Boise Cascade

Quadruple 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP Floor E

Dry | 1 span | No cantilevers | 0/12 slope

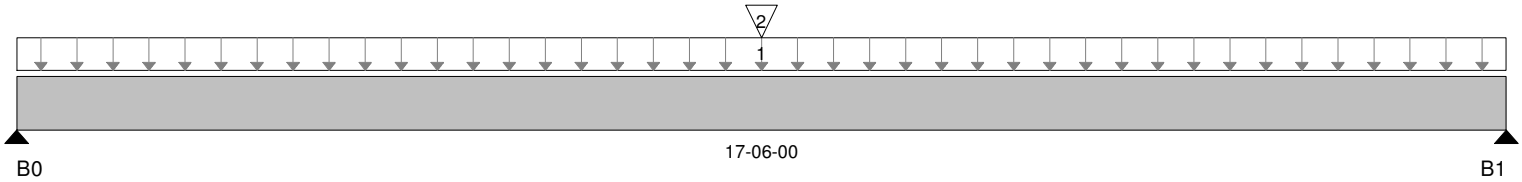
November 10

BC CALC® Design Report

Reviewed for Code Compliance
Inspections Division
Approved with Conditions
Date: 11/28/17

Build 6080
Job Name: Adler
Address: 5 Monument St
City, State, Zip: Portland, ME
Customer: Hancock Lumber
Code reports: ESR-1040

File Name: Adler-5 Monument St
Description: Beam In 2nd Floor Catching Ridge Po
Specifier:
Designer:
Company:
Misc:



Total of Horizontal Design Spans = 17-06-00

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind	Roof Live
B0	467 / 0	1,766 / 0	4,289 / 0		
B1	467 / 0	1,766 / 0	4,289 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live 100%	Dead 90%	Snow 115%	Wind 160%	Roof Live 125%	Trib.
1	Standard Load	Unf. Area (lb/ft^2)	L	00-00-00	17-06-00	40	10				01-04-00
2	Reaction from Desi...	Conc. Pt. (lbs)	L	08-09-00	08-09-00		2,803	8,578			n/a

Controls Summary

	Value	% Allowable	Duration	Case	Location
Pos. Moment	51,389 ft-lbs	77%	115%	2	08-09-00
End Shear	6,004 lbs	28%	115%	2	01-02-14
Total Load Defl.	L/294 (0.713")	81.5%	n/a	2	08-09-00
Live Load Defl.	L/406 (0.517")	88.6%	n/a	5	08-09-00
Max Defl.	0.713"	71.3%	n/a	2	08-09-00
Span / Depth	15	n/a	n/a	0	00-00-00
Squash Blocks	Valid				

Notes

Entered/Displayed Horizontal Span Length(s) = Clear Span + 1/2 min. end bearing + 1/2 intermediate bearing
Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
Design meets arbitrary (1") Maximum Total load deflection criteria.
Minimum bearing length for B0 is 1-1/2".
Minimum bearing length for B1 is 1-1/2".
Calculations assume member is fully braced.
Design based on Dry Service Condition.

Boise Cascade

Quadruple 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP Floor E

Dry | 1 span | No cantilevers | 0/12 slope

November 10

BC CALC® Design Report

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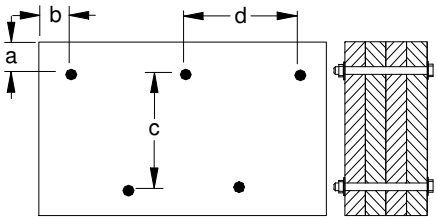
Inspections Division
Approved with Conditions
Date: 11/28/17

Build 6080
Job Name: Adler
Address: 5 Monument St
City, State, Zip: Portland, ME
Customer: Hancock Lumber
Code reports: ESR-1040

File Name: Adler-5 Monument St
Description: Beam In 2nd Floor Catching Ridge Po
Specifier:
Designer:
Company:
Misc:

Connection Diagram



a minimum = 2" c = 10"
b minimum = 2-1/2" d = 24"

Connection design assumes point load is top-loaded. For connection design of side-loaded point loads, please consult a technical representative or professional of Record.
Beams 7 inches wide will be assumed to be either top-loaded only, or equally loaded from each side.
Bolts are assumed to be Grade A307 or Grade 2 or higher.
Member has no side loads.
Connectors are: 1/2 in. Staggered Through Bolt

Disclosure

Completeness and accuracy of input must be verified by anyone who would rely on output as evidence of suitability for particular application. Output here based on building code-accepted design properties and analysis methods. Installation of Boise Cascade engineered wood products must be in accordance with current Installation Guide and applicable building codes. To obtain Installation Guide or ask questions, please call (800)232-0788 before installation.

