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: 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: 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: 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: 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: 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: 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 Structor Mike H M. Hay

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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: 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: 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: 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-Garage 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

Location: FL1- Ceiling joists at breakfast room Floor Joist [2015 International Building Code(2015 NDS)] (2) 1.5 IN x 9.25 IN x 15.0 FT @ 16 O.C. #2 - Southern Pine - Dry Use Section Adequate By: 22.9% Controlling Factor: Moment



Location: FL2- Roof beam at Bedroom 4 Roof Beam [2015 International Building Code(2015 NDS)] (2) 1.75 IN x 9.25 IN x 13.33 FT Versa-Lam 2800 Fb DF - Boise Cascade Section Adequate By: 120.5% Controlling Factor: Deflection

Location: FI1- Ceiling joists above Family room Floor Joist [2015 International Building Code(2015 NDS)] 1.5 IN x 9.25 IN x 17.83 FT @ 12 O.C. #2 - Spruce-Pine-Fir - Dry Use Section Adequate By: 29.7% Controlling Factor: Moment

Location: FI1- Beam at family room ceiling Multi-Loaded Multi-Span Beam [2015 International Building Code(2015 NDS)] (2) 1.75 IN x 16.0 IN x 18.67 FT Versa-Lam 2800 Fb DF - Boise Cascade Section Adequate By: 25.8% Controlling Factor: Deflection

Location: FL1- Beam at breakfast room Multi-Loaded Multi-Span Beam [2015 International Building Code(2015 NDS)] (3) 1.75 IN x 9.25 IN x 15.0 FT Versa-Lam 2800 Fb DF - Boise Cascade Section Adequate By: 38.7% Controlling Factor: Deflection

Location: FL1- Header at bedroom hallway Multi-Loaded Multi-Span Beam [2015 International Building Code(2015 NDS)] (2) 1.75 IN x 9.25 IN x 4.25 FT Versa-Lam 2800 Fb DF - Boise Cascade Section Adequate By: 97.9% Controlling Factor: Shear

Location: FL1-Beam between Kitchen and Family Uniformly Loaded Floor Beam [2015 International Building Code(2015 NDS)] (2) 1.75 IN x 16.0 IN x 17.83 FT 1.9E Microllam - iLevel Trus Joist Section Adequate By: 11.5% Controlling Factor: Shear

Location: FL2- Beam at fl2 bath Multi-Loaded Multi-Span Beam [2015 International Building Code(2015 NDS)] (2) 1.5 IN x 9.25 IN x 9.67 FT #2 - Spruce-Pine-Fir - Dry Use Section Adequate By: 3.3% Controlling Factor: Moment Mike H M. Hay

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Location: FL1- beam at master entry Multi-Loaded Multi-Span Beam [2015 International Building Code(2015 NDS)] (3) 1.5 IN x 9.25 IN x 5.0 FT #2 - Spruce-Pine-Fir - Dry Use Section Adequate By: 35.8% Controlling Factor: Shear

Location: FL1- Header at Breakfast rooom door Multi-Loaded Multi-Span Beam [2015 International Building Code(2015 NDS)] (2) 1.5 IN x 9.25 IN x 6.0 FT #2 - Southern Pine - Dry Use Section Adequate By: 23.4% Controlling Factor: Moment

Location: FL1- Beam at stairs in garage Multi-Loaded Multi-Span Beam [2015 International Building Code(2015 NDS)] (2) 1.75 IN x 9.25 IN x 11.67 FT Versa-Lam 2800 Fb DF - Boise Cascade Section Adequate By: 68.1% Controlling Factor: Deflection

Location: FI1- Beam between garages Multi-Loaded Multi-Span Beam [2015 International Building Code(2015 NDS)] (2) 1.5 IN x 9.25 IN x 3.67 FT #2 - Southern Pine - Dry Use Section Adequate By: 36.1% Controlling Factor: Shear



Shear:

1901 lb

7074 lb

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 LOADING DIAGRAM 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 Total Load Deflection Criteria: L/180 Live Load Deflection Criteria: L/240 REACTIONS Α В С 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** TR Bearing Length 0.04 in 1.68 in 0.27 in BEAM DATA Left Center 16.67 ft Span Length 4.08 ft 16.67 ft 4.08 ft Ā Unbraced Length-Top 0 ft 0 ft Unbraced Length-Bottom 4.08 ft 16.67 ft **Beam End Elevation Difference** 14.25 ft UNIFORM LOADS Left Center Live Load Duration Factor 1.15 Uniform Live Load 0 plf 0 plf Notch Depth 0.00 Uniform Dead Load 0 plf 0 plf **MATERIAL PROPERTIES** Beam Self Weight 10 plf 10 plf 1.9E Microllam - iLevel Trus Joist Total Uniform Load 10 10 plf plf **Base Values Adjusted TRAPEZOIDAL LOADS - LEFT SPAN** Bending Stress: 2600 psi Fb' = Fb = 2651 psi Load Number One Cd=1.15 CI=0.86 CF=1.04 Left Live Load 212 plf Shear Stress: 328 psi Fv = 285 psi Fv' = Left Dead Load 159 plf Cd=1.15 **Right Live Load** 177 plf Modulus of Elasticity: F = 1900 ksi F' = 1900 ksi Right Dead Load 132 plf Comp. \perp to Grain: Fc - ⊥ = 750 psi Fc - ⊥' = 750 psi Load Start 0 ft Load End 4.08 ft **Controlling Moment:** -5516 ft-lb Load Length 4.08 ft Over left support of span 2 (Center Span) CENTER SPAN Created by combining all dead loads and live loads on span(s) 1, 2 Load Number One Controlling Shear: 1901 lb Left Live Load 177 plf At left support of span 2 (Center Span) Left Dead Load 132 plf Created by combining all dead loads and live loads on span(s) 1, 2 Right Live Load 0 plf Right Dead Load 0 plf Comparisons with required sections: Req'd Provided Load Start 0 ft Section Modulus: 24.97 in3 49.91 in3 Load End 16.67 ft Area (Shear): 8.7 in2 32.38 in2 Load Length 16.67 ft 87.22 in4 Moment of Inertia (deflection): 230.84 in4 Moment: -5516 ft-lb 11026 ft-lb

