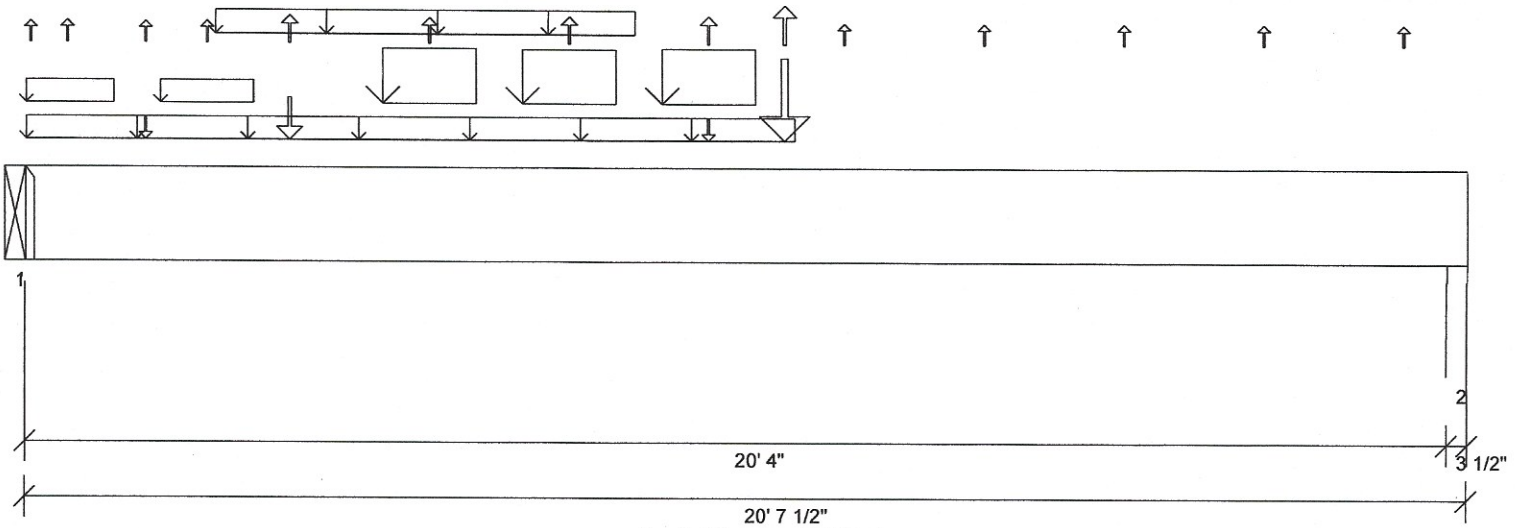
Member: 4 - 2.0 RigidLam LVL 1-3/4 x 16

Status: Design Passed



Graphical Illustration - Not To Scale
Member Cut Length - 20'- 7 1/2"
MemberPitch - 0/12

Design Information:

Building Code:	IRC 2012	Floor Dead Load:	10.0 lb/ft²	Roof Dead Load:	10.0 lb/ft²	Ground Snow Load:	0.0 lb/ft²
Design Methodology:	ASD	Floor Live Load:	40.0 lb/ft²	Roof Live Load:	20.0 lb/ft²		
		Unbraced Length Top:	0'	Bottom:	1'- 10 1/2"		

Design Results:

	Location	Design	Control		Result	LDF	Load Combination
Critical Moment (Pos)	10'- 10 1/4"	52921.98 lb ft	93040.51 lb ft		Passed - 57%	1.25	D + Lr
Critical Moment (Neg)		0.00 lb ft	0.00 lb ft				
Critical Moment (Neg)		0.00 lb ft	0.00 lb ft				
Critical Shear	1'- 4"	8109.25 lb	27066.67 lb		Passed - 30%	1.25	D + Lr
Live Load Deflection	9'- 11 15/16"	0'- 5/16"	N/A (L/480)		Passed - L/714	-	Lr
Total Load Deflection	9'- 11 15/16"	0'- 3/4"	N/A (L/240)		Passed - L/313	-	D + Lr
Max. Reaction			Supported Mtl	Supporting Mtl			
	0'	8454.13 lb	8454.13 lb	0.00 lb	Passed - 100%	1.25	D + Lr
	20'- 5"	5841.42 lb	20343.71 lb	17762.46 lb	Passed - 33%	1.25	D + Lr

Design Notes:

* Member design assumed proper ply to ply connection. Verify connection between plies according to code specification

Loading:

				Maximum Load Magnitudes			
Type	Start	End	Source	Dead	Floor Live	Roof Live	Snow
Self Weight	0'	20'- 7 1/2"	Self Weight	30 lb/ft	-	-	-
Uniform	-0'	11'	E29(i17)	65 lb/ft	-	-	-
Uniform	-0'	1'- 3 1/16"	E29(i17)	-	-	52 lb/ft	-
Uniform	1'- 11 1/16"	3'- 3 1/16"	E29(i17)	-	-	51 lb/ft	-
Uniform	2'- 8 1/2"	8'- 8 1/2"	Smoothed Load	38 lb/ft	-	38 lb/ft	-
Uniform	5'- 1 1/4"	6'- 5 1/4"	E29(i17)	503 lb/ft	-	482 lb/ft	-
Uniform	7'- 1 1/4"	8'- 5 1/4"	E29(i17)	487 lb/ft	-	472 lb/ft	-
Uniform	9'- 1 1/4"	10'- 5 1/4"	E29(i17)	494 lb/ft	-	486 lb/ft	-
Point	0'- 3/4"	0'- 3/4"	H1(Cond06)	-	-	-3.00 lb	-
Point	0'- 7 1/16"	0'- 7 1/16"	E29(i17)	-	-	-	-
Point	1'- 8 1/2"	1'- 8 1/2"	H1(Cond05)	-	-	70.00/-5.00 lb	-
Point	2'- 7 1/16"	2'- 7 1/16"	E29(i17)	-	-	-	-
Point	3'- 9 1/4"	3'- 9 1/4"	-	1092.00 lb	-	886.00/-56.00 lb	-
Point	5'- 9 1/4"	5'- 9 1/4"	-	-	-	-6.00 lb	-
Point	7'- 9 1/4"	7'- 9 1/4"	-	-	-	-6.00 lb	-
Point	9'- 9 3/16"	9'- 9 3/16"	-	-	-	72.00/-4.00 lb	-
Point	10'- 10 1/4"	10'- 10 1/4"	-	2984.00 lb	-	2656.00/-8.00 lb	-
Point	11'- 8 1/2"	11'- 8 1/2"	H2(Cond01)	-	-	-4.00 lb	-
Point	13'- 8 1/2"	13'- 8 1/2"	H2(Cond02)	-	-	-6.00 lb	-
Point	15'- 8 1/2"	15'- 8 1/2"	H2(Cond03)	-	-	-6.00 lb	-
Point	17'- 8 1/2"	17'- 8 1/2"	H2(Cond04)	-	-	-6.00 lb	-
Point	19'- 8 1/2"	19'- 8 1/2"	H2(Cond05)	-	-	-5.00 lb	-

Support Information:

				Maximum Analysis Reactions			
Support	Start	End	Source	Dead	Floor Live	Roof Live	Snow
1	0'	0'	BM3(i227)	4841.00 lb	-	3611.00/-73.00 lb	-
2	20'- 4"	20'- 7 1/2"	-	3346.00 lb	-	2496.00/-42.00 lb	-
++>	20'- 6 5/8"	20'- 6 5/8"	3(i30)	1673.00 lb	-	1248.00/-21.00 lb	-
++>	20'- 6 5/8"	20'- 6 5/8"	E10(i2)	1673.00 lb	-	1248.00/-21.00 lb	-

Connector Information:

Support	Manufacturer	Model	Nailing Requirements			Min Seat Length	Other Information
			Top	Face	Member		
1		THDH7214	-	66- BM3	16- FB1	N/A	User Defined Hanger - Not Designed

