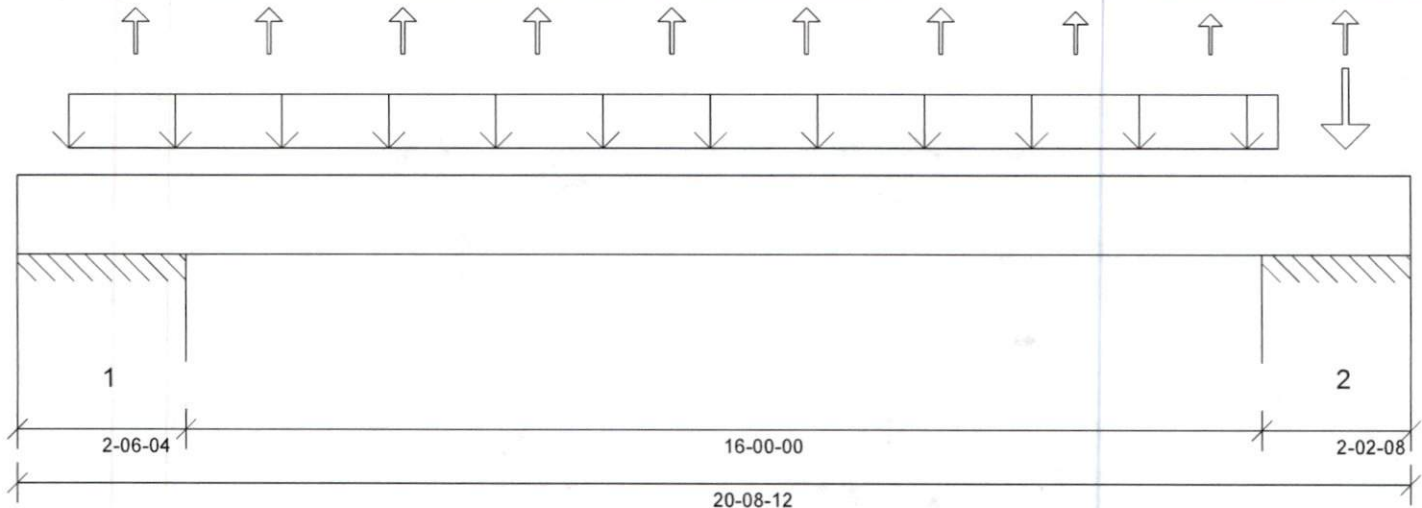




Job: 20010097  
 Member Type: Beam | Level: 1st Floor  
 MiTek SAPPiRE™ Structure Version 8.3.2.221.Update4  
 Designed by Single Member Design Engine  
 Member: 2 - 2.0 RigidLam LVL 1-3/4 x 14

Label: GDH-i17

Page: 1 of 5  
 Date: 03/09/2020 09:48:31  
 Status: Design Passed



20-08-12  
 Graphical Illustration - Not To Scale  
 Member Cut Length - 20'- 8 3/4"  
 MemberPitch - 0/12

**Design Information:**

Building Code: IRC2015	Floor Dead Load: 10.0 lb/ft <sup>2</sup>	Roof Dead Load: 10.0 lb/ft <sup>2</sup>	Ground Snow Load: 20.0 lb/ft <sup>2</sup>
Design Methodology: ASD	Floor Live Load: 40.0 lb/ft <sup>2</sup>	Roof Live Load: 20.0 lb/ft <sup>2</sup>	
	Unbraced Length Top: 1'- 10 1/2"	Bottom: 16'	

