



Calculation Package for
Forest Ave Lot 4

Project no: S200420

June 16, 2020



Project Number: xxx	Plan Name: Forest Ave Lot 4	Sheet Number: DC
Engineer: xxx	Specifics: Design Criteria	Date: 6/16/2020

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, S_s = **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**
 K_zt = **1.00**

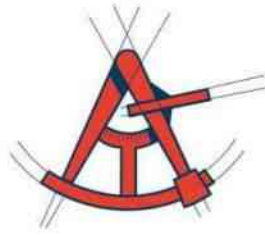
SOIL PROPERTIES:

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**

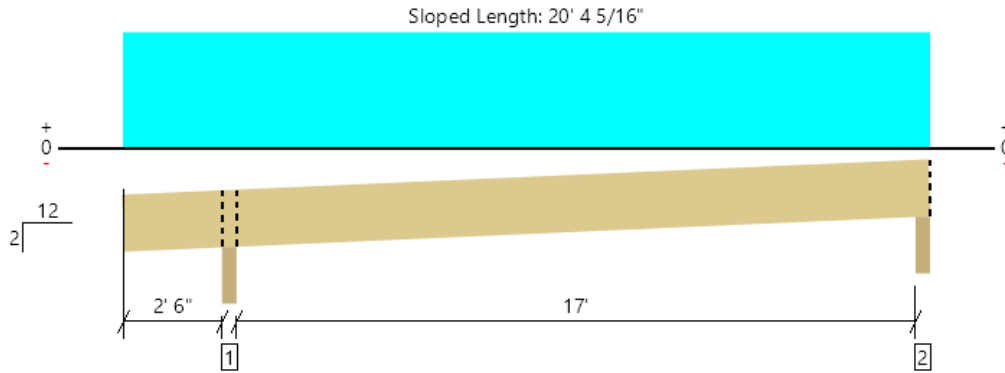


LONGITUDE
ONE TWENTY[°]
ENGINEERING & DESIGN

FRAMING CALCULATIONS

BEAM REFERENCE PER PLAN

RF, RJ-1 (TYP ROOF RAFTER)
1 piece(s) 2 x 12 Hem-Fir 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' 6 3/16"

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	922 @ 2' 7 3/4"	2156 (3.50")	Passed (43%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	623 @ 3' 8 5/8"	1941	Passed (32%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	2888 @ 11' 4 13/16"	2964	Passed (97%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.428 @ 11' 3 9/16"	0.873	Passed (L/490)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.681 @ 11' 3 11/16"	1.164	Passed (L/308)	--	1.0 D + 1.0 S (All Spans)

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

- Deflection criteria: LL (L/240) and TL (L/180).
- Overhang deflection criteria: LL (2L/240) and TL (2L/180).
- Top Edge Bracing (Lu): Top compression edge must be braced at 1' 5" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 20' 4" o/c based on loads applied, unless detailed otherwise.
- 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"	349	573	922	Blocking
2 - Beveled Plate - SPF	3.50"	3.50"	1.50"	262	436	698	Blocking

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

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 20' 1"	24"	15.0	25.0	ROOF

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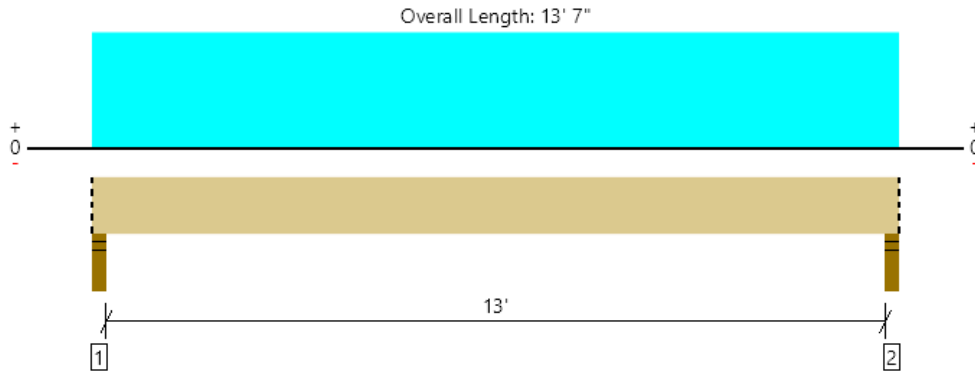
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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



RF, RB-1

1 piece(s) 4 x 12 Hem-Fir 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)	1019 @ 2"	4961 (3.50")	Passed (21%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	834 @ 1' 2 3/4"	4528	Passed (18%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	3291 @ 6' 9 1/2"	6615	Passed (50%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.112 @ 6' 9 1/2"	0.442	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.193 @ 6' 9 1/2"	0.663	Passed (L/825)	--	1.0 D + 1.0 S (All Spans)

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

- Deflection criteria: LL (L/360) and TL (L/240).
- Top Edge Bracing (Lu): Top compression edge must be braced at 13' 7" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 13' 7" o/c based on loads applied, unless detailed otherwise.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Stud wall - SPF	3.50"	3.50"	1.50"	424	594	1018	Blocking
2 - Stud wall - SPF	3.50"	3.50"	1.50"	424	594	1018	Blocking

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 13' 7"	N/A	10.0	--	
1 - Uniform (PSF)	0 to 13' 7" (Front)	3' 6"	15.0	25.0	ROOF

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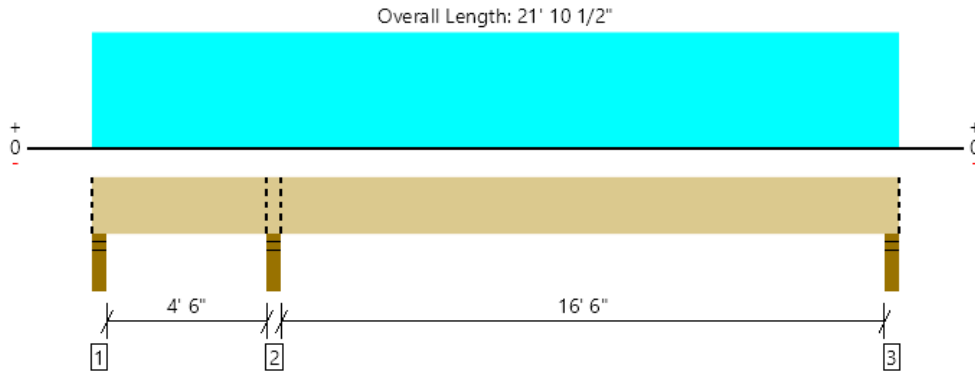
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ForteWEB Software Operator	Job Notes
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RF, RB-2

1 piece(s) 4 x 12 Hem-Fir 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)	2746 @ 4' 11 1/4"	4961 (3.50")	Passed (55%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1346 @ 6' 1/4"	4528	Passed (30%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	-4200 @ 4' 11 1/4"	6615	Passed (63%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.155 @ 14' 2 7/16"	0.559	Passed (L/999+)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.264 @ 14' 2 1/2"	0.839	Passed (L/763)	--	1.0 D + 1.0 S (Alt Spans)

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

- Deflection criteria: LL (L/360) and TL (L/240).
- Top Edge Bracing (Lu): Top compression edge must be braced at 21' 11" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 21' 11" o/c based on loads applied, unless detailed otherwise.
- -603 lbs uplift at support located at 2". Strapping or other restraint may be required.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Stud wall - SPF	3.50"	3.50"	1.50"	-207	-396	-603	Blocking
2 - Stud wall - SPF	3.50"	3.50"	1.94"	1144	1602	2746	Blocking
3 - Stud wall - SPF	3.50"	3.50"	1.50"	430	604	1034	Blocking

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 21' 10 1/2"	N/A	10.0	--	
1 - Uniform (PSF)	0 to 21' 10 1/2" (Front)	3' 6"	15.0	25.0	ROOF

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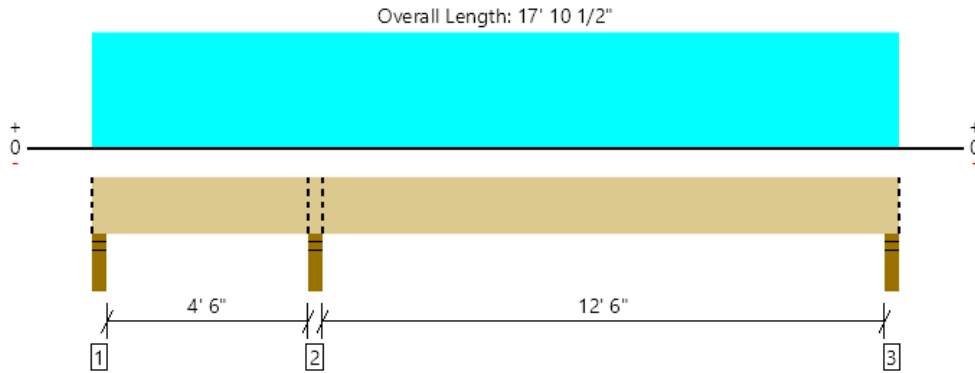
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ForteWEB Software Operator	Job Notes
AP L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	



RF, RB-3

1 piece(s) 4 x 12 Hem-Fir 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)	1990 @ 4' 11 1/4"	4961 (3.50")	Passed (40%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	979 @ 6' 1/4"	4528	Passed (22%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	-2342 @ 4' 11 1/4"	6615	Passed (35%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.054 @ 11' 11 1/8"	0.426	Passed (L/999+)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.092 @ 11' 11 1/4"	0.639	Passed (L/999+)	--	1.0 D + 1.0 S (Alt Spans)

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

- Deflection criteria: LL (L/360) and TL (L/240).
- Top Edge Bracing (Lu): Top compression edge must be braced at 17' 11" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 17' 11" o/c based on loads applied, unless detailed otherwise.
- -213 lbs uplift at support located at 2". Strapping or other restraint may be required.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Stud wall - SPF	3.50"	3.50"	1.50"	-45	73/-168	73/-213	Blocking
2 - Stud wall - SPF	3.50"	3.50"	1.50"	829	1161	1990	Blocking
3 - Stud wall - SPF	3.50"	3.50"	1.50"	333	469	802	Blocking

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 17' 10 1/2"	N/A	10.0	--	
1 - Uniform (PSF)	0 to 17' 10 1/2" (Front)	3' 6"	15.0	25.0	ROOF

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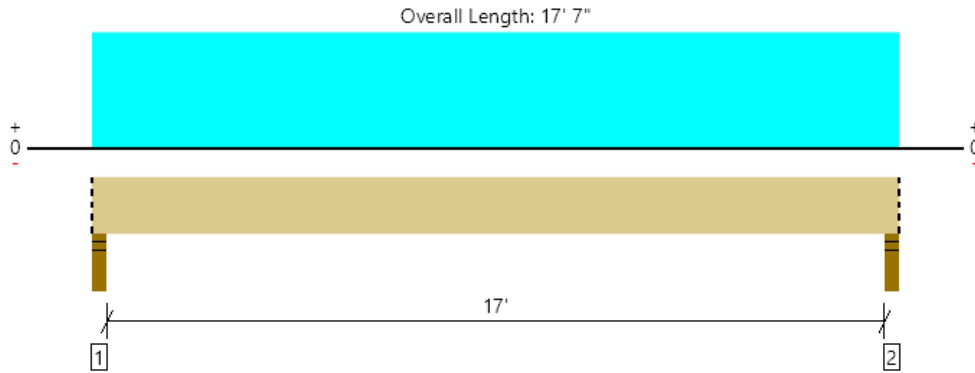
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ForteWEB Software Operator	Job Notes
AP L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	



RF, RB-4

1 piece(s) 4 x 12 Hem-Fir 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)	1319 @ 2"	4961 (3.50")	Passed (27%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1134 @ 1' 2 3/4"	4528	Passed (25%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	5578 @ 8' 9 1/2"	6615	Passed (84%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.323 @ 8' 9 1/2"	0.575	Passed (L/641)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.553 @ 8' 9 1/2"	0.863	Passed (L/374)	--	1.0 D + 1.0 S (All Spans)

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

- Deflection criteria: LL (L/360) and TL (L/240).
- Top Edge Bracing (Lu): Top compression edge must be braced at 17' 7" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 17' 7" o/c based on loads applied, unless detailed otherwise.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Stud wall - SPF	3.50"	3.50"	1.50"	549	769	1318	Blocking
2 - Stud wall - SPF	3.50"	3.50"	1.50"	549	769	1318	Blocking

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 17' 7"	N/A	10.0	--	
1 - Uniform (PSF)	0 to 17' 7" (Front)	3' 6"	15.0	25.0	ROOF

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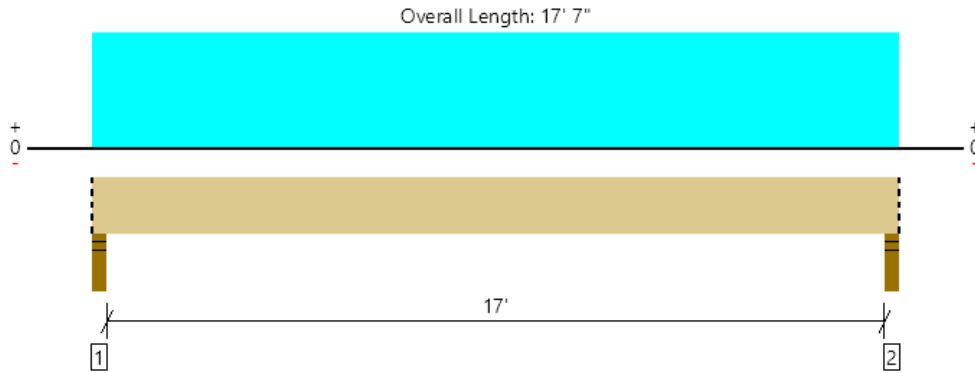
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ForteWEB Software Operator	Job Notes
AP L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	



RF, RB-5

1 piece(s) 4 x 12 Hem-Fir 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)	1319 @ 2"	4961 (3.50")	Passed (27%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1134 @ 1' 2 3/4"	4528	Passed (25%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	5578 @ 8' 9 1/2"	6615	Passed (84%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.323 @ 8' 9 1/2"	0.575	Passed (L/641)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.553 @ 8' 9 1/2"	0.863	Passed (L/374)	--	1.0 D + 1.0 S (All Spans)

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

- Deflection criteria: LL (L/360) and TL (L/240).
- Top Edge Bracing (Lu): Top compression edge must be braced at 17' 7" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 17' 7" o/c based on loads applied, unless detailed otherwise.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Stud wall - SPF	3.50"	3.50"	1.50"	549	769	1318	Blocking
2 - Stud wall - SPF	3.50"	3.50"	1.50"	549	769	1318	Blocking

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 17' 7"	N/A	10.0	--	
1 - Uniform (PSF)	0 to 17' 7" (Front)	3' 6"	15.0	25.0	ROOF

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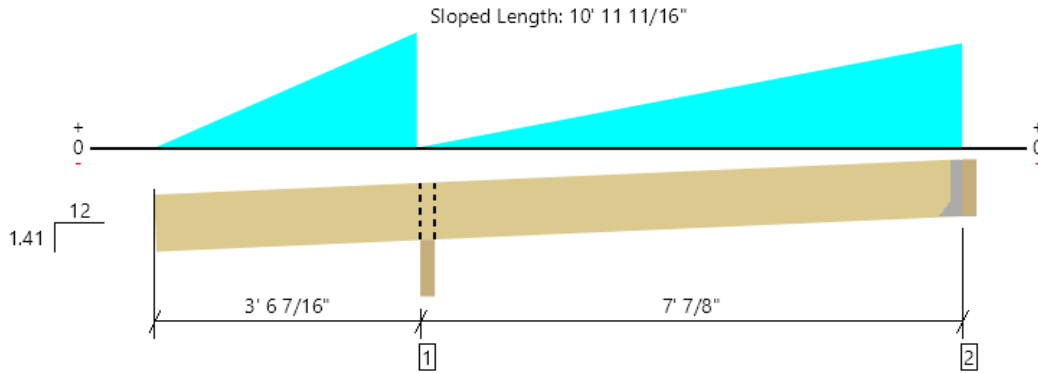
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ForteWEB Software Operator	Job Notes
AP L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	



RF, HB-1

1 piece(s) 2 x 12 Hem-Fir No. 2



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

Member Length : 10' 9 1/2"

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	278 @ 10' 7 1/4"	911 (1.50")	Passed (30%)	--	1.0 D + 1.0 S (Alt Spans)
Shear (lbs)	204 @ 4' 9 1/8"	1941	Passed (11%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	-362 @ 3' 8 3/16"	2577	Passed (14%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.009 @ 0	0.371	Passed (2L/999+)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.014 @ 0	0.494	Passed (2L/999+)	--	1.0 D + 1.0 S (Alt Spans)

System : Roof
 Member Type : Flush Beam
 Building Use : Residential
 Building Code : IBC 2015
 Design Methodology : ASD
 Member Pitch : 1.41/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Overhang deflection criteria: LL (2L/240) and TL (2L/180).
- Top Edge Bracing (Lu): Top compression edge must be braced at 10' 8" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 10' 8" o/c based on loads applied, unless detailed otherwise.
- 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"	197	292	489	Blocking
2 - Hanger on 11 1/4" SPF beam	3.50"	Hanger ¹	1.50"	87	191	278	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.

Connector: Simpson Strong-Tie

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 10' 7 1/4"	N/A	4.3	--	
1 - Tapered (PLF)	0 to 3' 6 7/16"	N/A	0.0 to 53.4	0.0 to 88.4	Generated from Roof Geometry
2 - Tapered (PLF)	3' 6 7/16" to 10' 7 1/4"	N/A	0.0 to 40.0	0.0 to 88.4	Generated from Roof Geometry

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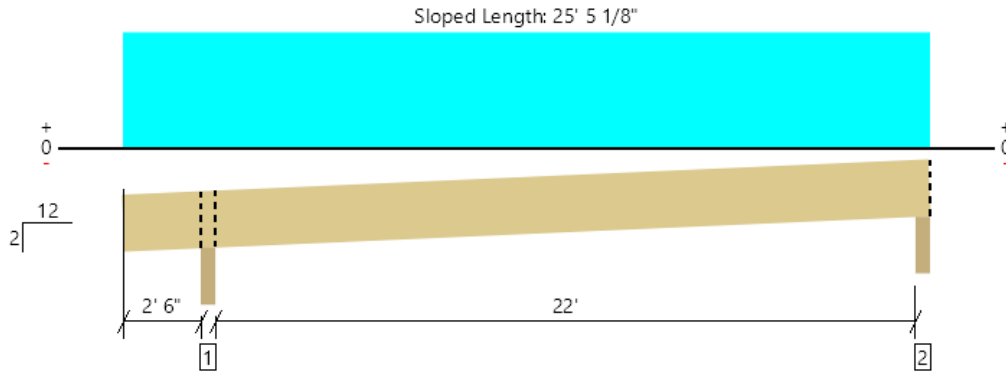
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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



RF, RJ-2

2 piece(s) 2 x 12 Hem-Fir 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 : 25' 7"

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1119 @ 2' 7 3/4"	4311 (3.50")	Passed (26%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	820 @ 3' 8 5/8"	3881	Passed (21%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	4870 @ 13' 10 7/16"	5928	Passed (82%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.600 @ 13' 9 7/16"	1.127	Passed (L/451)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.958 @ 13' 9 9/16"	1.502	Passed (L/282)	--	1.0 D + 1.0 S (All Spans)

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

- Deflection criteria: LL (L/240) and TL (L/180).
- Overhang deflection criteria: LL (2L/240) and TL (2L/180). Upward deflection on left cantilever exceeds overhang deflection criteria.
- Top Edge Bracing (Lu): Top compression edge must be braced at 6' 4" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 25' 5" o/c based on loads applied, unless detailed otherwise.
- 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"	423	696	1119	Blocking
2 - Beveled Plate - SPF	3.50"	3.50"	1.50"	340	562	902	Blocking

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

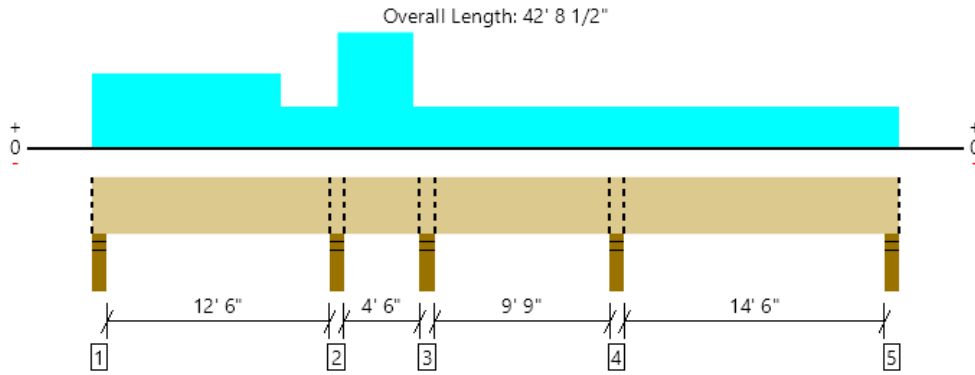
Vertical Load	Location (Side)	Spacing	Dead (0.90)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 25' 1"	24"	15.0	25.0	ROOF

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



RF, RB-6
1 piece(s) 4 x 12 Hem-Fir 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)	5025 @ 12' 11 1/4"	4961 (3.50")	Passed (101%)	--	1.0 D + 1.0 S (Adj Spans)
Shear (lbs)	2158 @ 11' 10 1/4"	4528	Passed (48%)	1.15	1.0 D + 1.0 S (Adj Spans)
Moment (Ft-lbs)	-5606 @ 12' 11 1/4"	6615	Passed (85%)	1.15	1.0 D + 1.0 S (Adj Spans)
Live Load Defl. (in)	0.133 @ 5' 10 3/4"	0.426	Passed (L/999+)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.217 @ 5' 10 9/16"	0.639	Passed (L/708)	--	1.0 D + 1.0 S (Alt Spans)

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

- Deflection criteria: LL (L/360) and TL (L/240).
- Top Edge Bracing (Lu): Top compression edge must be braced at 31' 4" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 23' 11" o/c based on loads applied, unless detailed otherwise.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Stud wall - SPF	3.50"	3.50"	1.50"	759	1190	1949	Blocking
2 - Stud wall - SPF	3.50"	3.50"	3.55"	1924	3101	5025	Blocking
3 - Stud wall - SPF	3.50"	3.50"	1.50"	212	977/-128	1189/-128	Blocking
4 - Stud wall - SPF	3.50"	3.50"	2.39"	1364	2027	3391	Blocking
5 - Stud wall - SPF	3.50"	3.50"	1.50"	518	781	1299	Blocking

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 42' 8 1/2"	N/A	10.0	--	
1 - Uniform (PSF)	0 to 10' (Front)	9'	15.0	25.0	ROOF
2 - Uniform (PSF)	10' to 13' (Front)	5'	15.0	25.0	ROOF
3 - Uniform (PSF)	13' to 17' (Front)	14'	15.0	25.0	ROOF
4 - Uniform (PSF)	17' to 42' 8 1/2" (Front)	5'	15.0	25.0	ROOF

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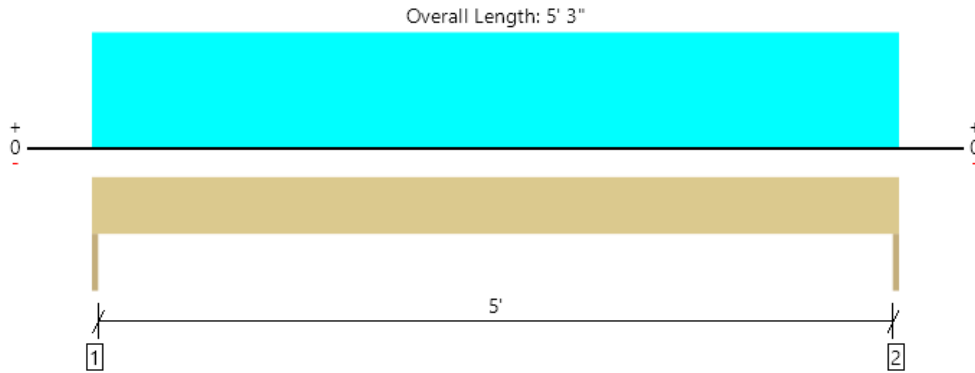
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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



TH, TH-1

1 piece(s) 4 x 8 Douglas Fir-Larch 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)	1592 @ 0	3281 (1.50")	Passed (49%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1150 @ 8 3/4"	3502	Passed (33%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	2089 @ 2' 7 1/2"	3438	Passed (61%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.036 @ 2' 7 1/2"	0.175	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.058 @ 2' 7 1/2"	0.262	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).
- Top Edge Bracing (Lu): Top compression edge must be braced at 5' 3" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 5' 3" o/c based on loads applied, unless detailed otherwise.
- 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"	607	984	1591	None
2 - Trimmer - SPF	1.50"	1.50"	1.50"	607	984	1591	None

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 5' 3"	N/A	6.4	--	
1 - Uniform (PSF)	0 to 5' 3"	15'	15.0	25.0	Roof

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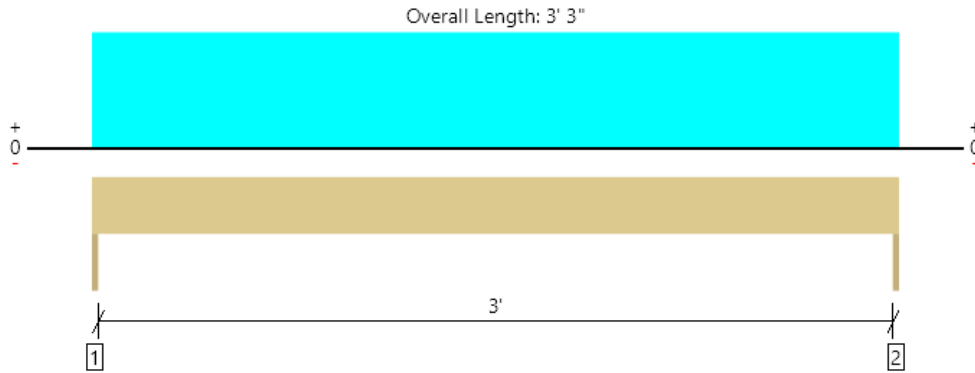
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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



TH, TH-2

1 piece(s) 4 x 6 Douglas Fir-Larch 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)	528 @ 0	3281 (1.50")	Passed (16%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	338 @ 7"	2657	Passed (13%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	429 @ 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).
- Top Edge Bracing (Lu): Top compression edge must be braced at 3' 3" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 3' 3" o/c based on loads applied, unless detailed otherwise.
- 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"	203	325	528	None
2 - Trimmer - SPF	1.50"	1.50"	1.50"	203	325	528	None

Vertical Loads	Location (Side)	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'	15.0	25.0	Roof

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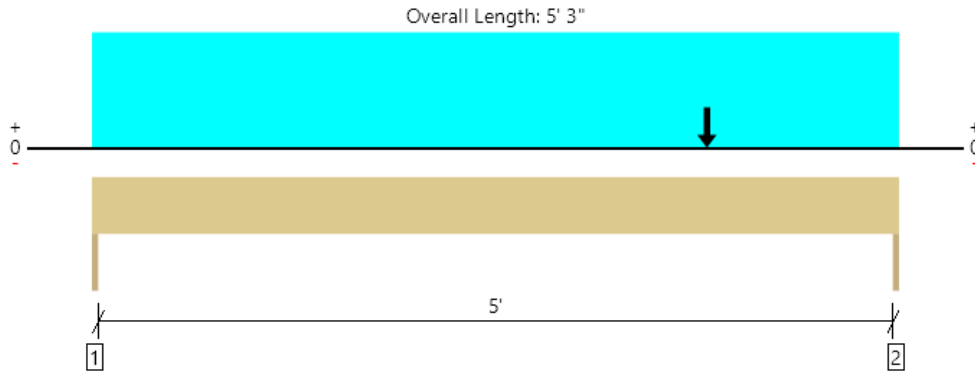
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ForteWEB Software Operator	Job Notes
AP L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	



TH, TH-3

1 piece(s) 4 x 6 Douglas Fir-Larch 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)	1569 @ 5' 3"	3281 (1.50")	Passed (48%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1356 @ 4' 8"	2657	Passed (51%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	1808 @ 3' 1 3/4"	1979	Passed (91%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.070 @ 2' 8 5/8"	0.175	Passed (L/895)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.116 @ 2' 8 5/8"	0.262	Passed (L/543)	--	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).
- Top Edge Bracing (Lu): Top compression edge must be braced at 5' 3" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 5' 3" o/c based on loads applied, unless detailed otherwise.
- 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"	446	702	1148	None
2 - Trimmer - SPF	1.50"	1.50"	1.50"	621	948	1569	None

Vertical Loads	Location (Side)	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"	9'	15.0	25.0	Roof
2 - Point (lb)	4'	N/A	333	469	Linked from: RB-3, Support 3

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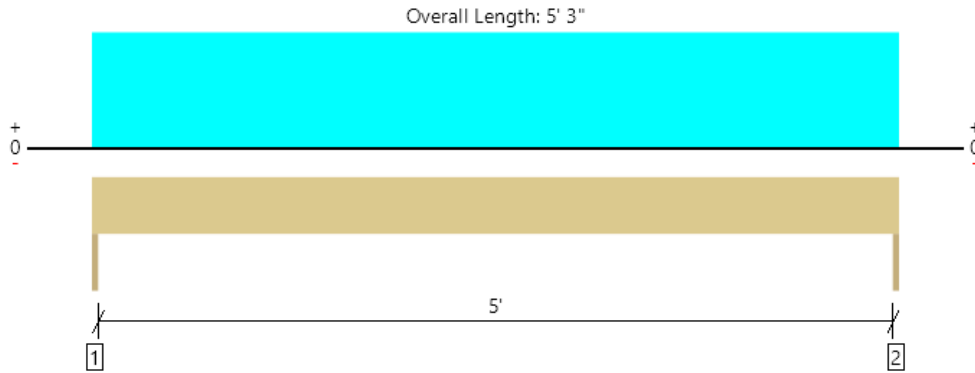
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ForteWEB Software Operator	Job Notes
AP L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	



TH, TH-4

1 piece(s) 4 x 6 Douglas Fir-Larch 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)	1273 @ 0	3281 (1.50")	Passed (39%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	990 @ 7"	2657	Passed (37%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	1671 @ 2' 7 1/2"	1979	Passed (84%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.066 @ 2' 7 1/2"	0.175	Passed (L/954)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.107 @ 2' 7 1/2"	0.262	Passed (L/590)	--	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).
- Top Edge Bracing (Lu): Top compression edge must be braced at 5' 3" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 5' 3" o/c based on loads applied, unless detailed otherwise.
- 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"	485	788	1273	None
2 - Trimmer - SPF	1.50"	1.50"	1.50"	485	788	1273	None

Vertical Loads	Location (Side)	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"	12'	15.0	25.0	Roof

Weyerhaeuser Notes

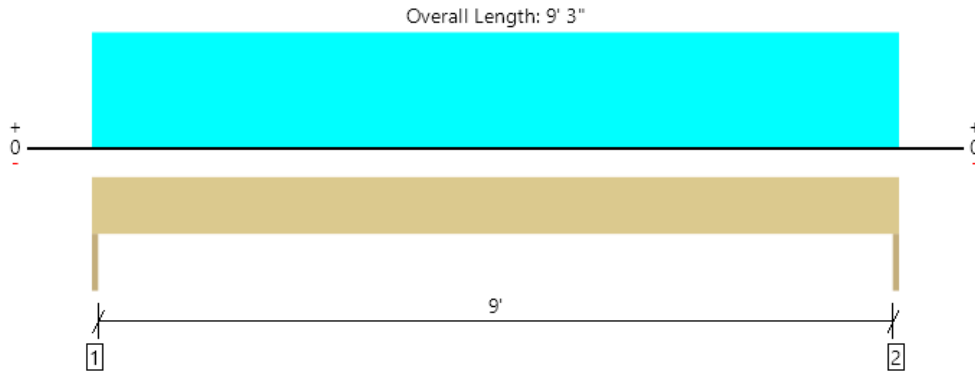
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ForteWEB Software Operator	Job Notes
AP L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	



TH, TH-5
1 piece(s) 4 x 10 Douglas Fir-Larch 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)	1148 @ 0	3281 (1.50")	Passed (35%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	926 @ 10 3/4"	4468	Passed (21%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	2655 @ 4' 7 1/2"	5166	Passed (51%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.067 @ 4' 7 1/2"	0.308	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.111 @ 4' 7 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).
- Top Edge Bracing (Lu): Top compression edge must be braced at 9' 3" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 9' 3" o/c based on loads applied, unless detailed otherwise.
- 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"	454	694	1148	None
2 - Trimmer - SPF	1.50"	1.50"	1.50"	454	694	1148	None

Vertical Loads	Location (Side)	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"	6'	15.0	25.0	Roof

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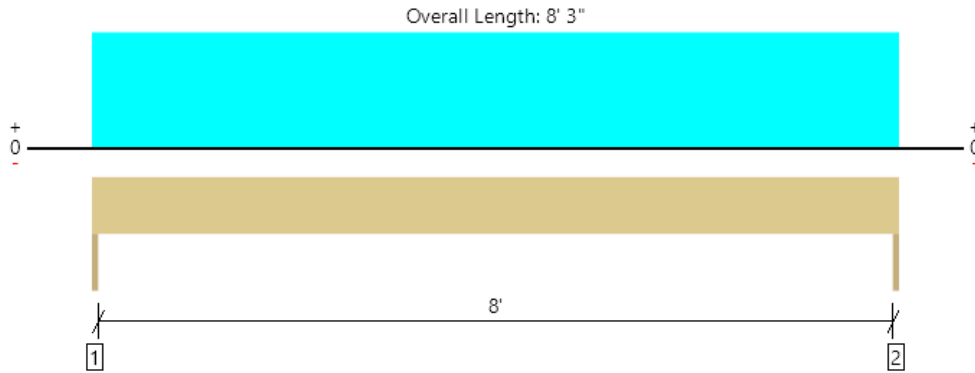
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ForteWEB Software Operator	Job Notes
AP L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	