page

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 LOADING DIAGRAM 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 Total Load Deflection Criteria: L/180 Live Load Deflection Criteria: L/240 REACTIONS С А В Live Load 69 lb 3345 lb 2151 lb Dead Load -855 lb 2646 lb 1663 lh Total Load -786 lb 5991 lb 3814 lb TR2 Uplift (1.5 F.S) -2039 lb 0 **lb** 0 **Ib** TR1 Bearing Length 0.00 in 2.28 in 1.45 in BEAM DATA Left Center 12.83 ft 4.08 ft Span Length 4.08 ft 12.83 ft A Unbraced Length-Top 0 ft 0 ft Unbraced Length-Bottom 4.08 ft 12.83 ft Live Load Duration Factor 1.15 UNIFORM LOADS Left Center Notch Depth 0.00 Uniform Live Load 0 plf 0 plf MATERIAL PROPERTIES Uniform Dead Load 0 plf 0 plf 1.9E Microllam - iLevel Trus Joist Beam Self Weight 10 plf 10 plf Total Uniform Load 10 plf **Base Values** Adjusted 10 plf Fb' = Bending Stress: Fb = 2600 psi 2926 psi **TRAPEZOIDAL LOADS - LEFT SPAN** Cd=1.15 Cl=0.94 CF=1.04 Load Number One Two Shear Stress: Fv = 285 psi Fv' = 328 psi Left Live Load 0 plf 0 plf Cd=1 15 Left Dead Load 0 plf 0 plf Modulus of Elasticity: 1900 ksi E = 1900 ksi F' = **Right Live Load** 60 plf 52 plf Comp. \perp to Grain: Fc - ⊥ = 750 psi Fc - ⊥' = 750 psi Right Dead Load 39 plf 45 plf Load Start 0 ft 0 ft **Controlling Moment:** -8667 ft-lb Load End 4.08 ft 4.08 ft Over left support of span 2 (Center Span) Load Length 4.08 ft 4.08 ft Created by combining all dead loads and live loads on span(s) 1, 2 **CENTER SPAN Controlling Shear:** -3814 lb Load Number One Two 13.0 Ft from left support of span 2 (Center Span) Left Live Load 60 plf 52 plf Created by combining all dead loads and live loads on span(s) 2 Left Dead Load 45 plf 39 plf **Right Live Load** 320 plf 215 plf Comparisons with required sections: Req'd **Provided** 161 plf Right Dead Load 240 plf Section Modulus: 49.91 in3 35.54 in3 Load Start 0 ft 0 ft Area (Shear): 17.45 in2 32.38 in2 Load End 12.83 ft 12.83 ft Moment of Inertia (deflection): 230.84 in4 124.49 in4 Load Length 12.83 ft 12.83 ft Moment: -8667 ft-lb 12170 ft-lb Shear: -3814 lb 7074 lb



| Project: 250304B 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 | Mike Haynes M. Haynes Designs StruCalc Version 10.0.1.6 4/17/2025 7:59:05 AM |
|--|--|
| 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 | TR2 |
| BEAM DATA Center | |
| Span Length 3.83 ft | |
| Unbraced Length-Top 0 ft | 3.83 ft |
| Unbraced Length-Bottom 3.83 ft | |
| Live Load Duration Factor 1.00 | |
| Notch Depth 0.00 | UNIFORM LOADS Center |
| MATERIAL PROPERTIES | Uniform Live Load 0 plf |
| #2 - Spruce-Pine-Fir (South) | Uniform Dead Load 0 plf |
| Base Values Adjusted | Beam Self Weight 2 plf |
| Bending Stress: Fb = 775 psi Fb' = 853 psi | Total Uniform Load 2 plf |
| Cd=1.00 CF=1.10 | TRAPEZOIDAL LOADS - CENTER SPAN |
| Shear Stress: Fv = 135 psi Fv' = 135 psi | Load Number One Two |
| | Left Live Load 60 plf 143 plf |
| Modulus of Elasticity: $E = 1100$ ksi $E' = 1100$ ksi | Left Dead Load 45 plf 107 plf |
| Comp. -10 Grain: FC - $- = 335$ psi FC - $- = 335$ psi | Right Live Load 0 plf 119 plf |
| Controlling Moment: 521 ft lb | Right Dead Load 0 plf 89 plf |
| 1.84 Et from left support of span 2 (Center Span) | Load Start 0 ft 0 ft |
| Created by combining all dead loads and live loads on span(s) 2 | Load End 3.83 ft 3.83 ft |
| Controlling Shear: 590 lb | Load Length 3.83 ft 3.83 ft |
| At left support of span 2 (Center Span) | |
| Created by combining all dead loads and live loads on span(s) 2 | |
| | |
| Comparing the required continues Deald Dravided | |

| Comparisons with required sections: | <u>Req'd</u> | Provided |
|-------------------------------------|--------------|------------|
| Section Modulus: | 7.34 in3 | 21.39 in3 |
| Area (Shear): | 6.56 in2 | 13.88 in2 |
| Moment of Inertia (deflection): | 6.52 in4 | 98.93 in4 |
| Moment: | 521 ft-lb | 1520 ft-lb |
| Shear: | 590 lb | 1249 lb |

Moment:

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



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CAUTIONS * Laminations are to be fully connected to provide uniform transfer of loads to all members DEFLECTIONS Center Left LOADING DIAGRAM 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 Total Load Deflection Criteria: L/180 Live Load Deflection Criteria: L/240 REACTIONS Α В С 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 **Ib** 0 **lb** 2.45 in **Bearing Length** 0.05 in 3.43 in TR1 BEAM DATA Left Center 5.67 ft 7.5 ft Span Length 5.67 ft 7.5 ft Ā B Unbraced Length-Top 0 ft 0 ft Unbraced Length-Bottom 5.67 ft 7.5 ft **Beam End Elevation Difference** 8.5 ft UNIFORM LOADS Left Center Live Load Duration Factor 1.15 Uniform Live Load 0 plf 0 plf Notch Depth 0.00 Uniform Dead Load 0 plf 0 plf **MATERIAL PROPERTIES** Beam Self Weight 5 plf 5 plf #2 - Spruce-Pine-Fir (South) Total Uniform Load 5 plf 5 plf **Base Values** Adjusted TRAPEZOIDAL LOADS - LEFT SPAN Bending Stress: Fb = 775 psi Fb' = 891 psi Load Number One Cd=1.15 CF=1.00 Left Live Load 0 plf Shear Stress: Fv = 135 psi Fv' =155 psi Left Dead Load 0 plf Cd=1.15 **Right Live Load** 161 plf Modulus of Elasticity: F = 1100 ksi F' = 1100 ksi Right Dead Load 121 plf Comp. \perp to Grain: Fc-⊥= 335 psi Fc - ⊥' = 335 psi Load Start 0 ft Load End 5.67 ft **Controlling Moment:** 3429 ft-lb Load Length 5.67 ft 4.579 Ft from left support of span 2 (Center Span) CENTER SPAN Created by combining all dead loads and live loads on span(s) 2 Load Number One Controlling Shear: -2073 lb Left Live Load 161 plf 7.562 Ft from left support of span 2 (Center Span) Left Dead Load 121 plf Created by combining all dead loads and live loads on span(s) 2 Right Live Load 510 plf Right Dead Load 382 plf Comparisons with required sections: Req'd Provided Load Start 0 ft Section Modulus: 46.16 in3 63.28 in3 Load End 7.5 ft Area (Shear): 20.02 in2 33.75 in2 Load Length 7.5 ft Moment of Inertia (deflection): 65.03 in4 355.96 in4

