/a	n/a	1.481	1.481	0.741
Z-Z, +D+0.750L+0.750S+0.450W+H	2.0	0.0	n/a	n/a	n/a	1.481	1.481	0.741
Z-Z, +D+0.750L+0.750S+0.5250E+H	2.0	0.0	n/a	n/a	n/a	1.481	1.481	0.741
Z-Z, +0.60D+0.60W+0.60H	2.0	0.0	n/a	n/a	n/a	0.4565	0.4565	0.228
Z-Z, +0.60D+0.70E+0.60H	2.0	0.0	n/a	n/a	n/a	0.4565	0.4565	0.228

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				

General Footing

Description : 2.5' (30") SQ FTG @ Deck - max loading

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+1.60H	0.70	+Z	Bottom	0.216	Min Temp %	0.240	4.927	OK

General Footing

Description : 2.5' (30") SQ FTG @ Deck - max loading

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+1.60H	0.70	-Z	Bottom	0.216	Min Temp %	0.240	4.927	OK
X-X, +1.20D+0.50Lr+1.60L+1.60H	1.80	+Z	Bottom	0.216	Min Temp %	0.240	4.927	OK
X-X, +1.20D+0.50Lr+1.60L+1.60H	1.80	-Z	Bottom	0.216	Min Temp %	0.240	4.927	OK
X-X, +1.20D+1.60L+0.50S+1.60H	1.80	+Z	Bottom	0.216	Min Temp %	0.240	4.927	OK
X-X, +1.20D+1.60L+0.50S+1.60H	1.80	-Z	Bottom	0.216	Min Temp %	0.240	4.927	OK
X-X, +1.20D+1.60Lr+0.50L+1.60H	0.9750	+Z	Bottom	0.216	Min Temp %	0.240	4.927	OK
X-X, +1.20D+1.60Lr+0.50L+1.60H	0.9750	-Z	Bottom	0.216	Min Temp %	0.240	4.927	OK
X-X, +1.20D+1.60Lr+0.50W+1.60H	0.60	+Z	Bottom	0.216	Min Temp %	0.240	4.927	OK
X-X, +1.20D+1.60Lr+0.50W+1.60H	0.60	-Z	Bottom	0.216	Min Temp %	0.240	4.927	OK
X-X, +1.20D+0.50L+1.60S+1.60H	0.9750	+Z	Bottom	0.216	Min Temp %	0.240	4.927	OK
X-X, +1.20D+0.50L+1.60S+1.60H	0.9750	-Z	Bottom	0.216	Min Temp %	0.240	4.927	OK
X-X, +1.20D+1.60S+0.50W+1.60H	0.60	+Z	Bottom	0.216	Min Temp %	0.240	4.927	OK
X-X, +1.20D+1.60S+0.50W+1.60H	0.60	-Z	Bottom	0.216	Min Temp %	0.240	4.927	OK
X-X, +1.20D+0.50Lr+0.50L+W+1.60H	0.9750	+Z	Bottom	0.216	Min Temp %	0.240	4.927	OK
X-X, +1.20D+0.50Lr+0.50L+W+1.60H	0.9750	-Z	Bottom	0.216	Min Temp %	0.240	4.927	OK
X-X, +1.20D+0.50L+0.50S+W+1.60H	0.9750	+Z	Bottom	0.216	Min Temp %	0.240	4.927	OK
X-X, +1.20D+0.50L+0.50S+W+1.60H	0.9750	-Z	Bottom	0.216	Min Temp %	0.240	4.927	OK
X-X, +1.20D+0.50L+0.20S+E+1.60H	0.9750	+Z	Bottom	0.216	Min Temp %	0.240	4.927	OK
X-X, +1.20D+0.50L+0.20S+E+1.60H	0.9750	-Z	Bottom	0.216	Min Temp %	0.240	4.927	OK
X-X, +0.90D+W+0.90H	0.450	+Z	Bottom	0.216	Min Temp %	0.240	4.927	OK
X-X, +0.90D+W+0.90H	0.450	-Z	Bottom	0.216	Min Temp %	0.240	4.927	OK
X-X, +0.90D+E+0.90H	0.450	+Z	Bottom	0.216	Min Temp %	0.240	4.927	OK
X-X, +0.90D+E+0.90H	0.450	-Z	Bottom	0.216	Min Temp %	0.240	4.927	OK
Z-Z, +1.40D+1.60H	0.70	-X	Bottom	0.216	Min Temp %	0.240	4.927	OK
Z-Z, +1.40D+1.60H	0.70	+X	Bottom	0.216	Min Temp %	0.240	4.927	OK
Z-Z, +1.20D+0.50Lr+1.60L+1.60H	1.80	-X	Bottom	0.216	Min Temp %	0.240	4.927	OK
Z-Z, +1.20D+0.50Lr+1.60L+1.60H	1.80	+X	Bottom	0.216	Min Temp %	0.240	4.927	OK
Z-Z, +1.20D+1.60L+0.50S+1.60H	1.80	-X	Bottom	0.216	Min Temp %	0.240	4.927	OK
Z-Z, +1.20D+1.60L+0.50S+1.60H	1.80	+X	Bottom	0.216	Min Temp %	0.240	4.927	OK
Z-Z, +1.20D+1.60Lr+0.50L+1.60H	0.9750	-X	Bottom	0.216	Min Temp %	0.240	4.927	OK
Z-Z, +1.20D+1.60Lr+0.50L+1.60H	0.9750	+X	Bottom	0.216	Min Temp %	0.240	4.927	OK
Z-Z, +1.20D+1.60Lr+0.50W+1.60H	0.60	-X	Bottom	0.216	Min Temp %	0.240	4.927	OK
Z-Z, +1.20D+1.60Lr+0.50W+1.60H	0.60	+X	Bottom	0.216	Min Temp %	0.240	4.927	OK
Z-Z, +1.20D+0.50L+1.60S+1.60H	0.9750	-X	Bottom	0.216	Min Temp %	0.240	4.927	OK
Z-Z, +1.20D+0.50L+1.60S+1.60H	0.9750	+X	Bottom	0.216	Min Temp %	0.240	4.927	OK
Z-Z, +1.20D+1.60S+0.50W+1.60H	0.60	-X	Bottom	0.216	Min Temp %	0.240	4.927	OK
Z-Z, +1.20D+1.60S+0.50W+1.60H	0.60	+X	Bottom	0.216	Min Temp %	0.240	4.927	OK
Z-Z, +1.20D+0.50Lr+0.50L+W+1.60H	0.9750	-X	Bottom	0.216	Min Temp %	0.240	4.927	OK
Z-Z, +1.20D+0.50Lr+0.50L+W+1.60H	0.9750	+X	Bottom	0.216	Min Temp %	0.240	4.927	OK
Z-Z, +1.20D+0.50L+0.50S+W+1.60H	0.9750	-X	Bottom	0.216	Min Temp %	0.240	4.927	OK
Z-Z, +1.20D+0.50L+0.50S+W+1.60H	0.9750	+X	Bottom	0.216	Min Temp %	0.240	4.927	OK
Z-Z, +1.20D+0.50L+0.20S+E+1.60H	0.9750	-X	Bottom	0.216	Min Temp %	0.240	4.927	OK
Z-Z, +1.20D+0.50L+0.20S+E+1.60H	0.9750	+X	Bottom	0.216	Min Temp %	0.240	4.927	OK
Z-Z, +0.90D+W+0.90H	0.450	-X	Bottom	0.216	Min Temp %	0.240	4.927	OK
Z-Z, +0.90D+W+0.90H	0.450	+X	Bottom	0.216	Min Temp %	0.240	4.927	OK
Z-Z, +0.90D+E+0.90H	0.450	-X	Bottom	0.216	Min Temp %	0.240	4.927	OK
Z-Z, +0.90D+E+0.90H	0.450	+X	Bottom	0.216	Min Temp %	0.240	4.927	OK

One Way Shear

Load Combination...	Vu @ -X	Vu @ +X	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D+1.60H	7.111 psi	7.111 psi	7.111 psi	7.111 psi	7.111 psi	82.158 psi	0.08655	OK
+1.20D+0.50Lr+1.60L+1.60H	18.286 psi	18.286 psi	18.286 psi	18.286 psi	18.286 psi	82.158 psi	0.2226	OK
+1.20D+1.60L+0.50S+1.60H	18.286 psi	18.286 psi	18.286 psi	18.286 psi	18.286 psi	82.158 psi	0.2226	OK
+1.20D+1.60Lr+0.50L+1.60H	9.905 psi	9.905 psi	9.905 psi	9.905 psi	9.905 psi	82.158 psi	0.1206	OK
+1.20D+1.60Lr+0.50W+1.60H	6.095 psi	6.095 psi	6.095 psi	6.095 psi	6.095 psi	82.158 psi	0.07419	OK
+1.20D+0.50L+1.60S+1.60H	9.905 psi	9.905 psi	9.905 psi	9.905 psi	9.905 psi	82.158 psi	0.1206	OK
+1.20D+1.60S+0.50W+1.60H	6.095 psi	6.095 psi	6.095 psi	6.095 psi	6.095 psi	82.158 psi	0.07419	OK
+1.20D+0.50Lr+0.50L+W+1.60H	9.905 psi	9.905 psi	9.905 psi	9.905 psi	9.905 psi	82.158 psi	0.1206	OK
+1.20D+0.50L+0.50S+W+1.60H	9.905 psi	9.905 psi	9.905 psi	9.905 psi	9.905 psi	82.158 psi	0.1206	OK
+1.20D+0.50L+0.20S+E+1.60H	9.905 psi	9.905 psi	9.905 psi	9.905 psi	9.905 psi	82.158 psi	0.1206	OK
+0.90D+W+0.90H	4.571 psi	4.571 psi	4.571 psi	4.571 psi	4.571 psi	82.158 psi	0.05564	OK
+0.90D+E+0.90H	4.571 psi	4.571 psi	4.571 psi	4.571 psi	4.571 psi	82.158 psi	0.05564	OK

General Footing

Description : 2.5' (30") SQ FTG @ Deck - max loading

Punching Shear

All units k

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D+1.60H	27.016 psi	164.317 psi	0.1644	OK
+1.20D+0.50Lr+1.60L+1.60H	69.469 psi	164.317 psi	0.4228	OK
+1.20D+1.60L+0.50S+1.60H	69.469 psi	164.317 psi	0.4228	OK
+1.20D+1.60Lr+0.50L+1.60H	37.629 psi	164.317 psi	0.229	OK
+1.20D+1.60Lr+0.50W+1.60H	23.156 psi	164.317 psi	0.1409	OK
+1.20D+0.50L+1.60S+1.60H	37.629 psi	164.317 psi	0.229	OK
+1.20D+1.60S+0.50W+1.60H	23.156 psi	164.317 psi	0.1409	OK
+1.20D+0.50Lr+0.50L+W+1.60H	37.629 psi	164.317 psi	0.229	OK
+1.20D+0.50L+0.50S+W+1.60H	37.629 psi	164.317 psi	0.229	OK
+1.20D+0.50L+0.20S+E+1.60H	37.629 psi	164.317 psi	0.229	OK
+0.90D+W+0.90H	17.367 psi	164.317 psi	0.1057	OK
+0.90D+E+0.90H	17.367 psi	164.317 psi	0.1057	OK

General Footing

Description : 3' SQ FTG - max loading

Code References

Calculations per ACI 318-14, IBC 2015, ASCE 7-10
Load Combinations Used : ASCE 7-10

General Information

Material Properties

f'c : Concrete 28 day strength	=	2.50	ksi
fy : Rebar Yield	=	40.0	ksi
Ec : Concrete Elastic Modulus	=	3,122.0	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	=	1.50 : 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	:	No
Use Pedestal wt for stability, mom & shear	:	No

Soil Design Values

Allowable Soil Bearing	=	2.0	ksf
Increase Bearing By Footing Weight	=	No	
Soil Passive Resistance (for Sliding)	=	250.0	pcf
Soil/Concrete Friction Coeff.	=	0.30	

Increases based on footing Depth

Footing base depth below soil surface	=	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

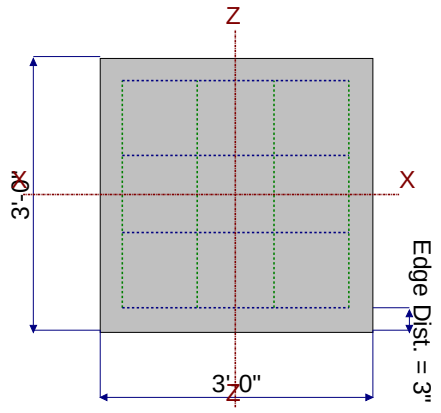
Width parallel to X-X Axis	=	3.0 ft
Length parallel to Z-Z Axis	=	3.0 ft
Footing Thickness	=	10.0 in

Pedestal dimensions...

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

Rebar Centerline to Edge of Concrete...

at Bottom of footing	=	3.0 in

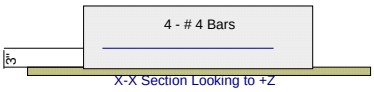


Reinforcing

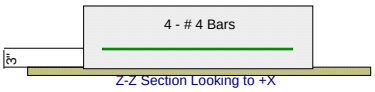
Bars parallel to X-X Axis			
Number of Bars	=		4.0
Reinforcing Bar Size	=	#	4
Bars parallel to Z-Z Axis			
Number of Bars	=		4.0
Reinforcing Bar Size	=	#	4

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	=	6.0		9.0					k
OB : Overburden	=								ksf
M-xx	=								k-ft
M-zz	=								k-ft
V-x	=								k
V-z	=								k

General Footing

Description : 3' SQ FTG - max loading

DESIGN SUMMARY

Design OK

	Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.8940	Soil Bearing	1.788 ksf	2.0 ksf	+D+L+H 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	0.4970	Z Flexure (+X)	2.70 k-ft	5.433 k-ft	+1.20D+0.50Lr+1.60L+1.60H
PASS	0.4970	Z Flexure (-X)	2.70 k-ft	5.433 k-ft	+1.20D+0.50Lr+1.60L+1.60H
PASS	0.4970	X Flexure (+Z)	2.70 k-ft	5.433 k-ft	+1.20D+0.50Lr+1.60L+1.60H
PASS	0.4970	X Flexure (-Z)	2.70 k-ft	5.433 k-ft	+1.20D+0.50Lr+1.60L+1.60H
PASS	0.3429	1-way Shear (+X)	25.714 psi	75.0 psi	+1.20D+0.50Lr+1.60L+1.60H
PASS	0.3429	1-way Shear (-X)	25.714 psi	75.0 psi	+1.20D+0.50Lr+1.60L+1.60H
PASS	0.3429	1-way Shear (+Z)	25.714 psi	75.0 psi	+1.20D+0.50Lr+1.60L+1.60H
PASS	0.3429	1-way Shear (-Z)	25.714 psi	75.0 psi	+1.20D+0.50Lr+1.60L+1.60H
PASS	0.7053	2-way Punching	105.796 psi	150.0 psi	+1.20D+0.50Lr+1.60L+1.60H

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+H	2.0	n/a	0.0	0.7875	0.7875	n/a	n/a	0.394
X-X, +D+L+H	2.0	n/a	0.0	1.788	1.788	n/a	n/a	0.894
X-X, +D+Lr+H	2.0	n/a	0.0	0.7875	0.7875	n/a	n/a	0.394
X-X, +D+S+H	2.0	n/a	0.0	0.7875	0.7875	n/a	n/a	0.394
X-X, +D+0.750Lr+0.750L+H	2.0	n/a	0.0	1.538	1.538	n/a	n/a	0.769
X-X, +D+0.750L+0.750S+H	2.0	n/a	0.0	1.538	1.538	n/a	n/a	0.769
X-X, +D+0.60W+H	2.0	n/a	0.0	0.7875	0.7875	n/a	n/a	0.394
X-X, +D+0.70E+H	2.0	n/a	0.0	0.7875	0.7875	n/a	n/a	0.394
X-X, +D+0.750Lr+0.750L+0.450W+H	2.0	n/a	0.0	1.538	1.538	n/a	n/a	0.769
X-X, +D+0.750L+0.750S+0.450W+H	2.0	n/a	0.0	1.538	1.538	n/a	n/a	0.769
X-X, +D+0.750L+0.750S+0.5250E+H	2.0	n/a	0.0	1.538	1.538	n/a	n/a	0.769
X-X, +0.60D+0.60W+0.60H	2.0	n/a	0.0	0.4725	0.4725	n/a	n/a	0.236
X-X, +0.60D+0.70E+0.60H	2.0	n/a	0.0	0.4725	0.4725	n/a	n/a	0.236
Z-Z, +D+H	2.0	0.0	n/a	n/a	n/a	0.7875	0.7875	0.394
Z-Z, +D+L+H	2.0	0.0	n/a	n/a	n/a	1.788	1.788	0.894
Z-Z, +D+Lr+H	2.0	0.0	n/a	n/a	n/a	0.7875	0.7875	0.394
Z-Z, +D+S+H	2.0	0.0	n/a	n/a	n/a	0.7875	0.7875	0.394
Z-Z, +D+0.750Lr+0.750L+H	2.0	0.0	n/a	n/a	n/a	1.538	1.538	0.769
Z-Z, +D+0.750L+0.750S+H	2.0	0.0	n/a	n/a	n/a	1.538	1.538	0.769
Z-Z, +D+0.60W+H	2.0	0.0	n/a	n/a	n/a	0.7875	0.7875	0.394
Z-Z, +D+0.70E+H	2.0	0.0	n/a	n/a	n/a	0.7875	0.7875	0.394
Z-Z, +D+0.750Lr+0.750L+0.450W+H	2.0	0.0	n/a	n/a	n/a	1.538	1.538	0.769
Z-Z, +D+0.750L+0.750S+0.450W+H	2.0	0.0	n/a	n/a	n/a	1.538	1.538	0.769
Z-Z, +D+0.750L+0.750S+0.5250E+H	2.0	0.0	n/a	n/a	n/a	1.538	1.538	0.769
Z-Z, +0.60D+0.60W+0.60H	2.0	0.0	n/a	n/a	n/a	0.4725	0.4725	0.236
Z-Z, +0.60D+0.70E+0.60H	2.0	0.0	n/a	n/a	n/a	0.4725	0.4725	0.236

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				

General Footing

Description : 3' SQ FTG - max loading

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+1.60H	1.050	+Z	Bottom	0.216	Min Temp %	0.2667	5.433	OK

General Footing

Description : 3' SQ FTG - max loading

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+1.60H	1.050	-Z	Bottom	0.216	Min Temp %	0.2667	5.433	OK
X-X, +1.20D+0.50Lr+1.60L+1.60H	2.70	+Z	Bottom	0.216	Min Temp %	0.2667	5.433	OK
X-X, +1.20D+0.50Lr+1.60L+1.60H	2.70	-Z	Bottom	0.216	Min Temp %	0.2667	5.433	OK
X-X, +1.20D+1.60L+0.50S+1.60H	2.70	+Z	Bottom	0.216	Min Temp %	0.2667	5.433	OK
X-X, +1.20D+1.60L+0.50S+1.60H	2.70	-Z	Bottom	0.216	Min Temp %	0.2667	5.433	OK
X-X, +1.20D+1.60Lr+0.50L+1.60H	1.463	+Z	Bottom	0.216	Min Temp %	0.2667	5.433	OK
X-X, +1.20D+1.60Lr+0.50L+1.60H	1.463	-Z	Bottom	0.216	Min Temp %	0.2667	5.433	OK
X-X, +1.20D+1.60Lr+0.50W+1.60H	0.90	+Z	Bottom	0.216	Min Temp %	0.2667	5.433	OK
X-X, +1.20D+1.60Lr+0.50W+1.60H	0.90	-Z	Bottom	0.216	Min Temp %	0.2667	5.433	OK
X-X, +1.20D+0.50L+1.60S+1.60H	1.463	+Z	Bottom	0.216	Min Temp %	0.2667	5.433	OK
X-X, +1.20D+0.50L+1.60S+1.60H	1.463	-Z	Bottom	0.216	Min Temp %	0.2667	5.433	OK
X-X, +1.20D+1.60S+0.50W+1.60H	0.90	+Z	Bottom	0.216	Min Temp %	0.2667	5.433	OK
X-X, +1.20D+1.60S+0.50W+1.60H	0.90	-Z	Bottom	0.216	Min Temp %	0.2667	5.433	OK
X-X, +1.20D+0.50Lr+0.50L+W+1.60H	1.463	+Z	Bottom	0.216	Min Temp %	0.2667	5.433	OK
X-X, +1.20D+0.50Lr+0.50L+W+1.60H	1.463	-Z	Bottom	0.216	Min Temp %	0.2667	5.433	OK
X-X, +1.20D+0.50L+0.50S+W+1.60H	1.463	+Z	Bottom	0.216	Min Temp %	0.2667	5.433	OK
X-X, +1.20D+0.50L+0.50S+W+1.60H	1.463	-Z	Bottom	0.216	Min Temp %	0.2667	5.433	OK
X-X, +1.20D+0.50L+0.20S+E+1.60H	1.463	+Z	Bottom	0.216	Min Temp %	0.2667	5.433	OK
X-X, +1.20D+0.50L+0.20S+E+1.60H	1.463	-Z	Bottom	0.216	Min Temp %	0.2667	5.433	OK
X-X, +0.90D+W+0.90H	0.6750	+Z	Bottom	0.216	Min Temp %	0.2667	5.433	OK
X-X, +0.90D+W+0.90H	0.6750	-Z	Bottom	0.216	Min Temp %	0.2667	5.433	OK
X-X, +0.90D+E+0.90H	0.6750	+Z	Bottom	0.216	Min Temp %	0.2667	5.433	OK
X-X, +0.90D+E+0.90H	0.6750	-Z	Bottom	0.216	Min Temp %	0.2667	5.433	OK
Z-Z, +1.40D+1.60H	1.050	-X	Bottom	0.216	Min Temp %	0.2667	5.433	OK
Z-Z, +1.40D+1.60H	1.050	+X	Bottom	0.216	Min Temp %	0.2667	5.433	OK
Z-Z, +1.20D+0.50Lr+1.60L+1.60H	2.70	-X	Bottom	0.216	Min Temp %	0.2667	5.433	OK
Z-Z, +1.20D+0.50Lr+1.60L+1.60H	2.70	+X	Bottom	0.216	Min Temp %	0.2667	5.433	OK
Z-Z, +1.20D+1.60L+0.50S+1.60H	2.70	-X	Bottom	0.216	Min Temp %	0.2667	5.433	OK
Z-Z, +1.20D+1.60L+0.50S+1.60H	2.70	+X	Bottom	0.216	Min Temp %	0.2667	5.433	OK
Z-Z, +1.20D+1.60Lr+0.50L+1.60H	1.463	-X	Bottom	0.216	Min Temp %	0.2667	5.433	OK
Z-Z, +1.20D+1.60Lr+0.50L+1.60H	1.463	+X	Bottom	0.216	Min Temp %	0.2667	5.433	OK
Z-Z, +1.20D+1.60Lr+0.50W+1.60H	0.90	-X	Bottom	0.216	Min Temp %	0.2667	5.433	OK
Z-Z, +1.20D+1.60Lr+0.50W+1.60H	0.90	+X	Bottom	0.216	Min Temp %	0.2667	5.433	OK
Z-Z, +1.20D+0.50L+1.60S+1.60H	1.463	-X	Bottom	0.216	Min Temp %	0.2667	5.433	OK
Z-Z, +1.20D+0.50L+1.60S+1.60H	1.463	+X	Bottom	0.216	Min Temp %	0.2667	5.433	OK
Z-Z, +1.20D+1.60S+0.50W+1.60H	0.90	-X	Bottom	0.216	Min Temp %	0.2667	5.433	OK
Z-Z, +1.20D+1.60S+0.50W+1.60H	0.90	+X	Bottom	0.216	Min Temp %	0.2667	5.433	OK
Z-Z, +1.20D+0.50Lr+0.50L+W+1.60H	1.463	-X	Bottom	0.216	Min Temp %	0.2667	5.433	OK
Z-Z, +1.20D+0.50Lr+0.50L+W+1.60H	1.463	+X	Bottom	0.216	Min Temp %	0.2667	5.433	OK
Z-Z, +1.20D+0.50L+0.50S+W+1.60H	1.463	-X	Bottom	0.216	Min Temp %	0.2667	5.433	OK
Z-Z, +1.20D+0.50L+0.50S+W+1.60H	1.463	+X	Bottom	0.216	Min Temp %	0.2667	5.433	OK
Z-Z, +1.20D+0.50L+0.20S+E+1.60H	1.463	-X	Bottom	0.216	Min Temp %	0.2667	5.433	OK
Z-Z, +1.20D+0.50L+0.20S+E+1.60H	1.463	+X	Bottom	0.216	Min Temp %	0.2667	5.433	OK
Z-Z, +0.90D+W+0.90H	0.6750	-X	Bottom	0.216	Min Temp %	0.2667	5.433	OK
Z-Z, +0.90D+W+0.90H	0.6750	+X	Bottom	0.216	Min Temp %	0.2667	5.433	OK
Z-Z, +0.90D+E+0.90H	0.6750	-X	Bottom	0.216	Min Temp %	0.2667	5.433	OK
Z-Z, +0.90D+E+0.90H	0.6750	+X	Bottom	0.216	Min Temp %	0.2667	5.433	OK

One Way Shear

Load Combination...	Vu @ -X	Vu @ +X	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D+1.60H	10 psi	10 psi	10 psi	10 psi	10 psi	75 psi	0.1333	OK
+1.20D+0.50Lr+1.60L+1.60H	25.714 psi	25.714 psi	25.714 psi	25.714 psi	25.714 psi	75 psi	0.3429	OK
+1.20D+1.60L+0.50S+1.60H	25.714 psi	25.714 psi	25.714 psi	25.714 psi	25.714 psi	75 psi	0.3429	OK
+1.20D+1.60Lr+0.50L+1.60H	13.929 psi	13.929 psi	13.929 psi	13.929 psi	13.929 psi	75 psi	0.1857	OK
+1.20D+1.60Lr+0.50W+1.60H	8.571 psi	8.571 psi	8.571 psi	8.571 psi	8.571 psi	75 psi	0.1143	OK
+1.20D+0.50L+1.60S+1.60H	13.929 psi	13.929 psi	13.929 psi	13.929 psi	13.929 psi	75 psi	0.1857	OK
+1.20D+1.60S+0.50W+1.60H	8.571 psi	8.571 psi	8.571 psi	8.571 psi	8.571 psi	75 psi	0.1143	OK
+1.20D+0.50Lr+0.50L+W+1.60H	13.929 psi	13.929 psi	13.929 psi	13.929 psi	13.929 psi	75 psi	0.1857	OK
+1.20D+0.50L+0.50S+W+1.60H	13.929 psi	13.929 psi	13.929 psi	13.929 psi	13.929 psi	75 psi	0.1857	OK
+1.20D+0.50L+0.20S+E+1.60H	13.929 psi	13.929 psi	13.929 psi	13.929 psi	13.929 psi	75 psi	0.1857	OK
+0.90D+W+0.90H	6.429 psi	6.429 psi	6.429 psi	6.429 psi	6.429 psi	75 psi	0.08571	OK
+0.90D+E+0.90H	6.429 psi	6.429 psi	6.429 psi	6.429 psi	6.429 psi	75 psi	0.08571	OK

General Footing

Description : 3' SQ FTG - max loading

Punching Shear

All units k

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D+1.60H	41.143 psi	150 psi	0.2743	OK
+1.20D+0.50Lr+1.60L+1.60H	105.796 psi	150 psi	0.7053	OK
+1.20D+1.60L+0.50S+1.60H	105.796 psi	150 psi	0.7053	OK
+1.20D+1.60Lr+0.50L+1.60H	57.306 psi	150 psi	0.382	OK
+1.20D+1.60Lr+0.50W+1.60H	35.265 psi	150 psi	0.2351	OK
+1.20D+0.50L+1.60S+1.60H	57.306 psi	150 psi	0.382	OK
+1.20D+1.60S+0.50W+1.60H	35.265 psi	150 psi	0.2351	OK
+1.20D+0.50Lr+0.50L+W+1.60H	57.306 psi	150 psi	0.382	OK
+1.20D+0.50L+0.50S+W+1.60H	57.306 psi	150 psi	0.382	OK
+1.20D+0.50L+0.20S+E+1.60H	57.306 psi	150 psi	0.382	OK
+0.90D+W+0.90H	26.449 psi	150 psi	0.1763	OK
+0.90D+E+0.90H	26.449 psi	150 psi	0.1763	OK

General Footing

Description : 4' SQ FTG - max loading

Code References

Calculations per ACI 318-14, IBC 2015, ASCE 7-10
Load Combinations Used : ASCE 7-10

General Information

Material Properties

f'c : Concrete 28 day strength	=	2.50	ksi
fy : Rebar Yield	=	40.0	ksi
Ec : Concrete Elastic Modulus	=	3,122.0	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	=	1.50	: 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	:	No	
Use Pedestal wt for stability, mom & shear	:	No	

Soil Design Values

Allowable Soil Bearing	=	2.0	ksf
Increase Bearing By Footing Weight	=	No	
Soil Passive Resistance (for Sliding)	=	250.0	pcf
Soil/Concrete Friction Coeff.	=	0.30	

Increases based on footing Depth

Footing base depth below soil surface	=	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

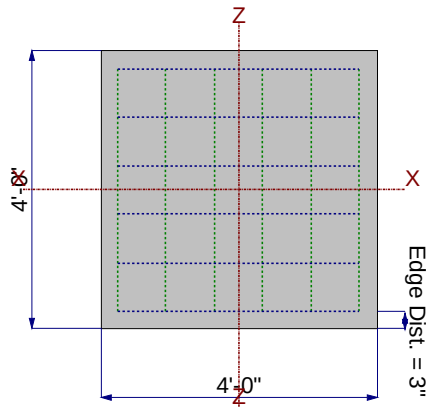
Width parallel to X-X Axis	=	4.0 ft
Length parallel to Z-Z Axis	=	4.0 ft
Footing Thickness	=	12.0 in

Pedestal dimensions...