TH, TH-6

1 piece(s) 4 x 10 Douglas Fir-Larch 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)	1024 @ 0	3281 (1.50")	Passed (31%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	801 @ 10 3/4"	4468	Passed (18%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	2112 @ 4' 1 1/2"	5166	Passed (41%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.042 @ 4' 1 1/2"	0.275	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.070 @ 4' 1 1/2"	0.412	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)

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

- Deflection criteria: LL (L/360) and TL (L/240).
- Top Edge Bracing (Lu): Top compression edge must be braced at 8' 3" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 8' 3" o/c based on loads applied, unless detailed otherwise.
- 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"	405	619	1024	None
2 - Trimmer - SPF	1.50"	1.50"	1.50"	405	619	1024	None

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 8' 3"	N/A	8.2	--	
1 - Uniform (PSF)	0 to 8' 3"	6'	15.0	25.0	Roof

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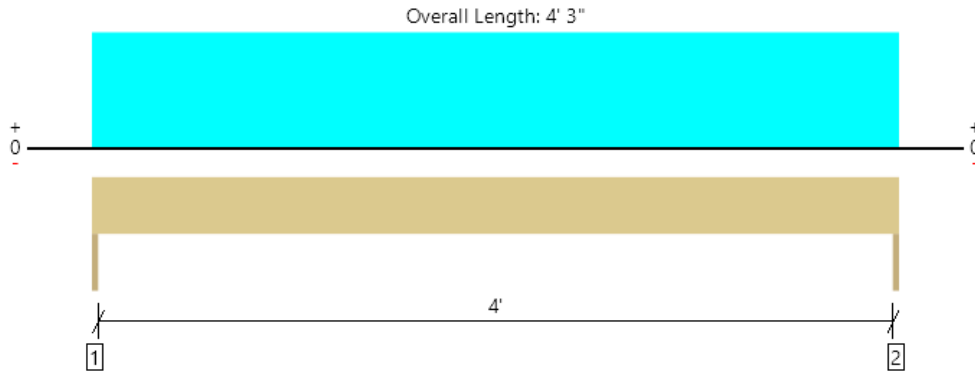
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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



TH, TH-7

1 piece(s) 4 x 6 Douglas Fir-Larch 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)	520 @ 0	3281 (1.50")	Passed (16%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	378 @ 7"	2657	Passed (14%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	553 @ 2' 1 1/2"	1979	Passed (28%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.014 @ 2' 1 1/2"	0.142	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.023 @ 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).
- Top Edge Bracing (Lu): Top compression edge must be braced at 4' 3" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 4' 3" o/c based on loads applied, unless detailed otherwise.
- 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"	202	319	521	None
2 - Trimmer - SPF	1.50"	1.50"	1.50"	202	319	521	None

Vertical Loads	Location (Side)	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"	6'	15.0	25.0	Roof

Weyerhaeuser Notes

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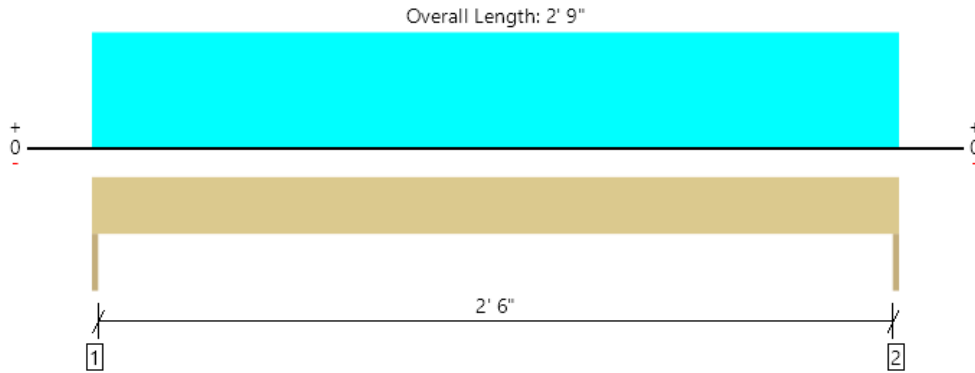
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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



TH, TH-8

1 piece(s) 4 x 6 Douglas Fir-Larch 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)	667 @ 0	3281 (1.50")	Passed (20%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	384 @ 7"	2657	Passed (14%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	458 @ 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).
- Top Edge Bracing (Lu): Top compression edge must be braced at 2' 9" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 2' 9" o/c based on loads applied, unless detailed otherwise.
- 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"	254	413	667	None
2 - Trimmer - SPF	1.50"	1.50"	1.50"	254	413	667	None

Vertical Loads	Location (Side)	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"	12'	15.0	25.0	Roof

Weyerhaeuser Notes

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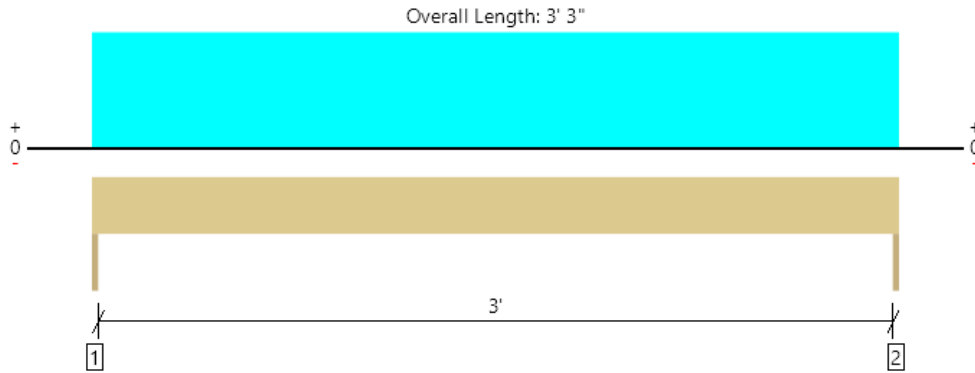
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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



TH, TH-9

1 piece(s) 4 x 6 Douglas Fir-Larch 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)	788 @ 0	3281 (1.50")	Passed (24%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	505 @ 7"	2657	Passed (19%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	640 @ 1' 7 1/2"	1979	Passed (32%)	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).
- Top Edge Bracing (Lu): Top compression edge must be braced at 3' 3" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 3' 3" o/c based on loads applied, unless detailed otherwise.
- 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"	300	488	788	None
2 - Trimmer - SPF	1.50"	1.50"	1.50"	300	488	788	None

Vertical Loads	Location (Side)	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'	15.0	25.0	Roof

Weyerhaeuser Notes

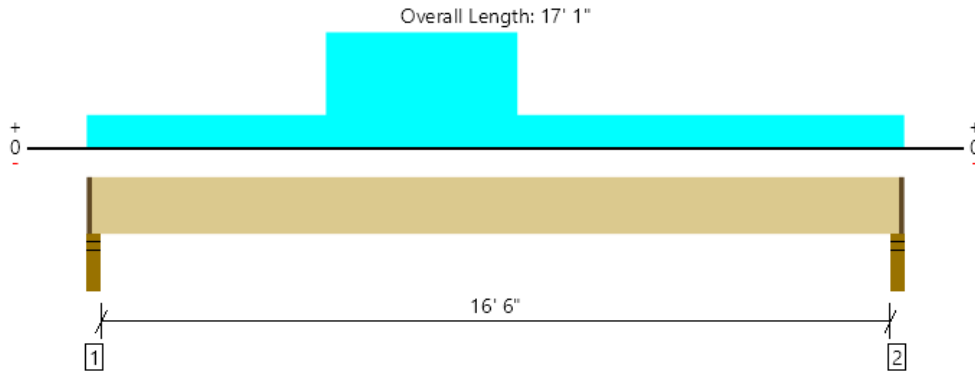
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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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



TB, TB-1 (REACTION ONLY)
 1 piece(s) 1 3/4" x 11 7/8" 1.55E TimberStrand® LSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1548 @ 2"	1673 (2.25")	Passed (93%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	1418 @ 1' 3 3/8"	4295	Passed (33%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	7527 @ 7' 8 5/8"	7977	Passed (94%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.747 @ 8' 4 5/16"	0.419	Failed (L/269)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	1.003 @ 8' 4 3/8"	0.837	Failed (L/200)	--	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).
- Top Edge Bracing (Lu): Top compression edge must be braced at 2' 5" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 16' 11" o/c based on loads applied, unless detailed otherwise.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Total	
1 - Stud wall - SPF	3.50"	2.25"	2.08"	402	1157	1559	1 1/4" Rim Board
2 - Stud wall - SPF	3.50"	2.25"	1.82"	358	1010	1368	1 1/4" Rim Board

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	1 1/4" to 16' 11 3/4"	N/A	6.5	--	
1 - Uniform (PSF)	0 to 17' 1" (Front)	2'	12.0	40.0	Default Load
2 - Uniform (PSF)	5' to 9' (Front)	5'	12.0	40.0	STAIR

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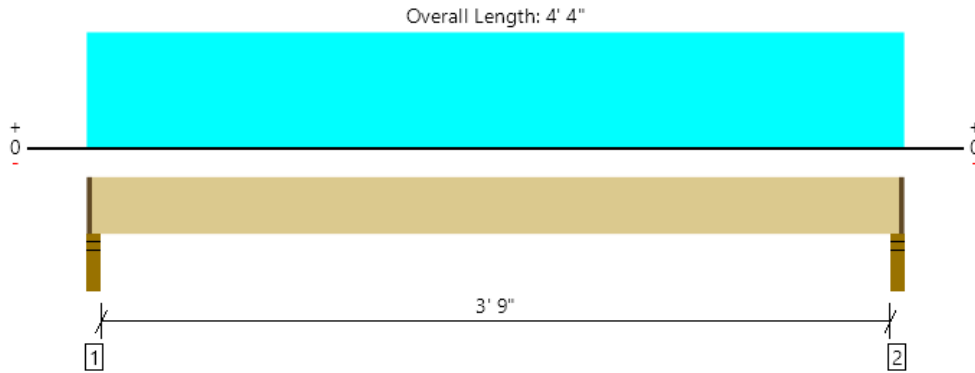
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ForteWEB Software Operator	Job Notes
AP L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	



TB, TB-2 (REACTION ONLY)

1 piece(s) 1 3/4" x 11 7/8" 1.55E TimberStrand® LSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	550 @ 2"	1673 (2.25")	Passed (33%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	236 @ 1' 3 3/8"	4295	Passed (5%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	533 @ 2' 2"	7977	Passed (7%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.006 @ 2' 2"	0.100	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.008 @ 2' 2"	0.200	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).
- Top Edge Bracing (Lu): Top compression edge must be braced at 4' 2" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 4' 2" o/c based on loads applied, unless detailed otherwise.

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"	143	433	576	1 1/4" Rim Board
2 - Stud wall - SPF	3.50"	2.25"	1.50"	143	433	576	1 1/4" Rim Board

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	1 1/4" to 4' 2 3/4"	N/A	6.5	--	
1 - Uniform (PSF)	0 to 4' 4" (Front)	5'	12.0	40.0	Default Load

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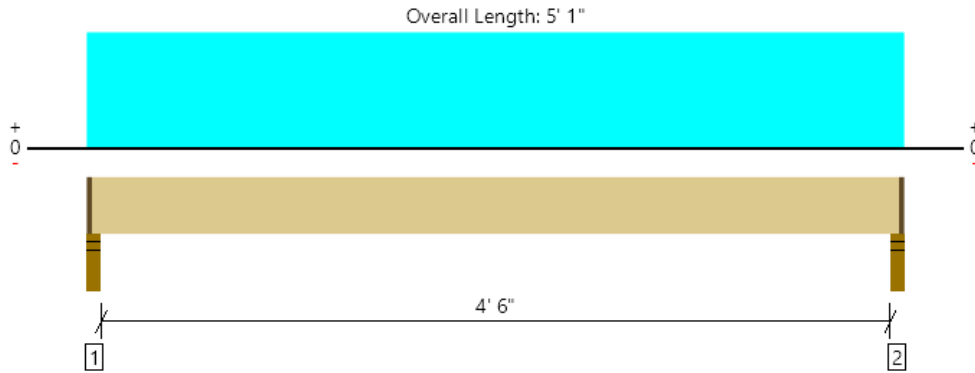
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ForteWEB Software Operator	Job Notes
AP L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	



TB, TB-3 (REACTION ONLY)

1 piece(s) 1 3/4" x 11 7/8" 1.55E TimberStrand® LSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1410 @ 2"	1673 (2.25")	Passed (84%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	729 @ 1' 3 3/8"	4295	Passed (17%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	1632 @ 2' 6 1/2"	7977	Passed (20%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.022 @ 2' 6 1/2"	0.119	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.029 @ 2' 6 1/2"	0.237	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).
- Top Edge Bracing (Lu): Top compression edge must be braced at 4' 11" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 4' 11" o/c based on loads applied, unless detailed otherwise.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Total	
1 - Stud wall - SPF	3.50"	2.25"	1.90"	351	1118	1469	1 1/4" Rim Board
2 - Stud wall - SPF	3.50"	2.25"	1.90"	351	1118	1469	1 1/4" Rim Board

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	1 1/4" to 4' 11 3/4"	N/A	6.5	--	
1 - Uniform (PSF)	0 to 5' 1" (Front)	11'	12.0	40.0	Default Load

Weyerhaeuser Notes

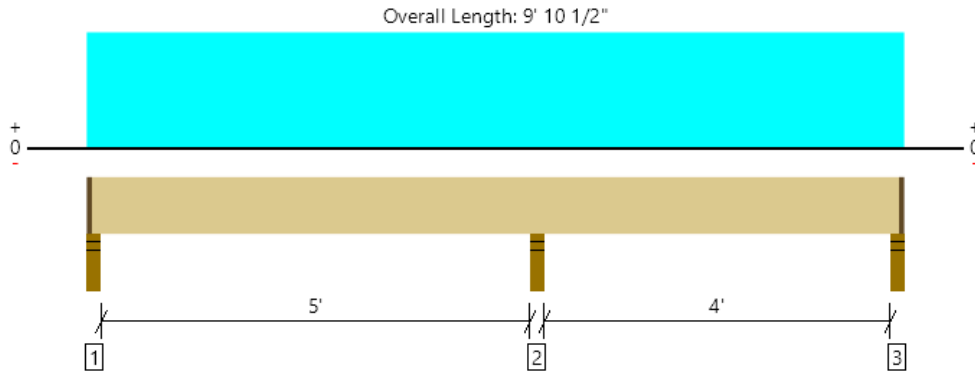
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ForteWEB Software Operator	Job Notes
AP L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	



TB, TB-4 (REACTION ONLY)
 1 piece(s) 1 3/4" x 11 7/8" 1.55E TimberStrand® LSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	2590 @ 5' 5 1/4"	2603 (3.50")	Passed (99%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	886 @ 4' 3 5/8"	4939	Passed (18%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	-1265 @ 5' 5 1/4"	9173	Passed (14%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.013 @ 2' 7"	0.132	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (Alt Spans)
Total Load Defl. (in)	0.022 @ 2' 6 9/16"	0.264	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).
- Top Edge Bracing (Lu): Top compression edge must be braced at 9' 8" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 9' 8" o/c based on loads applied, unless detailed otherwise.

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"	404	195/-7	585	1184/-7	1 1/4" Rim Board
2 - Stud wall - SPF	3.50"	3.50"	3.48"	1086	481	1504	3071	None
3 - Stud wall - SPF	3.50"	2.25"	1.50"	291	165/-28	460	916/-28	1 1/4" Rim Board

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

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 9' 9 1/4"	N/A	6.5	--	--	
1 - Uniform (PSF)	0 to 9' 10 1/2" (Front)	2'	12.0	40.0	-	Default Load
2 - Uniform (PSF)	0 to 9' 10 1/2" (Front)	10'	15.0	-	25.0	ROOF

Weyerhaeuser Notes

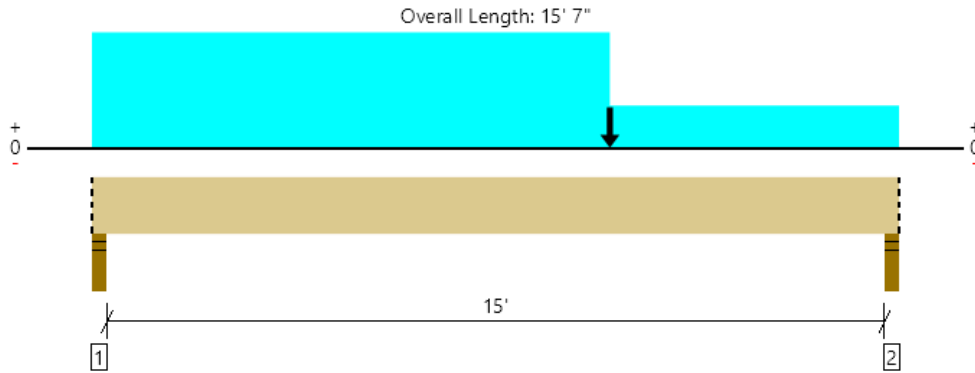
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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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



TB, TB-5 (REACTION ONLY)
1 piece(s) 3 1/2" x 18" 2.0E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDf	Load: Combination (Pattern)
Member Reaction (lbs)	4563 @ 2"	5206 (3.50")	Passed (88%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	4323 @ 13' 9 1/2"	14007	Passed (31%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	22689 @ 10'	50215	Passed (45%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.169 @ 7' 11 7/8"	0.381	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.299 @ 7' 11 7/8"	0.762	Passed (L/612)	--	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).
- Top Edge Bracing (Lu): Top compression edge must be braced at 15' 7" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 15' 7" o/c based on loads applied, unless detailed otherwise.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - SPF	3.50"	3.50"	3.07"	1982	623	2580	5185	Blocking
2 - Stud wall - SPF	3.50"	3.50"	3.05"	2023	623	2521	5167	Blocking

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 15' 7"	N/A	19.6	--	--	
1 - Uniform (PSF)	0 to 15' 7" (Front)	2'	12.0	40.0	-	Default Load
2 - Uniform (PSF)	0 to 10' (Front)	10'	15.0	-	25.0	ROOF
3 - Point (lb)	10' (Front)	N/A	829	-	1161	Linked from: RB-3, Support 2
4 - Point (lb)	10' (Front)	N/A	829	-	1161	Linked from: RB-3, Support 2
5 - Uniform (PSF)	10' to 15' 7" (Front)	2'	15.0	-	25.0	ROOF

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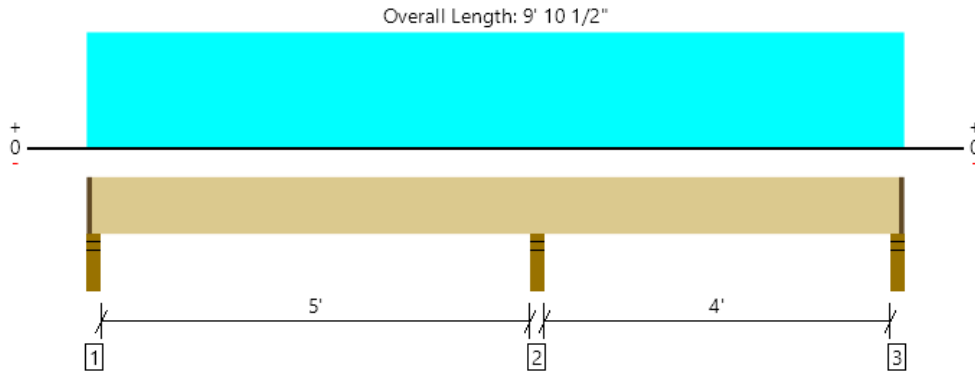
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ForteWEB Software Operator	Job Notes
AP L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	



TB, TB-6 (REACTION ONLY)

1 piece(s) 1 3/4" x 11 7/8" 1.55E TimberStrand® LSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1154 @ 5' 5 1/4"	2603 (3.50")	Passed (44%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	395 @ 4' 3 5/8"	4939	Passed (8%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	-564 @ 5' 5 1/4"	9173	Passed (6%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.006 @ 2' 7 3/16"	0.132	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (Alt Spans)
Total Load Defl. (in)	0.010 @ 2' 6 3/4"	0.264	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).
- Top Edge Bracing (Lu): Top compression edge must be braced at 9' 8" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 9' 8" o/c based on loads applied, unless detailed otherwise.

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"	169	195/-7	176	540/-7	1 1/4" Rim Board
2 - Stud wall - SPF	3.50"	3.50"	1.55"	454	481	451	1386	None
3 - Stud wall - SPF	3.50"	2.25"	1.50"	121	165/-28	138	424/-28	1 1/4" Rim Board

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

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 9' 9 1/4"	N/A	6.5	--	--	
1 - Uniform (PSF)	0 to 9' 10 1/2" (Front)	2'	12.0	40.0	-	Default Load
2 - Uniform (PSF)	0 to 9' 10 1/2" (Front)	3'	15.0	-	25.0	ROOF

Weyerhaeuser Notes

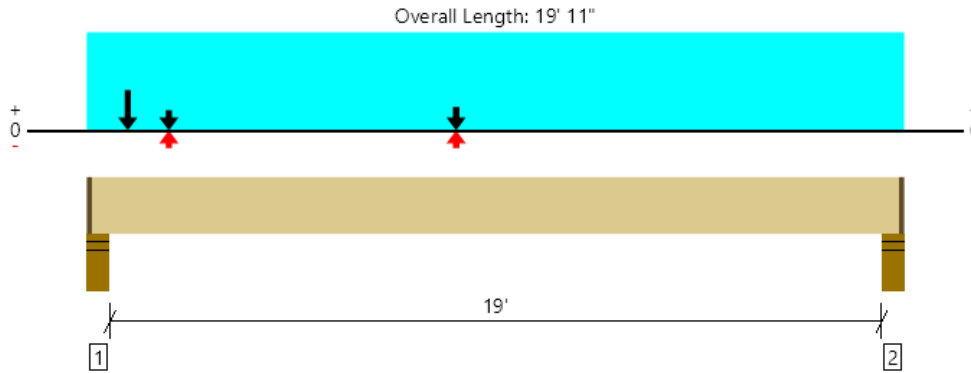
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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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



TB, TB-7 (REACTION ONLY)
1 piece(s) 5 1/4" x 18" 2.0E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern) [Group]
Member Reaction (lbs)	8615 @ 4"	9483 (4.25")	Passed (91%)	--	1.0 D + 0.75 L + 0.75 S (All Spans) [1]
Shear (lbs)	5594 @ 1' 11 1/2"	18270	Passed (31%)	1.00	1.0 D + 1.0 L (All Spans) [1]
Moment (Ft-lbs)	29580 @ 9' 5 3/4"	65497	Passed (45%)	1.00	1.0 D + 1.0 L (All Spans) [1]
Live Load Defl. (in)	0.276 @ 9' 11 1/4"	0.481	Passed (L/837)	--	1.0 D + 1.0 L (All Spans) [1]
Total Load Defl. (in)	0.420 @ 9' 10 7/8"	0.962	Passed (L/550)	--	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).
- Top Edge Bracing (Lu): Top compression edge must be braced at 19' 9" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 19' 9" o/c based on loads applied, unless detailed otherwise.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - SPF	5.50"	4.25"	3.86"	3372	4225	2834	10431	1 1/4" Rim Board
2 - Stud wall - SPF	5.50"	4.25"	2.68"	1974	4072	787	6833	1 1/4" Rim Board

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

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 19' 9 3/4"	N/A	29.5	--	--	
1 - Uniform (PSF)	0 to 19' 11" (Front)	10'	12.0	40.0	-	Default Load
2 - Uniform (PSF)	0 to 19' 11" (Front)	2'	15.0	-	25.0	ROOF
3 - Point (lb)	1' (Front)	N/A	1364	-	2027	Linked from: RB-6, Support 4
4 - Point (lb)	2' (Front)	N/A	121	165/-28	138	Linked from: TB-6 (REACTION ONLY), Support 3
5 - Point (lb)	9' (Front)	N/A	291	165/-28	460	Linked from: TB-4 (REACTION ONLY), Support 3

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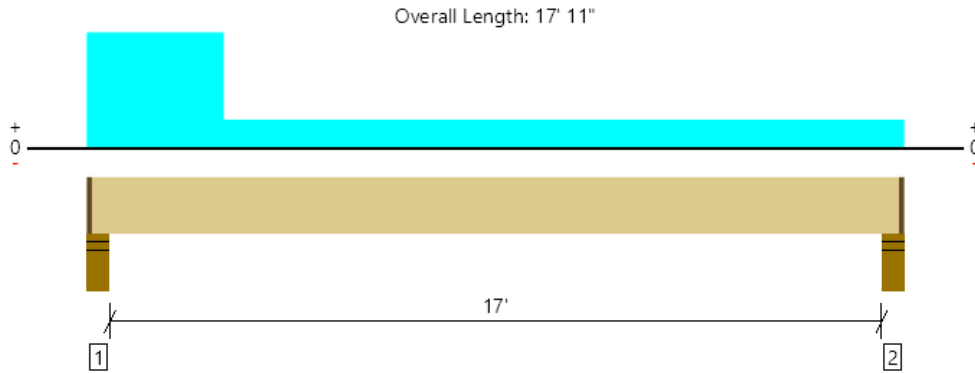
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ForteWEB Software Operator	Job Notes
AP L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	



TB, TB-8 (REACTION ONLY)

1 piece(s) 1 3/4" x 11 7/8" 1.55E TimberStrand® LSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1527 @ 4"	3161 (4.25")	Passed (48%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	991 @ 1' 5 3/8"	4295	Passed (23%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	4326 @ 8' 8 13/16"	7977	Passed (54%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.442 @ 8' 11 1/2"	0.431	Failed (L/468)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.648 @ 8' 10 3/4"	0.863	Passed (L/319)	--	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).
- Top Edge Bracing (Lu): Top compression edge must be braced at 7' 6" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 17' 9" o/c based on loads applied, unless detailed otherwise.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - SPF	5.50"	4.25"	2.05"	608	717	559	1884	1 1/4" Rim Board
2 - Stud wall - SPF	5.50"	4.25"	1.50"	297	717	41	1055	1 1/4" Rim Board

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

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 17' 9 3/4"	N/A	6.5	--	--	
1 - Uniform (PSF)	0 to 17' 11" (Front)	2'	12.0	40.0	-	Default Load
2 - Uniform (PSF)	0 to 3' (Front)	8'	15.0	-	25.0	ROOF

Weyerhaeuser Notes

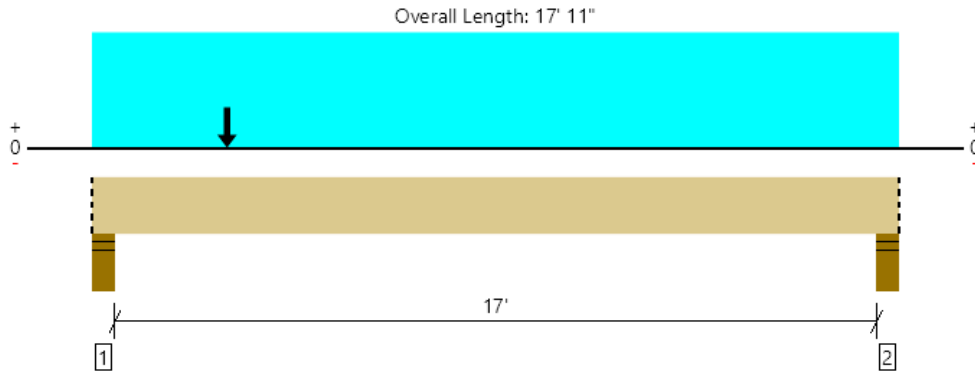
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ForteWEB Software Operator	Job Notes
AP L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	



TB, TB-9 (REACTION ONLY)
1 piece(s) 5 1/4" x 18" 2.0E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	10763 @ 4"	12272 (5.50")	Passed (88%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	10011 @ 1' 11 1/2"	21011	Passed (48%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	28161 @ 5' 5 9/16"	75322	Passed (37%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.188 @ 8' 4 1/4"	0.431	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.324 @ 8' 4 5/8"	0.863	Passed (L/638)	--	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).
- Top Edge Bracing (Lu): Top compression edge must be braced at 17' 11" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 17' 11" o/c based on loads applied, unless detailed otherwise.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - SPF	5.50"	5.50"	4.82"	4405	4289	4188	12882	Blocking
2 - Stud wall - SPF	5.50"	5.50"	2.14"	2076	1370	2230	5676	Blocking

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 17' 11"	N/A	29.5	--	--	
1 - Uniform (PSF)	0 to 17' 11" (Front)	2'	12.0	40.0	-	Default Load
2 - Uniform (PSF)	0 to 17' 11" (Front)	8'	15.0	-	25.0	ROOF
3 - Point (lb)	3' (Front)	N/A	3372	4225	2834	Linked from: TB-7 (REACTION ONLY), Support 1

Weyerhaeuser Notes

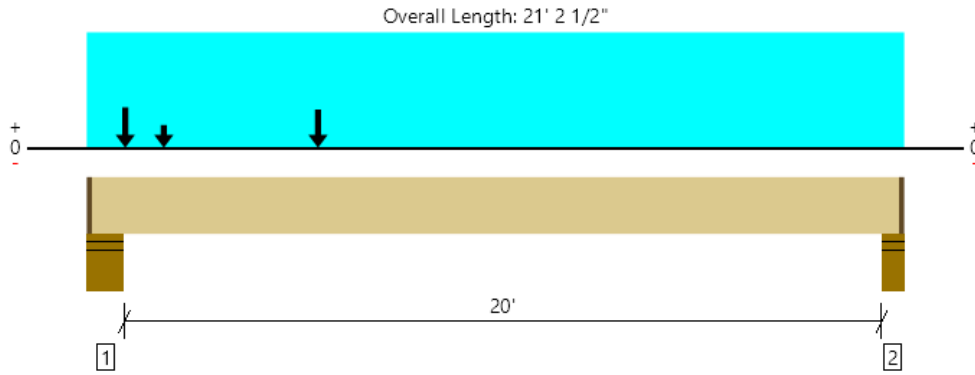
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ForteWEB Software Operator	Job Notes
AP L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	



TB, TB-10 (REACTION ONLY)
1 piece(s) 5 1/4" x 18" 2.0E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	16579 @ 7 1/2"	17292 (7.75")	Passed (96%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	10874 @ 2' 3"	21011	Passed (52%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	51459 @ 8' 10 13/16"	75322	Passed (68%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.408 @ 10' 4 13/16"	0.506	Passed (L/595)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.809 @ 10' 5 1/16"	1.013	Passed (L/300)	--	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).
- Top Edge Bracing (Lu): Top compression edge must be braced at 21' o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 21' o/c based on loads applied, unless detailed otherwise.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - SPF	9.00"	7.75"	7.43"	7933	5242	6381	19556	1 1/4" Rim Board
2 - Stud wall - SPF	5.50"	4.25"	3.93"	4431	3537	2332	10300	1 1/4" Rim Board

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

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 21' 1 1/4"	N/A	29.5	--	--	
1 - Uniform (PSF)	0 to 21' 2 1/2" (Front)	8'	12.0	40.0	-	Default Load
2 - Uniform (PSF)	0 to 21' 2 1/2" (Front)	6'	15.0	-	25.0	ROOF
3 - Uniform (PSF)	0 to 21' 2 1/2" (Front)	10'	15.0	-	-	Ext Wall
4 - Point (lb)	2' (Front)	N/A	518	-	781	Linked from: RB-6, Support 5
5 - Point (lb)	1' (Front)	N/A	2076	1370	2230	Linked from: TB-9 (REACTION ONLY), Support 2
6 - Point (lb)	6' (Front)	N/A	2023	623	2521	Linked from: TB-5 (REACTION ONLY), Support 2

Weyerhaeuser Notes

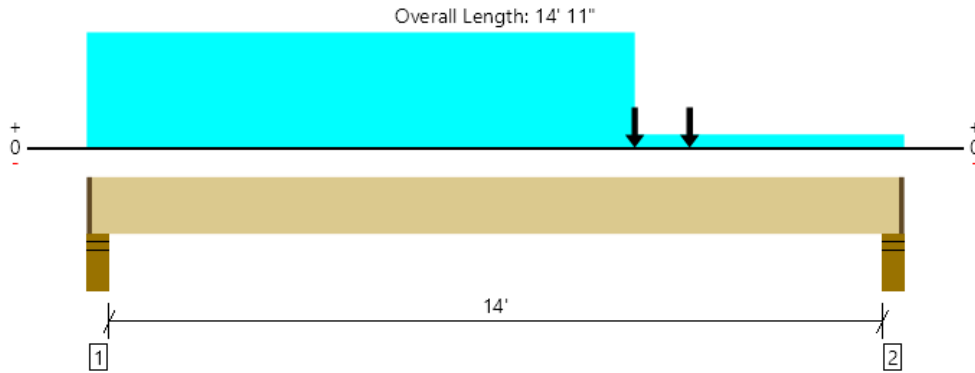
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AP L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	



TB, TB-11 (REACTION ONLY)
1 piece(s) 3 1/2" x 18" 2.0E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDf	Load: Combination (Pattern)
Member Reaction (lbs)	6370 @ 4"	6322 (4.25")	Passed (101%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	4806 @ 1' 11 1/2"	14007	Passed (34%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	22611 @ 7' 7 7/8"	50215	Passed (45%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.165 @ 7' 5 1/2"	0.356	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.282 @ 7' 5 5/8"	0.712	Passed (L/605)	--	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).
- Top Edge Bracing (Lu): Top compression edge must be braced at 14' 9" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 14' 9" o/c based on loads applied, unless detailed otherwise.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - SPF	5.50"	4.25"	4.28"	2655	597	3801	7053	1 1/4" Rim Board
2 - Stud wall - SPF	5.50"	4.25"	3.24"	2091	597	2737	5425	1 1/4" Rim Board

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

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	19.6	--	--	
1 - Uniform (PSF)	0 to 14' 11" (Front)	2'	12.0	40.0	-	Default Load
2 - Uniform (PSF)	0 to 10' (Front)	20'	15.0	-	25.0	ROOF
3 - Point (lb)	10' (Front)	N/A	549	-	769	Linked from: RB-5, Support 1
4 - Point (lb)	11' (Front)	N/A	549	-	769	Linked from: RB-4, Support 1