3429 ft-lb

-2073 lb

4700 ft-lb

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 a | II members |
| DEFLECTIONSCenterLive Load0.10IN L/1328Dead Load0.09inTotal Load0.18IN L/691Live Load Deflection Criteria: L/360Total Load Deflection Criteria: L/240 | LOADING DIAGRAM |
| REACTIONS A B Live Load 968 b 675 b Dead Load 886 b 627 lb Total Load 1854 lb 1302 lb Bearing Length 1.84 in 1.30 in | TR2 |
| BEAM DATACenterSpan Length9ftUnbraced Length-Top0ftUnbraced Length-Bottom9ftBeam End Elevation Difference5.67ft | A 9 ft B |
| Live Load Duration Factor 1.00 Notch Depth 0.00 MATERIAL PROPERTIES #2 - Spruce-Pine-Fir (South) Base Values Adjusted | UNIFORM LOADSCenterUniform Live Load0plfUniform Dead Load0plfBeam Self Weight5plfTotal Uniform Load5plf |
| Bending Stress: Fb = 775 psi Fb' = 775 psi Cd=1.00 CF=1.00 Cd=1.00 Cd=1.00 | TRAPEZOIDAL LOADS - CENTER SPAN Load Number One Load Number 420 mK |
| $Cd=1.00$ Modulus of Elasticity:E = 1100 ksiComp. \perp to Grain:Fc - \perp = 335 psiFc - \perp = 335 psi | Left Live Load 138 pir 142 pir Left Dead Load 104 plf 106 plf Right Live Load 0 plf 85 plf Right Dead Load 0 plf 64 plf |
| 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 | Load Start0 ft0 ftLoad End9 ft9 ftLoad Length9 ft9 ft |
| 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: | <u>Req'd</u> | 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 |

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

Shear:

| * Laminations are to be fully connected to provide uniform transfer of loads to all members | | | |
|--|---|--|--|
| * Laminations are to be fully connected to provide uniform transfer of loads to all 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 Ib 4791 Ib 2767 Ib Dead Load -1532 Ib 4509 Ib 2553 Ib Total Load -1442 Ib 9300 Ib 5320 Ib Uplift (1.5 F.S) -3293 Ib 0 Ib Bearing Length 0.00 in 3.54 in 2.03 in | TR2 | | |
| BEAM DATALeftCenterSpan Length4.33ft14.75ftUnbraced Length-Top0ft0ftUnbraced Length-Bottom4.33ft14.75ft | A 4.33 ft B 14.75 ft C | | |
| Beam End Elevation Difference 12.25 ft Live Load Duration Factor 1.00 Notch Depth 0.00 | UNIFORM LOADSLeftCenterUniform Live Load0plf0Uniform Dead Load0plf0 | | |
| MATERIAL PROPERTIES 1.9E Microllam - iLevel Trus Joist Race Values Adjusted | Beam Self Weight13plf13plfTotal Uniform Load13plf13plf | | |
| Dase values Adjusted Bending Stress: $Fb = 2600 \text{ psi}$ $Fb' = 2281 \text{ psi}$ $Cd=1.00 Cl=0.88 CF=1.00$ $Cf=1.00 Cl=0.88 CF=1.00$ $Cf=1.00 Cl=0.88 CF=1.00 Cl=0.88 CF=1.00 Cl=0.88 CF=1.00 Cl=0.88 CF=1.00 Cl=0.88 CF=1.00 Cl=0.88 Cl=0.88 Cf=1.00 Cf=1.0$ | TRAPEZOIDAL LOADS - LEFT SPAN Load Number One Two I off Live Lead 0 plf 93 plf 0 plf | | |
| Shear Stress: $Fv = 285 \text{ psi}$ $Fv' = 285 \text{ psi}$ Cd=1.00 | Left Dead Load 0 plf 70 plf 0 plf Right Live Load 47 plf 113 plf 57 plf | | |
| Modulus of Elasticity: $E = 1900$ ksi $E' = 1900$ ksiComp. \perp to Grain: $Fc - \perp = 750$ psi $Fc - \perp' = 750$ psi | Right Dead Load35 plf85 plf42 plfLoad Start0 ft3 ft0 ft | | |
| Controlling Moment:-14825 ft-lbOver left support of span 2 (Center Span)Created by combining all dead loads and live loads on span(s) 1, 2Controlling Shear:4550 lbAt left support of span 2 (Center Span)Created by combining all dead loads and live loads on span(s) 1, 2 | Load End3 ft4.33 ft4.33 ftLoad Length3 ft1.33 ft4.33 ftCENTER SPANLoad NumberOneTwoLeft Live Load113 plf57 plfLeft Dead Load85 plf42 plfRight Live Load343 plf240 plf | | |
| Comparisons with required sections:Req'dProvidedSection Modulus:77.98 in382.26 in3Area (Shear):23.95 in241.56 in2Moment of Inertia (deflection):277.7 in4488.41 in4Moment:-14825 ft-lb15639 ft-lb | 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 | | |

7897 lb

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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| <u>CAUTIONS</u> * Laminations are to be fully connected to provide uniform transfer of loads to a | II members |
|---|--|
| DEFLECTIONSCenterLive Load0.19IN L/698Dead Load0.15inTotal Load0.34IN L/384Live Load Deflection Criteria: L/360Total Load Deflection Criteria: L/240 | LOADING DIAGRAM |
| 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 | A 11 ft B |
| Notch Depth 0.00 | ROOF LOADING Side 1 Side 2 |
| MATERIAL PROPERTIES #2 - Spruce-Pine-Fir (South) Base Values Adjusted Bonding Stress: Eb = 775 pci Eb = 1127 pci | Roof Live LoadRLL =25psf0psfRoof Dead LoadRDL =15psf0psfRoof Tributary WidthRTW =7.5ft0ft |
| Bending Stress: $FB = -775$ psi $FB = -7127$ psi $Cd = 1.15$ Cd = 1.15 CF = 1.10 Cr = 1.15 Shear Stress: $Fv = -135$ psi $Fv' = -155$ psi $Cd = 1.15$ | FLOOR LOADING Side 1 Side 2 Floor Live Load FLL = 0 psf 0 psf |
| Modulus of Elasticity:E =1100 ksiE' =1100 ksiComp. \perp to Grain:Fc - \perp =335 psiFc - \perp ' =335 psi | Floor Dead LoadFDL =0psf0psfFloor Tributary WidthFTW =0ft0ft |
| Controlling Moment:5149 ft-lb5.5 ft from left support | Wall Load WALL = 0 plf |
| Created by combining all dead and live loads. Controlling Shear: 1872 lb At support. Created by combining all dead and live loads. | Roof Uniform Live Load:wL-roof =188plfRoof Uniform Dead Load:wD-roof =146plfFloor Uniform Live Load:wL-floor =0plfFloor Uniform Dead Load:wD-floor =0plf |
| Comparisons with required sections:Req'dProvidedSection Modulus:54.81 in364.17 in3Area (Shear):18.09 in241.63 in2Moment of Inertia (deflection):185.34 in4296.79 in4 | Beam Self Weight:BSW =6plfCombined Uniform Live Load:wL =188plfCombined Uniform Dead Load:wD =153plfCombined Uniform Total Load:wT =340plf |
| Moment: 5149 ft-lb 6029 ft-lb Shear: 1872 lb 4308 lb | |