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Boise Cascade

Triple 1-3/4" x 5-1/2" VERSA-LAM® 2.0 3100 SP Floor E

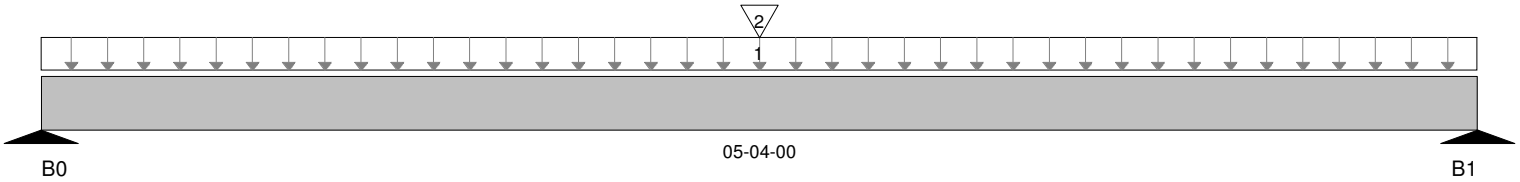
Dry | 1 span | No cantilevers | 0/12 slope November 10

BC CALC® Design Report

Reviewed for Code Compliance
Inspections Division
Approved with Conditions
Date: 11/28/17

Build 6080
Job Name: Adler
Address: 5 Monument St
City, State, Zip: Portland, ME
Customer: Hancock Lumber
Code reports: ESR-1040

File Name: Adler-5 Monument St
Description: Gable Window Header Carrying Ridge Post
Specifier:
Designer:
Company:
Misc:



Total of Horizontal Design Spans = 05-04-00

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind	Roof Live
B0		523 / 0	1,660 / 0		
B1		523 / 0	1,661 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live 100%	Dead 90%	Snow 115%	Wind 160%	Roof Live 125%	Trib.
1	Standard Load	Unf. Area (lb/ft^2)	L	00-00-00	05-04-00		15	50			02-00-00
2	Reaction from Desi...	Conc. Pt. (lbs)	L	02-08-00	02-08-00		841	2,788			n/a

Controls Summary

	Value	% Allowable	Duration	Case	Location
Pos. Moment	5,330 ft-lbs	62.2%	115%	1	02-08-00
End Shear	2,110 lbs	33.4%	115%	1	00-06-06
Total Load Defl.	L/417 (0.153")	57.5%	n/a	1	02-08-00
Live Load Defl.	L/999 (0.117")	n/a	n/a	2	02-08-00
Max Defl.	0.153"	15.3%	n/a	1	02-08-00
Span / Depth	11.6	n/a	n/a	0	00-00-00
Squash Blocks	Valid				

Notes

Entered/Displayed Horizontal Span Length(s) = Clear Span + 1/2 min. end bearing + 1/2 intermediate bearing
Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
Design meets arbitrary (1") Maximum Total load deflection criteria.
Minimum bearing length for B0 is 1-1/2".
Minimum bearing length for B1 is 1-1/2".
Calculations assume member is fully braced.
Design based on Dry Service Condition.