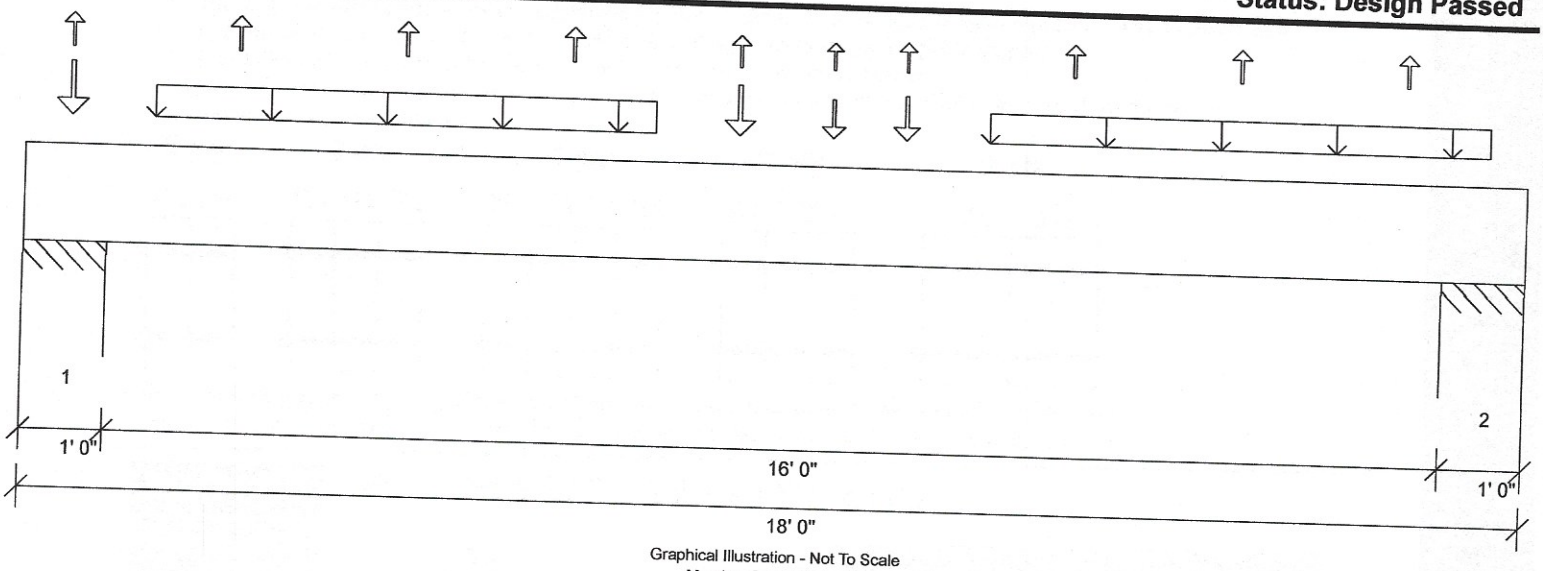
Errors, Warnings & Notes:

* The dead loads used in the design of this member were applied to the structure as sloped dead loads.
* The member graphic, dimensions, and locations shown on this report are based on the centerline of the member.
* Analysis and Design has been performed using precision loading from actual modeled conditions. Some loads may have been modified to simplify reporting.

Lot 99 MP

Member: 2 - 2.0 RigidLam LVL 1-3/4 x 14

Status: Design Passed



Graphical Illustration - Not To Scale
Member Cut Length - 18'
MemberPitch - 0/12

Design Information:

Building Code: IRC 2012
Design Methodology: ASD

Floor Dead Load: 10.0 lb/ft²
Floor Live Load: 40.0 lb/ft²
Unbraced Length Top: 1'- 10 1/2"

Roof Dead Load: 10.0 lb/ft²
Roof Live Load: 20.0 lb/ft²
Bottom: 16'

Ground Snow Load: 0.0 lb/ft²

Design Results:

	Location	Design	Control	Result	LDF	Load Combination
Critical Moment (Pos)	8'- 6 1/2"	4030.63 lb ft	36215.18 lb ft	Passed - 11%	1.25	D + Lr
Critical Moment (Neg)		0.00 lb ft	0.00 lb ft			
Critical Moment (Neg)		0.00 lb ft	0.00 lb ft			
Critical Shear	2'- 2"	925.58 lb	11841.67 lb	Passed - 8%	1.25	D + Lr
Live Load Deflection	8'- 11 3/8"	0'- 1/16"	N/A (L/480)	Passed - L/999	-	Lr
Total Load Deflection	8'- 11 11/16"	0'- 1/8"	N/A (L/240)	Passed - L/999	-	D + Lr
Max. Reaction			Supported Mtl / Supporting Mtl			
	0'- 11"	1163.61 lb	31500.01 lb / 30450.00 lb	Passed - 4%	1.25	D + Lr
	17'- 1"	1000.81 lb	31500.06 lb / 30450.05 lb	Passed - 3%	1.25	D + Lr

Design Notes:

* Member design assumed proper ply to ply connection. Verify connection between plies according to code specification

Loading:

Type	Start	End	Source	Maximum Load Magnitudes: Dead	Floor Live	Roof Live	Snow
Self Weight	0'	18'	Self Weight	13 lb/ft	-	-	-
Uniform	1'- 6 1/2"	7'- 6 1/2"	Smoothed Load	52 lb/ft	-	60 lb/ft	-
Uniform	11'- 6 1/2"	17'- 6 1/2"	Smoothed Load	46 lb/ft	-	51 lb/ft	-
Point	0'- 6 1/2"	0'- 6 1/2"	H1(Cond05)	99.00 lb	-	111.00 lb	-
Point	2'- 6 1/2"	2'- 6 1/2"	H1(Cond04)	-	-	-	-
Point	4'- 6 1/2"	4'- 6 1/2"	H1(Cond03)	-	-	-	-
Point	6'- 6 1/2"	6'- 6 1/2"	H1(Cond02)	-	-	-	-
Point	8'- 6 1/2"	8'- 6 1/2"	H1(Cond01)	92.00 lb	-	99.00 lb	-
Point	9'- 8"	9'- 8"	H3(Cond01)	65.00 lb	-	50.00 lb	-
Point	10'- 6 1/2"	10'- 6 1/2"	H2(Cond01)	77.00 lb	-	73.00 lb	-
Point	12'- 6 1/2"	12'- 6 1/2"	H2(Cond02)	-	-	-	-
Point	14'- 6 1/2"	14'- 6 1/2"	H2(Cond03)	-	-	-	-
Point	16'- 6 1/2"	16'- 6 1/2"	H2(Cond04)	-	-	-	-

Support Information:

Support	Start	End	Source	Maximum Analysis Reactions: Dead	Floor Live	Roof Live	Snow
1	0'	1'	E13(i22)	616.00 lb	-	548.00 lb	-
2	17'	18'	E12(i1)	544.00 lb	-	457.00/-3.00 lb	-

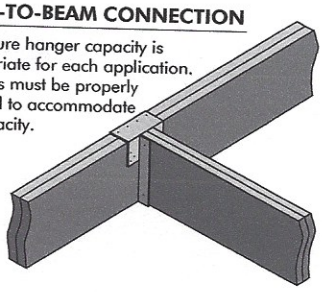
Errors, Warnings & Notes:

* The dead loads used in the design of this member were applied to the structure as sloped dead loads.
* The member graphic, dimensions, and locations shown on this report are based on the centerline of the member.
* Analysis and Design has been performed using precision loading from actual modeled conditions. Some loads may have been modified to simplify reporting.

RigidLam LVL Bearing Details

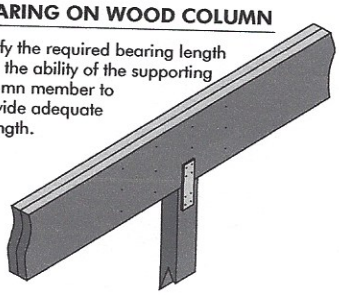
BEAM-TO-BEAM CONNECTION

Make sure hanger capacity is appropriate for each application. Hangers must be properly installed to accommodate full capacity.



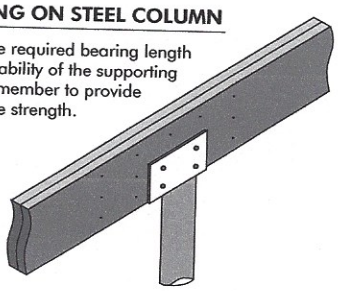
BEARING ON WOOD COLUMN

Verify the required bearing length and the ability of the supporting column member to provide adequate strength.

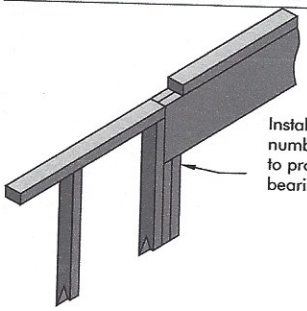


BEARING ON STEEL COLUMN

Verify the required bearing length and the ability of the supporting column member to provide adequate strength.



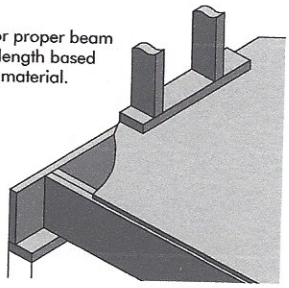
BEARING FOR DOOR OR WINDOW HEADER



Install the appropriate number of jack studs to provide required bearing length.

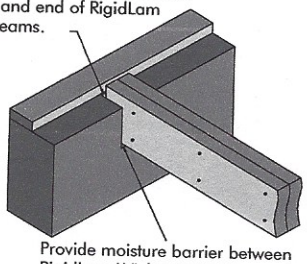
BEARING ON EXTERIOR WALL

Check for proper beam bearing length based on plate material.



POCKET CONSTRUCTION

Provide 1/2" air space on top, sides and end of RigidLam LVL beams.

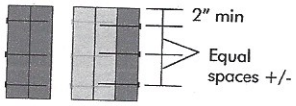


Provide moisture barrier between RigidLam LVL beams and concrete.

Fastening Recommendations For Multiple Ply LVL Members

TOP LOADED MEMBERS - 2 & 3 PLY

For 12" deep (or less) members, nail plies together with 2 rows of 16dx3½" com. nails at 12" o.c. (add 1 row for 16d sinkers).