**Design Results:**

	Location	Design	Control	Result	LDF	Load Combination
Critical Moment (Pos)	9'- 9 1/4"	5539.76 lb ft	33317.95 lb ft	Passed - 17%	1.15	D + Lr
Critical Moment (Neg)	18'- 7 3/4"	-9904.09 lb ft	27802.80 lb ft	Passed - 36%	1.60	D + 0.75(L + Lr + 0.6W)
Critical Shear	3'- 8 1/4"	3325.55 lb	10894.33 lb	Passed - 31%	1.15	D + Lr
Live Load Deflection	10'- 5 13/16"	0'- 1/16"	0'- 3/4" (L/360)	Passed - L/999	-	0.75(L + Lr + 0.6W)
Total Load Deflection	10'- 5 13/16"	0'- 1/8"	0'- 1" (L/240)	Passed - L/999	-	D + 0.75(L + Lr + 0.6W)
Max. Reaction			Supported Mt   Supporting Mt			
	0'- 1 1/2"	546.53 lb	25565.22 lb   32413.50 lb	Passed - 2%	1.60	0.6D + 0.6W
	0'- 1 1/2"	-3694.19 lb	18375.00 lb   -	Passed - 20%	1.15	D + Lr
	2'- 4 3/4"	7789.28 lb	18375.00 lb   32413.50 lb	Passed - 42%	1.15	D + Lr
	2'- 4 3/4"	-1183.60 lb	25565.22 lb   -	Passed - 5%	1.60	0.6D + 0.6W
	18'- 7 3/4"	8575.07 lb	18375.00 lb   32413.50 lb	Passed - 47%	1.15	D + Lr
	18'- 7 3/4"	-1014.61 lb	25565.22 lb   -	Passed - 4%	1.60	0.6D + 0.6W
	20'- 7 1/4"	589.78 lb	25565.22 lb   32413.50 lb	Passed - 2%	1.60	0.6D + 0.6W
	20'- 7 1/4"	-4321.64 lb	18375.00 lb   -	Passed - 24%	1.15	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'	20'- 8 3/4"	Self Weight	13 lb/ft	-	-	-
Uniform	0'- 9 1/4"	18'- 9 1/4"	Smoothed Load	197 lb/ft	33 lb/ft	222 lb/ft	83 lb/ft
Point	1'- 9 1/4"	1'- 9 1/4"	A1(c08)	-	-20.00 lb	-70.00 lb	-
Point	3'- 9 1/4"	3'- 9 1/4"	A1(c05)	-	-19.00 lb	-70.00 lb	-
Point	5'- 9 1/4"	5'- 9 1/4"	A1(c01)	-	-19.00 lb	-70.00 lb	-
Point	7'- 9 1/4"	7'- 9 1/4"	A1(c02)	-	-19.00 lb	-70.00 lb	-
Point	9'- 9 1/4"	9'- 9 1/4"	A1(c04)	-	-19.00 lb	-70.00 lb	-
Point	11'- 9 1/4"	11'- 9 1/4"	A1(c09)	-	-19.00 lb	-70.00 lb	-
Point	13'- 9 1/4"	13'- 9 1/4"	A1(c07)	-	-19.00 lb	-70.00 lb	-
Point	15'- 9 1/4"	15'- 9 1/4"	A1(c06)	-	-19.00 lb	-70.00 lb	-
Point	17'- 9 1/4"	17'- 9 1/4"	A1(c10)	-	-19.00 lb	-70.00 lb	-
Point	19'- 9 1/4"	19'- 9 1/4"	A1(c03)	420.00 lb	75.00/-22.00 lb	495.00/-70.00 lb	188.00 lb

**Support Information:**

Support	Start	End	Source	Maximum Analysis Reactions			
				Dead	Floor Live	Roof Live	Snow
1	0'	2'- 6 1/4"	E9(i16)	2044.00 lb	404.00/-263.00 lb	2477.00/-963.00 lb	808.00 lb
==>	0'- 1 1/2"	0'- 1 1/2"	E9(i16)	-	79.00/-91.00 lb	290.00/-333.00 lb	-
==>	2'- 4 3/4"	2'- 4 3/4"	E9(i16)	2044.00 lb	325.00/-172.00 lb	2187.00/-630.00 lb	808.00 lb
2	18'- 6 1/4"	20'- 8 3/4"	E8(i7)	2190.00 lb	440.00/-289.00 lb	2695.00/-1049.00 lb	883.00 lb
==>	18'- 7 3/4"	18'- 7 3/4"	E8(i7)	2190.00 lb	352.00/-189.00 lb	2364.00/-691.00 lb	883.00 lb
==>	20'- 7 1/4"	20'- 7 1/4"	E8(i7)	-	88.00/-100.00 lb	331.00/-358.00 lb	-

**Errors, Warnings & Notes:**

- \* CAUTION: The maximum net analysis reaction exceeds the user-defined maximum uplift value at one or more supports.
- \* The dead loads used in the design of this member were applied to the structure as projected dead loads.
- \* The member graphic, dimensions, and locations shown in this report are based on the centerline of the member.