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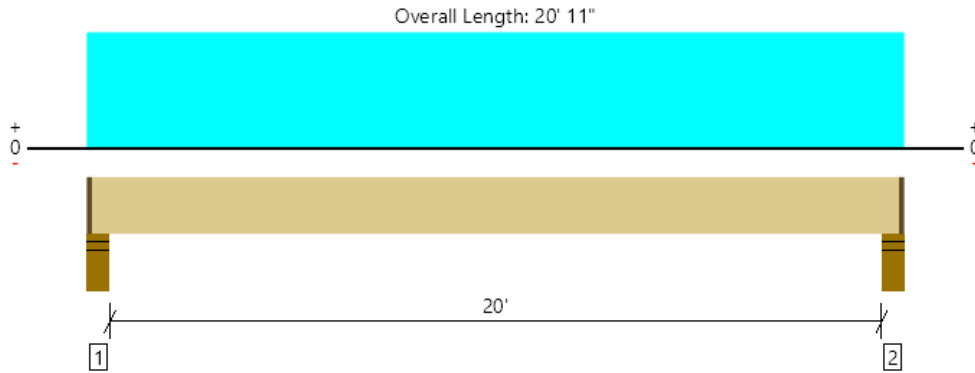
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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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



TB, TB-12 (REACTION ONLY)
 1 piece(s) 7" x 14" 2.OE 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)	6794 @ 4"	12644 (4.25")	Passed (54%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	5796 @ 1' 7 1/2"	21789	Passed (27%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	33635 @ 10' 5 1/2"	62472	Passed (54%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.382 @ 10' 5 1/2"	0.506	Passed (L/636)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.815 @ 10' 5 1/2"	1.013	Passed (L/298)	--	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).
- Top Edge Bracing (Lu): Top compression edge must be braced at 20' 9" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 20' 9" o/c based on loads applied, unless detailed otherwise.
- 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"	4.25"	2.28"	3643	1673	2615	7931	1 1/4" Rim Board
2 - Stud wall - SPF	5.50"	4.25"	2.28"	3643	1673	2615	7931	1 1/4" Rim Board

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

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' 9 3/4"	N/A	30.7	--	--	
1 - Uniform (PSF)	0 to 20' 11" (Front)	4'	12.0	40.0	-	Default Load
2 - Uniform (PSF)	0 to 20' 11" (Front)	10'	12.0	-	25.0	ROOF
3 - Uniform (PSF)	0 to 20' 11" (Front)	10'	15.0	-	-	EXT WALL

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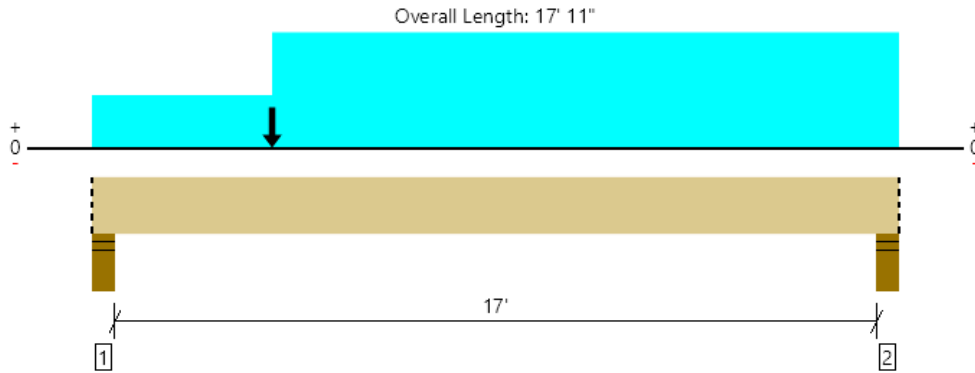
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ForteWEB Software Operator	Job Notes
AP L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	



TB, TB-13 (REACTION ONLY)
1 piece(s) 3 1/2" x 18" 2.0E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	6224 @ 17' 7"	8181 (5.50")	Passed (76%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	5365 @ 1' 11 1/2"	12180	Passed (44%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	26536 @ 8' 7 7/16"	43665	Passed (61%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.238 @ 8' 10 1/2"	0.431	Passed (L/868)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.471 @ 8' 10 3/4"	0.863	Passed (L/439)	--	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).
- Top Edge Bracing (Lu): Top compression edge must be braced at 17' 11" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 17' 11" o/c based on loads applied, unless detailed otherwise.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - SPF	5.50"	5.50"	4.03"	3067	2777	1120	6964	Blocking
2 - Stud wall - SPF	5.50"	5.50"	4.18"	3112	3030	1120	7262	Blocking

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 17' 11"	N/A	19.6	--	--	
1 - Uniform (PSF)	4' to 17' 11" (Front)	8'	12.0	40.0	-	Default Load
2 - Uniform (PSF)	0 to 17' 11" (Front)	5'	15.0	-	25.0	ROOF
3 - Point (lb)	4' (Front)	N/A	460	1353	-	Linked from: TB-14 (REACTION ONLY), Support 1
4 - Uniform (PSF)	0 to 17' 11" (Front)	10'	15.0	-	-	EXT WALL

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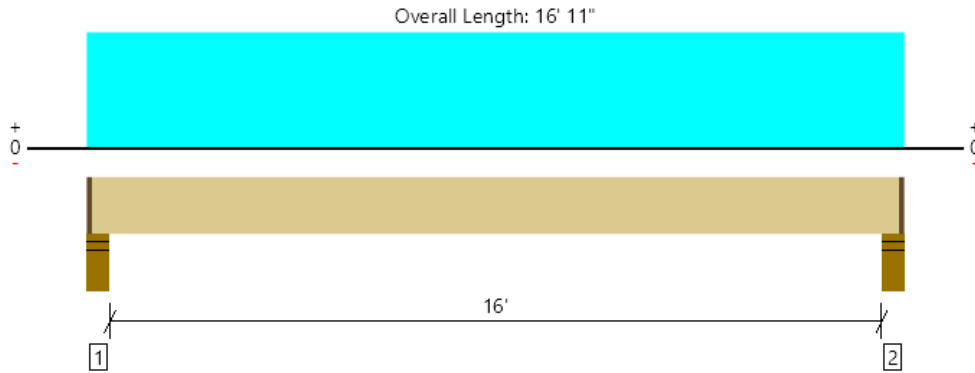
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ForteWEB Software Operator	Job Notes
AP L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	



TB, TB-14 (REACTION ONLY)
 1 piece(s) 1 3/4" x 11 7/8" 1.55E TimberStrand® LSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1792 @ 4"	3161 (4.25")	Passed (57%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	1504 @ 1' 5 3/8"	4295	Passed (35%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	7080 @ 8' 5 1/2"	7977	Passed (89%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.701 @ 8' 5 1/2"	0.406	Failed (L/278)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.940 @ 8' 5 1/2"	0.813	Failed (L/208)	--	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).
- Top Edge Bracing (Lu): Top compression edge must be braced at 3' 5" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 16' 9" o/c based on loads applied, unless detailed otherwise.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Total	
1 - Stud wall - SPF	5.50"	4.25"	2.41"	460	1353	1813	1 1/4" Rim Board
2 - Stud wall - SPF	5.50"	4.25"	2.41"	460	1353	1813	1 1/4" Rim Board

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	1 1/4" to 16' 9 3/4"	N/A	6.5	--	
1 - Uniform (PSF)	0 to 16' 11" (Front)	4'	12.0	40.0	Default Load

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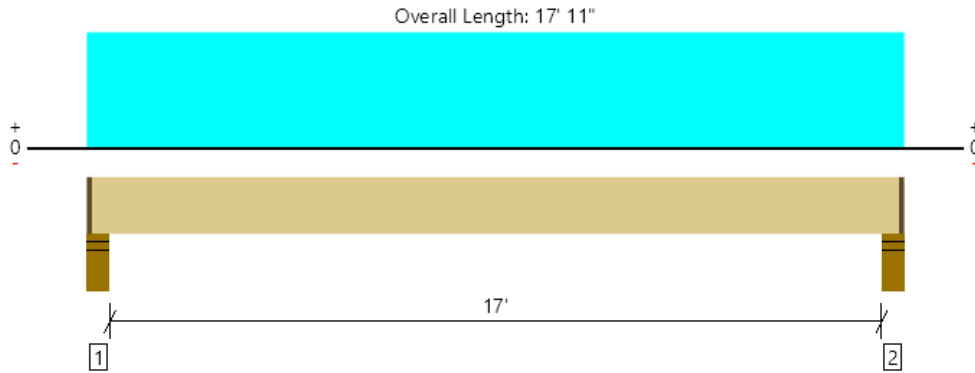
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ForteWEB Software Operator	Job Notes
AP L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	



TB, TB-15 (REACTION ONLY)
 1 piece(s) 3 1/2" x 11 7/8" 2.0E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1531 @ 4"	6322 (4.25")	Passed (24%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1299 @ 1' 5 3/8"	9241	Passed (14%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	6433 @ 8' 11 1/2"	22888	Passed (28%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.214 @ 8' 11 1/2"	0.431	Passed (L/966)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.371 @ 8' 11 1/2"	0.863	Passed (L/559)	--	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).
- Top Edge Bracing (Lu): Top compression edge must be braced at 17' 9" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 17' 9" o/c based on loads applied, unless detailed otherwise.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Stud wall - SPF	5.50"	4.25"	1.50"	652	896	1548	1 1/4" Rim Board
2 - Stud wall - SPF	5.50"	4.25"	1.50"	652	896	1548	1 1/4" Rim Board

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	1 1/4" to 17' 9 3/4"	N/A	13.0	--	
1 - Uniform (PSF)	0 to 17' 11" (Front)	4'	15.0	25.0	ROOF

Weyerhaeuser Notes

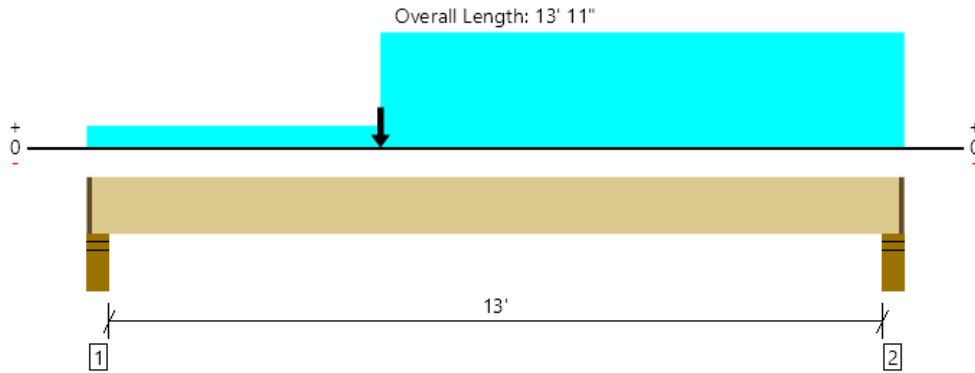
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ForteWEB Software Operator	Job Notes
AP L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	



TB, TB-16 (REACTION ONLY)
 1 piece(s) 3 1/2" x 18" 2.0E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	3921 @ 13' 7"	6322 (4.25")	Passed (62%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	3220 @ 1' 11 1/2"	14007	Passed (23%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	15005 @ 5' 8 1/2"	50215	Passed (30%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.091 @ 6' 10 3/8"	0.331	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.161 @ 6' 10 1/4"	0.663	Passed (L/990)	--	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).
- Top Edge Bracing (Lu): Top compression edge must be braced at 13' 9" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 13' 9" o/c based on loads applied, unless detailed otherwise.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - SPF	5.50"	4.25"	2.22"	1501	557	1802	3860	1 1/4" Rim Board
2 - Stud wall - SPF	5.50"	4.25"	2.64"	1717	557	2252	4526	1 1/4" Rim Board

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

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 13' 9 3/4"	N/A	19.6	--	--	
1 - Uniform (PSF)	5' to 13' 11" (Front)	11'	15.0	-	25.0	ROOF
2 - Point (lb)	5' (Front)	N/A	1144	-	1602	Linked from: RB-2, Support 2
3 - Uniform (PSF)	0 to 13' 11" (Front)	2'	12.0	40.0	-	DEFAULT

Weyerhaeuser Notes

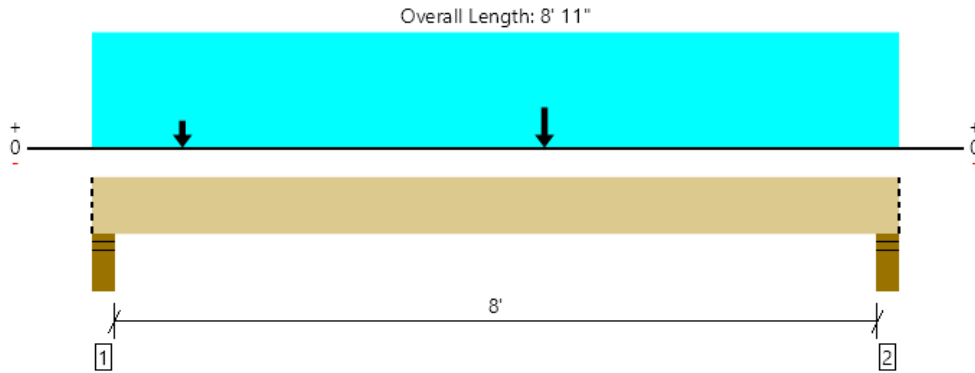
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ForteWEB Software Operator	Job Notes
AP L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	



TB, TB-17 (REACTION ONLY)
1 piece(s) 3 1/2" x 18" 2.0E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	5302 @ 4"	8181 (5.50")	Passed (65%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	3190 @ 6' 11 1/2"	14007	Passed (23%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	11153 @ 5'	50215	Passed (22%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.028 @ 5'	0.206	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.056 @ 5'	0.412	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).
- Top Edge Bracing (Lu): Top compression edge must be braced at 8' 11" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 8' 11" o/c based on loads applied, unless detailed otherwise.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - SPF	5.50"	5.50"	3.56"	2534	242	2768	5544	Blocking
2 - Stud wall - SPF	5.50"	5.50"	2.76"	2095	315	2007	4417	Blocking

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 8' 11"	N/A	19.6	--	--	
1 - Uniform (PSF)	0 to 8' 11" (Front)	8'	12.0	-	25.0	ROOF
2 - Uniform (PSF)	0 to 8' 11" (Front)	10'	15.0	-	-	Ext Wall
3 - Point (lb)	1' (Front)	N/A	759	-	1190	Linked from: RB-6, Support 1
4 - Point (lb)	5' (Front)	N/A	1501	557	1802	Linked from: TB-16 (REACTION ONLY), Support 1

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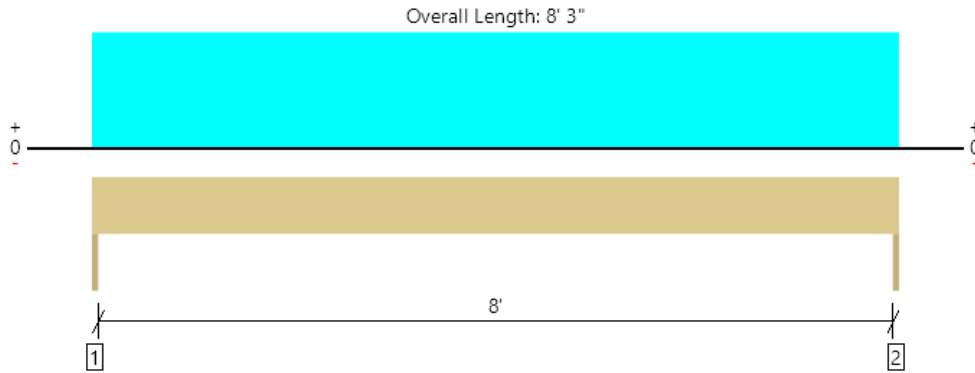
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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



SH, SH-1

1 piece(s) 4 x 10 Douglas Fir-Larch 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)	2187 @ 0	3281 (1.50")	Passed (67%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1712 @ 10 3/4"	4468	Passed (38%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	4511 @ 4' 1 1/2"	5166	Passed (87%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.063 @ 4' 1 1/2"	0.275	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.150 @ 4' 1 1/2"	0.412	Passed (L/662)	--	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).
- Top Edge Bracing (Lu): Top compression edge must be braced at 8' 3" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 8' 3" o/c based on loads applied, unless detailed otherwise.
- 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"	1259	165	928	2352	None
2 - Trimmer - SPF	1.50"	1.50"	1.50"	1259	165	928	2352	None

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 8' 3"	N/A	8.2	--	--	
1 - Uniform (PSF)	0 to 8' 3"	1'	12.0	40.0	-	Default Load
2 - Uniform (PSF)	0 to 8' 3"	10'	15.0	-	-	Ext Wall
3 - Uniform (PSF)	0 to 8' 3"	9'	15.0	-	25.0	Roof

Weyerhaeuser Notes

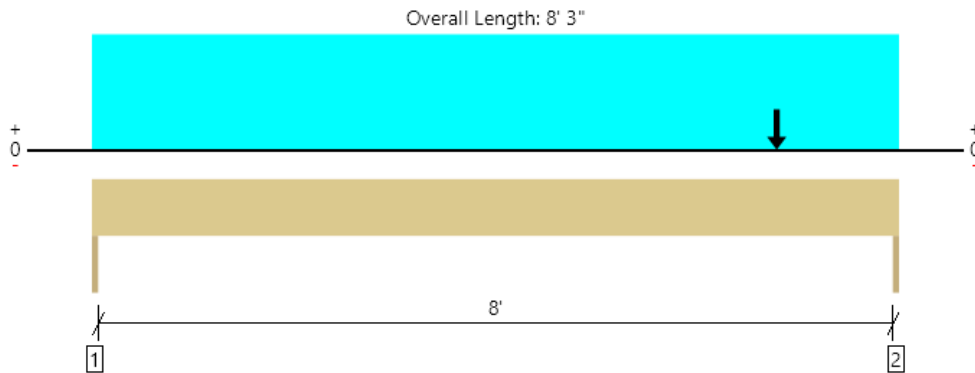
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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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



SH, SH-2
1 piece(s) 5 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)	4556 @ 8' 3"	5363 (1.50")	Passed (85%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	3772 @ 7' 4 1/2"	8745	Passed (43%)	1.00	1.0 D + 1.0 L (All Spans)
Pos Moment (Ft-lbs)	8270 @ 4' 3 9/16"	14850	Passed (56%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.128 @ 4' 2 1/16"	0.275	Passed (L/771)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.170 @ 4' 2 1/16"	0.412	Passed (L/581)	--	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).
- Top Edge Bracing (Lu): Top compression edge must be braced at 8' 3" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lb): Bottom compression edge must be braced at 8' 3" o/c based on loads applied, unless detailed otherwise.
- Critical positive moment adjusted by a volume factor of 1.00 that was calculated using length L = 8' 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"	936	2914	6	3856	None
2 - Trimmer - SPF	1.50"	1.50"	1.50"	1143	3413	35	4591	None

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 8' 3"	N/A	12.0	--	--	
1 - Uniform (PSF)	0 to 8' 3"	17'	12.0	40.0	-	Default Load
2 - Point (lb)	7'	N/A	297	717	41	Linked from: TB-8 (REACTION ONLY), Support 2

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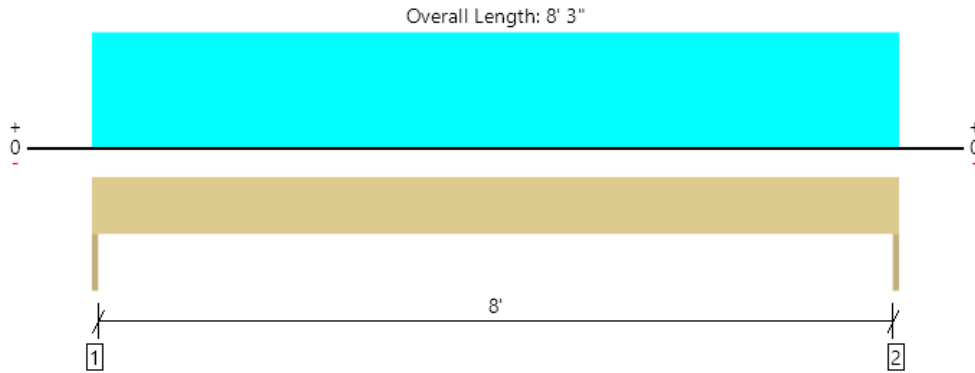
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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



SH, SH-3

1 piece(s) 4 x 10 Douglas Fir-Larch 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)	2352 @ 0	3281 (1.50")	Passed (72%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1841 @ 10 3/4"	4468	Passed (41%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	4851 @ 4' 1 1/2"	5166	Passed (94%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.071 @ 4' 1 1/2"	0.275	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.161 @ 4' 1 1/2"	0.412	Passed (L/615)	--	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).
- Top Edge Bracing (Lu): Top compression edge must be braced at 8' 3" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 8' 3" o/c based on loads applied, unless detailed otherwise.
- 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"	1321	165	1031	2517	None
2 - Trimmer - SPF	1.50"	1.50"	1.50"	1321	165	1031	2517	None

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 8' 3"	N/A	8.2	--	--	
1 - Uniform (PSF)	0 to 8' 3"	1'	12.0	40.0	-	Default Load
2 - Uniform (PSF)	0 to 8' 3"	10'	15.0	-	25.0	ROOF
3 - Uniform (PSF)	0 to 8' 3"	10'	15.0	-	-	EXT WALL

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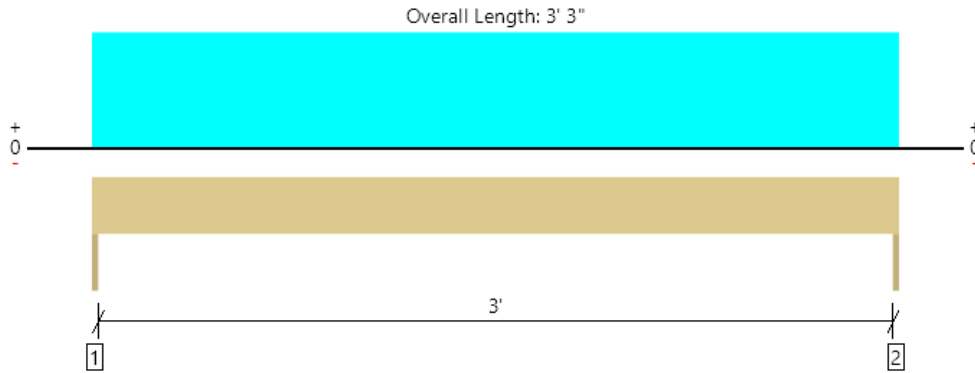
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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



SH, SH-4

1 piece(s) 4 x 6 Douglas Fir-Larch 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)	333 @ 0	3281 (1.50")	Passed (10%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	213 @ 7"	2657	Passed (8%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	271 @ 1' 7 1/2"	1979	Passed (14%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.004 @ 1' 7 1/2"	0.108	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.007 @ 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).
- Top Edge Bracing (Lu): Top compression edge must be braced at 3' 3" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 3' 3" o/c based on loads applied, unless detailed otherwise.
- 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"	130	203	333	None
2 - Trimmer - SPF	1.50"	1.50"	1.50"	130	203	333	None

Vertical Loads	Location (Side)	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"	5'	15.0	25.0	ROOF

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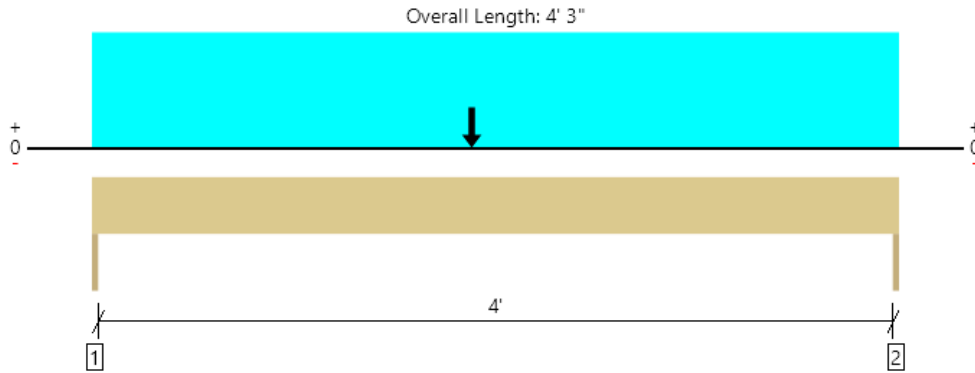
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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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



SH, SH-5
1 piece(s) 4 x 10 Douglas Fir-Larch 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)	1174 @ 0	3281 (1.50")	Passed (36%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	1027 @ 10 3/4"	3885	Passed (26%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	2020 @ 2'	4492	Passed (45%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.011 @ 2' 1 3/8"	0.142	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.015 @ 2' 1 3/8"	0.213	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).
- Top Edge Bracing (Lu): Top compression edge must be braced at 4' 3" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 4' 3" o/c based on loads applied, unless detailed otherwise.
- 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"	307	868	1175	None
2 - Trimmer - SPF	1.50"	1.50"	1.50"	283	799	1082	None

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 4' 3"	N/A	8.2	--	
1 - Uniform (PSF)	0 to 4' 3"	3'	12.0	40.0	DEFAULT
2 - Point (lb)	2'	N/A	402	1157	Linked from: TB-1 (REACTION ONLY), Support 1

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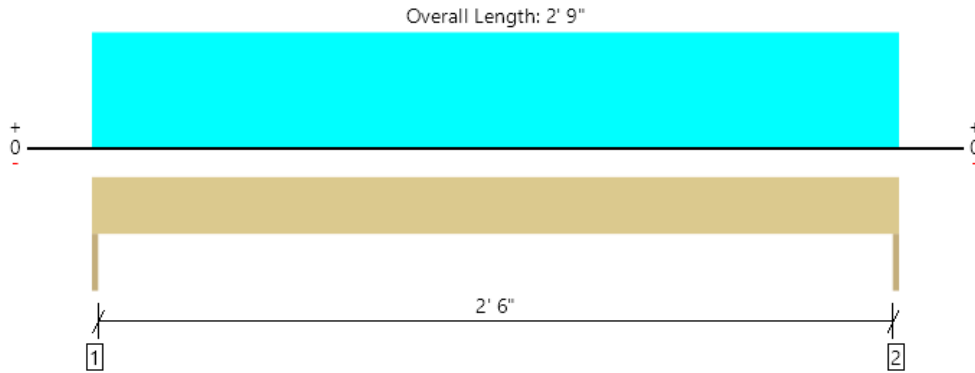
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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



SH, SH-6

1 piece(s) 4 x 6 Douglas Fir-Larch 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)	849 @ 0	3281 (1.50")	Passed (26%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	470 @ 7"	2310	Passed (20%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	561 @ 1' 4 1/2"	1720	Passed (33%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.005 @ 1' 4 1/2"	0.092	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.010 @ 1' 4 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).
- Top Edge Bracing (Lu): Top compression edge must be braced at 2' 9" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 2' 9" o/c based on loads applied, unless detailed otherwise.
- 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"	432	385	172	989	None
2 - Trimmer - SPF	1.50"	1.50"	1.50"	432	385	172	989	None

Vertical Loads	Location (Side)	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"	7'	12.0	40.0	-	DEFAULT
2 - Uniform (PSF)	0 to 2' 9"	10'	15.0	-	-	EXT WALL
3 - Uniform (PSF)	0 to 2' 9"	5'	15.0	-	25.0	ROOF

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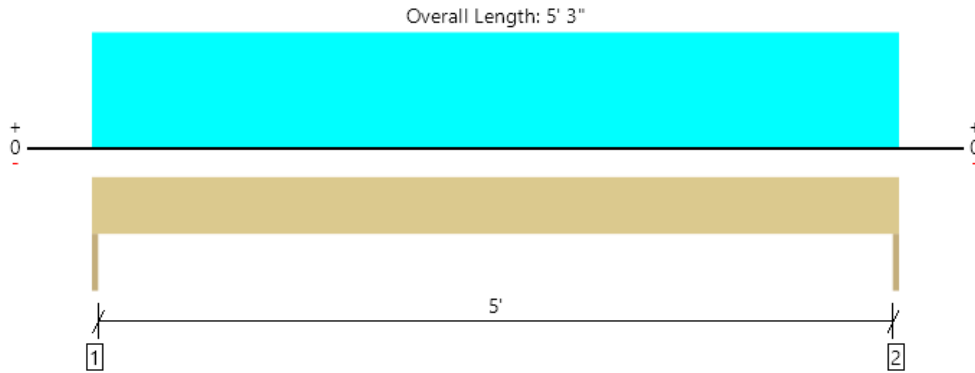
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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



SH, SH-7

1 piece(s) 4 x 10 Douglas Fir-Larch 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)	1807 @ 0	3281 (1.50")	Passed (55%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	1085 @ 10 3/4"	3885	Passed (28%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	2161 @ 2' 7 1/2"	4492	Passed (48%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.016 @ 2' 7 1/2"	0.175	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.032 @ 2' 7 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).
- Top Edge Bracing (Lu): Top compression edge must be braced at 5' 3" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 5' 3" o/c based on loads applied, unless detailed otherwise.
- 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"	911	735	459	2105	None
2 - Trimmer - SPF	1.50"	1.50"	1.50"	911	735	459	2105	None

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	8.2	--	--	
1 - Uniform (PSF)	0 to 5' 3"	7'	12.0	40.0	-	DEFAULT
2 - Uniform (PSF)	0 to 5' 3"	10'	15.0	-	-	EXT WALL
3 - Uniform (PSF)	0 to 5' 3"	7'	15.0	-	25.0	ROOF

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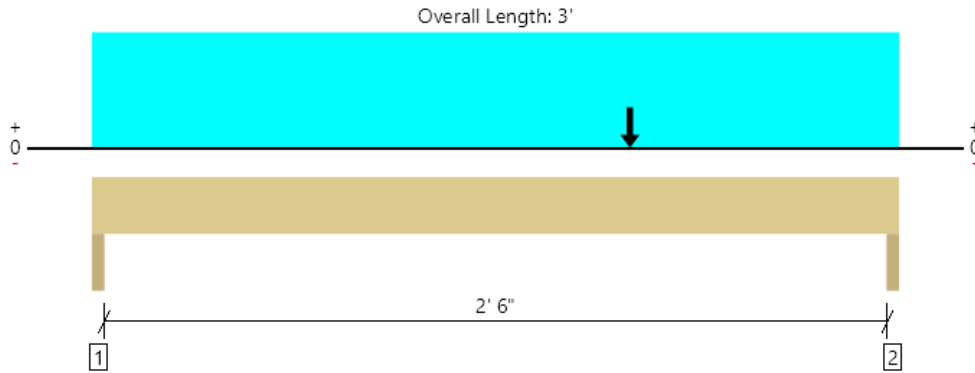
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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



SH, SH-8

1 piece(s) 4 x 10 Douglas Fir-Larch 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)	3306 @ 2' 10 1/2"	6563 (3.00")	Passed (50%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	2727 @ 1' 11 3/4"	4468	Passed (61%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	2664 @ 2'	5166	Passed (52%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.004 @ 1' 6 9/16"	0.092	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.008 @ 1' 6 9/16"	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).
- Top Edge Bracing (Lu): Top compression edge must be braced at 3' o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 3' o/c based on loads applied, unless detailed otherwise.
- 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"	841	717	717	2275	None
2 - Trimmer - SPF	3.00"	3.00"	1.51"	1465	920	1535	3920	None

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 3'	N/A	8.2	--	--	
1 - Uniform (PSF)	0 to 3'	9'	12.0	40.0	-	DEFAULT
2 - Uniform (PSF)	0 to 3'	10'	8.0	-	-	INT WALL
3 - Point (lb)	2'	N/A	1717	557	2252	Linked from: TB-16 (REACTION ONLY), Support 2

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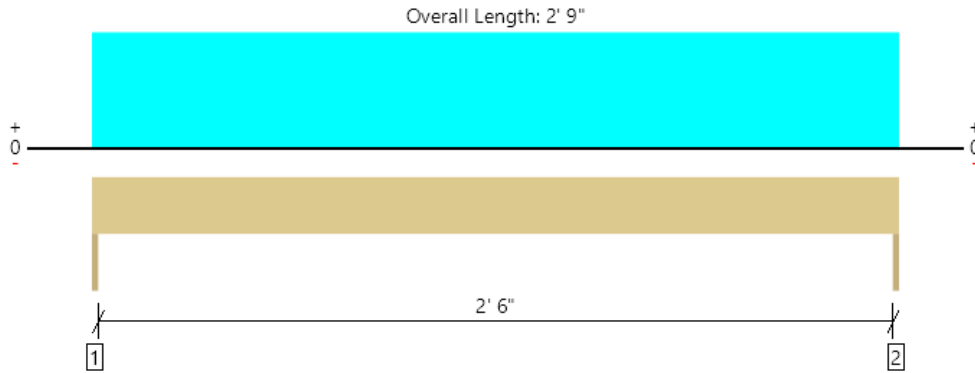
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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



SH, SH-9

1 piece(s) 4 x 6 Douglas Fir-Larch 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)	927 @ 0	3281 (1.50")	Passed (28%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	534 @ 7"	2657	Passed (20%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	637 @ 1' 4 1/2"	1979	Passed (32%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.006 @ 1' 4 1/2"	0.092	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.011 @ 1' 4 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).
- Top Edge Bracing (Lu): Top compression edge must be braced at 2' 9" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 2' 9" o/c based on loads applied, unless detailed otherwise.
- 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"	422	330	344	1096	None
2 - Trimmer - SPF	1.50"	1.50"	1.50"	422	330	344	1096	None

Vertical Loads	Location (Side)	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"	6'	12.0	40.0	-	DEFAULT
2 - Uniform (PSF)	0 to 2' 9"	10'	8.0	-	-	INT WALL
3 - Uniform (PSF)	0 to 2' 9"	10'	15.0	-	25.0	ROOF

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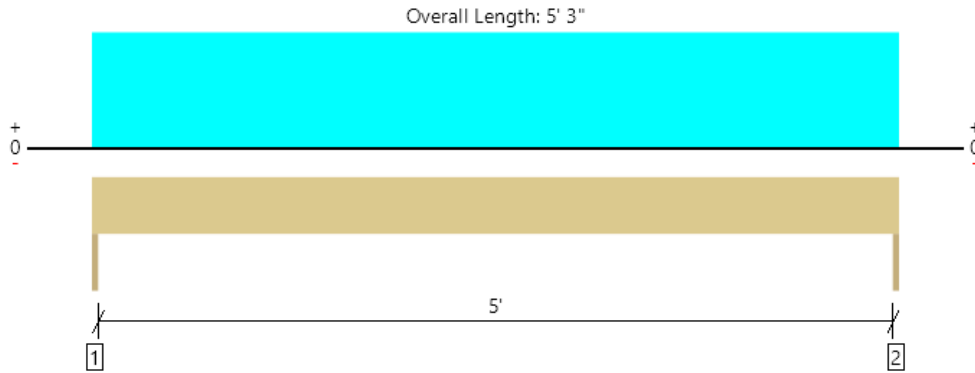
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ForteWEB Software Operator	Job Notes
AP L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	



SH, SH-10

1 piece(s) 4 x 10 Douglas Fir-Larch 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)	1779 @ 0	3281 (1.50")	Passed (54%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	1172 @ 10 3/4"	4468	Passed (26%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	2335 @ 2' 7 1/2"	5166	Passed (45%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.017 @ 2' 7 1/2"	0.175	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.031 @ 2' 7 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).
- Top Edge Bracing (Lu): Top compression edge must be braced at 5' 3" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 5' 3" o/c based on loads applied, unless detailed otherwise.
- 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"	814	630	656	2100	None
2 - Trimmer - SPF	1.50"	1.50"	1.50"	814	630	656	2100	None

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	8.2	--	--	
1 - Uniform (PSF)	0 to 5' 3"	6'	12.0	40.0	-	DEFAULT
2 - Uniform (PSF)	0 to 5' 3"	10'	8.0	-	-	INT WALL
3 - Uniform (PSF)	0 to 5' 3"	10'	15.0	-	25.0	ROOF

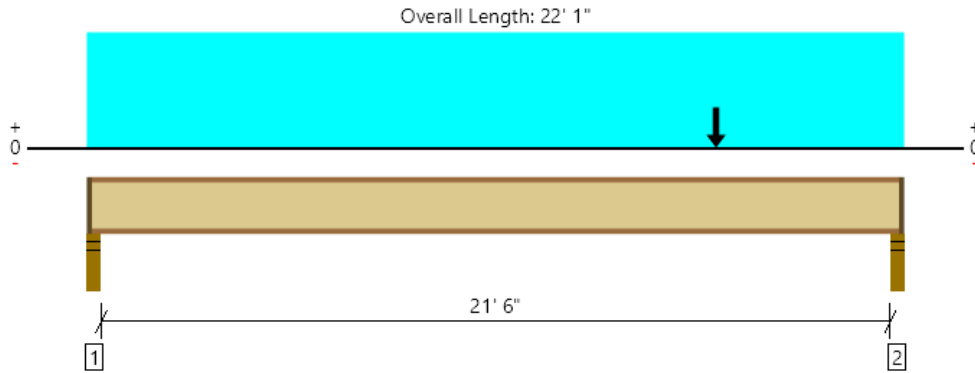
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ForteWEB Software Operator	Job Notes
AP L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	



SJ, SJ-1 (REACTION ONLY)
 1 piece(s) 11 7/8" TJI @ 210 @ 16" OC

Support 2 failed reaction check due to insufficient bearing capacity.



