



Boise Cascade
Engineered Wood Products

Versa-Lam Horizontal Hole Analysis

Triple 1.75" x 16" Versa-Lam 3100 SP

2" dia. horizontal hole

Select Calculation Method

- Calculate by Entering PLF Loads (simple span only)
- Input Actual Moment, Shear & Deflections

Versa-Lam Grade		3100 SP
Allowable Bending Stress (lb/in ²)	F _b	3100
Allowable Shear Stress (lb/in ²)	F _v	285
Ply Width		1 3/4
# of Plys		3
MOE (lb/in ²)	E	2.0E+06
Member Width (in)	b	5.25
Member Depth (in)	d	16
Member Weight (lb/ft)	w	21.6
Member Length (ft)	L	20
Section Modulus (in ³)	S	224.0
Moment of Inertia (in ⁴)	I	1792.0
Design Hole Diameter (in)	dia	2
Hole Size Factor		1
Factored Hole Diameter (in)		2
Hole Cross-Section Location (in)	y	12
Hole Span Location (ft)	x	5 10/12
New Centroid (in)	y'	7.4
New Moment of Inertia (in ⁴)	I'	1569.1
Allowable Moment (lb*ft)	M _{allow}	38016
Maximum Moment from BC CALC (lb*ft)	M _{actual}	30270
Moment Check		
		OK
Effective Shear Depth	d _{shear}	10.00
Allowable Shear (lb)	V _{allow}	9975
Maximum Shear from BC CALC (lb)	V _{actual}	5202
Shear Check		
		OK
Live Deflection L/over Limit		360
Maximum Live Deflection w/o Hole (in)		0.434
Live Deflection w/ Hole (in)		0.495
Live Deflection Check		
		OK
Total Deflection L/over Limit		240
Maximum Total Deflection w/o Hole (in)		0.6075
Total Deflection w/ Hole (in)		0.694
Total Deflection Check		
		OK

Description: Single Span Floor Beam

Loading: 30 LL/10 DL psf, 11'-6" Tributary

Span(s): 20'-0"

Address: 42 Randall St.

Portland, ME

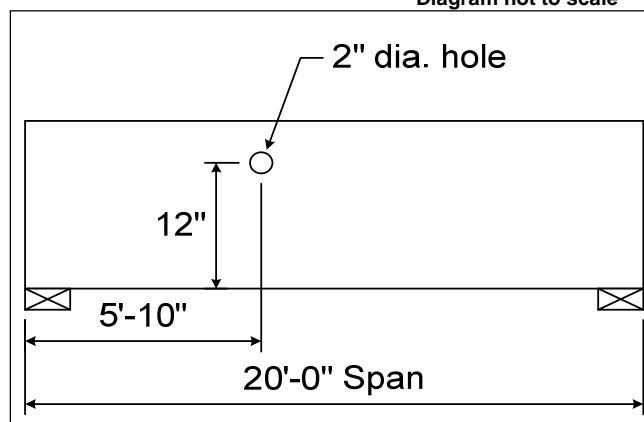
Customer: Chris Grey

Distributor: Boise Cascade - Portsmouth

Contact: Sinh Nguyen

Date: 10/16/2014

Diagram not to scale



Triple 1.75" x 16" Versa-Lam 3100 SP with a 2" dia. horizontal hole is allowable according to the information shown above

Design Notes:

Top side of member shall be continuously laterally braced by sheathing or laterally braced 24 inches o.c. maximum. All loads shown have been provided by others. Hole sizes, cuts and locations shown are based on degree of information provided by others. If edge of hole is not at least 4 inches horizontally from edge of any face or top mount hanger, hanger manufacturer shall be contacted for any reductions in hanger capacity. Top of any hanger located on the side of the beam shall be a maximum of 3-1/8 inches from the top of the beam. Beam plies shall be fastened with nails or screws as shown in Installation Guide or on BC CALC Design Report for maximum side load applied. Bolted beam ply connections require additional hole spacing requirements that are not shown.

Hole Notes:

Horizontal hole analysis is for checking effects of holes due to lag bolts, bolts, electrical holes, duct holes or other types of holes and is based on vertical and horizontal locations shown on this report.

Connection design to support loads is the responsibility of others.