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 LOADING DIAGRAM 0.28 IN L/521 Live Load 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 В А 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 TR1 **BEAM DATA** Center Span Length 12 ft Unbraced Length-Top 12 ft 0 ft Ā Unbraced Length-Bottom 12 ft Live Load Duration Factor 1.00 Notch Depth 0.00 UNIFORM LOADS Center **MATERIAL PROPERTIES** Uniform Live Load 0 plf 1.9E Microllam - iLevel Trus Joist Uniform Dead Load 0 plf **Base Values** Adjusted Beam Self Weight 10 plf Bending Stress: 2600 psi 2694 psi Total Uniform Load 10 plf Fb =Fb' =Cd=1.00 CF=1.04 **TRAPEZOIDAL LOADS - CENTER SPAN** Shear Stress: 285 psi 285 psi Fv = Fv' = Load Number Two <u>One</u> Cd=1.00 Left Live Load 227 plf 80 plf Modulus of Elasticity: 1900 ksi E' = 1900 ksi F = Left Dead Load 57 plf 20 plf Comp. \perp to Grain: Fc - ⊥ = 750 psi 750 psi Fc - ⊥' = 80 plf **Right Live Load** 227 plf Right Dead Load 57 plf 20 plf **Controlling Moment:** 6028 ft-lb Load Start 0 ft 0 ft 5.64 Ft from left support of span 2 (Center Span) Load End 12 ft 5.33 ft Created by combining all dead loads and live loads on span(s) 2 Load Length 12 ft 5.33 ft **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: | <u>Req'd</u> | 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 |

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 1.9É 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 a | ll members |
| DEFLECTIONSCenterLive Load0.12IN L/979Dead Load0.10inTotal Load0.22IN L/534Live Load Deflection Criteria: L/260Total Load Deflection Criteria: L/240 | LOADING DIAGRAM |
| REACTIONSABLive Load502lb2843lbDead Load447lb2300lbTotal Load949lb5143lbBearing Length0.36in1.96in | 1 |
| BEAM DATACenterSpan Length10ftUnbraced Length-Top0ftFloor Duration Factor1.00Notch Depth0.00 | A 10 ft B |
| MATERIAL PROPERTIES1.9E Microllam - iLevel Trus Joist1.9E Microllam - iLevel Trus JoistBending Stress: $Fb = 2600 \text{ psi}$ $Fb = 2600 \text{ psi}$ $Fb' = 2694 \text{ psi}$ $Cd=1.00 \ CF=1.04$ Shear Stress: $Fv = 285 \text{ psi}$ $Cd=1.00$ | FLOOR LOADINGSide 1Side 2Floor Live LoadFLL =0psf0psfFloor Dead LoadFDL =0psf0psfFloor Tributary WidthFTW =0ft0ftWall LoadWALL =0plf1 |
| Modulus of Elasticity: $E =$ 1900 ksi $E' =$ 1900 ksiComp. \perp to Grain: $Fc - \perp =$ 750 psi $Fc - \perp =$ 750 psiControlling Moment:7703 ft-lb5.0 ft from left support | BEAM LOADING Beam Total Live Load: wL = 0 plf Beam Total Dead Load: wD = 0 plf Beam Self Weight: BSW = 10 plf |
| Created by combining all dead and live loads. Controlling Shear: -5143 lb At support. Created by combining all dead and live loads. | POINT LOADS - CENTER SPAN Load Number One * Live Load 3345 lb Dead Load 2646 lb |
| Comparisons with required sections: Req'd Provided 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 | Location 8.5 ft * Load obtained from Load Tracker. See Summary Report for details. |

Shear:

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 | LOADING DIAGRAM |
|--|--|
| Live Load 0.12 IN L/1000 | |
| Total Load 0.19 IN L/656 | 1 |
| Live Load Deflection Criteria: L/360 Total Load Deflection Criteria: L/240 | |
| | |
| <u>REACTIONS</u> <u>A</u> <u>D</u> Live Load 3037 lb 2469 lb | TR3 |
| Dead Load 1977 lb 1504 lb | TR2 |
| Total Load 5014 lb 3973 lb | TR1 |
| Bearing Length 3.82 in 3.03 in | |
| BEAM DATA Center | |
| Span Length 10.33 ft | |
| Unbraced Length-Top 0 ft | A 10.33 ft B |
| Unbraced Length-Bottom 10.33 ft | |
| Live Load Duration Factor 1.00 | |
| Notch Depth 0.00 | UNIFORM LOADS Center |
| MATERIAL PROPERTIES | Uniform Live Load 0 plf |
| 1.9E Microllam - iLevel Trus Joist | Uniform Dead Load 64 plf |
| Base Values Adjusted | Beam Self Weight 9 plf |
| Bending Stress: $Fb = 2600 \text{ psi} Fb' = 2500 \text{ psi}$ | Total Uniform Load 73 plf |
| Cd=1.00 CF=0.96 | POINT LOADS - CENTER SPAN |
| Shear Stress: $Fv = 285 \text{ psi}$ $Fv' = 285 \text{ psi}$ | Load Number <u>One</u> * |
| Ga=7.00 | Live Load 1031 lb |
| Modulus of Elasticity: $E = 1900$ ksi $E = 1900$ ksi | Dead Load 841 lb |
| Comp. -10 Gram. -100 ps -100 ps | Location 1.58 ft |
| Controlling Moment: 10987 ft-lb | * Load obtained from Load Tracker. See Summary Report for details. |
| 4.75 Ft from left support of span 2 (Center Span) | TRAPEZOIDAL LOADS - CENTER SPAN |
| Created by combining all dead loads and live loads on span(s) 2 | Load Number <u>One Two</u> <u>Three</u> |
| Controlling Shear: 5015 lb | Left Live Load 230 plf 110 plf 110 plf |
| At left support of span 2 (Center Span) | Left Dead Load 58 plf 55 plf 82.5 plf |
| Created by combining all dead loads and live loads on span(s) 2 | Right Live Load 230 plf 110 plf 110 plf |
| | Right Dead Load 58 plf 55 plf 82.5 plf |
| Comparisons with required sections: <u>Req'd</u> <u>Provided</u> | |
| Section Modulus: 52.73 in 3 74.67 in 3 | Load End 10.33 ft 10.33 ft 10.33 ft |
| Area (Snear): 26.39 in2 28 in2 | Load Length 10.33 π 10.33 π 8.75 π |
| Moment of Inertia (deflection): 218.44 in4 597.33 in4 | |
| Moment: 10987 tt-lb 15557 ft-lb | |