Boise Cascade

Triple 1-3/4" x 5-1/2" VERSA-LAM® 2.0 3100 SP Floor B

Dry | 1 span | No cantilevers | 0/12 slope November 10

BC CALC® Design Report

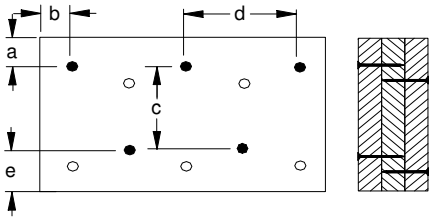
Reviewed for Code Compliance
Inspections Division
Approved with Conditions
Date: 11/28/17

Build 6080

Job Name: Adler
Address: 5 Monument St
City, State, Zip: Portland, ME
Customer: Hancock Lumber
Code reports: ESR-1040

File Name: Adler-5 Monument St
Description: Gable Window Header Carrying Ridge Post
Specifier:
Designer:
Company:
Misc:

Connection Diagram



a minimum = 2" c = 1/2"
b minimum = 3" d = 24"
e minimum = 3"

Connection design assumes point load is top-loaded. For connection design of side-loaded point loads, please consult a technical representative or professional of Record.
Nailing schedule applies to both sides of the member.
Member has no side loads.
Connectors are: 16d Sinker Nails

Disclosure

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Boise Cascade

Triple 1-3/4" x 7-1/4" VERSA-LAM® 2.0 3100 SP Floor E

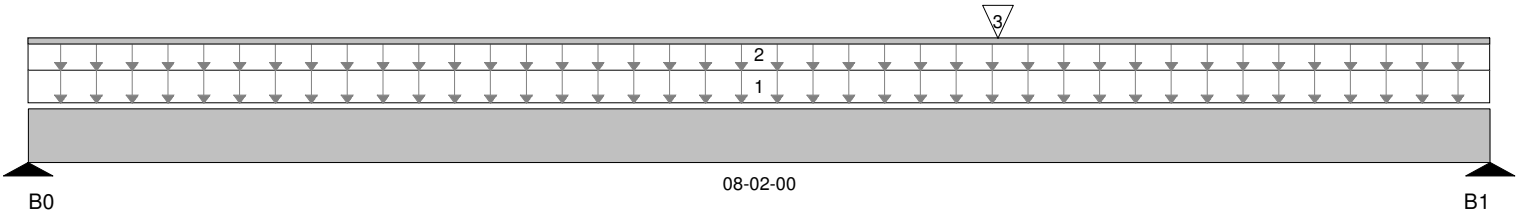
Dry | 1 span | No cantilevers | 0/12 slope November 10

BC CALC® Design Report

Reviewed for Code Compliance
Inspections Division
Approved with Conditions
Date: 11/28/17

Build 6080
Job Name: Adler
Address: 5 Monument St
City, State, Zip: Portland, ME
Customer: Hancock Lumber
Code reports: ESR-1040

File Name: Adler-5 Monument St
Description: Gable End Triple Window Header
Specifier:
Designer:
Company:
Misc:



Total of Horizontal Design Spans = 08-02-00

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind	Roof Live
B0		833 / 0	967 / 0		
B1		1,004 / 0	1,510 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live 100%	Dead 90%	Snow 115%	Wind 160%	Roof Live 125%	Trib.
1	Standard Load	Unf. Area (lb/ft^2)	L	00-00-00	08-02-00		15	50			02-00-00
2		Unf. Lin. (lb/ft)	L	00-00-00	08-02-00		120				n/a
3	Reaction from Desi...	Conc. Pt. (lbs)	R	02-09-00	02-09-00		523	1,660			n/a

Controls Summary

	Value	% Allowable	Duration	Case	Location
Pos. Moment	5,926 ft-lbs	41%	115%	1	05-05-00
End Shear	2,337 lbs	28.1%	115%	1	00-08-02
Total Load Defl.	L/518 (0.189")	46.3%	n/a	1	04-03-11
Live Load Defl.	L/999 (0.114")	n/a	n/a	2	04-04-09
Max Defl.	0.189"	18.9%	n/a	1	04-03-11
Span / Depth	13.5	n/a	n/a	0	00-00-00
Squash Blocks	Valid				

Notes

Entered/Displayed Horizontal Span Length(s) = Clear Span + 1/2 min. end bearing + 1/2 intermediate bearing
Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
Design meets arbitrary (1") Maximum Total load deflection criteria.
Minimum bearing length for B0 is 1-1/2".
Minimum bearing length for B1 is 1-1/2".
Calculations assume member is fully braced.
Design based on Dry Service Condition.

