

StruCalc Version 10.0.1.6

8/28/2023 9:23:42 AM

Location: ROOF- Hip st Bedroom 2
 Multi-Loaded Multi-Span Beam
 [2015 International Building Code(2015 NDS)]
 (2) 1.75 IN x 9.25 IN x 20.75 FT (4.1 + 16.7) (Actual 25.2 FT)
 1.9E Microllam - iLevel Trus Joist
 Section Adequate By: 99.9%
 Controlling Factor: Moment

Location: FL! -Garage Door header
 Uniformly Loaded Floor Beam
 [2015 International Building Code(2015 NDS)]
 (2) 1.75 IN x 16.0 IN x 18.67 FT
 1.9E Microllam - iLevel Trus Joist
 Section Adequate By: 74.4%
 Controlling Factor: Moment

Location: ROOF- Valley over Dining
 Multi-Loaded Multi-Span Beam
 [2015 International Building Code(2015 NDS)]
 (2) 1.75 IN x 9.25 IN x 16.91 FT (4.1 + 12.8)
 1.9E Microllam - iLevel Trus Joist
 Section Adequate By: 40.4%
 Controlling Factor: Moment

Location: FL1-Beam at Rear of garage
 Multi-Loaded Multi-Span Beam
 [2015 International Building Code(2015 NDS)]
 (2) 1.75 IN x 9.25 IN x 12.0 FT
 1.9E Microllam - iLevel Trus Joist
 Section Adequate By: 44.7%
 Controlling Factor: Deflection

Location: ROOF- Hip over Family
 Multi-Loaded Multi-Span Beam
 [2015 International Building Code(2015 NDS)]
 1.5 IN x 9.25 IN x 3.83 FT
 #2 - Spruce-Pine-Fir (South) - Dry Use
 Section Adequate By: 111.6%
 Controlling Factor: Shear

Location: FL1-Beam between Dining and Family
 Uniformly Loaded Floor Beam
 [2015 International Building Code(2015 NDS)]
 (2) 1.75 IN x 9.25 IN x 10.0 FT
 1.9E Microllam - iLevel Trus Joist
 Section Adequate By: 19.6%
 Controlling Factor: Shear

Location: ROOF-Valley at Master Bath
 Multi-Loaded Multi-Span Beam
 [2015 International Building Code(2015 NDS)]
 (2) 1.5 IN x 11.25 IN x 13.17 FT (5.7 + 7.5) (Actual 15.7 FT)
 #2 - Spruce-Pine-Fir (South) - Dry Use
 Section Adequate By: 37.1%
 Controlling Factor: Moment

Location: FL1- Beam at Dining
 Multi-Loaded Multi-Span Beam
 [2015 International Building Code(2015 NDS)]
 1.75 IN x 16.0 IN x 10.33 FT
 1.9E Microllam - iLevel Trus Joist
 Section Adequate By: 6.1%
 Controlling Factor: Shear

Location: ROOF- Hip at laundry
 Multi-Loaded Multi-Span Beam
 [2015 International Building Code(2015 NDS)]
 (2) 1.5 IN x 11.25 IN x 9.0 FT (Actual 10.6 FT)
 #2 - Spruce-Pine-Fir (South) - Dry Use
 Section Adequate By: 14.3%
 Controlling Factor: Moment

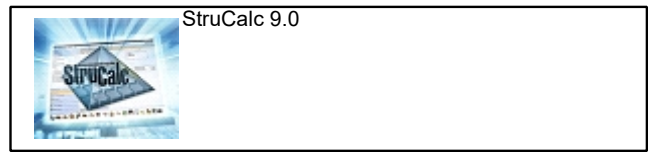
Location: FL1-Beam between Kitchen and Family
 Uniformly Loaded Floor Beam
 [2015 International Building Code(2015 NDS)]
 (2) 1.75 IN x 18.0 IN x 17.83 FT
 1.9E Microllam - iLevel Trus Joist
 Section Adequate By: 8.5%
 Controlling Factor: Moment

Location: ROOF-Valley at Playroom
 Multi-Loaded Multi-Span Beam
 [2015 International Building Code(2015 NDS)]
 (2) 1.75 IN x 11.875 IN x 19.08 FT (4.3 + 14.8) (Actual 22.7 FT)
 1.9E Microllam - iLevel Trus Joist
 Section Adequate By: 5.5%
 Controlling Factor: Moment

Location: FL!- Beam at breakfast room
 Multi-Loaded Multi-Span Beam
 [2015 International Building Code(2015 NDS)]
 (3) 1.75 IN x 18.0 IN x 15.0 FT
 1.9E Microllam - iLevel Trus Joist
 Section Adequate By: 13.6%
 Controlling Factor: Moment

Location: FL2- Roof beam at Foyer
 Combination Roof And Floor Beam
 [2015 International Building Code(2015 NDS)]
 (3) 1.5 IN x 9.25 IN x 11.0 FT
 #2 - Spruce-Pine-Fir (South) - Dry Use
 Section Adequate By: 17.1%
 Controlling Factor: Moment

Location: FL1-Front porch header
 Combination Roof And Floor Beam
 [2015 International Building Code(2015 NDS)]
 (2) 1.5 IN x 9.25 IN x 11.0 FT
 #2 - Spruce-Pine-Fir (South) - Dry Use
 Section Adequate By: 28.0%
 Controlling Factor: Moment



Location: FL1-Gsrage beam
Uniformly Loaded Floor Beam
[2015 International Building Code(2015 NDS)]
(3) 1.75 IN x 24.0 IN x 24.67 FT
Versa-Lam 2800 Fb DF - Boise Cascade
Section Adequate By: 116.7%
Controlling Factor: Moment

Location: FL1- header at side load garage
Multi-Loaded Multi-Span Beam
[2015 International Building Code(2015 NDS)]
(2) 1.75 IN x 24.0 IN x 18.67 FT
Versa-Lam 2800 Fb DF - Boise Cascade
Section Adequate By: 19.2%
Controlling Factor: Moment

Project: 230609B Fletcher

Location: ROOF- Hip st Bedroom 2

Multi-Loaded Multi-Span Beam

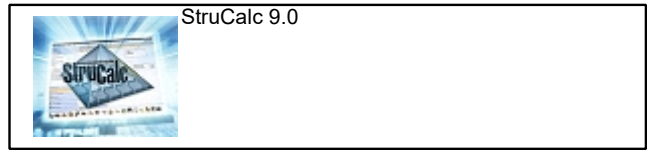
[2015 International Building Code(2015 NDS)]

(2) 1.75 IN x 9.25 IN x 20.75 FT (4.1 + 16.7) (Actual 25.2 FT)

1.9E Microllam - iLevel Trus Joist

Section Adequate By: 99.9%

Controlling Factor: Moment



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CAUTIONS

* Laminations are to be fully connected to provide uniform transfer of loads to all members

DEFLECTIONS

	Left	Center
Live Load	-0.02 IN L/3637	0.25 IN L/964
Dead Load	-0.01 in	0.26 in
Total Load	-0.03 IN L/1986	0.51 IN L/476
Live Load Deflection Criteria: L/240 Total Load Deflection Criteria: L/180		

REACTIONS

	A	B	C
Live Load	389 lb	2196 lb	334 lb
Dead Load	-291 lb	2221 lb	379 lb
Total Load	98 lb	4417 lb	713 lb
Uplift (1.5 F.S)	-936 lb	0 lb	0 lb
Bearing Length	0.04 in	1.68 in	0.27 in

BEAM DATA

	Left	Center
Span Length	4.08 ft	16.67 ft
Unbraced Length-Top	0 ft	0 ft
Unbraced Length-Bottom	4.08 ft	16.67 ft
Beam End Elevation Difference	14.25 ft	
Live Load Duration Factor	1.15	
Notch Depth	0.00	

MATERIAL PROPERTIES

1.9E Microllam - iLevel Trus Joist

	Base Values	Adjusted
Bending Stress:	Fb = 2600 psi Cd=1.15 Cl=0.86 CF=1.04	Fb' = 2651 psi
Shear Stress:	Fv = 285 psi Cd=1.15	Fv' = 328 psi
Modulus of Elasticity:	E = 1900 ksi	E' = 1900 ksi
Comp. ⊥ to Grain:	Fc - ⊥ = 750 psi	Fc - ⊥' = 750 psi

Controlling Moment:

-5516 ft-lb

Over left support of span 2 (Center Span)

Created by combining all dead loads and live loads on span(s) 1, 2

Controlling Shear:

1901 lb

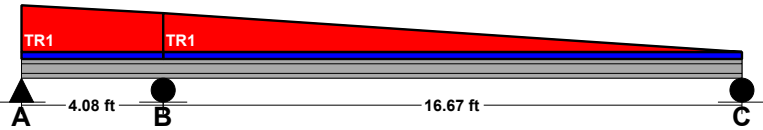
At left support of span 2 (Center Span)

Created by combining all dead loads and live loads on span(s) 1, 2

Comparisons with required sections:

	Req'd	Provided
Section Modulus:	24.97 in3	49.91 in3
Area (Shear):	8.7 in2	32.38 in2
Moment of Inertia (deflection):	87.22 in4	230.84 in4
Moment:	-5516 ft-lb	11026 ft-lb
Shear:	1901 lb	7074 lb

LOADING DIAGRAM



UNIFORM LOADS

	Left	Center
Uniform Live Load	0 plf	0 plf
Uniform Dead Load	0 plf	0 plf
Beam Self Weight	10 plf	10 plf
Total Uniform Load	10 plf	10 plf

TRAPEZOIDAL LOADS - LEFT SPAN

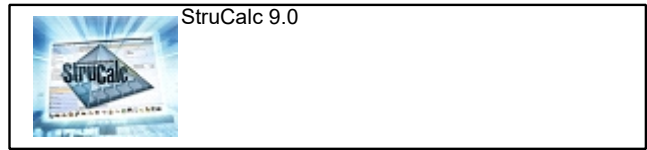
Load Number	One
Left Live Load	212 plf
Left Dead Load	159 plf
Right Live Load	177 plf
Right Dead Load	132 plf
Load Start	0 ft
Load End	4.08 ft
Load Length	4.08 ft

CENTER SPAN

Load Number	One
Left Live Load	177 plf
Left Dead Load	132 plf
Right Live Load	0 plf
Right Dead Load	0 plf
Load Start	0 ft
Load End	16.67 ft
Load Length	16.67 ft

Project: 230609B Fletcher

Location: ROOF- Valley over Dining
 Multi-Loaded Multi-Span Beam
 [2015 International Building Code(2015 NDS)]
 (2) 1.75 IN x 9.25 IN x 16.91 FT (4.1 + 12.8)
 1.9E Microllam - iLevel Trus Joist
 Section Adequate By: 40.4%
 Controlling Factor: Moment



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CAUTIONS

* Laminations are to be fully connected to provide uniform transfer of loads to all members

DEFLECTIONS

	Left	Center
Live Load	-0.02 IN L/2408	0.26 IN L/593
Dead Load	-0.02 in	0.20 in
Total Load	-0.04 IN L/1374	0.46 IN L/334
Live Load Deflection Criteria: L/240 Total Load Deflection Criteria: L/180		

REACTIONS

	A	B	C
Live Load	69 lb	3345 lb	2151 lb
Dead Load	-855 lb	2646 lb	1663 lb
Total Load	-786 lb	5991 lb	3814 lb
Uplift (1.5 F.S)	-2039 lb	0 lb	0 lb
Bearing Length	0.00 in	2.28 in	1.45 in

BEAM DATA

	Left	Center
Span Length	4.08 ft	12.83 ft
Unbraced Length-Top	0 ft	0 ft
Unbraced Length-Bottom	4.08 ft	12.83 ft
Live Load Duration Factor	1.15	
Notch Depth	0.00	

MATERIAL PROPERTIES

1.9E Microllam - iLevel Trus Joist

	Base Values	Adjusted
Bending Stress:	Fb = 2600 psi Cd=1.15 Cl=0.94 CF=1.04	Fb' = 2926 psi
Shear Stress:	Fv = 285 psi Cd=1.15	Fv' = 328 psi
Modulus of Elasticity:	E = 1900 ksi	E' = 1900 ksi
Comp. ⊥ to Grain:	Fc - ⊥ = 750 psi	Fc - ⊥' = 750 psi

Controlling Moment:

-8667 ft-lb

Over left support of span 2 (Center Span)

Created by combining all dead loads and live loads on span(s) 1, 2

Controlling Shear:

-3814 lb

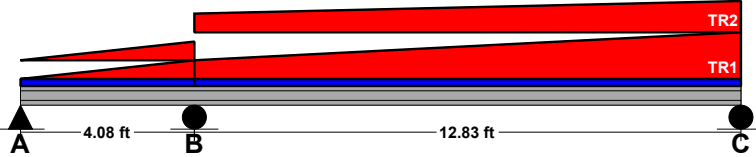
13.0 Ft from left support of span 2 (Center Span)

Created by combining all dead loads and live loads on span(s) 2

Comparisons with required sections:

	Req'd	Provided
Section Modulus:	35.54 in3	49.91 in3
Area (Shear):	17.45 in2	32.38 in2
Moment of Inertia (deflection):	124.49 in4	230.84 in4
Moment:	-8667 ft-lb	12170 ft-lb
Shear:	-3814 lb	7074 lb

LOADING DIAGRAM



UNIFORM LOADS

	Left	Center
Uniform Live Load	0 plf	0 plf
Uniform Dead Load	0 plf	0 plf
Beam Self Weight	10 plf	10 plf
Total Uniform Load	10 plf	10 plf

TRAPEZOIDAL LOADS - LEFT SPAN

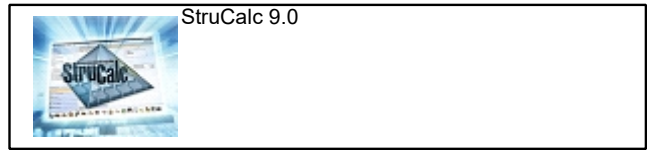
Load Number	One	Two
Left Live Load	0 plf	0 plf
Left Dead Load	0 plf	0 plf
Right Live Load	60 plf	52 plf
Right Dead Load	45 plf	39 plf
Load Start	0 ft	0 ft
Load End	4.08 ft	4.08 ft
Load Length	4.08 ft	4.08 ft

CENTER SPAN

Load Number	One	Two
Left Live Load	60 plf	52 plf
Left Dead Load	45 plf	39 plf
Right Live Load	320 plf	215 plf
Right Dead Load	240 plf	161 plf
Load Start	0 ft	0 ft
Load End	12.83 ft	12.83 ft
Load Length	12.83 ft	12.83 ft

Project: 230609B Fletcher

Location: ROOF- Hip over Family
Multi-Loaded Multi-Span Beam
[2015 International Building Code(2015 NDS)]
1.5 IN x 9.25 IN x 3.83 FT
#2 - Spruce-Pine-Fir (South) - Dry Use
Section Adequate By: 111.6%
Controlling Factor: Shear



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DEFLECTIONS		Center
Live Load	0.01	IN L/6418
Dead Load	0.01	in
Total Load	0.01	IN L/3642
Live Load Deflection Criteria: L/360		Total Load Deflection Criteria: L/240

REACTIONS		A	B
Live Load	335 lb	282 lb	
Dead Load	255 lb	215 lb	
Total Load	590 lb	497 lb	
Bearing Length	1.17 in	0.99 in	

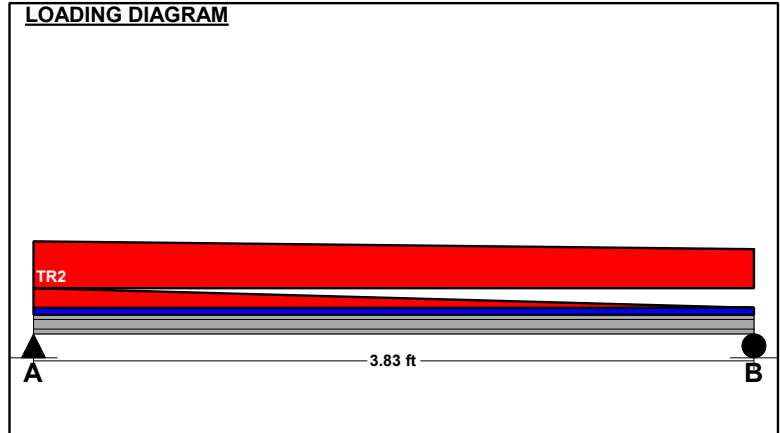
BEAM DATA		Center
Span Length	3.83	ft
Unbraced Length-Top	0	ft
Unbraced Length-Bottom	3.83	ft
Live Load Duration Factor	1.00	
Notch Depth	0.00	