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

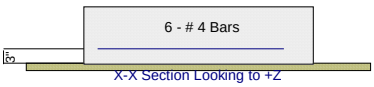
Rebar Centerline to Edge of Concrete...

at Bottom of footing	=	3.0 in

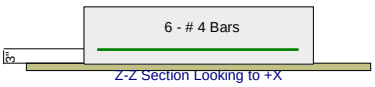


Reinforcing

Bars parallel to X-X Axis			
Number of Bars	=		6.0
Reinforcing Bar Size	=	#	4
Bars parallel to Z-Z Axis			
Number of Bars	=		6.0
Reinforcing Bar Size	=	#	4



X-X Section Looking to +Z



Z-Z Section Looking to +X

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	=	9.0		7.0	11.0				k
OB : Overburden	=								ksf
M-xx	=								k-ft
M-zz	=								k-ft
V-x	=								k
V-z	=								k

General Footing

Lic. # : KW-06011993 — L120 Engineering and Design

DESCRIPTIO 60x36x12

Code References

Calculations per ACI 318-14, IBC 2015, CBC 2016, ASCE 7-10
Load Combinations Used : ASCE 7-10

General Information

Material Properties

f'c : Concrete 28 day strength	=	2.50	ksi
fy : Rebar Yield	=	60.0	ksi
Ec : Concrete Elastic Modulus	=	3,155.92	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	:	No
Use ftg wt for stability, moments & shears	:	Yes
Add Pedestal Wt for Soil Pressure	:	No
Use Pedestal wt for stability, mom & shear	:	No

Soil Design Values

Allowable Soil Beari	=	1.50	ksf
Increase Bearing By Footing Weight	=	No	
Soil Passive Resistance (for Sliding)	=	250.0	pcf
Soil/Concrete Friction Coeff.	=	0.30	

Increases based on footing Depth

Footing base depth below soil surface	=	1.0	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

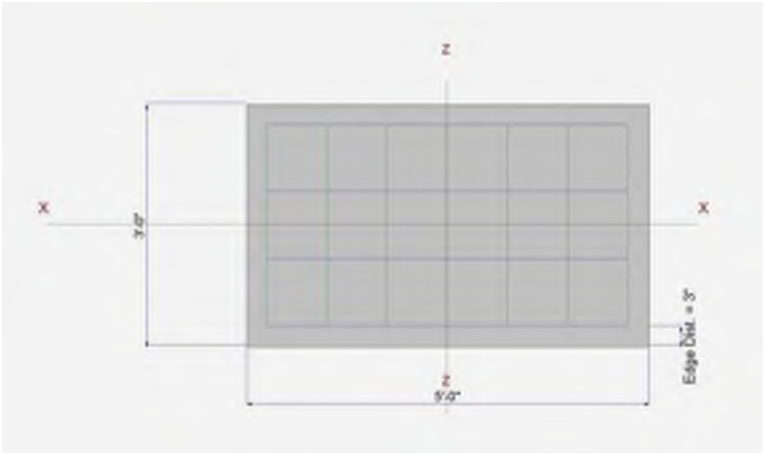
Width parallel to X-X Axis	=	5.0	ft
Length parallel to Z-Z Axis	=	3.0	ft
Footing Thickness	=	12.0	in

Pedestal dimensions...

px : parallel to X-X Axis	=		in
pz : parallel to Z-Z Axis	=		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	=		4.0
Reinforcing Bar Size	=	#	4
Bars parallel to Z-Z Axis			
Number of Bars	=		7.0
Reinforcing Bar Size	=	#	4

Bandwidth Distribution Check (ACI 15.4.4.2)

Direction Requiring Closer Separatio — Bars along Z-Z Axis

# Bars required within zone	75.0 %
# Bars required on each side of zone	25.0 %

Applied Loads

		D	Lr	L	S	W	E	H	
P : Column Load	=	7.0		6.30					k
OB : Overburden	=								ksf
M-xx	=								k-ft
M-zz	=								k-ft
V-x	=								k
V-z	=								k

General Footing

Lic. # : KW-06011993 L120 Engineering and Design

DESCRIPTIO 60x36x12

DESIGN SUMMARY

Design OK

	Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.5911	Soil Bearing	0.8867 ksf	1.50 ksf	+D+L+H 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	0.3694	Z Flexure (+X)	3.850 k-ft/ft	10.424 k-ft/ft	+1.20D+0.50Lr+1.60L+1.60H
PASS	0.3694	Z Flexure (-X)	3.850 k-ft/ft	10.424 k-ft/ft	+1.20D+0.50Lr+1.60L+1.60H
PASS	0.1269	X Flexure (+Z)	1.386 k-ft/ft	10.925 k-ft/ft	+1.20D+0.50Lr+1.60L+1.60H
PASS	0.1269	X Flexure (-Z)	1.386 k-ft/ft	10.925 k-ft/ft	+1.20D+0.50Lr+1.60L+1.60H
PASS	0.2662	1-way Shear (+X)	19.963 psi	75.0 psi	+1.20D+0.50Lr+1.60L+1.60H
PASS	0.2662	1-way Shear (-X)	19.963 psi	75.0 psi	+1.20D+0.50Lr+1.60L+1.60H
PASS	0.1141	1-way Shear (+Z)	8.556 psi	75.0 psi	+1.20D+0.50Lr+1.60L+1.60H
PASS	0.1141	1-way Shear (-Z)	8.556 psi	75.0 psi	+1.20D+0.50Lr+1.60L+1.60H
PASS	0.3660	2-way Punching	54.898 psi	150.0 psi	+1.20D+0.50Lr+1.60L+1.60H

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+H	1.50	n/a	0.0	0.4667	0.4667	n/a	n/a	0.311
X-X, +D+L+H	1.50	n/a	0.0	0.8867	0.8867	n/a	n/a	0.591
X-X, +D+Lr+H	1.50	n/a	0.0	0.4667	0.4667	n/a	n/a	0.311
X-X, +D+S+H	1.50	n/a	0.0	0.4667	0.4667	n/a	n/a	0.311
X-X, +D+0.750Lr+0.750L+H	1.50	n/a	0.0	0.7817	0.7817	n/a	n/a	0.521
X-X, +D+0.750L+0.750S+H	1.50	n/a	0.0	0.7817	0.7817	n/a	n/a	0.521
X-X, +D+0.60W+H	1.50	n/a	0.0	0.4667	0.4667	n/a	n/a	0.311
X-X, +D+0.70E+H	1.50	n/a	0.0	0.4667	0.4667	n/a	n/a	0.311
X-X, +D+0.750Lr+0.750L+0.450W	1.50	n/a	0.0	0.7817	0.7817	n/a	n/a	0.521
X-X, +D+0.750L+0.750S+0.450W	1.50	n/a	0.0	0.7817	0.7817	n/a	n/a	0.521
X-X, +D+0.750L+0.750S+0.5250E	1.50	n/a	0.0	0.7817	0.7817	n/a	n/a	0.521
X-X, +0.60D+0.60W+0.60H	1.50	n/a	0.0	0.280	0.280	n/a	n/a	0.187
X-X, +0.60D+0.70E+0.60H	1.50	n/a	0.0	0.280	0.280	n/a	n/a	0.187
Z-Z, +D+H	1.50	0.0	n/a	n/a	n/a	0.4667	0.4667	0.311
Z-Z, +D+L+H	1.50	0.0	n/a	n/a	n/a	0.8867	0.8867	0.591
Z-Z, +D+Lr+H	1.50	0.0	n/a	n/a	n/a	0.4667	0.4667	0.311
Z-Z, +D+S+H	1.50	0.0	n/a	n/a	n/a	0.4667	0.4667	0.311
Z-Z, +D+0.750Lr+0.750L+H	1.50	0.0	n/a	n/a	n/a	0.7817	0.7817	0.521
Z-Z, +D+0.750L+0.750S+H	1.50	0.0	n/a	n/a	n/a	0.7817	0.7817	0.521
Z-Z, +D+0.60W+H	1.50	0.0	n/a	n/a	n/a	0.4667	0.4667	0.311
Z-Z, +D+0.70E+H	1.50	0.0	n/a	n/a	n/a	0.4667	0.4667	0.311
Z-Z, +D+0.750Lr+0.750L+0.450W	1.50	0.0	n/a	n/a	n/a	0.7817	0.7817	0.521
Z-Z, +D+0.750L+0.750S+0.450W	1.50	0.0	n/a	n/a	n/a	0.7817	0.7817	0.521
Z-Z, +D+0.750L+0.750S+0.5250E	1.50	0.0	n/a	n/a	n/a	0.7817	0.7817	0.521
Z-Z, +0.60D+0.60W+0.60H	1.50	0.0	n/a	n/a	n/a	0.280	0.280	0.187
Z-Z, +0.60D+0.70E+0.60H	1.50	0.0	n/a	n/a	n/a	0.280	0.280	0.187

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				

General Footing

Lic. # : KW-06011993 L120 Engineering and Design

DESCRIPTIO 60x36x12

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+1.60H	0.7350	+Z	Bottom	0.2592	Min Temp %	0.280	10.925	OK
X-X, +1.40D+1.60H	0.7350	-Z	Bottom	0.2592	Min Temp %	0.280	10.925	OK
X-X, +1.20D+0.50Lr+1.60L+1.60H	1.386	+Z	Bottom	0.2592	Min Temp %	0.280	10.925	OK
X-X, +1.20D+0.50Lr+1.60L+1.60H	1.386	-Z	Bottom	0.2592	Min Temp %	0.280	10.925	OK
X-X, +1.20D+1.60L+0.50S+1.60H	1.386	+Z	Bottom	0.2592	Min Temp %	0.280	10.925	OK
X-X, +1.20D+1.60L+0.50S+1.60H	1.386	-Z	Bottom	0.2592	Min Temp %	0.280	10.925	OK
X-X, +1.20D+1.60Lr+0.50L+1.60H	0.8663	+Z	Bottom	0.2592	Min Temp %	0.280	10.925	OK
X-X, +1.20D+1.60Lr+0.50L+1.60H	0.8663	-Z	Bottom	0.2592	Min Temp %	0.280	10.925	OK
X-X, +1.20D+1.60Lr+0.50W+1.60	0.630	+Z	Bottom	0.2592	Min Temp %	0.280	10.925	OK
X-X, +1.20D+1.60Lr+0.50W+1.60	0.630	-Z	Bottom	0.2592	Min Temp %	0.280	10.925	OK
X-X, +1.20D+0.50L+1.60S+1.60H	0.8663	+Z	Bottom	0.2592	Min Temp %	0.280	10.925	OK
X-X, +1.20D+0.50L+1.60S+1.60H	0.8663	-Z	Bottom	0.2592	Min Temp %	0.280	10.925	OK
X-X, +1.20D+1.60S+0.50W+1.60H	0.630	+Z	Bottom	0.2592	Min Temp %	0.280	10.925	OK
X-X, +1.20D+1.60S+0.50W+1.60H	0.630	-Z	Bottom	0.2592	Min Temp %	0.280	10.925	OK
X-X, +1.20D+0.50Lr+0.50L+W+1.	0.8663	+Z	Bottom	0.2592	Min Temp %	0.280	10.925	OK
X-X, +1.20D+0.50Lr+0.50L+W+1.	0.8663	-Z	Bottom	0.2592	Min Temp %	0.280	10.925	OK
X-X, +1.20D+0.50L+0.50S+W+1.6	0.8663	+Z	Bottom	0.2592	Min Temp %	0.280	10.925	OK
X-X, +1.20D+0.50L+0.50S+W+1.6	0.8663	-Z	Bottom	0.2592	Min Temp %	0.280	10.925	OK
X-X, +1.20D+0.50L+0.20S+E+1.6	0.8663	+Z	Bottom	0.2592	Min Temp %	0.280	10.925	OK
X-X, +1.20D+0.50L+0.20S+E+1.6	0.8663	-Z	Bottom	0.2592	Min Temp %	0.280	10.925	OK
X-X, +0.90D+W+0.90H	0.4725	+Z	Bottom	0.2592	Min Temp %	0.280	10.925	OK
X-X, +0.90D+W+0.90H	0.4725	-Z	Bottom	0.2592	Min Temp %	0.280	10.925	OK
X-X, +0.90D+E+0.90H	0.4725	+Z	Bottom	0.2592	Min Temp %	0.280	10.925	OK
X-X, +0.90D+E+0.90H	0.4725	-Z	Bottom	0.2592	Min Temp %	0.280	10.925	OK
Z-Z, +1.40D+1.60H	2.042	-X	Bottom	0.2592	Min Temp %	0.2667	10.424	OK
Z-Z, +1.40D+1.60H	2.042	+X	Bottom	0.2592	Min Temp %	0.2667	10.424	OK
Z-Z, +1.20D+0.50Lr+1.60L+1.60H	3.850	-X	Bottom	0.2592	Min Temp %	0.2667	10.424	OK
Z-Z, +1.20D+0.50Lr+1.60L+1.60H	3.850	+X	Bottom	0.2592	Min Temp %	0.2667	10.424	OK
Z-Z, +1.20D+1.60L+0.50S+1.60H	3.850	-X	Bottom	0.2592	Min Temp %	0.2667	10.424	OK
Z-Z, +1.20D+1.60L+0.50S+1.60H	3.850	+X	Bottom	0.2592	Min Temp %	0.2667	10.424	OK
Z-Z, +1.20D+1.60Lr+0.50L+1.60H	2.406	-X	Bottom	0.2592	Min Temp %	0.2667	10.424	OK
Z-Z, +1.20D+1.60Lr+0.50L+1.60H	2.406	+X	Bottom	0.2592	Min Temp %	0.2667	10.424	OK
Z-Z, +1.20D+1.60Lr+0.50W+1.60	1.750	-X	Bottom	0.2592	Min Temp %	0.2667	10.424	OK
Z-Z, +1.20D+1.60Lr+0.50W+1.60	1.750	+X	Bottom	0.2592	Min Temp %	0.2667	10.424	OK
Z-Z, +1.20D+0.50L+1.60S+1.60H	2.406	-X	Bottom	0.2592	Min Temp %	0.2667	10.424	OK
Z-Z, +1.20D+0.50L+1.60S+1.60H	2.406	+X	Bottom	0.2592	Min Temp %	0.2667	10.424	OK
Z-Z, +1.20D+1.60S+0.50W+1.60H	1.750	-X	Bottom	0.2592	Min Temp %	0.2667	10.424	OK
Z-Z, +1.20D+1.60S+0.50W+1.60H	1.750	+X	Bottom	0.2592	Min Temp %	0.2667	10.424	OK
Z-Z, +1.20D+0.50Lr+0.50L+W+1.	2.406	-X	Bottom	0.2592	Min Temp %	0.2667	10.424	OK
Z-Z, +1.20D+0.50Lr+0.50L+W+1.	2.406	+X	Bottom	0.2592	Min Temp %	0.2667	10.424	OK
Z-Z, +1.20D+0.50L+0.50S+W+1.6	2.406	-X	Bottom	0.2592	Min Temp %	0.2667	10.424	OK
Z-Z, +1.20D+0.50L+0.50S+W+1.6	2.406	+X	Bottom	0.2592	Min Temp %	0.2667	10.424	OK
Z-Z, +1.20D+0.50L+0.20S+E+1.6	2.406	-X	Bottom	0.2592	Min Temp %	0.2667	10.424	OK
Z-Z, +1.20D+0.50L+0.20S+E+1.6	2.406	+X	Bottom	0.2592	Min Temp %	0.2667	10.424	OK
Z-Z, +0.90D+W+0.90H	1.313	-X	Bottom	0.2592	Min Temp %	0.2667	10.424	OK
Z-Z, +0.90D+W+0.90H	1.313	+X	Bottom	0.2592	Min Temp %	0.2667	10.424	OK
Z-Z, +0.90D+E+0.90H	1.313	-X	Bottom	0.2592	Min Temp %	0.2667	10.424	OK
Z-Z, +0.90D+E+0.90H	1.313	+X	Bottom	0.2592	Min Temp %	0.2667	10.424	OK

One Way Shear

Load Combination...	Vu @ -X	Vu @ +X	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D+1.60H	10.59 psi	10.59 psi	4.54 psi	4.54 psi	10.59 psi	75.00 psi	0.14	OK
+1.20D+0.50Lr+1.60L+1.60H	19.96 psi	19.96 psi	8.56 psi	8.56 psi	19.96 psi	75.00 psi	0.27	OK
+1.20D+1.60L+0.50S+1.60H	19.96 psi	19.96 psi	8.56 psi	8.56 psi	19.96 psi	75.00 psi	0.27	OK
+1.20D+1.60Lr+0.50L+1.60H	12.48 psi	12.48 psi	5.35 psi	5.35 psi	12.48 psi	75.00 psi	0.17	OK
+1.20D+1.60Lr+0.50W+1.60H	9.07 psi	9.07 psi	3.89 psi	3.89 psi	9.07 psi	75.00 psi	0.12	OK
+1.20D+0.50L+1.60S+1.60H	12.48 psi	12.48 psi	5.35 psi	5.35 psi	12.48 psi	75.00 psi	0.17	OK
+1.20D+1.60S+0.50W+1.60H	9.07 psi	9.07 psi	3.89 psi	3.89 psi	9.07 psi	75.00 psi	0.12	OK
+1.20D+0.50Lr+0.50L+W+1.60H	12.48 psi	12.48 psi	5.35 psi	5.35 psi	12.48 psi	75.00 psi	0.17	OK
+1.20D+0.50L+0.50S+W+1.60H	12.48 psi	12.48 psi	5.35 psi	5.35 psi	12.48 psi	75.00 psi	0.17	OK
+1.20D+0.50L+0.20S+E+1.60H	12.48 psi	12.48 psi	5.35 psi	5.35 psi	12.48 psi	75.00 psi	0.17	OK
+0.90D+W+0.90H	6.81 psi	6.81 psi	2.92 psi	2.92 psi	6.81 psi	75.00 psi	0.09	OK

General Footing

Lic. # : KW-06011993 L120 Engineering and Design

DESCRIPTIO 60x36x12

One Way Shear

Load Combination...	Vu @ -X	Vu @ +X	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+0.90D+E+0.90H	6.81 psi	6.81 psi	2.92 psi	2.92 psi	6.81 psi	75.00 psi	0.09	OK
							All units k	

Two-Way "Punching" Shear

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D+1.60H	29.11 psi	150.00 psi	0.1941	OK
+1.20D+0.50Lr+1.60L+1.60H	54.90 psi	150.00 psi	0.366	OK
+1.20D+1.60L+0.50S+1.60H	54.90 psi	150.00 psi	0.366	OK
+1.20D+1.60Lr+0.50L+1.60H	34.31 psi	150.00 psi	0.2287	OK
+1.20D+1.60Lr+0.50W+1.60H	24.95 psi	150.00 psi	0.1664	OK
+1.20D+0.50L+1.60S+1.60H	34.31 psi	150.00 psi	0.2287	OK
+1.20D+1.60S+0.50W+1.60H	24.95 psi	150.00 psi	0.1664	OK
+1.20D+0.50Lr+0.50L+W+1.60H	34.31 psi	150.00 psi	0.2287	OK
+1.20D+0.50L+0.50S+W+1.60H	34.31 psi	150.00 psi	0.2287	OK
+1.20D+0.50L+0.20S+E+1.60H	34.31 psi	150.00 psi	0.2287	OK
+0.90D+W+0.90H	18.72 psi	150.00 psi	0.1248	OK
+0.90D+E+0.90H	18.72 psi	150.00 psi	0.1248	OK

Project Title:
Engineer:
Project ID:
Project Descr:

Cantilevered Retaining Wall

DESCRIPTION: 10'6" backfill (2.5 ksi, 8H, 35 active, 300 passive, 2000 psf)

Code Reference

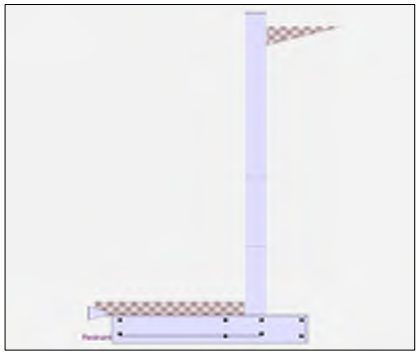
Calculations per IBC 2018 1807.3, CBC 2019, ASCE 7-16

Criteria

Retained Height	=	10.50 ft
Wall height above soil	=	0.50 ft
Slope Behind Wall	=	0.00
Height of Soil over Toe	=	6.00 in
Water height over heel	=	0.0 ft

Soil Data

Allow Soil Bearing	=	2,600.0 psf
Equivalent Fluid Pressure Method		
Active Heel Pressure	=	35.0 psf/ft
	=	
Passive Pressure	=	300.0 psf/ft
Soil Density, Heel	=	110.00 pcf
Soil Density, Toe	=	110.00 pcf
Footing||Soil Friction	=	0.450
Soil height to ignore for passive pressure	=	12.00 in



Surcharge Loads

Surcharge Over Heel	=	0.0 psf
Used To Resist Sliding & Overturning		
Surcharge Over Toe	=	0.0 psf
Used for Sliding & Overturning		

Lateral Load Applied to Stem

Lateral Load	=	84.0 #/ft
...Height to Top	=	0.00 ft
...Height to Bottom	=	0.00 ft
Load Type	=	Wind (W) (Service Level)
Wind on Exposed Stem (Service Level)	=	0.0 psf

Adjacent Footing Load

Adjacent Footing Load	=	0.0 lbs
Footing Width	=	0.00 ft
Eccentricity	=	0.00 in
Wall to Ftg CL Dist	=	0.00 ft
Footing Type		Spread Footing
Base Above/Below Soil at Back of Wall	=	0.0 ft
Poisson's Ratio	=	0.350

Axial Load Applied to Stem

Axial Dead Load	=	1,000.0 lbs
Axial Live Load	=	1,000.0 lbs
Axial Load Eccentricity	=	0.0 in

Project Title:
Engineer:
Project ID:
Project Descr:

Cantilevered Retaining Wall

LIC# : KW-06011993, Build:20.22.2.15 L120 Engineering and Design

DESCRIPTION: 10'6" backfill (2.5 ksi, 8H, 35 active, 300 passive, 2000 psf)

Design Summary

Wall Stability Ratios

Overturning	=	2.28	OK
Slab Resists All Sliding !			
Global Stability	=	1.22	
Total Bearing Load	=	5,669 lbs	
...resultant ecc.	=	2.68 in	
Soil Pressure @ Toe	=	1,156 psf	OK
Soil Pressure @ Heel	=	734 psf	OK
Allowable	=	2,600 psf	
Soil Pressure Less Than Allowable			
ACI Factored @ Toe	=	1,618 psf	
ACI Factored @ Heel	=	1,027 psf	
Footing Shear @ Toe	=	39.2 psi	OK
Footing Shear @ Heel	=	17.2 psi	OK
Allowable	=	75.0 psi	

Sliding Calcs

Lateral Sliding Force	=	2,314.4 lbs

Vertical component of active lateral soil pressure IS NOT considered in the calculation of soil bearing

Load Factors

Building Code	
Dead Load	1.200
Live Load	1.600
Earth, H	1.600
Wind, W	1.000
Seismic, E	1.000

Stem Construction

		3rd	2nd	Bottom
		Stem OK	Stem OK	Stem OK
Design Height Above Ftg	ft =	5.00	2.50	0.00
Wall Material Above "Ht"	=	Concrete	Concrete	Concrete
Design Method	=	SD	SD	SD
Thickness	=	8.00	8.00	8.00
Rebar Size	=	# 4	# 4	# 4
Rebar Spacing	=	12.00	8.00	4.00
Rebar Placed at	=	Edge	Edge	Edge
Design Data				
fb/FB + fa/Fa	=	**0.286**	**0.600**	**0.722**
Total Force @ Section				
Service Level	lbs =			
Strength Level	lbs =	847.0	1,792.0	3,087.0
Moment....Actual				
Service Level	ft-# =			
Strength Level	ft-# =	1,552.8	4,778.7	10,804.5
Moment.....Allowable	ft-# =	5,412.6	7,959.6	14,963.4
Shear.....Actual				
Service Level	psi =			
Strength Level	psi =	11.3	23.9	41.2
Shear.....Allowable	psi =	75.0	75.0	75.0
Anet (Masonry)	in2 =			
Rebar Depth 'd'	in =	6.25	6.25	6.25
Masonry Data				
f'm	psi =			
Fs	psi =			
Solid Grouting	=			
Modular Ratio 'n'	=			
Wall Weight	psf =	100.0	100.0	100.0
Short Term Factor	=			
Equiv. Solid Thick.	=			
Masonry Block Type	=			
Masonry Design Method	=	ASD		
Concrete Data				
f'c	psi =	2,500.0	2,500.0	2,500.0
Fy	psi =	60,000.0	60,000.0	60,000.0

Project Title:
Engineer:
Project ID:
Project Descr:

Cantilevered Retaining Wall

DESCRIPTION: 10'6" backfill (2.5 ksi, 8H, 35 active, 300 passive, 2000 psf)

Concrete Stem Rebar Area Details

3rd Stem	Vertical Reinforcing	Horizontal Reinforcing	
As (based on applied moment) :	0.0582 in2/ft		
(4/3) * As :	0.0776 in2/ft	Min Stem T&S Reinf Area 1.152 in2	
200bd/fy : 200(12)(6.25)/60000 :	0.25 in2/ft	Min Stem T&S Reinf Area per ft of stem Height : 0.192 in2/ft	
0.0018bh : 0.0018(12)(8) :	0.1728 in2/ft	Horizontal Reinforcing Options :	
	==========	One layer of :	Two layers of :
Required Area :	0.1728 in2/ft	#4@ 12.50 in	#4@ 25.00 in
Provided Area :	0.2 in2/ft	#5@ 19.38 in	#5@ 38.75 in
Maximum Area :	0.8467 in2/ft	#6@ 27.50 in	#6@ 55.00 in

2nd Stem	Vertical Reinforcing	Horizontal Reinforcing	
As (based on applied moment) :	0.179 in2/ft		
(4/3) * As :	0.2387 in2/ft	Min Stem T&S Reinf Area 0.480 in2	
200bd/fy : 200(12)(6.25)/60000 :	0.25 in2/ft	Min Stem T&S Reinf Area per ft of stem Height : 0.192 in2/ft	
0.0018bh : 0.0018(12)(8) :	0.1728 in2/ft	Horizontal Reinforcing Options :	
	==========	One layer of :	Two layers of :
Required Area :	0.2387 in2/ft	#4@ 12.50 in	#4@ 25.00 in
Provided Area :	0.3 in2/ft	#5@ 19.38 in	#5@ 38.75 in
Maximum Area :	0.8467 in2/ft	#6@ 27.50 in	#6@ 55.00 in

Bottom Stem	Vertical Reinforcing	Horizontal Reinforcing	
As (based on applied moment) :	0.4048 in2/ft		
(4/3) * As :	0.5397 in2/ft	Min Stem T&S Reinf Area 0.480 in2	
200bd/fy : 200(12)(6.25)/60000 :	0.25 in2/ft	Min Stem T&S Reinf Area per ft of stem Height : 0.192 in2/ft	
0.0018bh : 0.0018(12)(8) :	0.1728 in2/ft	Horizontal Reinforcing Options :	
	==========	One layer of :	Two layers of :
Required Area :	0.4048 in2/ft	#4@ 12.50 in	#4@ 25.00 in
Provided Area :	0.6 in2/ft	#5@ 19.38 in	#5@ 38.75 in
Maximum Area :	0.8467 in2/ft	#6@ 27.50 in	#6@ 55.00 in

Project Title:
Engineer:
Project ID:
Project Descr:

Cantilevered Retaining Wall

DESCRIPTION: 10'6" backfill (2.5 ksi, 8H, 35 active, 300 passive, 2000 psf)

Footing Data

Toe Width	=	4.08 ft
Heel Width	=	1.92
Total Footing Width	=	6.00
Footing Thickness	=	12.00 in
Key Width	=	12.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	2.00 ft

f'c = 2,500 psi Fy = 60,000 psi
Footing Concrete Density = 150.00 pcf
Min. As % = 0.0018
Cover @ Top 2.00 @ Btm.= 3.00 in

Footing Design Results

		Toe	Heel	
Factored Pressure	=	1,618	1,027	psf
Mu' : Upward	=	12,371	0	ft-#
Mu' : Downward	=	2,051	1,224	ft-#
Mu: Design	=	10,321	1,224	ft-#
phiMin	=	21,719	12,248	ft-#
Actual 1-Way Shear	=	39.17	17.18	psi
Allow 1-Way Shear	=	75.00	75.00	psi

Toe Reinforcing = # 4 @ 4.00 in
Heel Reinforcing = # 6 @ 18.00 in
Key Reinforcing = None Spec'd
Footing Torsion, Tu = 0.00 ft-lbs
Footing Allow. Torsion, phi Tu = 0.00 ft-lbs

If torsion exceeds allowable, provide supplemental design for footing torsion.

Other Acceptable Sizes & Spacings

Toe:
Heel:
Key:

Min footing T&S reinf Area 1.56 in2
Min footing T&S reinf Area per foot 0.26 in2 /ft

If one layer of horizontal bars:	If two layers of horizontal bars:
#4@ 9.26 in	#4@ 18.52 in
#5@ 14.35 in	#5@ 28.70 in
#6@ 20.37 in	#6@ 40.74 in

Summary of Overturning & Resisting Forces & Moments

Item		.....OVERTURNING..... Force lbs	Distance ft	Moment ft-#		.....RESISTING..... Force lbs	Distance ft	Moment ft-#
HL Act Pres (ab water tbl)		2,314.4	3.83	8,871.8	Soil Over HL (ab. water tbl)	1,444.1	5.37	7,762.0
HL Act Pres (be water tbl)					Soil Over HL (bel. water tbl)		5.37	7,762.0
Hydrostatic Force					Watre Table			
Buoyant Force	=				Sloped Soil Over Heel	=		
Surcharge over Heel	=				Surcharge Over Heel	=		
Surcharge Over Toe	=				Adjacent Footing Load	=		
Adjacent Footing Load	=				Axial Dead Load on Stem	=	1,000.0	4.42	4,416.3
Added Lateral Load	=		1.00		* Axial Live Load on Stem	=	1,000.0	4.42	4,416.3
Load @ Stem Above Soil	=				Soil Over Toe	=	224.6	2.04	458.4
	=				Surcharge Over Toe	=			
					Stem Weight(s)	=	1,100.0	4.42	4,858.0
					Earth @ Stem Transitions	=			
					Footing Weight	=	900.0	3.00	2,700.0
					Key Weight	=		2.50	
					Vert. Component	=			
Total	=	2,314.4	**O.T.M.** =	8,871.8	**Total =**		4,668.7 lbs	**R.M.=**	20,194.7

Resisting/Overturning Ratio = **2.28**
Vertical Loads used for Soil Pressure = 5,668.7 lbs

* Axial live load NOT included in total displayed, or used for overturning resistance, but is included for soil pressure calculation.

Vertical component of active lateral soil pressure IS NOT considered in the calculation of Sliding Resistance.

Vertical component of active lateral soil pressure IS NOT considered in the calculation of Overturning Resistance.

Project Title:
Engineer:
Project ID:
Project Descr:

Cantilevered Retaining Wall

DESCRIPTION: 10'6" backfill (2.5 ksi, 8H, 35 active, 300 passive, 2000 psf)

Tilt

Horizontal Deflection at Top of Wall due to settlement of soil

(Deflection due to wall bending not considered)

Soil Spring Reaction Modulus	250.0	pci
Horizontal Defl @ Top of Wall (approximate only)	0.059	in

The above calculation is not valid if the heel soil bearing pressure exceeds that of the toe, because the wall would then tend to rotate into the retained soil.

Project Title:
Engineer:
Project ID:
Project Descr:

Cantilevered Retaining Wall

DESCRIPTION: 10'6" backfill (2.5 ksi, 8H, 35 active, 300 passive, 2000 psf)

Rebar Lap & Embedment Lengths Information

Stem Design Segment: 3rd
Stem Design Height: 5.00 ft above top of footing

Lap Splice length for #4 bar specified in this stem design segment =	18.72 in
Development length for #4 bar specified in this stem design segment =	14.40 in

---

Stem Design Segment: 2nd
Stem Design Height: 2.50 ft above top of footing

Lap Splice length for #4 bar specified in this stem design segment =	18.72 in
Development length for #4 bar specified in this stem design segment =	14.40 in

---

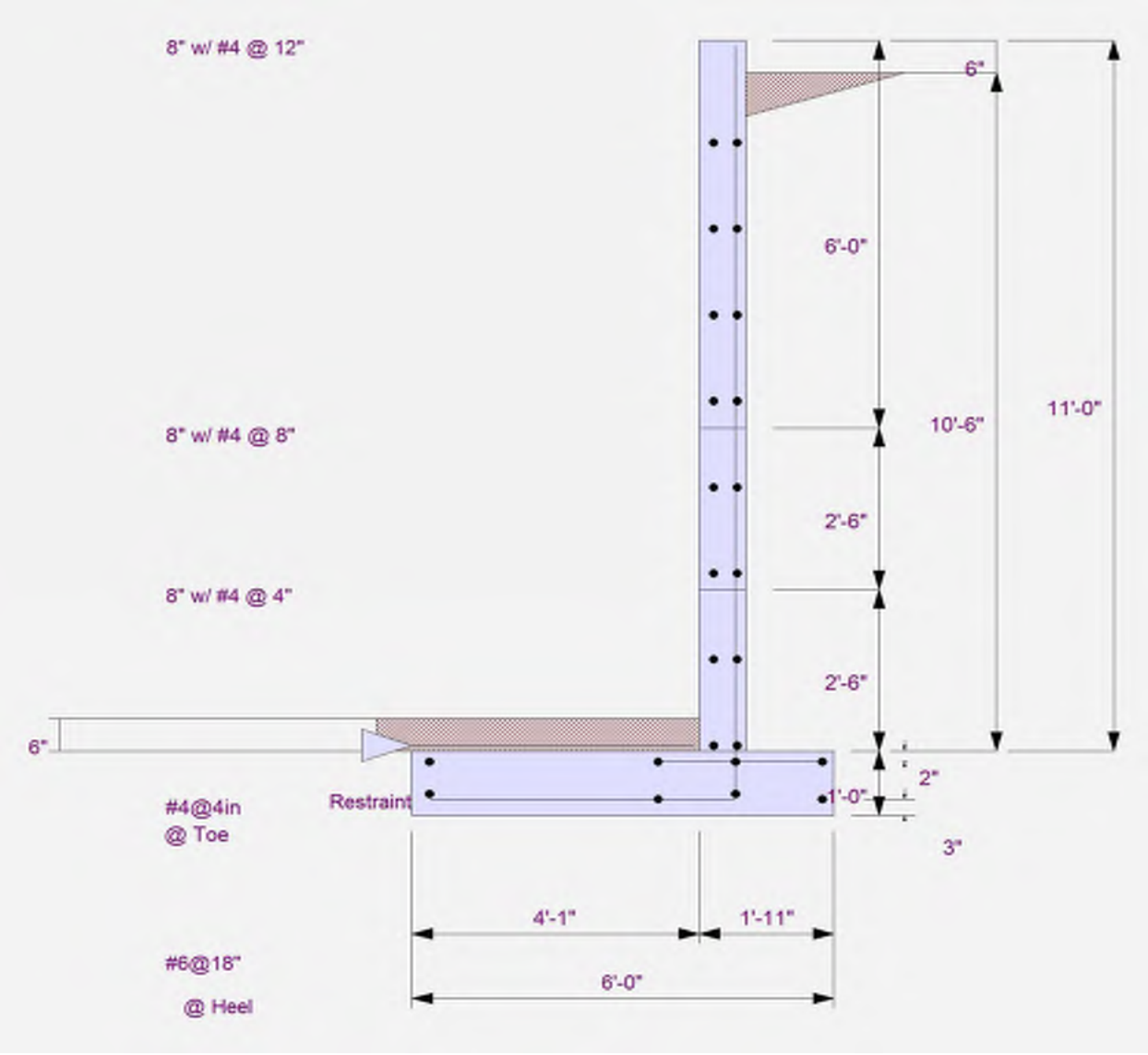
Stem Design Segment: Bottom
Stem Design Height: 0.00 ft above top of footing

Lap Splice length for #4 bar specified in this stem design segment =	18.72 in
Development length for #4 bar specified in this stem design segment =	14.40 in
Hooked embedment length into footing for #4 bar specified in this stem design segment =	8.40 in
As Provided =	0.6000 in2/ft
As Required =	0.4048 in2/ft

Project Title:
Engineer:
Project ID:
Project Descr:

Cantilevered Retaining Wall

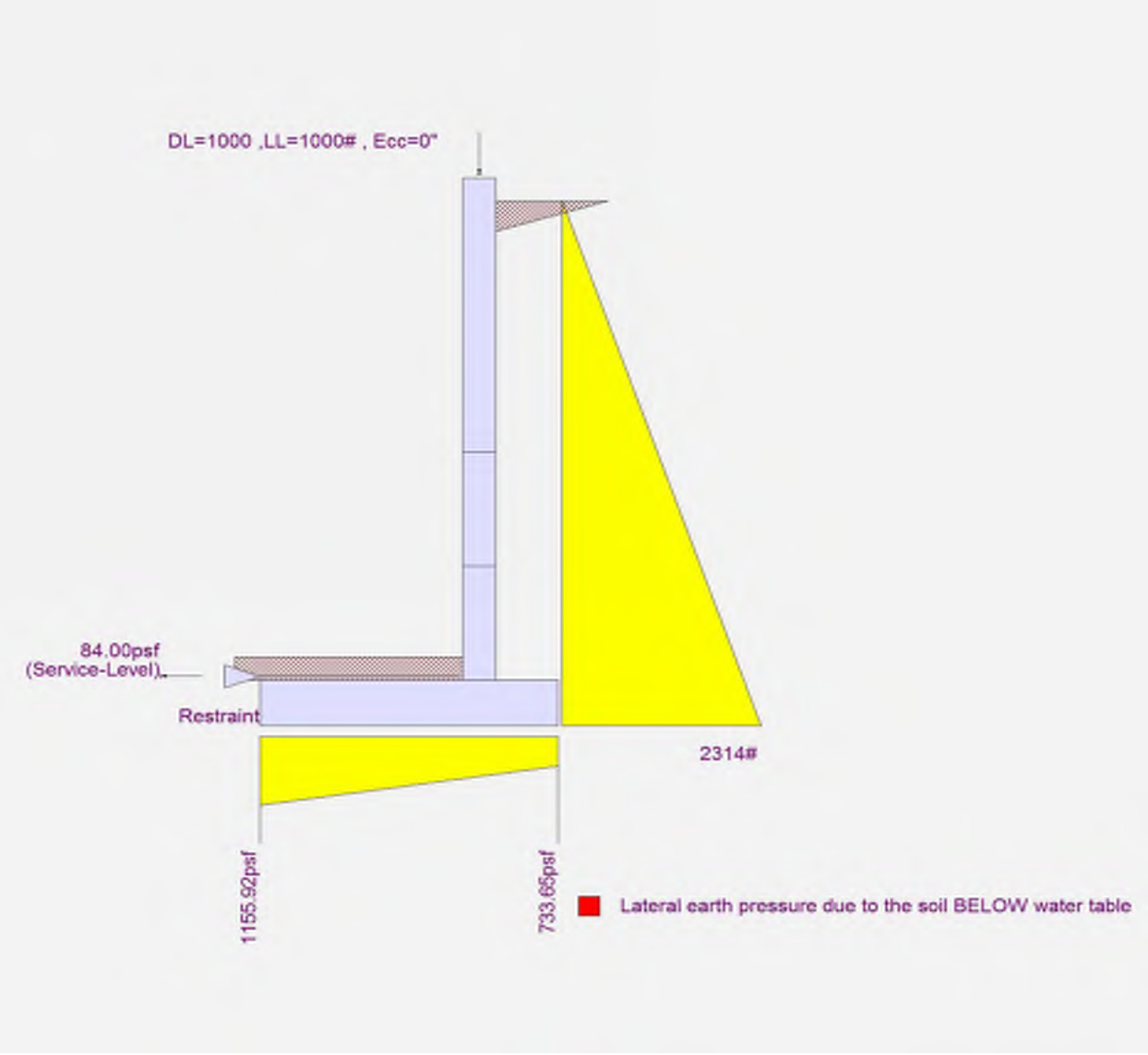
DESCRIPTION: 10'6" backfill (2.5 ksi, 8H, 35 active, 300 passive, 2000 psf)