Boise Cascade

Triple 1-3/4" x 7-1/4" VERSA-LAM® 2.0 3100 SP Floor E

Dry | 1 span | No cantilevers | 0/12 slope November 10

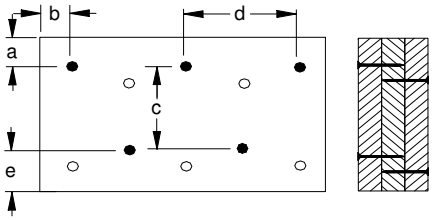
BC CALC® Design Report

Reviewed for Code Compliance
Inspections Division
Approved with Conditions
Date: 11/28/17

Build 6080
Job Name: Adler
Address: 5 Monument St
City, State, Zip: Portland, ME
Customer: Hancock Lumber
Code reports: ESR-1040

File Name: Adler-5 Monument St
Description: Gable End Triple Window Header
Specifier:
Designer:
Company:
Misc:

Connection Diagram



a minimum = 2" c = 2-1/4"
b minimum = 3" d = 24"
e minimum = 3"

Connection design assumes point load is top-loaded. For connection design of side-loaded point loads, please consult a technical representative or professional of Record.
Nailing schedule applies to both sides of the member.
Member has no side loads.
Connectors are: 16d Sinker Nails

Disclosure

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Boise Cascade

Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP Roof B

Dry | 2 spans | No cantilevers | 0/12 slope

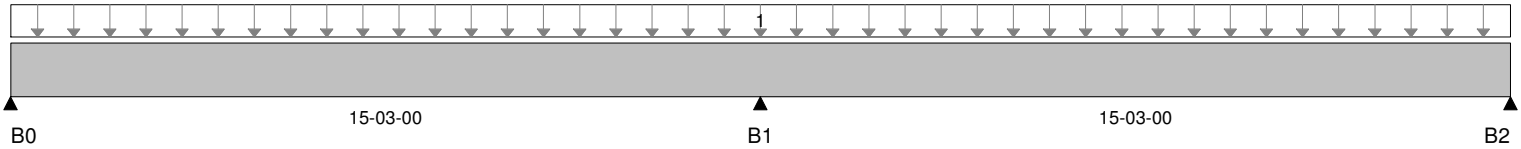
November 10

BC CALC® Design Report

Reviewed for Code Compliance
Inspections Division
Approved with Conditions
Date: 11/28/17

Build 6080
Job Name: Adler
Address: 5 Monument St
City, State, Zip: Portland, ME
Customer: Hancock Lumber
Code reports: ESR-1040

File Name: Adler-5 Monument St
Description: Ridge Beam
Specifier:
Designer:
Company:
Misc:



Total of Horizontal Design Spans = 30-06-00

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind	Roof Live
B0		841 / 0	2,788 / 0		
B1		2,803 / 0	8,578 / 0		
B2		841 / 0	2,788 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live 100%	Dead 90%	Snow 115%	Wind 160%	Roof Live 125%	Trib.
1	Standard Load	Unf. Area (lb/ft^2)	L	00-00-00	30-06-00		15	50			09-00-00

Controls Summary

	Value	% Allowable	Duration	Case	Location
Pos. Moment	11,027 ft-lbs	45.1%	115%	8	24-04-09
Neg. Moment	-17,356 ft-lbs	70.9%	115%	9	15-03-00
End Shear	2,994 lbs	33%	115%	7	01-00-12
Cont. Shear	5,013 lbs	55.2%	115%	9	14-01-06
Total Load Defl.	L/471 (0.388")	38.2%	n/a	7	06-09-14
Live Load Defl.	L/586 (0.312")	41%	n/a	10	06-09-14
Total Neg. Defl.	L/999 (-0.02")	n/a	n/a	7	16-09-01
Max Defl.	0.388"	38.8%	n/a	7	06-09-14
Span / Depth	15.4	n/a	n/a	0	00-00-00
Squash Blocks	Valid				

Cautions

For roof members with slope (1/4)/12 or less final design must ensure that ponding instability will not occur.
For roof members with slope (1/2)/12 or less final design must account for Rain-on-Snow surcharge load.

Notes

Entered/Displayed Horizontal Span Length(s) = Clear Span + 1/2 min. end bearing + 1/2 intermediate bearing
Design meets Code minimum (L/180) Total load deflection criteria.
Design meets Code minimum (L/240) Live load deflection criteria.
Design meets arbitrary (1") Maximum Total load deflection criteria.
Minimum bearing length for B0 is 1-1/2".
Minimum bearing length for B1 is 4-5/16".
Minimum bearing length for B2 is 1-1/2".
Calculations assume member is fully braced.
Design based on Dry Service Condition.