MATERIAL PROPERTIES			
#2 - Spruce-Pine-Fir (South)			
	Base Values	Adjusted	
Bending Stress:	Fb = 775 psi	Fb' = 853 psi	
	Cd=1.00 CF=1.10		
Shear Stress:	Fv = 135 psi	Fv' = 135 psi	
	Cd=1.00		
Modulus of Elasticity:	E = 1100 ksi	E' = 1100 ksi	
Comp. \perp to Grain:	Fc - \perp = 335 psi	Fc - \perp ' = 335 psi	

Controlling Moment: 521 ft-lb
1.84 Ft from left support of span 2 (Center Span)
Created by combining all dead loads and live loads on span(s) 2

Controlling Shear: 590 lb
At left support of span 2 (Center Span)
Created by combining all dead loads and live loads on span(s) 2

Comparisons with required sections:	Req'd	Provided
Section Modulus:	7.34 in ³	21.39 in ³
Area (Shear):	6.56 in ²	13.88 in ²
Moment of Inertia (deflection):	6.52 in ⁴	98.93 in ⁴
Moment:	521 ft-lb	1520 ft-lb
Shear:	590 lb	1249 lb



UNIFORM LOADS		Center
Uniform Live Load	0	plf
Uniform Dead Load	0	plf
Beam Self Weight	2	plf
Total Uniform Load	2	plf

TRAPEZOIDAL LOADS - CENTER SPAN		
Load Number	One	Two
Left Live Load	60 plf	143 plf
Left Dead Load	45 plf	107 plf
Right Live Load	0 plf	119 plf
Right Dead Load	0 plf	89 plf
Load Start	0 ft	0 ft
Load End	3.83 ft	3.83 ft
Load Length	3.83 ft	3.83 ft

Project: 230609B Fletcher

Location: ROOF-Valley at Master Bath

Multi-Loaded Multi-Span Beam

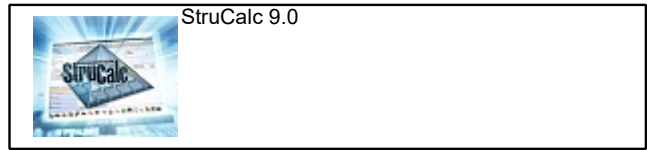
[2015 International Building Code(2015 NDS)]

(2) 1.5 IN x 11.25 IN x 13.17 FT (5.7 + 7.5) (Actual 15.7 FT)

#2 - Spruce-Pine-Fir (South) - Dry Use

Section Adequate By: 37.1%

Controlling Factor: Moment



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CAUTIONS

* Laminations are to be fully connected to provide uniform transfer of loads to all members

DEFLECTIONS

	Left	Center
Live Load	-0.02 IN L/4842	0.06 IN L/1831
Dead Load	-0.01 in	0.05 in
Total Load	-0.03 IN L/2959	0.11 IN L/985
Live Load Deflection Criteria: L/240 Total Load Deflection Criteria: L/180		

REACTIONS

	A	B	C
Live Load	126 lb	1792 lb	1303 lb
Dead Load	-80 lb	1652 lb	1163 lb
Total Load	46 lb	3444 lb	2466 lb
Uplift (1.5 F.S)	-309 lb	0 lb	0 lb
Bearing Length	0.05 in	3.43 in	2.45 in

BEAM DATA

	Left	Center
Span Length	5.67 ft	7.5 ft
Unbraced Length-Top	0 ft	0 ft
Unbraced Length-Bottom	5.67 ft	7.5 ft
Beam End Elevation Difference		8.5 ft
Live Load Duration Factor		1.15
Notch Depth		0.00

MATERIAL PROPERTIES

#2 - Spruce-Pine-Fir (South)

	Base Values	Adjusted
Bending Stress:	Fb = 775 psi Cd=1.15 CF=1.00	Fb' = 891 psi
Shear Stress:	Fv = 135 psi Cd=1.15	Fv' = 155 psi
Modulus of Elasticity:	E = 1100 ksi	E' = 1100 ksi
Comp. ⊥ to Grain:	Fc - ⊥ = 335 psi	Fc - ⊥' = 335 psi

Controlling Moment:

3429 ft-lb

4.579 Ft from left support of span 2 (Center Span)

Created by combining all dead loads and live loads on span(s) 2

Controlling Shear:

-2073 lb

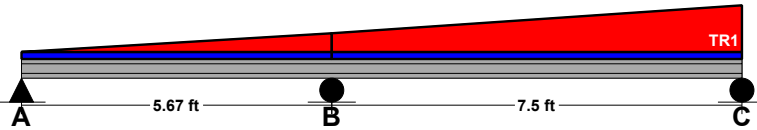
7.562 Ft from left support of span 2 (Center Span)

Created by combining all dead loads and live loads on span(s) 2

Comparisons with required sections:

	Req'd	Provided
Section Modulus:	46.16 in3	63.28 in3
Area (Shear):	20.02 in2	33.75 in2
Moment of Inertia (deflection):	65.03 in4	355.96 in4
Moment:	3429 ft-lb	4700 ft-lb
Shear:	-2073 lb	3493 lb

LOADING DIAGRAM



UNIFORM LOADS

	Left	Center
Uniform Live Load	0 plf	0 plf
Uniform Dead Load	0 plf	0 plf
Beam Self Weight	5 plf	5 plf
Total Uniform Load	5 plf	5 plf

TRAPEZOIDAL LOADS - LEFT SPAN

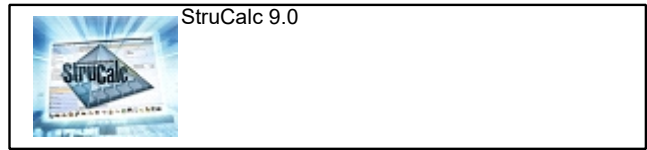
Load Number	One
Left Live Load	0 plf
Left Dead Load	0 plf
Right Live Load	161 plf
Right Dead Load	121 plf
Load Start	0 ft
Load End	5.67 ft
Load Length	5.67 ft

CENTER SPAN

Load Number	One
Left Live Load	161 plf
Left Dead Load	121 plf
Right Live Load	510 plf
Right Dead Load	382 plf
Load Start	0 ft
Load End	7.5 ft
Load Length	7.5 ft

Project: 230609B Fletcher

Location: ROOF- Hip at laundry
Multi-Loaded Multi-Span Beam
[2015 International Building Code(2015 NDS)]
(2) 1.5 IN x 11.25 IN x 9.0 FT (Actual 10.6 FT)
#2 - Spruce-Pine-Fir (South) - Dry Use
Section Adequate By: 14.3%
Controlling Factor: Moment



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CAUTIONS

* Laminations are to be fully connected to provide uniform transfer of loads to all members

DEFLECTIONS

Center

Live Load 0.10 IN L/1328
Dead Load 0.09 in
Total Load 0.18 IN L/691
Live Load Deflection Criteria: L/360 Total Load Deflection Criteria: L/240

REACTIONS

A B

Live Load 968 lb 675 lb
Dead Load 886 lb 627 lb
Total Load 1854 lb 1302 lb
Bearing Length 1.84 in 1.30 in

BEAM DATA

Center

Span Length 9 ft
Unbraced Length-Top 0 ft
Unbraced Length-Bottom 9 ft
Beam End Elevation Difference 5.67 ft
Live Load Duration Factor 1.00
Notch Depth 0.00

MATERIAL PROPERTIES

#2 - Spruce-Pine-Fir (South)

	Base Values	Adjusted
Bending Stress:	Fb = 775 psi Cd=1.00 CF=1.00	Fb' = 775 psi
Shear Stress:	Fv = 135 psi Cd=1.00	Fv' = 135 psi
Modulus of Elasticity:	E = 1100 ksi	E' = 1100 ksi
Comp. ⊥ to Grain:	Fc - ⊥ = 335 psi	Fc - ⊥' = 335 psi

Controlling Moment:

3577 ft-lb

4.137 Ft from left support of span 2 (Center Span)

Created by combining all dead loads and live loads on span(s) 2

Controlling Shear:

1568 lb

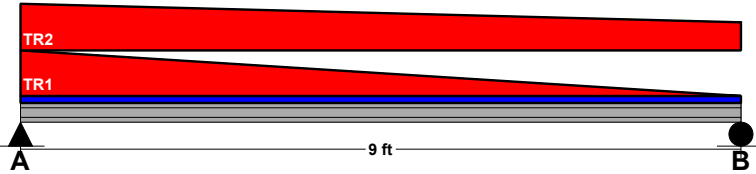
At left support of span 2 (Center Span)