Project Title:
Engineer:
Project ID:
Project Descr:

Cantilevered Retaining Wall

DESCRIPTION: 10'6" backfill (2.5 ksi, 8H, 35 active, 300 passive, 2000 psf)



Project Title:
Engineer:
Project ID:
Project Descr:

Cantilevered Retaining Wall

LIC# : KW-06011993, Build:20.22.2.15 L120 Engineering and Design

DESCRIPTION: 9'6" backfill (2.5 ksi, 8H, 35 active, 300 passive, 2000 psf)

Code Reference

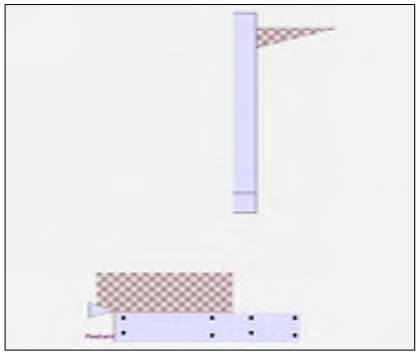
Calculations per IBC 2018 1807.3, CBC 2019, ASCE 7-16

Criteria

Retained Height	=	9.50 ft
Wall height above soil	=	0.50 ft
Slope Behind Wall	=	0.00
Height of Soil over Toe	=	16.00 in
Water height over heel	=	0.0 ft

Soil Data

Allow Soil Bearing	=	2,600.0 psf
Equivalent Fluid Pressure Method		
Active Heel Pressure	=	35.0 psf/ft
	=	
Passive Pressure	=	300.0 psf/ft
Soil Density, Heel	=	110.00 pcf
Soil Density, Toe	=	110.00 pcf
Footing||Soil Friction	=	0.450
Soil height to ignore for passive pressure	=	12.00 in



Surcharge Loads

Surcharge Over Heel	=	0.0 psf
Used To Resist Sliding & Overturning		
Surcharge Over Toe	=	0.0 psf
Used for Sliding & Overturning		

Lateral Load Applied to Stem

Lateral Load	=	76.0 #/ft
...Height to Top	=	0.00 ft
...Height to Bottom	=	0.00 ft
Load Type	=	Wind (W) (Service Level)
Wind on Exposed Stem (Service Level)	=	0.0 psf

Adjacent Footing Load

Adjacent Footing Load	=	0.0 lbs
Footing Width	=	0.00 ft
Eccentricity	=	0.00 in
Wall to Ftg CL Dist	=	0.00 ft
Footing Type		Spread Footing
Base Above/Below Soil at Back of Wall	=	0.0 ft
Poisson's Ratio	=	0.350

Axial Load Applied to Stem

Axial Dead Load	=	900.0 lbs
Axial Live Load	=	1,500.0 lbs
Axial Load Eccentricity	=	0.0 in

Project Title:
Engineer:
Project ID:
Project Descr:

Cantilevered Retaining Wall

DESCRIPTION: 9'6" backfill (2.5 ksi, 8H, 35 active, 300 passive, 2000 psf)

Design Summary

Wall Stability Ratios

Overturning	=	2.17	OK
Slab Resists All Sliding !			
Global Stability	=	1.51	
Total Bearing Load	=	5,649 lbs	
...resultant ecc.	=	3.02 in	
Soil Pressure @ Toe	=	1,386 psf	OK
Soil Pressure @ Heel	=	767 psf	OK
Allowable	=	2,600 psf	
Soil Pressure Less Than Allowable			
ACI Factored @ Toe	=	1,941 psf	
ACI Factored @ Heel	=	1,074 psf	
Footing Shear @ Toe	=	33.7 psi	OK
Footing Shear @ Heel	=	15.7 psi	OK
Allowable	=	75.0 psi	

Sliding Calcs

Lateral Sliding Force	=	1,929.4 lbs

Vertical component of active lateral soil pressure IS NOT considered in the calculation of soil bearing

Load Factors

Building Code	
Dead Load	1.200
Live Load	1.600
Earth, H	1.600
Wind, W	1.000
Seismic, E	1.000

Stem Construction

		3rd	2nd	
		Stem OK	Stem OK	
Design Height Above Ftg	ft =	4.00	3.33	
Wall Material Above "Ht"	=	Concrete	Concrete	
Design Method	=	SD	SD	SD
Thickness	=	8.00	8.00	
Rebar Size	=	# 4	# 4	
Rebar Spacing	=	12.00	6.00	
Rebar Placed at	=	Edge	Edge	
Design Data				
fb/FB + fa/Fa	=	**0.286**	**0.210**	
Total Force @ Section				
Service Level	lbs =			
Strength Level	lbs =	847.0	1,065.9	
Moment....Actual				
Service Level	ft-# =			
Strength Level	ft-# =	1,552.8	2,192.3	
Moment.....Allowable	ft-# =	5,412.6	10,400.4	
Shear.....Actual				
Service Level	psi =			
Strength Level	psi =	11.3	14.2	
Shear.....Allowable	psi =	75.0	75.0	
Anet (Masonry)	in2 =			
Rebar Depth 'd'	in =	6.25	6.25	
Masonry Data				
f'm	psi =			
Fs	psi =			
Solid Grouting	=			
Modular Ratio 'n'	=			
Wall Weight	psf =	100.0	100.0	
Short Term Factor	=			
Equiv. Solid Thick.	=			
Masonry Block Type	=			
Masonry Design Method	=	ASD		
Concrete Data				
f'c	psi =	2,500.0	2,500.0	
Fy	psi =	60,000.0	60,000.0	

Project Title:
Engineer:
Project ID:
Project Descr:

Cantilevered Retaining Wall

DESCRIPTION: 9'6" backfill (2.5 ksi, 8H, 35 active, 300 passive, 2000 psf)

Concrete Stem Rebar Area Details

2nd Stem	Vertical Reinforcing	Horizontal Reinforcing	
As (based on applied moment) :	0.0582 in2/ft		
(4/3) * As :	0.0776 in2/ft	Min Stem T&S Reinf Area 1.152 in2	
200bd/fy : 200(12)(6.25)/60000 :	0.25 in2/ft	Min Stem T&S Reinf Area per ft of stem Height : 0.192 in2/ft	
0.0018bh : 0.0018(12)(8) :	0.1728 in2/ft	Horizontal Reinforcing Options :	
	==========	One layer of :	Two layers of :
Required Area :	0.1728 in2/ft	#4@ 12.50 in	#4@ 25.00 in
Provided Area :	0.2 in2/ft	#5@ 19.38 in	#5@ 38.75 in
Maximum Area :	0.8467 in2/ft	#6@ 27.50 in	#6@ 55.00 in

Bottom Stem	Vertical Reinforcing	Horizontal Reinforcing	
As (based on applied moment) :	0.0821 in2/ft		
(4/3) * As :	0.1095 in2/ft	Min Stem T&S Reinf Area 0.129 in2	
200bd/fy : 200(12)(6.25)/60000 :	0.25 in2/ft	Min Stem T&S Reinf Area per ft of stem Height : 0.192 in2/ft	
0.0018bh : 0.0018(12)(8) :	0.1728 in2/ft	Horizontal Reinforcing Options :	
	==========	One layer of :	Two layers of :
Required Area :	0.1728 in2/ft	#4@ 12.50 in	#4@ 25.00 in
Provided Area :	0.4 in2/ft	#5@ 19.38 in	#5@ 38.75 in
Maximum Area :	0.8467 in2/ft	#6@ 27.50 in	#6@ 55.00 in

Footing Data

Toe Width	=	3.33 ft
Heel Width	=	1.92
Total Footing Width	=	5.25
Footing Thickness	=	12.00 in
Key Width	=	12.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	2.00 ft

f'c = 2,500 psi Fy = 60,000 psi
Footing Concrete Density = 150.00 pcf
Min. As % = 0.0018
Cover @ Top 2.00 @ Btm.= 3.00 in

Footing Design Results

		Toe	Heel	
Factored Pressure	=	1,941	1,074	psf
Mu' : Upward	=	9,744	0	ft-#
Mu' : Downward	=	1,974	1,121	ft-#
Mu: Design	=	7,770	1,121	ft-#
phiMin	=	14,903	12,248	ft-#
Actual 1-Way Shear	=	33.66	15.73	psi
Allow 1-Way Shear	=	75.00	75.00	psi

Toe Reinforcing = # 4 @ 6.00 in
Heel Reinforcing = # 6 @ 18.00 in
Key Reinforcing = None Spec'd
Footing Torsion, Tu = 0.00 ft-lbs
Footing Allow. Torsion, phi Tu = 0.00 ft-lbs

If torsion exceeds allowable, provide supplemental design for footing torsion.

Other Acceptable Sizes & Spacings

Toe:
Heel:
Key:

Min footing T&S reinf Area 1.36 in2
Min footing T&S reinf Area per foot 0.26 in2 /ft

If one layer of horizontal bars:	If two layers of horizontal bars:
#4@ 9.26 in	#4@ 18.52 in
#5@ 14.35 in	#5@ 28.70 in
#6@ 20.37 in	#6@ 40.74 in

Project Title:
Engineer:
Project ID:
Project Descr:

Cantilevered Retaining Wall

DESCRIPTION: 9'6" backfill (2.5 ksi, 8H, 35 active, 300 passive, 2000 psf)

Summary of Overturning & Resisting Forces & Moments

Item		.....OVERTURNING..... Force lbs	Distance ft	Moment ft-#		.....RESISTING..... Force lbs	Distance ft	Moment ft-#
HL Act Pres (ab water tbl)		1,929.4	3.50	6,752.8	Soil Over HL (ab. water tbl)	1,306.6	4.62	6,038.9
HL Act Pres (be water tbl)					Soil Over HL (bel. water tbl)		4.62	6,038.9
Hydrostatic Force					Watre Table			
Buoyant Force	=				Sloped Soil Over Heel	=		
Surcharge over Heel	=				Surcharge Over Heel	=		
Surcharge Over Toe	=				Adjacent Footing Load	=		
Adjacent Footing Load	=				Axial Dead Load on Stem	= 900.0	3.66	3,297.0
Added Lateral Load	=		1.00		* Axial Live Load on Stem	= 1,500.0	3.66	5,495.0
Load @ Stem Above Soil	=				Soil Over Toe	= 488.4	1.67	813.2
	=				Surcharge Over Toe	=		
					Stem Weight(s)	= 667.0	3.66	2,443.4
					Earth @ Stem Transitions	=		
					Footing Weight	= 787.1	2.62	2,064.8
					Key Weight	=	2.50	
					Vert. Component	=		
Total	=	1,929.4	**O.T.M.** =	6,752.8	**Total =**	4,149.0 lbs	**R.M.=**	14,657.3

Resisting/Overturning Ratio = **2.17**
Vertical Loads used for Soil Pressure = 5,649.0 lbs

* Axial live load NOT included in total displayed, or used for overturning resistance, but is included for soil pressure calculation.

Vertical component of active lateral soil pressure IS NOT considered in the calculation of Sliding Resistance.

Vertical component of active lateral soil pressure IS NOT considered in the calculation of Overturning Resistance.

Tilt

Horizontal Deflection at Top of Wall due to settlement of soil

(Deflection due to wall bending not considered)

Soil Spring Reaction Modulus	250.0	pci
Horizontal Defl @ Top of Wall (approximate only)	0.073	in

The above calculation is not valid if the heel soil bearing pressure exceeds that of the toe, because the wall would then tend to rotate into the retained soil.

Project Title:
Engineer:
Project ID:
Project Descr:

Cantilevered Retaining Wall

DESCRIPTION: 9'6" backfill (2.5 ksi, 8H, 35 active, 300 passive, 2000 psf)

Rebar Lap & Embedment Lengths Information

Stem Design Segment: 2nd
Stem Design Height: 4.00 ft above top of footing

Lap Splice length for #4 bar specified in this stem design segment =	18.72 in
Development length for #4 bar specified in this stem design segment =	14.40 in

---

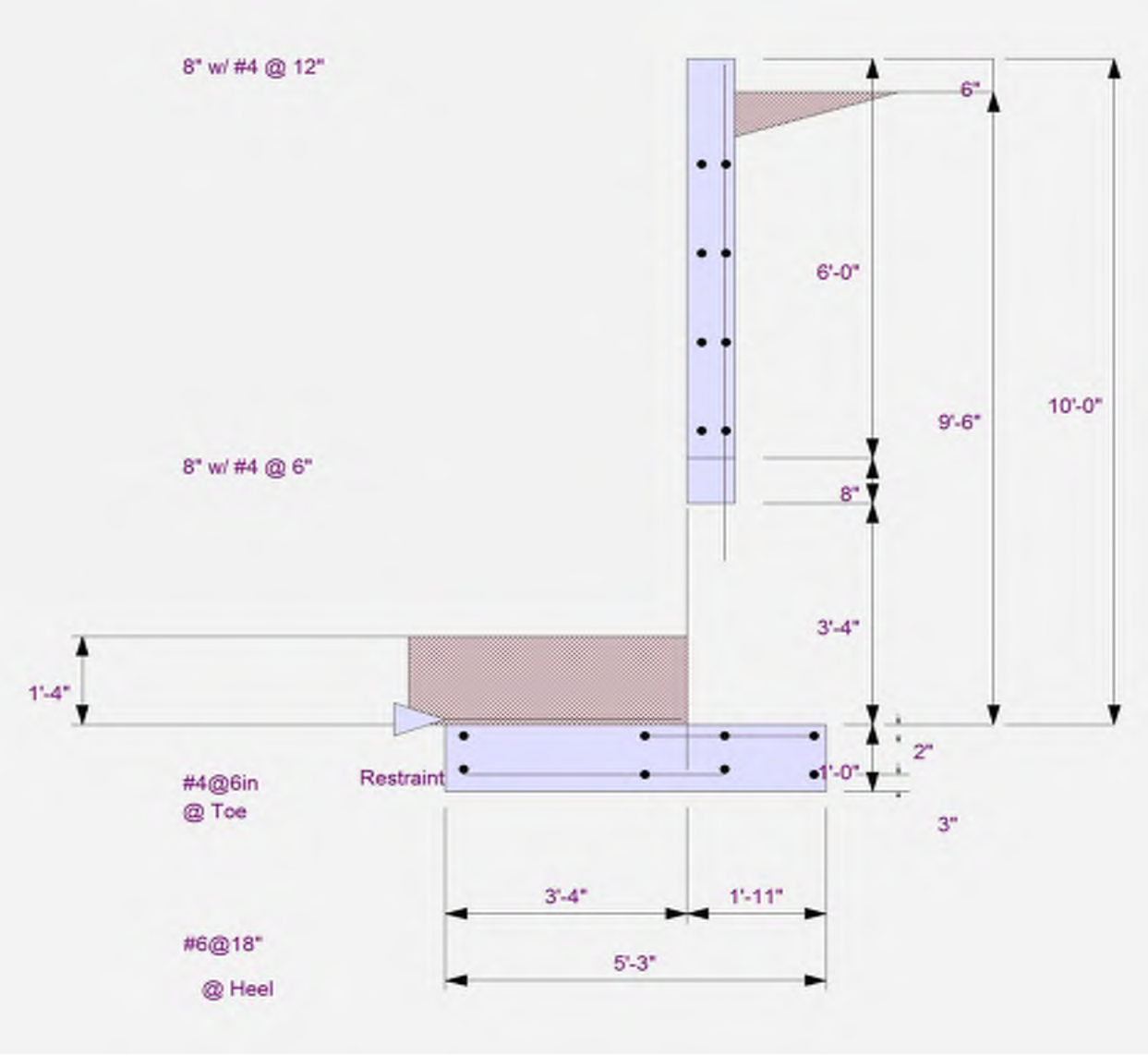
Stem Design Segment: Bottom
Stem Design Height: 3.33 ft above top of footing

Lap Splice length for #4 bar specified in this stem design segment =	18.72 in
Development length for #4 bar specified in this stem design segment =	14.40 in
Hooked embedment length into footing for #4 bar specified in this stem design segment =	8.40 in
As Provided =	0.4000 in2/ft
As Required =	0.1728 in2/ft

Project Title:
Engineer:
Project ID:
Project Descr:

Cantilevered Retaining Wall

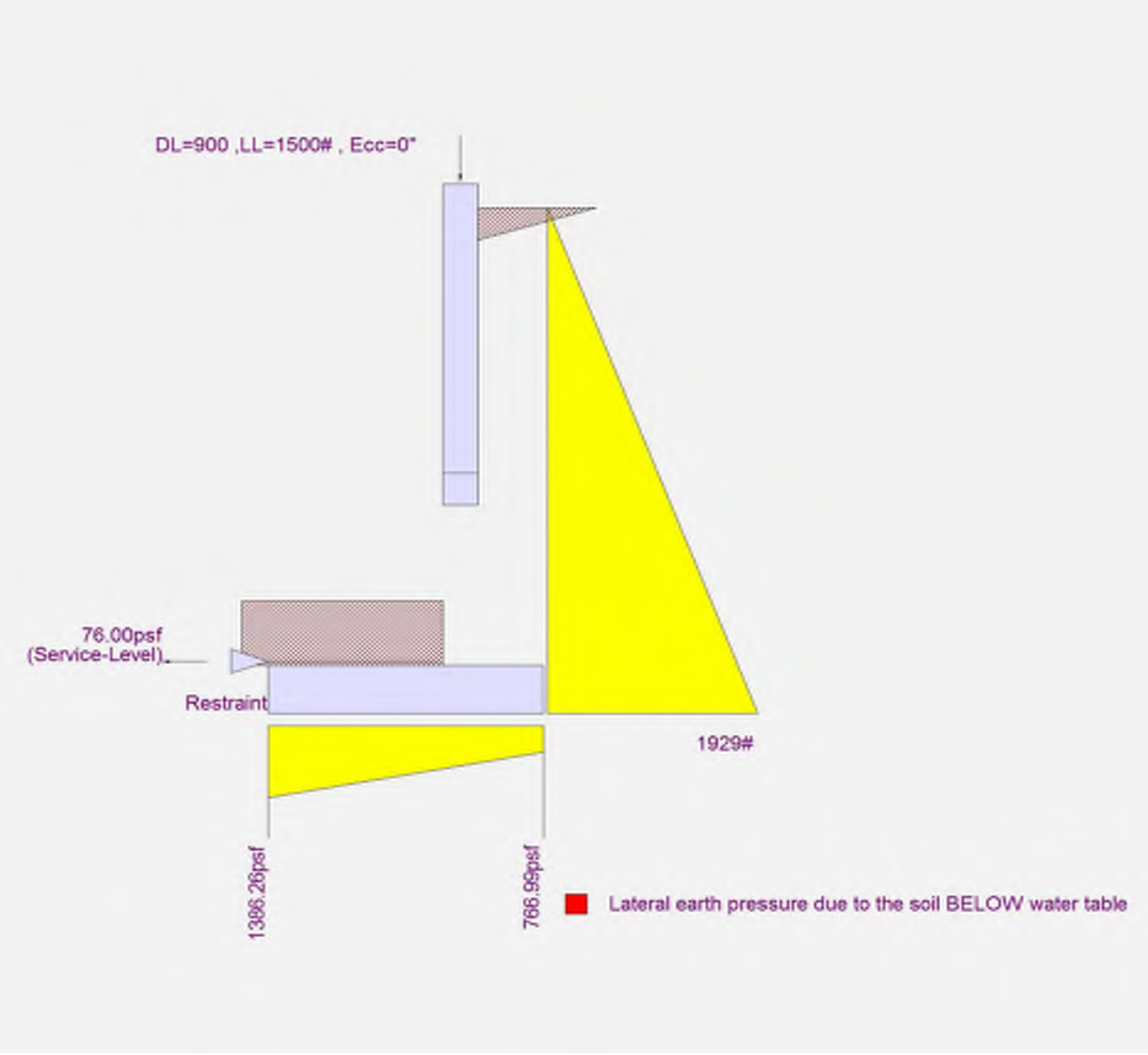
DESCRIPTION: 9'6" backfill (2.5 ksi, 8H, 35 active, 300 passive, 2000 psf)



Project Title:
Engineer:
Project ID:
Project Descr:

Cantilevered Retaining Wall

DESCRIPTION: 9'6" backfill (2.5 ksi, 8H, 35 active, 300 passive, 2000 psf)



Project Title:
Engineer:
Project ID:
Project Descr:

Cantilevered Retaining Wall

DESCRIPTION: 8' backfill (2.5 ksi, 8H, 35 active, 300 passive, 2000 psf)

Code Reference

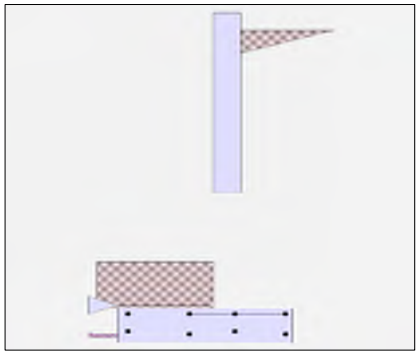
Calculations per IBC 2018 1807.3, CBC 2019, ASCE 7-16

Criteria

Retained Height	=	8.00 ft
Wall height above soil	=	0.50 ft
Slope Behind Wall	=	0.00
Height of Soil over Toe	=	16.00 in
Water height over heel	=	0.0 ft

Soil Data

Allow Soil Bearing	=	2,600.0 psf
Equivalent Fluid Pressure Method		
Active Heel Pressure	=	35.0 psf/ft
	=	
Passive Pressure	=	300.0 psf/ft
Soil Density, Heel	=	110.00 pcf
Soil Density, Toe	=	110.00 pcf
Footing||Soil Friction	=	0.450
Soil height to ignore for passive pressure	=	12.00 in



Surcharge Loads

Surcharge Over Heel	=	0.0 psf
Used To Resist Sliding & Overturning		
Surcharge Over Toe	=	0.0
Used for Sliding & Overturning		

Lateral Load Applied to Stem

Lateral Load	=	64.0 #/ft
...Height to Top	=	0.00 ft
...Height to Bottom	=	0.00 ft
Load Type	=	Wind (W) (Service Level)
Wind on Exposed Stem (Service Level)	=	0.0 psf

Adjacent Footing Load

Adjacent Footing Load	=	0.0 lbs
Footing Width	=	0.00 ft
Eccentricity	=	0.00 in
Wall to Ftg CL Dist	=	0.00 ft
Footing Type		Spread Footing
Base Above/Below Soil at Back of Wall	=	0.0 ft
Poisson's Ratio	=	0.350

Axial Load Applied to Stem

Axial Dead Load	=	900.0 lbs
Axial Live Load	=	1,500.0 lbs
Axial Load Eccentricity	=	0.0 in

Project Title:
Engineer:
Project ID:
Project Descr:

Cantilevered Retaining Wall

DESCRIPTION: 8' backfill (2.5 ksi, 8H, 35 active, 300 passive, 2000 psf)

Design Summary

Wall Stability Ratios

Overturning	=	2.24	OK
Slab Resists All Sliding !			
Global Stability	=	1.79	
Total Bearing Load	=	4,996 lbs	
...resultant ecc.	=	3.26 in	
Soil Pressure @ Toe	=	1,628 psf	OK
Soil Pressure @ Heel	=	725 psf	OK
Allowable	=	2,600 psf	
Soil Pressure Less Than Allowable			
ACI Factored @ Toe	=	2,279 psf	
ACI Factored @ Heel	=	1,015 psf	
Footing Shear @ Toe	=	25.8 psi	OK
Footing Shear @ Heel	=	13.6 psi	OK
Allowable	=	75.0 psi	

Sliding Calcs

Lateral Sliding Force	=	1,417.5 lbs

Vertical component of active lateral soil pressure IS NOT considered in the calculation of soil bearing

Load Factors

Building Code	
Dead Load	1.200
Live Load	1.600
Earth, H	1.600
Wind, W	1.000
Seismic, E	1.000

Stem Construction

		2nd		
		Stem OK		
Design Height Above Ftg	ft =	3.33		
Wall Material Above "Ht"	=	Concrete		
Design Method	=	SD	SD	SD
Thickness	=	8.00		
Rebar Size	=	# 4		
Rebar Spacing	=	9.00		
Rebar Placed at	=	Edge		
Design Data				
fb/FB + fa/Fa	=	**0.133**		
Total Force @ Section				
Service Level	lbs =			
Strength Level	lbs =	610.6		
Moment....Actual				
Service Level	ft-# =			
Strength Level	ft-# =	950.6		
Moment.....Allowable	=	7,122.4		
Shear.....Actual				
Service Level	psi =			
Strength Level	psi =	8.1		
Shear.....Allowable	psi =	75.0		
Anet (Masonry)	in2 =			
Rebar Depth 'd'	in =	6.25		
Masonry Data				
f'm	psi =			
Fs	psi =			
Solid Grouting	=			
Modular Ratio 'n'	=			
Wall Weight	psf =	100.0		
Short Term Factor	=			
Equiv. Solid Thick.	=			
Masonry Block Type	=			
Masonry Design Method	=	ASD		
Concrete Data				
f'c	psi =	2,500.0		
Fy	psi =	60,000.0		

Project Title:
Engineer:
Project ID:
Project Descr:

Cantilevered Retaining Wall

DESCRIPTION: 8' backfill (2.5 ksi, 8H, 35 active, 300 passive, 2000 psf)

Concrete Stem Rebar Area Details

Bottom Stem	Vertical Reinforcing	Horizontal Reinforcing	
As (based on applied moment) :	0.0356 in2/ft		
(4/3) * As :	0.0475 in2/ft	Min Stem T&S Reinf Area 0.993 in2	
200bd/fy : 200(12)(6.25)/60000 :	0.25 in2/ft	Min Stem T&S Reinf Area per ft of stem Height : 0.192 in2/ft	
0.0018bh : 0.0018(12)(8) :	0.1728 in2/ft	Horizontal Reinforcing Options :	
	==========	One layer of :	Two layers of :
Required Area :	0.1728 in2/ft	#4@ 12.50 in	#4@ 25.00 in
Provided Area :	0.2667 in2/ft	#5@ 19.38 in	#5@ 38.75 in
Maximum Area :	0.8467 in2/ft	#6@ 27.50 in	#6@ 55.00 in

Footing Data

Toe Width	=	2.33 ft
Heel Width	=	1.92
Total Footing Width	=	4.25
Footing Thickness	=	12.00 in
Key Width	=	12.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	2.00 ft

f'c = 2,500 psi Fy = 60,000 psi
Footing Concrete Density = 150.00 pcf
Min. As % = 0.0018
Cover @ Top 2.00 @ Btm.= 3.00 in

Footing Design Results

		Toe	Heel	
Factored Pressure	=	2,279	1,015	psf
Mu' : Upward	=	5,558	0	ft-#
Mu' : Downward	=	966	966	ft-#
Mu: Design	=	4,592	966	ft-#
phiMin	=	10,125	12,248	ft-#
Actual 1-Way Shear	=	25.80	13.56	psi
Allow 1-Way Shear	=	75.00	75.00	psi

Toe Reinforcing = # 4 @ 9.00 in
Heel Reinforcing = # 6 @ 18.00 in
Key Reinforcing = None Spec'd
Footing Torsion, Tu = 0.00 ft-lbs
Footing Allow. Torsion, phi Tu = 0.00 ft-lbs

If torsion exceeds allowable, provide supplemental design for footing torsion.

Other Acceptable Sizes & Spacings

Toe:
Heel:
Key:

Min footing T&S reinf Area 1.10 in2
Min footing T&S reinf Area per foot 0.26 in2 /ft

If one layer of horizontal bars:	If two layers of horizontal bars:
#4@ 9.26 in	#4@ 18.52 in
#5@ 14.35 in	#5@ 28.70 in
#6@ 20.37 in	#6@ 40.74 in

Project Title:
Engineer:
Project ID:
Project Descr:

Cantilevered Retaining Wall

DESCRIPTION: 8' backfill (2.5 ksi, 8H, 35 active, 300 passive, 2000 psf)

Summary of Overturning & Resisting Forces & Moments

Item		.....OVERTURNING..... Force lbs	Distance ft	Moment ft-#		.....RESISTING..... Force lbs	Distance ft	Moment ft-#
HL Act Pres (ab water tbl)		1,417.5	3.00	4,252.5	Soil Over HL (ab. water tbl)	1,100.3	3.62	3,985.1
HL Act Pres (be water tbl)					Soil Over HL (bel. water tbl)		3.62	3,985.1
Hydrostatic Force					Watre Table			
Buoyant Force	=				Sloped Soil Over Heel	=		
Surcharge over Heel	=				Surcharge Over Heel	=		
Surcharge Over Toe	=				Adjacent Footing Load	=		
Adjacent Footing Load	=				Axial Dead Load on Stem	=	900.0	2.66	2,397.0
Added Lateral Load	=		1.00		* Axial Live Load on Stem	=	1,500.0	2.66	3,995.0
Load @ Stem Above Soil	=				Soil Over Toe	=	341.7	1.17	398.1
	=				Surcharge Over Toe	=			
					Stem Weight(s)	=	517.0	2.66	1,376.9
					Earth @ Stem Transitions	=			
					Footing Weight	=	637.1	2.12	1,352.8
					Key Weight	=		2.50	
					Vert. Component	=			
Total	=	1,417.5	**O.T.M.** =	4,252.5	**Total =**		3,496.1 lbs	**R.M.=**	9,509.9

Resisting/Overturning Ratio = **2.24**

Vertical Loads used for Soil Pressure = 4,996.1 lbs

* Axial live load NOT included in total displayed, or used for overturning resistance, but is included for soil pressure calculation.

Vertical component of active lateral soil pressure IS NOT considered in the calculation of Sliding Resistance.

Vertical component of active lateral soil pressure IS NOT considered in the calculation of Overturning Resistance.

Tilt

Horizontal Deflection at Top of Wall due to settlement of soil

(Deflection due to wall bending not considered)

Soil Spring Reaction Modulus	250.0	pci
Horizontal Defl @ Top of Wall (approximate only)	0.090	in

The above calculation is not valid if the heel soil bearing pressure exceeds that of the toe, because the wall would then tend to rotate into the retained soil.