Boise Cascade

Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP Roof B

Dry | 2 spans | No cantilevers | 0/12 slope

November 10

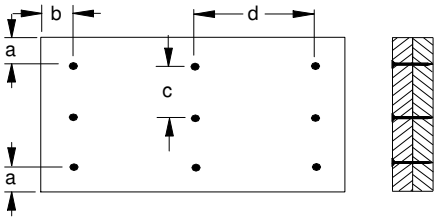
BC CALC® Design Report

Reviewed for Code Compliance
Inspections Division
Approved with Conditions
Date: 11/28/17

Build 6080
Job Name: Adler
Address: 5 Monument St
City, State, Zip: Portland, ME
Customer: Hancock Lumber
Code reports: ESR-1040

File Name: Adler-5 Monument St
Description: Ridge Beam
Specifier:
Designer:
Company:
Misc:

Connection Diagram



a minimum = 2" c = 3-15/16"
b minimum = 3" d = 12"

Calculated Side Load = 585.0 lb/ft

Connectors are: 16d Box Nails

Disclosure

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VERSA-LAM® 1.8 2750 Columns

Reviewed for Code Compliance
Inspections Division
Approved with Conditions
Date: 11/28/17

Column Length [ft]	Allowable Axial Load (lb)														
	3½" x 3½"			3½" x 4⅜"			3½" x 5¼"			3½" x 5½"			3½" x 7"		
	100%	115%	125%	100%	115%	125%	100%	115%	125%	100%	115%	125%	100%	115%	125%
4	15,265	16,750	17,650	19,100	20,950	22,070	22,920	25,150	26,500	24,020	26,350	27,770	30,570	33,545	35,345
5	12,830	13,770	14,320	16,050	17,220	17,910	19,260	20,670	21,505	20,185	21,660	22,530	25,690	27,580	28,680
6	10,580	11,190	11,540	13,240	13,990	14,440	15,890	16,800	17,335	16,645	17,605	18,165	21,190	22,410	23,120
7	8,745	9,160	9,400	10,940	11,460	11,760	13,130	13,760	14,120	13,755	14,410	14,795	17,510	18,350	18,835
8	7,295	7,590	7,765	9,120	9,490	9,710	10,950	11,400	11,660	11,475	11,945	12,215	14,610	15,210	15,555
9	6,155	6,375	6,500	7,700	7,970	8,130	9,245	9,575	9,765	9,685	10,030	10,230	12,330	12,770	13,025
10	5,250	5,415	5,510	6,570	6,770	6,890	7,885	8,135	8,280	8,260	8,525	8,675	10,520	10,850	11,040
11	4,525	4,655	4,730	5,660	5,820	5,910	6,795	6,990	7,100	7,120	7,325	7,440	9,065	9,325	9,475
12	3,935	4,040	4,095	4,920	5,050	5,120	5,910	6,065	6,150	6,195	6,355	6,445	7,885	8,090	8,210
13	3,455	3,535	3,580	4,320	4,420	4,480	5,185	5,310	5,380	5,435	5,565	5,635	6,920	7,080	7,175
14	3,050	3,120	3,155	3,820	3,900	3,950	4,585	4,685	4,740	4,805	4,905	4,965	6,115	6,250	6,325
	3½" x 7¼"			5¼" x 5¼"			5¼" x 5½"			5¼" x 7"			5¼" x 7¼"		
	100%	115%	125%	100%	115%	125%	100%	115%	125%	100%	115%	125%	100%	115%	125%
4	31,670	34,750	36,625												
5	26,615	28,560	29,705												
6	21,950	23,215	23,950	34,355	37,695	39,715	36,010	39,495	41,610						
7	18,140	19,005	19,505	30,700	33,170	34,625	32,165	34,750	36,280						
8	15,135	15,755	16,110	27,095	28,910	29,975	28,390	30,295	31,405	36,160	38,590	40,000	37,450	39,960	41,420
9	12,770	13,225	13,490	23,815	25,180	25,980	24,950	26,385	27,220	31,770	33,600	34,670	32,910	34,800	35,910
10	10,895	11,240	11,440	20,950	22,005	22,620	21,950	23,060	23,700	27,950	29,360	30,190	28,960	30,420	31,260
11	9,390	9,660	9,810	18,500	19,340	19,820	19,385	20,260	20,770	24,690	25,810	26,450	25,570	26,720	27,400
12	8,170	8,380	8,500	16,420	17,085	17,475	17,200	17,910	18,305	21,910	22,800	23,320	22,690	23,620	24,150
13	7,165	7,335	7,430	14,640	15,185	15,500	15,340	15,910	16,240	19,540	20,270	20,680	20,230	20,990	21,430
14	6,335	6,470	6,550	13,120	13,570	13,830	13,750	14,220	14,490	17,510	18,110	18,460	18,140	18,760	19,110
15				11,820	12,195	12,405	12,385	12,775	13,000	15,770	16,270	16,560	16,330	16,850	17,150
16				10,690	11,005	11,185	11,200	11,530	11,720	14,270	14,690	14,930	14,780	15,210	15,460
17				9,715	9,980	10,135	10,180	10,460	10,620	12,960	13,320	13,520	13,420	13,790	14,010
18				8,860	9,090	9,220	9,285	9,525	9,660	11,820	12,130	12,300	12,250	12,560	12,740
19				8,110	8,310	8,420	8,500	8,705	8,825	10,820	11,090	11,240	11,210	11,480	11,640
20				7,455	7,625	7,720	7,810	7,990	8,090	9,950	10,170	10,300	10,300	10,540	10,670
21				6,870	7,020	7,105	7,195	7,355	7,445	9,170	9,370	9,480	9,490	9,700	9,820
22															