5015 lb

5320 lb

Jage

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 al | I members |
|--|--|
| DEFLECTIONS Center Live Load 0.17 IN L/775 | LOADING DIAGRAM |
| 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 <u>A</u> <u>B</u> | |
| Live Load 619 lb 619 lb | |
| Dead Load 3/4 lb 3/4 lb | |
| Bearing Length 0.99 in 0.99 in | |
| | |
| BEAM DATA Center | |
| Span Length Top 0 ft | 11 ft |
| Roof Pitch 3 12 | A B |
| Floor Duration Factor 1.00 | |
| Roof Duration Factor 1.15 | |
| Notch Depth 0.00 | Side 1 Side 2 |
| MATERIAL PROPERTIES | Roof Live Load RLL = 25 psf 0 psf |
| #2 - Spruce-Pine-Fir (South) | Roof Dead Load RDL = 15 psf 0 psf |
| Base Values Adjusted | Roof Tributary Width RTW = 2.5 ft 0 ft |
| Bending Stress: Fb = 775 psi Fb' = 980 psi | |
| Cd=1.15 CF=1.10 | FLOOR LOADING |
| Shear Stress: $Fv = 135 \text{ psi}$ $Fv' = 155 \text{ psi}$ | <u>Side 1</u> <u>Side 2</u> |
| Ca=1.15 Modulus of Electicity: E = 1100 ksi E' = 1100 ksi | Floor Live Load $FLL = 20 \text{ psi} 0 \text{ psi}$ |
| Comp \perp to Grain: E = 1100 ksi E = 1100 ksi | Floor Tributary Width $ETW = 2.5$ ft 0 ft |
| | |
| Controlling Moment: 2730 ft-lb 5.5 ft from left support | Wall Load WALL = 0 plf |
| Created by combining all dead and live loads. | BEAM LOADING |
| Controlling Shear: -993 lb | Root Uniform Live Load: WL -root = 63 pit |
| At support. | Floor Liniform Live Load: wL -floor = 50 plf |
| Created by combining all dead and live loads. | Floor Uniform Dead Load: wD -floor = 25 plf |
| | Beam Self Weight: BSW = 4 plf |
| Comparisons with required sections: Req'd Provided | Combined Uniform Live Load: wL = 113 plf |
| Section Modulus: 33.41 in3 42.78 in3 | Combined Uniform Dead Load: wD = 68 plf |
| Area (Sirear). S.Sy In 2 27.75 In 2 Memory of Inartia (deflection): 09.26 in 4 107.96 in 4 | Combined Uniform Total Load: wT = 180 plf |
| Moment: 2730 ft-lb 3/05 ft-lb | |
| Shear: -993 lb 2872 lb | |

Moment:

Shear:

Location: FL1-Garage 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 LOADING DIAGRAM 0.31 IN L/947 Live Load Dead Load 0.14 in Total Load 0.45 IN L/651 Total Load Deflection Criteria: L/240 Live Load Deflection Criteria: L/360 REACTIONS В А 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 24.67 ft Unbraced Length-Top 0 ft Ā Floor Duration Factor 1.00 Notch Depth 0.00 FLOOR LOADING **MATERIAL PROPERTIES** Side 2 Versa-Lam 2800 Fb DF - Boise Cascade Side 1 Floor Live Load FLL = Base Values 40 psf 40 psf **Adjusted** Bending Stress: Fb =2800 psi Fb' = 2592 psi Floor Dead Load FDL = 15 psf 15 psf Cd=1.00 CF=0.93 Floor Tributary Width FTW = 5.7 ft 5.7 ft Shear Stress: Fv = 285 psi Fv' =285 psi Cd=1.00 Wall Load WALL = 0 plf Modulus of Elasticity: E = E' = 2000 ksi 2000 ksi **BEAM LOADING** Comp. \perp to Grain: Fc - ⊥ = 750 psi Fc - ⊥' = 750 psi Beam Total Live Load: wL = 454 plf Beam Total Dead Load: wD = 170 plf **Controlling Moment:** 50244 ft-lb Beam Self Weight: BSW = 37 plf 12.335 ft from left support Total Maximum Load: wT = 660 plf Created by combining all dead and live loads. Controlling Shear: -8147 lb At support. Created by combining all dead and live loads. Comparisons with required sections: **Provided** Req'd Section Modulus: 232.57 in3 504 in3 Area (Shear): 42.88 in2 126 in2 Moment of Inertia (deflection): 6048 in4

2298.18 in4

50244 ft-lb

-8147 lb

108883 ft-lb

Shear:

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 LOADING DIAGRAM 0.28 IN L/811 Live Load Dead Load 0.14 in Total Load 0.42 IN L/539 Total Load Deflection Criteria: L/240 Live Load Deflection Criteria: L/360 1 REACTIONS А В Live Load 6143 lb 5871 lb Dead Load 3180 lb 3045 lb Total Load 9323 lb 8916 lb TR3 Bearing Length 3.55 in 3.40 in TR1 **BEAM DATA** Center Span Length 18.67 ft 18.67 ft Unbraced Length-Top 0 ft Ā Unbraced Length-Bottom 18.67 ft Live Load Duration Factor 1.00 Notch Depth 0.00 UNIFORM LOADS Center **MATERIAL PROPERTIES** Uniform Live Load 0 plf Versa-Lam 2800 Fb DF - Boise Cascade Uniform Dead Load 0 plf **Base Values** Adjusted Beam Self Weight 25 plf Bending Stress: 2800 psi 2592 psi Total Uniform Load Fb =Fb' =25 plf Cd=1.00 CF=0.93 **POINT LOADS - CENTER SPAN** Shear Stress: 285 psi 285 psi Fv = Fv' =Load Number One ' Cd=1.00 Live Load 5595 lb Modulus of Elasticity: 2000 ksi E' = 2000 ksi F = Dead Load 2551 lb Comp. \perp to Grain: Fc - ⊥ = 750 psi Fc - ⊥' = 750 psi Location 9.33 ft * Load obtained from Load Tracker. See Summary Report for details. **Controlling Moment:** 60896 ft-lb **TRAPEZOIDAL LOADS - CENTER SPAN** 9.34 Ft from left support of span 2 (Center Span) Created by combining all dead loads and live loads on span(s) 2 Load Number One Two Three Left Live Load 163 plf 82 plf 243 plf Controlling Shear: 9323 lb Left Dead Load 81 plf 41 plf 122 plf At left support of span 2 (Center Span) 243 plf **Right Live Load** 163 plf 82 plf Created by combining all dead loads and live loads on span(s) 2 Right Dead Load 81 plf 41 plf 122 plf Load Start 4.33 ft Comparisons with required sections: 0 ft 0 ft Req'd Provided Load End 18.67 ft 18.67 ft 4.33 ft Section Modulus: 281.88 in3 336 in3 Load Length 4.33 ft 14.34 ft 18.67 ft Area (Shear): 49.07 in2 84 in2 1794.34 in4 4032 in4 Moment of Inertia (deflection): Moment: 60896 ft-lb 72589 ft-lb

9323 lb

Location: FL1- Ceiling joists at breakfast room Floor Joist [2015 International Building Code(2015 NDS)] (2) 1.5 IN x 9.25 IN x 15.0 FT @ 16 O.C. #2 - Southern Pine - Dry Use Section Adequate By: 22.9% Controlling Factor: Moment