Project Title:
Engineer:
Project ID:
Project Descr:

Cantilevered Retaining Wall

DESCRIPTION: 8' backfill (2.5 ksi, 8H, 35 active, 300 passive, 2000 psf)

Rebar Lap & Embedment Lengths Information

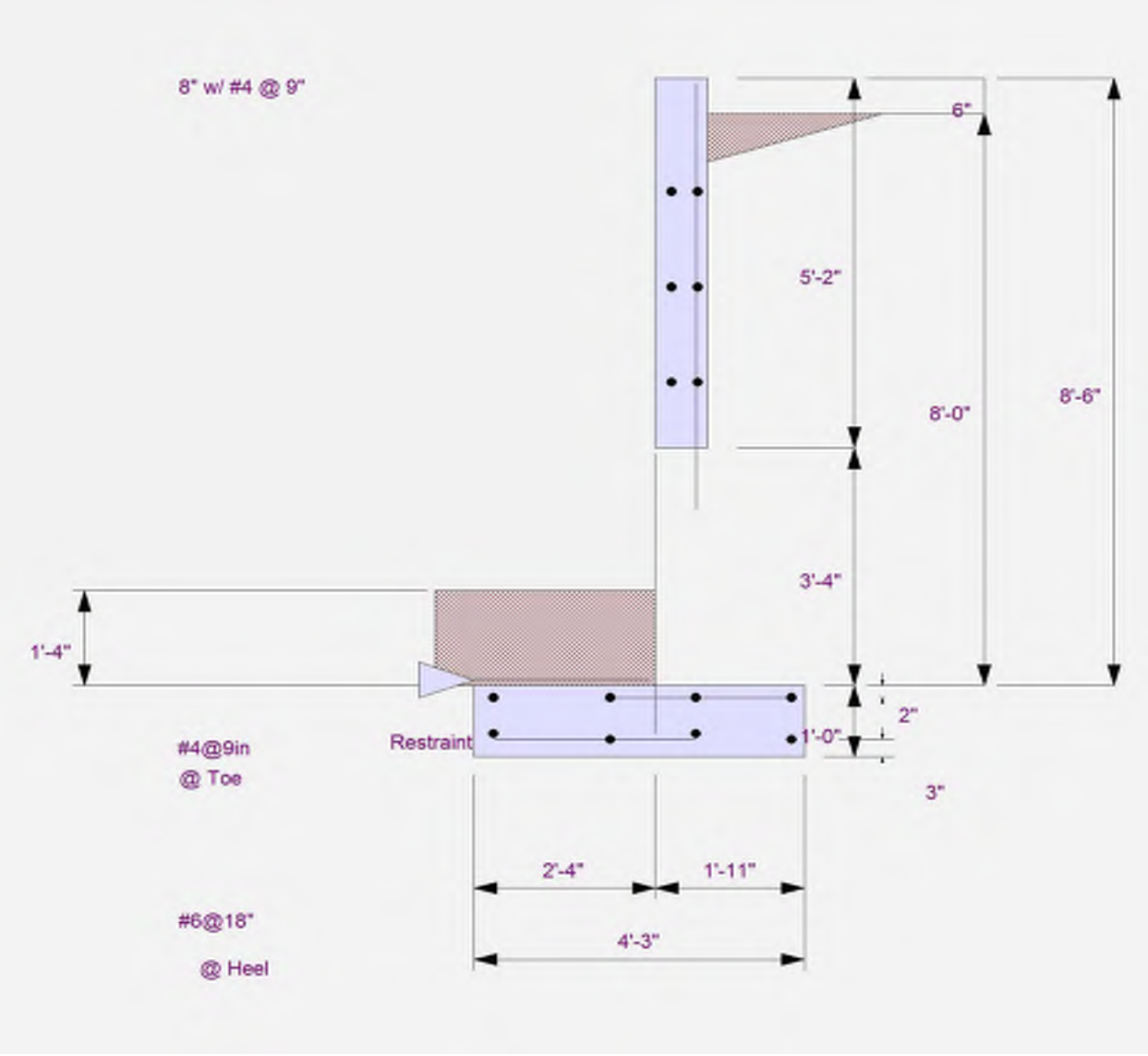
Stem Design Segment: Bottom
Stem Design Height: 3.33 ft above top of footing

Lap Splice length for #4 bar specified in this stem design segment =	18.72 in
Development length for #4 bar specified in this stem design segment =	14.40 in
Hooked embedment length into footing for #4 bar specified in this stem design segment =	8.40 in
As Provided =	0.2667 in2/ft
As Required =	0.1728 in2/ft

Project Title:
Engineer:
Project ID:
Project Descr:

Cantilevered Retaining Wall

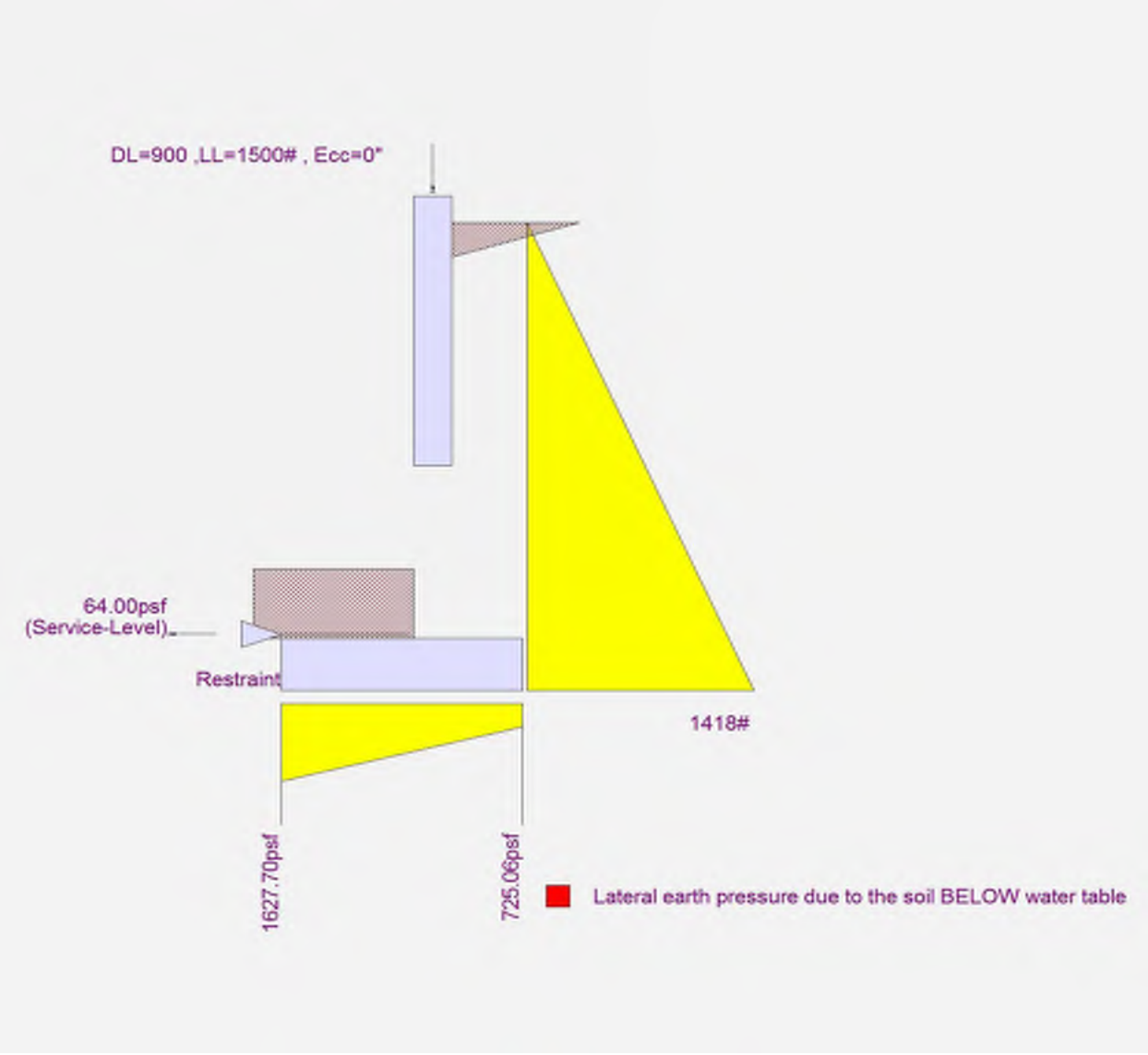
DESCRIPTION: 8' backfill (2.5 ksi, 8H, 35 active, 300 passive, 2000 psf)



Project Title:
Engineer:
Project ID:
Project Descr:

Cantilevered Retaining Wall

DESCRIPTION: 8' backfill (2.5 ksi, 8H, 35 active, 300 passive, 2000 psf)



Project Title:
Engineer:
Project ID:
Project Descr:

Cantilevered Retaining Wall

LIC# : KW-06011993, Build:20.22.2.15 L120 Engineering and Design

DESCRIPTION: 8' backfill site retaining 2.5ksi 8H 35active 300 passive 0.45

Code Reference

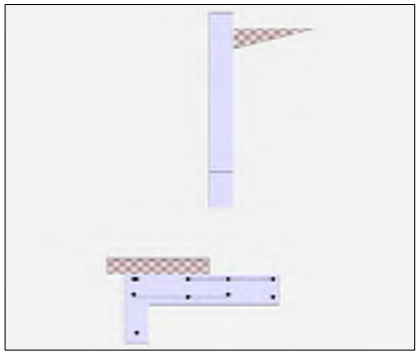
Calculations per IBC 2018 1807.3, CBC 2019, ASCE 7-16

Criteria

Retained Height	=	8.00 ft
Wall height above soil	=	0.50 ft
Slope Behind Wall	=	0.00
Height of Soil over Toe	=	6.00 in
Water height over heel	=	0.0 ft

Soil Data

Allow Soil Bearing	=	2,600.0 psf
Equivalent Fluid Pressure Method		
Active Heel Pressure	=	35.0 psf/ft
	=	
Passive Pressure	=	300.0 psf/ft
Soil Density, Heel	=	110.00 pcf
Soil Density, Toe	=	110.00 pcf
Footing||Soil Friction	=	0.450
Soil height to ignore for passive pressure	=	12.00 in



Surcharge Loads

Surcharge Over Heel	=	0.0 psf
Used To Resist Sliding & Overturning		
Surcharge Over Toe	=	0.0 psf
Used for Sliding & Overturning		

Axial Load Applied to Stem

Axial Dead Load	=	900.0 lbs
Axial Live Load	=	1,500.0 lbs
Axial Load Eccentricity	=	0.0 in

Lateral Load Applied to Stem

Lateral Load	=	64.0 #/ft
...Height to Top	=	0.00 ft
...Height to Bottom	=	0.00 ft
Load Type	=	Wind (W) (Service Level)
Wind on Exposed Stem (Service Level)	=	0.0 psf

Adjacent Footing Load

Adjacent Footing Load	=	0.0 lbs
Footing Width	=	0.00 ft
Eccentricity	=	0.00 in
Wall to Ftg CL Dist	=	0.00 ft
Footing Type		Spread Footing
Base Above/Below Soil at Back of Wall	=	0.0 ft
Poisson's Ratio	=	0.350

Project Title:
Engineer:
Project ID:
Project Descr:

Cantilevered Retaining Wall

LIC# : KW-06011993, Build:20.22.2.15 L120 Engineering and Design

DESCRIPTION: 8' backfill site retaining 2.5ksi 8H 35active 300 passive 0.45

Design Summary

Wall Stability Ratios

Overturning	=	2.19	OK
Sliding	=	1.78	OK
Global Stability	=	1.55	
Total Bearing Load	=	4,907 lbs	
...resultant ecc.	=	3.36 in	
Soil Pressure @ Toe	=	1,613 psf	OK
Soil Pressure @ Heel	=	698 psf	OK
Allowable	=	2,600 psf	
Soil Pressure Less Than Allowable			
ACI Factored @ Toe	=	2,258 psf	
ACI Factored @ Heel	=	977 psf	
Footing Shear @ Toe	=	27.8 psi	OK
Footing Shear @ Heel	=	13.6 psi	OK
Allowable	=	75.0 psi	

Sliding Calcs

Lateral Sliding Force	=	1,417.5 lbs	
less 100% Passive Force	-	984.4 lbs	
less 100% Friction Force	-	1,533.4 lbs	
Added Force Req'd	=	0.0 lbs	OK
....for 1.5 Stability	=	0.0 lbs	OK

Vertical component of active lateral soil pressure IS NOT considered in the calculation of soil bearing

Load Factors

Building Code	
Dead Load	1.200
Live Load	1.600
Earth, H	1.600
Wind, W	1.000
Seismic, E	1.000

Stem Construction

		3rd	2nd	
		Stem OK	Stem OK	
Design Height Above Ftg	ft =	2.17	3.33	
Wall Material Above "Ht"	=	Concrete	Concrete	
Design Method	=	SD	SD	SD
Thickness	=	8.00	8.00	
Rebar Size	=	# 4	# 4	
Rebar Spacing	=	12.00	9.00	
Rebar Placed at	=	Edge	Edge	
Design Data				
fb/FB + fa/Fa	=	**0.341**	**0.133**	
Total Force @ Section				
Service Level	lbs =			
Strength Level	lbs =	951.7	610.6	
Moment....Actual				
Service Level	ft-# =			
Strength Level	ft-# =	1,849.4	950.6	
Moment.....Allowable	ft-# =	5,412.6	7,122.4	
Shear.....Actual				
Service Level	psi =			
Strength Level	psi =	12.7	8.1	
Shear.....Allowable	psi =	75.0	75.0	
Anet (Masonry)	in2 =			
Rebar Depth 'd'	in =	6.25	6.25	
Masonry Data				
f'm	psi =			
Fs	psi =			
Solid Grouting	=			
Modular Ratio 'n'	=			
Wall Weight	psf =	100.0	100.0	
Short Term Factor	=			
Equiv. Solid Thick.	=			
Masonry Block Type	=			
Masonry Design Method	=	ASD		
Concrete Data				
f'c	psi =	2,500.0	2,500.0	
Fy	psi =	60,000.0	60,000.0	

Project Title:
Engineer:
Project ID:
Project Descr:

Cantilevered Retaining Wall

DESCRIPTION: 8' backfill site retaining 2.5ksi 8H 35active 300 passive 0.45

Concrete Stem Rebar Area Details

2nd Stem	Vertical Reinforcing	Horizontal Reinforcing	
As (based on applied moment) :	0.0693 in2/ft		
(4/3) * As :	0.0924 in2/ft	Min Stem T&S Reinf Area 1.215 in2	
200bd/fy : 200(12)(6.25)/60000 :	0.25 in2/ft	Min Stem T&S Reinf Area per ft of stem Height : 0.192 in2/ft	
0.0018bh : 0.0018(12)(8) :	0.1728 in2/ft	Horizontal Reinforcing Options :	
	==========	One layer of :	Two layers of :
Required Area :	0.1728 in2/ft	#4@ 12.50 in	#4@ 25.00 in
Provided Area :	0.2 in2/ft	#5@ 19.38 in	#5@ 38.75 in
Maximum Area :	0.8467 in2/ft	#6@ 27.50 in	#6@ 55.00 in

Bottom Stem	Vertical Reinforcing	Horizontal Reinforcing	
As (based on applied moment) :	0.0356 in2/ft		
(4/3) * As :	0.0475 in2/ft	Min Stem T&S Reinf Area 0.223 in2	
200bd/fy : 200(12)(6.25)/60000 :	0.25 in2/ft	Min Stem T&S Reinf Area per ft of stem Height : 0.192 in2/ft	
0.0018bh : 0.0018(12)(8) :	0.1728 in2/ft	Horizontal Reinforcing Options :	
	==========	One layer of :	Two layers of :
Required Area :	0.1728 in2/ft	#4@ 12.50 in	#4@ 25.00 in
Provided Area :	0.2667 in2/ft	#5@ 19.38 in	#5@ 38.75 in
Maximum Area :	0.8467 in2/ft	#6@ 27.50 in	#6@ 55.00 in

Footing Data

Toe Width	=	2.33 ft
Heel Width	=	1.92
Total Footing Width	=	4.25
Footing Thickness	=	12.00 in
Key Width	=	8.00 in
Key Depth	=	15.00 in
Key Distance from Toe	=	0.00 ft

f'c = 2,500 psi Fy = 60,000 psi
Footing Concrete Density = 150.00 pcf
Min. As % = 0.0018
Cover @ Top 2.00 @ Btm.= 3.00 in

Footing Design Results

		Toe	Heel	
Factored Pressure	=	2,258	977	psf
Mu' : Upward	=	5,494	0	ft-#
Mu' : Downward	=	668	966	ft-#
Mu: Design	=	4,827	966	ft-#
phiMin	=	10,125	11,325	ft-#
Actual 1-Way Shear	=	27.76	13.56	psi
Allow 1-Way Shear	=	75.00	75.00	psi

Toe Reinforcing = # 4 @ 9.00 in
Heel Reinforcing = # 4 @ 9.00 in
Key Reinforcing = # 4 @ 9.00 in
Footing Torsion, Tu = 0.00 ft-lbs
Footing Allow. Torsion, phi Tu = 0.00 ft-lbs

If torsion exceeds allowable, provide supplemental design for footing torsion.

Other Acceptable Sizes & Spacings

Toe:
Heel:
Key:

Min footing T&S reinf Area 1.10 in2
Min footing T&S reinf Area per foot 0.26 in2 /ft

If one layer of horizontal bars:	If two layers of horizontal bars:
#4@ 9.26 in	#4@ 18.52 in
#5@ 14.35 in	#5@ 28.70 in
#6@ 20.37 in	#6@ 40.74 in

Project Title:
Engineer:
Project ID:
Project Descr:

Cantilevered Retaining Wall

DESCRIPTION: 8' backfill site retaining 2.5ksi 8H 35active 300 passive 0.45

Summary of Overturning & Resisting Forces & Moments

Item		.....OVERTURNING..... Force lbs	Distance ft	Moment ft-#		.....RESISTING..... Force lbs	Distance ft	Moment ft-#
HL Act Pres (ab water tbl)		1,417.5	3.00	4,252.5	Soil Over HL (ab. water tbl)	1,100.3	3.62	3,985.1
HL Act Pres (be water tbl)					Soil Over HL (bel. water tbl)		3.62	3,985.1
Hydrostatic Force					Watre Table			
Buoyant Force	=				Sloped Soil Over Heel	=		
Surcharge over Heel	=				Surcharge Over Heel	=		
Surcharge Over Toe	=				Adjacent Footing Load	=		
Adjacent Footing Load	=				Axial Dead Load on Stem	=	900.0	2.66	2,397.0
Added Lateral Load	=		1.00		* Axial Live Load on Stem	=	1,500.0	2.66	3,995.0
Load @ Stem Above Soil	=				Soil Over Toe	=	128.2	1.17	149.3
	=				Surcharge Over Toe	=			
					Stem Weight(s)	=	517.0	2.66	1,376.9
					Earth @ Stem Transitions	=			
					Footing Weight	=	637.1	2.12	1,352.8
					Key Weight	=	125.0	0.33	41.7
					Vert. Component	=			
Total	=	1,417.5	**O.T.M.** =	4,252.5	**Total =**		3,407.5 lbs	**R.M.=**	9,302.8

Resisting/Overturning Ratio = **2.19**

Vertical Loads used for Soil Pressure = 4,907.5 lbs

* Axial live load NOT included in total displayed, or used for overturning resistance, but is included for soil pressure calculation.

Vertical component of active lateral soil pressure IS NOT considered in the calculation of Sliding Resistance.

Vertical component of active lateral soil pressure IS NOT considered in the calculation of Overturning Resistance.

Tilt

Horizontal Deflection at Top of Wall due to settlement of soil

(Deflection due to wall bending not considered)

Soil Spring Reaction Modulus	250.0	pci
Horizontal Defl @ Top of Wall (approximate only)	0.090	in

The above calculation is not valid if the heel soil bearing pressure exceeds that of the toe, because the wall would then tend to rotate into the retained soil.

Project Title:
Engineer:
Project ID:
Project Descr:

Cantilevered Retaining Wall

LIC# : KW-06011993, Build:20.22.2.15 L120 Engineering and Design

DESCRIPTION: 8' backfill site retaining 2.5ksi 8H 35active 300 passive 0.45

Rebar Lap & Embedment Lengths Information

Stem Design Segment: 2nd
Stem Design Height: 2.17 ft above top of footing

Lap Splice length for #4 bar specified in this stem design segment =	18.72 in
Development length for #4 bar specified in this stem design segment =	14.40 in

---

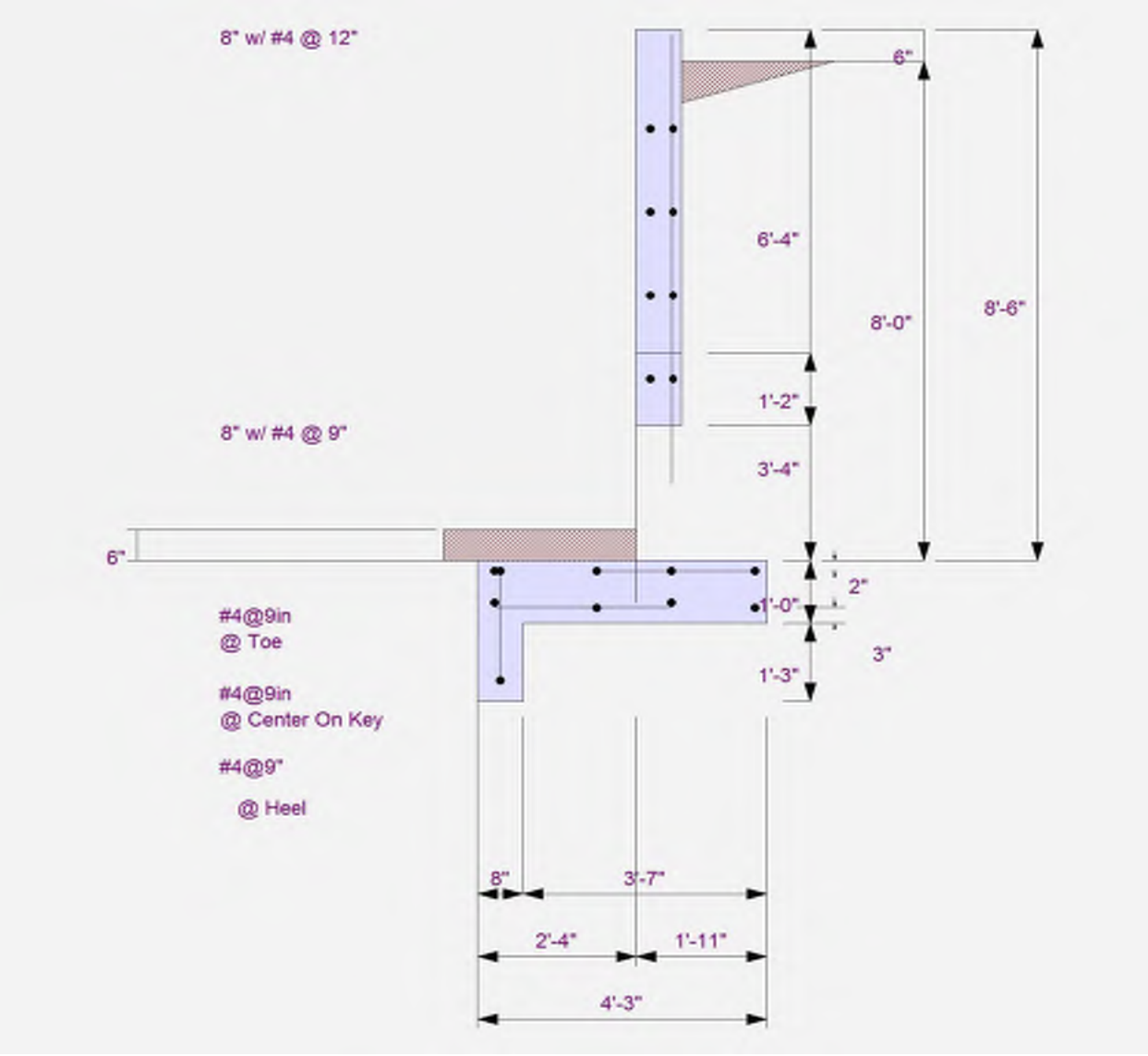
Stem Design Segment: Bottom
Stem Design Height: 3.33 ft above top of footing

Lap Splice length for #4 bar specified in this stem design segment =	18.72 in
Development length for #4 bar specified in this stem design segment =	14.40 in
Hooked embedment length into footing for #4 bar specified in this stem design segment =	8.40 in
As Provided =	0.2667 in2/ft
As Required =	0.1728 in2/ft

Project Title:
Engineer:
Project ID:
Project Descr:

Cantilevered Retaining Wall

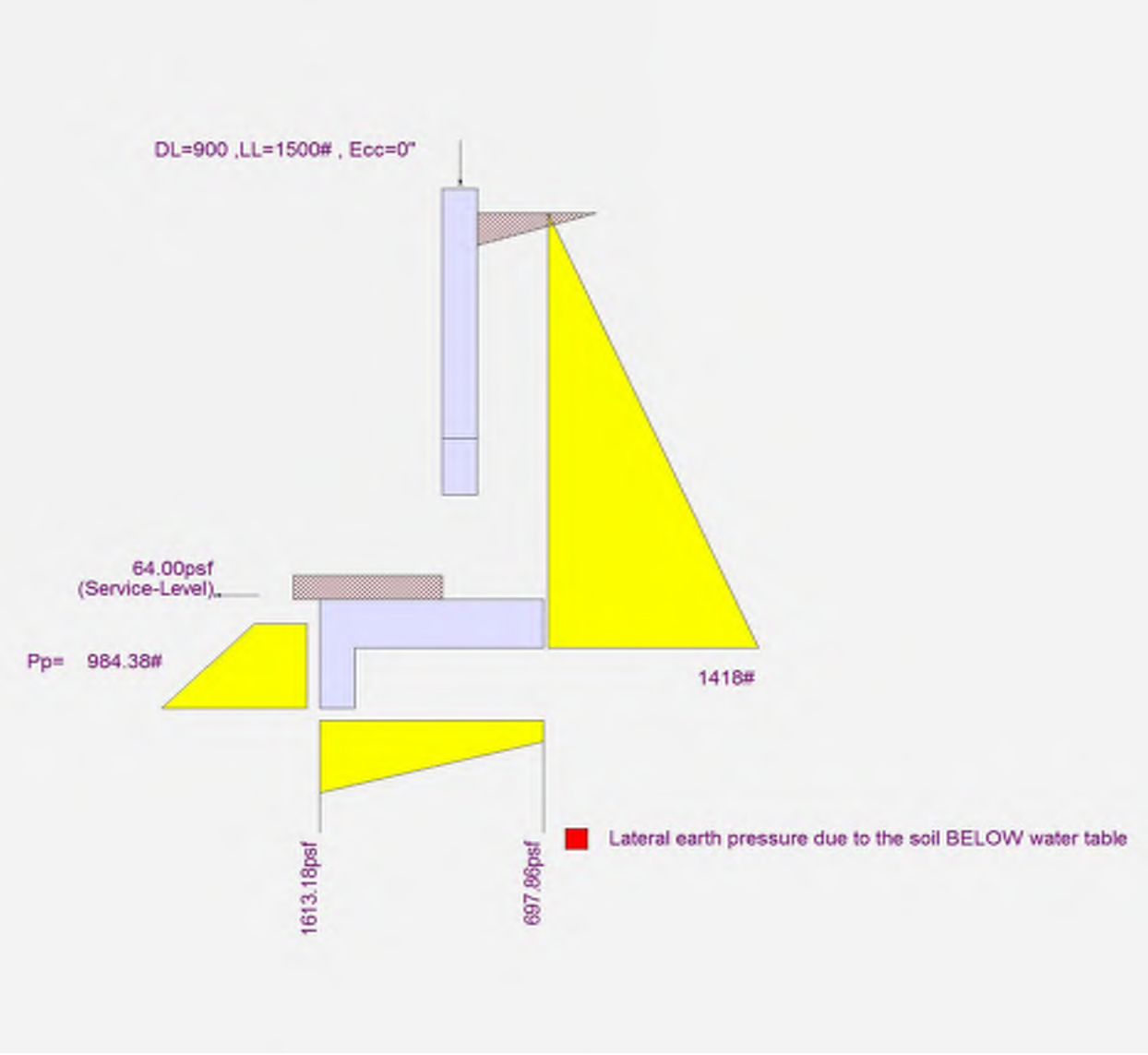
DESCRIPTION: 8' backfill site retaining 2.5ksi 8H 35active 300 passive 0.45



Project Title:
Engineer:
Project ID:
Project Descr:

Cantilevered Retaining Wall

DESCRIPTION: 8' backfill site retaining 2.5ksi 8H 35active 300 passive 0.45



Project Title:
Engineer:
Project ID:
Project Descr:

Cantilevered Retaining Wall

DESCRIPTION: 6' backfill (2.5 ksi, 8H, 35 active, 300 passive, 2000 psf)

Code Reference

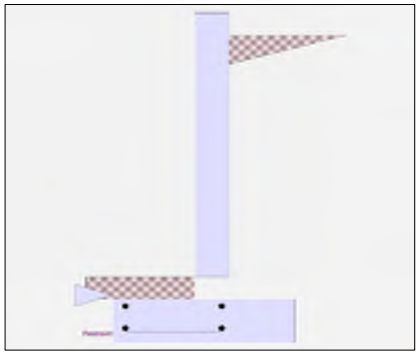
Calculations per IBC 2018 1807.3, CBC 2019, ASCE 7-16

Criteria

Retained Height	=	6.00 ft
Wall height above soil	=	0.50 ft
Slope Behind Wall	=	0.00
Height of Soil over Toe	=	6.00 in
Water height over heel	=	0.0 ft

Soil Data

Allow Soil Bearing	=	2,600.0 psf
Equivalent Fluid Pressure Method		
Active Heel Pressure	=	35.0 psf/ft
	=	
Passive Pressure	=	300.0 psf/ft
Soil Density, Heel	=	110.00 pcf
Soil Density, Toe	=	110.00 pcf
Footing||Soil Friction	=	0.450
Soil height to ignore for passive pressure	=	12.00 in



Surcharge Loads

Surcharge Over Heel	=	0.0 psf
Used To Resist Sliding & Overturning		
Surcharge Over Toe	=	0.0
Used for Sliding & Overturning		

Lateral Load Applied to Stem

Lateral Load	=	48.0 #/ft
...Height to Top	=	0.00 ft
...Height to Bottom	=	0.00 ft
Load Type	=	Wind (W) (Service Level)
Wind on Exposed Stem (Service Level)	=	0.0 psf

Adjacent Footing Load

Adjacent Footing Load	=	0.0 lbs
Footing Width	=	0.00 ft
Eccentricity	=	0.00 in
Wall to Ftg CL Dist	=	0.00 ft
Footing Type		Spread Footing
Base Above/Below Soil at Back of Wall	=	0.0 ft
Poisson's Ratio	=	0.350

Axial Load Applied to Stem

Axial Dead Load	=	900.0 lbs
Axial Live Load	=	1,500.0 lbs
Axial Load Eccentricity	=	0.0 in

Project Title:
Engineer:
Project ID:
Project Descr:

Cantilevered Retaining Wall

DESCRIPTION: 6' backfill (2.5 ksi, 8H, 35 active, 300 passive, 2000 psf)

Design Summary

Wall Stability Ratios

Overturning	=	3.11	OK
Slab Resists All Sliding !			
Global Stability	=	1.96	
Total Bearing Load	=	4,437 lbs	
...resultant ecc.	=	1.79 in	
Soil Pressure @ Toe	=	1,594 psf	OK
Soil Pressure @ Heel	=	944 psf	OK
Allowable	=	2,600 psf	
Soil Pressure Less Than Allowable			
ACI Factored @ Toe	=	2,231 psf	
ACI Factored @ Heel	=	1,321 psf	
Footing Shear @ Toe	=	15.8 psi	OK
Footing Shear @ Heel	=	10.1 psi	OK
Allowable	=	75.0 psi	

Sliding Calcs

Lateral Sliding Force	=	857.5 lbs

Vertical component of active lateral soil pressure IS NOT considered in the calculation of soil bearing

Load Factors

Building Code	
Dead Load	1.200
Live Load	1.600
Earth, H	1.600
Wind, W	1.000
Seismic, E	1.000

Stem Construction

		3rd		
		Stem OK		
Design Height Above Ftg	ft =	0.50		
Wall Material Above "Ht"	=	Concrete		
Design Method	=	SD	SD	SD
Thickness	=	8.00		
Rebar Size	=	# 4		
Rebar Spacing	=	12.00		
Rebar Placed at	=	Edge		
Design Data				
fb/FB + fa/Fa	=	**0.286**		
Total Force @ Section				
Service Level	lbs =			
Strength Level	lbs =	847.0		
Moment....Actual				
Service Level	ft-# =			
Strength Level	ft-# =	1,552.8		
Moment.....Allowable	=	5,412.6		
Shear.....Actual				
Service Level	psi =			
Strength Level	psi =	11.3		
Shear.....Allowable	psi =	75.0		
Anet (Masonry)	in2 =			
Rebar Depth 'd'	in =	6.25		
Masonry Data				
f'm	psi =			
Fs	psi =			
Solid Grouting	=			
Modular Ratio 'n'	=			
Wall Weight	psf =	100.0		
Short Term Factor	=			
Equiv. Solid Thick.	=			
Masonry Block Type	=			
Masonry Design Method	=	ASD		
Concrete Data				
f'c	psi =	2,500.0		
Fy	psi =	60,000.0		

Project Title:
Engineer:
Project ID:
Project Descr:

Cantilevered Retaining Wall

DESCRIPTION: 6' backfill (2.5 ksi, 8H, 35 active, 300 passive, 2000 psf)

Concrete Stem Rebar Area Details

Bottom Stem	Vertical Reinforcing	Horizontal Reinforcing	
As (based on applied moment) :	0.0582 in2/ft		
(4/3) * As :	0.0776 in2/ft	Min Stem T&S Reinf Area 1.152 in2	
200bd/fy : 200(12)(6.25)/60000 :	0.25 in2/ft	Min Stem T&S Reinf Area per ft of stem Height : 0.192 in2/ft	
0.0018bh : 0.0018(12)(8) :	0.1728 in2/ft	Horizontal Reinforcing Options :	
	==========	One layer of :	Two layers of :
Required Area :	0.1728 in2/ft	#4@ 12.50 in	#4@ 25.00 in
Provided Area :	0.2 in2/ft	#5@ 19.38 in	#5@ 38.75 in
Maximum Area :	0.8467 in2/ft	#6@ 27.50 in	#6@ 55.00 in

Footing Data

Toe Width	=	1.58 ft
Heel Width	=	1.92
Total Footing Width	=	3.50
Footing Thickness	=	12.00 in
Key Width	=	11.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	2.00 ft

f'c = 2,500 psi Fy = 60,000 psi
Footing Concrete Density = 150.00 pcf
Min. As % = 0.0018
Cover @ Top 2.00 @ Btm.= 3.00 in

Footing Design Results

		Toe	Heel	
Factored Pressure	=	2,231	1,321	psf
Mu' : Upward	=	2,614	0	ft-#
Mu' : Downward	=	307	760	ft-#
Mu: Design	=	2,307	760	ft-#
phiMin	=	10,125	2,500	ft-#
Actual 1-Way Shear	=	15.81	10.13	psi
Allow 1-Way Shear	=	75.00	40.00	psi

Toe Reinforcing = # 4 @ 9.00 in
Heel Reinforcing = None Spec'd
Key Reinforcing = None Spec'd
Footing Torsion, Tu = 0.00 ft-lbs
Footing Allow. Torsion, phi Tu = 0.00 ft-lbs

If torsion exceeds allowable, provide supplemental design for footing torsion.

Other Acceptable Sizes & Spacings

Toe:
Heel:
Key:

Min footing T&S reinf Area 0.91 in2
Min footing T&S reinf Area per foot 0.26 in2 /ft

If one layer of horizontal bars:	If two layers of horizontal bars:
#4@ 9.26 in	#4@ 18.52 in
#5@ 14.35 in	#5@ 28.70 in
#6@ 20.37 in	#6@ 40.74 in

Project Title:
Engineer:
Project ID:
Project Descr:

Cantilevered Retaining Wall

DESCRIPTION: 6' backfill (2.5 ksi, 8H, 35 active, 300 passive, 2000 psf)

Summary of Overturning & Resisting Forces & Moments

Item		.....OVERTURNING..... Force lbs	Distance ft	Moment ft-#		.....RESISTING..... Force lbs	Distance ft	Moment ft-#
HL Act Pres (ab water tbl)		857.5	2.33	2,000.8	Soil Over HL (ab. water tbl)	825.2	2.87	2,369.9
HL Act Pres (be water tbl)					Soil Over HL (bel. water tbl)		2.87	2,369.9
Hydrostatic Force					Watre Table			
Buoyant Force	=				Sloped Soil Over Heel	=		
Surcharge over Heel	=				Surcharge Over Heel	=		
Surcharge Over Toe	=				Adjacent Footing Load	=		
Adjacent Footing Load	=				Axial Dead Load on Stem	=	900.0	1.91	1,722.0
Added Lateral Load	=		1.00		* Axial Live Load on Stem	=	1,500.0	1.91	2,870.0
Load @ Stem Above Soil	=				Soil Over Toe	=	86.9	0.79	68.7
	=				Surcharge Over Toe	=			
					Stem Weight(s)	=	600.0	1.91	1,148.0
					Earth @ Stem Transitions	=			
					Footing Weight	=	524.6	1.75	917.2
					Key Weight	=		2.46	
					Vert. Component	=			
Total	=	857.5	**O.T.M.** =	2,000.8	**Total =**		2,936.7 lbs	**R.M.=**	6,225.7

Resisting/Overturning Ratio = **3.11**
Vertical Loads used for Soil Pressure = 4,436.7 lbs

* Axial live load NOT included in total displayed, or used for overturning resistance, but is included for soil pressure calculation.

Vertical component of active lateral soil pressure IS NOT considered in the calculation of Sliding Resistance.

Vertical component of active lateral soil pressure IS NOT considered in the calculation of Overturning Resistance.

Tilt

Horizontal Deflection at Top of Wall due to settlement of soil

(Deflection due to wall bending not considered)

Soil Spring Reaction Modulus	250.0	pci
Horizontal Defl @ Top of Wall (approximate only)	0.082	in

The above calculation is not valid if the heel soil bearing pressure exceeds that of the toe, because the wall would then tend to rotate into the retained soil.