Created by combining all dead loads and live loads on span(s) 2

Comparisons with required sections:

	Req'd	Provided
Section Modulus:	55.38 in3	63.28 in3
Area (Shear):	17.43 in2	33.75 in2
Moment of Inertia (deflection):	123.64 in4	355.96 in4
Moment:	3577 ft-lb	4087 ft-lb
Shear:	1568 lb	3038 lb

LOADING DIAGRAM



UNIFORM LOADS

Center

Uniform Live Load 0 plf
Uniform Dead Load 0 plf
Beam Self Weight 5 plf
Total Uniform Load 5 plf

TRAPEZOIDAL LOADS - CENTER SPAN

Load Number	One	Two
Left Live Load	138 plf	142 plf
Left Dead Load	104 plf	106 plf
Right Live Load	0 plf	85 plf
Right Dead Load	0 plf	64 plf
Load Start	0 ft	0 ft
Load End	9 ft	9 ft
Load Length	9 ft	9 ft

Project: 230609B Fletcher

Location: ROOF-Valley at Playroom

Multi-Loaded Multi-Span Beam

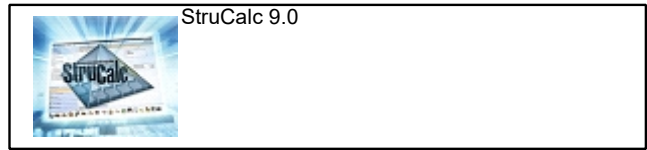
[2015 International Building Code(2015 NDS)]

(2) 1.75 IN x 11.875 IN x 19.08 FT (4.3 + 14.8) (Actual 22.7 FT)

1.9E Microllam - iLevel Trus Joist

Section Adequate By: 5.5%

Controlling Factor: Moment



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CAUTIONS

* Laminations are to be fully connected to provide uniform transfer of loads to all members

DEFLECTIONS

	Left	Center
Live Load	-0.02 IN L/2559	0.35 IN L/609
Dead Load	-0.02 in	0.32 in
Total Load	-0.05 IN L/1345	0.66 IN L/317
Live Load Deflection Criteria: L/240 Total Load Deflection Criteria: L/180		

REACTIONS

	A	B	C
Live Load	90 lb	4791 lb	2767 lb
Dead Load	-1532 lb	4509 lb	2553 lb
Total Load	-1442 lb	9300 lb	5320 lb
Uplift (1.5 F.S)	-3293 lb	0 lb	0 lb
Bearing Length	0.00 in	3.54 in	2.03 in

BEAM DATA

	Left	Center
Span Length	4.33 ft	14.75 ft
Unbraced Length-Top	0 ft	0 ft
Unbraced Length-Bottom	4.33 ft	14.75 ft
Beam End Elevation Difference	12.25 ft	
Live Load Duration Factor	1.00	
Notch Depth	0.00	

MATERIAL PROPERTIES

1.9E Microllam - iLevel Trus Joist

	Base Values	Adjusted
Bending Stress:	Fb = 2600 psi Cd=1.00 Cl=0.88 CF=1.00	Fb' = 2281 psi
Shear Stress:	Fv = 285 psi Cd=1.00	Fv' = 285 psi
Modulus of Elasticity:	E = 1900 ksi	E' = 1900 ksi
Comp. ⊥ to Grain:	Fc - ⊥ = 750 psi	Fc - ⊥' = 750 psi

Controlling Moment:

-14825 ft-lb

Over left support of span 2 (Center Span)

Created by combining all dead loads and live loads on span(s) 1, 2

Controlling Shear:

4550 lb

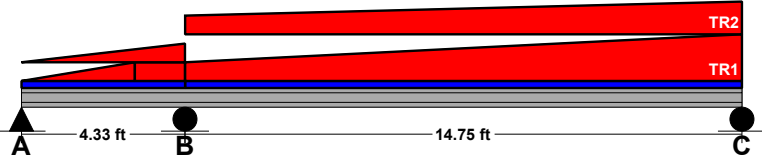
At left support of span 2 (Center Span)

Created by combining all dead loads and live loads on span(s) 1, 2

Comparisons with required sections:

	Req'd	Provided
Section Modulus:	77.98 in ³	82.26 in ³
Area (Shear):	23.95 in ²	41.56 in ²
Moment of Inertia (deflection):	277.7 in ⁴	488.41 in ⁴
Moment:	-14825 ft-lb	15639 ft-lb
Shear:	4550 lb	7897 lb

LOADING DIAGRAM



UNIFORM LOADS

	Left	Center
Uniform Live Load	0 plf	0 plf
Uniform Dead Load	0 plf	0 plf
Beam Self Weight	13 plf	13 plf
Total Uniform Load	13 plf	13 plf

TRAPEZOIDAL LOADS - LEFT SPAN

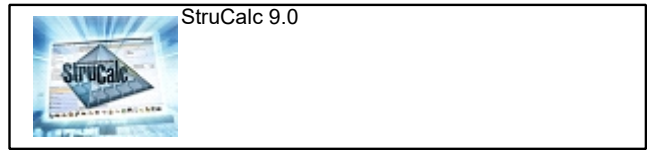
Load Number	One	Two	Three
Left Live Load	0 plf	93 plf	0 plf
Left Dead Load	0 plf	70 plf	0 plf
Right Live Load	47 plf	113 plf	57 plf
Right Dead Load	35 plf	85 plf	42 plf
Load Start	0 ft	3 ft	0 ft
Load End	3 ft	4.33 ft	4.33 ft
Load Length	3 ft	1.33 ft	4.33 ft

CENTER SPAN

Load Number	One	Two
Left Live Load	113 plf	57 plf
Left Dead Load	85 plf	42 plf
Right Live Load	343 plf	240 plf
Right Dead Load	257 plf	180 plf
Load Start	0 ft	0 ft
Load End	14.75 ft	14.75 ft
Load Length	14.75 ft	14.75 ft

Project: 230609B Fletcher

Location: FL2- Roof beam at Foyer
Combination Roof And Floor Beam
[2015 International Building Code(2015 NDS)]
(3) 1.5 IN x 9.25 IN x 11.0 FT
#2 - Spruce-Pine-Fir (South) - Dry Use
Section Adequate By: 17.1%
Controlling Factor: Moment



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CAUTIONS

* Laminations are to be fully connected to provide uniform transfer of loads to all members

DEFLECTIONS

Center

Live Load 0.19 IN L/698
Dead Load 0.15 in
Total Load 0.34 IN L/384
Live Load Deflection Criteria: L/360 Total Load Deflection Criteria: L/240

REACTIONS

A B

Live Load 1031 lb 1031 lb
Dead Load 841 lb 841 lb
Total Load 1872 lb 1872 lb
Bearing Length 1.24 in 1.24 in

BEAM DATA

Center

Span Length 11 ft
Unbraced Length-Top 0 ft
Roof Pitch 10 :12
Floor Duration Factor 1.00
Roof Duration Factor 1.15
Notch Depth 0.00

MATERIAL PROPERTIES

#2 - Spruce-Pine-Fir (South)

Base Values Adjusted
Bending Stress: Fb = 775 psi Fb' = 1127 psi
Cd=1.15 CF=1.10 Cr=1.15
Shear Stress: Fv = 135 psi Fv' = 155 psi
Cd=1.15
Modulus of Elasticity: E = 1100 ksi E' = 1100 ksi
Comp. \perp to Grain: Fc - \perp = 335 psi Fc - \perp ' = 335 psi

Controlling Moment: 5149 ft-lb

5.5 ft from left support

Created by combining all dead and live loads.

Controlling Shear: 1872 lb

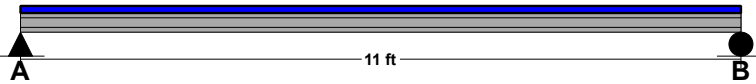
At support.

Created by combining all dead and live loads.