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)	1177 @ 21' 10 1/2"	1134 (2.25")	Failed (104%)	1.00	1.0 D + 1.0 L (All Spans)
Shear (lbs)	1164 @ 21' 9 1/2"	1655	Passed (70%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	5491 @ 12' 9 1/2"	3795	Failed (145%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.747 @ 11' 4 9/16"	0.542	Failed (L/348)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	1.318 @ 11' 7"	1.083	Failed (L/197)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
TJ-Pro™ Rating	19	40	Failed	--	--

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

- Deflection criteria: LL (L/480) and TL (L/240).
- Top Edge Bracing (Lu): Top compression edge must be braced at 6" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 21' 11" o/c based on loads applied, unless detailed otherwise.
- 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"	2.25"	1.75"	298	589	90	977	1 1/4" Rim Board
2 - Stud wall - SPF	3.50"	2.25"	2.42"	595	589	310	1494	1 1/4" Rim Board

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

Vertical Loads	Location (Side)	Spacing	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 22' 1"	16"	12.0	40.0	-	Default Load
2 - Point (PLF)	17'	16"	225.0	-	-	EXT WALL
3 - Point (PLF)	17'	16"	180.0	-	300.0	ROOF

Weyerhaeuser Notes

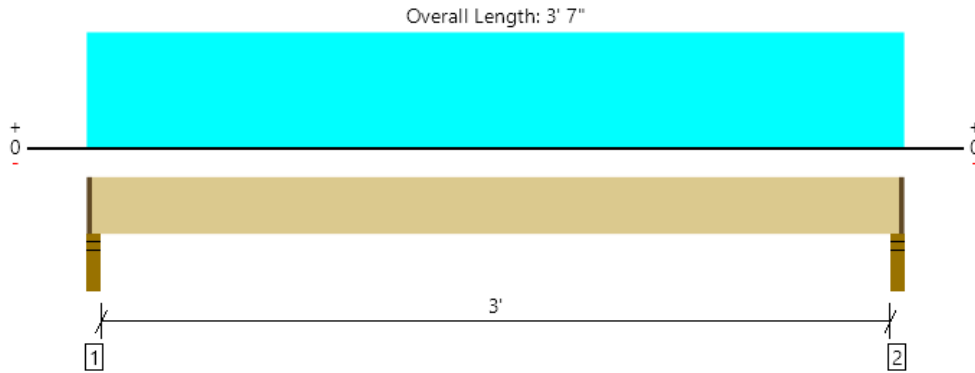
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SB, SB-1 (REACTION ONLY)
 1 piece(s) 1 3/4" x 11 7/8" 1.55E TimberStrand® LSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	450 @ 2"	1673 (2.25")	Passed (27%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	136 @ 1' 3 3/8"	4295	Passed (3%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	352 @ 1' 9 1/2"	7977	Passed (4%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.003 @ 1' 9 1/2"	0.081	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.004 @ 1' 9 1/2"	0.162	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).
- Top Edge Bracing (Lu): Top compression edge must be braced at 3' 5" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 3' 5" o/c based on loads applied, unless detailed otherwise.

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"	118	358	476	1 1/4" Rim Board
2 - Stud wall - SPF	3.50"	2.25"	1.50"	118	358	476	1 1/4" Rim Board

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

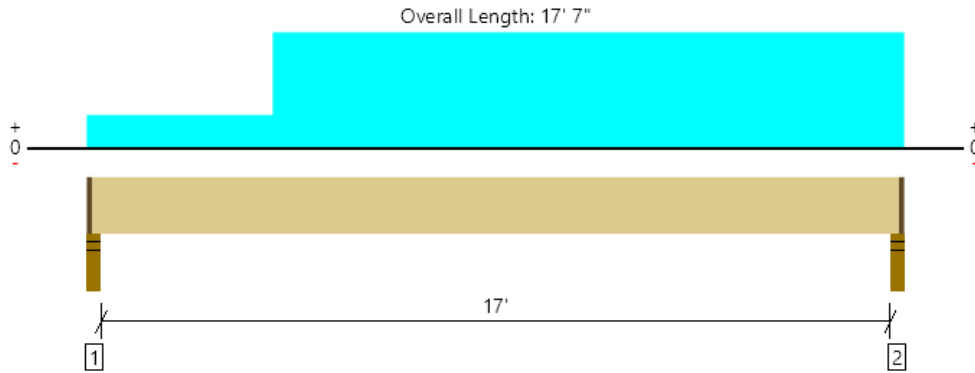
Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	1 1/4" to 3' 5 3/4"	N/A	6.5	--	
1 - Uniform (PSF)	0 to 3' 7" (Front)	5'	12.0	40.0	Default Load

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



SB, SB-2 (REACTION ONLY)
1 piece(s) 3 1/2" x 18" 2.0E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	3222 @ 17' 5"	3347 (2.25")	Passed (96%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	2575 @ 15' 9 1/2"	12180	Passed (21%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	13331 @ 9' 15/16"	43665	Passed (31%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.168 @ 8' 10 5/8"	0.431	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.232 @ 8' 10 9/16"	0.863	Passed (L/894)	--	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).
- Top Edge Bracing (Lu): Top compression edge must be braced at 17' 5" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 17' 5" o/c based on loads applied, unless detailed otherwise.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Total	
1 - Stud wall - SPF	3.50"	2.25"	1.63"	695	1747	2442	1 1/4" Rim Board
2 - Stud wall - SPF	3.50"	2.25"	2.17"	884	2376	3260	1 1/4" Rim Board

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	1 1/4" to 17' 5 3/4"	N/A	19.6	--	
1 - Uniform (PSF)	0 to 17' 7" (Front)	2'	12.0	40.0	Default Load
2 - Uniform (PSF)	4' to 17' 7" (Front)	5'	12.0	40.0	Default Load

Weyerhaeuser Notes

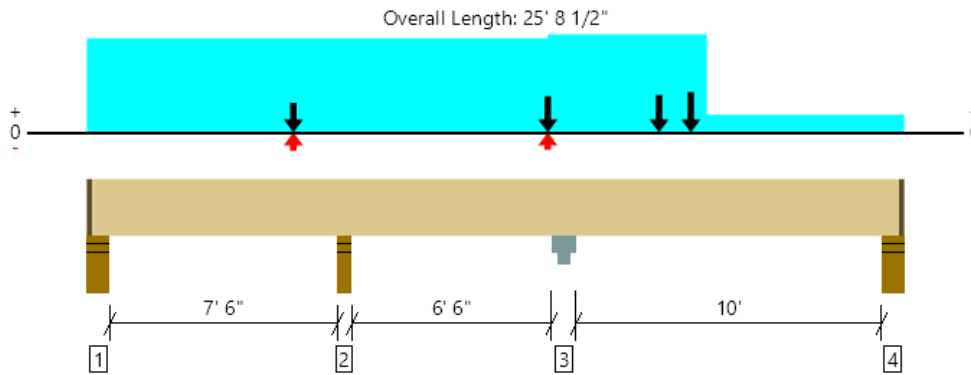
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ForteWEB Software Operator	Job Notes
AP L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	



SB, SB-3 (REACTION ONLY)
1 piece(s) 3 1/2" x 18" 2.0E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern) [Group]
Member Reaction (lbs)	5242 @ 8' 1 1/4"	5206 (3.50")	Passed (101%)	--	1.0 D + 0.75 L + 0.75 S (Adj Spans) [1]
Shear (lbs)	6375 @ 16' 9"	12180	Passed (52%)	1.00	1.0 D + 1.0 L (Adj Spans) [1]
Moment (Ft-lbs)	-11416 @ 15'	43665	Passed (26%)	1.00	1.0 D + 1.0 L (Adj Spans) [1]
Live Load Defl. (in)	0.060 @ 19'	0.259	Passed (L/999+)	--	1.0 D + 1.0 L (Alt Spans) [1]
Total Load Defl. (in)	0.080 @ 19'	0.519	Passed (L/999+)	--	1.0 D + 1.0 L (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).
- Top Edge Bracing (Lu): Top compression edge must be braced at 25' 6" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 25' 6" o/c based on loads applied, unless detailed otherwise.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - SPF	5.50"	4.25"	1.57"	821	1576/-85	141/-3	2538/-88	1 1/4" Rim Board
2 - Stud wall - SPF	3.50"	3.50"	3.52"	1722	3515/-119	1178	6415/-119	None
3 - Column Cap - steel	6.00"	6.00"	5.91"	3621	9302	556	13479	None
4 - Stud wall - SPF	5.50"	4.25"	1.50"	600	1632/-79	9/-9	2241/-88	1 1/4" Rim Board

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

<p>ForteWEB Software Operator</p> <p>AP L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com</p>	<p>Job Notes</p>
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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 25' 7 1/4"	N/A	19.6	--	--	
1 - Uniform (PSF)	0 to 25' 8 1/2" (Front)	2'	12.0	40.0	-	Default Load
2 - Uniform (PSF)	14' 6" to 19' 6" (Front)	9'	12.0	40.0	-	Default Load
3 - Point (lb)	18' (Front)	N/A	358	1010	-	Linked from: TB-1 (REACTION ONLY), Support 2
4 - Point (lb)	18' (Front)	N/A	351	1118	-	Linked from: TB-3 (REACTION ONLY), Support 2
5 - Point (lb)	14' 6" (Front)	N/A	351	1118	-	Linked from: TB-3 (REACTION ONLY), Support 1
6 - Point (lb)	14' 6" (Front)	N/A	404	195/-7	585	Linked from: TB-4 (REACTION ONLY), Support 1
7 - Point (lb)	6' 6" (Front)	N/A	169	195/-7	176	Linked from: TB-6 (REACTION ONLY), Support 1
8 - Point (lb)	6' 6" (Front)	N/A	212	-	977/-128	Linked from: RB-6, Support 3
9 - Uniform (PSF)	0 to 14' 6" (Front)	7'	12.0	40.0	-	3RD STORY LIVING
10 - Uniform (PSF)	0 to 14' 6" (Front)	10'	8.0	-	-	INT WALL
11 - Point (lb)	19' (Front)	N/A	884	2376	-	Linked from: SB-2, Support 2

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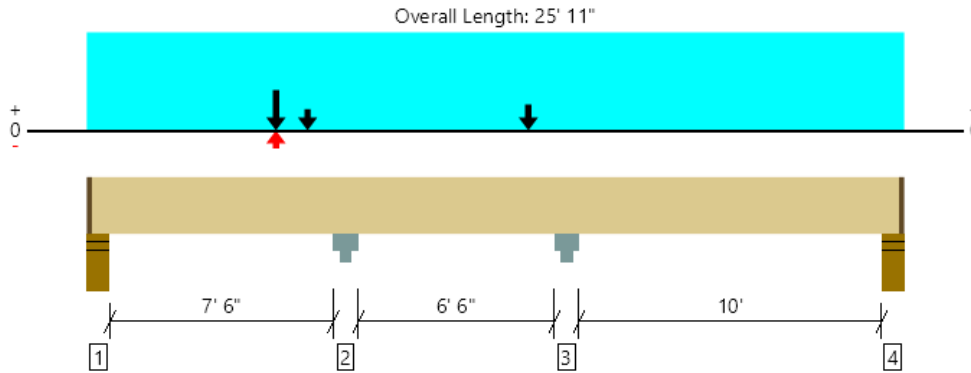
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ForteWEB Software Operator	Job Notes
AP L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	



SB, SB-4 (REACTION ONLY)
1 piece(s) 5 1/4" x 18" 2.0E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern) [Group]
Member Reaction (lbs)	12064 @ 8' 2 1/2"	19688 (6.00")	Passed (61%)	--	1.0 D + 0.75 L + 0.75 S (Adj Spans) [1]
Shear (lbs)	6767 @ 6' 5 1/2"	18270	Passed (37%)	1.00	1.0 D + 1.0 L (Adj Spans) [1]
Moment (Ft-lbs)	-8450 @ 8' 2 1/2"	65497	Passed (13%)	1.00	1.0 D + 1.0 L (Adj Spans) [1]
Live Load Defl. (in)	0.020 @ 4' 5 1/4"	0.197	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (Alt Spans) [1]
Total Load Defl. (in)	0.032 @ 4' 4 7/8"	0.394	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).
- Top Edge Bracing (Lu): Top compression edge must be braced at 25' 9" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 25' 9" o/c based on loads applied, unless detailed otherwise.

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"	1297	1999/-85	497	3793/-85	1 1/4" Rim Board
2 - Column Cap - steel	6.00"	6.00"	3.68"	4772	6550	3173	14495	None
3 - Column Cap - steel	6.00"	6.00"	2.19"	2760	4424	1109	8293	None
4 - Stud wall - SPF	5.50"	4.25"	1.50"	1007	1772/-46	19/-26	2798/-72	1 1/4" Rim Board

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

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 25' 9 3/4"	N/A	29.5	--	--	
1 - Uniform (PSF)	0 to 25' 11" (Front)	4'	12.0	40.0	-	Default Load
2 - Uniform (PSF)	0 to 25' 11" (Front)	5'	12.0	40.0	-	3RD STORY LIVING
3 - Uniform (PSF)	0 to 25' 11" (Front)	10'	8.0	-	-	INT WALL
4 - Point (lb)	7' (Front)	N/A	454	481	451	Linked from: TB-6 (REACTION ONLY), Support 2
5 - Point (lb)	14' (Front)	N/A	1086	481	1504	Linked from: TB-4 (REACTION ONLY), Support 2
6 - Point (lb)	6' (Front)	N/A	2665	2861/-317	2590	Linked from: SB-6 (REACTION ONLY), Support 1

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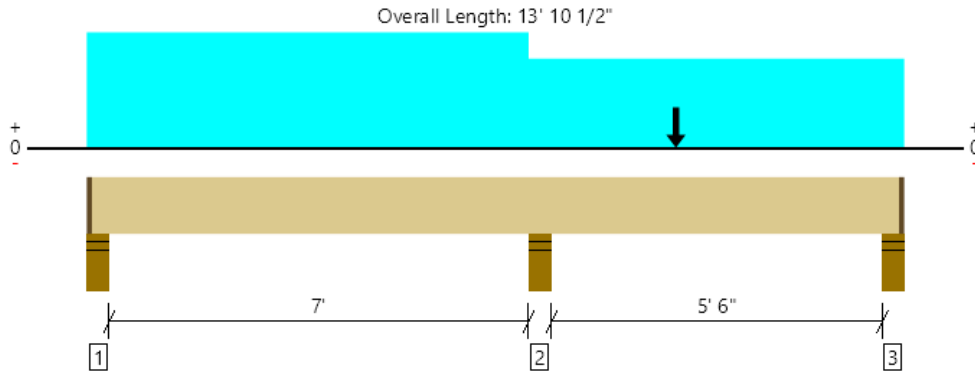
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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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



SB, SB-5 (REACTION ONLY)
1 piece(s) 3 1/2" x 18" 2.0E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	8006 @ 7' 8 1/4"	8181 (5.50")	Passed (98%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	2614 @ 9' 5"	12180	Passed (21%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	-5538 @ 7' 8 1/4"	43665	Passed (13%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.016 @ 3' 9 9/16"	0.184	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.022 @ 3' 8 11/16"	0.368	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).
- Top Edge Bracing (Lu): Top compression edge must be braced at 13' 8" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 13' 8" o/c based on loads applied, unless detailed otherwise.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - SPF	5.50"	4.25"	2.06"	914	2239/-106	-38	3153/-144	1 1/4" Rim Board
2 - Stud wall - SPF	5.50"	5.50"	5.38"	2716	5290	424	8430	None
3 - Stud wall - SPF	5.50"	4.25"	1.53"	714	1632/-361	173	2519/-361	1 1/4" Rim Board

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

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 13' 9 1/4"	N/A	19.6	--	--	
1 - Uniform (PSF)	0 to 7' 6" (Front)	7'	12.0	40.0	-	Default Load
2 - Uniform (PSF)	0 to 13' 10 1/2" (Front)	9'	12.0	40.0	-	3RD STORY LIVING
3 - Uniform (PSF)	0 to 13' 10 1/2" (Front)	10'	8.0	-	-	INT WALL
4 - Uniform (PSF)	7' 6" to 13' 10 1/2" (Front)	3'	12.0	40.0	-	Default Load
5 - Point (lb)	10' (Front)	N/A	608	717	559	Linked from: TB-8 (REACTION ONLY), Support 1

Weyerhaeuser Notes

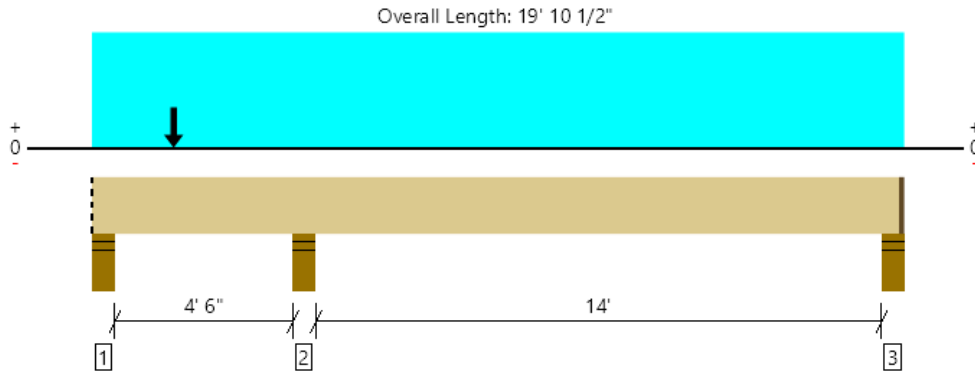
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ForteWEB Software Operator	Job Notes
AP L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	



SB, SB-6 (REACTION ONLY)
1 piece(s) 3 1/2" x 18" 2.0E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	6753 @ 4"	8181 (5.50")	Passed (83%)	--	1.0 D + 0.75 L + 0.75 S (Alt Spans)
Shear (lbs)	6550 @ 1' 11 1/2"	14007	Passed (47%)	1.15	1.0 D + 0.75 L + 0.75 S (Alt Spans)
Moment (Ft-lbs)	11053 @ 2'	50215	Passed (22%)	1.15	1.0 D + 0.75 L + 0.75 S (Alt Spans)
Live Load Defl. (in)	0.019 @ 2'	0.121	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (Alt Spans)
Total Load Defl. (in)	0.031 @ 2'	0.243	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).
- Top Edge Bracing (Lu): Top compression edge must be braced at 19' 9" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 19' 9" o/c based on loads applied, unless detailed otherwise.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - SPF	5.50"	5.50"	4.54"	2665	2861/-317	2590	8116/-317	Blocking
2 - Stud wall - SPF	5.50"	5.50"	3.91"	2398	2901	1652	6951	None
3 - Stud wall - SPF	5.50"	4.25"	1.50"	208	494/-51	-54	702/-105	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.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 19' 9 1/4"	N/A	19.6	--	--	
1 - Uniform (PSF)	0 to 19' 10 1/2" (Front)	2'	12.0	40.0	-	Default Load
2 - Point (lb)	2' (Front)	N/A	4405	4289	4188	Linked from: TB-9 (REACTION ONLY), Support 1

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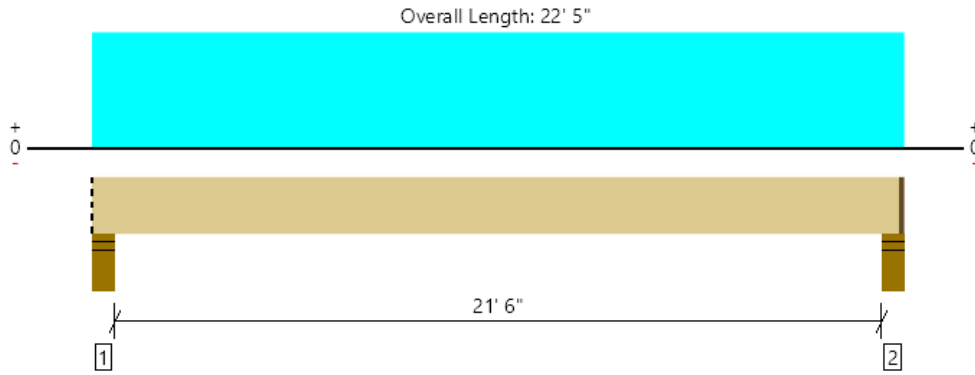
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ForteWEB Software Operator	Job Notes
AP L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	



SB, SB-7 (REACTION ONLY)
1 piece(s) 5 1/4" x 18" 2.0E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDf	Load: Combination (Pattern)
Member Reaction (lbs)	5467 @ 22' 1"	9483 (4.25")	Passed (58%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	4554 @ 1' 11 1/2"	21011	Passed (22%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	29111 @ 11' 2 1/2"	75322	Passed (39%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.163 @ 11' 2 1/2"	0.544	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.521 @ 11' 2 1/2"	1.087	Passed (L/501)	--	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).
- Top Edge Bracing (Lu): Top compression edge must be braced at 22' 4" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 22' 4" o/c based on loads applied, unless detailed otherwise.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - SPF	5.50"	5.50"	2.47"	3795	897	1401	6093	Blocking
2 - Stud wall - SPF	5.50"	4.25"	2.45"	3792	897	1401	6090	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.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 22' 3 3/4"	N/A	29.5	--	--	
1 - Uniform (PSF)	0 to 22' 5" (Front)	2'	12.0	40.0	-	Default Load
2 - Uniform (PSF)	0 to 22' 5" (Front)	14'	15.0	-	-	EXT WALL
3 - Uniform (PSF)	0 to 22' 5" (Front)	5'	15.0	-	25.0	ROOF

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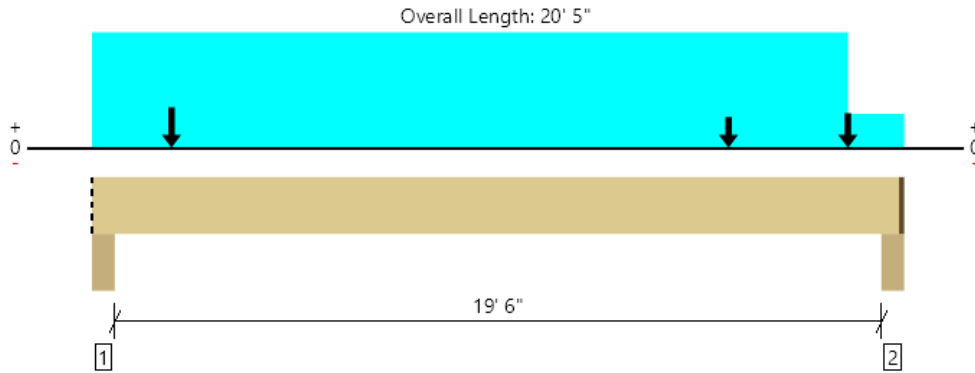
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ForteWEB Software Operator	Job Notes
AP L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	



SB, SB-8 (REACTION ONLY)
1 piece(s) 7" x 18" 2.OE 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)	17889 @ 20' 1"	18594 (4.25")	Passed (96%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	13505 @ 18' 5 1/2"	24360	Passed (55%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	59957 @ 10' 8 11/16"	87330	Passed (69%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.370 @ 10' 3 15/16"	0.494	Passed (L/641)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.725 @ 10' 4 1/4"	0.988	Passed (L/327)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

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

- Deflection criteria: LL (L/480) and TL (L/240).
- Top Edge Bracing (Lu): Top compression edge must be braced at 20' 4" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 20' 4" o/c based on loads applied, unless detailed otherwise.
- 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	5.50"	5.50"	3.68"	7648	6441	4810	18899	Blocking
2 - Column - SPF	5.50"	4.25"	4.09"	9739	6494	4411	20644	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.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 20' 3 3/4"	N/A	39.5	--	--	
1 - Uniform (PSF)	0 to 20' 5" (Front)	3'	12.0	40.0	-	Default Load
2 - Uniform (PSF)	0 to 20' 5" (Front)	10'	15.0	-	-	EXT WALL
3 - Uniform (PLF)	0 to 19' (Front)	N/A	223.5	441.8	67.5	Linked from: SJ-1 (REACTION ONLY), Support 1
4 - Point (lb)	2' (Front)	N/A	2655	597	3801	Linked from: TB-11 (REACTION ONLY), Support 1
5 - Point (lb)	16' (Front)	N/A	2091	597	2737	Linked from: TB-11 (REACTION ONLY), Support 2
6 - Point (lb)	19' (Front)	N/A	3795	897	1401	Linked from: SB-7 (REACTION ONLY), Support 1

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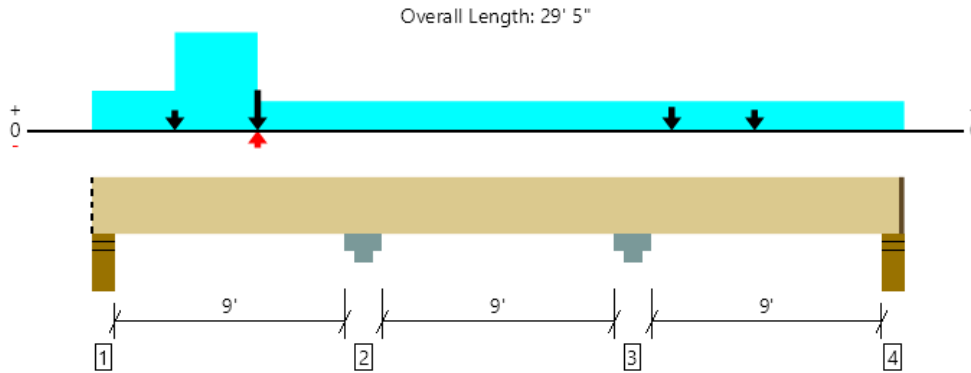
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ForteWEB Software Operator	Job Notes
AP L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	



SB, SB-9 (REACTION ONLY)
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)	15949 @ 4"	16363 (5.50")	Passed (97%)	--	1.0 D + 0.75 L + 0.75 S (Alt Spans) [1]
Shear (lbs)	24400 @ 7' 11 1/2"	24360	Passed (100%)	1.00	1.0 D + 1.0 L (Adj Spans) [1]
Moment (Ft-lbs)	59220 @ 6'	87330	Passed (68%)	1.00	1.0 D + 1.0 L (Alt Spans) [1]
Live Load Defl. (in)	0.099 @ 6'	0.237	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (Alt Spans) [1]
Total Load Defl. (in)	0.181 @ 6'	0.475	Passed (L/630)	--	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).
- Top Edge Bracing (Lu): Top compression edge must be braced at 29' 4" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 29' 4" o/c based on loads applied, unless detailed otherwise.
- 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"	5.36"	7071	8369/-162	3468	18908/-162	Blocking
2 - Column Cap - steel	9.00"	9.00"	7.74"	14849	16394	8933	40176	None
3 - Column Cap - steel	9.00"	9.00"	3.04"	5177	8088/-992	2745	16010/-992	None
4 - Stud wall - SPF	5.50"	4.25"	1.72"	2348	2635/-128	1101	6084/-128	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.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 29' 3 3/4"	N/A	39.4	--	--	
1 - Uniform (PSF)	0 to 29' 5" (Front)	8'	12.0	40.0	-	Default Load
2 - Uniform (PSF)	0 to 6' (Front)	10'	15.0	-	-	EXT WALL
3 - Uniform (PSF)	3' to 6' (Front)	16'	12.0	40.0	-	THIRD FLOOR
4 - Point (lb)	3' (Front)	N/A	1143	3413	35	Linked from: SH-2, Support 2
5 - Point (lb)	24' (Front)	N/A	2628	1193	1678	Linked from: SB-10 (REACTION ONLY), Support 2
6 - Point (lb)	6' (Front)	N/A	208	494/-51	-54	Linked from: SB-6 (REACTION ONLY), Support 3
7 - Point (lb)	6' (Front)	N/A	7933	5242	6381	Linked from: TB-10 (REACTION ONLY), Support 1
8 - Point (lb)	21' (Front)	N/A	4431	3537	2332	Linked from: TB-10 (REACTION ONLY), Support 2
9 - Point (lb)	6' (Front)	N/A	7648	6441	4810	Linked from: SB-8 (REACTION ONLY), Support 1

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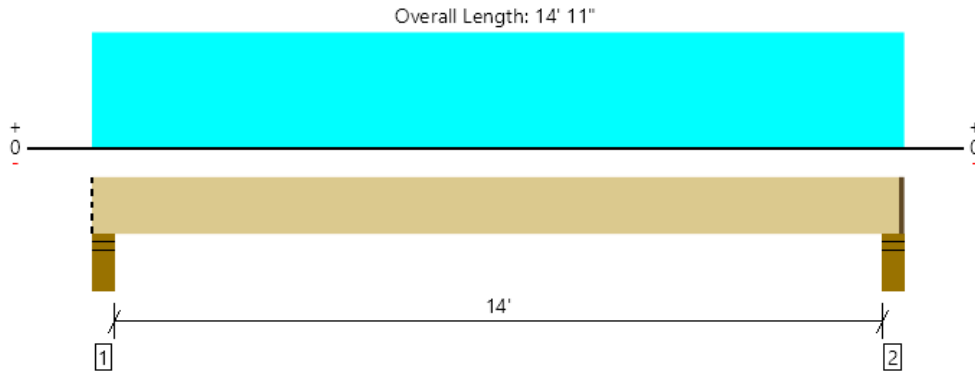
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ForteWEB Software Operator	Job Notes
AP L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	



SB, SB-10 (REACTION ONLY)
1 piece(s) 3 1/2" x 18" 2.0E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDf	Load: Combination (Pattern)
Member Reaction (lbs)	4717 @ 14' 7"	6322 (4.25")	Passed (75%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	3528 @ 1' 11 1/2"	14007	Passed (25%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	16281 @ 7' 5 1/2"	50215	Passed (32%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.092 @ 7' 5 1/2"	0.356	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.205 @ 7' 5 1/2"	0.712	Passed (L/835)	--	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).
- Top Edge Bracing (Lu): Top compression edge must be braced at 14' 10" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 14' 10" o/c based on loads applied, unless detailed otherwise.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - SPF	5.50"	5.50"	3.22"	2630	1193	1678	5501	Blocking
2 - Stud wall - SPF	5.50"	4.25"	3.17"	2628	1193	1678	5499	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.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 14' 9 3/4"	N/A	19.6	--	--	
1 - Uniform (PSF)	0 to 14' 11" (Front)	2'	12.0	40.0	-	Default Load
2 - Uniform (PSF)	0 to 14' 11" (Front)	10'	15.0	-	-	EXT WALL
3 - Uniform (PSF)	0 to 14' 11" (Front)	2'	12.0	40.0	-	THIRD FLOOR
4 - Uniform (PSF)	0 to 14' 11" (Front)	9'	15.0	-	25.0	ROOF

Weyerhaeuser Notes

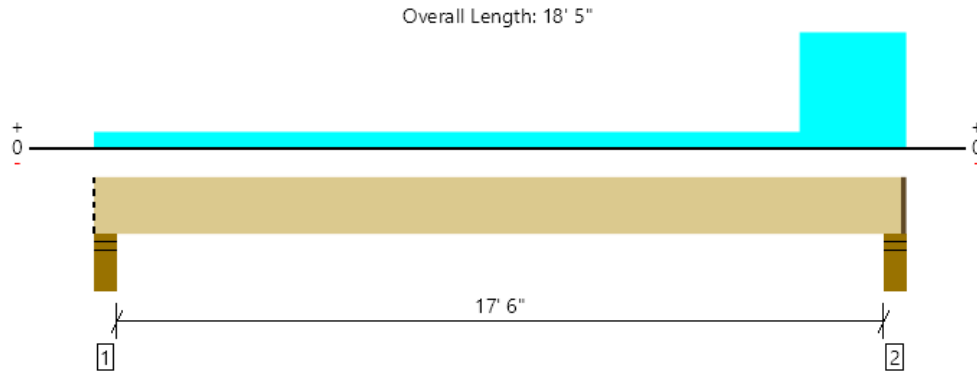
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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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



SB, SB-11 (REACTION ONLY)
1 piece(s) 1 3/4" x 11 7/8" 1.55E TimberStrand® LSL



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

Design Results	Actual @ Location	Allowed	Result	LDf	Load: Combination (Pattern)
Member Reaction (lbs)	2033 @ 18' 1"	3161 (4.25")	Passed (64%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	1254 @ 16' 11 5/8"	4295	Passed (29%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	4875 @ 9' 8 3/4"	7977	Passed (61%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.551 @ 9' 4"	0.444	Failed (L/387)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.778 @ 9' 4 5/16"	0.887	Passed (L/274)	--	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).
- Top Edge Bracing (Lu): Top compression edge must be braced at 6' 5" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 18' 4" o/c based on loads applied, unless detailed otherwise.