Project Title:
Engineer:
Project ID:
Project Descr:

Cantilevered Retaining Wall

DESCRIPTION: 6' backfill (2.5 ksi, 8H, 35 active, 300 passive, 2000 psf)

Rebar Lap & Embedment Lengths Information

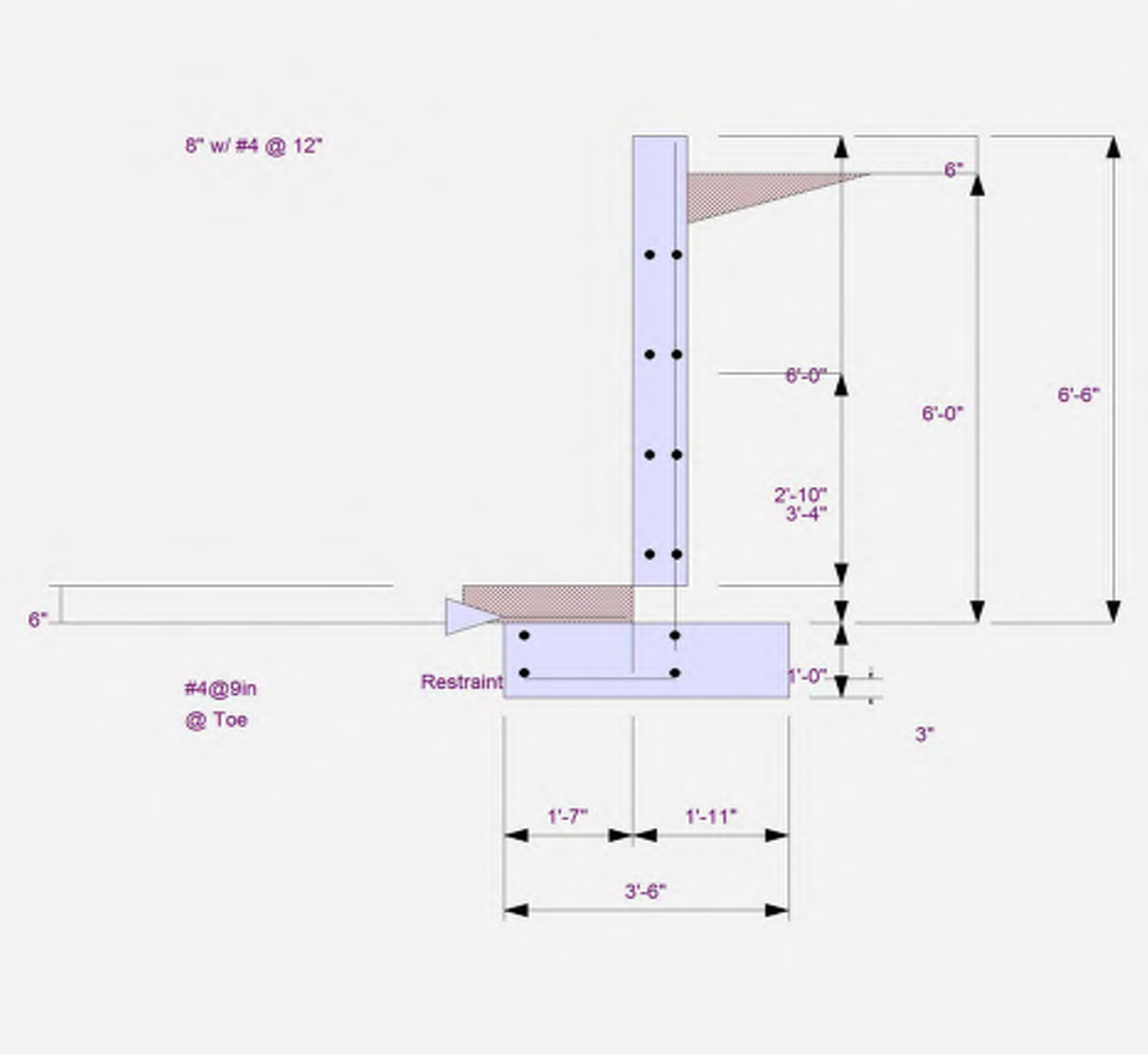
Stem Design Segment: Bottom
Stem Design Height: 0.50 ft above top of footing

Lap Splice length for #4 bar specified in this stem design segment =	18.72 in
Development length for #4 bar specified in this stem design segment =	14.40 in
Hooked embedment length into footing for #4 bar specified in this stem design segment =	8.40 in
As Provided =	0.2000 in2/ft
As Required =	0.1728 in2/ft

Project Title:
Engineer:
Project ID:
Project Descr:

Cantilevered Retaining Wall

DESCRIPTION: 6' backfill (2.5 ksi, 8H, 35 active, 300 passive, 2000 psf)

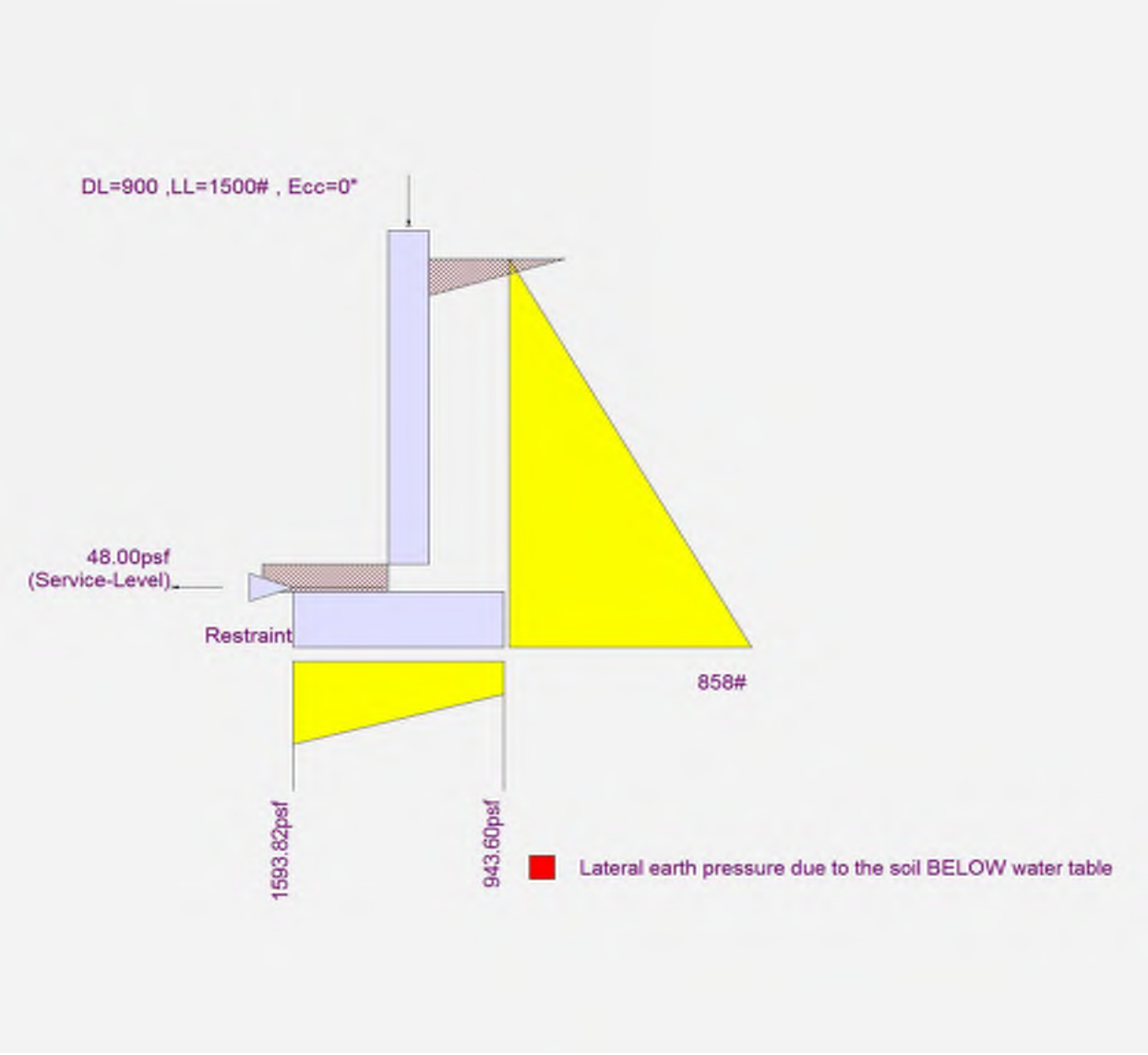


Project Title:
Engineer:
Project ID:
Project Descr:

Cantilevered Retaining Wall

LIC# : KW-06011993, Build:20.22.2.15 L120 Engineering and Design

DESCRIPTION: 6' backfill (2.5 ksi, 8H, 35 active, 300 passive, 2000 psf)



Project Title:
Engineer:
Project ID:
Project Descr:

Cantilevered Retaining Wall

DESCRIPTION: 4' backfill (2.5 ksi, 8H, 35 active, 300 passive, 2000 psf)

Code Reference

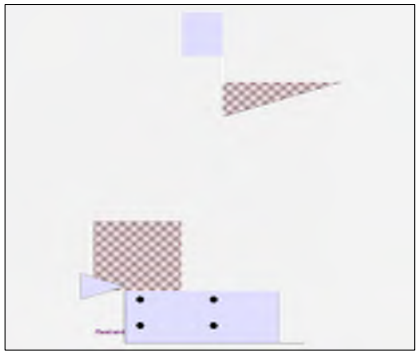
Calculations per IBC 2018 1807.3, CBC 2019, ASCE 7-16

Criteria

Retained Height	=	4.00 ft
Wall height above soil	=	0.50 ft
Slope Behind Wall	=	0.00
Height of Soil over Toe	=	16.00 in
Water height over heel	=	0.0 ft

Soil Data

Allow Soil Bearing	=	2,600.0 psf
Equivalent Fluid Pressure Method		
Active Heel Pressure	=	35.0 psf/ft
	=	
Passive Pressure	=	300.0 psf/ft
Soil Density, Heel	=	110.00 pcf
Soil Density, Toe	=	110.00 pcf
Footing||Soil Friction	=	0.450
Soil height to ignore for passive pressure	=	12.00 in



Surcharge Loads

Surcharge Over Heel	=	0.0 psf
Used To Resist Sliding & Overturning		
Surcharge Over Toe	=	0.0
Used for Sliding & Overturning		

Axial Load Applied to Stem

Axial Dead Load	=	900.0 lbs
Axial Live Load	=	1,500.0 lbs
Axial Load Eccentricity	=	0.0 in

Lateral Load Applied to Stem

Lateral Load	=	32.0 #/ft
...Height to Top	=	0.00 ft
...Height to Bottom	=	0.00 ft
Load Type	=	Wind (W) (Service Level)
Wind on Exposed Stem (Service Level)	=	0.0 psf

Adjacent Footing Load

Adjacent Footing Load	=	0.0 lbs
Footing Width	=	0.00 ft
Eccentricity	=	0.00 in
Wall to Ftg CL Dist	=	0.00 ft
Footing Type		Spread Footing
Base Above/Below Soil at Back of Wall	=	0.0 ft
Poisson's Ratio	=	0.300

Project Title:
Engineer:
Project ID:
Project Descr:

Cantilevered Retaining Wall

LIC# : KW-06011993, Build:20.22.2.15 L120 Engineering and Design

DESCRIPTION: 4' backfill (2.5 ksi, 8H, 35 active, 300 passive, 2000 psf)

Design Summary

Wall Stability Ratios

Overturning	=	3.26	OK
Slab Resists All Sliding !			
Global Stability	=	3.38	
Total Bearing Load	=	3,230 lbs	
...resultant ecc.	=	1.92 in	
Soil Pressure @ Toe	=	1,788 psf	OK
Soil Pressure @ Heel	=	796 psf	OK
Allowable	=	2,600 psf	
Soil Pressure Less Than Allowable			
ACI Factored @ Toe	=	2,503 psf	
ACI Factored @ Heel	=	1,115 psf	
Footing Shear @ Toe	=	4.1 psi	OK
Footing Shear @ Heel	=	5.4 psi	OK
Allowable	=	75.0 psi	

Sliding Calcs

Lateral Sliding Force	=	437.5 lbs

Vertical component of active lateral soil pressure IS NOT considered in the calculation of soil bearing

Load Factors

Building Code	
Dead Load	1.200
Live Load	1.600
Earth, H	1.600
Wind, W	1.000
Seismic, E	1.000

Stem Construction

		3rd		
		Stem OK		
Design Height Above Ftg	ft =	5.33		
Wall Material Above "Ht"	=	Concrete		
Design Method	=	SD	SD	SD
Thickness	=	8.00		
Rebar Size	=	# 4		
Rebar Spacing	=	12.00		
Rebar Placed at	=	Edge		
Design Data				
fb/FB + fa/Fa	=	**0.000**		
Total Force @ Section				
Service Level	lbs =			
Strength Level	lbs =			
Moment....Actual				
Service Level	ft-# =			
Strength Level	ft-# =			
Moment.....Allowable	=	5,412.6		
Shear.....Actual				
Service Level	psi =			
Strength Level	psi =			
Shear.....Allowable	psi =	75.0		
Anet (Masonry)	in2 =			
Rebar Depth 'd'	in =	6.25		
Masonry Data				
f'm	psi =			
Fs	psi =			
Solid Grouting	=			
Modular Ratio 'n'	=			
Wall Weight	psf =	100.0		
Short Term Factor	=			
Equiv. Solid Thick.	=			
Masonry Block Type	=			
Masonry Design Method	=	ASD		
Concrete Data				
f'c	psi =	2,500.0		
Fy	psi =	60,000.0		

Project Title:
Engineer:
Project ID:
Project Descr:

Cantilevered Retaining Wall

DESCRIPTION: 4' backfill (2.5 ksi, 8H, 35 active, 300 passive, 2000 psf)

Concrete Stem Rebar Area Details

Bottom Stem	Vertical Reinforcing	Horizontal Reinforcing	
As (based on applied moment) :	0 in2/ft		
(4/3) * As :	0 in2/ft	Min Stem T&S Reinf Area 0.159 in2	
200bd/fy : 200(12)(6.25)/60000 :	0.25 in2/ft	Min Stem T&S Reinf Area per ft of stem Height : 0.192 in2/ft	
0.0018bh : 0.0018(12)(8) :	0.1728 in2/ft	Horizontal Reinforcing Options :	
	==========	One layer of :	Two layers of :
Required Area :	0.1728 in2/ft	#4@ 12.50 in	#4@ 25.00 in
Provided Area :	0.2 in2/ft	#5@ 19.38 in	#5@ 38.75 in
Maximum Area :	0.8467 in2/ft	#6@ 27.50 in	#6@ 55.00 in

Footing Data

Toe Width	=	0.92 ft
Heel Width	=	1.58
Total Footing Width	=	2.50
Footing Thickness	=	12.00 in
Key Width	=	11.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	2.00 ft

f'c = 2,500 psi Fy = 60,000 psi
Footing Concrete Density = 150.00 pcf
Min. As % = 0.0018
Cover @ Top 2.00 @ Btm.= 3.00 in

Footing Design Results

		Toe	Heel	
Factored Pressure	=	2,503	1,115	psf
Mu' : Upward	=	980	0	ft-#
Mu' : Downward	=	150	297	ft-#
Mu: Design	=	831	297	ft-#
phiMin	=	10,125	2,500	ft-#
Actual 1-Way Shear	=	4.15	5.41	psi
Allow 1-Way Shear	=	75.00	40.00	psi

Toe Reinforcing = # 4 @ 9.00 in
Heel Reinforcing = None Spec'd
Key Reinforcing = None Spec'd
Footing Torsion, Tu = 0.00 ft-lbs
Footing Allow. Torsion, phi Tu = 0.00 ft-lbs

If torsion exceeds allowable, provide supplemental design for footing torsion.

Other Acceptable Sizes & Spacings

Toe:
Heel:
Key:

Min footing T&S reinf Area 0.65 in2
Min footing T&S reinf Area per foot 0.26 in2 /ft

If one layer of horizontal bars:	If two layers of horizontal bars:
#4@ 9.26 in	#4@ 18.52 in
#5@ 14.35 in	#5@ 28.70 in
#6@ 20.37 in	#6@ 40.74 in

Project Title:
Engineer:
Project ID:
Project Descr:

Cantilevered Retaining Wall

LIC# : KW-06011993, Build:20.22.2.15 L120 Engineering and Design

DESCRIPTION: 4' backfill (2.5 ksi, 8H, 35 active, 300 passive, 2000 psf)

Summary of Overturning & Resisting Forces & Moments

Item		.....OVERTURNING..... Force lbs	Distance ft	Moment ft-#		.....RESISTING..... Force lbs	Distance ft	Moment ft-#
HL Act Pres (ab water tbl)		437.5	1.67	729.2	Soil Over HL (ab. water tbl)	403.3	2.04	823.5
HL Act Pres (be water tbl)					Soil Over HL (bel. water tbl)		2.04	823.5
Hydrostatic Force					Watre Table			
Buoyant Force	=				Sloped Soil Over Heel	=		
Surcharge over Heel	=				Surcharge Over Heel	=		
Surcharge Over Toe	=				Adjacent Footing Load	=		
Adjacent Footing Load	=				Axial Dead Load on Stem	=	900.0	1.25	1,125.0
Added Lateral Load	=		1.00		* Axial Live Load on Stem	=	1,500.0	1.25	1,875.0
Load @ Stem Above Soil	=				Soil Over Toe	=	134.4	0.46	61.6
	=				Surcharge Over Toe	=			
					Stem Weight(s)	=	-83.0	1.25	-103.8
					Earth @ Stem Transitions	=			
					Footing Weight	=	375.0	1.25	468.7
					Key Weight	=		2.46	
					Vert. Component	=			
Total	=	437.5	**O.T.M.** =	729.2	**Total =**		1,729.8 lbs	**R.M.=**	2,375.1

Resisting/Overturning Ratio = **3.26**
Vertical Loads used for Soil Pressure = 3,229.8 lbs

* Axial live load NOT included in total displayed, or used for overturning resistance, but is included for soil pressure calculation.

Vertical component of active lateral soil pressure IS NOT considered in the calculation of Sliding Resistance.

Vertical component of active lateral soil pressure IS NOT considered in the calculation of Overturning Resistance.

Tilt

Horizontal Deflection at Top of Wall due to settlement of soil

(Deflection due to wall bending not considered)

Soil Spring Reaction Modulus	250.0	pci
Horizontal Defl @ Top of Wall (approximate only)	0.089	in

The above calculation is not valid if the heel soil bearing pressure exceeds that of the toe, because the wall would then tend to rotate into the retained soil.

Project Title:
Engineer:
Project ID:
Project Descr:

Cantilevered Retaining Wall

DESCRIPTION: 4' backfill (2.5 ksi, 8H, 35 active, 300 passive, 2000 psf)

Rebar Lap & Embedment Lengths Information

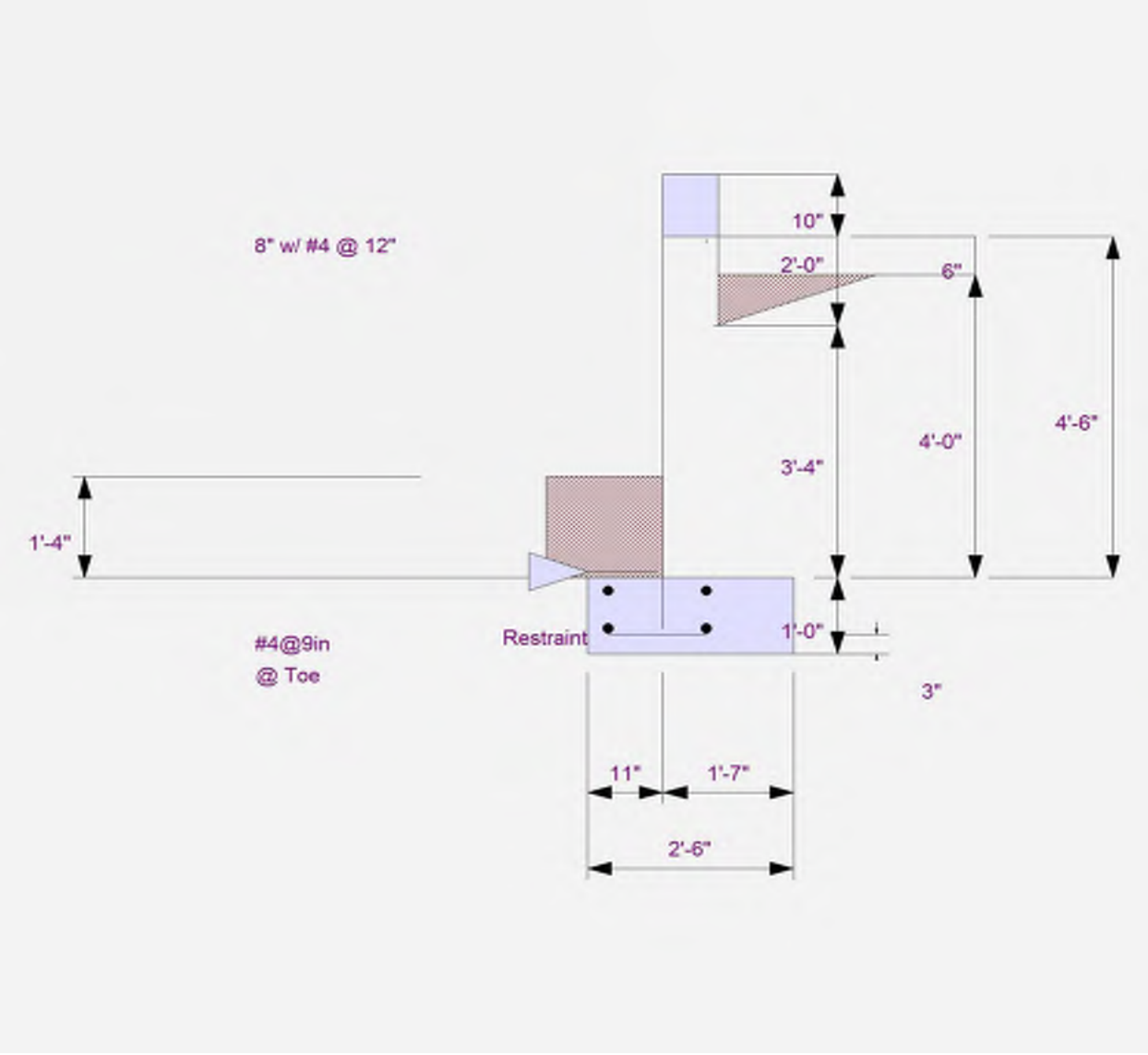
Stem Design Segment: Bottom
Stem Design Height: 5.33 ft above top of footing

Lap Splice length for #4 bar specified in this stem design segment =	18.72 in
Development length for #4 bar specified in this stem design segment =	14.40 in
Hooked embedment length into footing for #4 bar specified in this stem design segment =	8.40 in
As Provided =	0.2000 in2/ft
As Required =	0.1728 in2/ft

Project Title:
Engineer:
Project ID:
Project Descr:

Cantilevered Retaining Wall

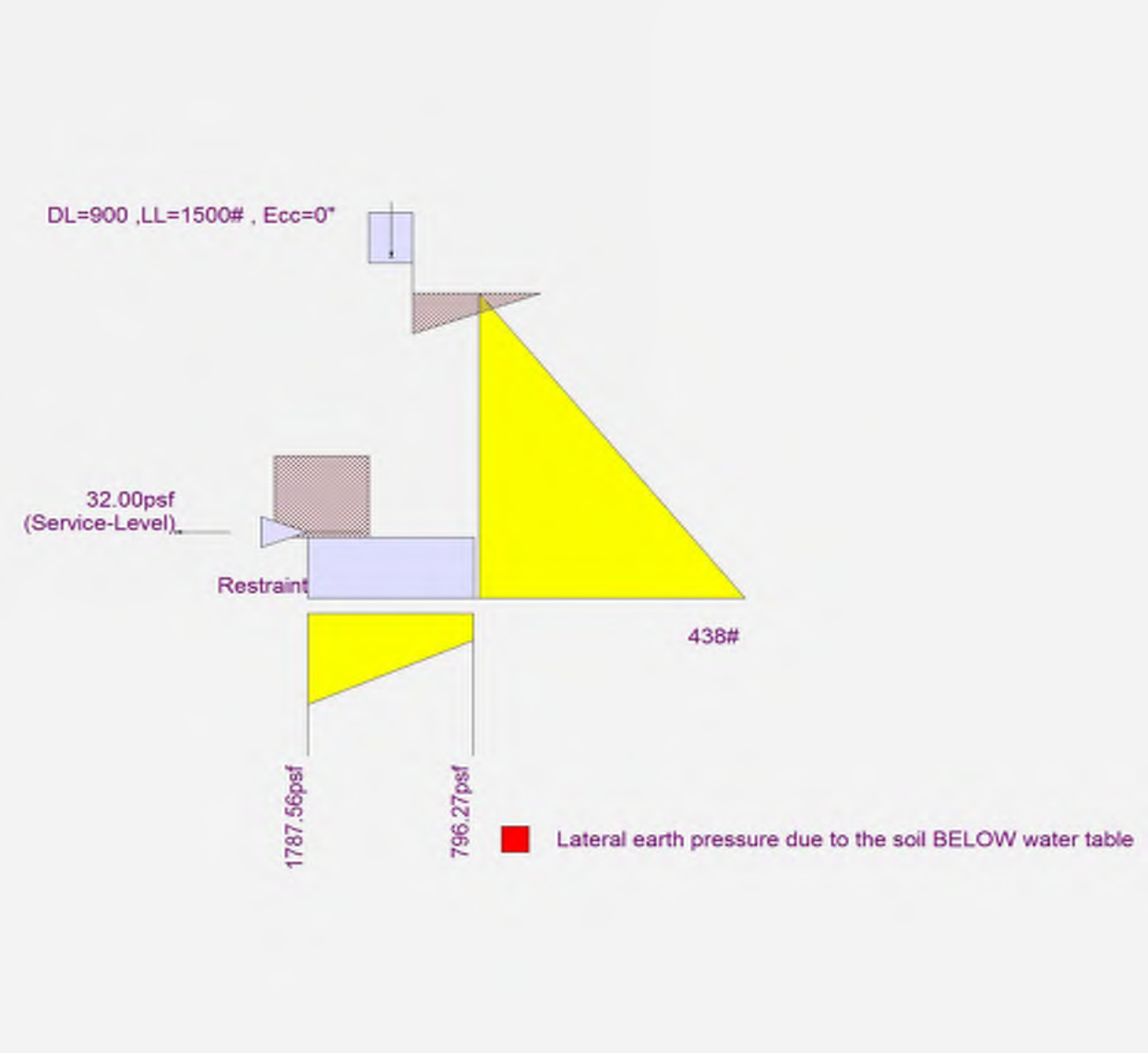
DESCRIPTION: 4' backfill (2.5 ksi, 8H, 35 active, 300 passive, 2000 psf)



Project Title:
Engineer:
Project ID:
Project Descr:

Cantilevered Retaining Wall

DESCRIPTION: 4' backfill (2.5 ksi, 8H, 35 active, 300 passive, 2000 psf)



Project Title:
Engineer:
Project ID:
Project Descr:

Cantilevered Retaining Wall

LIC# : KW-06011993, Build:20.22.2.15 L120 Engineering and Design

DESCRIPTION: 4' backfill site retaining (2.5 ksi, 8H, 35 active, 300 passive, 0.45)

Code Reference

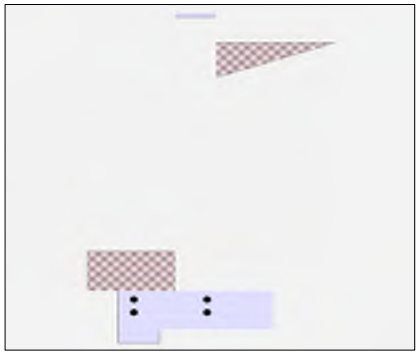
Calculations per IBC 2018 1807.3, CBC 2019, ASCE 7-16

Criteria

Retained Height	=	4.75 ft
Wall height above soil	=	0.50 ft
Slope Behind Wall	=	0.00
Height of Soil over Toe	=	9.00 in
Water height over heel	=	0.0 ft

Soil Data

Allow Soil Bearing	=	2,600.0 psf
Equivalent Fluid Pressure Method		
Active Heel Pressure	=	35.0 psf/ft
	=	
Passive Pressure	=	300.0 psf/ft
Soil Density, Heel	=	110.00 pcf
Soil Density, Toe	=	110.00 pcf
Footing||Soil Friction	=	0.450
Soil height to ignore for passive pressure	=	12.00 in



Surcharge Loads

Surcharge Over Heel	=	0.0 psf
Used To Resist Sliding & Overturning		
Surcharge Over Toe	=	0.0
Used for Sliding & Overturning		

Axial Load Applied to Stem

Axial Dead Load	=	0.0 lbs
Axial Live Load	=	0.0 lbs
Axial Load Eccentricity	=	0.0 in

Lateral Load Applied to Stem

Lateral Load	=	32.0 #/ft
...Height to Top	=	0.00 ft
...Height to Bottom	=	0.00 ft
Load Type	=	Wind (W) (Service Level)
Wind on Exposed Stem (Service Level)	=	0.0 psf

Adjacent Footing Load

Adjacent Footing Load	=	0.0 lbs
Footing Width	=	0.00 ft
Eccentricity	=	0.00 in
Wall to Ftg CL Dist	=	0.00 ft
Footing Type		Spread Footing
Base Above/Below Soil at Back of Wall	=	0.0 ft
Poisson's Ratio	=	0.300

Project Title:
Engineer:
Project ID:
Project Descr:

Cantilevered Retaining Wall

DESCRIPTION: 4' backfill site retaining (2.5 ksi, 8H, 35 active, 300 passive, 0.45)

Design Summary

Wall Stability Ratios

Overturning	=	2.01	OK
Sliding	=	1.51	OK
Global Stability	=	2.18	
Total Bearing Load	=	1,087 lbs	
...resultant ecc.	=	1.26 in	
Soil Pressure @ Toe	=	427 psf	OK
Soil Pressure @ Heel	=	256 psf	OK
Allowable	=	2,600 psf	
Soil Pressure Less Than Allowable			
ACI Factored @ Toe	=	598 psf	
ACI Factored @ Heel	=	358 psf	
Footing Shear @ Toe	=	2.1 psi	OK
Footing Shear @ Heel	=	12.8 psi	OK
Allowable	=	82.2 psi	

Sliding Calcs

Lateral Sliding Force	=	529.4 lbs	
less 100% Passive Force	-	309.4 lbs	
less 100% Friction Force	-	489.2 lbs	
Added Force Req'd	=	0.0 lbs	OK
....for 1.5 Stability	=	0.0 lbs	OK

Vertical component of active lateral soil pressure IS considered in the calculation of soil bearing pressures.

Load Factors

Building Code	
Dead Load	1.200
Live Load	1.600
Earth, H	1.600
Wind, W	1.000
Seismic, E	1.000

Stem Construction

		3rd		
		Stem OK		
Design Height Above Ftg	ft =	5.33		
Wall Material Above "Ht"	=	Concrete		
Design Method	=	SD	SD	SD
Thickness	=	8.00		
Rebar Size	=	# 4		
Rebar Spacing	=	12.00		
Rebar Placed at	=	Edge		
Design Data				
fb/FB + fa/Fa	=	**0.000**		
Total Force @ Section				
Service Level	lbs =			
Strength Level	lbs =			
Moment....Actual				
Service Level	ft-# =			
Strength Level	ft-# =			
Moment.....Allowable	=	3,655.6		
Shear.....Actual				
Service Level	psi =			
Strength Level	psi =			
Shear.....Allowable	psi =	75.0		
Anet (Masonry)	in2 =			
Rebar Depth 'd'	in =	6.25		
Masonry Data				
f'm	psi =			
Fs	psi =			
Solid Grouting	=			
Modular Ratio 'n'	=			
Wall Weight	psf =	100.0		
Short Term Factor	=			
Equiv. Solid Thick.	=			
Masonry Block Type	=			
Masonry Design Method	=	ASD		
Concrete Data				
f'c	psi =	2,500.0		
Fy	psi =	40,000.0		

Project Title:
Engineer:
Project ID:
Project Descr:

Cantilevered Retaining Wall

DESCRIPTION: 4' backfill site retaining (2.5 ksi, 8H, 35 active, 300 passive, 0.45)

Concrete Stem Rebar Area Details

Bottom Stem	Vertical Reinforcing	Horizontal Reinforcing	
As (based on applied moment) :	0 in2/ft		
(4/3) * As :	0 in2/ft	Min Stem T&S Reinf Area 0.015 in2	
200bd/fy : 200(12)(6.25)/40000 :	0.375 in2/ft	Min Stem T&S Reinf Area per ft of stem Height : 0.192 in2/ft	
0.0018bh : 0.0018(12)(8) :	0.1728 in2/ft	Horizontal Reinforcing Options :	
	==========	One layer of :	Two layers of :
Required Area :	0.1728 in2/ft	#4@ 12.50 in	#4@ 25.00 in
Provided Area :	0.2 in2/ft	#5@ 19.38 in	#5@ 38.75 in
Maximum Area :	1.27 in2/ft	#6@ 27.50 in	#6@ 55.00 in

Footing Data

Toe Width	=	0.92 ft
Heel Width	=	1.58
Total Footing Width	=	2.50
Footing Thickness	=	9.00 in
Key Width	=	8.00 in
Key Depth	=	3.00 in
Key Distance from Toe	=	0.00 ft

f'c = 3,000 psi Fy = 40,000 psi
Footing Concrete Density = 150.00 pcf
Min. As % = 0.0018
Cover @ Top 2.00 @ Btm.= 3.00 in

Footing Design Results

		Toe	Heel	
Factored Pressure	=	598	358	psf
Mu' : Upward	=	239	0	ft-#
Mu' : Downward	=	98	664	ft-#
Mu: Design	=	141	664	ft-#
phiMin	=	3,372	1,342	ft-#
Actual 1-Way Shear	=	2.15	12.77	psi
Allow 1-Way Shear	=	82.16	43.82	psi

Toe Reinforcing = # 4 @ 12.00 in
Heel Reinforcing = None Spec'd
Key Reinforcing = None Spec'd
Footing Torsion, Tu = 0.00 ft-lbs
Footing Allow. Torsion, phi Tu = 0.00 ft-lbs

If torsion exceeds allowable, provide supplemental design for footing torsion.