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| CAUTIONS | |
|---|--|
| * Properly connect sheathing to double joists/rafters or fully laminate to transfer | diaphragm forces. |
| DEFLECTIONS Center | LOADING DIAGRAM |
| Live Load 0.29 IN L/629 | |
| Dead Load 0.12 in | |
| Total Load 0.40 IN L/447 | |
| Live Load Deflection Criteria: L/480 Total Load Deflection Criteria: L/360 | |
| REACTIONS A B | |
| Live Load 468 lb 493 lb | 1 |
| Dead Load 208 lb 218 lb | 2 |
| Total Load 676 lb 711 lb | |
| Bearing Length 0.40 in 0.42 in | |
| | IRI |
| <u>SUPPORT LOADS</u> <u>A</u> <u>D</u> | |
| Deed Lead 150 plf 164 plf | 15 ft |
| Tetal Load 507 plf 522 plf | A B |
| | |
| MATERIAL PROPERTIES | |
| #2 - Southern Pine | JOIST DATA Center |
| Base Values Adjusted | Span Length 15 ft |
| Bending Stress: Fb = 800 psi Fb' = 920 psi | Unbraced Length-Top 0 ft |
| Cd=1.00 CF=1.00 Cr=1.15 | Unbraced Length-Bottom 0 ft |
| Shear Stress: Fv = 175 psi Fv' = 175 psi | Floor sheathing applied to top of joists-top of joists fully braced. |
| Cd=1.00 | Floor Duration Factor 1.00 |
| Modulus of Elasticity: E = 1400 ksi E' = 1400 ksi | JOIST LOADING |
| Comp. \perp to Grain: Fc - \perp = 565 psi Fc - \perp = 565 psi | Uniform Floor Loading Center |
| | Live Load LL = 20 psf |
| Controlling Moment: 2668 ft-lb | Dead Load DL = 10 psf |
| 7.35 Ft from left support of span 2 (Center Span) | Total Load TL = 30 psf |
| Created by combining all dead loads and live loads on span(s) 2 | TL Adj. For Joist Spacing wT = 40 plf |
| Controlling Shear: -/11 lb | Wall Loading |
| At right support of span 2 (Center Span) | Wall One |
| Created by combining all dead loads and live loads on span(s) 2 | Live Load (\perp to Joists): L1 = 127 plf |
| | Dead Load (\perp to Joists): D1 = 85 plf |
| Comparisons with required sections: <u>Req'd</u> <u>Provided</u> | Load Location X1 = 3.67 ft |
| Section Modulus: 34.81 in3 42.78 in3 | Wall Two |
| Area (Shear): 6.1 in2 27.75 in2 | Live Load (\perp to Joists): L2 = 127 plf |
| ivioment of inertia (deflection): 159.42 in4 197.86 in4 | Dead Load (\perp to Joists): D2 = 85 plf |
| Moment: 2668 ft-lb 3280 ft-lb | Load Location X2 = 12 ft |
| Snear: -/11 lb 3238 lb | Partially Distributed Loading |
| | Live Load LL = 20 psf |
| | Dead Load DL = 0 psf |
| | Load Start A = 3.67 ft |
| | Load End B = 12 ft |
| | Load Length C = 8.33 ft |

Moment of Inertia (deflection):

Moment:

Shear:

104.67 in4

1746 lb

5817 ft-lb

230.84 in4

13786 ft-lb

7074 lb

Location: FL2- Roof beam at Bedroom 4 Roof Beam [2015 International Building Code(2015 NDS)] (2) 1.75 IN x 9.25 IN x 13.33 FT Versa-Lam 2800 Fb DF - Boise Cascade Section Adequate By: 120.5% Controlling Factor: Deflection



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| CAUTIONS * Laminations are to be fully connected to provide uniform transfer of loads to al | II members |
|---|---|
| DEFLECTIONSCenterLive Load0.22IN L/733Dead Load0.18inTotal Load0.40IN L/397Live Load Deflection Criteria: L/240Total Load Deflection Criteria: L/180 | LOADING DIAGRAM |
| REACTIONSABLive Load945lb945lbDead Load801lb801lbTotal Load1746lb1746lbBearing Length0.66in0.66in | |
| BEAM DATASpan Length13.3 ftUnbraced Length-Top0 ftUnbraced Length-Bottom0 ftRoof Pitch10 :12Roof Duration Factor1.15 | A 13.33 ft B |
| MATERIAL PROPERTIES Versa-Lam 2800 Fb DF - Boise Cascade Base Values Adjusted Bending Stress: Fb = 2800 psi Fb' = 3314 psi | KOOP LOADING Side One: Roof Live Load: LL = 25 psf Roof Dead Load: DL = 15 psf Tributary Width: TW = 5.7 ft |
| $Cd=1.15 \ CF=1.03$ Shear Stress: $Fv = 285 \ psi \ Cd=1.15$ Modulus of Elasticity: $E = 2000 \ ksi \ E' = 2000 \ ksi$ Comp. \perp to Grain: $Fc - \perp = 750 \ psi \ Fc - \perp' = 750 \ psi$ | Side Two: Roof Live Load: LL = 0 psf Roof Dead Load: DL = 0 psf Tributary Width: TW = 0 ft |
| Controlling Moment:5817 ft-lb6.665 ft from left supportCreated by combining all dead and live loads.Controlling Shear:1746 lbAt support.Created by combining all dead and live loads. | Wall Load: WALL = 0 plf SLOPE/PITCH ADJUSTED LENGTHS AND LOADS Adjusted Beam Length: Ladj = 13.33 ft Beam Self Weight: BSW = 9 plf Beam Uniform Live Load: wL = 142 plf Beam Uniform Dead Load: wD_adj = 120 plf Total Uniform Load: wT = 262 plf |
| Comparisons with required sections:Req'dProvidedSection Modulus:21.06 in349.91 in3Area (Shear):7.99 in232.38 in2 | ·' |

Location: FI1- Ceiling joists above Family room Floor Joist [2015 International Building Code(2015 NDS)] 1.5 IN x 9.25 IN x 17.83 FT @ 12 O.C. #2 - Spruce-Pine-Fir - Dry Use Section Adequate By: 29.7% Controlling Factor: Moment