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"	304	771	21	1096	Blocking
2 - Stud wall - SPF	5.50"	4.25"	2.73"	714	1379	402	2495	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.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 18' 3 3/4"	N/A	6.5	--	--	
1 - Uniform (PSF)	0 to 18' 5" (Front)	2'	12.0	40.0	-	Default Load
2 - Uniform (PSF)	16' to 18' 5" (Front)	7'	12.0	40.0	-	Default Load
3 - Uniform (PSF)	16' to 18' 5" (Front)	7'	15.0	-	25.0	ROOF

Weyerhaeuser Notes

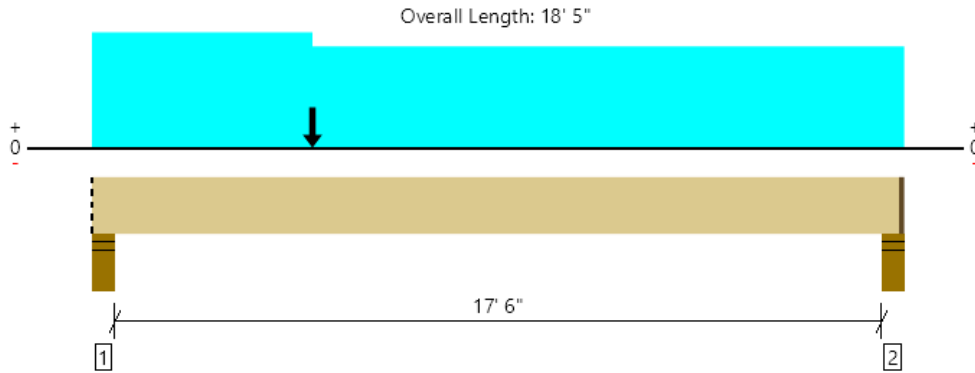
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ForteWEB Software Operator	Job Notes
AP L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	



SB, SB-12 (REACTION ONLY)
1 piece(s) 5 1/4" x 18" 2.0E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	12245 @ 4"	12272 (5.50")	Passed (100%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	10248 @ 1' 11 1/2"	21011	Passed (49%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	47611 @ 7' 8 1/8"	75322	Passed (63%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.289 @ 8' 11 5/8"	0.444	Passed (L/737)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.588 @ 8' 11 1/4"	0.887	Passed (L/362)	--	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).
- Top Edge Bracing (Lu): Top compression edge must be braced at 18' 4" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 18' 4" o/c based on loads applied, unless detailed otherwise.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - SPF	5.50"	5.50"	5.49"	6437	3862	3882	14181	Blocking
2 - Stud wall - SPF	5.50"	4.25"	4.19"	4704	3747	2569	11020	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.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 18' 3 3/4"	N/A	29.5	--	--	
1 - Uniform (PSF)	0 to 18' 5" (Front)	2'	12.0	40.0	-	Default Load
2 - Uniform (PSF)	0 to 18' 5" (Front)	8'	12.0	40.0	-	3RD FLOOR
3 - Point (lb)	5' (Front)	N/A	2534	242	2768	Linked from: TB-17 (REACTION ONLY), Support 1
4 - Uniform (PSF)	0 to 18' 5" (Front)	8'	15.0	-	25.0	ROOF
5 - Uniform (PSF)	0 to 5' (Front)	20'	15.0	-	-	EXT WALL
6 - Uniform (PSF)	5' to 18' 5" (Front)	20'	8.0	-	-	INT WALL

Weyerhaeuser Notes

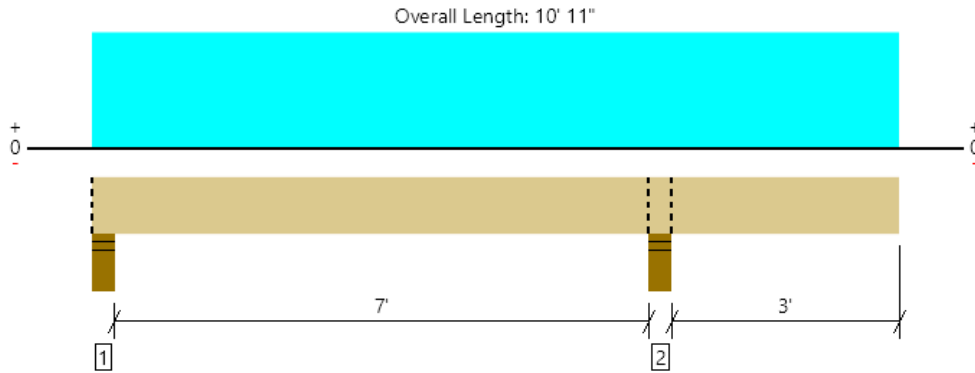
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ForteWEB Software Operator	Job Notes
AP L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	



SB, SB-13 (REACTION ONLY)
1 piece(s) 4 x 10 Douglas Fir-Larch 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)	2499 @ 7' 8 1/4"	8181 (5.50")	Passed (31%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1111 @ 6' 8 1/4"	4468	Passed (25%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	-1711 @ 7' 8 1/4"	5166	Passed (33%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.027 @ 3' 10 9/16"	0.184	Passed (L/999+)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.040 @ 3' 9 11/16"	0.368	Passed (L/999+)	--	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).
- Top Edge Bracing (Lu): Top compression edge must be braced at 10' 11" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 10' 11" o/c based on loads applied, unless detailed otherwise.
- 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"	423	731	1154	Blocking
2 - Stud wall - SPF	5.50"	5.50"	1.68"	976	1523	2499	Blocking

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 10' 11"	N/A	8.2	--	
1 - Uniform (PSF)	0 to 10' 11" (Front)	8'	15.0	25.0	ROOF

Weyerhaeuser Notes

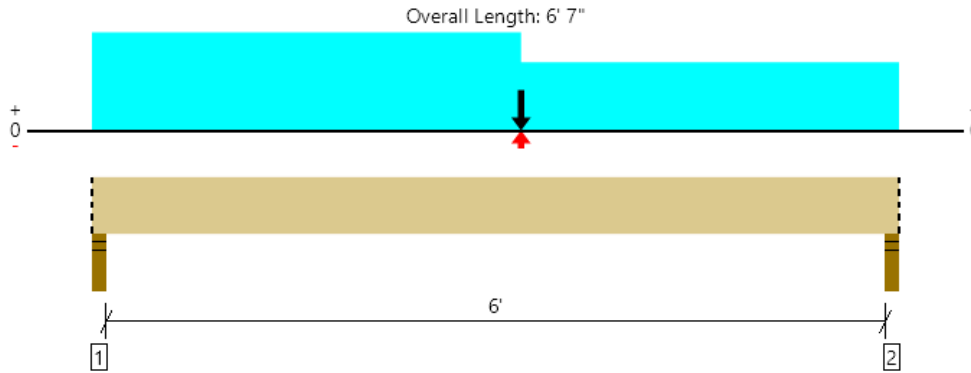
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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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



SB, SB-14 (REACTION ONLY)
1 piece(s) 3 1/2" x 18" 2.0E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern) [Group]
Member Reaction (lbs)	3502 @ 2"	5206 (3.50")	Passed (67%)	--	1.0 D + 0.75 L + 0.75 S (All Spans) [1]
Shear (lbs)	2406 @ 4' 9 1/2"	12180	Passed (20%)	1.00	1.0 D + 1.0 L (All Spans) [1]
Moment (Ft-lbs)	7241 @ 3' 6"	43665	Passed (17%)	1.00	1.0 D + 1.0 L (All Spans) [1]
Live Load Defl. (in)	0.012 @ 3' 6"	0.156	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans) [1]
Total Load Defl. (in)	0.026 @ 3' 6"	0.313	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).
- Top Edge Bracing (Lu): Top compression edge must be braced at 6' 7" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 6' 7" o/c based on loads applied, unless detailed otherwise.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - SPF	3.50"	3.50"	2.35"	2015	1481	503	3999	Blocking
2 - Stud wall - SPF	3.50"	3.50"	2.22"	1978	1255	504	3737	Blocking

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 6' 7"	N/A	19.6	--	--	
1 - Uniform (PSF)	0 to 3' 6" (Front)	6'	12.0	40.0	-	Default Load
2 - Uniform (PSF)	0 to 6' 7" (Front)	20'	15.0	-	-	EXT WALL
3 - Uniform (PSF)	0 to 6' 7" (Front)	6'	15.0	-	25.0	ROOF
4 - Uniform (PSF)	3' 6" to 6' 7" (Front)	1'	12.0	40.0	-	Default Load
5 - Point (lb)	3' 6" (Front)	N/A	1007	1772/-46	19/-26	Linked from: SB-4 (REACTION ONLY), Support 4

Weyerhaeuser Notes

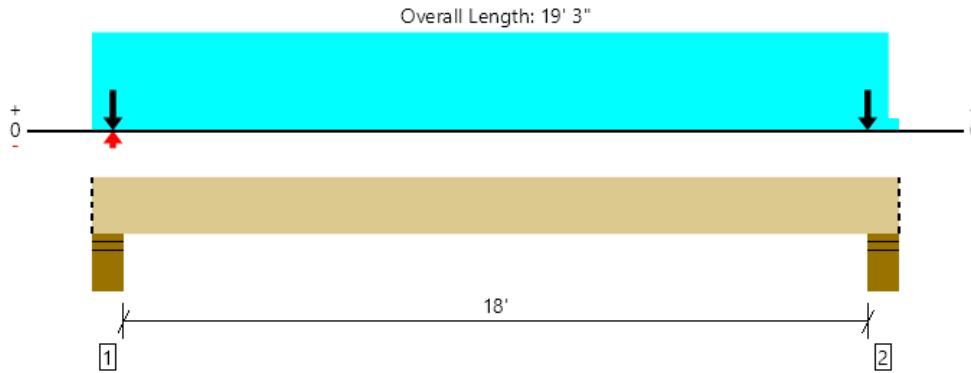
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ForteWEB Software Operator	Job Notes
AP L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	



SB, SB-15 (REACTION ONLY)
1 piece(s) 5 1/4" x 18" 2.0E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern) [Group]
Member Reaction (lbs)	15972 @ 6"	16734 (7.50")	Passed (95%)	--	1.0 D + 0.75 L + 0.75 S (All Spans) [1]
Shear (lbs)	7658 @ 17' 1 1/2"	18270	Passed (42%)	1.00	1.0 D + 1.0 L (All Spans) [1]
Moment (Ft-lbs)	41287 @ 9' 8 5/16"	65497	Passed (63%)	1.00	1.0 D + 1.0 L (All Spans) [1]
Live Load Defl. (in)	0.317 @ 9' 7 11/16"	0.456	Passed (L/691)	--	1.0 D + 0.75 L + 0.75 S (All Spans) [1]
Total Load Defl. (in)	0.613 @ 9' 7 13/16"	0.913	Passed (L/357)	--	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).
- Top Edge Bracing (Lu): Top compression edge must be braced at 19' 3" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 19' 3" o/c based on loads applied, unless detailed otherwise.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - SPF	7.50"	7.50"	7.16"	7557	6899	4321	18777	Blocking
2 - Stud wall - SPF	7.50"	7.50"	7.15"	8789	5026	4524	18339	Blocking

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 19' 3"	N/A	29.5	--	--	
1 - Uniform (PSF)	0 to 19' 3" (Front)	4'	15.0	-	25.0	ROOF
2 - Uniform (PLF)	0 to 19' (Front)	N/A	446.3	441.8	232.5	Linked from: SJ-1 (REACTION ONLY), Support 2
3 - Point (lb)	18' 6" (Front)	N/A	3795	897	1401	Linked from: SB-7 (REACTION ONLY), Support 1
4 - Point (lb)	6" (Front)	N/A	2348	2635/-128	1101	Linked from: SB-9 (REACTION ONLY), Support 4

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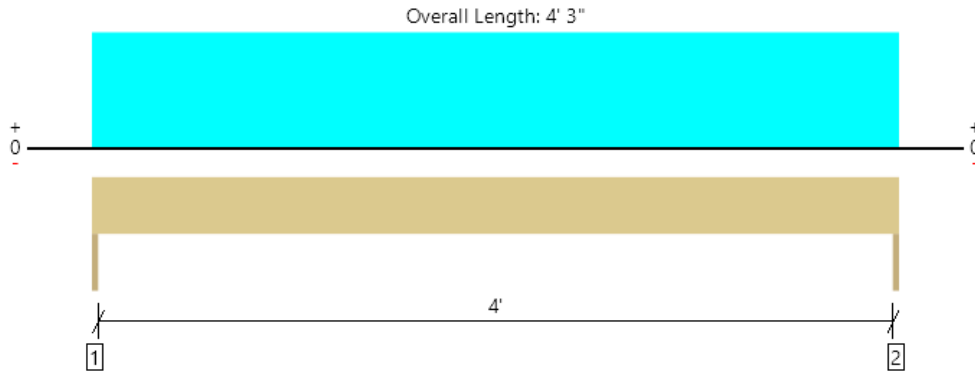
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ForteWEB Software Operator	Job Notes
AP L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	



FH, FH-1

1 piece(s) 6 x 6 Douglas Fir-Larch 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)	1393 @ 0	5156 (1.50")	Passed (27%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	1011 @ 7"	3428	Passed (29%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	1480 @ 2' 1 1/2"	1733	Passed (85%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.027 @ 2' 1 1/2"	0.142	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.049 @ 2' 1 1/2"	0.213	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).
- Top Edge Bracing (Lu): Top compression edge must be braced at 4' 3" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 4' 3" o/c based on loads applied, unless detailed otherwise.
- Applicable calculations are based on NDS.
- This product has a square cross section. The analysis engine has checked both edge and plank orientations to allow for either installation.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Total	
1 - Trimmer - SPF	1.50"	1.50"	1.50"	628	765	1393	None
2 - Trimmer - SPF	1.50"	1.50"	1.50"	628	765	1393	None

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 4' 3"	N/A	7.7	--	
1 - Uniform (PSF)	0 to 4' 3"	9'	12.0	40.0	Default Load
2 - Uniform (PSF)	0 to 4' 3"	12'	15.0	-	EXT WALL

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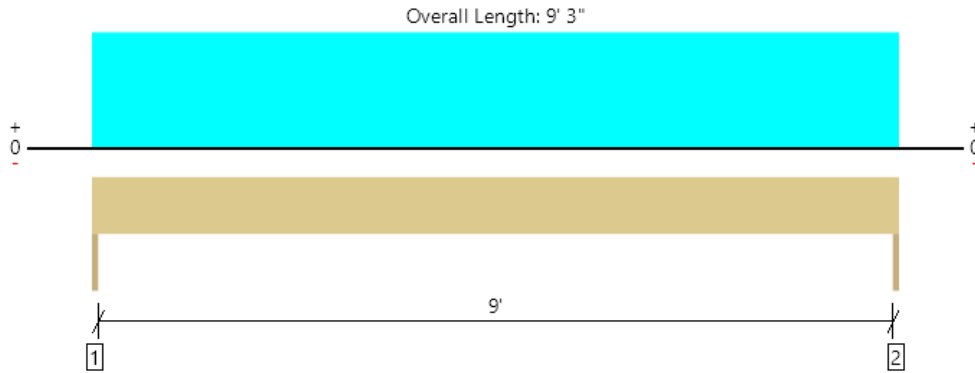
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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



FH, FH-2

1 piece(s) 3 1/2" x 6" 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)	764 @ 0	3413 (1.50")	Passed (22%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	660 @ 7 1/2"	4267	Passed (15%)	1.15	1.0 D + 1.0 S (All Spans)
Pos Moment (Ft-lbs)	1766 @ 4' 7 1/2"	4830	Passed (37%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.145 @ 4' 7 1/2"	0.308	Passed (L/764)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.240 @ 4' 7 1/2"	0.313	Passed (L/463)	--	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").
- Top Edge Bracing (Lu): Top compression edge must be braced at 9' 3" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lb): Bottom compression edge must be braced at 9' 3" o/c based on loads applied, unless detailed otherwise.
- 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	Snow	Total	
1 - Trimmer - SPF	1.50"	1.50"	1.50"	301	462	763	None
2 - Trimmer - SPF	1.50"	1.50"	1.50"	301	462	763	None

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 9' 3"	N/A	5.1	--	
1 - Uniform (PSF)	0 to 9' 3"	4'	15.0	25.0	SNOW

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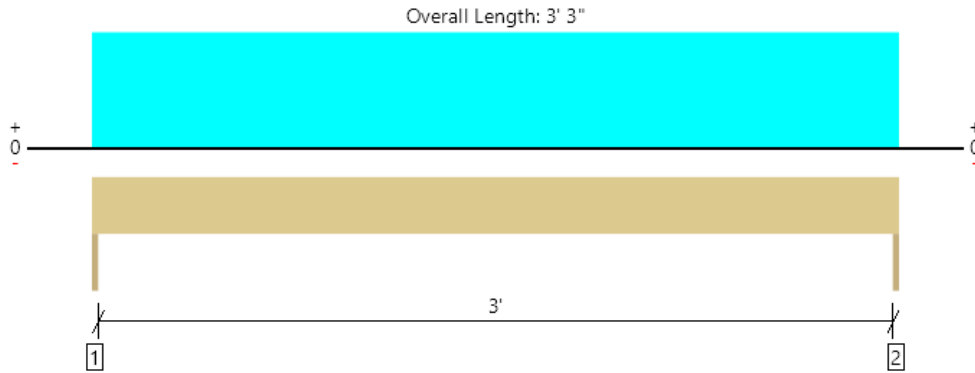
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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



FH, FH-3

1 piece(s) 4 x 6 Douglas Fir-Larch 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)	268 @ 0	3281 (1.50")	Passed (8%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	172 @ 7"	2657	Passed (6%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	218 @ 1' 7 1/2"	1979	Passed (11%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.003 @ 1' 7 1/2"	0.108	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.005 @ 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).
- Top Edge Bracing (Lu): Top compression edge must be braced at 3' 3" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 3' 3" o/c based on loads applied, unless detailed otherwise.
- 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"	105	163	268	None
2 - Trimmer - SPF	1.50"	1.50"	1.50"	105	163	268	None

Vertical Loads	Location (Side)	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"	4'	15.0	25.0	SNOW

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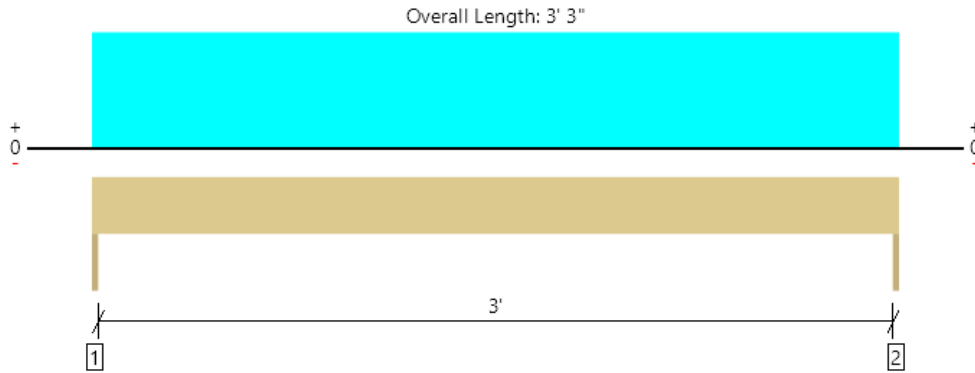
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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



FH, FH-4

1 piece(s) 4 x 6 Douglas Fir-Larch 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)	1050 @ 0	3281 (1.50")	Passed (32%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	673 @ 7"	2310	Passed (29%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	853 @ 1' 7 1/2"	1720	Passed (50%)	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 + 1.0 L (All Spans)
Total Load Defl. (in)	0.021 @ 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).
- Top Edge Bracing (Lu): Top compression edge must be braced at 3' 3" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 3' 3" o/c based on loads applied, unless detailed otherwise.
- 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"	432	618	1050	None
2 - Trimmer - SPF	1.50"	1.50"	1.50"	432	618	1050	None

Vertical Loads	Location (Side)	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"	8'	12.0	40.0	DEFAULT
2 - Uniform (PSF)	0 to 3' 3"	10'	15.0	-	EXT WALL
3 - Uniform (PSF)	0 to 3' 3"	1'	15.0	60.0	DECK

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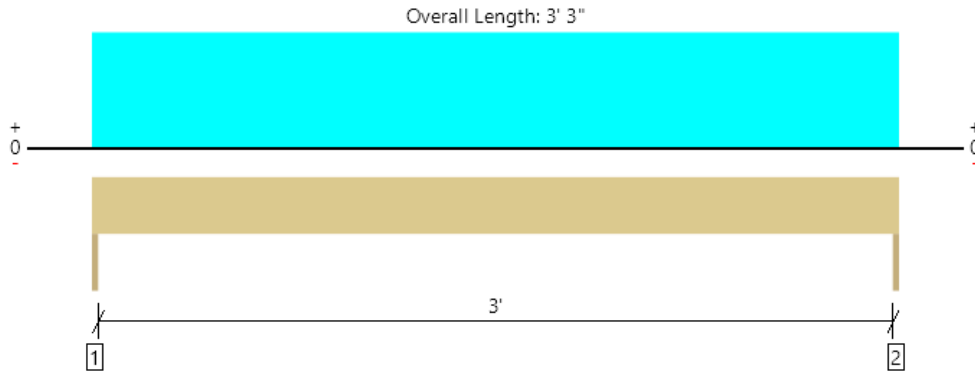
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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



FH, FH-5

1 piece(s) 4 x 6 Douglas Fir-Larch 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)	1378 @ 0	3281 (1.50")	Passed (42%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	883 @ 7"	2310	Passed (38%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	1119 @ 1' 7 1/2"	1720	Passed (65%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.014 @ 1' 7 1/2"	0.108	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.027 @ 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).
- Top Edge Bracing (Lu): Top compression edge must be braced at 3' 3" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 3' 3" o/c based on loads applied, unless detailed otherwise.
- 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"	695	683	1378	None
2 - Trimmer - SPF	1.50"	1.50"	1.50"	695	683	1378	None

Vertical Loads	Location (Side)	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"	9'	12.0	40.0	DEFAULT
2 - Uniform (PSF)	0 to 3' 3"	20'	15.0	-	EXT WALL
3 - Uniform (PSF)	0 to 3' 3"	1'	15.0	60.0	DEFAULT

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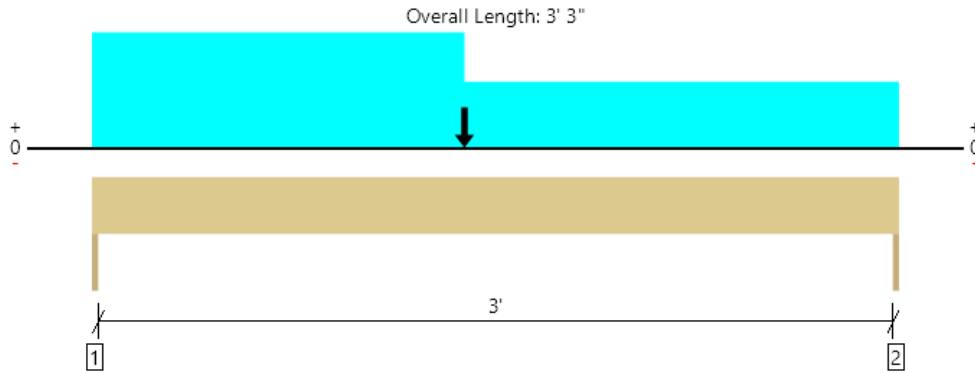
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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



FH, FH-6

1 piece(s) 4 x 8 Douglas Fir-Larch 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)	2410 @ 0	3281 (1.50")	Passed (73%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	1606 @ 8 3/4"	3045	Passed (53%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	2375 @ 1' 6"	2989	Passed (79%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.013 @ 1' 7 1/4"	0.108	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.023 @ 1' 7 1/4"	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).
- Top Edge Bracing (Lu): Top compression edge must be braced at 3' 3" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 3' 3" o/c based on loads applied, unless detailed otherwise.
- 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"	1023	1386	386	2795	None
2 - Trimmer - SPF	1.50"	1.50"	1.50"	871	1041	331	2243	None

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 3' 3"	N/A	6.4	--	--	
1 - Uniform (PSF)	0 to 3' 3"	9'	12.0	40.0	-	DEFAULT
2 - Uniform (PSF)	0 to 3' 3"	20'	8.0	-	-	INT WALL
3 - Point (lb)	1' 6"	N/A	841	717	717	Linked from: SH-8, Support 1
4 - Uniform (PSF)	0 to 1' 6"	9'	12.0	40.0	-	DEFAULT

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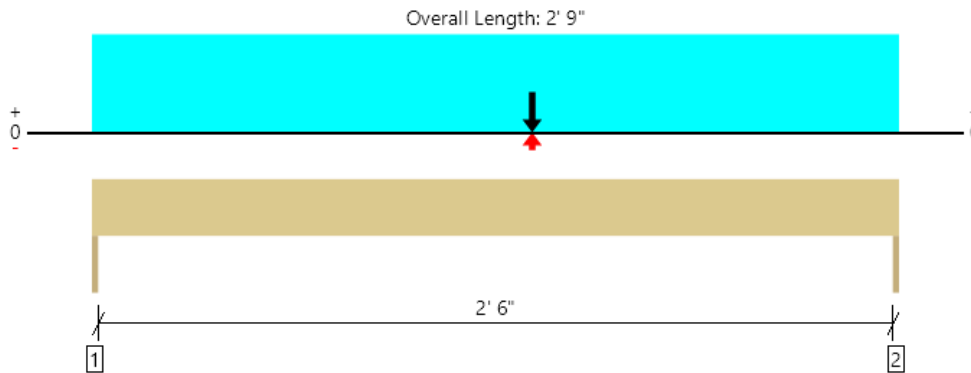
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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



FH, FH-7

1 piece(s) 3 1/2" x 7 1/2" 24F-V4 DF Glulam



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

Design Results	Actual @ Location	Allowed	Result	LDf	Load: Combination (Pattern) [Group]
Member Reaction (lbs)	3366 @ 2' 9"	3413 (1.50")	Passed (99%)	--	1.0 D + 1.0 L (All Spans) [1]
Shear (lbs)	3088 @ 2'	4638	Passed (67%)	1.00	1.0 D + 1.0 L (All Spans) [1]
Pos Moment (Ft-lbs)	3918 @ 1' 6"	6563	Passed (60%)	1.00	1.0 D + 1.0 L (All Spans) [1]
Live Load Defl. (in)	0.013 @ 1' 4 5/8"	0.092	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans) [1]
Total Load Defl. (in)	0.020 @ 1' 4 5/8"	0.138	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans) [1]

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

- Deflection criteria: LL (L/360) and TL (L/240).
- Top Edge Bracing (Lu): Top compression edge must be braced at 2' 9" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lb): Bottom compression edge must be braced at 2' 9" o/c based on loads applied, unless detailed otherwise.
- Critical positive moment adjusted by a volume factor of 1.00 that was calculated using length L = 2' 9".
- The effects of positive or negative camber have not been accounted for when calculating deflection.
- The specified glulam is assumed to have its strong laminations at the bottom of the beam. Install with proper side up as indicated by the manufacturer.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Trimmer - SPF	1.50"	1.50"	1.50"	907	1983	535	3425	None
2 - Trimmer - SPF	1.50"	1.50"	1.50"	1064	2302	643	4009	None

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 2' 9"	N/A	6.4	--	--	
1 - Uniform (PSF)	0 to 2' 9"	7'	12.0	40.0	-	DEFAULT
2 - Point (lb)	1' 6"	N/A	1722	3515/-119	1178	Linked from: SB-3 (REACTION ONLY), Support 2

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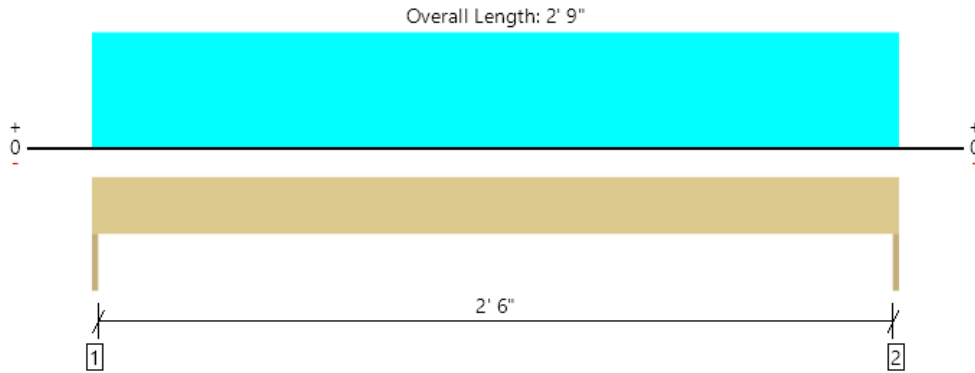
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ForteWEB Software Operator	Job Notes
AP L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	



FH, FH-8

1 piece(s) 4 x 6 Douglas Fir-Larch 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)	507 @ 0	3281 (1.50")	Passed (15%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	292 @ 7"	2310	Passed (13%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	349 @ 1' 4 1/2"	1720	Passed (20%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.005 @ 1' 4 1/2"	0.092	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.006 @ 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).
- Top Edge Bracing (Lu): Top compression edge must be braced at 2' 9" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 2' 9" o/c based on loads applied, unless detailed otherwise.
- 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"	122	385	507	None
2 - Trimmer - SPF	1.50"	1.50"	1.50"	122	385	507	None

Vertical Loads	Location (Side)	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'	12.0	40.0	DEFAULT

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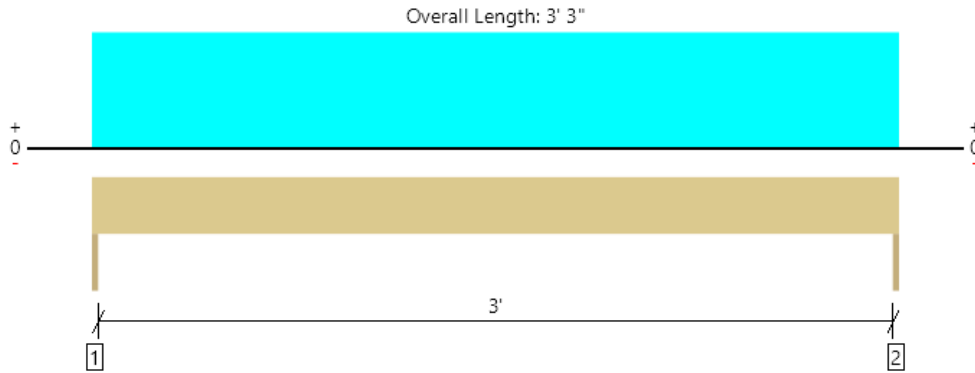
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ForteWEB Software Operator	Job Notes
AP L120 Engineering and Design (214) 625-2819 apatsevich@l120engineering.com	



FH, FH-9

1 piece(s) 4 x 6 Douglas Fir-Larch 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)	853 @ 0	3281 (1.50")	Passed (26%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	547 @ 7"	2310	Passed (24%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	693 @ 1' 7 1/2"	1720	Passed (40%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.013 @ 1' 7 1/2"	0.108	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.017 @ 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).
- Top Edge Bracing (Lu): Top compression edge must be braced at 3' 3" o/c based on loads applied, unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 3' 3" o/c based on loads applied, unless detailed otherwise.
- 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"	203	650	853	None
2 - Trimmer - SPF	1.50"	1.50"	1.50"	203	650	853	None

Vertical Loads	Location (Side)	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"	10'	12.0	40.0	DEFAULT

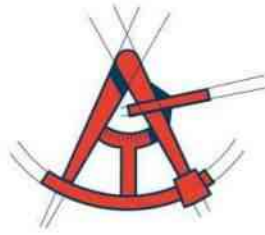
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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
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LONGITUDE
ONE TWENTY[®]
ENGINEERING & DESIGN