Other Acceptable Sizes & Spacings

Toe:
Heel:
Key:

Min footing T&S reinf Area 0.49 in2
Min footing T&S reinf Area per foot 0.19 in2 /ft

If one layer of horizontal bars:	If two layers of horizontal bars:
#4@ 12.35 in	#4@ 24.69 in
#5@ 19.14 in	#5@ 38.27 in
#6@ 27.16 in	#6@ 54.32 in

Project Title:
Engineer:
Project ID:
Project Descr:

Cantilevered Retaining Wall

DESCRIPTION: 4' backfill site retaining (2.5 ksi, 8H, 35 active, 300 passive, 0.45)

Summary of Overturning & Resisting Forces & Moments

Item		.....OVERTURNING..... Force lbs	Distance ft	Moment ft-#		.....RESISTING..... Force lbs	Distance ft	Moment ft-#
HL Act Pres (ab water tbl)		529.4	1.83	970.5	Soil Over HL (ab. water tbl)	479.3	2.04	979.0
HL Act Pres (be water tbl)					Soil Over HL (bel. water tbl)		2.04	979.0
Hydrostatic Force					Watre Table			
Buoyant Force	=				Sloped Soil Over Heel	=		
Surcharge over Heel	=				Surcharge Over Heel	=		
Surcharge Over Toe	=				Adjacent Footing Load	=		
Adjacent Footing Load	=				Axial Dead Load on Stem	=		
Added Lateral Load	=		0.75		* Axial Live Load on Stem	=		
Load @ Stem Above Soil	=				Soil Over Toe	=	75.7	0.46	34.7
	=				Surcharge Over Toe	=		
					Stem Weight(s)	=	-8.0	1.25	-10.0
					Earth @ Stem Transitions	=		
					Footing Weight	=	281.4	1.25	351.9
					Key Weight	=	25.0	0.33	8.3
					Vert. Component	=	233.7	2.50	584.5
Total	=	529.4	**O.T.M.** =	970.5	**Total =**		1,087.0 lbs	**R.M.=**	1,948.4

Resisting/Overturning Ratio = **2.01**
Vertical Loads used for Soil Pressure = 1,087.0 lbs

* Axial live load NOT included in total displayed, or used for overturning resistance, but is included for soil pressure calculation.

Vertical component of active lateral soil pressure IS considered in the calculation of Sliding Resistance.

Vertical component of active lateral soil pressure IS considered in the calculation of Overturning Resistance.

Tilt

Horizontal Deflection at Top of Wall due to settlement of soil

(Deflection due to wall bending not considered)

Soil Spring Reaction Modulus	250.0	pci
Horizontal Defl @ Top of Wall (approximate only)	0.025	in

The above calculation is not valid if the heel soil bearing pressure exceeds that of the toe, because the wall would then tend to rotate into the retained soil.

Project Title:
Engineer:
Project ID:
Project Descr:

Cantilevered Retaining Wall

DESCRIPTION: 4' backfill site retaining (2.5 ksi, 8H, 35 active, 300 passive, 0.45)

Rebar Lap & Embedment Lengths Information

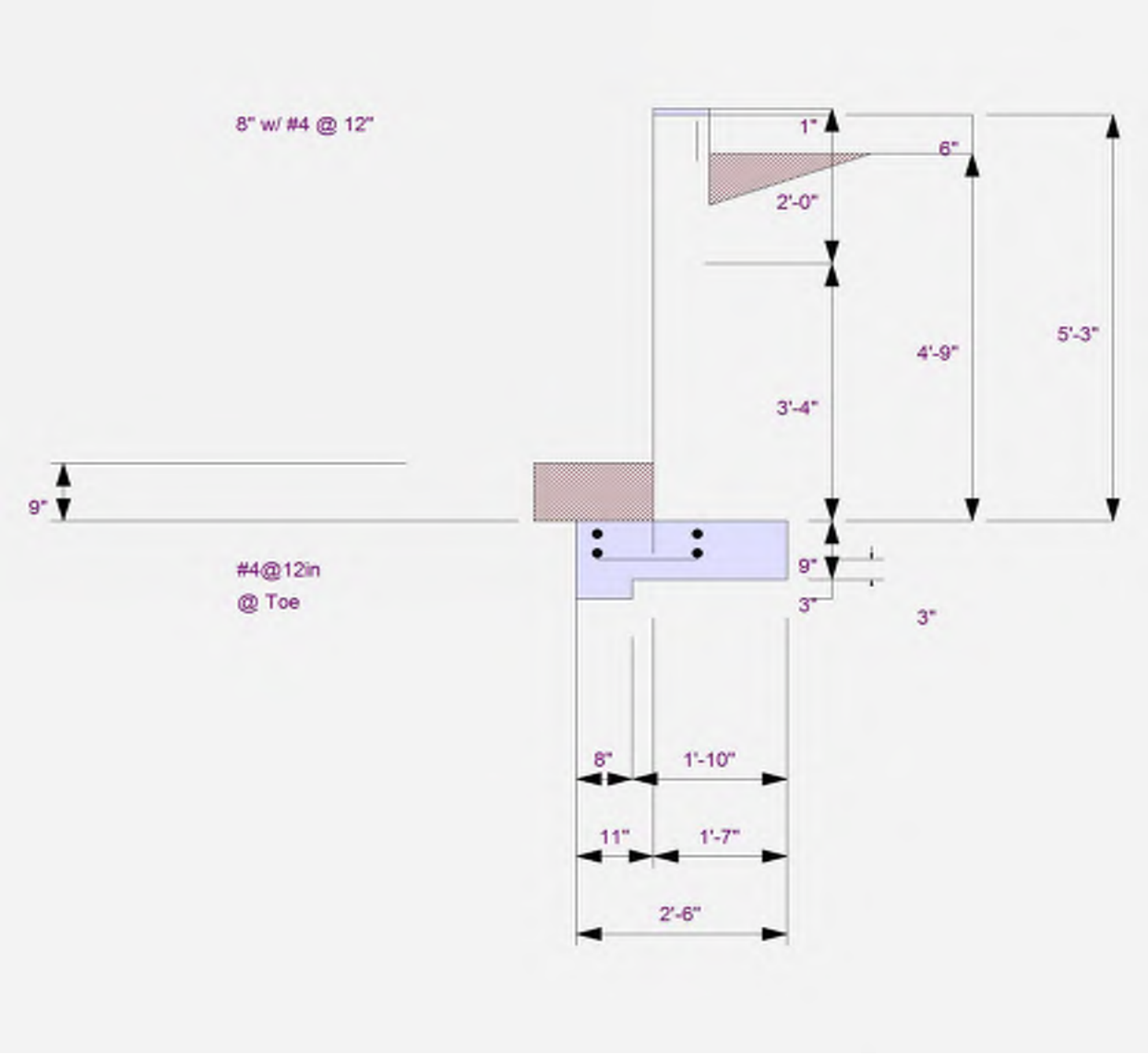
Stem Design Segment: Bottom
Stem Design Height: 5.33 ft above top of footing

Lap Splice length for #4 bar specified in this stem design segment =	15.60 in
Development length for #4 bar specified in this stem design segment =	12.00 in
Hooked embedment length into footing for #4 bar specified in this stem design segment =	6.00 in
As Provided =	0.2000 in2/ft
As Required =	0.1728 in2/ft

Project Title:
Engineer:
Project ID:
Project Descr:

Cantilevered Retaining Wall

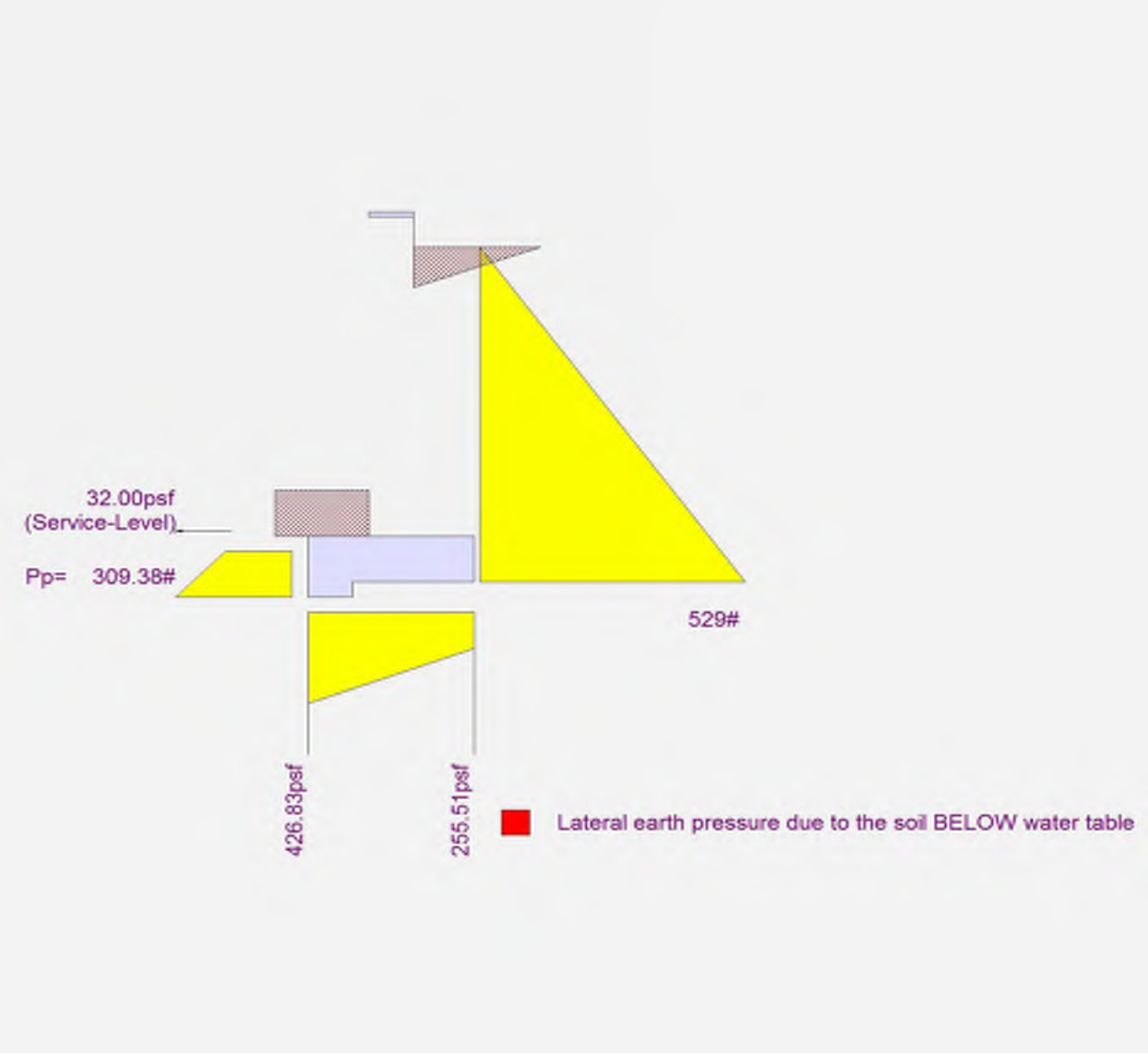
DESCRIPTION: 4' backfill site retaining (2.5 ksi, 8H, 35 active, 300 passive, 0.45)



Project Title:
Engineer:
Project ID:
Project Descr:

Cantilevered Retaining Wall

DESCRIPTION: 4' backfill site retaining (2.5 ksi, 8H, 35 active, 300 passive, 0.45)



1.Project information

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

Project description:
Location:
Fastening description:

2. Input Data & Anchor Parameters

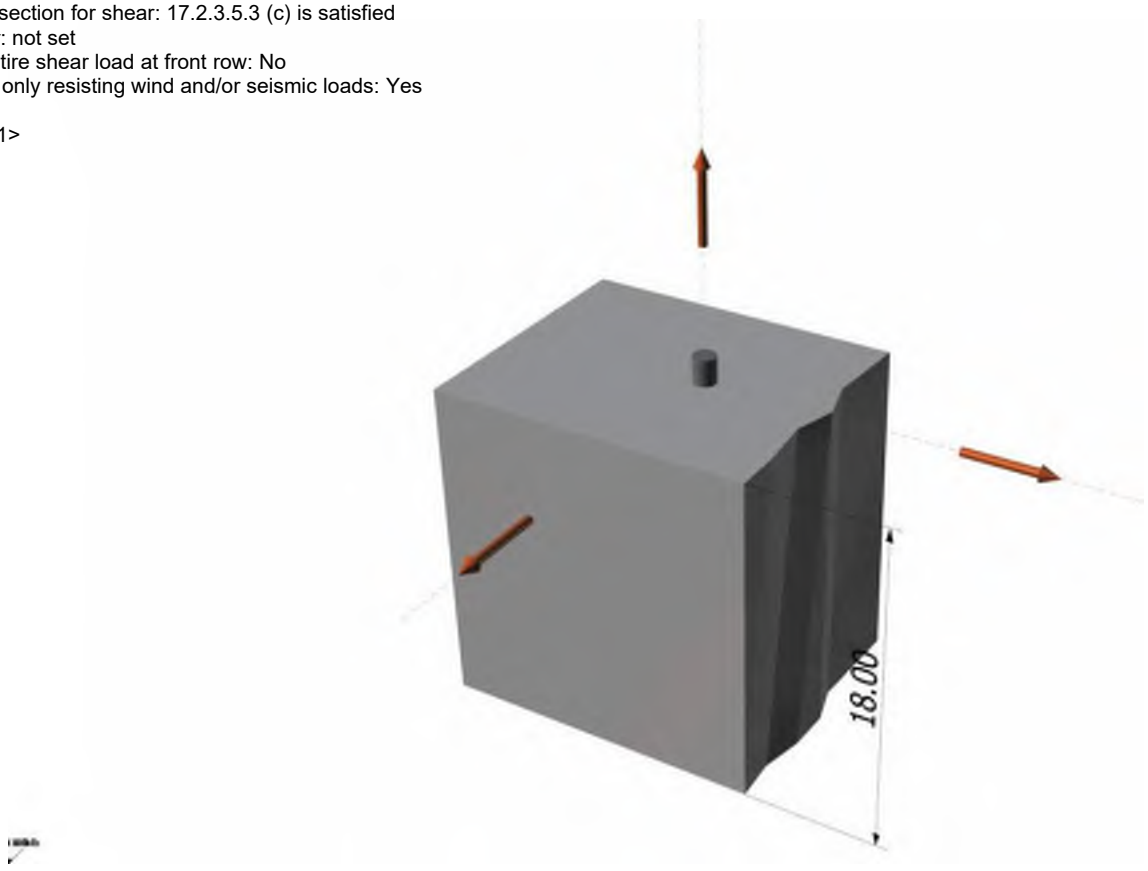
General
Design method:ACI 318-14
Units: Imperial units

Anchor Information:
Anchor type: Cast-in-place
Material: AB
Diameter (inch): 0.625
Effective Embedment depth, h_{ef} (inch): 8.000
Anchor category: -
Anchor ductility: Yes
h_{min} (inch): 10.13
C_{min} (inch): 3.75
S_{min} (inch): 3.75

Load and Geometry
Load factor source: ACI 318 Section 5.3
Load combination: not set
Seismic design: Yes
Anchors subjected to sustained tension: Not applicable
Ductility section for tension: not satisfied
Ductility section for shear: 17.2.3.5.3 (c) is satisfied
Ω_0 factor: not set
Apply entire shear load at front row: No
Anchors only resisting wind and/or seismic loads: Yes

Base Material
Concrete: Normal-weight
Concrete thickness, h (inch): 18.00
State: Uncracked
Compressive strength, f'_c (psi): 2500
$\Psi_{c,V}$: 1.0
Reinforcement condition: A tension, A shear
Supplemental reinforcement: No
Reinforcement provided at corners: Yes
Ignore concrete breakout in tension: No
Ignore concrete breakout in shear: No
Ignore 6do requirement: No
Build-up grout pad: No

<Figure 1>



<Figure 2>

Recommended Anchor
Anchor Name: PAB Pre-Assembled Anchor Bolt - PAB5 (5/8"Ø)

3. Resulting Anchor Forces

Anchor	Tension load, N_{ua} (lb)	Shear load x, V_{uax} (lb)	Shear load y, V_{uay} (lb)	Shear load combined, $\sqrt{(V_{uax})^2+(V_{uay})^2}$ (lb)
1	4300.0	0.0	0.0	0.0
Sum	4300.0	0.0	0.0	0.0

Maximum concrete compression strain (‰): 0.00
Maximum concrete compression stress (psi): 0
Resultant tension force (lb): 4300
Resultant compression force (lb): 0
Eccentricity of resultant tension forces in x-axis, e'_{Nx} (inch): 0.00
Eccentricity of resultant tension forces in y-axis, e'_{Ny} (inch): 0.00

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

N_{sa} (lb)	ϕ	ϕN_{sa} (lb)
13100	0.75	9825

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

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

k_c	λ_a	f'_c (psi)	h_{ef} (in)	N_b (lb)
24.0	1.00	2500	4.000	9600

$0.75\phi N_{cb} = 0.75\phi \, (A_{Nc} / A_{Nco}) \Psi_{ed,N} \Psi_{c,N} \Psi_{cp,N} N_b$ (Sec. 17.3.1 & Eq. 17.4.2.1a)

A_{Nc} (in^2)	A_{Nco} (in^2	$c_{a,min}$ (in)	$\Psi_{ed,N}$	$\Psi_{c,N}$	$\Psi_{cp,N}$	N_b (lb)	ϕ	$0.75\phi N_{cb}$ (lb)
103.00	144.00	4.00	0.900	1.25	1.000	9600	0.75	4345

6. Pullout Strength of Anchor in Tension (Sec. 17.4.3)

$0.75\phi N_{pn} = 0.75\phi \Psi_{c,P} N_p = 0.75\phi \Psi_{c,P} 8 A_{brg} f'_c$ (Sec. 17.3.1, Eq. 17.4.3.1 & 17.4.3.4)

$\Psi_{c,P}$	A_{brg} (in^2)	f'_c (psi)	ϕ	$0.75\phi N_{pn}$ (lb)
1.4	2.10	2500	0.70	30841

11. Results

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

Tension	Factored Load, N_{ua} (lb)	Design Strength, ϕN_n (lb)	Ratio	Status
Steel	4300	9825	0.44	Pass
Concrete breakout	**4300**	**4345**	**0.99**	**Pass (Governs)**
Pullout	4300	30841	0.14	Pass

PAB5 (5/8"Ø) with hef = 8.000 inch meets the selected design criteria.

12. Warnings

- Brittle failure governs for tension. Governing anchor failure mode is brittle failure. Attachment shall be designed to satisfy the requirements of ACI 318-14 Section 17.2.3.4.3 for structures assigned to Seismic Design Category C, D, E, or F when the component of the strength level earthquake force applied to anchors exceeds 20 percent of the total factored anchor force associated with the same load combination. In case when ACI 318-14 Sections 17.2.3.4.3 (a)(iii) to (vi), (b), (c) or (d) is satisfied for tension loading, select appropriate checkbox from Inputs tab to disable this message. Alternatively, Ω0 factor can be entered to satisfy ACI 318-14 Section 17.2.3.4.3(d) to increase the earthquake portion of the loads as required.

- Per designer input, ductility requirements for shear have been determined to be satisfied – designer to verify.

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

1.Project information

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

Project description:
Location:
Fastening description:

2. Input Data & Anchor Parameters

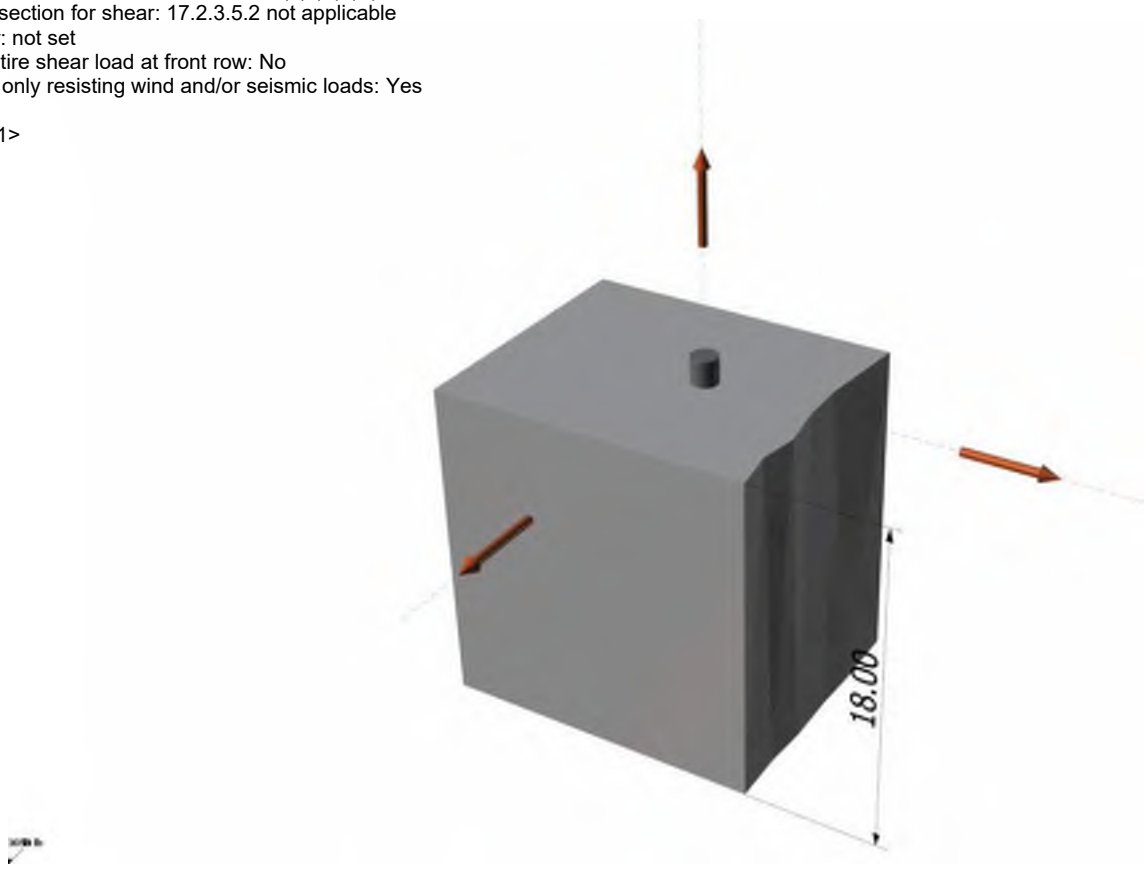
General
Design method:ACI 318-14
Units: Imperial units

Anchor Information:
Anchor type: Cast-in-place
Material: AB
Diameter (inch): 0.750
Effective Embedment depth, h_{ef} (inch): 12.000
Anchor category: -
Anchor ductility: Yes
h_{min} (inch): 14.25
C_{min} (inch): 1.63
S_{min} (inch): 3.00

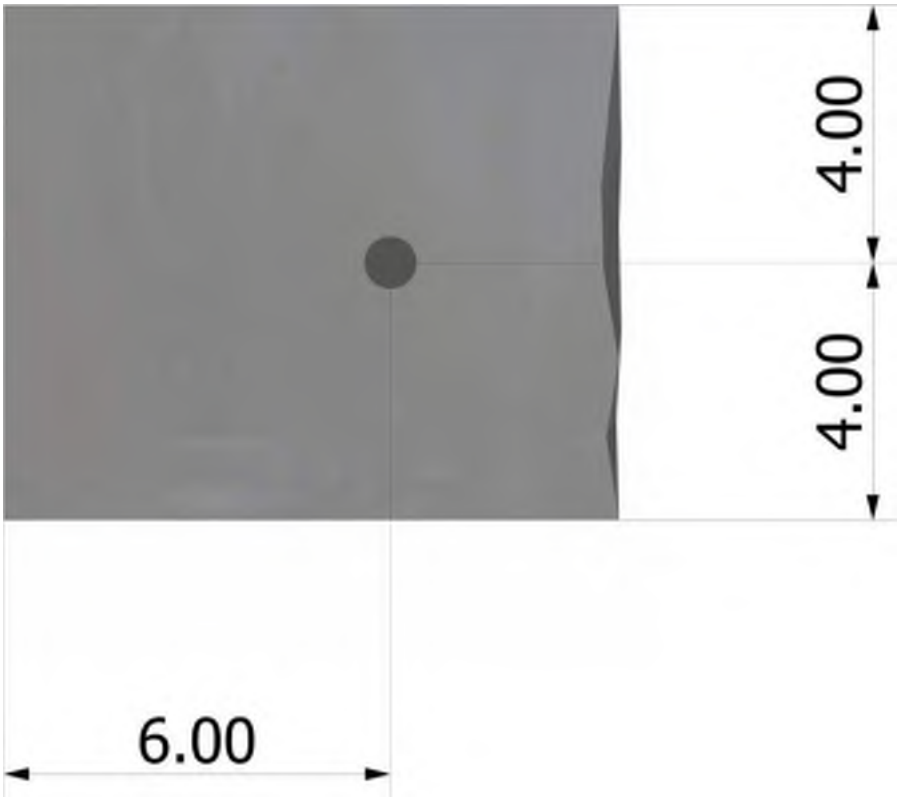
Load and Geometry
Load factor source: ACI 318 Section 5.3
Load combination: U = 0.9D + 1.0E
Seismic design: Yes
Anchors subjected to sustained tension: Not applicable
Ductility section for tension: 17.2.3.4.3 (a) (iii)-(vi) is satisfied
Ductility section for shear: 17.2.3.5.2 not applicable
Ω_0 factor: not set
Apply entire shear load at front row: No
Anchors only resisting wind and/or seismic loads: Yes

Base Material
Concrete: Normal-weight
Concrete thickness, h (inch): 18.00
State: Cracked
Compressive strength, f'_c (psi): 2500
$\Psi_{c,V}$: 1.0
Reinforcement condition: A tension, A shear
Supplemental reinforcement: Not applicable
Reinforcement provided at corners: Yes
Ignore concrete breakout in tension: Yes
Ignore concrete breakout in shear: No
Ignore 6do requirement: Yes
Build-up grout pad: No

<Figure 1>



<Figure 2>



Recommended Anchor
Anchor Name: PAB Pre-Assembled Anchor Bolt - PAB6 (3/4"Ø)

3. Resulting Anchor Forces

Anchor	Tension load, N_{ua} (lb)	Shear load x, V_{uax} (lb)	Shear load y, V_{uay} (lb)	Shear load combined, $\sqrt{(V_{uax})^2+(V_{uay})^2}$ (lb)
1	13050.0	0.0	0.0	0.0
Sum	13050.0	0.0	0.0	0.0

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

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

N_{sa} (lb)	ϕ	ϕN_{sa} (lb)
19370	0.75	14528

6. Pullout Strength of Anchor in Tension (Sec. 17.4.3)

$0.75\phi N_{pn} = 0.75\phi\Psi_{c,P}N_p = 0.75\phi\Psi_{c,P}8A_{brg}f'_c$ (Sec. 17.3.1, Eq. 17.4.3.1 & 17.4.3.4)

$\Psi_{c,P}$	A_{brg} (in^2)	f'_c (psi)	ϕ	$0.75\phi N_{pn}$ (lb)
1.0	3.53	2500	0.70	37107

7. Side-Face Blowout Strength of Anchor in Tension (Sec. 17.4.4)

$0.75\phi N_{sb} = 0.75\phi\{(1+c_{a2}/c_{a1})/4\}(160c_{a1}\sqrt{A_{brg}})\lambda\sqrt{f'_c}$ (Sec. 17.3.1 & Eq. 17.4.4.1)

c_{a1} (in)	c_{a2} (in)	A_{brg} (in^2)	λ_a	f'_c (psi)	ϕ	$0.75\phi N_{sbg}$ (lb)
4.00	6.00	3.53	1.00	2500	0.75	21149

11. Results

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

Tension	Factored Load, N_{ua} (lb)	Design Strength, øN_n (lb)	Ratio	Status
Steel	**13050**	**14528**	**0.90**	**Pass (Governs)**
Pullout	13050	37107	0.35	Pass
Side-face blowout	13050	21149	0.62	Pass

PAB6 (3/4"Ø) with hef = 12.000 inch meets the selected design criteria.

ACI 318-14 Section 17.2.3.4.3(a) (i) & (ii) Calculations for Ductility requirement for tension load

Steel	Factored Load, N_{ua} (lb)	1.2 x Nominal Strength, N_n (lb)	Ratio	
Steel	**13050**	**23244**	**56.1%**	**Governs**

Concrete	Nominal Strength, N_n (lb)	Nominal Strength, N_n (lb)	Ratio
Pullout	13050	70680	18.5%
Side-face blowout	13050	37598	34.7%

ACI 318-14 Section 17.2.3.4.3(a) (i) & (ii) satisfied since steel ratio governs and the steel element is ductile.

12. Warnings

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

- Concrete breakout strength in tension has not been evaluated against applied tension load(s) per designer option. Refer to ACI 318 Section 17.3.2.1 for conditions where calculations of the concrete breakout strength may not be required.

- Per designer input, the shear component of the strength-level earthquake force applied to anchors does not exceed 20 percent of the total factored anchor shear force associated with the same load combination. Therefore the ductility requirements of ACI 318 17.2.3.5.2 for shear need not be satisfied – designer to verify.

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

1.Project information

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

Project description:
Location:
Fastening description:

2. Input Data & Anchor Parameters

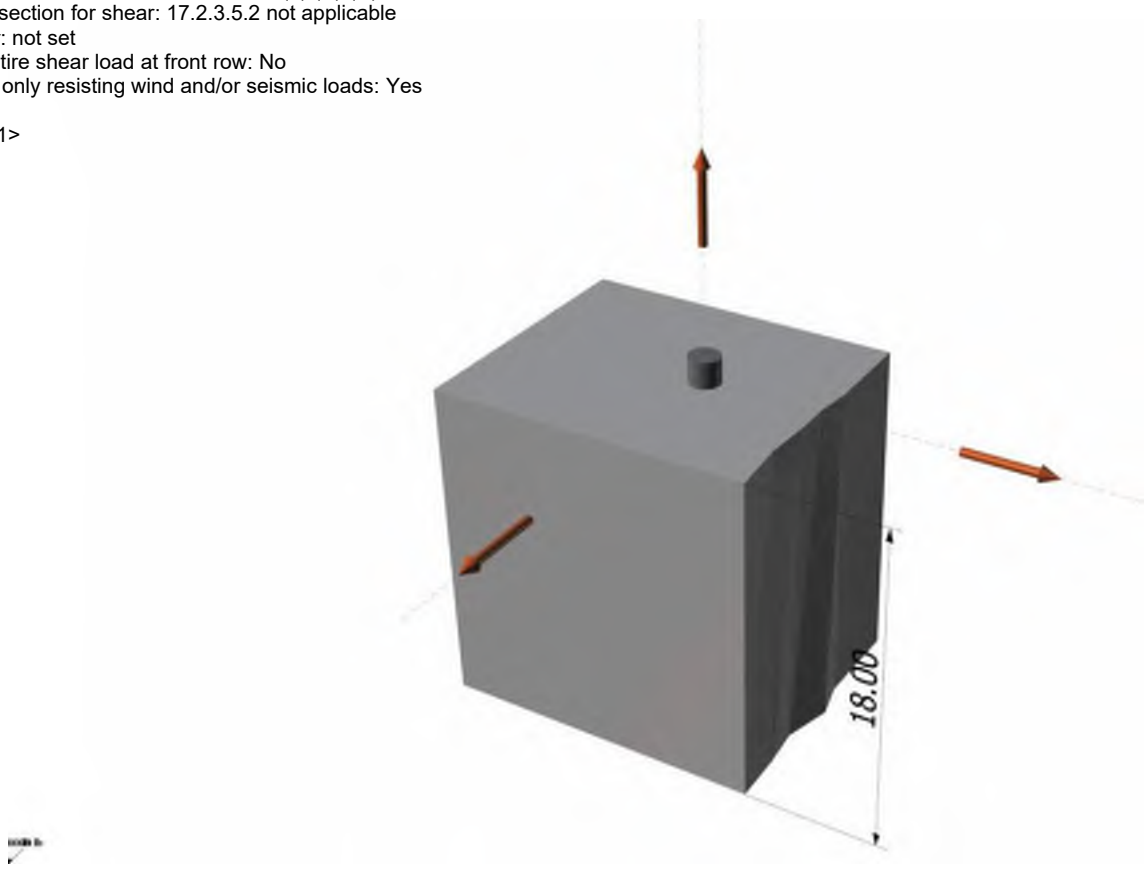
General
Design method:ACI 318-14
Units: Imperial units

Anchor Information:
Anchor type: Cast-in-place
Material: AB_H
Diameter (inch): 0.875
Effective Embedment depth, h_{ef} (inch): 12.000
Anchor category: -
Anchor ductility: Yes
h_{min} (inch): 14.38
C_{min} (inch): 1.75
S_{min} (inch): 3.50

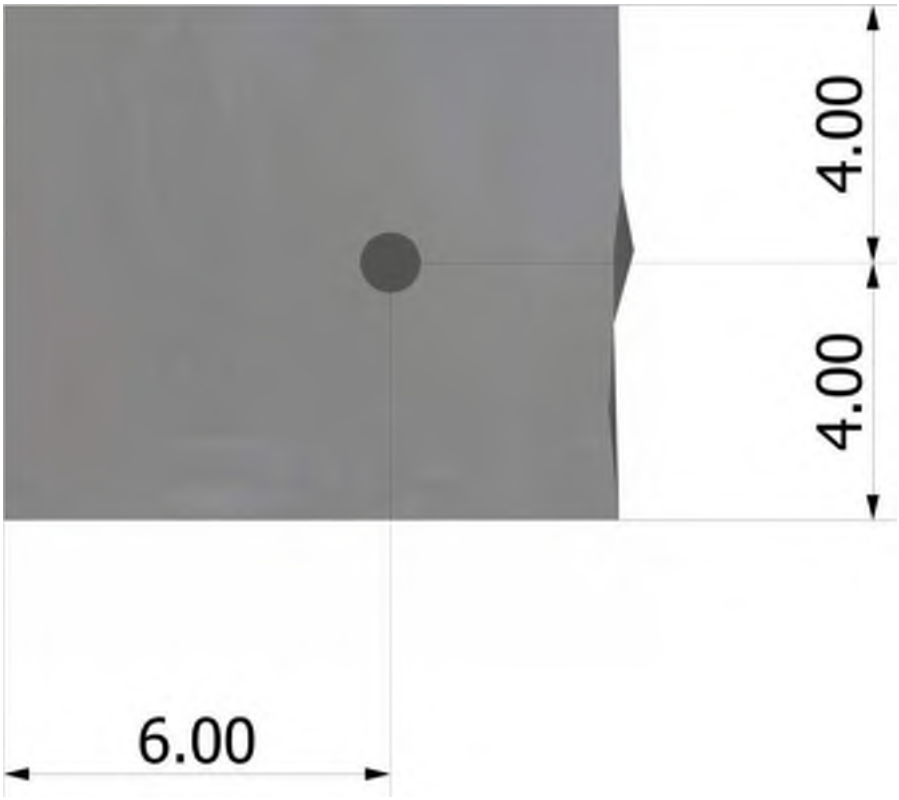
Load and Geometry
Load factor source: ACI 318 Section 5.3
Load combination: U = 0.9D + 1.0E
Seismic design: Yes
Anchors subjected to sustained tension: Not applicable
Ductility section for tension: 17.2.3.4.3 (a) (iii)-(vi) is satisfied
Ductility section for shear: 17.2.3.5.2 not applicable
Ω_0 factor: not set
Apply entire shear load at front row: No
Anchors only resisting wind and/or seismic loads: Yes

Base Material
Concrete: Normal-weight
Concrete thickness, h (inch): 18.00
State: Cracked
Compressive strength, f'_c (psi): 2500
$\Psi_{c,V}$: 1.0
Reinforcement condition: A tension, A shear
Supplemental reinforcement: Not applicable
Reinforcement provided at corners: Yes
Ignore concrete breakout in tension: Yes
Ignore concrete breakout in shear: No
Ignore 6do requirement: Yes
Build-up grout pad: No

<Figure 1>



<Figure 2>



Recommended Anchor
Anchor Name: PAB Pre-Assembled Anchor Bolt - PAB7H (7/8"Ø)

3. Resulting Anchor Forces

Anchor	Tension load, N_{ua} (lb)	Shear load x, V_{uax} (lb)	Shear load y, V_{uay} (lb)	Shear load combined, $\sqrt{(V_{uax})^2+(V_{uay})^2}$ (lb)
1	18000.0	0.0	0.0	0.0
Sum	18000.0	0.0	0.0	0.0

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

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

N_{sa} (lb)	ϕ	ϕN_{sa} (lb)
55440	0.75	41580

6. Pullout Strength of Anchor in Tension (Sec. 17.4.3)

$0.75\phi N_{pn} = 0.75\phi\Psi_{c,P}N_p = 0.75\phi\Psi_{c,P}8A_{brg}f'_c$ (Sec. 17.3.1, Eq. 17.4.3.1 & 17.4.3.4)

$\Psi_{c,P}$	A_{brg} (in^2)	f'_c (psi)	ϕ	$0.75\phi N_{pn}$ (lb)
1.0	4.07	2500	0.70	42683

7. Side-Face Blowout Strength of Anchor in Tension (Sec. 17.4.4)

$0.75\phi N_{sb} = 0.75\phi\{(1+c_{a2}/c_{a1})/4\}(160c_{a1}\sqrt{A_{brg}})\lambda\sqrt{f'_c}$ (Sec. 17.3.1 & Eq. 17.4.4.1)

c_{a1} (in)	c_{a2} (in)	A_{brg} (in^2)	λ_a	f'_c (psi)	ϕ	$0.75\phi N_{sbg}$ (lb)
4.00	6.00	4.07	1.00	2500	0.75	22682

11. Results

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

Tension	Factored Load, N_{ua} (lb)	Design Strength, øN_n (lb)	Ratio	Status
Steel	18000	41580	0.43	Pass
Pullout	18000	42683	0.42	Pass
Side-face blowout	**18000**	**22682**	**0.79**	**Pass (Governs)**

PAB7H (7/8"Ø) with hef = 12.000 inch meets the selected design criteria.