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| DEFLECTIONS Center | LOADING DIAGRAM |
|--|---|
| Live Load 0.55 IN L/390 | |
| Dead Load 0.16 in | |
| Total Load 0.71 IN L/300 | |
| Live Load Deflection Criteria: L/240 Total Load Deflection Criteria: L/180 | |
| REACTIONS A B | |
| Live Load 244 lb 329 lb | |
| Dead Load 89 lb 89 lb | |
| Total Load 333 lb 418 lb | |
| Bearing Length 0.52 in 0.66 in | |
| | TR1 |
| SUPPORT LOADS <u>A</u> <u>B</u> | |
| Live Load 244 plf 329 plf | |
| Dead Load 89 plf 89 plf | A 17.83 ft B |
| Total Load 333 plf 418 plf | |
| MATERIAL PROPERTIES | |
| #2 - Spruce-Pine-Fir | JOIST DATA Center |
| Base Values Adjusted | Span Length 17.83 ft |
| Bending Stress: $Fh = 875 \text{ nsi}$ $Fh' = 1273 \text{ nsi}$ | Linbraced Length-Top 0 ft |
| Cd=1 15 CF=1 10 Cr=1 15 | Linbraced Length-Bottom 0 ft |
| Shear Stress: $E_V = -135 \text{ nsi} = E_V' = -155 \text{ nsi}$ | Floor sheathing applied to top of joists top of joists fully braced |
| Cd=1.15 | Elect Duration Easter 115 |
| Gu = 1.75 Modulus of Electricity: $E = -1400$ kci $E' = -1400$ kci | |
| Comp to Crain: E = 1400 KSI E = 1400 KSI | JOIST LOADING |
| Comp to Grain | Uniform Floor Loading <u>Center</u> |
| Controlling Moments 1740 ft lb | Live Load LL = 20 psf |
| O 45 Et from left own part of onen 2 (Conton Chan) | Dead Load DL = 10 psf |
| 9.45 Ft from left support of span 2 (Center Span) | Total Load TL = 30 psf |
| Created by combining all dead loads and live loads on span(s) 2 | TL Adj. For Joist Spacing wT = 30 plf |
| Controlling Shear: -418 lb | Partially Distributed Loading |
| 18.0 Ft from left support of span 2 (Center Span) | Live Load LL = 20 psf |
| Created by combining all dead loads and live loads on span(s) 2 | Dead Load DL = 0 psf |
| | Load Start A = 7 ft |
| Comparisons with required sections: <u>Req'd</u> <u>Provided</u> | Load End B = 17.83 ft |
| Section Modulus: 16.49 in 3 21.39 in 3 | Load Length $C = 10.83$ ft |
| Area (Shear): 4.04 in2 13.88 in2 | |
| Moment of Inertia (deflection): 60.81 in4 98.93 in4 | |
| Moment: 1749 ft-lb 2269 ft-lb | |
| Shear: -418 lb 1436 lb | |

Location: FI1- Beam at family room ceiling Multi-Loaded Multi-Span Beam [2015 International Building Code(2015 NDS)] (2) 1.75 IN x 16.0 IN x 18.67 FT Versa-Lam 2800 Fb DF - Boise Cascade Section Adequate By: 25.8% 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 0.49 IN L/453 Dead Load 0.16 in Total Load 0.65 IN L/344 Live Load Deflection Criteria: L/360 Total Load Deflection Criteria: L/240 | | | |
| Live Load 3919 lb 4231 lb | | | |
| Dead Load 1220 lb 1376 lb Total Load 5139 lb 5607 lb | | | |
| Bearing Length 1.96 in 2.14 in | TR1 | | |
| BEAM DATA Center | | | |
| Span Length18.67ftUnbraced Length-Top0ftUnbraced Length-Bottom18.67ftLive Load Duration Factor1.00 | A 18.67 ft B | | |
| Notch Depth 0.00 | UNIFORM LOADS Center | | |
| MATERIAL PROPERTIES Versa-Lam 2800 Fb DF - Boise Cascade Base Values Adjusted Bending Stress: Fb = 2800 psi Fb' = 2712 psi | Uniform Live Load0plfUniform Dead Load0plfBeam Self Weight16plfTotal Uniform Load16plf | | |
| Cd=1.00 CF=0.97 | TRAPEZOIDAL LOADS - CENTER SPAN | | |
| Shear Stress. $FV = 265 \text{ psi}$ $FV = 265 \text{ psi}$ $Cd=1.00$ Modulus of Elasticity: $E = 2000 \text{ ksi}$ $E' = 2000 \text{ ksi}$ Comp. \perp to Grain: $Fc - \perp = 750 \text{ psi}$ $Fc - \perp = 750 \text{ psi}$ Controlling Moment:24715 ft-lb9.71 Ft from left support of span 2 (Center Span)Created by combining all dead loads and live loads on span(s) 2 | Load NumberOne *Two *Three *Left Live Load329 plf80 plf70 plfLeft Dead Load89 plf20 plf35 plfRight Live Load329 plf80 plf70 plfRight Dead Load89 plf20 plf35 plfLoad Start0 ft0 ft11.33 ftLoad End18.67 ft18.67 ft18.67 ft | | |
| Controlling Shear:-5607 lb19.0 Ft from left support of span 2 (Center Span)Created by combining all dead loads and live loads on span(s) 2 | * Load obtained from Load Tracker. See Summary Report for details. | | |

| Comparisons with required sections: | <u>Req'd</u> | Provided |
|-------------------------------------|--------------|-------------|
| Section Modulus: | 109.36 in3 | 149.33 in3 |
| Area (Shear): | 29.51 in2 | 56 in2 |
| Moment of Inertia (deflection): | 949.32 in4 | 1194.67 in4 |
| Moment: | 24715 ft-lb | 33748 ft-lb |
| Shear: | -5607 lb | 10640 lb |

Shear:

Location: FL1- Beam at breakfast room Multi-Loaded Multi-Span Beam [2015 International Building Code(2015 NDS)] (3) 1.75 IN x 9.25 IN x 15.0 FT Versa-Lam 2800 Fb DF - Boise Cascade Section Adequate By: 38.7% Controlling Factor: Deflection



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| CAUTIONS * Laminations are to be fully connected to provide uniform transfer of loads to a | II members |
|--|--|
| DEFLECTIONSCenterLive Load0.36IN L/499Dead Load0.13inTotal Load0.49IN L/366Live Load Deflection Criteria: L/360Total Load Deflection Criteria: L/240 | LOADING DIAGRAM |
| REACTIONS A B Live Load 2759 lb 730 lb Dead Load 920 lb 327 lb Total Load 3679 lb 1057 lb Bearing Length 0.93 in 0.27 in | 1 TR1 |
| BEAM DATA Center Span Length 15 ft Unbraced Length-Top 0 ft Unbraced Length-Bottom 15 ft Live Load Duration Factor 1.00 | A 15 ft B |
| MATERIAL PROPERTIES Versa-Lam 2800 Fb DF - Boise Cascade Base Values Adjusted Bending Stress: Fb = 2800 psi | UNIFORM LOADSCenterUniform Live Load0Diform Dead Load0Beam Self Weight14Diform Load14Diform Load14 |
| Cd=1.00 CF=1.03 Shear Stress: $Fv = 285 \text{ psi}$ $Fv = 285 \text{ psi}$ $Fv' = 285 \text{ psi}$ Cd=1.00 $Cd=1.00$ Modulus of Elasticity: $E = 2000 \text{ ksi}$ $E' = 2000 \text{ ksi}$ Comp. \perp to Grain: $Fc - \perp = 750 \text{ psi}$ $Fc - \perp' = 750 \text{ psi}$ | POINT LOADS - CENTER SPAN Load Number <u>One</u> * Live Load 2229 lb Dead Load 694 lb Location 3.83 ft |
| Controlling Moment:10858 ft-lb3.9 Ft from left support of span 2 (Center Span)Created by combining all dead loads and live loads on span(s) 2Controlling Shear:3679 lbAt left support of span 2 (Center Span)Created by combining all dead loads and live loads on span(s) 2 | * Load obtained from Load Tracker. See Summary Report for details. TRAPEZOIDAL LOADS - CENTER SPAN Load Number One * Left Live Load 329 plf Left Dead Load 89 plf Right Live Load 329 plf Bight Live Load 89 plf |
| Comparisons with required sections:Req'dProvidedSection Modulus:45.21 in374.87 in3Area (Shear):19.37 in248.56 in2Moment of Inertia (deflection):249.6 in4346.26 in4Moment:10858 ft-lb17982 ft-lb | Load Start 0 ft Load End 3.83 ft Load Length 3.83 ft * Load obtained from Load Tracker. See Summary Report for details. |