FOUNDATION CALCULATIONS

FOOTING REFERENCE PER PLAN

Wall Footing

File = W:\ENGINE-1\FOUND-1\FOUND-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

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
f _y : Rebar Yield	=	40.0 ksi
E _c : 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 when base footing is below	=	ksf ft

Increases based on footing Width

Allow. Pressure Increase per foot of width when footing is wider than	=	ksf ft
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Adjusted Allowable Bearing Pressure

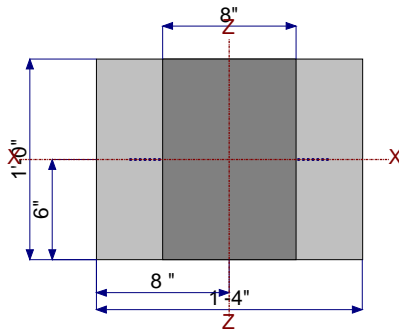
= 2.0 ksf

Dimensions

Footing Width	=	1.333 ft
Wall Thickness	=	8.0 in
Wall center offset from center of footing	=	0 in

Reinforcing

Footing Thickness	=	8.0 in	Bars along X-X Axis	=	
Rebar Centerline to Edge of Concrete... at Bottom of footing	=	3.0 in	Bar spacing	=	10.00
			Reinforcing Bar Size	=	# 4



4 bars @ 10 in o.c.
X-X Section Looking to +Z

Applied Loads

	D	L _r	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
V _x applied	=						in above top of footing

Wall Footing

File = W:\ENGINE-1\FOUND-1\FOUND-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		Actual / Allowable Ratio
			-X	+X	
, +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
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Footing Has NO Overturning

Sliding Stability

Force Application Axis Load Combination...	Sliding Force	Resisting Force	Sliding SafetyRatio	Status
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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+0.50Lr+1.60S+1.60H	0.1386	-X	Bottom	0.1728	Min Temp %	0.24	3.464	OK
, +1.20D+0.50Lr+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

File = W:\ENGINE-1\FOUND-1\FOUND-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

, +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

File = W:\ENGINE-1\FOUNDAs-1\FOUNDAs-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

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

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

Units : k

General Footing

File = W:\ENGINE-1\FOUND-1\FOUND-1.EC6
ENERCALC, INC. 1983-2016, Build:6.16.6.7, Ver:6.14.5.31

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
f_y : Rebar Yield	=	40.0	ksi
E_c : Concrete Elastic Modulus	=	3,122.0	ksi
Concrete Density	=	145.0	pcf
ϕ Values Flexure	=	0.90	
Shear	=	0.750	

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	

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

Increases based on footing Depth

Footing base depth below soil surface	=	0.670	ft
Allow press. increase per foot of depth when footing base is below	=		ksf

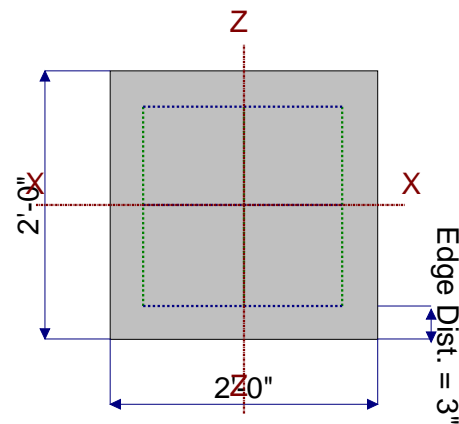
Increases based on footing plan dimension

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

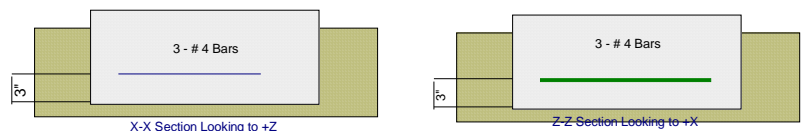


Reinforcing

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

Bandwidth Distribution Check (ACI 15.4.4.2)

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



Applied Loads

	D	Lr	L	S	W	E	H
P : Column Load	=	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\FOUND-1\FOUND-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	Overturing - X-X	0.0 k-ft	0.0 k-ft	No Overturing
PASS	n/a	Overturing - Z-Z	0.0 k-ft	0.0 k-ft	No Overturing
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	Zecc (in)	Actual Soil Bearing Stress @ Location				Actual / Allow Ratio
				Bottom, -Z	Top, +Z	Left, -X	Right, +X	
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

Overturing Stability

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

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

File = W:\ENGINE-1\FOUNDAs-1\FOUNDAs-1.EC6
ENERCALC, INC. 1983-2016, Build:6.16.6.7, Ver:6.14.5.31

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
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General Footing

File = W:\ENGINE-1\FOUND-1\FOUND-1.EC6
ENERCALC, INC. 1983-2016, Build:6.16.6.7, Ver:6.14.5.31

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

All units k

Punching Shear

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D+1.60H	16.25 psi	150psi	0.1083	OK
+1.20D+0.50Lr+1.60L+1.60H	51.071 psi	150psi	0.3405	OK

General Footing

File = W:\ENGINE-1\FOUNDAs-1\FOUNDAs-1.EC6
ENERCALC, INC. 1983-2016, Build:6.16.6.7, Ver:6.14.5.31

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	150psi	0.3405	OK
+1.20D+1.60Lr+0.50L+1.60H	25.536 psi	150psi	0.1702	OK
+1.20D+1.60Lr+0.50W+1.60H	13.929 psi	150psi	0.09286	OK
+1.20D+0.50L+1.60S+1.60H	25.536 psi	150psi	0.1702	OK
+1.20D+1.60S+0.50W+1.60H	13.929 psi	150psi	0.09286	OK
+1.20D+0.50Lr+0.50L+W+1.60H	25.536 psi	150psi	0.1702	OK
+1.20D+0.50L+0.50S+W+1.60H	25.536 psi	150psi	0.1702	OK
+1.20D+0.50L+0.20S+E+1.60H	25.536 psi	150psi	0.1702	OK
+0.90D+W+0.90H	10.446 psi	150psi	0.06964	OK
+0.90D+E+0.90H	10.446 psi	150psi	0.06964	OK

General Footing

File = W:\ENGINE-1\FOUND-1\FOUND-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

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
f_y : Rebar Yield	=	40.0	ksi
E_c : Concrete Elastic Modulus	=	3,122.0	ksi
Concrete Density	=	145.0	pcf
ϕ Values Flexure	=	0.90	
Shear	=	0.750	

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	

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

Increases based on footing Depth

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

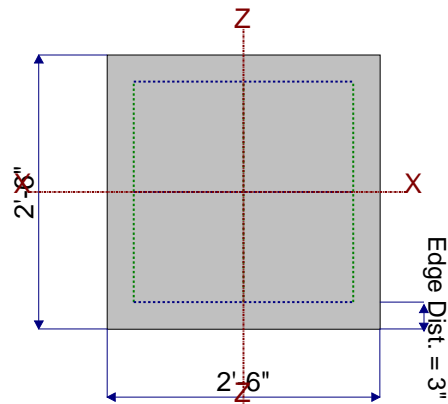
Increases based on footing plan dimension

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

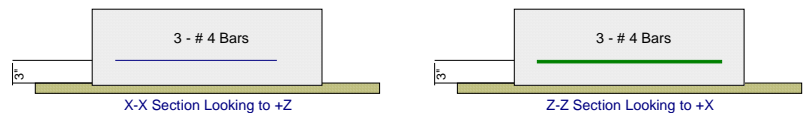


Reinforcing

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



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\FOUND-1\FOUND-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	Overturing - X-X	0.0 k-ft	0.0 k-ft	No Overturing
PASS	n/a	Overturing - Z-Z	0.0 k-ft	0.0 k-ft	No Overturing
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	Zecc (in)	Actual Soil Bearing Stress @ Location				Actual / Allow Ratio
				Bottom, -Z	Top, +Z	Left, -X	Right, +X	
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

Overturing Stability

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

Sliding Stability

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

All units k

General Footing

File = W:\ENGINE-1\FOUNDAs-1\FOUNDAs-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

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

File = W:\ENGINE-1\FOUND-1\FOUND-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

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

File = W:\ENGINE-1\FOUNDAs-1\FOUNDAs-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

Punching Shear

All units k

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D+1.60H	27.016 psi	164.317psi	0.1644	OK
+1.20D+0.50Lr+1.60L+1.60H	69.469 psi	164.317psi	0.4228	OK
+1.20D+1.60L+0.50S+1.60H	69.469 psi	164.317psi	0.4228	OK
+1.20D+1.60Lr+0.50L+1.60H	37.629 psi	164.317psi	0.229	OK
+1.20D+1.60Lr+0.50W+1.60H	23.156 psi	164.317psi	0.1409	OK
+1.20D+0.50L+1.60S+1.60H	37.629 psi	164.317psi	0.229	OK
+1.20D+1.60S+0.50W+1.60H	23.156 psi	164.317psi	0.1409	OK
+1.20D+0.50Lr+0.50L+W+1.60H	37.629 psi	164.317psi	0.229	OK
+1.20D+0.50L+0.50S+W+1.60H	37.629 psi	164.317psi	0.229	OK
+1.20D+0.50L+0.20S+E+1.60H	37.629 psi	164.317psi	0.229	OK
+0.90D+W+0.90H	17.367 psi	164.317psi	0.1057	OK
+0.90D+E+0.90H	17.367 psi	164.317psi	0.1057	OK

General Footing

File = W:\ENGINE-1\FOUND-1\FOUND-1.EC6
ENERCALC, INC. 1983-2016, Build:6.16.6.7, Ver:6.14.5.31

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
f_y : Rebar Yield	=	40.0	ksi
E_c : Concrete Elastic Modulus	=	3,122.0	ksi
Concrete Density	=	145.0	pcf
ϕ Values Flexure	=	0.90	
Shear	=	0.750	

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	

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

Increases based on footing Depth

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

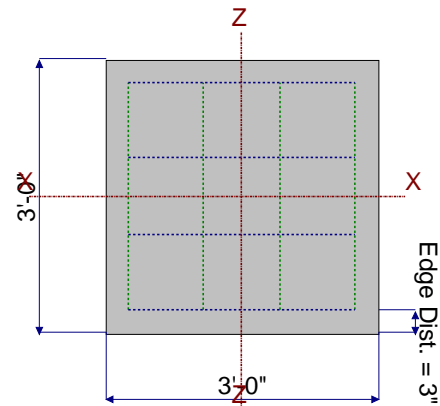
Increases based on footing plan dimension

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

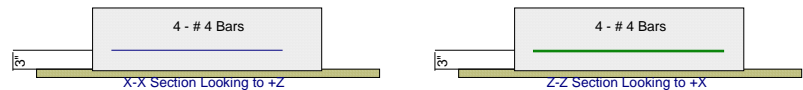


Reinforcing

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



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

File = W:\ENGINE-1\FOUND-1\FOUND-1.EC6
ENERCALC, INC. 1983-2016, Build:6.16.6.7, Ver:6.14.5.31

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	Overturing - X-X	0.0 k-ft	0.0 k-ft	No Overturing
PASS	n/a	Overturing - Z-Z	0.0 k-ft	0.0 k-ft	No Overturing
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	Zecc (in)	Actual Soil Bearing Stress @ Location				Actual / Allow Ratio
				Bottom, -Z	Top, +Z	Left, -X	Right, +X	
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

Overturing Stability

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

Sliding Stability

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

All units k

General Footing

File = W:\ENGINE-1\FOUNDAs-1\FOUNDAs-1.EC6
ENERCALC, INC. 1983-2016, Build:6.16.6.7, Ver:6.14.5.31

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

File = W:\ENGINE-1\FOUND-1\FOUND-1.EC6
ENERCALC, INC. 1983-2016, Build:6.16.6.7, Ver:6.14.5.31

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	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	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	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	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	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	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	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	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	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	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	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	6.429 psi	75 psi	0.08571	OK

General Footing

File = W:\ENGINE-1\FOUNDAs-1\FOUNDAs-1.EC6
ENERCALC, INC. 1983-2016, Build:6.16.6.7, Ver:6.14.5.31

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	150psi	0.2743	OK
+1.20D+0.50Lr+1.60L+1.60H	105.796 psi	150psi	0.7053	OK
+1.20D+1.60L+0.50S+1.60H	105.796 psi	150psi	0.7053	OK
+1.20D+1.60Lr+0.50L+1.60H	57.306 psi	150psi	0.382	OK
+1.20D+1.60Lr+0.50W+1.60H	35.265 psi	150psi	0.2351	OK
+1.20D+0.50L+1.60S+1.60H	57.306 psi	150psi	0.382	OK
+1.20D+1.60S+0.50W+1.60H	35.265 psi	150psi	0.2351	OK
+1.20D+0.50Lr+0.50L+W+1.60H	57.306 psi	150psi	0.382	OK
+1.20D+0.50L+0.50S+W+1.60H	57.306 psi	150psi	0.382	OK
+1.20D+0.50L+0.20S+E+1.60H	57.306 psi	150psi	0.382	OK
+0.90D+W+0.90H	26.449 psi	150psi	0.1763	OK
+0.90D+E+0.90H	26.449 psi	150psi	0.1763	OK

General Footing

File = W:\ENGINE-1\FOUND-1\FOUND-1.EC6
ENERCALC, INC. 1983-2016, Build:6.16.6.7, Ver:6.14.5.31

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
f_y : Rebar Yield	=	40.0	ksi
E_c : 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 when footing base is below	=		ksf
	=		ft

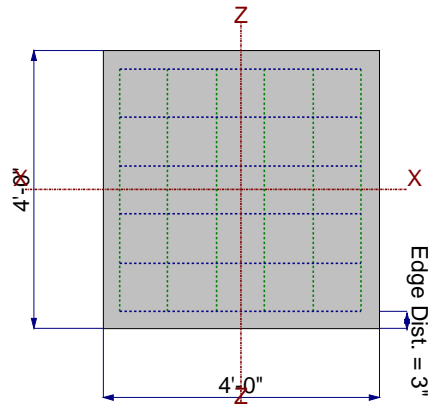
Increases based on footing plan dimension

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

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
f _y : Rebar Yield	=	60.0 ksi
E _c : Concrete Elastic Modulus	=	3,155.92 ksi
Concrete Density	=	145.0 pcf
φ Values Flexure	=	0.90
Shear	=	0.750

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

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

Increases based on footing Depth

Footing base depth below soil surface	=	1.0 ft
Allow press. increase per foot of depth when footing base is below	=	ksf ft

Increases based on footing plan dimension

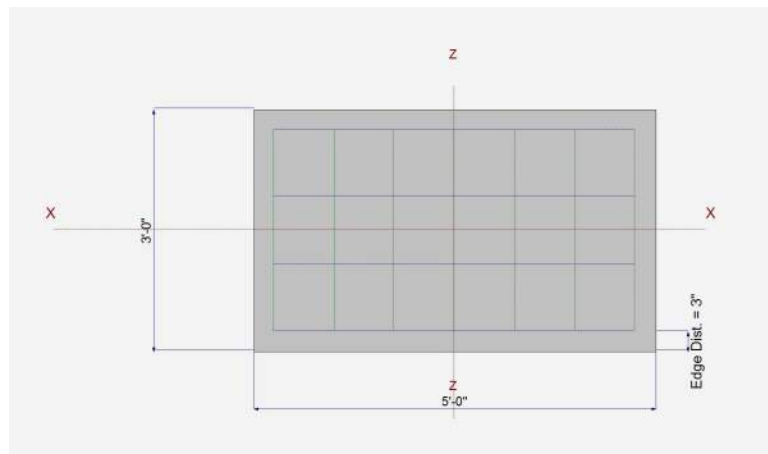
Allowable pressure increase per foot of depth when max. length or width is greater than	=	ksf
	=	ft

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

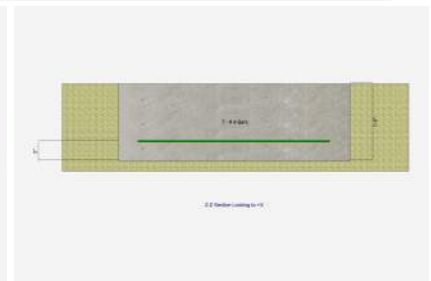
Bars parallel to Z-Z Axis	=	
Number of Bars	=	7.0
Reinforcing Bar Size	=	# 4

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	L _r	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	Overturing - X-X	0.0 k-ft	0.0 k-ft	No Overturing
PASS	n/a	Overturing - Z-Z	0.0 k-ft	0.0 k-ft	No Overturing
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	Zecc (in)	Actual Soil Bearing Stress @ Location				Actual / Allow Ratio
				Bottom, -Z	Top, +Z	Left, -X	Right, +X	
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

Overturing Stability

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

Sliding Stability

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

All units k

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+0.50Lr+0.50L+1.60H	0.8663	+Z	Bottom	0.2592	Min Temp %	0.280	10.925	OK
X-X, +1.20D+0.50Lr+0.50L+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+1.6	0.8663	+Z	Bottom	0.2592	Min Temp %	0.280	10.925	OK
X-X, +1.20D+0.50Lr+0.50L+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+0.50S+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+0.50Lr+0.50L+1.60H	2.406	-X	Bottom	0.2592	Min Temp %	0.2667	10.424	OK
Z-Z, +1.20D+0.50Lr+0.50L+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+1.6	2.406	-X	Bottom	0.2592	Min Temp %	0.2667	10.424	OK
Z-Z, +1.20D+0.50Lr+0.50L+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+0.50S+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	150.00psi	0.1941	OK
+1.20D+0.50Lr+1.60L+1.60H	54.90 psi	150.00psi	0.366	OK
+1.20D+1.60L+0.50S+1.60H	54.90 psi	150.00psi	0.366	OK
+1.20D+1.60Lr+0.50L+1.60H	34.31 psi	150.00psi	0.2287	OK
+1.20D+1.60Lr+0.50W+1.60H	24.95 psi	150.00psi	0.1664	OK
+1.20D+0.50L+1.60S+1.60H	34.31 psi	150.00psi	0.2287	OK
+1.20D+1.60S+0.50W+1.60H	24.95 psi	150.00psi	0.1664	OK
+1.20D+0.50Lr+0.50L+W+1.60H	34.31 psi	150.00psi	0.2287	OK
+1.20D+0.50L+0.50S+W+1.60H	34.31 psi	150.00psi	0.2287	OK
+1.20D+0.50L+0.20S+E+1.60H	34.31 psi	150.00psi	0.2287	OK
+0.90D+W+0.90H	18.72 psi	150.00psi	0.1248	OK
+0.90D+E+0.90H	18.72 psi	150.00psi	0.1248	OK

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Cantilevered Retaining Wall

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 L120 Engineering and Design

Lic. #: KW-06011993

DESCRIPTIO 10'6" backfill (2.5 ksi)

Criteria

Retained Height = 10.50 ft
 Wall height above s = 0.50 ft
 Slope Behind W: = 0.00 : 1
 Height of Soil over T = 16.00 in
 Water height over hee = 0.0 ft
 Vertical component of active
 Lateral soil pressure options:
 NOTUSED for Soil Pressure.
 NOTUSED for Sliding Resistance
 NOTUSED for Overturning Resistance

Soil Data

Allow Soil Bear = 2,600.0 psf
 Equivalent Fluid Pressure Method
 Heel Active Pressure = 30.0 psf/ft
 Toe Active Pressure = 0.0 psf/ft
 Passive Pressure = 350.0 psf/ft
 Soil Density, Heel = 110.00 pcf
 Soil Density, Toe = 0.00 pcf
 Friction Coeff btwn Ftg & = 0.400
 Soil height to ignore
 for passive pressure = 12.00 in

Calculations per ACI 318-11, ACI 530-11,
 IBC 2012, CBC 2013, ASCE 7-10

Surcharge Loads

Surcharge Over He = 0.0 psf
 Used To Resist Sliding & Overturning
 Surcharge Over Tc = 0.0 psf
 Used for Sliding & Overturning

Axial Load Applied to Stem

Axial Dead Loa = 1,000.0 lbs
 Axial Live Loa = 1,000.0 lbs
 Axial Load Eccentric = 0.0 in

Lateral Load Applied to Stem

Lateral Loa = 84.0 plf
 ...Height to Tc = 10.50 ft
 ...Height to Botto = 0.00 ft

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

Design Summary

Wall Stability Ratios

Overturning = 1.50 OK
 Sliding = 0.89 OK
Slab Resists All Sliding!
 Total Bearing Loa = 5,444 lbs
 ...resultant ecc = 11.67 in
 Soil Pressure @ Tc = 1,790 psf OK
 Soil Pressure @ Heel = 25 psf OK
 Allowable = 2,600 psf
Soil Pressure Less Than Allowable
 ACI Factored @ Toe = 2,280 psf
 ACI Factored @ Heel = 31 psf
 Footing Shear @ T = 40.8 psi OK
 Footing Shear @ Heel = 17.2 psi OK
 Allowable = 75.0 psi
Sliding Calcs Slab Resists All Sliding!
 Lateral Sliding For = 2,865.8 lbs
 less 100% Passive For = - 777.8 lbs
 less 100% Friction For = - 1,770.0 lbs
 Added Force Req = 310.3 lbs NG
for 1.5 : 1 Stabili = 1,743.2 lbs NG

Stem Construction

Design Height Above

	Top Stem	2nd	3rd
Design Height Above	Stem OK = 5.00	Stem OK = 2.50	Stem OK = 0.00
Wall Material Above "H"	Concrete	Concrete	Concrete
Thickness	in = 8.00	8.00	8.00
Rebar Size	= # 4	# 4	# 4
Rebar Spacing	in = 16.00	8.00	4.00
Rebar Placed at	= Edge	Edge	Edge
Design Data			
fb/FB + fa/Fa	= 0.635	0.852	0.928
Total Force @ Section	lbs = 1,188.0	2,208.0	3,528.0
Moment.....Actual	ft-l = 2,601.5	6,784.0	13,891.5
Moment.....Allowable	ft-l = 4,099.3	7,959.6	14,963.4
Shear.....Actual	psi = 19.5	34.8	54.1
Shear.....Allowable	psi = 75.0	75.0	75.0
Wall Weight	psf = 100.0	100.0	100.0
Rebar Depth 'd'	in = 6.25	6.25	6.25
Lap splice if above	in = 18.72	18.72	18.72
Lap splice if below	in = 18.72	18.72	5.04
Hook embed into footing	in = 18.72	18.72	5.04

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

Load Factors

Dead Load	1.200
Live Load	1.600
Earth, H	1.600
Wind, W	1.600
Seismic, E	1.000

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Cantilevered Retaining Wall

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 L120 Engineering and Design

Lic. #: KW-06011993

DESCRIPTIO 10'6" backfill (2.5 ksi)

Footing Dimensions & Strengths

Toe Width = 4.08 ft
 Heel Width = 1.92
 Total Footing Wid = 6.00
 Footing Thickness = 12.00 in
 Key Width = 12.00 in
 Key Depth = 0.00 in
 Key Distance from Tc = 2.00 ft
 f'c = 2,500 psi Fy = 60,000 psi
 Footing Concrete Dens = 150.00 pcf
 Min. As % = 0.0018
 Cover @ Top 2.00 @ Btm = 3.00 in

Footing Design Results

	<u>Toe</u>	<u>Heel</u>
Factored Pressure =	2,280	31 psf
Mu' : Upward =	14,751	0 ft-lb
Mu' : Downward =	2,967	1,224 ft-lb
Mu: Design =	11,784	1,224 ft-lb
Actual 1-Way Shear =	40.78	17.18 psi
Allow 1-Way Shear =	75.00	75.00 psi
Toe Reinforcir =	# 4 @ 4.00 in	
Heel Reinforcir =	None Spec'd	
Key Reinforcir =	None Spec'd	

Other Acceptable Sizes & Spacings

Toe: #4@ 7.25 in, #5@ 11.00 in, #6@ 15.75 in, #7@ 21.25 in, #8@ 28.00 in, #9
 Heel: Not req'd, Mu < S * Fr
 Key:

Summary of Overturning & Resisting Forces & Moments

Item	.....OVERTURNING.....				.....RESISTING.....		
	Force lbs	Distance ft	Moment ft-lb		Force lbs	Distance ft	Moment ft-lb
Heel Active Pressure =	1,983.8	3.83	7,604.4	Soil Over He =	1,444.1	5.37	7,762.0
Surcharge over Heel =				Sloped Soil Over He =			
Toe Active Pressure =		0.78		Surcharge Over He =			
Surcharge Over Tc =				Adjacent Footing Lo =			
Adjacent Footing Lo =				Axial Dead Load on Stem =	1,000.0	4.42	4,416.3
Added Lateral Load @ Stem Above =	882.0	6.25	5,512.5	* Axial Live Load on Stem =	1,000.0	4.42	4,416.3
				Soil Over Tc =		2.04	
				Surcharge Over Tc =			
				Stem Weight(=	1,100.0	4.42	4,858.0
				Earth @ Stem Transiti =			
				Footing Weig =	900.0	3.00	2,700.0
				Key Weigt =		2.50	
				Vert. Compone =			
Total =	2,865.8	O.T.M. =	13,116.9	Total =	4,444.1 lbs	R.M. =	19,736.3
Resisting/Overturning Ratio		=	1.50				
Vertical Loads used for Soil Pressure =		5,444.1 lbs					

* Axial live load NOT included in total displayed, or used for overturning resistance, but is included for soil pressure calculation.

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Cantilevered Retaining Wall

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Lic. #: KW-06011993

L120 Engineering and Design

DESCRIPTIO 8' backfill (2.5 ksi)

Calculations per ACI 318-11, ACI 530-11,
 IBC 2012, CBC 2013, ASCE 7-10

Criteria

Retained Height = 8.00 ft
 Wall height above s = 0.50 ft
 Slope Behind W: = 0.00 : 1
 Height of Soil over T = 16.00 in
 Water height over hee = 0.0 ft
 Vertical component of active
 Lateral soil pressure options:
 NOTUSED for Soil Pressure.
 NOTUSED for Sliding Resistance
 NOTUSED for Overturning Resistance

Soil Data

Allow Soil Bear = 2,600.0 psf
 Equivalent Fluid Pressure Method
 Heel Active Pressure = 30.0 psf/ft
 Toe Active Pressure = 0.0 psf/ft
 Passive Pressure = 350.0 psf/ft
 Soil Density, Heel = 110.00 pcf
 Soil Density, Toe = 0.00 pcf
 Friction Coeff btwn Ftg & = 0.400
 Soil height to ignore
 for passive pressure = 12.00 in

Surcharge Loads

Surcharge Over He = 0.0 psf
 Used To Resist Sliding & Overturning
 Surcharge Over Tc = 0.0 psf
 Used for Sliding & Overturning

Lateral Load Applied to Stem

Lateral Loa = 64.0 plf
 ...Height to Tc = 8.00 ft
 ...Height to Botto = 0.00 ft

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 Loa = 900.0 lbs
 Axial Live Loa = 1,500.0 lbs
 Axial Load Eccentric = 0.0 in

Wind on Exposed Stem = 0.0 psf

Design Summary

Wall Stability Ratios

Overturning = 1.61 OK
 Sliding = 1.26 OK
Slab Resists All Sliding!
 Total Bearing Loa = 4,987 lbs
 ...resultant ecc = 6.74 in
 Soil Pressure @ Tc = 2,106 psf OK
 Soil Pressure @ Heel = 242 psf OK
 Allowable = 2,600 psf
Soil Pressure Less Than Allowable
 ACI Factored @ Toe = 2,781 psf
 ACI Factored @ Heel = 320 psf
 Footing Shear @ T = 30.2 psi OK
 Footing Shear @ Heel = 13.6 psi OK
 Allowable = 75.0 psi
Sliding Calcs Slab Resists All Sliding!
 Lateral Sliding For = 1,727.0 lbs
 less 100% Passive For = - 777.8 lbs
 less 100% Friction For = - 1,390.9 lbs
 Added Force Req = 0.0 lbs OK
for 1.5 : 1 Stabili = 417.8 lbs NG

Stem Construction

	Top Stem	2nd
Design Height Above	ft = 2.17	Stem OK 0.00
Wall Material Above "H"	= Concrete	Concrete
Thickness	in = 8.00	8.00
Rebar Size	= # 4	# 4
Rebar Spacing	in = 18.00	9.00
Rebar Placed at	= Edge	Edge
Design Data		
fb/FB + fa/Fa	= 0.731	0.863
Total Force @ Section	lbs = 1,188.9	2,048.0
Moment.....Actual	ft-l = 2,672.9	6,144.0
Moment.....Allowable	ft-l = 3,655.6	7,122.4
Shear.....Actual	psi = 18.8	31.4
Shear.....Allowable	psi = 75.0	75.0
Wall Weight	psf = 100.0	100.0
Rebar Depth 'd'	in = 6.25	6.25
Lap splice if above	in = 18.72	18.72
Lap splice if below	in = 18.72	5.04
Hook embed into footing	in = 18.72	5.04

Concrete Data

f'c = 2,500.0 psi
 Fy = 60,000.0 psi

Load Factors

Dead Load = 1.200
 Live Load = 1.600
 Earth, H = 1.600
 Wind, W = 1.600
 Seismic, E = 1.000

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Cantilevered Retaining Wall

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 L120 Engineering and Design

Lic. #: KW-06011993

DESCRIPTIO 8' backfill (2.5 ksi)

Footing Dimensions & Strengths

Toe Width = 2.33 ft
 Heel Width = 1.92
 Total Footing Wid = 4.25
 Footing Thickness = 12.00 in
 Key Width = 12.00 in
 Key Depth = 0.00 in
 Key Distance from Tc = 2.00 ft
 f'c = 2,500 psi Fy = 60,000 psi
 Footing Concrete Dens = 150.00 pcf
 Min. As % = 0.0018
 Cover @ Top 2.00 @ Btm = 3.00 in

Footing Design Results

	<u>Toe</u>	<u>Heel</u>
Factored Pressure =	2,781	320 psf
Mu' : Upward =	6,327	0 ft-lb
Mu' : Downward =	966	966 ft-lb
Mu: Design =	5,361	966 ft-lb
Actual 1-Way Shear =	30.15	13.56 psi
Allow 1-Way Shear =	75.00	75.00 psi
Toe Reinforcir =	# 4 @ 9.00 in	
Heel Reinforcir =	None Spec'd	
Key Reinforcir =	None Spec'd	

Other Acceptable Sizes & Spacings

Toe: #4@ 12.75 in, #5@ 19.75 in, #6@ 28.00 in, #7@ 38.00 in, #8@ 48.25 in, #
 Heel: Not req'd, Mu < S * Fr
 Key:

Summary of Overturning & Resisting Forces & Moments

Item	.....OVERTURNING.....				.....RESISTING.....		
	Force lbs	Distance ft	Moment ft-lb		Force lbs	Distance ft	Moment ft-lb
Heel Active Pressure =	1,215.0	3.00	3,645.0	Soil Over He =	1,100.3	3.62	3,985.1
Surcharge over Heel =				Sloped Soil Over He =			
Toe Active Pressure =		0.78		Surcharge Over He =			
Surcharge Over Tc =				Adjacent Footing Lo =			
Adjacent Footing Lo =				Axial Dead Load on Stem =	900.0	2.66	2,397.0
Added Lateral Load @ Stem Above =	512.0	5.00	2,560.0	* Axial Live Load on Stem =	1,500.0	2.66	3,995.0
				Soil Over Tc =		1.17	
				Surcharge Over Tc =			
				Stem Weight(=	850.0	2.66	2,263.8
				Earth @ Stem Transiti =			
				Footing Weig =	637.1	2.12	1,352.8
				Key Weigt =		2.50	
				Vert. Compone =			
Total =	1,727.0	O.T.M. =	6,205.0	Total =	3,487.3 lbs	R.M =	9,998.7
Resisting/Overturning Ratio		=	1.61				
ertical Loads used for Soil Pressure =			4,987.3 lbs				

* Axial live load NOT included in total displayed, or used for overturning resistance, but is included for soil pressure calculation.