- Transfer reactions may differ from design results as allowed per building codes and standard load distribution practices.

- This report is based on modeled conditions input by the user. Actual field conditions may differ from those shown. These results should be reviewed by a qualified design professional.



**Job: 20010097**  
Member Type: Beam | Level: 1st Floor  
MiTek SAPPHIRE™ Structure Version 8.3.2.221.Update4  
Designed by Single Member Design Engine

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

**Label: GDH-i17**

Page: 2 of 5  
Date: 03/09/2020 09:48:31

**Status: Design Passed**

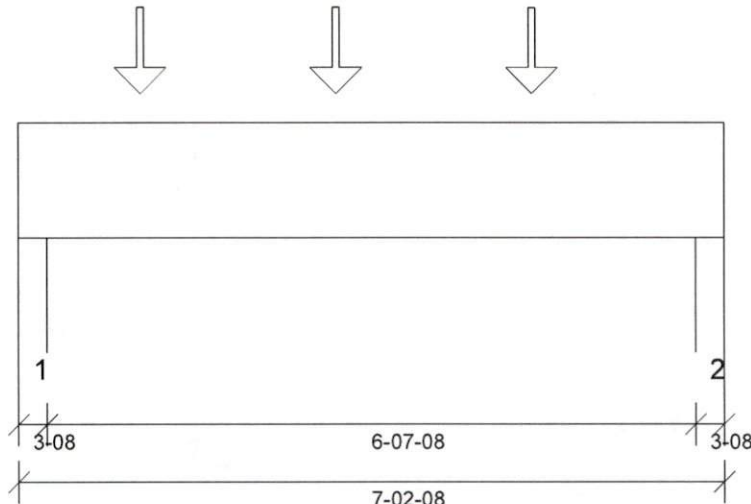
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\* Analysis and Design has been performed using precision loading from actual modeled conditions. Some loads may have been modified to simplify reporting.



**Job: 20010097**  
 Member Type: Beam | Level: 1st Floor  
 MiTek SAPPHIRE™ Structure Version 8.3.2.221.Update4  
 Designed by Single Member Design Engine  
**Member: 2 - 2.0 RigidLam LVL 1-3/4 x 14**

**Label: BM2-i37**  
 Page: 3 of 5  
 Date: 03/09/2020 09:48:33  
**Status: Design Passed**



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

**Design Information:**

Building Code: IRC2015	Floor Dead Load: 10.0 lb/ft²	Roof Dead Load: 10.0 lb/ft²	Ground Snow Load: 20.0 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'- 8 1/2"	

**Design Results:**

	Location	Design	Control	Result	LDF	Load Combination	
Critical Moment (Pos)	3'- 3"	3210.36 lb ft	28972.14 lb ft	Passed - 11%	1.00	D + L	
Critical Shear	1'- 5 1/2"	1554.78 lb	9473.33 lb	Passed - 16%	1.00	D + L	
Live Load Deflection	3'- 6 15/16"	0'	0'- 3/4" (L/360)	Passed - L/999	-	L	
Total Load Deflection	3'- 6 15/16"	0'	0'- 1" (L/240)	Passed - L/999	-	D + L	
Max. Reaction	0'- 2 1/2"	1758.46 lb	Supported Mtg 9187.47 lb	Supported Mtg 5206.23 lb	Passed - 34%	1.00	D + L
	7'	1429.78 lb	9187.46 lb	5206.23 lb	Passed - 27%	1.00	D + L

**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'	7'- 2 1/2"	Self Weight	13 lb/ft	-	-	-
Point	1'- 3"	1'- 3"	F3A(c01)	280.00 lb	755.00 lb	-	-
Point	3'- 3"	3'- 3"	F3A(c02)	280.00 lb	755.00 lb	-	-
Point	5'- 3"	5'- 3"	F3A(c03)	278.00 lb	747.00 lb	-	-

**Support Information:**

Support	Start	End	Source	Maximum Analysis Reactions			
				Dead	Floor Live	Roof Live	Snow
1	0'	0'- 3 1/2"	5(i11)	510.00 lb	1248.00 lb	-	-
2	6'- 11"	7'- 2 1/2"	9(i15)	421.00 lb	1009.00 lb	-	-