Allowable Design Stresses		
	Modulus of Elasticity:	$E = 1.8 \times 10^6$ psi
Bending:	Parallel to Gluelines (Beam):	$F_b = 2750*(12/d)^{1/9}$ psi
	Perp to Gluelines (Plank):	$F_b = 2500*(12/d)^{1/9}$ psi
	Compression Parallel to Grain:	$F_{c\parallel} = 3000$ psi
Compression Perpendicular to Grain:		
	Parallel to Gluelines (Beam):	$F_{c\parallel} = 750$ psi
	Perp to Gluelines (Plank):	$F_c\perp = 450$ psi
	Tension Parallel to Grain:	$F_t = 1650$ psi

Notes

1) Table assumes that the column is braced at column ends only. Effective column length is equal to actual column length.
2) Allowable loads are based upon one-piece (solid) column members used in dry service conditions. Contact project's design professional of record or Boise Cascade EWP Engineering for multi-piece column design.
3) Allowable loads are based on an eccentricity value equal to 0.167 multiplied by either the column thickness or width (worst case).
4) Allowable loads are based on axial loaded columns using the design provisions of the National Design Specification for Wood Construction (NDS), 2005 edition. For side or other combined bending and axial loads, see provisions of NDS, 2005 edition.
5) Load values are not shown for short lengths due to loads exceeding common connector capacities. Load values are not shown for longer lengths if the controlling slenderness ratio exceeds 50 (per NDS).
6) Wind loads are not considered in this table: analyze such conditions with BC CALC® software.

VERSA-STUD® 1.7 2650

Allowable Design Values

Product	Bending F_b [psi]	Compression Parallel to Grain F_c [psi]	Modulus of Elasticity E [psi]	Horizontal Shear F_v [psi]
VERSA-STUD 1.7 2650	**2650**	**3000**	**1,700,000**	**285**
Spruce Pine Fir (North) # 1 / 2 Grade	875	1150	1,400,000	135
Hem-Fir # 2 Grade	850	1300	1,300,000	150
Western Woods # 2 Grade	675	900	1,000,000	135

Notes:

- Design values are for loads applied to the narrow face of the studs.
- Dimension lumber values taken from 2005 Edition, *NDS Design Values for Wood Construction* (per 2006 IBC/IRC).
- Repetitive member and size factors have not been applied.

For further design information, please see VERSA-STUD® 1.7 2650 Eastern Tall Wall Guide.