Comparisons with required sections:

	<u>Req'd</u>	<u>Provided</u>
Section Modulus:	54.81 in3	64.17 in3
Area (Shear):	18.09 in2	41.63 in2
Moment of Inertia (deflection):	185.34 in4	296.79 in4
Moment:	5149 ft-lb	6029 ft-lb
Shear:	1872 lb	4308 lb

LOADING DIAGRAM



ROOF LOADING

		<u>Side 1</u>	<u>Side 2</u>
Roof Live Load	RLL =	25 psf	0 psf
Roof Dead Load	RDL =	15 psf	0 psf
Roof Tributary Width	RTW =	7.5 ft	0 ft

FLOOR LOADING

		<u>Side 1</u>	<u>Side 2</u>
Floor Live Load	FLL =	0 psf	0 psf
Floor Dead Load	FDL =	0 psf	0 psf
Floor Tributary Width	FTW =	0 ft	0 ft
Wall Load	WALL =	0 plf	

BEAM LOADING

Roof Uniform Live Load:	wL-roof =	188 plf
Roof Uniform Dead Load:	wD-roof =	146 plf
Floor Uniform Live Load:	wL-floor =	0 plf
Floor Uniform Dead Load:	wD-floor =	0 plf
Beam Self Weight:	BSW =	6 plf
Combined Uniform Live Load:	wL =	188 plf
Combined Uniform Dead Load:	wD =	153 plf
Combined Uniform Total Load:	wT =	340 plf

Project: 230609B Fletcher

Location: FL! -Garage Door header

Uniformly Loaded Floor Beam

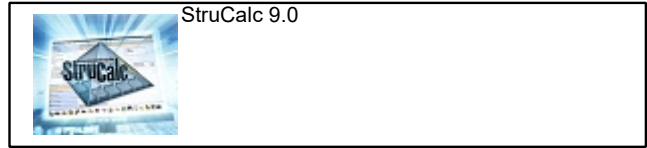
[2015 International Building Code(2015 NDS)]

(2) 1.75 IN x 16.0 IN x 18.67 FT

1.9E Microllam - iLevel Trus Joist

Section Adequate By: 74.4%

Controlling Factor: Moment



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CAUTIONS

* Laminations are to be fully connected to provide uniform transfer of loads to all members

DEFLECTIONS

Center

Live Load 0.27 IN L/820

Dead Load 0.22 in

Total Load 0.49 IN L/455

Live Load Deflection Criteria: L/360 Total Load Deflection Criteria: L/240

REACTIONS

A

B

Live Load 2117 lb 2117 lb

Dead Load 1704 lb 1704 lb

Total Load 3821 lb 3821 lb

Bearing Length 1.46 in 1.46 in

BEAM DATA

Center

Span Length 18.67 ft

Unbraced Length-Top 0 ft

Floor Duration Factor 1.00

Notch Depth 0.00

MATERIAL PROPERTIES

1.9E Microllam - iLevel Trus Joist

Base Values

Adjusted

Bending Stress: Fb = 2600 psi Fb' = 2500 psi

Cd=1.00 CF=0.96

Shear Stress: Fv = 285 psi Fv' = 285 psi

Cd=1.00

Modulus of Elasticity: E = 1900 ksi E' = 1900 ksi

Comp. ⊥ to Grain: Fc - ⊥ = 750 psi Fc - ⊥' = 750 psi

Controlling Moment: 17836 ft-lb

9.335 ft from left support

Created by combining all dead and live loads.

Controlling Shear: 3821 lb

At support.

Created by combining all dead and live loads.

Comparisons with required sections:

Req'd

Provided

Section Modulus: 85.61 in3 149.33 in3

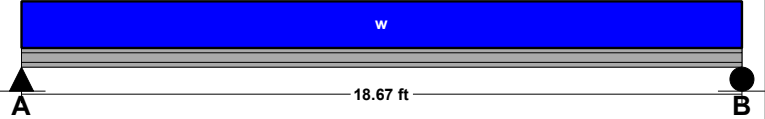
Area (Shear): 20.11 in2 56 in2

Moment of Inertia (deflection): 630.84 in4 1194.67 in4

Moment: 17836 ft-lb 31114 ft-lb

Shear: 3821 lb 10640 lb

LOADING DIAGRAM



FLOOR LOADING

Side 1

Side 2

Floor Live Load FLL = 40 psf 0 psf

Floor Dead Load FDL = 15 psf 0 psf

Floor Tributary Width FTW = 5.7 ft 0 ft

Wall Load WALL = 80 plf

BEAM LOADING

Beam Total Live Load: wL = 227 plf

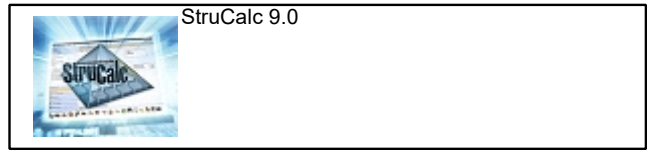
Beam Total Dead Load: wD = 165 plf

Beam Self Weight: BSW = 18 plf

Total Maximum Load: wT = 409 plf

Project: 230609B Fletcher

Location: FL1-Beam at Rear of garage
Multi-Loaded Multi-Span Beam
[2015 International Building Code(2015 NDS)]
(2) 1.75 IN x 9.25 IN x 12.0 FT
1.9E Microllam - iLevel Trus Joist
Section Adequate By: 44.7%
Controlling Factor: Deflection



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CAUTIONS

* Laminations are to be fully connected to provide uniform transfer of loads to all members

DEFLECTIONS

Center

Live Load 0.28 IN L/521
Dead Load 0.08 in
Total Load 0.36 IN L/404
Live Load Deflection Criteria: L/360 Total Load Deflection Criteria: L/240

REACTIONS

A B

Live Load 1694 lb 1457 lb
Dead Load 486 lb 426 lb
Total Load 2180 lb 1883 lb
Bearing Length 0.83 in 0.72 in

BEAM DATA

Center

Span Length 12 ft
Unbraced Length-Top 0 ft
Unbraced Length-Bottom 12 ft
Live Load Duration Factor 1.00
Notch Depth 0.00

MATERIAL PROPERTIES

1.9E Microllam - iLevel Trus Joist

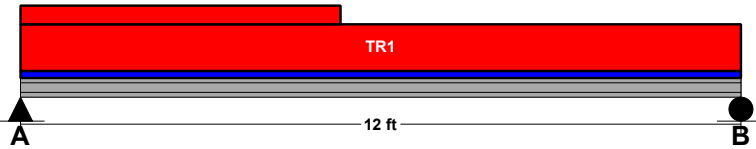
Base Values Adjusted
Bending Stress: Fb = 2600 psi Fb' = 2694 psi
Cd=1.00 CF=1.04
Shear Stress: Fv = 285 psi Fv' = 285 psi
Cd=1.00
Modulus of Elasticity: E = 1900 ksi E' = 1900 ksi
Comp. \perp to Grain: Fc - \perp = 750 psi Fc - \perp ' = 750 psi

Controlling Moment: 6028 ft-lb
5.64 Ft from left support of span 2 (Center Span)
Created by combining all dead loads and live loads on span(s) 2
Controlling Shear: 2179 lb
At left support of span 2 (Center Span)
Created by combining all dead loads and live loads on span(s) 2

Comparisons with required sections:

	Req'd	Provided
Section Modulus:	26.85 in3	49.91 in3
Area (Shear):	11.47 in2	32.38 in2
Moment of Inertia (deflection):	159.54 in4	230.84 in4
Moment:	6028 ft-lb	11204 ft-lb
Shear:	2179 lb	6151 lb

LOADING DIAGRAM



UNIFORM LOADS

Center

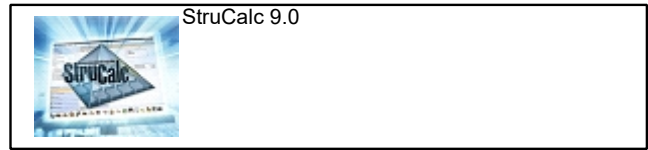
Uniform Live Load 0 plf
Uniform Dead Load 0 plf
Beam Self Weight 10 plf
Total Uniform Load 10 plf

TRAPEZOIDAL LOADS - CENTER SPAN

Load Number	One	Two
Left Live Load	227 plf	80 plf
Left Dead Load	57 plf	20 plf
Right Live Load	227 plf	80 plf
Right Dead Load	57 plf	20 plf
Load Start	0 ft	0 ft
Load End	12 ft	5.33 ft
Load Length	12 ft	5.33 ft

Project: 230609B Fletcher

Location: FL1-Beam between Dining and Family
Uniformly Loaded Floor Beam
[2015 International Building Code(2015 NDS)]
(2) 1.75 IN x 9.25 IN x 10.0 FT
1.9E Microllam - iLevel Trus Joist
Section Adequate By: 19.6%
Controlling Factor: Shear



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CAUTIONS

* Laminations are to be fully connected to provide uniform transfer of loads to all members

DEFLECTIONS

Center

Live Load 0.12 IN L/979
Dead Load 0.10 in
Total Load 0.22 IN L/534
Live Load Deflection Criteria: L/360 Total Load Deflection Criteria: L/240

REACTIONS

A

B

Live Load 502 lb 2843 lb
Dead Load 447 lb 2300 lb
Total Load 949 lb 5143 lb
Bearing Length 0.36 in 1.96 in

BEAM DATA

Center

Span Length 10 ft
Unbraced Length-Top 0 ft
Floor Duration Factor 1.00
Notch Depth 0.00

MATERIAL PROPERTIES

1.9E Microllam - iLevel Trus Joist

	<u>Base Values</u>	<u>Adjusted</u>
Bending Stress:	Fb = 2600 psi Cd=1.00 CF=1.04	Fb' = 2694 psi
Shear Stress:	Fv = 285 psi Cd=1.00	Fv' = 285 psi
Modulus of Elasticity:	E = 1900 ksi	E' = 1900 ksi
Comp. \perp to Grain:	Fc \perp = 750 psi	Fc \perp ' = 750 psi

Controlling Moment:

7703 ft-lb

5.0 ft from left support

Created by combining all dead and live loads.