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Cantilevered Retaining Wall

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 L120 Engineering and Design

Lic. #: KW-06011993

DESCRIPTIO 6' backfill (2.5ksi)

Criteria

Retained Height = 6.00 ft
 Wall height above s = 0.50 ft
 Slope Behind W: = 0.00 : 1
 Height of Soil over T = 16.00 in
 Water height over hee = 0.0 ft
 Vertical component of active
 Lateral soil pressure options:
 NOTUSED for Soil Pressure.
 NOTUSED for Sliding Resistance
 NOTUSED for Overturning Resistance

Soil Data

Allow Soil Bear = 2,600.0 psf
 Equivalent Fluid Pressure Method
 Heel Active Pressure = 30.0 psf/ft
 Toe Active Pressure = 0.0 psf/ft
 Passive Pressure = 350.0 psf/ft
 Soil Density, Heel = 110.00 pcf
 Soil Density, Toe = 0.00 pcf
 Friction Coeff btwn Ftg & = 0.400
 Soil height to ignore
 for passive pressure = 12.00 in

Calculations per ACI 318-11, ACI 530-11,
 IBC 2012, CBC 2013, ASCE 7-10

Surcharge Loads

Surcharge Over He = 0.0 psf
 Used To Resist Sliding & Overturning
 Surcharge Over Tc = 0.0 psf
 Used for Sliding & Overturning

Axial Load Applied to Stem

Axial Dead Loa = 900.0 lbs
 Axial Live Loa = 1,500.0 lbs
 Axial Load Eccentric = 0.0 in

Lateral Load Applied to Stem

Lateral Loa = 48.0 plf
 ...Height to Tc = 6.00 ft
 ...Height to Botto = 0.00 ft

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

Design Summary

Wall Stability Ratios

Overturning = 2.15 OK
 Sliding = 1.87 OK
Slab Resists All Sliding!
 Total Bearing Loa = 4,350 lbs
 ...resultant ec = 3.99 in
 Soil Pressure @ Tc = 1,953 psf OK
 Soil Pressure @ Heel = 535 psf OK
 Allowable = 2,600 psf
Soil Pressure Less Than Allowable
 ACI Factored @ Toe = 2,613 psf
 ACI Factored @ Heel = 715 psf
 Footing Shear @ T = 16.8 psi OK
 Footing Shear @ Heel = 10.7 psi OK
 Allowable = 75.0 psi
Sliding Calcs Slab Resists All Sliding!
 Lateral Sliding For = 1,023.0 lbs
 less 100% Passive For = - 777.8 lbs
 less 100% Friction For = - 1,139.9 lbs
 Added Force Req = 0.0 lbs OK
for 1.5 : 1 Stabili = 0.0 lbs OK

Stem Construction

Design Height Above ft = 0.50
 Wall Material Above "H" = Concrete
 Thicknes in = 8.00
 Rebar Size = # 4
 Rebar Spacing in = 18.00
 Rebar Placed at = Edge

Design Data

fb/FB + fa/Fa = 0.563
 Total Force @ Section lbs = 990.0
 Moment.....Actual ft-l = 2,057.0
 Moment.....Allowable ft-l = 3,655.6
 Shear.....Actual psi = 13.2
 Shear.....Allowable psi = 75.0
 Wall Weight psf = 100.0
 Rebar Depth 'd' in = 6.25
 Lap splice if above in = 18.72
 Lap splice if below in = 8.40
 Hook embed into footing in = 8.40

Concrete Data

f'c psi = 2,500.0
 Fy psi =

Load Factors

Dead Load 1.200
 Live Load 1.600
 Earth, H 1.600
 Wind, W 1.600
 Seismic, E 1.000

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Cantilevered Retaining Wall

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Lic. #: KW-06011993

DESCRIPTIO 6' backfill (2.5ksi)

Footing Dimensions & Strengths

Toe Width = 1.58 ft
 Heel Width = 1.92
 Total Footing Wid = 3.50
 Footing Thickness = 12.00 in
 Key Width = 11.00 in
 Key Depth = 0.00 in
 Key Distance from Tc = 2.00 ft
 f'c = 2,500 psi Fy = 60,000 psi
 Footing Concrete Dens = 150.00 pcf
 Min. As % = 0.0018
 Cover @ Top 2.00 @ Btm = 3.00 in

Footing Design Results

	<u>Toe</u>	<u>Heel</u>
Factored Pressure =	2,613	715 psf
Mu' : Upward =	0	0 ft-lb
Mu' : Downward =	0	760 ft-lb
Mu: Design =	2,057	760 ft-lb
Actual 1-Way Shear =	16.77	10.66 psi
Allow 1-Way Shear =	75.00	75.00 psi
Toe Reinforcir =	# 4 @ 15.00 in	
Heel Reinforcir =	None Spec'd	
Key Reinforcir =	None Spec'd	

Other Acceptable Sizes & Spacings

Toe: Not req'd, Mu < S * Fr
 Heel: Not req'd, Mu < S * Fr
 Key:

Summary of Overturning & Resisting Forces & Moments

Item	.....OVERTURNING.....				.....RESISTING.....		
	Force lbs	Distance ft	Moment ft-lb		Force lbs	Distance ft	Moment ft-lb
Heel Active Pressure =	735.0	2.33	1,715.0	Soil Over He =	825.2	2.87	2,369.9
Surcharge over Heel =				Sloped Soil Over He =			
Toe Active Pressure =		0.78		Surcharge Over He =			
Surcharge Over Tc =				Adjacent Footing Lo =			
Adjacent Footing Lo =				Axial Dead Load on Stem =	900.0	1.91	1,722.0
Added Lateral Load @ Stem Above =	288.0	4.00	1,152.0	* Axial Live Load on Stem =	1,500.0	1.91	2,870.0
				Soil Over Tc =		0.79	
				Surcharge Over Tc =			
				Stem Weight(=	600.0	1.91	1,148.0
				Earth @ Stem Transiti =			
				Footing Weig =	524.6	1.75	917.2
				Key Weigt =		2.46	
				Vert. Compone =			
Total =	1,023.0	O.T.M. =	2,867.0	Total =	2,849.8 lbs	R.M =	6,157.1
Resisting/Overturning Ratio		=	2.15				
ertical Loads used for Soil Pressure =			4,349.8 lbs				

* Axial live load NOT included in total displayed, or used for overturning resistance, but is included for soil pressure calculation.

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Cantilevered Retaining Wall

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DESCRIPTIO 4' backfill (2.5 ksi)

Calculations per ACI 318-11, ACI 530-11,
 IBC 2012, CBC 2013, ASCE 7-10

Criteria

Retained Height = 4.00 ft
 Wall height above s = 0.50 ft
 Slope Behind W: = 0.00 : 1
 Height of Soil over T = 16.00 in
 Water height over hee = 0.0 ft
 Vertical component of active
 Lateral soil pressure options:
 NOTUSED for Soil Pressure.
 NOTUSED for Sliding Resistance
 NOTUSED for Overturning Resistance

Soil Data

Allow Soil Bear = 2,600.0 psf
 Equivalent Fluid Pressure Method
 Heel Active Pressure = 30.0 psf/ft
 Toe Active Pressure = 0.0 psf/ft
 Passive Pressure = 350.0 psf/ft
 Soil Density, Heel = 110.00 pcf
 Soil Density, Toe = 0.00 pcf
 Friction Coeff btwn Ftg & = 0.400
 Soil height to ignore
 for passive pressure = 12.00 in

Surcharge Loads

Surcharge Over He = 0.0 psf
 Used To Resist Sliding & Overturning
 Surcharge Over Tc = 0.0 psf
 Used for Sliding & Overturning

Lateral Load Applied to Stem

Lateral Loa = 32.0 plf
 ...Height to Tc = 4.00 ft
 ...Height to Botto = 0.00 ft

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

Axial Load Applied to Stem

Axial Dead Loa = 900.0 lbs
 Axial Live Loa = 1,500.0 lbs
 Axial Load Eccentric = 0.0 in

Wind on Exposed Ste = 0.0 psf

Design Summary

Wall Stability Ratios

Overturning = 2.95 OK
 Sliding = 3.24 OK
Slab Resists All Sliding !
 Total Bearing Lo: = 3,628 lbs
 ...resultant ec = 2.28 in
 Soil Pressure @ Tc = 2,113 psf OK
 Soil Pressure @ Heel = 789 psf OK
 Allowable = 2,600 psf
Soil Pressure Less Than Allowable
 ACI Factored @ Toe = 2,886 psf
 ACI Factored @ Heel = 1,078 psf
 Footing Shear @ T = 4.9 psi OK
 Footing Shear @ Heel = 5.7 psi OK
 Allowable = 75.0 psi
Sliding Calcs Slab Resists All Sliding !
 Lateral Sliding For = 503.0 lbs
 less 100% Passive For = - 777.8 lbs
 less 100% Friction For = - 850.0 lbs
 Added Force Req = 0.0 lbs OK
for 1.5 : 1 Stabili = 0.0 lbs OK

Stem Construction

Design Height Above ft = 0.00
 Wall Material Above "H" = Concrete
 Thicknes in = 8.00
 Rebar Size = # 4
 Rebar Spacing in = 18.00
 Rebar Placed at = Edge

Top Stem

Design Data
 fb/FB + fa/Fa = 0.210
 Total Force @ Section lbs = 512.0
 Moment.....Actual ft-l = 768.0
 Moment.....Allowable ft-l = 3,655.6
 Shear.....Actual psi = 6.8
 Shear.....Allowable psi = 75.0
 Wall Weight psf = 100.0
 Rebar Depth 'd' in = 6.25
 Lap splice if above in = 18.72
 Lap splice if below in = 8.40
 Hook embed into footing in = 8.40

Concrete Data

f'c psi = 2,500.0
 Fy psi =

Load Factors

Dead Load 1.200
 Live Load 1.600
 Earth, H 1.600
 Wind, W 1.600
 Seismic, E 1.000

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Cantilevered Retaining Wall

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L120 Engineering and Design

DESCRIPTIO 4' backfill (2.5 ksi)

Footing Dimensions & Strengths

Toe Width = 0.92 ft
 Heel Width = 1.58
 Total Footing Wid = 2.50
 Footing Thickness = 12.00 in
 Key Width = 11.00 in
 Key Depth = 0.00 in
 Key Distance from Tc = 2.00 ft
 f'c = 2,500 psi Fy = 60,000 psi
 Footing Concrete Dens = 150.00 pcf
 Min. As % = 0.0018
 Cover @ Top = 2.00 @ Btm = 3.00 in

Footing Design Results

	<u>Toe</u>	<u>Heel</u>
Factored Pressure =	2,886	1,078 psf
Mu' : Upward =	0	0 ft-lb
Mu' : Downward =	0	297 ft-lb
Mu: Design =	768	297 ft-lb
Actual 1-Way Shear =	4.89	5.69 psi
Allow 1-Way Shear =	75.00	75.00 psi
Toe Reinforcir =	# 4 @ 18.00 in	
Heel Reinforcir =	None Spec'd	
Key Reinforcir =	None Spec'd	

Other Acceptable Sizes & Spacings
 Toe: Not req'd, $M_u < S \cdot F_r$
 Heel: Not req'd, $M_u < S \cdot F_r$
 Key:

Summary of Overturning & Resisting Forces & Moments

Item	.....OVERTURNING.....			.....RESISTING.....			
	Force lbs	Distance ft	Moment ft-lb	Force lbs	Distance ft	Moment ft-lb	
Heel Active Pressure =	375.0	1.67	625.0	Soil Over He =	403.3	2.04	823.5
Surcharge over Heel =				Sloped Soil Over He =			
Toe Active Pressure =		0.78		Surcharge Over He =			
Surcharge Over Tc =				Adjacent Footing Lo =			
Adjacent Footing Lo =				Axial Dead Load on Stem =	900.0	1.25	1,125.0
Added Lateral Load @ Stem Above =	128.0	3.00	384.0	* Axial Live Load on Stem =	1,500.0	1.25	1,875.0
				Soil Over Tc =		0.46	
				Surcharge Over Tc =			
				Stem Weight(=	450.0	1.25	562.5
				Earth @ Stem Transiti =			
				Footing Weig =	375.0	1.25	468.7
				Key Weigt =		2.46	
				Vert. Compone =			
Total =	503.0	O.T.M. =	1,009.0	Total =	2,128.3 lbs	R.M. =	2,979.7
Resisting/Overturning Ratio =			2.95				
Vertical Loads used for Soil Pressure =			3,628.3 lbs				

* Axial live load NOT included in total displayed, or used for overturning resistance, but is included for soil pressure calculation.

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Cantilevered Retaining Wall

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Lic. #: KW-06011993

DESCRIPTIO 1'6" backfill (2.5 ksi)

Criteria

Retained Height = 1.50 ft
 Wall height above s = 0.50 ft
 Slope Behind W: = 0.00 : 1
 Height of Soil over T = 16.00 in
 Water height over hee = 0.0 ft
 Vertical component of active
 Lateral soil pressure options:
 NOTUSED for Soil Pressure.
 NOTUSED for Sliding Resistance
 NOTUSED for Overturning Resistance

Soil Data

Allow Soil Bear = 2,600.0 psf
 Equivalent Fluid Pressure Method
 Heel Active Pressure = 30.0 psf/ft
 Toe Active Pressure = 0.0 psf/ft
 Passive Pressure = 350.0 psf/ft
 Soil Density, Heel = 110.00 pcf
 Soil Density, Toe = 0.00 pcf
 Friction Coeff btwn Ftg & = 0.400
 Soil height to ignore
 for passive pressure = 12.00 in

Calculations per ACI 318-11, ACI 530-11,
 IBC 2012, CBC 2013, ASCE 7-10

Surcharge Loads

Surcharge Over He = 0.0 psf
 Used To Resist Sliding & Overturning
 Surcharge Over Tc = 0.0 psf
 Used for Sliding & Overturning

Axial Load Applied to Stem

Axial Dead Loa = 1,500.0 lbs
 Axial Live Loa = 2,000.0 lbs
 Axial Load Eccentric = 0.0 in

Lateral Load Applied to Stem

Lateral Loa = 0.0 plf
 ...Height to Tc = 0.00 ft
 ...Height to Botto = 0.00 ft

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

Design Summary

Wall Stability Ratios

Overturning = 26.88 OK
 Sliding = 17.67 OK
Slab Resists All Sliding!
 Total Bearing Loa = 3,991 lbs
 ...resultant ecc = 0.05 in
 Soil Pressure @ Tc = 2,428 psf OK
 Soil Pressure @ Heel = 2,361 psf OK
 Allowable = 2,600 psf
Soil Pressure Less Than Allowable
 ACI Factored @ Toe = 3,400 psf
 ACI Factored @ Heel = 3,307 psf
 Footing Shear @ T = 0.0 psi OK
 Footing Shear @ Heel = 1.9 psi OK
 Allowable = 82.2 psi
Sliding Calcs Slab Resists All Sliding!
 Lateral Sliding For = 81.7 lbs
 less 100% Passive For = - 646.5 lbs
 less 100% Friction For = - 796.0 lbs
 Added Force Req = 0.0 lbs OK
for 1.5 : 1 Stabili = 0.0 lbs OK

Stem Construction

Design Height Above ft = 0.00
 Wall Material Above "H" = Concrete
 Thicknes in = 8.00
 Rebar Size = # 4
 Rebar Spacing in = 18.00
 Rebar Placed at = Jser Spec

Design Data

fb/FB + fa/Fa = 0.012
 Total Force @ Section lbs = 54.0
 Moment.....Actual ft-l = 27.0
 Moment.....Allowable ft-l = 2,305.6
 Shear.....Actual psi = 1.1
 Shear.....Allowable psi = 75.0
 Wall Weight psf = 100.0
 Rebar Depth 'd' in = 4.00
 Lap splice if above in = 18.72
 Lap splice if below in = 6.00
 Hook embed into footing in = 6.00

Concrete Data

f'c psi = 2,500.0
 Fy psi =

Load Factors

Dead Load 1.200
 Live Load 1.600
 Earth, H 1.600
 Wind, W 1.600
 Seismic, E 1.000

Cantilevered Retaining Wall

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L120 Engineering and Design

DESCRIPTIO 1'6" backfill (2.5 ksi)

Footing Dimensions & Strengths

Toe Width	=	0.50 ft
Heel Width	=	1.17
Total Footing Wid	=	1.67
Footing Thickness	=	10.00 in
Key Width	=	11.00 in
Key Depth	=	0.00 in
Key Distance from Tc	=	2.00 ft
f'c =	3,000 psi	Fy = 60,000 psi
Footing Concrete Dens	=	150.00 pcf
Min. As %	=	0.0018
Cover @ Top	2.00	@ Btm = 3.00 in

Footing Design Results

	<u>Toe</u>	<u>Heel</u>
Factored Pressure	= 3,400	3,307 psf
Mu' : Upward	= 0	0 ft-lb
Mu' : Downward	= 0	0 ft-lb
Mu: Design	= 27	27 ft-lb
Actual 1-Way Shear	= 0.00	1.93 psi
Allow 1-Way Shear	= 82.16	82.16 psi
Toe Reinforcir	=	None Spec'd
Heel Reinforcir	=	None Spec'd
Key Reinforcir	=	None Spec'd

Other Acceptable Sizes & Spacings

Toe: Not req'd, $M_u < S * F_r$
 Heel: Not req'd, $M_u < S * F_r$
 Key:

Summary of Overturning & Resisting Forces & Moments

Item	.....OVERTURNING.....				.....RESISTING.....				
	Force lbs	Distance ft	Moment ft-lb		Force lbs	Distance ft	Moment ft-lb		
Heel Active Pressure	=	81.7	0.78	63.5	Soil Over He	=	82.5	1.42	116.9
Surcharge over Heel	=				Sloped Soil Over He	=			
Toe Active Pressure	=		0.72		Surcharge Over He	=			
Surcharge Over Tc	=				Adjacent Footing Lo	=			
Adjacent Footing Lo	=				Axial Dead Load on St	=	1,500.0	0.83	1,250.0
Added Lateral Load	=				* Axial Live Load on Stem	=	2,000.0	0.83	1,666.7
Load @ Stem Above S	=				Soil Over Tc	=		0.25	
					Surcharge Over Tc	=			
					Stem Weight	=	200.0	0.83	166.7
					Earth @ Stem Transiti	=			
					Footing Weig	=	208.3	0.83	173.6
					Key Weigt	=		2.46	
					Vert. Compone	=			
Total	=	81.7	O.T.M. =	63.5	Total =	1,990.8 lbs	R.M.=	1,707.2	
Resisting/Overturning Ratio			=	26.88					
ertical Loads used for Soil Pressure	=	3,990.8	lbs						

* Axial live load NOT included in total displayed, or used for overturning resistance, but is included for soil pressure calculation.

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Cantilevered Retaining Wall

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DESCRIPTIO 4' backfill (2.5 ksi) (no slab)

Calculations per ACI 318-11, ACI 530-11,
 IBC 2012, CBC 2013, ASCE 7-10

Criteria

Retained Height = 4.75 ft
 Wall height above s = 0.50 ft
 Slope Behind W: = 0.00 : 1
 Height of Soil over T = 9.00 in
 Water height over hee = 0.0 ft
 Vertical component of active
 Lateral soil pressure options:
 USED for Soil Pressure.
 USED for Sliding Resistance
 USED for Overturning Resistance

Soil Data

Allow Soil Bear = 2,600.0 psf
 Equivalent Fluid Pressure Method
 Heel Active Pressure = 30.0 psf/ft
 Toe Active Pressure = 0.0 psf/ft
 Passive Pressure = 350.0 psf/ft
 Soil Density, Heel = 110.00 pcf
 Soil Density, Toe = 110.00 pcf
 Friction Coeff btwn Ftg & = 0.400
 Soil height to ignore
 for passive pressure = 12.00 in

Surcharge Loads

Surcharge Over He = 0.0 psf
 Used To Resist Sliding & Overturning
 Surcharge Over Tc = 0.0 psf
 Used for Sliding & Overturning

Lateral Load Applied to Stem

Lateral Loa = 32.0 plf
 ...Height to Tc = 4.00 ft
 ...Height to Botto = 0.00 ft

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 = Line Load
 Base Above/Below Soi
 at Back of Wall = 0.0 ft
 Poisson's Ratio = 0.300

Axial Load Applied to Stem

Axial Dead Loa = 0.0 lbs
 Axial Live Loa = 0.0 lbs
 Axial Load Eccentrici = 0.0 in

Wind on Exposed Ste = 0.0 psf

Design Summary

Wall Stability Ratios

Overturning = 1.72 OK
 Sliding = 1.57 OK
 Total Bearing Loa = 1,386 lbs
 ...resultant ecc = 7.68 in
 Soil Pressure @ Tc = 1,513 psf OK
 Soil Pressure @ Heel = 0 psf OK
 Allowable = 2,600 psf
 Soil Pressure Less Than Allowable
 ACI Factored @ Toe = 1,816 psf
 ACI Factored @ Heel = 0 psf
 Footing Shear @ T = 9.2 psi OK
 Footing Shear @ Heel = 9.0 psi OK
 Allowable = 82.2 psi
Sliding Calcs(Vertical Component Used)
 Lateral Sliding For = 581.8 lbs
 less 100% Passive For = - 360.9 lbs
 less 100% Friction For = - 550.0 lbs
 Added Force Req = 0.0 lbs OK
for 1.5 : 1 Stabili = 0.0 lbs OK

Stem Construction

Design Height Above ft = 0.00
 Wall Material Above "H" = Concrete
 Thicknes in = 8.00
 Rebar Size = # 4
 Rebar Spacing in = 18.00
 Rebar Placed at = Edge

Top Stem

Design Data
 fb/FB + fa/Fa = 0.453
 Total Force @ Section lbs = 669.5
 Moment.....Actual ft-l = 1,113.4
 Moment.....Allowable ft-l = 2,458.0
 Shear.....Actual psi = 8.9
 Shear.....Allowable psi = 75.0
 Wall Weight psf = 100.0
 Rebar Depth 'd' in = 6.25
 Lap splice if above in = 12.48
 Lap splice if below in = 6.00
 Hook embed into footing in = 6.00

Concrete Data

f'c psi = 2,500.0
 Fy psi =

Load Factors

Dead Load 1.200
 Live Load 1.600
 Earth, H 1.600
 Wind, W 1.600
 Seismic, E 1.000

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Cantilevered Retaining Wall

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DESCRIPTIO 8' backfill (2.5 ksi) site-retaining

Calculations per ACI 318-11, ACI 530-11,
 IBC 2012, CBC 2013, ASCE 7-10

Criteria

Retained Height = 8.00 ft
 Wall height above s = 0.50 ft
 Slope Behind W: = 0.00 : 1
 Height of Soil over T = 6.00 in
 Water height over hee = 0.0 ft
 Vertical component of active
 Lateral soil pressure options:
 NOTUSED for Soil Pressure.
 NOTUSED for Sliding Resistance
 NOTUSED for Overturning Resistance

Soil Data

Allow Soil Bear = 2,600.0 psf
 Equivalent Fluid Pressure Method
 Heel Active Pressure = 30.0 psf/ft
 Toe Active Pressure = 0.0 psf/ft
 Passive Pressure = 350.0 psf/ft
 Soil Density, Heel = 110.00 pcf
 Soil Density, Toe = 110.00 pcf
 Friction Coeff btwn Ftg & = 0.400
 Soil height to ignore
 for passive pressure = 12.00 in

Surcharge Loads

Surcharge Over He = 0.0 psf
 Used To Resist Sliding & Overturning
 Surcharge Over Tc = 0.0 psf
 Used for Sliding & Overturning

Lateral Load Applied to Stem

Lateral Loa = 64.0 plf
 ...Height to Tc = 8.00 ft
 ...Height to Botto = 0.00 ft

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 = Line Load
 Base Above/Below Soil
 at Back of Wall = 0.0 ft
 Poisson's Ratio = 0.350

Axial Load Applied to Stem

Axial Dead Loa = 900.0 lbs
 Axial Live Loa = 1,500.0 lbs
 Axial Load Eccentric = 0.0 in

Wind on Exposed Ste = 0.0 psf

Design Summary

Wall Stability Ratios

Overturning = 1.64 OK
 Sliding = 1.53 OK
 Total Bearing Loa = 5,240 lbs
 ...resultant ecc = 7.21 in
 Soil Pressure @ Tc = 2,281 psf OK
 Soil Pressure @ Heel = 187 psf OK
 Allowable = 2,600 psf
 Soil Pressure Less Than Allowable
 ACI Factored @ Toe = 2,999 psf
 ACI Factored @ Heel = 245 psf
 Footing Shear @ T = 35.1 psi OK
 Footing Shear @ Heel = 13.6 psi OK
 Allowable = 75.0 psi
Sliding Calcs(Vertical Component NOT Used)
 Lateral Sliding For = 1,727.0 lbs
 less 100% Passive For = - 1,148.4 lbs
 less 100% Friction For = - 1,496.0 lbs
 Added Force Req = 0.0 lbs OK
for 1.5 : 1 Stabili = 0.0 lbs OK

Stem Construction

	Top Stem	2nd
Design Height Above	ft = 2.17	Stem OK 0.00
Wall Material Above "H"	= Concrete	Concrete
Thickness	in = 8.00	8.00
Rebar Size	= # 4	# 4
Rebar Spacing	in = 18.00	9.00
Rebar Placed at	= Edge	Edge
Design Data		
fb/FB + fa/Fa	= 0.731	0.863
Total Force @ Section	lbs = 1,188.9	2,048.0
Moment.....Actual	ft-l = 2,672.9	6,144.0
Moment.....Allowable	ft-l = 3,655.6	7,122.4
Shear.....Actual	psi = 18.8	31.4
Shear.....Allowable	psi = 75.0	75.0
Wall Weight	psf = 100.0	100.0
Rebar Depth 'd'	in = 6.25	6.25
Lap splice if above	in = 18.72	18.72
Lap splice if below	in = 18.72	5.04
Hook embed into footing	in = 18.72	5.04

Concrete Data

f'c = 2,500.0 psi
 Fy = 60,000.0 psi

Load Factors

Dead Load = 1.200
 Live Load = 1.600
 Earth, H = 1.600
 Wind, W = 1.600
 Seismic, E = 1.000

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Cantilevered Retaining Wall

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Lic. #: KW-06011993

DESCRIPTIO 8' backfill (2.5 ksi) site-retaining

Footing Dimensions & Strengths

Toe Width = 2.33 ft
 Heel Width = 1.92
 Total Footing Wid = 4.25
 Footing Thickness = 12.00 in
 Key Width = 8.00 in
 Key Depth = 15.00 in
 Key Distance from Tc = 0.00 ft
 f'c = 2,500 psi Fy = 60,000 psi
 Footing Concrete Dens = 150.00 pcf
 Min. As % = 0.0018
 Cover @ Top 2.00 @ Btm = 3.00 in

Footing Design Results

	<u>Toe</u>	<u>Heel</u>
Factored Pressure =	2,999	245 psf
Mu' : Upward =	6,773	0 ft-lb
Mu' : Downward =	668	966 ft-lb
Mu: Design =	6,105	966 ft-lb
Actual 1-Way Shear =	35.06	13.56 psi
Allow 1-Way Shear =	75.00	75.00 psi
Toe Reinforcir =	# 4 @ 9.00 in	
Heel Reinforcir =	None Spec'd	
Key Reinforcir =	None Spec'd	

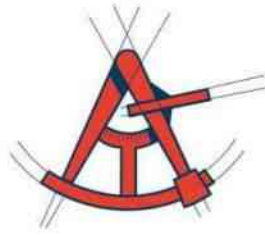
Other Acceptable Sizes & Spacings

Toe: #4@ 11.25 in, #5@ 17.25 in, #6@ 24.50 in, #7@ 33.25 in, #8@ 43.75 in, #
 Heel: Not req'd, Mu < S * Fr
 Key: #4@ 22.25 in, #5@ 34.50 in, #6@ 48.25 in, #7@ 48.25 in,

Summary of Overturning & Resisting Forces & Moments

Item	.....OVERTURNING.....				.....RESISTING.....		
	Force lbs	Distance ft	Moment ft-lb		Force lbs	Distance ft	Moment ft-lb
Heel Active Pressure =	1,215.0	3.00	3,645.0	Soil Over He =	1,100.3	3.62	3,985.1
Surcharge over Heel =				Sloped Soil Over He =			
Toe Active Pressure =		0.50		Surcharge Over He =			
Surcharge Over Tc =				Adjacent Footing Lo =			
Adjacent Footing Lo =				Axial Dead Load on Stem =	900.0	2.66	2,397.0
Added Lateral Load @ Stem Above =	512.0	5.00	2,560.0	* Axial Live Load on Stem =	1,500.0	2.66	3,995.0
				Soil Over Tc =	128.2	1.17	149.3
				Surcharge Over Tc =			
				Stem Weight(=	850.0	2.66	2,263.8
				Earth @ Stem Transiti =			
				Footing Weig =	637.1	2.12	1,352.8
				Key Weigt =	125.0	0.33	41.7
				Vert. Compone =			
Total =	1,727.0	O.T.M. =	6,205.0	Total =	3,740.5 lbs	R.M.=	10,189.6
Resisting/Overturning Ratio =			1.64				
Vertical Loads used for Soil Pressure =		5,240.5 lbs					

* Axial live load NOT included in total displayed, or used for overturning resistance, but is included for soil pressure calculation.



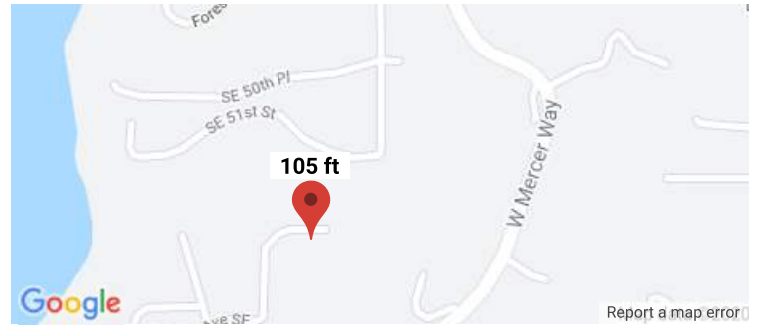
LONGITUDE
ONE TWENTY[°]
ENGINEERING & DESIGN

LATERAL CALCULATIONS

SHEAR-WALL REFERENCE PER PLAN

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

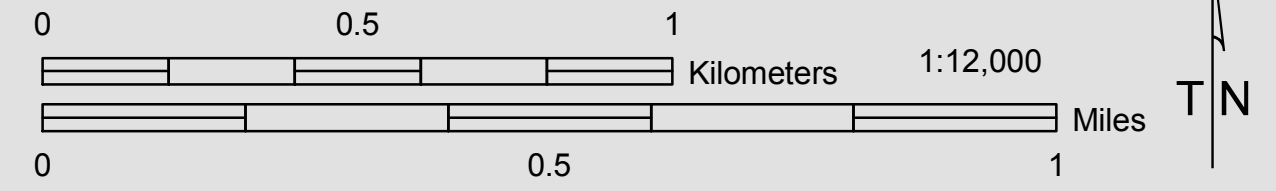
Hazard loads are interpolated from data provided in ASCE 7 and rounded up to the nearest whole integer. Per ASCE 7, islands and coastal areas outside the last contour should use the last wind speed contour of the coastal area – in some cases, this website will extrapolate past the last wind speed contour 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.

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

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



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 K_{zt} factor to be utilized for each specific project. The K_{zt} 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 K_{zt} 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 identified 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.

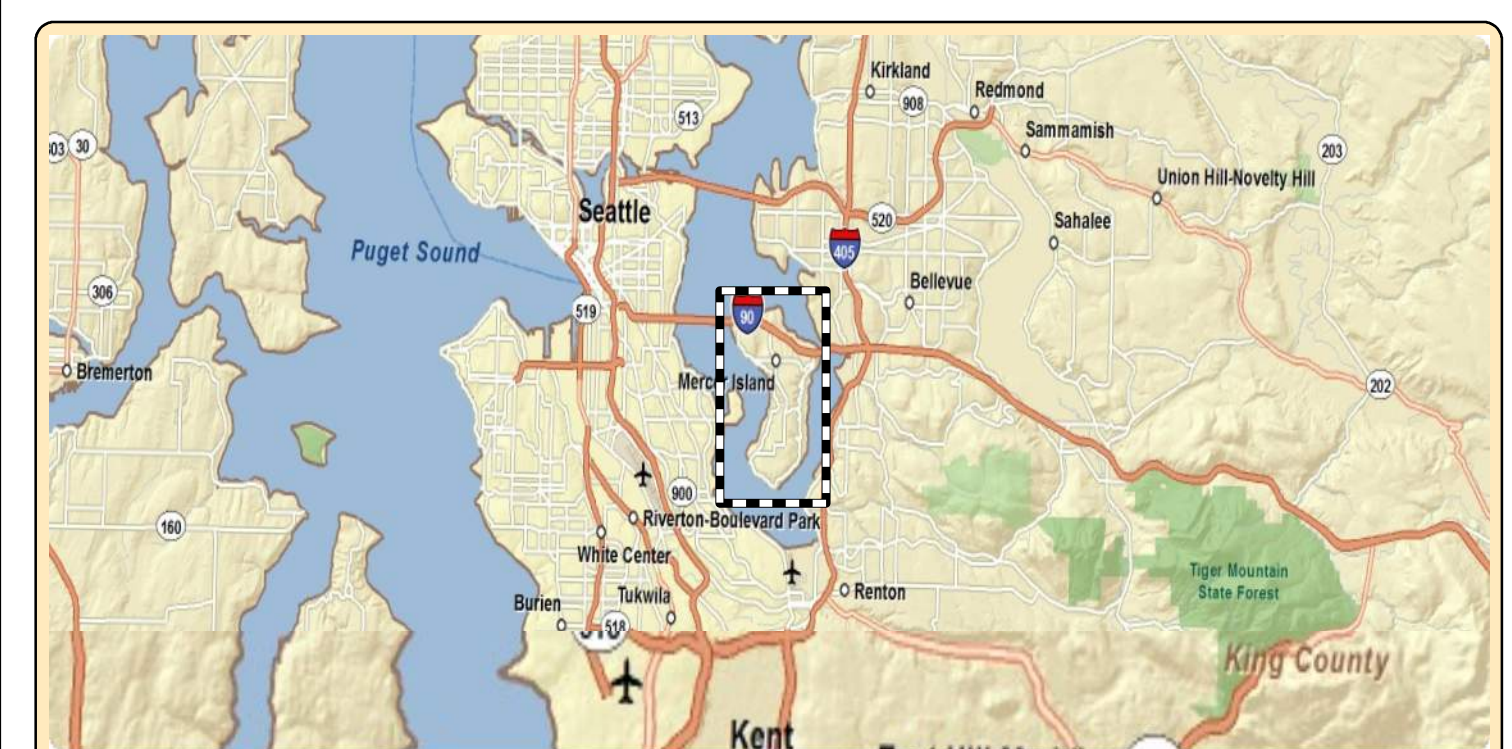
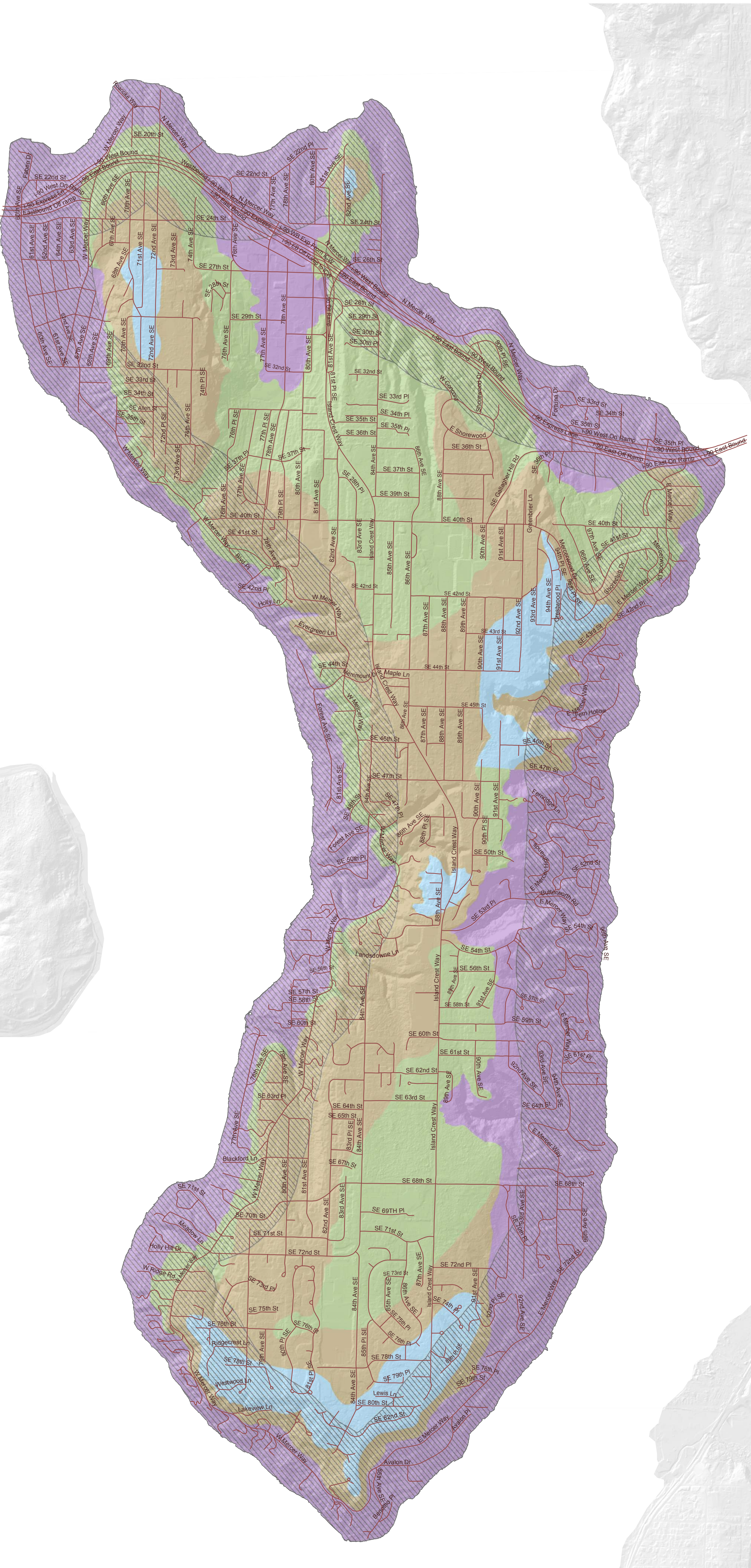
DEFINITIONS:

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.