ACI 318-14 Section 17.2.3.4.3(a) (i) & (ii) Calculations for Ductility requirement for tension load

Steel	Factored Load, N_{ua} (lb)	1.2 x Nominal Strength, N_n (lb)	Ratio	
Steel	18000	66528	27.1%	

Concrete	Nominal Strength, N_n (lb)	Nominal Strength, N_n (lb)	Ratio	
Pullout	18000	81300	22.1%	
Side-face blowout	**18000**	**40324**	**44.6%**	**Governs**

ACI 318-14 Section 17.2.3.4.3(a) (i) & (ii) is not satisfied since steel ratio does not govern.

12. Warnings

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

- Concrete breakout strength in tension has not been evaluated against applied tension load(s) per designer option. Refer to ACI 318 Section 17.3.2.1 for conditions where calculations of the concrete breakout strength may not be required.

- Brittle failure governs for tension. Governing anchor failure mode is brittle failure. Attachment shall be designed to satisfy the requirements of ACI 318-14 Section 17.2.3.4.3 for structures assigned to Seismic Design Category C, D, E, or F when the component of the strength level earthquake force applied to anchors exceeds 20 percent of the total factored anchor force associated with the same load combination. In case when ACI 318-14 Sections 17.2.3.4.3 (a)(iii) to (vi), (b), (c) or (d) is satisfied for tension loading, select appropriate checkbox from Inputs tab to disable this message. Alternatively, Ω0 factor can be entered to satisfy ACI 318-14 Section 17.2.3.4.3(d) to increase the earthquake portion of the loads as required.

- Per designer input, the shear component of the strength-level earthquake force applied to anchors does not exceed 20 percent of the total factored anchor shear force associated with the same load combination. Therefore the ductility requirements of ACI 318 17.2.3.5.2 for shear need not be satisfied – designer to verify.

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

1.Project information

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

Project description:
Location:
Fastening description:

2. Input Data & Anchor Parameters

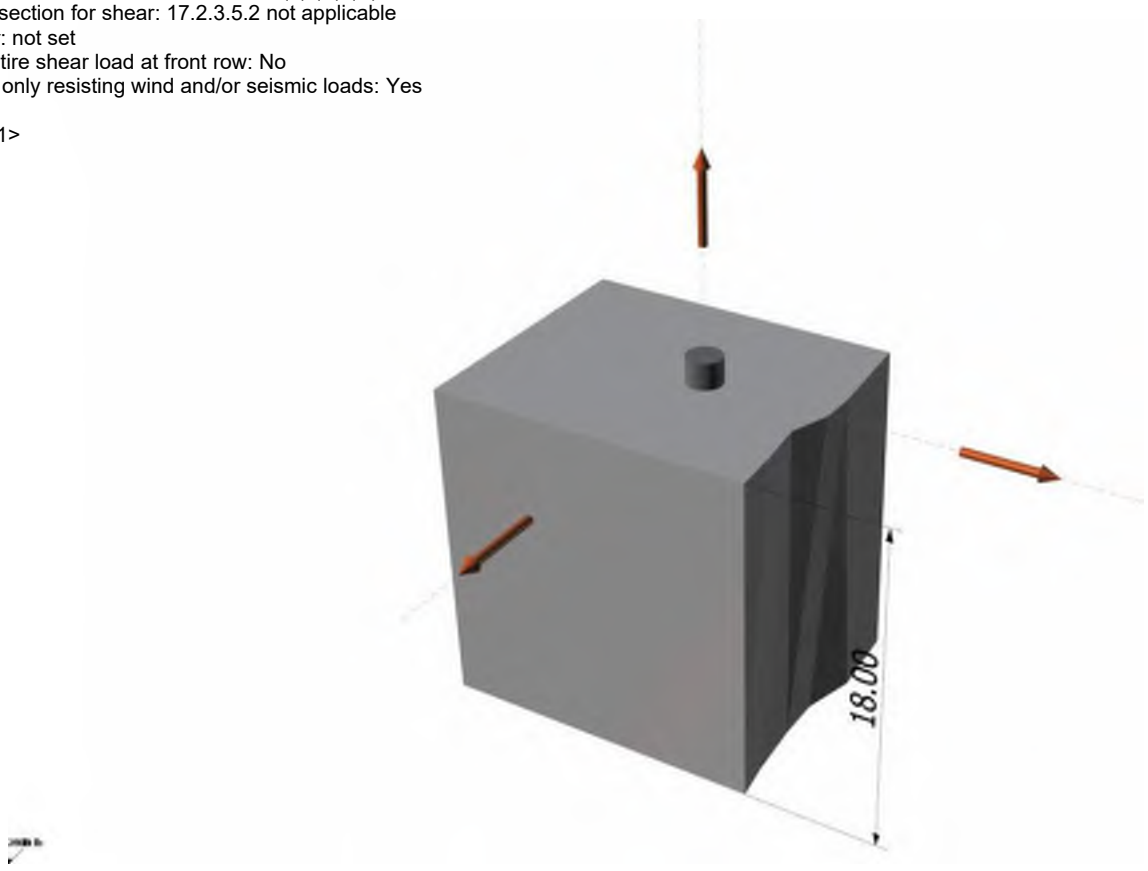
General
Design method:ACI 318-14
Units: Imperial units

Anchor Information:
Anchor type: Cast-in-place
Material: AB_H
Diameter (inch): 1.000
Effective Embedment depth, h_{ef} (inch): 15.000
Anchor category: -
Anchor ductility: Yes
h_{min} (inch): 17.63
C_{min} (inch): 1.88
S_{min} (inch): 4.00

Load and Geometry
Load factor source: ACI 318 Section 5.3
Load combination: U = 0.9D + 1.0E
Seismic design: Yes
Anchors subjected to sustained tension: Not applicable
Ductility section for tension: 17.2.3.4.3 (a) (iii)-(vi) is satisfied
Ductility section for shear: 17.2.3.5.2 not applicable
Ω_0 factor: not set
Apply entire shear load at front row: No
Anchors only resisting wind and/or seismic loads: Yes

Base Material
Concrete: Normal-weight
Concrete thickness, h (inch): 18.00
State: Cracked
Compressive strength, f'_c (psi): 2500
$\Psi_{c,V}$: 1.0
Reinforcement condition: A tension, A shear
Supplemental reinforcement: Not applicable
Reinforcement provided at corners: Yes
Ignore concrete breakout in tension: Yes
Ignore concrete breakout in shear: No
Ignore 6do requirement: Yes
Build-up grout pad: No

<Figure 1>



<Figure 2>

Recommended Anchor
Anchor Name: PAB Pre-Assembled Anchor Bolt - PAB8H (1"Ø)

3. Resulting Anchor Forces

Anchor	Tension load, N_{ua} (lb)	Shear load x, V_{uax} (lb)	Shear load y, V_{uay} (lb)	Shear load combined, $\sqrt{(V_{uax})^2+(V_{uay})^2}$ (lb)
1	22500.0	0.0	0.0	0.0
Sum	22500.0	0.0	0.0	0.0

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

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

N_{sa} (lb)	ϕ	ϕN_{sa} (lb)
72720	0.75	54540

6. Pullout Strength of Anchor in Tension (Sec. 17.4.3)

$0.75\phi N_{pn} = 0.75\phi\Psi_{c,P}N_p = 0.75\phi\Psi_{c,P}8A_{brg}f'_c$ (Sec. 17.3.1, Eq. 17.4.3.1 & 17.4.3.4)

$\Psi_{c,P}$	A_{brg} (in^2)	f'_c (psi)	ϕ	$0.75\phi N_{pn}$ (lb)
1.0	5.15	2500	0.70	54117

7. Side-Face Blowout Strength of Anchor in Tension (Sec. 17.4.4)

$0.75\phi N_{sb} = 0.75\phi\{(1+c_{a2}/c_{a1})/4\}(160c_{a1}\sqrt{A_{brg}})\lambda\sqrt{f'_c}$ (Sec. 17.3.1 & Eq. 17.4.4.1)

c_{a1} (in)	c_{a2} (in)	A_{brg} (in^2)	λ_a	f'_c (psi)	ϕ	$0.75\phi N_{sbg}$ (lb)
4.00	6.00	5.15	1.00	2500	0.75	25540

11. Results

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

Tension	Factored Load, N_{ua} (lb)	Design Strength, øN_n (lb)	Ratio	Status
Steel	22500	54540	0.41	Pass
Pullout	22500	54117	0.42	Pass
Side-face blowout	**22500**	**25540**	**0.88**	**Pass (Governs)**

PAB8H (1"Ø) with hef = 15.000 inch meets the selected design criteria.

ACI 318-14 Section 17.2.3.4.3(a) (i) & (ii) Calculations for Ductility requirement for tension load

Steel	Factored Load, N_{ua} (lb)	1.2 x Nominal Strength, N_n (lb)	Ratio	
Steel	22500	87264	25.8%	

Concrete	Nominal Strength, N_n (lb)	Nominal Strength, N_n (lb)	Ratio	
Pullout	22500	103080	21.8%	
Side-face blowout	**22500**	**45405**	**49.6%**	**Governs**

ACI 318-14 Section 17.2.3.4.3(a) (i) & (ii) is not satisfied since steel ratio does not govern.

12. Warnings

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

- Concrete breakout strength in tension has not been evaluated against applied tension load(s) per designer option. Refer to ACI 318 Section 17.3.2.1 for conditions where calculations of the concrete breakout strength may not be required.

- Brittle failure governs for tension. Governing anchor failure mode is brittle failure. Attachment shall be designed to satisfy the requirements of ACI 318-14 Section 17.2.3.4.3 for structures assigned to Seismic Design Category C, D, E, or F when the component of the strength level earthquake force applied to anchors exceeds 20 percent of the total factored anchor force associated with the same load combination. In case when ACI 318-14 Sections 17.2.3.4.3 (a)(iii) to (vi), (b), (c) or (d) is satisfied for tension loading, select appropriate checkbox from Inputs tab to disable this message. Alternatively, Ω0 factor can be entered to satisfy ACI 318-14 Section 17.2.3.4.3(d) to increase the earthquake portion of the loads as required.

- Per designer input, the shear component of the strength-level earthquake force applied to anchors does not exceed 20 percent of the total factored anchor shear force associated with the same load combination. Therefore the ductility requirements of ACI 318 17.2.3.5.2 for shear need not be satisfied – designer to verify.

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

LONGITUDE
ONE TWENTY°
ENGINEERING & DESIGN

LATERAL CALCULATIONS

SHEAR-WALL REFERENCE PER PLAN

(206) 790 9502
L120Engineering.com

Hazards by Location

Search Information

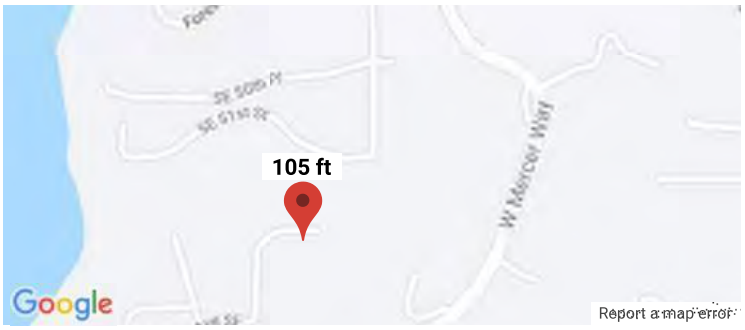
Address: 5202 Forest Ave SE, Mercer Island, WA 98040, USA

Coordinates: 47.55627369999999, -122.227956

Elevation: 105 ft

Timestamp: 2020-05-13T03:15:44.525Z

Hazard Type: Wind



ASCE 7-16

MRI 10-Year	67 mph
MRI 25-Year	73 mph
MRI 50-Year	78 mph
MRI 100-Year	83 mph
Risk Category I	92 mph
Risk Category II	97 mph
Risk Category III	104 mph
Risk Category IV	108 mph

ASCE 7-10

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

ASCE 7-05

ASCE 7-05 Wind Speed	85 mph

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

Disclaimer

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

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

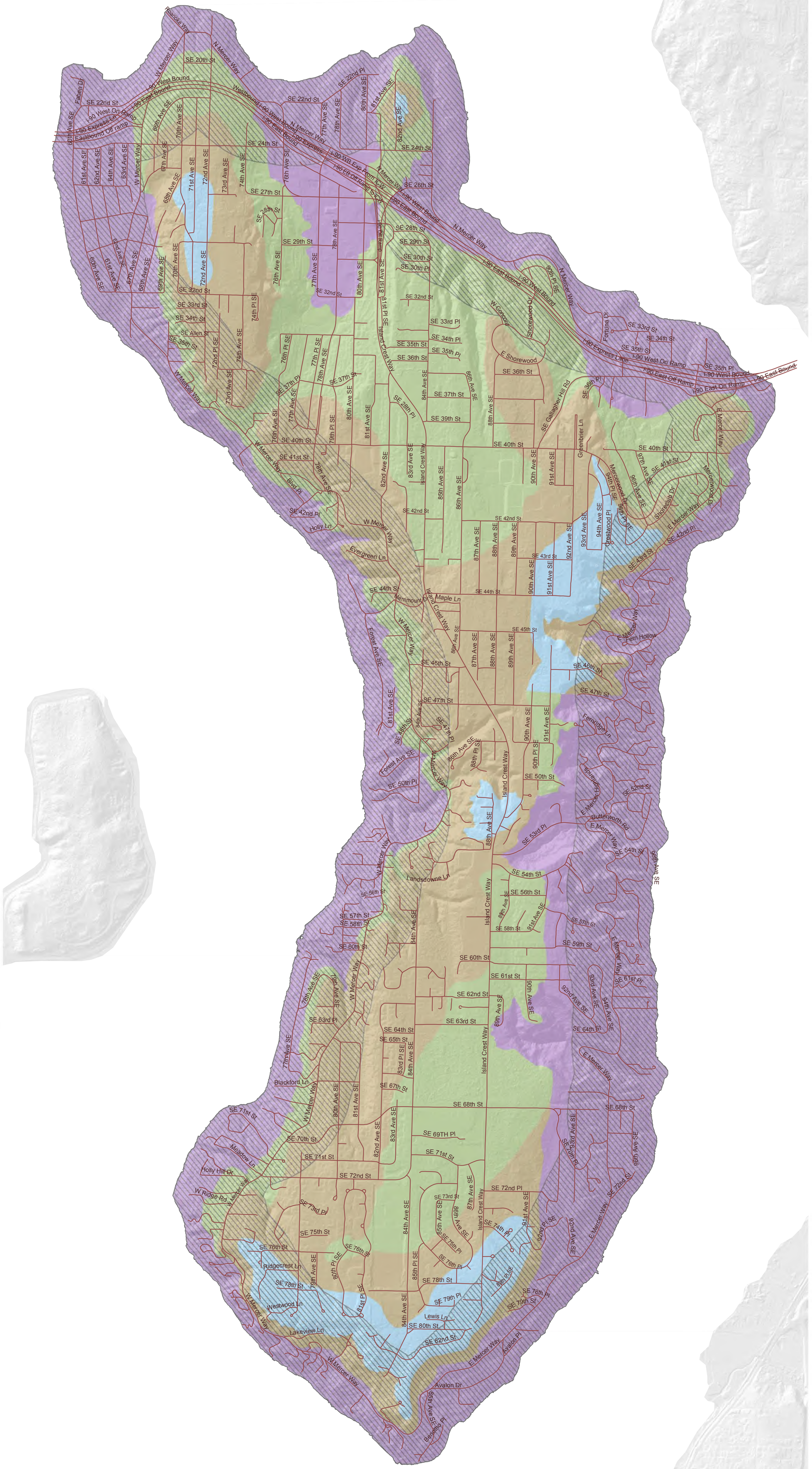
While the information presented on this website is believed to be correct, ATC and its sponsors and contributors assume no responsibility or liability for its accuracy. The material presented in the report should not be used or relied upon for any specific application without competent examination and verification of its accuracy, suitability and applicability by engineers or other licensed professionals. ATC does not intend that the use of this information replace the sound judgment of such competent professionals, having experience and knowledge in the field of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the results of the report provided by this website. Users of the information from this website assume all liability arising from such use. Use of the output of this website does not imply approval by the governing building code bodies responsible for building code approval and interpretation for the building site described by latitude/longitude location in the report.

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

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

0 0.5 1 Kilometers 1:12,000
0 0.5 1 Miles

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)

Hazards by Location

Search Information

Address: 5202 Forest Ave SE, Mercer Island, WA 98040, USA

Coordinates: 47.55627369999999, -122.227956

Elevation: 105 ft

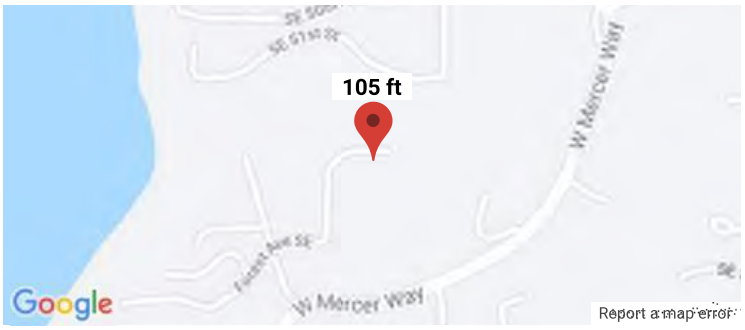
Timestamp: 2020-05-13T03:17:16.759Z

Hazard Type: Seismic

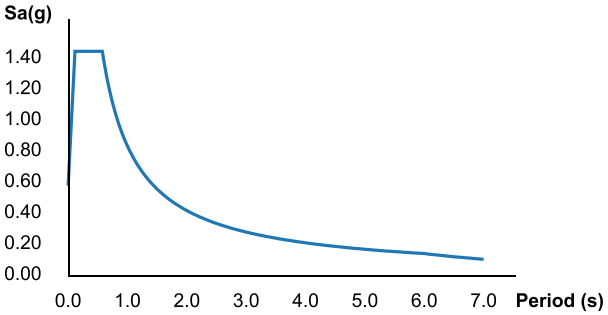
Reference Document: ASCE7-10

Risk Category: II

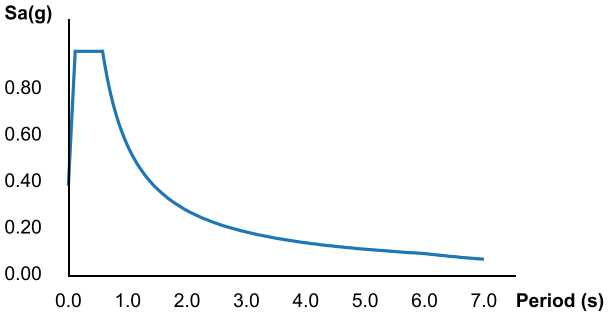
Site Class: D



MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	1.444	MCE_R ground motion (period=0.2s)
S_1	0.554	MCE_R ground motion (period=1.0s)
S_{MS}	1.444	Site-modified spectral acceleration value
S_{M1}	0.832	Site-modified spectral acceleration value
S_{DS}	0.962	Numeric seismic design value at 0.2s SA
S_{D1}	0.554	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	D	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.95	Coefficient of risk (0.2s)
CR_1	0.928	Coefficient of risk (1.0s)
PGA	0.599	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	0.599	Site modified peak ground acceleration
T_L	6	Long-period transition period (s)
SsRT	1.444	Probabilistic risk-targeted ground motion (0.2s)

SsUH	1.52	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	3.484	Factored deterministic acceleration value (0.2s)
S1RT	0.554	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.597	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.307	Factored deterministic acceleration value (1.0s)
PGAd	1.344	Factored deterministic acceleration value (PGA)

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

Disclaimer

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

While the information presented on this website is believed to be correct, ATC and its sponsors and contributors assume no responsibility or liability for its accuracy. The material presented in the report should not be used or relied upon for any specific application without competent examination and verification of its accuracy, suitability and applicability by engineers or other licensed professionals. ATC does not intend that the use of this information replace the sound judgment of such competent professionals, having experience and knowledge in the field of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the results of the report provided by this website. Users of the information from this website assume all liability arising from such use. Use of the output of this website does not imply approval by the governing building code bodies responsible for building code approval and interpretation for the building site described by latitude/longitude location in the report.

Project Number:	Plan Name:	Sheet Number:
xxx	**Forest Ave Lot 3**	**DC**
Engineer:	Specifics:	Date:
xxx	**Design Criteria**	**11/8/2021**

GRAVITY DESIGN:

BLUE = Review and update as required - Typical Input

Code Reference: IBC 2015

ROOF ASSEMBLY		
Live Load:		
Snow	25.0	psf
Dead Load:		
Composite Roofing	2.0	psf
19/32" Plywood Sheathing	2.5	psf
Trusses at 24" o.c.	3.0	psf
Insulation	1.8	psf
(2) Layers 5/8" GWB	4.4	psf
Misc or Tile Roof	1.3	psf
Total	**15.0**	**psf**

FLOOR ASSEMBLY		
Live Load:		
Residential	40.0	psf
Dead Load:		
Flooring	3.0	psf
3/4" T & G Plywood	2.5	psf
Floor Joists at 16" o.c.	2.5	psf
Insulation	0.5	psf
(1) Layers 5/8" GWB	2.2	psf
Misc or Tile Flooring	1.3	psf
Total	**12.0**	**psf**

EXTERIOR WALL ASSEMBLY		
2x6 at 16" o.c.	1.7	psf
Insulation	1.0	psf
1/2" Plywood Sheathing	1.5	psf
(2) layers 5/8" GWB	4.4	psf
Misc or Brick Covered Wall	3.4	psf
Total	**12.0**	**psf**

INTERIOR WALL ASSEMBLY		
2x4 at 8" o.c. Staggered	1.1	psf
Insulation	0.5	psf
(2) Layers 5/8" GWB	4.4	psf
Misc	2.0	psf
Total	**8.0**	**psf**

SEISMIC DESIGN:

Code Reference: ASCE 7-10

R = **6.5** Bearing Wall System, Wood Structural Panel Walls

Mapped Spectral Acceleration, Ss = **1.444**

Mapped Spectral Acceleration, S1 = **0.554**

Soil Site Class = **D**

WIND DESIGN:

Code Reference: ASCE 7-10

Basic Wind Speed (3 second Gust) = **110** mph

Exposure : **C**

Kzt = **1.00**

SOIL PROPERTIES:

Soil Bearing Pressure = **1,500** psf competent native soil or structural fill

1/3 increase for short-term wind or seismic loading is acceptable

Frost Depth = **18** in

Lateral Wall Pressures:

Unrestrained Active Pressure = **35** pcf for cantilevered retaining wall design

Restrained Active Pressure = **50** pcf for tank wall design

Passive Pressure = **250** pcf

Soil Friction Coeff. = **0.35**

Project Number:	Plan:	Sheet Number:
xxx	**Forest Ave Lot 3**	**L1**
Engineer:	Specifics:	Date
xxx	**WIND FORCES**	**11/8/2021**

IBC 2015 Section 1609 → ASCE 7-10 Section 28.6 - Simplified Procedure → Main Wind-Force Resisting System

LOAD CRITERIA:

Basic Wind Speed, V_s =	110 mph	(ASCE 7-10, Section 26.5 page 246)
Exposure =	C	(ASCE 7-10, Section 26.7 page 246)

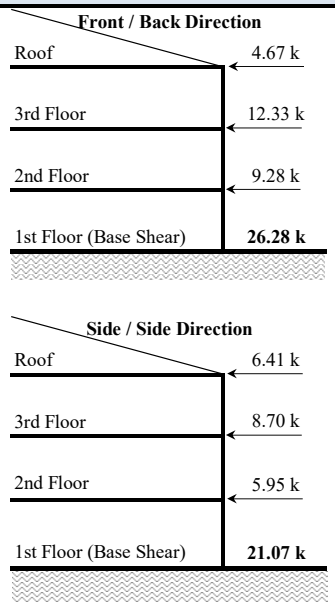
BUILDING GEOMETRY:

Roof Slope =	2.00 :12	=	9.46	degrees
Loads From Front/Back - Width (ft)=	68 ft		Roof:	Hip
Loads From Side - Width (ft) =	40 ft		Roof:	Gable
Average Eave Height =	27 ft			
Mean Roof Ht. , h =	29.00 ft		(ASCE 7-10, Figure 27.6-2 page 275)	
Edge Strip Width, a =	4 ft		(ASCE 7-10, Figure 28.6-1 page 303)	
End Zone Width, 2a =	8.00 ft		(ASCE 7-10, Figure 28.6-1 page 303)	

DESIGN:

Topographic Factor , Kzt =	1.00	(ASCE 7-10, Section 26.8, page 251)
Adjustment Factor, λ =	1.40	(ASCE 7-10, Figure 28.6-1, page 305)

WIND LOAD SUMMARY:

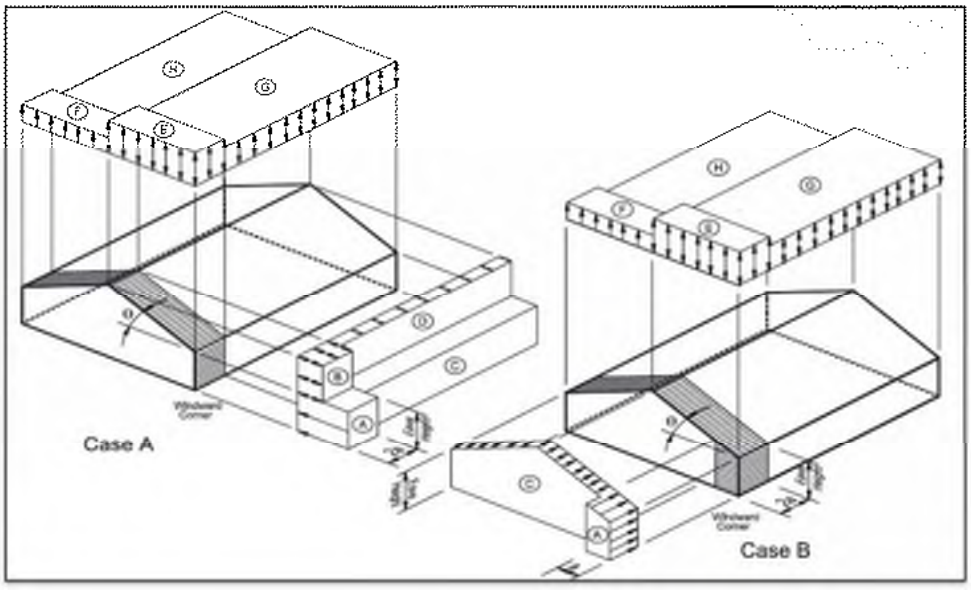


SIMPLIFIED DESIGN WIND PRESSURE, P_{S30} (psf)

(Exposure B at h = 30ft.)

Basic Wind Speed, Vs (mph)	Roof Angle (Degrees)	Load Case	ZONES*									
			Horizontal Pressure				Vertical Presssure				Overhang	
			A	B	C	D	E	F	G	H	E_{OH}	G_{OH}
110	9.46	A	21.34	-9.11	14.22	-5.28	-23.10	-13.99	-16.00	-10.72	-32.30	-25.30

* *Values Interpolated from Figure 28.6-1 ASCE 7 - 10 p. 303 to 305*



Project Number:	Plan:	Sheet Number:
xxx	**Forest Ave Lot 3**	**L1**
Engineer:	Specifics:	Date
xxx	**WIND FORCES**	**11/8/2021**

IBC 2015 Section 1609 → ASCE 7-10 Section 28.6 - Simplified Procedure → Main Wind-Force Resisting System

HORIZONTAL LOADS (psf) $p_s = \lambda * Kzt * Ps30$				**MIN. LOADS (psf)** *Per ASCE 7-10, 28.6.3*	
End zone		Interior zone		Roof	Wall
A (Wall)	B (Roof)	C (Wall)	D (Roof)		
29.88	-12.75	19.90	-7.39	8.0	16.0

ASD WIND FORCES: FRONT / BACK LOADING DIRECTION

	Location	Width (ft)	Height (ft)	Plane	End Zone Length (ft)	End Zone Pressure (W) (psf)	Interior zone Length (ft)	Interior zone Pressure (W) (psf)	Force 0.6 ω*W (kips)	Min Force 0.6 ω*W (kips)
ROOF	Height" of Roof to Plate (see note)	68.0	3.00	(roof)	8.0	-12.75	60.0	-7.39	0.00	1.27
	Plate to Mid 3rd LVL	68.0	4.00	(wall)	8.0	29.88	60.0	19.90	4.47	3.39
								Σ =	4.47	4.67
3rd FLOOR	Mid 3rd LVL to Floor	68.0	4.00	(wall)	8.0	29.88	60.0	19.90	4.47	3.39
	ght" Low-Roof to Plate (see note)	20.0	0.00	(roof)	8.0	-12.75	12.0	-7.39	0.00	0.00
	Floor to Mid 2nd LVL	88.0	5.50	(wall)	8.0	29.88	80.0	19.90	7.86	6.04
								Σ =	12.33	9.43
2nd FLOOR	Mid 2nd LVL to Floor	88.0	5.50	(wall)	8.0	29.88	80.0	19.90	7.86	6.04
	ght" Low-Roof to Plate (see note)	0.0	0.00	(roof)	8.0	-12.75	-8.0	-7.39	0.00	0.00
	Floor to Mid 1st LVL	88.0	1.00	(wall)	8.0	29.88	80.0	19.90	1.43	1.10
								Σ =	9.28	7.14
								Total Wind Base Shear (kips)	26.09	21.24

ASD WIND FORCES: SIDE / SIDE LOADING DIRECTION

	Location	Width (ft)	Height (ft)	Plane	End Zone Length (ft)	End Zone Pressure (W) (psf)	Interior zone Length (ft)	Interior zone Pressure (W) (psf)	Force 0.6 ω*W kips	Min Force 0.6 ω*W kips
ROOF	Height" of Roof to Plate (see note)	55.0	3.00	(roof)	8.0	29.88	47.0	19.90	2.75	1.03
	Plate to Mid 3rd LVL	55.0	4.00	(wall)	8.0	29.88	47.0	19.90	3.66	2.75
								Σ =	6.41	3.78
3rd FLOOR	Mid 3rd LVL to Floor	55.0	4.00	(wall)	8.0	29.88	47.0	19.90	3.66	2.75
	ght" Low-Roof to Plate (see note)	0.0	0.00	(roof)	8.0	29.88	-8.0	19.90	0.00	0.00
	Floor to Mid 2nd LVL	55.0	5.50	(wall)	8.0	29.88	47.0	19.90	5.04	3.78
								Σ =	8.70	6.52
2nd FLOOR	Mid 2nd LVL to Floor	55.0	5.50	(wall)	8.0	29.88	47.0	19.90	5.04	3.78
	ght" Low-Roof to Plate (see note)	0.0	0.00	(roof)	8.0	29.88	-8.0	19.90	0.00	0.00
	Floor to Mid 1st LVL	55.0	1.00	(wall)	8.0	29.88	47.0	19.90	0.92	0.69
								Σ =	5.95	4.46
								Total Wind Base Shear (kips)	21.07	14.76

Project Number:	Plan Name:	Sheet Number:
xxx	**Forest Ave Lot 3**	**L2**
Engineer:	Specifics:	Date:
xxx	**SEISMIC WEIGHTS**	**11/8/2021**

Unit Weights (psf)

Roof:	15	psf	25% of storage Live loads
Floor:	12	psf	Actual partition weight or 10 psf min if applicable
Exterior Wall:	12	psf	Operating weight of permenant equipment
Interior Wall:	8	psf	20% of uniform design snow loads for areas where Pf > 30 psf

Seismic Weights include: (REF §12.7)