Controlling Shear:

-5143 lb

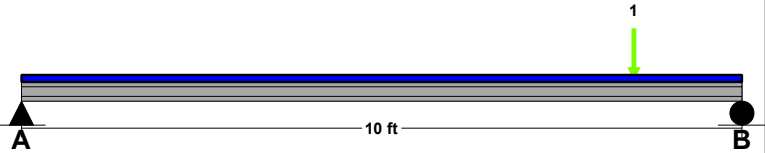
At support.

Created by combining all dead and live loads.

Comparisons with required sections:

	<u>Req'd</u>	<u>Provided</u>
Section Modulus:	34.32 in3	49.91 in3
Area (Shear):	27.07 in2	32.38 in2
Moment of Inertia (deflection):	103.67 in4	230.84 in4
Moment:	7703 ft-lb	11204 ft-lb
Shear:	-5143 lb	6151 lb

LOADING DIAGRAM



FLOOR LOADING

		<u>Side 1</u>	<u>Side 2</u>
Floor Live Load	FLL =	0 psf	0 psf
Floor Dead Load	FDL =	0 psf	0 psf
Floor Tributary Width	FTW =	0 ft	0 ft
Wall Load	WALL =	0 plf	

BEAM LOADING

Beam Total Live Load:	wL =	0 plf
Beam Total Dead Load:	wD =	0 plf
Beam Self Weight:	BSW =	10 plf
Total Maximum Load:	wT =	10 plf

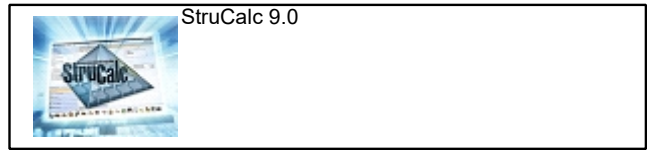
POINT LOADS - CENTER SPAN

Load Number	One *
Live Load	3345 lb
Dead Load	2646 lb
Location	8.5 ft

* Load obtained from Load Tracker. See Summary Report for details.

Project: 230609B Fletcher

Location: FL1- Beam at Dining
Multi-Loaded Multi-Span Beam
[2015 International Building Code(2015 NDS)]
1.75 IN x 16.0 IN x 10.33 FT
1.9E Microllam - iLevel Trus Joist
Section Adequate By: 6.1%
Controlling Factor: Shear



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DEFLECTIONS		Center
Live Load	0.12	IN L/1066
Dead Load	0.07	in
Total Load	0.19	IN L/656
Live Load Deflection Criteria: L/360		Total Load Deflection Criteria: L/240

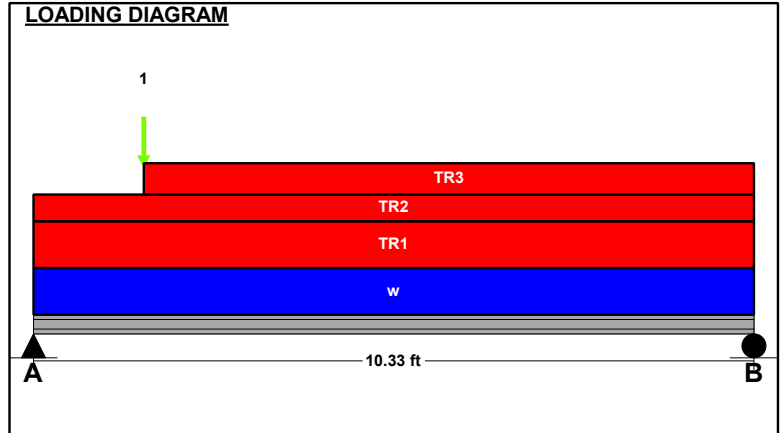
REACTIONS		A	B
Live Load	3037	lb	2469
Dead Load	1977	lb	1504
Total Load	5014	lb	3973
Bearing Length	3.82	in	3.03

BEAM DATA		Center
Span Length	10.33	ft
Unbraced Length-Top	0	ft
Unbraced Length-Bottom	10.33	ft
Live Load Duration Factor	1.00	
Notch Depth	0.00	

MATERIAL PROPERTIES			
1.9E Microllam - iLevel Trus Joist			
	Base Values	Adjusted	
Bending Stress:	Fb = 2600 psi	Fb' = 2500 psi	
	Cd=1.00 CF=0.96		
Shear Stress:	Fv = 285 psi	Fv' = 285 psi	
	Cd=1.00		
Modulus of Elasticity:	E = 1900 ksi	E' = 1900 ksi	
Comp. \perp to Grain:	Fc - \perp = 750 psi	Fc - \perp ' = 750 psi	

Controlling Moment: 10987 ft-lb
4.75 Ft from left support of span 2 (Center Span)
Created by combining all dead loads and live loads on span(s) 2
Controlling Shear: 5015 lb
At left support of span 2 (Center Span)
Created by combining all dead loads and live loads on span(s) 2

Comparisons with required sections:	Req'd	Provided
Section Modulus:	52.73 in3	74.67 in3
Area (Shear):	26.39 in2	28 in2
Moment of Inertia (deflection):	218.44 in4	597.33 in4
Moment:	10987 ft-lb	15557 ft-lb
Shear:	5015 lb	5320 lb



UNIFORM LOADS		Center
Uniform Live Load	0	plf
Uniform Dead Load	64	plf
Beam Self Weight	9	plf
Total Uniform Load	73	plf

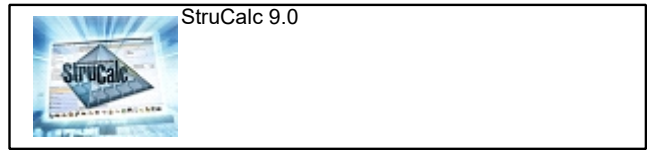
POINT LOADS - CENTER SPAN	
Load Number	One *
Live Load	1031 lb
Dead Load	841 lb
Location	1.58 ft

* Load obtained from Load Tracker. See Summary Report for details.

TRAPEZOIDAL LOADS - CENTER SPAN			
Load Number	One	Two	Three
Left Live Load	230 plf	110 plf	110 plf
Left Dead Load	58 plf	55 plf	82.5 plf
Right Live Load	230 plf	110 plf	110 plf
Right Dead Load	58 plf	55 plf	82.5 plf
Load Start	0 ft	0 ft	1.58 ft
Load End	10.33 ft	10.33 ft	10.33 ft
Load Length	10.33 ft	10.33 ft	8.75 ft

Project: 230609B Fletcher

Location: FL1-Beam between Kitchen and Family
Uniformly Loaded Floor Beam
[2015 International Building Code(2015 NDS)]
(2) 1.75 IN x 18.0 IN x 17.83 FT
1.9E Microllam - iLevel Trus Joist
Section Adequate By: 8.5%
Controlling Factor: Moment



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CAUTIONS

* Laminations are to be fully connected to provide uniform transfer of loads to all members

DEFLECTIONS

Center

Live Load 0.45 IN L/476
Dead Load 0.18 in
Total Load 0.63 IN L/338
Live Load Deflection Criteria: L/360 Total Load Deflection Criteria: L/240

REACTIONS

A B

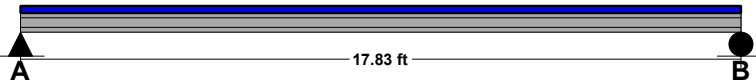
Live Load 5702 lb 5702 lb
Dead Load 2314 lb 2314 lb
Total Load 8016 lb 8016 lb
Bearing Length 3.05 in 3.05 in

BEAM DATA

Center

Span Length 17.83 ft
Unbraced Length-Top 0 ft
Floor Duration Factor 1.00
Notch Depth 0.00

LOADING DIAGRAM



MATERIAL PROPERTIES

1.9E Microllam - iLevel Trus Joist

	Base Values	Adjusted
Bending Stress:	Fb = 2600 psi Cd=1.00 CF=0.95	Fb' = 2460 psi
Shear Stress:	Fv = 285 psi Cd=1.00	Fv' = 285 psi
Modulus of Elasticity:	E = 1900 ksi	E' = 1900 ksi
Comp. ⊥ to Grain:	Fc ⊥ = 750 psi	Fc ⊥' = 750 psi

Controlling Moment: 35730 ft-lb

8.915 ft from left support

Created by combining all dead and live loads.