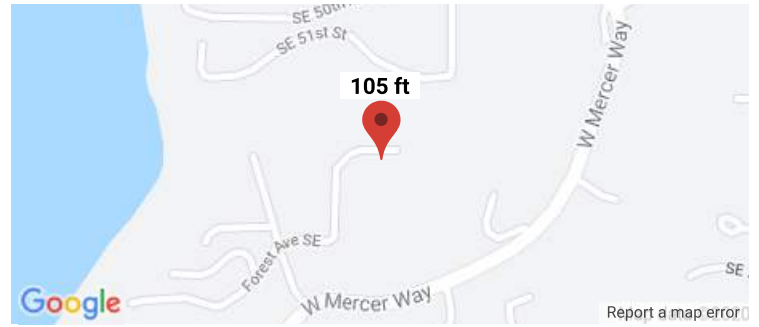
Exposure C: The wind exposure category that applies where the site in question is located within 1500 feet from the shoreline per IBC 2006 section 1609.4.3.

Wind Speed: Minimum 85 mph 3-second gust per IRC Figure R301.2(4)

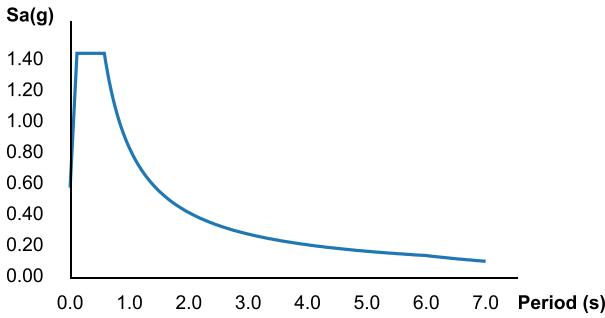


Search Information

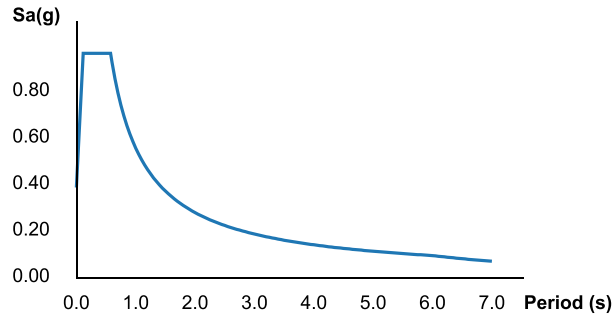
Address: 5202 Forest Ave SE, Mercer Island, WA 98040, USA
Coordinates: 47.55627369999999, -122.227956
Elevation: 105 ft
Timestamp: 2020-05-13T03:17:16.759Z
Hazard Type: Seismic
Reference Document: ASCE7-10
Risk Category: II
Site Class: D



MCE_R 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](#).

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Project Number: XXX	Plan: Forest Ave Lot 4	Sheet Number: L1
Engineer: XXX	Specifics: WIND FORCES	Date: 6/16/2020

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:

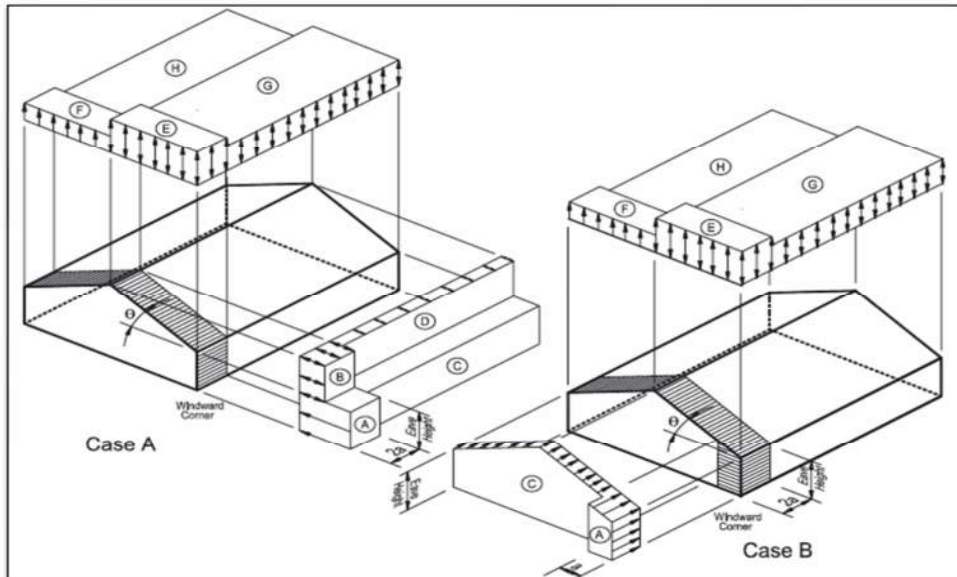
Topographic Factor, $K_{zt} = 1.00$ (ASCE 7-10, Section 26.8, page 251)
 Adjustment Factor, $\lambda = 1.40$ (ASCE 7-10, Figure 28.6-1, page 305)

WIND LOAD SUMMARY:	
Front / Back Direction	
Roof	4.67 k
3rd Floor	10.62 k
2nd Floor	12.30 k
1st Floor (Base Shear)	27.59 k
Side / Side Direction	
Roof	4.78 k
3rd Floor	6.49 k
2nd Floor	7.52 k
1st Floor (Base Shear)	18.79 k

SIMPLIFIED DESIGN WIND PRESSURE, P_{s30} (psf)
(Exposure B at h = 30ft.)

Basic Wind Speed, V_s (mph)	Roof Angle (Degrees)	Load Case	ZONES*									
			Horizontal Pressure				Vertical Pressure				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: XXX	Plan: Forest Ave Lot 4	Sheet Number: L1
Engineer: XXX	Specifics: WIND FORCES	Date: 6/16/2020

IBC 2015 Section 1609 → ASCE 7-10 Section 28.6 - Simplified Procedure → Main Wind-Force Resisting System

HORIZONTAL LOADS (psf)				MIN. LOADS (psf)	
$p_s = \lambda * K_z t * P_s 30$				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		Interior zone		Force 0.6 ω *W (kips)	Min Force 0.6 ω *W (kips)	
				Length (ft)	Pressure (W) (psf)	Length (ft)	Pressure (W) (psf)			
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
								$\Sigma =$	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
	Height" 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 2nd LVL	68.0	5.50	(wall)	8.0	29.88	60.0	19.90	6.15	4.67
							$\Sigma =$	10.62	8.06	
2nd FLOOR	Mid 2nd LVL to Floor	68.0	5.50	(wall)	8.0	29.88	60.0	19.90	6.15	4.67
	Height" 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	68.0	5.50	(wall)	8.0	29.88	60.0	19.90	6.15	4.67
							$\Sigma =$	12.30	9.34	
Total Wind Base Shear (kips)									27.39	22.06

ASD WIND FORCES: SIDE / SIDE LOADING DIRECTION										
Location	Width (ft)	Height (ft)	Plane	End Zone		Interior zone		Force 0.6 ω *W (kips)	Min Force 0.6 ω *W (kips)	
				Length (ft)	Pressure (W) (psf)	Length (ft)	Pressure (W) (psf)			
ROOF	Height" of Roof to Plate (see note)	40.0	3.00	(roof)	8.0	29.88	32.0	19.90	2.05	0.75
	Plate to Mid 3rd LVL	40.0	4.00	(wall)	8.0	29.88	32.0	19.90	2.73	2.00
								$\Sigma =$	4.78	2.75
3rd FLOOR	Mid 3rd LVL to Floor	40.0	4.00	(wall)	8.0	29.88	32.0	19.90	2.73	2.00
	Height" 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	40.0	5.50	(wall)	8.0	29.88	32.0	19.90	3.76	2.75
							$\Sigma =$	6.49	4.74	
2nd FLOOR	Mid 2nd LVL to Floor	40.0	5.50	(wall)	8.0	29.88	32.0	19.90	3.76	2.75
	Height" 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	40.0	5.50	(wall)	8.0	29.88	32.0	19.90	3.76	2.75
							$\Sigma =$	7.52	5.49	
Total Wind Base Shear (kips)									18.79	12.98

Project Number: xxx	Plan Name: Forest Ave Lot 4	Sheet Number: L2
Engineer: xxx	Specifics: SEISMIC WEIGHTS	Date: 6/16/2020

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 permanent 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 / LENGT H	HEIGHT (ft)	UNIT WEIGH (psf)		Item Total Weight. (lbs)	Level Sub- (kips)	Average Pressure (psf)
ROOF								
	Roof	3,000	1.03	15	=	46,571		
	Ext. Wall Below	220	4.00	12	=	10,560		
	Corridor Wall Below	300	4.00	8	=	9,600		
							67	22
3rd FLOOR								
	3rd Floor	1,850	1.00	12	=	22,200		
	Low Roof	200	1.03	15	=	3,105		
	Ext. Wall Above	220	4.00	12	=	10,560		
	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		
							65	31
2nd FLOOR								
	2nd Floor	2,300	1.00	12	=	27,600		
	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	220	4.50	12	=	11,880		
	Corridor Wall Below	80	4.50	8	=	2,880		
							61	27
1st FLOOR								
	Ext. Wall Above	220	4.50	12	=	11,880		
	Corridor Wall Above	80	4.50	8	=	2,880		
							15	

STRUCTURE WEIGHT FOR SEISMIC BASE SHEAR: 193 kips

TOTAL WEIGHT OF STRUCTURE: 207 kips
(Includes Basement Dead Load)

Project Number: xxx	Plan Name: Forest Ave Lot 4	Sheet Number: L3
Engineer: xxx	Specifics: SEISMIC FORCES	Date: 6/16/2020

Equivalent 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, $T_a = 0.256$ ($C_T \cdot (h_n)^{0.75}$) (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

$C_{s,MAX} = S_{D1}/(T \cdot R/I)$ $C_{s,MAX} = 0.332$ $T \leq T_L$ (ASCE 7 EQ 12.8.-3)

$C_{s,MAX} = S_{D1} T_L / (T^2 \cdot R/I)$ $C_{s,MAX} = NA$ $T > T_L$ (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 $S_1 > 0.6$ (ASCE 7 EQ 12.8.-6)

$C_s = 0.148$

Dead Load W = 193 kips

V = $C_s W = 28.5$ kips (ASCE 7 EQ 12.8.-1)

$Q_E = V = 28.5$ kips (ASCE 7 EQ 12.4.-3)

$\rho = 1.3$ (ASCE 7 12.3.4.2)

$E_H = \rho Q_E = 37.1$ kips (ASCE 7 EQ 12.4.-3)

$E_v = .2 S_{DS} D = 0.19 \times D$ kips

Factor for Alternate Basic Load combinations - 2015 IBC 1605.3.2

$E_H/1.4 = 26.5$ 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 C_{vx}	Story Force F_x (kips)	Factored Story Force (ASD) $F_x \rho/1.4 = E_H/1.4$ (kips)
Roof	3,000	10.00	31.00	67	2,069	0.51	14.5	13.5
3rd	1,850	10.50	21.00	65	1,355	0.33	9.5	8.8
2nd	2,300	10.50	10.50	61	645	0.16	4.5	4.2
Sum =				4,069	1.000	28.5	26.5	

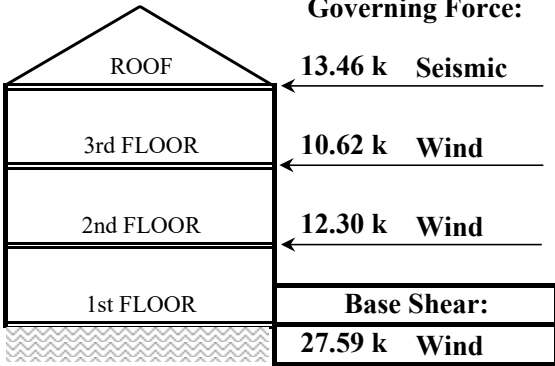
ASD DIAPHRAGM FORCES				
Floor	Design Shear $V_i = \Sigma f_x$ (kips)	Fpx Min $0.2 S_{DS} I_e w_{px}$ (kips)	Fpx Max $0.4 S_{DS} I_e w_{px}$ (kips)	Fpx (kips)
Roof	13.46	11.68	23.37	13.46
3rd	22.29	11.30	22.60	10.96
2nd	26.48	10.76	21.51	8.44

Fpx DIAPHRAGM	
(kips)	(psf)
13.46	4.5
11.30	6.1
10.76	4.7

Project Number: XXX	Plan Name: Forest Ave Lot 4	Sheet Number: L4
Engineer: XXX	Specifics: DESIGN LOADS	Date: 6/16/2020

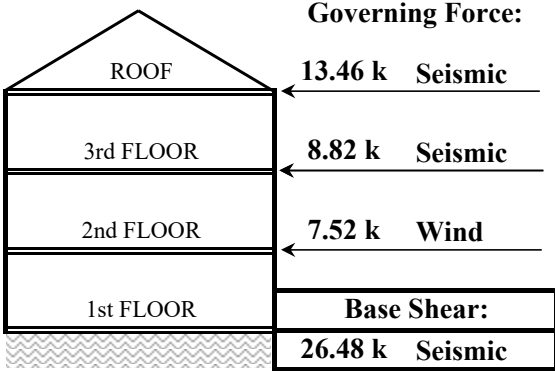
FRONT / BACK DIRECTION

Wind Force <i>0.6 ω * W_{F/B} (kips)</i>		Seismic Force <i>E/1.4 (kips)</i>	
Per Level	Sum	Per Level	Sum
4.67		13.46	
	4.67	8.82	13.46
10.62		4.20	22.29
	15.29		26.48
12.30			
	27.59		



SIDE / SIDE DIRECTION

Wind Force <i>0.6 ω * W_S (kips)</i>		Seismic Force <i>E/1.4 (kips)</i>	
Per Level	Sum	Per Level	Sum
4.78		13.46	
	4.78	8.82	13.46
6.49		4.20	22.29
	11.27		26.48
7.52			
	18.79		



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

Project Number: XXX	Plan Name: Forest Ave Lot 4	Sheet Number: L5
Engineer: XXX	Specifics: Shear walls	Date: 6/16/2020

3rd Story Walls (Front - Back Direction)

Temporary Shoring shear (kips) = **60%**
 Governing Force (F/B Direction) = **Seismic**
 Dead load factor (F/B Direction) = **0.90**
 Shear panel capacity (Wind or Seismic) = **Seismic**
 load balance check = **OK**

Gyp capacity = **60.00**
 (PLF)

IBC 2015 Equation 16-22

3rd Story Walls (Front - Back Direction)
Hold downs and window straps

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)	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	8.00	5.00	2.00	1.08	5.75	16.00	0.23	3.76	0.74	0.74	129	1.00	129	SW6	2.00	0.13	0.13	6.8	10.8	-0.31	fr-fr	HF	Edge	No HD	0.86	CS16
3	1.2	9.75	0.00	0.00	0.00	0.00	9.75	16.00	0.40	6.37	1.26	1.26	129	1.00	129	SW6	5.00	0.17	0.17	11.4	7.4	0.44	fr-fr	HF	Edge	No HD	0.00	No strap
3	1.3	9.00	0.00	0.00	0.00	0.00	9.00	16.00	0.37	5.88	1.16	1.16	129	1.00	129	SW6	5.00	0.17	0.17	10.6	6.3	0.51	fr-fr	HF	Edge	No HD	0.00	No strap
3	2.1	16.75	9.00	5.00	2.00	1.08	7.75	10.00	0.59	5.94	1.18	1.18	152	1.00	152	SW6	2.00	0.13	0.13	10.7	16.0	-0.33	fr-fr	HF	Edge	No HD	1.01	CS16
3	2.2	5.30	0.00	0.00	0.00	0.00	5.30	10.00	0.41	4.06	0.80	0.80	152	1.00	152	SW6	2.00	0.13	0.13	7.3	1.6	1.19	fr-fr	HF	Edge	BALLOON FR	0.00	No strap
3	3.1	16.50	0.00	0.00	0.00	0.00	16.50	18.00	1.00	18.00	3.56	3.56	216	1.00	216	SW6	2.00	0.13	0.13	32.4	15.6	1.05	fr-fr	HF	Edge	MST37	0.00	No strap
3	4.1	10.50	0.00	0.00	0.00	0.00	10.50	24.00	1.00	24.00	4.75	4.75	453	1.00	453	SW3	2.00	0.13	0.13	43.1	6.3	3.68	fr-beam	HF	Edge	MSTC66B3	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 = 81.55 Total OSB wall length = **64.55** (feet) S = 68.00 13.46 **13.46 OK** Total OSB Capacity (kips) **13.46**

2nd Story Walls (Front - Back Direction)

Story shear(kips) = **8.82**
 Story height (ft) = **10.08**
 Shear Panel height (ft) = **9.08**
 Total Diaphragm width (ft) = **68.00**
 Shear panel capacity (Wind or Seismic) = **Seismic**
 Accumulated Shear = **22.29**
 load balance check = **OK**

2nd Story Walls (Front - Back Direction)
Hold downs and window straps

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	1.1	22.25	11.00	5.00	2.00	1.08	11.25	16.00	0.56	8.89	1.15	2.91	259	1.00	259	SW4	2.00	0.13	NO	0.13	29.4	29.6	-0.01	fr-fr	HF	Edge	No HD	1.72	CS14
2	1.2	9.00	0.00	0.00	0.00	0.00	9.00	16.00	0.44	7.11	0.92	2.33	259	1.00	259	SW4	2.00	0.13	NO	0.13	23.5	4.8	2.19	fr-fr	HF	Edge	MST37	0.00	No strap
2	2.1	5.50	0.00	0.00	0.00	0.00	5.50	8.00	1.00	8.00	1.04	3.02	549	1.00	549	SW2	2.00	0.13	NO	0.13	30.4	1.8	5.72	fr-fr	HF	Edge	(2)MSTC66B3	0.00	No strap
2	3.1	3.75	0.00	0.00	0.00	0.00	3.75	19.00	0.45	8.64	1.12	2.74	731	0.93	787	2W3	14.00	0.28	NO	0.28	27.6	1.8	7.96	fr-fr	HF	Edge	CMST12	0.00	No strap
2	3.2	4.50	0.00	0.00	0.00	0.00	4.50	19.00	0.55	10.36	1.34	3.29	731	1.00	731	2W3	14.00	0.28	NO	0.28	33.1	2.5	7.66	fr-fr	HF	Edge	CMST12	0.00	No strap
2	4.1	13.25	0.00	0.00	0.00	0.00	13.25	25.00	0.47	11.83	1.53	3.78	286	1.00	286	SW4	2.00	0.13	NO	0.13	38.1	10.5	2.17	fr-beam	HF	Edge	MSTC48B3	0.00	No strap
2	4.2	8.25	0.00	0.00	0.00	0.00	8.25	25.00	0.29	7.37	0.96	2.36	286	1.00	286	SW4	2.00	0.13	NO	0.13	23.7	4.1	2.54	fr-beam	HF	Edge	MSTC48B3	0.00	No strap
2	4.3	6.50	0.00	0.00	0.00	0.00	6.50	25.00	0.23	5.80	0.75	1.86	286	1.00	286	SW4	2.00	0.13	NO	0.13	18.7	2.5	2.70	fr-beam	HF	Edge	MSTC48B3	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 = 73.00 Total OSB wall length = **62.00** (feet) S = 68.00 8.82 **22.29 OK** Total OSB Capacity (kips) **8.82**

1st Story Walls (Front - Back Direction)

Story shear(kips) = **5.30**
 Story height (ft) = **10.08**
 Shear Panel height (ft) = **9.08**
 Total Diaphragm width (ft) = **68.00**
 Shear panel capacity (Wind or Seismic) = **Seismic**
 Accumulated Shear = **27.59**
 load balance check = **OK**

1st Story Walls (Front - Back Direction)
Hold downs and window straps

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
1	1.1	10.50	0.00	0.00	0.00	0.00	10.50	17.00	0.54	9.15	0.71	3.97	378	1.00	378	SW3	2.00	0.13	NO	0.13	40.0	6.6	3.34	fr-conc	HF	Edge	HDU5	0.00	No strap
1	1.2	9.00	0.00	0.00	0.00	0.00	9.00	17.00	0.46	7.85	0.61	3.40	378	1.00	378	SW3	2.00	0.13	NO	0.13	34.3	4.8	3.46	fr-conc	HF	Edge	HDU5	0.00	No strap
1	2.1	18.25	0.00	0.00	0.00	0.00	18.25	17.00	1.00	17.00	1.32	6.75	370	1.00	370	SW3	2.00	0.13	NO	0.13	68.1	19.9	2.71	fr-conc	HF	Edge	STHD14	0.00	No strap
1	3.1	9.00	0.00	0.00	0.00	0.00	9.00	34.00	0.36	12.24	0.95	4.85	539	1.00	539	SW2	2.00	0.13	NO	0.13	48.9	4.8	5.18	fr-conc	HF	Edge	HDU8	0.00	No strap
1	3.2	16.00	0.00	0.00	0.00	0.00	16.00	34.00	0.64	21.76	1.70	8.62	539	1.00	539	SW2	2.00	0.13	NO	0.13	86.9	15.3	4.62	fr-conc	HF	Edge	HDU8	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 = 62.75 Total OSB wall length = **62.75** (feet) S = 68.00 5.30 **27.59 OK** Total OSB Capacity (kips) **5.30**

Project Number: XXX	Plan Name: Forest Ave Lot 4	Sheet Number: L6
Engineer: xxx	Specifics: Shear walls	Date: 6/16/2020

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)

Temporary Stud Species HF
Shoring shear (kips) 60%

Story shear(kips) = 13.46
Story height (ft) = 9.08
Shear Panel height (ft) = 8.08
Total Diaphragm width (ft) = 40.00

Governing Force (F/B Direction) = Seismic
Dead load factor (F/B Direction) = 0.90
Shear panel capacity (Wind or Seismic) = Seismic
load balance check = OK

IBC 2015 Equation 16-22

Gyp capacity = 60.00 (PLF)

3rd Story Walls (Side / Side Direction)

Hold downs and window straps

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
3	A.1	6.00	0.00	0.00	0.00	0.00	6.00	20.00	0.23	4.53	1.53	1.53	254	1.00	254	SW4	2.00	0.13	NO	0.13	13.9	2.1	2.15	flr-flr	HF	Edge	BALLOON FR	0.00	No strap
3	A.2	24.50	8.00	5.00	2.00	1.08	16.50	20.00	0.62	12.47	4.20	4.20	254	1.00	254	SW4	2.00	0.13	NO	0.13	38.1	34.3	0.16	flr-flr	HF	Edge	No HD	1.69	CS16
3	A.3	12.50	0.00	0.00	0.00	0.00	12.50	10.00	0.15	1.50	0.50	0.50	40	1.00	40	SW6	2.00	0.13	NO	0.13	4.6	8.9	-0.36	flr-flr	HF	Edge	No HD	0.00	No strap
3	B.1	15.75	0.00	0.00	0.00	0.00	15.75	20.00	0.45	9.03	3.04	3.04	193	1.00	193	SW6	6.00	0.19	NO	0.19	27.6	20.9	0.44	flr-flr	HF	Edge	No HD	0.00	No strap
3	B.2	16.50	0.00	0.00	0.00	0.00	16.50	20.00	0.47	9.47	3.19	3.19	193	1.00	193	SW6	6.00	0.19	NO	0.19	28.9	22.9	0.38	flr-flr	HF	Edge	No HD	0.00	No strap
3	C.1	16.50	0.00	0.00	0.00	0.00	16.50	20.00	0.15	3.00	1.01	1.01	61	1.00	61	SW6	2.00	0.13	NO	0.13	9.2	15.6	-0.40	flr-flr	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 = 91.75 Total OSB wall length = 83.75 (feet) S = 40.00 13.46 13.46 OK Total OSB Capacity (kips) 13.46

2nd Story Walls (Side / Side Direction)

Shear panel capacity (Wind or Seismic) = Seismic

Story shear(kips) = 8.82
Story height (ft) = 10.08
Shear Panel height (ft) = 9.08
Total Diaphragm width (ft) = 40.00

Accumulated Shear = 22.29
load balance check = OK

2nd Story Walls (Side / Side Direction)

Hold downs and window straps

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	6.00	0.00	0.00	0.00	0.00	6.00	0.00	0.00	0.00	0.00	1.53	254	1.00	254	SW4	2.00	0.13	NO	0.13	15.4	2.2	2.40	flr-flr	HF	Edge	BALLOON FR	0.00	No strap
2	A.2	24.50	8.00	5.00	2.00	1.08	16.50	20.00	1.00	20.00	4.41	9.11	552	1.00	552	SW2	2.00	0.13	NO	0.13	91.9	35.9	2.33	flr-flr	HF	Edge	MST37	3.66	CMSTC16
2	A.3	12.50	0.00	0.00	0.00	0.00	12.50	0.00	0.00	0.00	0.00	0.50	40	1.00	40	SW6	2.00	0.13	NO	0.13	5.1	9.3	-0.35	flr-flr	HF	Edge	No HD	0.00	No strap
2	B.1	16.50	0.00	0.00	0.00	0.00	16.50	20.00	0.66	13.20	2.91	7.35	446	1.00	446	SW3	2.00	0.13	NO	0.13	74.1	16.3	3.62	flr-conc	HF	Edge	HDU5	0.00	No strap
2	B.2	16.50	8.00	5.00	2.00	1.08	8.50	20.00	0.34	6.80	1.50	3.79	446	1.00	446	SW3	2.00	0.13	NO	0.13	38.2	16.3	1.37	flr-conc	HF	Edge	STHD14	2.95	CMSTC16

Total Length GYP required in F/B direction to resist 100% lateral forces (ft) [Not required] (including discounted capacity accounted for by OSB)

S = 76.00 Total OSB wall length = 60.00 (feet) S = 40.00 8.82 22.29 OK Total OSB Capacity (kips) 8.82

1st Story Walls (Side / Side Direction)

Shear panel capacity (Wind or Seismic) = Seismic

Story shear(kips) = 4.20
Story height (ft) = 10.08
Shear Panel height (ft) = 9.08
Total Diaphragm width (ft) = 40.00

Accumulated Shear = 26.48
load balance check = ads do not match story shear

1st Story Walls (Side / Side Direction)

Hold downs and window straps

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	
1	A.1	10.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00	1.53	153	1.00	153	SW6	2.00	0.13	NO	0.13	15.4	6.0	0.99	flr-conc	HF	Edge	STHD14	0.00	No strap	
1	A.2	2.00	0.00	0.00	0.00	0.00	2.00	20.00	0.25	5.00	0.52	2.93	1465	WSW24X9																
1	A.3	2.00	0.00	0.00	0.00	0.00	2.00	20.00	0.25	5.00	0.52	2.93	1465	WSW24X9																
1	A.4	2.00	0.00	0.00	0.00	0.00	2.00	20.00	0.25	5.00	0.52	2.93	1465	WSW24X9																
1	A.5	2.00	0.00	0.00	0.00	0.00	2.00	20.00	0.25	5.00	0.52	2.93	1465	WSW24X9																
1	B.3	19.25	0.00	0.00	0.00	0.00	19.25	20.00	0.50	10.00	1.05	1.05	55	1.00	55	SW6	2.00	0.13	NO	0.13	10.6	22.2	-0.62	flr-conc	HF	Edge	No HD	0.00	No strap	

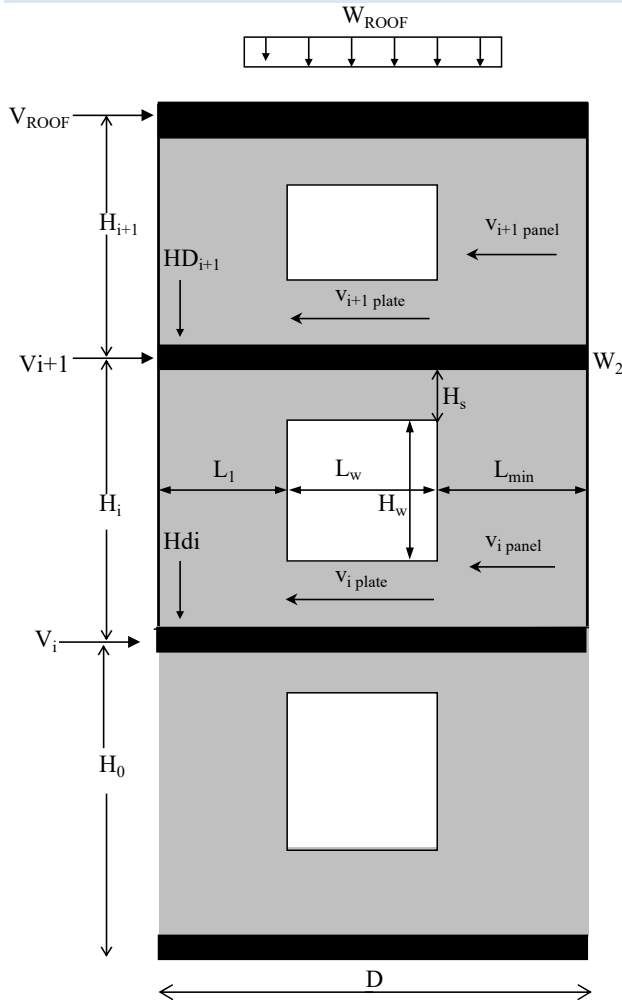
REST INTO CONCRETE RETAINING WALLS

Total Length GYP required in F/B direction to resist 100% lateral forces (ft) [Not required] (including discounted capacity accounted for by OSB)

S = 37.25 Total OSB wall length = 37.25 (feet) S = 30.00 3.15 14.29 Warning Total OSB Capacity (kips) 4.20

Project	Forest Ave Lot 4	sheet number:	L7
Subject	SHEAR WALL EQUATION DIAGRAM	Date	6/16/2020

SHEAR WALL WITH WINDOW BASED ON SHEAR TRANSFER:



Where:

- V_i = Story Shear
- W_i = Story Dead Load
- HD_i = Story Holddown
- M_{OTi} = Story Over Turning Moment
- M_{Ri} = Story Resisting Moment

$$M_{OT\ ROOF} = V_{ROOF} \times H_{i+1}$$

$$M_{OTi} = [(V_{i+1} + V_{ROOF}) \times H_i] + M_{OT\ ROOF}$$

$$M_{R\ ROOF} = 0.6 \times W_{ROOF} \times D^2 / 2$$

$$M_{Ri} = 0.6 \times (W_{i+1} + W_{ROOF}) \times D^2 / 2$$

$$HD_{i+1} = (M_{OT\ ROOF} - M_{R\ ROOF}) / (D - 6")$$

$$HD_i = (M_{OTi} - M_{Ri}) / (D - 6")$$

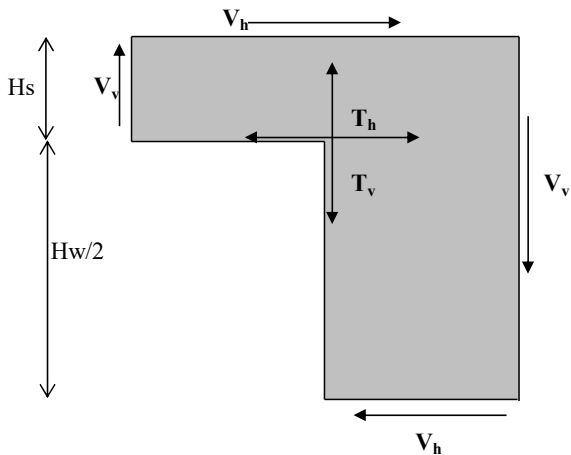
$$V_{i+1\ panel} = V_{ROOF} / (L_1 + L_{max})$$

$$V_{i\ panel} = (V_{ROOF} + V_{i+1}) / (L_1 + L_{max})$$

$$V_{i+1\ plate} = V_{ROOF} / D$$

$$V_{i\ plate} = (V_{ROOF} + V_{i+1}) / D$$

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.