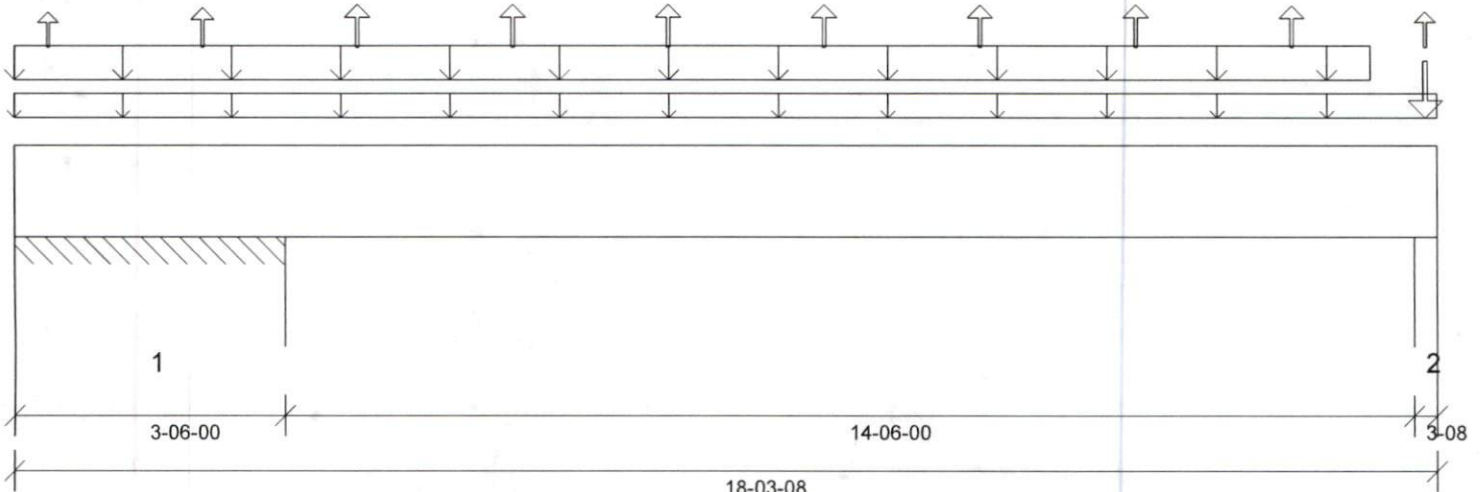
**Errors, Warnings & Notes:**

- \* The dead loads used in the design of this member were applied to the structure as projected 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.



Job: 20010097  
 Member Type: Beam | Level: 1st Floor  
 MITek SAPPHERE™ Structure Version 8.3.2.221.Update4  
 Designed by Single Member Design Engine  
 Member: 2 - 2.0 RigidLam LVL 1-3/4 x 14

Label: BM3-i38  
 Page: 4 of 5  
 Date: 03/09/2020 09:48:33  
 Status: Design Passed



Graphical Illustration - Not To Scale  
 Member Cut Length - 18'- 3 1/2"  
 MemberPitch - 0/12

**Design Information:**

Building Code: IRC2015	Floor Dead Load: 10.0 lb/ft²	Roof Dead Load: 10.0 lb/ft²	Ground Snow Load: 20.0 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)	12'- 5 1/4"	2700.50 lb ft	33317.95 lb ft	Passed - 8%	1.15	D + 0.75(L + Lr)
Critical Moment (Neg)	3'- 4 1/2"	-3536.05 lb ft	33317.95 lb ft	Passed - 11%	1.15	D + 0.75(L + Lr)
Critical Shear	4'- 8"	1284.57 lb	10894.33 lb	Passed - 12%	1.15	D + 0.75(L + Lr)
Live Load Deflection	11'- 6 9/16"	0'- 1/16"	0'- 3/4" (L/360)	Passed - L/999	-	0.75(L + Lr + 0.6W)
Total Load Deflection	11'- 6 5/8"	0'- 1/16"	0'- 1" (L/240)	Passed - L/999	-	D + 0.75(L + Lr + 0.6W)
Max. Reaction	0'- 1 1/2"	134.15 lb	Supported Mit: 18375.00 lb	Passed - 1%	1.60	0.6D + 0.6W
	0'- 1 1/2"	-973.15 lb	Supporting Mit: 10412.50 lb	Passed - 9%	1.60	D + 0.75(L + Lr + 0.6W)
	3'- 4 1/2"	2738.36 lb	18375.00 lb	Passed - 26%	1.15	D + 0.75(L + Lr)
	3'- 4 1/2"	-347.51 lb	25565.22 lb	Passed - 3%	1.60	0.6D + 0.6W
	18'- 1"	1070.83 lb	9187.66 lb	Passed - 21%	1.15	D + 0.75(L + Lr)
	18'- 1"	-81.83 lb	12782.83 lb	Passed - 2%	1.60	0.6D + 0.6W