Controlling Shear: -8016 lb

At support.

Created by combining all dead and live loads.

FLOOR LOADING

		Side 1	Side 2
Floor Live Load	FLL =	40 psf	40 psf
Floor Dead Load	FDL =	15 psf	15 psf
Floor Tributary Width	FTW =	6.6 ft	9.4 ft
Wall Load	WALL =	0 plf	

BEAM LOADING

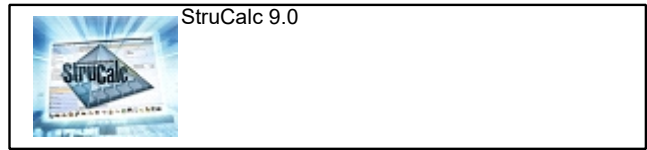
Beam Total Live Load:	wL =	640 plf
Beam Total Dead Load:	wD =	240 plf
Beam Self Weight:	BSW =	20 plf
Total Maximum Load:	wT =	899 plf

Comparisons with required sections:

	Req'd	Provided
Section Modulus:	174.26 in3	189 in3
Area (Shear):	42.19 in2	63 in2
Moment of Inertia (deflection):	1287.79 in4	1701 in4
Moment:	35730 ft-lb	38752 ft-lb
Shear:	-8016 lb	11970 lb

Project: 230609B Fletcher

Location: FL!- Beam at breakfast room
Multi-Loaded Multi-Span Beam
[2015 International Building Code(2015 NDS)]
(3) 1.75 IN x 18.0 IN x 15.0 FT
1.9E Microllam - iLevel Trus Joist
Section Adequate By: 13.6%
Controlling Factor: Moment



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CAUTIONS

* Laminations are to be fully connected to provide uniform transfer of loads to all members

DEFLECTIONS

Center

Live Load 0.27 IN L/671
Dead Load 0.16 in
Total Load 0.43 IN L/423
Live Load Deflection Criteria: L/360 Total Load Deflection Criteria: L/240

REACTIONS

A

B

Live Load 6807 lb 9590 lb
Dead Load 4316 lb 5446 lb
Total Load 11123 lb 15036 lb
Bearing Length 2.83 in 3.82 in

BEAM DATA

Center

Span Length 15 ft
Unbraced Length-Top 0 ft
Unbraced Length-Bottom 15 ft
Live Load Duration Factor 1.00
Notch Depth 0.00

MATERIAL PROPERTIES

1.9E Microllam - iLevel Trus Joist

Base Values Adjusted
Bending Stress: Fb = 2600 psi Fb' = 2460 psi
Cd=1.00 CF=0.95
Shear Stress: Fv = 285 psi Fv' = 285 psi
Cd=1.00
Modulus of Elasticity: E = 1900 ksi E' = 1900 ksi
Comp. \perp to Grain: Fc - \perp = 750 psi Fc - \perp ' = 750 psi

Controlling Moment:

51148 ft-lb

9.15 Ft from left support of span 2 (Center Span)

Created by combining all dead loads and live loads on span(s) 2

Controlling Shear:

-15035 lb

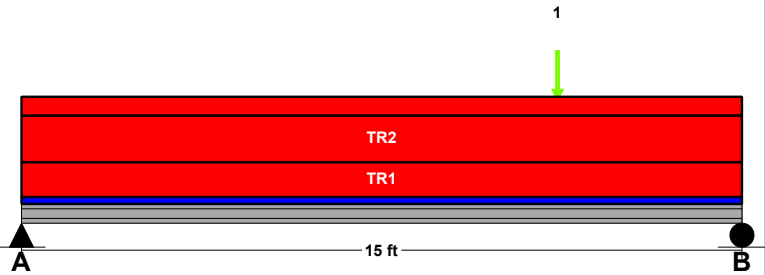
At right support of span 2 (Center Span)

Created by combining all dead loads and live loads on span(s) 2

Comparisons with required sections:

	Req'd	Provided
Section Modulus:	249.46 in3	283.5 in3
Area (Shear):	79.13 in2	94.5 in2
Moment of Inertia (deflection):	1448.08 in4	2551.5 in4
Moment:	51148 ft-lb	58128 ft-lb
Shear:	-15035 lb	17955 lb

LOADING DIAGRAM



UNIFORM LOADS

Center

Uniform Live Load 0 plf
Uniform Dead Load 0 plf
Beam Self Weight 30 plf
Total Uniform Load 30 plf

POINT LOADS - CENTER SPAN

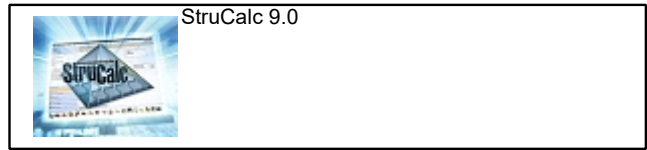
Load Number One
Live Load 5702 lb
Dead Load 2314 lb
Location 11.16 ft

TRAPEZOIDAL LOADS - CENTER SPAN

Load Number	<u>One</u>	<u>Two</u>	<u>Three</u>
Left Live Load	253 plf	315 plf	145 plf
Left Dead Load	158 plf	236 plf	73 plf
Right Live Load	253 plf	315 plf	145 plf
Right Dead Load	158 plf	236 plf	73 plf
Load Start	0 ft	0 ft	0 ft
Load End	15 ft	15 ft	15 ft
Load Length	15 ft	15 ft	15 ft

Project: 230609B Fletcher

Location: FL1-Front porch header
Combination Roof And Floor Beam
[2015 International Building Code(2015 NDS)]
(2) 1.5 IN x 9.25 IN x 11.0 FT
#2 - Spruce-Pine-Fir (South) - Dry Use
Section Adequate By: 28.0%
Controlling Factor: Moment



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CAUTIONS

* Laminations are to be fully connected to provide uniform transfer of loads to all members

DEFLECTIONS

Center

Live Load 0.17 IN L/775
Dead Load 0.10 in
Total Load 0.27 IN L/483
Live Load Deflection Criteria: L/360 Total Load Deflection Criteria: L/240

REACTIONS

A B

Live Load 619 lb 619 lb
Dead Load 374 lb 374 lb
Total Load 993 lb 993 lb
Bearing Length 0.99 in 0.99 in

BEAM DATA

Center

Span Length 11 ft
Unbraced Length-Top 0 ft
Roof Pitch 3 :12
Floor Duration Factor 1.00
Roof Duration Factor 1.15
Notch Depth 0.00

MATERIAL PROPERTIES

#2 - Spruce-Pine-Fir (South)

	Base Values	Adjusted
Bending Stress:	Fb = 775 psi Cd=1.15 CF=1.10	Fb' = 980 psi
Shear Stress:	Fv = 135 psi Cd=1.15	Fv' = 155 psi
Modulus of Elasticity:	E = 1100 ksi	E' = 1100 ksi
Comp. \perp to Grain:	Fc - \perp = 335 psi	Fc - \perp ' = 335 psi

Controlling Moment: 2730 ft-lb

5.5 ft from left support

Created by combining all dead and live loads.

Controlling Shear: -993 lb

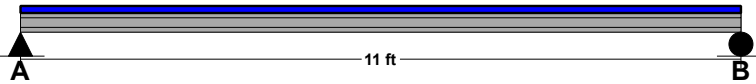
At support.

Created by combining all dead and live loads.