LEVEL	ITEM	AREA / LENGTH	HEIGHT (ft)	UNIT WEIGH (psf)		Item Total Weight. (lbs)	Level Sub- (kips)	Average Pressure (psf)
ROOF								
	Roof	3,400	1.03	15	=	52,781		
	Ext. Wall Below	250	4.00	12	=	12,000		
	Corridor Wall Below	300	4.00	8	=	9,600		
							74	**22**
3rd FLOOR								
	3rd Floor	2,600	1.00	12	=	31,200		
	Low Roof	600	1.03	15	=	9,314		
	Ext. Wall Above	250	4.00	12	=	12,000		
	Corridor Wall Above	300	4.00	8	=	9,600		
	Ext. Wall Below	220	4.50	12	=	11,880		
	Corridor Wall Below	200	4.50	8	=	7,200		
							81	**25**
2nd FLOOR								
	2nd Floor	200	1.00	12	=	2,400		
	Low Roof	0	1.03	15	=	0		
	Ext. Wall Above	220	4.50	12	=	11,880		
	Corridor Wall Above	200	4.50	8	=	7,200		
	Ext. Wall Below	100	4.50	12	=	5,400		
	Corridor Wall Below	0	4.50	8	=	0		
							27	**134**
1st FLOOR								
	Ext. Wall Above	100	4.50	12	=	5,400		
	Corridor Wall Above	0	4.50	8	=	0		
							5	

STRUCTURE WEIGHT FOR SEISMIC BASE SHEAR: 182 kips

TOTAL WEIGHT OF STRUCTURE: 188 kips
(Includes Basement Dead Load)

Project Number:	Plan Name:	Sheet Number:
xxx	**Forest Ave Lot 3**	**L3**
Engineer:	**Specifics:**	**Date:**
xxx	**SEISMIC FORCES**	**11/8/2021**

Equivelant Lateral Force Analysis per IBC 2015 1613.1 →ASCE 7-10 Table 12.6-1 →Sec 12.8

Data generated by: Seismic Design Values for Buildin **"Java Ground Motion Parameter Calculation"**

S_1 =	0.554		Maps
S_{DS} =	0.962		(ASCE 7 EQ 11.4.-3)
S_{D1} =	0.554		(ASCE 7 EQ 11.4.-4)
Seismic Importance Factor =	1.00		(ASCE 7 Table 11.5-1)
Seismic Design Category =	D		(ASCE 7 Table 11.6-1 & 11.6.2)
Response Modification Factor, R =	6.5		(ASCE 7 Table 12.2-1)
Seismic Force-Resisting System Description =	A.13 - light framed walls		
Building Height, h_n =	30.0	ft	
Building Period Coefficient, C_T =	0.020		(ASCE 7 Table 12.8.-2)
Approx. Fundamental Period, T_a =	0.256	$(C_T*(h_n^{0.75})$	(ASCE 7 EQ 12.8.-7)
Approx. Fundamental Period, T_L =	6.0	sec	(ASCE 7 11.4.5)

Seismic Response Coefficient

$C_s = S_{DS}/(R/I)$	C_s =	0.148		(ASCE 7 EQ 12.8.-2)

Seismic Response Coefficient, Maximum

$C_{s,\,MAX} = S_{D1}/(T*R/I)$	$C_{s,\,MAX}$ =	0.332	$T \le T_L$	(ASCE 7 EQ 12.8.-3)
$C_{s,\,MAX} = S_{D1}\,T_L/(T^2*R/$	$C_{s,\,MAX}$ =	NA	$T > T_L$	(ASCE 7 EQ 12.8.-4)

Seismic Response Coefficient, Minimum

$C_{s,\,MIN} = 0.01$	$C_{s,\,MIN}$ =	0.010		(ASCE 7 EQ 12.8.-5)
$C_{s,\,MIN} = 0.5\,S_1 / (R/I)$	$C_{s,\,MIN}$ =	NA	if S1 > 0.6	(ASCE 7 EQ 12.8.-6)

C_s =	**0.148**		
Dead Load W =	182	kips	
V = Cs W =	27.0	kips	(ASCE 7 EQ 12.8.-1)
Q_E = V =	27.0	kips	(ASCE 7 EQ 12.4-3)
ρ =	1.3		(ASCE 7 12.3.4.2)
$E_H = \rho\,Q_E$ =	35.1	kips	(ASCE 7 EQ 12.4-3)
$Ev = .2\,S_{DS}\,D$ =	0.19 x D	kips	

Factor for Alternate Basic Load conbinations - 2015 IBC 1605.3.2

$E_H/1.4$ =	**25.1**	**kips**	IBC 2015 1605.3.2
k =	1		(ASCE 7 12.8.3)

VERTICAL DISTRIBUTION (Per ASCE 7 - 12.8.3)

Floor	Area (ft^2)	Story Height H (ft)	Total Height h_x (ft)	Story Weight w_x (kips)	$w_x h_x^k$ (k-ft)	Vert Dist Factor Cvx	Story Force Fx (kips)	Factored Story Force (ASD) Fx ρ/1.4 = E_H/1.4 (kips)
Roof	3,400	10.00	21.50	74	1,599	0.62	16.9	**15.7**
3rd	2,600	10.50	11.50	81	934	0.36	9.8	**9.1**
2nd	200	1.00	1.00	27	27	0.01	0.3	**0.3**
			Sum =	2,560	1.000	27.0	**25.1**	

ASD DIAPHRAGM FORCES

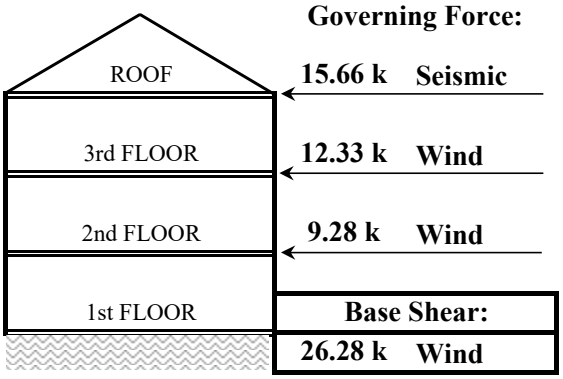
Floor	Design Shear Vi = Σfx (kips)	Fpx Min $0.2S_{DS}I_e w_{px}$ (kips)	Fpx Max $0.4S_{DS}I_e w_{px}$ (kips)	Fpx (kips)
Roof	15.66	13.02	26.05	15.66
3rd	24.81	14.22	28.43	12.95
2nd	25.07	4.71	9.41	3.69

Fpx DIAPHRAGM	
(kips)	(psf)
15.66	4.6
14.22	5.5
4.71	23.5

Project Number:	Plan Name:	Sheet Number:
xxx	**Forest Ave Lot 3**	**L4**
Engineer:	**Specifics:**	**Date:**
xxx	**DESIGN LOADS**	**11/8/2021**

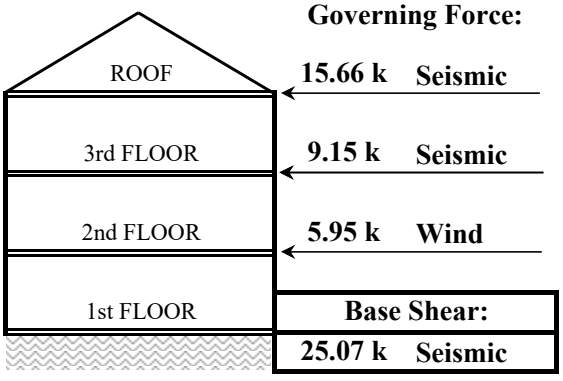
FRONT / BACK DIRECTION

Wind Force $0.6\,\omega * W_{F/B}$ (kips)		Seismic Force $E/1.4$ (kips)	
Per Level	Sum	Per Level	Sum
4.67		15.66	
	4.67		15.66
12.33		9.15	
	17.00		24.81
9.28		0.26	
	26.28		25.07



SIDE / SIDE DIRECTION

Wind Force $0.6\,\omega * W_{S}$ (kips)		Seismic Force $E/1.4$ (kips)	
Per Level	Sum	Per Level	Sum
6.41		15.66	
	6.41		15.66
8.70		9.15	
	15.12		24.81
5.95		0.26	
	21.07		25.07



Project Number:	Plan Name:	Sheet Number:
xxx	**Forest Ave Lot 3**	**L5**
Engineer:	Specifics:	Date:
xxx	**Shear walls**	**11/8/2021**

Notes:

* All walls designed with Force-Transfer should meet a minimum height to width ratio of 2:1 at Pier (SDPWS 2015, Table 4.3.4 p.25)
* Maximum allowed height to width ratio 3.5:1 for walls w/o openings (increased shear design values per SDPWS 2015, Table 4.3.4 p.25)
* Shear panel height is height to underside or roof or floor framing.

RED = Update Formula as required - Important
BLUE = Review and update as required - Typical Input

3rd Story Walls (Front - Back Direction)

Temporary Shoring shear (kips) 60%

100% story shear YES

Stud Species: HF

Gyp capacity = (PLF) 60.00

3rd Story Walls (Front - Back Direction)
Hold downs and window straps

Story shear(kips) = 15.66
Story height (ft) = 9.08
Shear Panel height (ft) = 8.08
Total Diaphragm width (ft) = 68.00

Governing Force (F/B Direction) = Seismic
Dead load factor (F/B Direction) = 0.90 IBC 2015 Equation 16-22
Shear panel capacity (Wind or Seismic) = Seismic
load balance check = OK

Story	Wall Mark	Wall L(ft)	Opening Width (ft)	Opening Height (ft)	Opening (max) to Edge (ft)	Plate to Opening (ft)	Effective Length (ft)	Trib. Width (ft)	Percent Sharing (%)	Effective Trib. Width	Story V(kips)	Sum V(kips)	Panel Shear (plf)	Height/Width Reduction (%) R = 2*L/H	Design Panel Shear (plf)	Wall Type	Roof DL Trib(ft)	Story DL(klf)	Sum DL(klf)	OTM (k-ft)	RM (k-ft)	Resultant HD(kips)	HD TYPE	HD/Strap to DF or HF?	HD location Edge/Interior?	Resultant HD	Force at Window (Kips)	Window Strap
3	1.1	13.75	9.00	5.00	2.00	1.08	4.75	20.00	0.30	5.94	1.37	**1.37**	288	1.00	**288**	SW4	2.00	0.13	0.13	12.4	10.8	0.12	flr-flr	HF	Edge	**No HD**	1.91	**CS14**
3	1.2	22.75	11.50	5.00	2.00	1.08	11.25	20.00	0.70	14.06	3.24	**3.24**	288	1.00	**288**	SW4	2.00	0.13	0.13	29.4	29.6	-0.01	flr-flr	HF	Edge	**No HD**	1.91	**CS14**
3	2.1	16.50	0.00	0.00	0.00	0.00	16.50	25.00	0.48	11.96	2.75	**2.75**	167	1.00	**167**	SW6	2.00	0.13	0.13	25.0	15.6	0.59	flr-beam	HF	Edge	**No HD**	0.00	**No strap**
3	2.2	18.00	0.00	0.00	0.00	0.00	18.00	25.00	0.52	13.04	3.00	**3.00**	167	1.00	**167**	SW6	2.00	0.13	0.13	27.3	18.5	0.50	flr-flr	HF	Edge	**No HD**	0.00	**No strap**
3	3.1	11.50	0.00	0.00	0.00	0.00	11.50	14.00	1.00	14.00	3.23	**3.23**	280	1.00	**280**	SW4	2.00	0.13	0.13	29.3	7.6	1.98	flr-flr	HF	Edge	**MST37**	0.00	**No strap**
3	4.1	5.00	0.00	0.00	0.00	0.00	5.00	9.00	0.40	3.60	0.83	**0.83**	WSW24X20															
3	4.2	3.75	0.00	0.00	0.00	0.00	3.75	9.00	0.30	2.70	0.62	**0.62**	166	0.93	**179**	SW6	2.00	0.13	0.13	5.6	0.8	1.49	flr-flr	HF	Edge	**MST37**	0.00	**No strap**
3	4.3	3.75	0.00	0.00	0.00	0.00	3.75	9.00	0.30	2.70	0.62	**0.62**	166	0.93	**179**	SW6	2.00	0.13	0.13	5.6	0.8	1.49	flr-flr	HF	Edge	**MST37**	0.00	**No strap**

Total Length GYP required in F/B direction to resist 100% lateral forces (ft) **Not required**
(including discounted capacity accounted for by OSB)

S = 95.00 | Total OSB wall length = (feet) 74.50 | S = 68.00 | 15.66 | **15.66** | **OK** | Total OSB Capacity (kips) 15.66

2nd Story Walls (Front - Back Direction)

Shear panel capacity (Wind or Seismic) = Seismic

2nd Story Walls (Front - Back Direction)
Hold downs and window straps

Story shear(kips) = 9.15
Story height (ft) = 10.08
Shear Panel height (ft) = 9.08
Total Diaphragm width (ft) = 88.00

Accumulated Shear = 24.81
load balance check = OK

Story	Wall Mark	Wall L(ft)	Opening Width (ft)	Opening Height (ft)	Opening (max) to Edge (ft)	Plate to Opening (ft)	Effective Length (ft)	Trib. Width (ft)	Percent Sharing (%)	Effective Trib. Width	Story V(kips)	Sum V(kips)	Panel Shear (plf)	Height/Width Reduction (%) R = 2*L/H	Design Panel Shear (plf)	Wall Type	Floor DL Trib(ft)	Story DL(klf)	Walls/DL Stacks?	Sum DL(klf)	OTM (k-ft)	RM (k-ft)	Resultant HD(kips)	HD TYPE	HD/Strap to DF or HF?	HD location Edge/Interior?	Resultant HD	Force at Window (Kips)	Window Strap
2	0.1	7.50	0.00	0.00	0.00	0.00	7.50	14.00	1.00	14.00	1.46	**1.46**	194	1.00	**194**	SW6	2.00	0.13	NO	0.13	14.7	3.4	1.61	flr-conc	HF	Edge	**STHD14**	0.00	**No strap**
2	1.1	13.00	0.00	0.00	0.00	0.00	13.00	17.00	0.65	11.05	1.15	**2.52**	194	1.00	**194**	SW6	2.00	0.13	NO	0.13	25.4	10.1	1.22	flr-beam	HF	Edge	**MSTC48B3**	0.00	**No strap**
2	1.2	3.50	0.00	0.00	0.00	0.00	3.50	17.00	0.18	2.98	0.31	**1.93**	551	0.87	**636**	2W4	2.00	0.13	NO	0.13	19.4	0.7	6.24	flr-conc	HF	Edge	**HDU8**	0.00	**No strap**
2	1.3	3.50	0.00	0.00	0.00	0.00	3.50	17.00	0.18	2.98	0.31	**1.93**	551	0.87	**636**	2W4	14.00	0.28	NO	0.28	19.4	1.5	5.97	flr-conc	HF	Edge	**HDU8**	0.00	**No strap**
2	2.1	4.50	0.00	0.00	0.00	0.00	4.50	16.00	1.00	16.00	1.66	**1.66**	370	1.00	**370**	SW3	14.00	0.28	NO	0.28	16.8	2.5	3.56	flr-conc	HF	Edge	**HDU5**	0.00	**No strap**
2	3.1	3.00	0.00	0.00	0.00	0.00	3.00	12.00	0.27	3.20	0.33	**1.87**	623	0.74	**839**	2W3	2.00	0.13	NO	0.13	18.8	0.5	7.32	flr-conc	HF	Edge	**HDU11**	0.00	**No strap**
2	3.2	5.25	0.00	0.00	0.00	0.00	5.25	12.00	0.47	5.60	0.58	**3.27**	623	1.00	**623**	2W4	2.00	0.13	NO	0.13	33.0	1.6	6.59	flr-conc	HF	Edge	**HDU11**	0.00	**No strap**
2	3.3	3.00	0.00	0.00	0.00	0.00	3.00	12.00	0.27	3.20	0.33	**1.87**	WSW24X10																
2	4.1	9.25	0.00	0.00	0.00	0.00	9.25	14.00	0.52	7.30	0.76	**3.98**	431	1.00	**431**	SW3	2.00	0.13	NO	0.13	40.2	5.1	4.00	flr-conc	HF	Edge	**HDU5**	0.00	**No strap**
2	4.2	5.00	0.00	0.00	0.00	0.00	5.00	0.00	1.00	0.00	0.00	**0.83**	WSW24X20																
2	4.3	3.00	0.00	0.00	0.00	0.00	3.00	14.00	0.17	2.37	0.25	**0.25**	82	0.74	**110**	SW6	2.00	0.13	NO	0.13	2.5	0.5	0.78	flr-conc	HF	Edge	**STHD14**	0.00	**No strap**
2	4.4	5.50	0.00	0.00	0.00	0.00	5.50	14.00	0.31	4.34	0.45	**0.45**	82	1.00	**82**	SW6	2.00	0.13	NO	0.13	4.5	1.8	0.55	flr-conc	HF	Edge	**STHD14**	0.00	**No strap**
2	5.1	3.00	0.00	0.00	0.00	0.00	3.00	15.00	1.00	15.00	1.56	**2.80**	WSW24X10																

Total Length GYP required in F/B direction to resist 100% lateral forces (ft) **Not required**
(including discounted capacity accounted for by OSB)

S = 69.00 | Total OSB wall length = (feet) 69.00 | S = 88.00 | 9.15 | **24.81** | **OK** | Total OSB Capacity (kips) 9.15

1st Story Walls (Front - Back Direction)

Shear panel capacity (Wind or Seismic) = Seismic

1st Story Walls (Front - Back Direction)
Hold downs and window straps

Story shear(kips) = 1.47
Story height (ft) = 10.08
Shear Panel height (ft) = 9.08
Total Diaphragm width (ft) = 88.00

Accumulated Shear = 26.28
load balance check = Warning-Wall loads do not match story shear

Story	Wall Mark	Wall L(ft)	Opening Width (ft)	Opening Height (ft)	Opening (max) to Edge (ft)	Plate to Opening (ft)	Effective Length (ft)	Trib. Width (ft)	Percent Sharing (%)	Effective Trib. Width	Story V(kips)	Sum V(kips)	Panel Shear (plf)	Height/Width Reduction (%) R = 2*L/H	Design Panel Shear (plf)	Wall Type	Floor DL Trib(ft)	Story DL(klf)	Walls/DL Stacks?	Sum DL(klf)	OTM (k-ft)	RM (k-ft)	Resultant HD(kips)	HD TYPE	HD/Strap to DF or HF?	HD location Edge/Interior?	Resultant HD	Force at Window (Kips)	Window Strap

Note: all first story/basement walls are concrete retaining walls

Total Length GYP required in F/B direction to resist 100% lateral forces (ft) **Not required**
(including discounted capacity accounted for by OSB)

S = 0.00 | Total OSB wall length = (feet) 0.00 | S = 0.00 | 0.00 | **0.00** | **Warning-** | Total OSB Capacity (kips) 1.47

Project Number:	Plan Name:	Sheet Number:
xxx	**Forest Ave Lot 3**	**L6**
Engineer:	**Specifics:**	**Date:**
xxx	**Shear walls**	**11/8/2021**

Notes:

* All walls designed with Force-Transfer should meet a minimum height to width ratio of 2:1 at Pier (SDPWS 2015, Table 4.3.4 p.25)
* Maximum allowed height to width ratio 3.5:1 for walls w/o openings (increased shear design values per SDPWS 2015, Table 4.3.4 p.25)
* Shear panel height is height to underside or roof or floor framing.

RED = Update Formula as required - Important
BLUE = Review and update as required - Typical Input

3rd Story Walls (Side / Side Direction)

3rd Story Walls (Side / Side Direction)
Hold downs and window straps

Temporary Shoring shear (kips) 60%

100% story shear YES

Story shear(kips) = 15.66
Story height (ft) = 9.08
Shear Panel height (ft) = 8.08
Total Diaphragm width (ft) = 55.00

Stud Species: HF
Governing Force (F/B Direction) = Seismic
Dead load factor (F/B Direction) = 0.90 IBC 2015 Equation 16-22
Shear panel capacity (Wind or Seismic) = Seismic
load balance check = OK

Gyp capacity = 60.00 (PLF)

Story	Wall Mark	Wall L(ft)	Opening Width (ft)	Opening Height (ft)	Opening (max) to Edge (ft)	Plate to Opening (ft)	Effective Length (ft)	Trib. Width (ft)	Percent Sharing (%)	Effective Trib. Width	Story V(kips)	Sum V(kips)	Panel Shear (plf)	Height/Width Reduction (%) R = 2*L/H	Design Panel Shear (plf)	Wall Type	Roof DL Trib(ft)	Story DL(klf)	Sum DL(klf)	OTM (k-ft)	RM (k-ft)	Resultant HD(kips)	HD TYPE	HD/Strap to DF or HF?	HD location Edge/Interior?	Resultant HD	Force at Window (Kips)	Window Strap
3	A.1	18.50	0.00	0.00	0.00	0.00	18.50	9.00	0.47	4.24	1.21	1.21	65	1.00	65	SW6	2.00	0.13	0.13	11.0	19.6	-0.48	flr-flr	HF	Edge	No HD	0.00	No strap
3	A.2	6.75	0.00	0.00	0.00	0.00	6.75	9.00	0.17	1.55	0.44	0.44	65	1.00	65	SW6	2.00	0.13	0.13	4.0	2.6	0.22	flr-flr	HF	Edge	No HD	0.00	No strap
3	A.3	14.00	0.00	0.00	0.00	0.00	14.00	9.00	0.36	3.21	0.91	0.91	65	1.00	65	SW6	2.00	0.13	0.13	8.3	11.2	-0.21	flr-flr	HF	Edge	No HD	0.00	No strap
3	B.1	7.00	0.00	0.00	0.00	0.00	7.00	17.00	0.18	3.01	0.86	0.86	123	1.00	123	SW6	10.00	0.25	0.25	7.8	5.4	0.36	flr-flr	HF	Edge	No HD	0.00	No strap
3	B.2	13.00	0.00	0.00	0.00	0.00	13.00	17.00	0.33	5.59	1.59	1.59	123	1.00	123	SW6	10.00	0.25	0.25	14.5	18.8	-0.34	flr-flr	HF	Edge	No HD	0.00	No strap
3	B.3	7.00	0.00	0.00	0.00	0.00	7.00	17.00	0.18	3.01	0.86	0.86	123	1.00	123	SW6	10.00	0.25	0.25	7.8	5.4	0.36	flr-flr	HF	Edge	No HD	0.00	No strap
3	B.4	12.50	0.00	0.00	0.00	0.00	12.50	17.00	0.32	5.38	1.53	1.53	123	1.00	123	SW6	10.00	0.25	0.25	13.9	17.4	-0.29	flr-flr	HF	Edge	No HD	0.00	No strap
3	C.1	17.50	0.00	0.00	0.00	0.00	17.50	19.00	1.00	19.00	5.41	5.41	309	1.00	309	SW4	2.00	0.13	0.13	49.1	17.5	1.86	flr-flr	HF	Edge	MST37	0.00	No strap
3	D.1	12.75	0.00	0.00	0.00	0.00	12.75	10.00	0.47	4.72	1.34	1.34	105	1.00	105	SW6	2.00	0.13	0.13	12.2	9.3	0.24	flr-flr	HF	Edge	No HD	0.00	No strap
3	D.2	3.75	0.00	0.00	0.00	0.00	3.75	10.00	0.14	1.39	0.40	0.40	105	0.93	114	SW6	2.00	0.13	0.13	3.6	0.8	0.86	flr-flr	HF	Edge	MST37	0.00	No strap
3	D.3	3.75	0.00	0.00	0.00	0.00	3.75	10.00	0.14	1.39	0.40	0.40	105	0.93	114	SW6	2.00	0.13	0.13	3.6	0.8	0.86	flr-flr	HF	Edge	MST37	0.00	No strap
3	D.4	10.75	4.00	5.00	2.00	1.08	6.75	10.00	0.25	2.50	0.71	0.71	105	1.00	105	SW6	2.00	0.13	0.13	6.5	6.6	-0.01	flr-flr	HF	Edge	No HD	0.70	CS16

Total Length GYP required in F/B direction to resist 100% lateral forces (ft) **Not required**
(including discounted capacity accounted for by OSB)

S = 127.25 | Total OSB wall length = 123.25 (feet) | S = 55.00 | 15.66 | **15.66** | OK | Total OSB Capacity (kips) | **15.66**

2nd Story Walls (Side / Side Direction)

2nd Story Walls (Side / Side Direction)
Hold downs and window straps

Shear panel capacity (Wind or Seismic) = Seismic

Story shear(kips) = 9.15
Story height (ft) = 10.08
Shear Panel height (ft) = 9.08
Total Diaphragm width (ft) = 55.00

Accumulated Shear = 24.81
load balance check = OK

Story	Wall Mark	Wall L(ft)	Opening Width (ft)	Opening Height (ft)	Opening (max) to Edge (ft)	Plate to Opening (ft)	Effective Length (ft)	Trib. Width (ft)	Percent Sharing (%)	Effective Trib. Width	Story V(kips)	Sum V(kips)	Panel Shear (plf)	Height/Width Reduction (%) R = 2*L/H	Design Panel Shear (plf)	Wall Type	Floor DL Trib(ft)	Story DL(klf)	Walls/DL Stacks?	Sum DL(klf)	OTM (k-ft)	RM (k-ft)	Resultant HD(kips)	HD TYPE	HD/Strap to DF or HF?	HD location Edge/Interior?	Resultant HD	Force at Window (Kips)	Window Strap
2	A.1	7.75	0.00	0.00	0.00	0.00	7.75	9.00	0.48	4.36	0.72	1.52	197	1.00	197	SW6	2.00	0.13	NO	0.13	15.4	3.6	1.62	flr-conc	HF	Edge	STHD14	0.00	No strap
2	A.2	10.25	2.00	5.00	2.00	1.08	8.25	9.00	0.52	4.64	0.77	1.62	197	1.00	197	SW6	2.00	0.13	NO	0.13	16.3	6.3	1.03	flr-conc	HF	Edge	STHD14	1.30	CS16
2	A.3	14.25	0.00	0.00	0.00	0.00	14.25	0.00	0.00	0.00	0.00	0.91	64	1.00	64	SW6	2.00	0.13	NO	0.13	9.2	12.1	-0.21	flr-conc	HF	Edge	No HD	0.00	No strap
2	B.1	8.25	0.00	0.00	0.00	0.00	8.25	19.00	0.45	8.59	1.43	3.62	438	1.00	438	SW3	2.00	0.13	NO	0.13	36.5	4.1	4.18	flr-beam	HF	Edge	(2) MSCTC66B3	0.00	No strap
2	B.2	4.00	0.00	0.00	0.00	0.00	4.00	19.00	0.22	4.16	0.69	1.75	438	0.99	443	SW3	2.00	0.13	NO	0.13	17.7	1.0	4.78	flr-conc	HF	Edge	HDU8	0.00	No strap
2	B.3	6.00	0.00	0.00	0.00	0.00	6.00	19.00	0.33	6.25	1.04	2.63	438	1.00	438	SW3	2.00	0.13	NO	0.13	26.5	2.2	4.43	flr-conc	HF	Edge	HDU8	0.00	No strap
2	C.1	3.50	0.00	0.00	0.00	0.00	3.50	18.00	0.13	2.27	0.38	1.06	303	0.87	350	SW4	2.00	0.13	NO	0.13	10.7	0.7	3.32	flr-conc	HF	Edge	HDU5	0.00	No strap
2	C.2	6.00	0.00	0.00	0.00	0.00	6.00	18.00	0.22	3.89	0.65	1.82	303	1.00	303	SW4	2.00	0.13	NO	0.13	18.3	2.2	2.94	flr-conc	HF	Edge	STHD14	0.00	No strap
2	C.3	12.75	0.00	0.00	0.00	0.00	12.75	18.00	0.46	8.27	1.38	3.86	303	1.00	303	SW4	2.00	0.13	NO	0.13	38.9	9.7	2.38	flr-conc	HF	Edge	STHD14	0.00	No strap
2	C.4	5.50	0.00	0.00	0.00	0.00	5.50	18.00	0.20	3.57	0.59	1.67	303	1.00	303	SW4	2.00	0.13	NO	0.13	16.8	1.8	3.00	flr-conc	HF	Edge	STHD14	0.00	No strap
2	D.1	19.00	0.00	0.00	0.00	0.00	19.00	9.00	0.45	4.07	0.68	1.97	103	1.00	103	SW6	2.00	0.13	NO	0.13	19.8	21.6	-0.10	flr-conc	HF	Edge	No HD	0.00	No strap
2	D.2	9.75	0.00	0.00	0.00	0.00	9.75	9.00	0.23	2.09	0.35	1.01	103	1.00	103	SW6	2.00	0.13	NO	0.13	10.2	5.7	0.48	flr-conc	HF	Edge	No HD	0.00	No strap
2	D.3	13.25	0.00	0.00	0.00	0.00	13.25	9.00	0.32	2.84	0.47	1.37	103	1.00	103	SW6	2.00	0.13	NO	0.13	13.8	10.5	0.26	flr-conc	HF	Edge	No HD	0.00	No strap

Total Length GYP required in F/B direction to resist 100% lateral forces (ft) **Not required**
(including discounted capacity accounted for by OSB)

S = 120.25 | Total OSB wall length = 118.25 (feet) | S = 55.00 | 9.15 | **24.81** | OK | Total OSB Capacity (kips) | **9.15**

1st Story Walls (Side / Side Direction)

1st Story Walls (Side / Side Direction)
Hold downs and window straps

Shear panel capacity (Wind or Seismic) = Seismic

Story shear(kips) = 0.26
Story height (ft) = 10.08
Shear Panel height (ft) = 9.08
Total Diaphragm width (ft) = 55.00

Accumulated Shear = 25.07
load balance check = ads do not match story shear

Story	Wall Mark	Wall L(ft)	Opening Width (ft)	Opening Height (ft)	Opening (max) to Edge (ft)	Plate to Opening (ft)	Effective Length (ft)	Trib. Width (ft)	Percent Sharing (%)	Effective Trib. Width	Story V(kips)	Sum V(kips)	Panel Shear (plf)	Height/Width Reduction (%) R = 2*L/H	Design Panel Shear (plf)	Wall Type	Floor DL Trib(ft)	Story DL(klf)	Walls/DL Stacks?	Sum DL(klf)	OTM (k-ft)	RM (k-ft)	Resultant HD(kips)	HD TYPE	HD/Strap to DF or HF?	HD location Edge/Interior?	Resultant HD	Force at Window (Kips)	Window Strap

Note: all first story/basement walls are concrete retaining walls

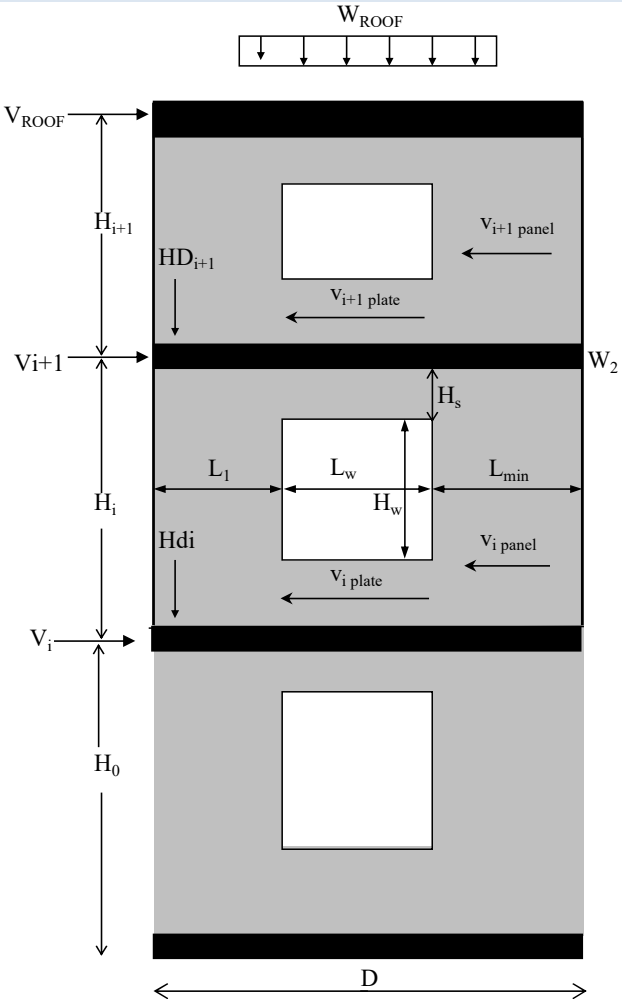
REST INTO CONCRETE RETAINING WALLS

Total Length GYP required in F/B direction to resist 100% lateral forces (ft) **Not required**
(including discounted capacity accounted for by OSB)

S = 0.00 | Total OSB wall length = 0.00 (feet) | S = 0.00 | 0.00 | **0.00** | Warning- | Total OSB Capacity (kips) | **0.26**

Project	sheet number:
Forest Ave Lot 3	**L7**
Subject	Date
SHEAR WALL EQUATION DIAGRAM	**11/8/2021**

SHEAR WALL WITH WINDOW BASED ON SHEAR TRANSFER:



Where:

V_i = Story Shear
W_i = Story Dead Load
HD_i = Story Holdown
M_{OTi} = Story Over Turning Moment
M_{Ri} = Story Resisting Moment

$M_{OT\ ROOF} = V_{ROOF} \times H_{1+1}$

$M_{OTi} = [(V_{i+1} + V_{ROOF}) \times H_i] + M_{OT\ ROOF}$

$M_{R\ ROOF} = 0.6 \times W_{ROOF} \times D^2/2$

$M_{Ri} = 0.6 \times (W_{i+1} + W_{ROOF}) \times D^2/2$

$HD_{i+1} = (M_{OT\ ROOF} - M_{R\ ROOF})/(D - 6")$

$HD_i = (M_{OTi} - M_{R1i})/(D - 6")$

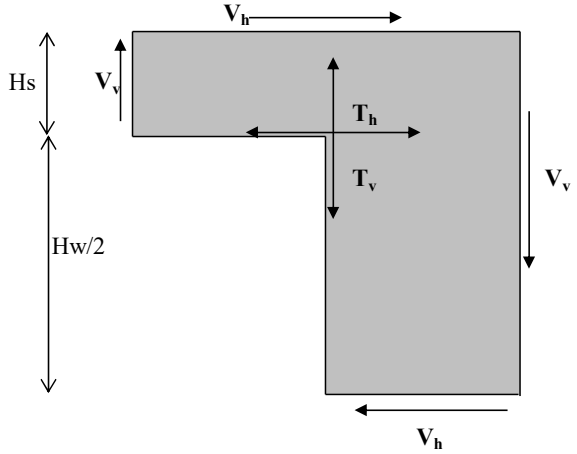
$V_{i+1\ panel} = V_{ROOF} / (L_1 + L_{max})$

$V_{i\ panel} = (V_{ROOF} + V_{i+1}) / (L_1 + L_{max})$

$V_{i+1\ plate} = V_{ROOF} / D$

$V_{i\ plate} = (V_{ROOF} + V_{i+1}) / D$

FORCE TRANSFER AROUND WINDOW CALCULATION (CANTILEVER PIER METHOD)



$V_h = v_{i\ panel} \times L_{max}$

$V_v = HD_i$

$T_h = V_h\ (H_w / 2 + H_s) / H_s$

T_v = Is resisted by the continuous stud adjacent to the window.