**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'- 3 1/2"	Self Weight	13 lb/ft	-	-	-
Uniform	0'	18'- 3 1/2"	FC1 Floor Material	10 lb/ft	39 lb/ft	-	-
Uniform	0'	17'- 5 1/4"	Smoothed Load	53 lb/ft	-	74 lb/ft	31 lb/ft
Point	0'- 5 1/4"	0'- 5 1/4"	T1(c02)	-	-	-1.00 lb	-
Point	2'- 5 1/4"	2'- 5 1/4"	T1(c03)	-	-	-1.00 lb	-
Point	4'- 5 1/4"	4'- 5 1/4"	T1(c01)	-	-	-2.00 lb	-
Point	6'- 5 1/4"	6'- 5 1/4"	T1A(c02)	-	-	-	-
Point	8'- 5 1/4"	8'- 5 1/4"	T1A(c01)	-	-	-	-
Point	10'- 5 1/4"	10'- 5 1/4"	T1A(c05)	-	-	-	-
Point	12'- 5 1/4"	12'- 5 1/4"	T1A(c03)	-	-	-	-
Point	14'- 5 1/4"	14'- 5 1/4"	T1A(c06)	-	-	-	-
Point	16'- 5 1/4"	16'- 5 1/4"	T1A(c04)	-	-	-	-
Point	18'- 1 3/4"	18'- 1 3/4"	E14(i32)	161.00 lb	-	69.00 lb	27.00 lb

**Support Information:**

Support	Start	End	Source	Maximum Analysis Reactions			
				Dead	Floor Live	Roof Live	Snow
1	0'	3'- 6"	9(i15)	1292.00/-347.00 lb	758.00/-267.00 lb	1420.00/-495.00 lb	524.00/-136.00 lb
==>	0'- 1 1/2"	3'- 1 1/2"	9(i15)	-347.00 lb	78.00/-267.00 lb	168.00/-492.00 lb	-136.00 lb
==>	3'- 4 1/2"	3'- 4 1/2"	9(i15)	1292.00 lb	680.00 lb	1252.00/-3.00 lb	524.00 lb
2	18'	18'- 3 1/2"	E7(i6)	564.00 lb	237.00/-1.00 lb	437.00/-1.00 lb	181.00 lb

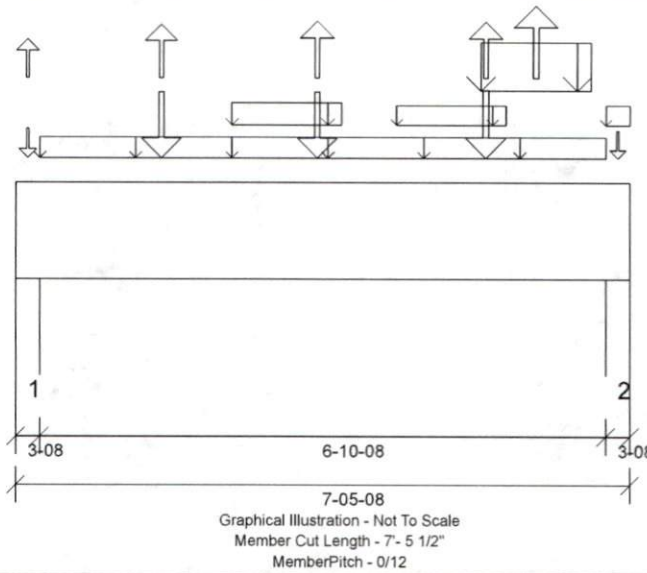
**Errors, Warnings & Notes:**

- \* CAUTION: The maximum net analysis reaction exceeds the user-defined maximum uplift value at one or more supports.
- \* The dead loads used in the design of this member were applied to the structure as projected 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.