Comparisons with required sections:

	Req'd	Provided
Section Modulus:	33.41 in3	42.78 in3
Area (Shear):	9.59 in2	27.75 in2
Moment of Inertia (deflection):	98.26 in4	197.86 in4
Moment:	2730 ft-lb	3495 ft-lb
Shear:	-993 lb	2872 lb

LOADING DIAGRAM



ROOF LOADING

		Side 1	Side 2
Roof Live Load	RLL =	25 psf	0 psf
Roof Dead Load	RDL =	15 psf	0 psf
Roof Tributary Width	RTW =	2.5 ft	0 ft

FLOOR LOADING

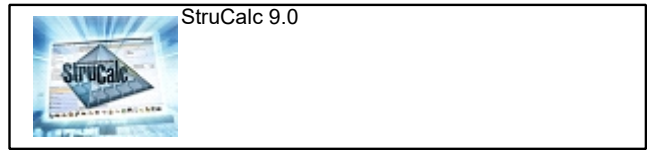
		Side 1	Side 2
Floor Live Load	FLL =	20 psf	0 psf
Floor Dead Load	FDL =	10 psf	0 psf
Floor Tributary Width	FTW =	2.5 ft	0 ft
Wall Load	WALL =	0 plf	

BEAM LOADING

Roof Uniform Live Load:	wL-roof =	63 plf
Roof Uniform Dead Load:	wD-roof =	39 plf
Floor Uniform Live Load:	wL-floor =	50 plf
Floor Uniform Dead Load:	wD-floor =	25 plf
Beam Self Weight:	BSW =	4 plf
Combined Uniform Live Load:	wL =	113 plf
Combined Uniform Dead Load:	wD =	68 plf
Combined Uniform Total Load:	wT =	180 plf

Project: 230609B Fletcher

Location: FL1-Gsrage beam
Uniformly Loaded Floor Beam
[2015 International Building Code(2015 NDS)]
(3) 1.75 IN x 24.0 IN x 24.67 FT
Versa-Lam 2800 Fb DF - Boise Cascade
Section Adequate By: 116.7%
Controlling Factor: Moment



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CAUTIONS

* Laminations are to be fully connected to provide uniform transfer of loads to all members

DEFLECTIONS

Center

Live Load 0.31 IN L/947
Dead Load 0.14 in
Total Load 0.45 IN L/651
Live Load Deflection Criteria: L/360 Total Load Deflection Criteria: L/240

REACTIONS

A B

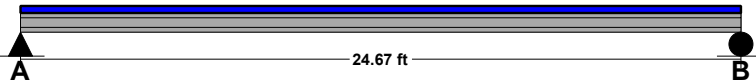
Live Load 5595 lb 5595 lb
Dead Load 2551 lb 2551 lb
Total Load 8146 lb 8146 lb
Bearing Length 2.07 in 2.07 in

BEAM DATA

Center

Span Length 24.67 ft
Unbraced Length-Top 0 ft
Floor Duration Factor 1.00
Notch Depth 0.00

LOADING DIAGRAM



MATERIAL PROPERTIES

Versa-Lam 2800 Fb DF - Boise Cascade

	<u>Base Values</u>	<u>Adjusted</u>
Bending Stress:	Fb = 2800 psi Cd=1.00 CF=0.93	Fb' = 2592 psi
Shear Stress:	Fv = 285 psi Cd=1.00	Fv' = 285 psi
Modulus of Elasticity:	E = 2000 ksi	E' = 2000 ksi
Comp. ⊥ to Grain:	Fc ⊥ = 750 psi	Fc ⊥' = 750 psi

Controlling Moment: 50244 ft-lb

12.335 ft from left support
Created by combining all dead and live loads.

Controlling Shear: -8147 lb

At support.
Created by combining all dead and live loads.

FLOOR LOADING

		<u>Side 1</u>	<u>Side 2</u>
Floor Live Load	FLL =	40 psf	40 psf
Floor Dead Load	FDL =	15 psf	15 psf
Floor Tributary Width	FTW =	5.7 ft	5.7 ft
Wall Load	WALL =	0 plf	

BEAM LOADING

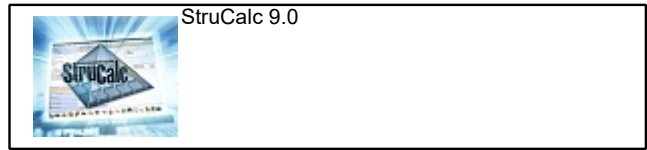
Beam Total Live Load:	wL =	454 plf
Beam Total Dead Load:	wD =	170 plf
Beam Self Weight:	BSW =	37 plf
Total Maximum Load:	wT =	660 plf

Comparisons with required sections:

	<u>Req'd</u>	<u>Provided</u>
Section Modulus:	232.57 in3	504 in3
Area (Shear):	42.88 in2	126 in2
Moment of Inertia (deflection):	2298.18 in4	6048 in4
Moment:	50244 ft-lb	108883 ft-lb
Shear:	-8147 lb	23940 lb

Project: 230609B Fletcher

Location: FL1- header at side load garage
Multi-Loaded Multi-Span Beam
[2015 International Building Code(2015 NDS)]
(2) 1.75 IN x 24.0 IN x 18.67 FT
Versa-Lam 2800 Fb DF - Boise Cascade
Section Adequate By: 19.2%
Controlling Factor: Moment



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CAUTIONS

* Laminations are to be fully connected to provide uniform transfer of loads to all members

DEFLECTIONS

Center

Live Load 0.28 IN L/811
Dead Load 0.14 in
Total Load 0.42 IN L/539
Live Load Deflection Criteria: L/360 Total Load Deflection Criteria: L/240

REACTIONS

A B

Live Load 6143 lb 5871 lb
Dead Load 3180 lb 3045 lb
Total Load 9323 lb 8916 lb
Bearing Length 3.55 in 3.40 in

BEAM DATA

Center

Span Length 18.67 ft
Unbraced Length-Top 0 ft
Unbraced Length-Bottom 18.67 ft
Live Load Duration Factor 1.00
Notch Depth 0.00

MATERIAL PROPERTIES

Versa-Lam 2800 Fb DF - Boise Cascade

	Base Values	Adjusted
Bending Stress:	Fb = 2800 psi Cd=1.00 CF=0.93	Fb' = 2592 psi
Shear Stress:	Fv = 285 psi Cd=1.00	Fv' = 285 psi
Modulus of Elasticity:	E = 2000 ksi	E' = 2000 ksi
Comp. \perp to Grain:	Fc - \perp = 750 psi	Fc - \perp ' = 750 psi

Controlling Moment:

60896 ft-lb

9.34 Ft from left support of span 2 (Center Span)

Created by combining all dead loads and live loads on span(s) 2

Controlling Shear:

9323 lb

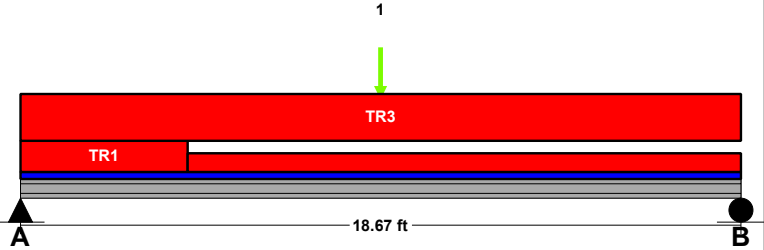
At left support of span 2 (Center Span)

Created by combining all dead loads and live loads on span(s) 2

Comparisons with required sections:

	Req'd	Provided
Section Modulus:	281.88 in3	336 in3
Area (Shear):	49.07 in2	84 in2
Moment of Inertia (deflection):	1794.34 in4	4032 in4
Moment:	60896 ft-lb	72589 ft-lb
Shear:	9323 lb	15960 lb

LOADING DIAGRAM



UNIFORM LOADS

Center

Uniform Live Load 0 plf
Uniform Dead Load 0 plf
Beam Self Weight 25 plf
Total Uniform Load 25 plf

POINT LOADS - CENTER SPAN

Load Number One *
Live Load 5595 lb
Dead Load 2551 lb
Location 9.33 ft

* Load obtained from Load Tracker. See Summary Report for details.

TRAPEZOIDAL LOADS - CENTER SPAN

Load Number	One	Two	Three
Left Live Load	163 plf	82 plf	243 plf
Left Dead Load	81 plf	41 plf	122 plf
Right Live Load	163 plf	82 plf	243 plf
Right Dead Load	81 plf	41 plf	122 plf
Load Start	0 ft	4.33 ft	0 ft
Load End	4.33 ft	18.67 ft	18.67 ft
Load Length	4.33 ft	14.34 ft	18.67 ft