2-Ply 3-Ply

For 14", 16" or 18" deep members, nail plies together with 3 rows of 16dx3½" com. nails at 12" o.c. (add 1 row for 16d sinkers).

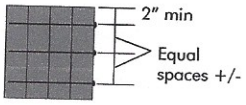
For 20", 22" or 24" deep members, nail plies together with 4 rows of 16dx3½" com. nails at 12" o.c. (add 1 row for 16d sinkers).

TOP LOADED MEMBERS - 4 PLY

For 4-Ply Top Loaded members, it is recommended to connect the plies together with appropriate wood screws (see page 33 for approved wood screws).

The recommended fastener spacing is two rows at 24" o.c. for up to and including 16" deep members, and 3 rows at 24" o.c. for members up to and including 24" deep. If the fastener point penetrates a minimum of 75% of the 4th ply, they may be applied from one side of the beam; otherwise, the fasteners must be applied from both sides and staggered.

Load must be applied evenly to all 4 plies; otherwise, use connections for side loaded members.



4-Ply

SIDE LOADED MEMBERS

MAXIMUM UNIFORM LOAD APPLIED TO EITHER OUTSIDE PIECE - POUNDS PER LINEAL FOOT

1-1/2" Thick Pieces in Member	Nail Size	Nailed				Bolted					
		2 rows 10d common at 12" o.c.		3 rows 10d common at 12" o.c.		2 rows 1/2" bolts at 24" o.c.		2 rows 1/2" bolts at 12" o.c.		3 rows 1/2" bolts at 12" o.c.	
		1.3E & 1.5E	2.0E & 2.2E	1.3E & 1.5E	2.0E & 2.2E	1.3E & 1.5E	2.0E & 2.2E	1.3E & 1.5E	2.0E & 2.2E	1.3E & 1.5E	2.0E & 2.2E
2 - 1-1/2"	10d com. (0.148" x 3")	465	465	700	700	395	435	795	870	1190	1305
3 - 1-1/2"	10d com. (0.148" x 3")	350	350	525	525	295	325	595	650	895	980
4 - 1-1/2"	use bolts	-	-	-	-	265	290	530	580	795	870

1-3/4" Thick Pieces in Member	Nail Size	Nailed				Bolted					
		2 rows 16d common at 12" o.c.		3 rows 16d common at 12" o.c.		2 rows 1/2" bolts at 24" o.c.		2 rows 1/2" bolts at 12" o.c.		3 rows 1/2" bolts at 12" o.c.	
		1.3E & 1.5E	2.0E & 2.2E	1.3E & 1.5E	2.0E & 2.2E	1.3E & 1.5E	2.0E & 2.2E	1.3E & 1.5E	2.0E & 2.2E	1.3E & 1.5E	2.0E & 2.2E
2 - 1-3/4"	16d com. (0.162" x 3-1/2")	560	560	845	845	460	505	925	1015	1390	1520
3 - 1-3/4"	16d com. (0.162" x 3-1/2")	420	420	635	635	345	380	695	760	1040	1140
4 - 1-3/4"	use bolts	-	-	-	-	305	335	615	675	925	1015
2 - 3-1/2"	use bolts	-	-	-	-	820	860	1640	1720	2465	2580

RECOMMENDED FASTENER DESIGN INFORMATION IN TERMS OF EQUIVALENT SPECIFIC GRAVITY FOR HEADER GRADES OF RIGIDLAM LVL

	Face		Edge	
	1.3E & 1.5E	2.0E & 2.2E	1.3E & 1.5E	2.0E & 2.2E
Withdrawal - nail	0.50	0.50	0.47	0.50
Dowel Bearing - nail	0.50	0.50	0.47	0.50
Dowel Bearing - bolt	0.47	0.50	Not applicable	

- Use appropriate software (e.g. Simpson Strong-Tie® Component Solutions™) or beam/header charts or plf load tables to size the beam.
- The table values apply to common (A307) bolts. Bolt holes must be centered at least two inches from the top and bottom edges of the beam. Bolt holes must be the same diameter as the bolts. Washers must be used under the bolt heads and nuts. Offset or stagger rows of bolt holes by one-half of the bolt spacing.
- The specified nailing applies to both sides of a three-piece beam.
- 7 inch wide beams may not be loaded from one side only. They must be loaded from both sides and/or top-loaded.
- The side loaded table values for nails may be doubled for 6" o.c. spacing and tripled for 4" o.c. spacing.
- Duration of load factors (e.g. 115%, 125% etc.) may be applied to the table values.