**Job: 20010097**  
 Member Type: Beam | Level: 1st Floor  
 MiTek SAPPiRE™ Structure Version 8.3.2.221.Update4  
 Designed by Single Member Design Engine  
**Member: 2 - 2.0 RigidLam LVL 1-3/4 x 14**

**Label: BM4-i46**  
 Page: 5 of 5  
 Date: 03/09/2020 09:48:33  
**Status: Design Passed**



**Design Information:**

Building Code: IRC2015	Floor Dead Load: 10.0 lb/ft <sup>2</sup>	Roof Dead Load: 10.0 lb/ft <sup>2</sup>	Ground Snow Load: 20.0 lb/ft <sup>2</sup>
Design Methodology: ASD	Floor Live Load: 40.0 lb/ft <sup>2</sup>	Roof Live Load: 20.0 lb/ft <sup>2</sup>	
	Unbraced Length Top: 0'	Bottom: 1'- 10 1/2"	

**Design Results:**

	Location	Design	Control	Result	LDF	Load Combination
Critical Moment (Pos)	3'- 9 1/4"	2182.19 lb ft	33317.95 lb ft	Passed - 7%	1.15	D + Lr
Critical Moment (Neg)	3'- 9 1/4"	-419.92 lb ft	46355.42 lb ft	Passed - 1%	1.60	0.6D + 0.6W
Critical Shear	6'	891.08 lb	10894.33 lb	Passed - 8%	1.15	D + Lr
Live Load Deflection	3'- 9 1/2"	0'	0'- 3/4" (L/360)	Passed - L/999	-	0.6W
Total Load Deflection	3'- 9 1/4"	0'	0'- 1" (L/240)	Passed - L/999	-	D + 0.75(L + Lr + 0.6W)
Max. Reaction			<u>Supported Mt</u> <u>Supporting Mt</u>			
	0'- 2 1/2"	1071.76 lb	9187.47 lb    5206.23 lb	Passed - 21%	1.15	D + Lr
	0'- 2 1/2"	-223.02 lb	12782.57 lb    -	Passed - 4%	1.60	0.6D + 0.6W
	7'- 3"	1612.79 lb	9187.42 lb    5206.20 lb	Passed - 31%	1.15	D + Lr
	7'- 3"	-217.61 lb	12782.50 lb    -	Passed - 4%	1.60	0.6D + 0.6W

**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'	7'- 5 1/2"	Self Weight	13 lb/ft	-	-	-
Uniform	0'- 3 1/2"	7'- 2"	E12(i30)	65 lb/ft	-	-	-
Uniform	2'- 7 1/2"	3'- 11 1/2"	E12(i30)	58 lb/ft	-	27 lb/ft	8 lb/ft
Uniform	4'- 7 1/2"	5'- 11 1/2"	E12(i30)	17 lb/ft	-	-	-
Uniform	5'- 7 13/16"	6'- 11 13/16"	E12(i30)	200 lb/ft	-	309 lb/ft	130 lb/ft
Uniform	7'- 2"	7'- 5 1/2"	FC1 Floor Material	-	40 lb/ft	-	-
Point	1'- 9 1/4"	1'- 9 1/4"	P1(c01)	206.00 lb	-	153.00 lb	83.00 lb
Point	3'- 7 15/16"	3'- 7 15/16"	-	206.00 lb	-	153.00/-4.00 lb	83.00 lb
Point	5'- 8 1/2"	5'- 8 1/2"	-	212.00 lb	-	164.00/-20.00 lb	89.00/-6.00 lb
Point	0'- 1 3/4"	0'- 1 3/4"	E13(i31)	52.00 lb	-	52.00 lb	22.00 lb
Point	6'- 3 13/16"	6'- 3 13/16"	E12(i30)	-	-	-	-
Point	7'- 3 3/4"	7'- 3 3/4"	E11(i28)	119.00 lb	-	-	-

**Support Information:**

Support	Start	End	Source	Maximum Analysis Reactions			
				Dead	Floor Live	Roof Live	Snow
1	0'	0'- 3 1/2"	2(i10)	718.00 lb	-	357.00/-8.00 lb	173.00 lb
2	7'- 2"	7'- 5 1/2"	6(i12)	991.00 lb	12.00 lb	619.00/-16.00 lb	283.00 lb

**Errors, Warnings & Notes:**

- \* The dead loads used in the design of this member were applied to the structure as projected 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.