3679 lb

Moment: Shear:

Location: FL1- Header at bedroom hallway Multi-Loaded Multi-Span Beam [2015 International Building Code(2015 NDS)] (2) 1.75 IN x 9.25 IN x 4.25 FT Versa-Lam 2800 Fb DF - Boise Cascade Section Adequate By: 97.9% Controlling Factor: Shear



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| CAUTIONS | | | |
|---|--|--|--|
| " Laminations are to be fully connected to provide uniform transfer of loads to a | il members | | |
| DEFLECTIONS Center | LOADING DIAGRAM | | |
| Live Load 0.03 IN L/2026 | | | |
| Dead Load 0.01 in | | | |
| Total Load 0.03 IN L/1522 | | | |
| Live Load Deflection Criteria: L/360 Total Load Deflection Criteria: L/240 | | | |
| REACTIONS A B | | | |
| Live Load 2319 lb 2089 lb | 1 | | |
| Dead Load 789 lb 717 lb | | | |
| Total Load 3108 lb 2806 lb | | | |
| Bearing Length 1.18 in 1.07 in | | | |
| | TR1 | | |
| Show Longth 405 th | | | |
| Span Length 4.25 ft | A 35 # | | |
| Unbraced Length-Top 0 ft | A 4.25 II B | | |
| Unbraced Length-Bottom 4.25 ft | | | |
| Live Load Duration Factor 1.00 | | | |
| Notch Depth 0.00 | UNIFORM LOADS Center | | |
| MATERIAL PROPERTIES | Uniform Live Load 0 plf | | |
| Versa-Lam 2800 Fb DF - Boise Cascade | Uniform Dead Load 0 plf | | |
| Base Values Adjusted | Beam Self Weight 9 plf | | |
| Bending Stress: Fb = 2800 psi Fb' = 2882 psi | Total Uniform Load 9 plf | | |
| Cd=1.00 CF=1.03 | | | |
| Shear Stress: Fv = 285 psi Fv' = 285 psi | POINT LOADS - CENTER SPAN | | |
| Cd=1.00 | Load Number <u>One</u> | | |
| Modulus of Elasticity: E = 2000 ksi E' = 2000 ksi | Live Load 3919 lb | | |
| Comp. \perp to Grain: Fc - \perp = 750 psi Fc - \perp = 750 psi | Dead Load 1220 lb | | |
| | Location 2 ft | | |
| Controlling Moment: 5845 ft-lb | * Load obtained from Load Tracker. See Summary Report for details. | | |
| 2.0 Ft from left support of span 2 (Center Span) | TRAPEZOIDAL LOADS - CENTER SPAN | | |
| Created by combining all dead loads and live loads on span(s) 2 | Load Number <u>One</u> | | |
| Controlling Shear: 3108 lb | Left Live Load 115 plf | | |
| At left support of span 2 (Center Span) | Left Dead Load 58 plf | | |
| Created by combining all dead loads and live loads on span(s) 2 | Right Live Load 115 plf | | |
| | Right Dead Load 58 plf | | |
| Comparisons with required sections: Reg'd Provided | Load Start 0 ft | | |
| Section Modulus: 24.34 in 3 49.91 in 3 | Load End 4.25 ft | | |
| Area (Shear): 16.36 in2 32.38 in2 | Load Length 4.25 ft | | |
| Moment of Inertia (deflection): 41.02 in4 230.84 in4 | | | |

5845 ft-lb

3108 lb

11988 ft-lb

Location: FL1-Beam between Kitchen and Family Uniformly Loaded Floor Beam [2015 International Building Code(2015 NDS)] (2) 1.75 IN x 16.0 IN x 17.83 FT 1.9E Microllam - iLevel Trus Joist Section Adequate By: 11.5% Controlling Factor: Shear



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| CAUTIONS | |
|---|--|
| * Laminations are to be fully connected to provide uniform transfer of loads to a | ll members |
| DEFLECTIONS Center Live Load 0.33 IN L/642 | LOADING DIAGRAM |
| Dead Load 0.15 in | |
| Total Load 0.48 IN L/443 | |
| Live Load Deflection Criteria: L/360 Total Load Deflection Criteria: L/240 | |
| REACTIONS A B | |
| Live Load 2635 lb 6998 lb | |
| Dead Load 1058 lb 2546 lb | |
| Total Load 3693 lb 9544 lb | 1 |
| Bearing Length 1.41 in 3.64 in | 2 |
| BEAM DATA Center | |
| Span Length 17.83 ft | |
| Unbraced Length-Top 0 ft | A 17.83 ft B |
| Floor Duration Factor 1.00 | |
| Notch Depth 0.00 | |
| MATERIAL PROPERTIES | FLOOR LOADING |
| 1.9E Microllam - iLevel Trus Joist | Side 1 Side 2 |
| Base Values Adjusted | Floor Live Load FLL = 0 psf 40 psf |
| Bending Stress: Fb = 2600 psi Fb' = 2500 psi | Floor Dead Load FDL = 0 psf 10 psf |
| Cd=1.00 CF=0.96 | Floor Tributary Width FTW = 0 ft 6.3 ft |
| Shear Stress: Fv = 285 psi Fv' = 285 psi | |
| Cd=1.00 | Wall Load WALL = 0 plf |
| Modulus of Elasticity: E = 1900 ksi E' = 1900 ksi | BEAM LOADING |
| Comp. \perp to Grain: Fc - \perp = 750 psi Fc - \perp = 750 psi | Beam Total Live Load: wL = 250 plf |
| • · · ··· • | Beam Total Dead Load: wD = 63 plf |
| Controlling Moment: 20485 ft-lb | Beam Self Weight: BSW = 18 plf |
| 8.915 ft from left support | Total Maximum Load: wT = 330 plf |
| Created by combining all dead and live loads. | POINT LOADS - CENTER SPAN |
| At support | Load Number One * Two * |
| Created by combining all dead and live loads | Live Load 4231 lb 945 lb |
| | Dead Load 1376 lb 801 lb |
| Comparisons with required sections: Reg'd Provided | Location 17.83 ft 10.16 ft |
| Section Modulus: 98.32 in3 149.33 in3 | * Load obtained from Load Tracker. See Summary Report for details. |
| Area (Shear): 50.23 in2 56 in2 | |
| Moment of Inertia (deflection): 669.39 in4 1194.67 in4 | |
| Moment: 20485 ft-lb 31114 ft-lb | |
| Shear: -9544 lb 10640 lb | |

Location: FL2- Beam at fl2 bath Multi-Loaded Multi-Span Beam [2015 International Building Code(2015 NDS)] (2) 1.5 IN x 9.25 IN x 9.67 FT #2 - Spruce-Pine-Fir - Dry Use Section Adequate By: 3.3% Controlling Factor: Moment



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| CAUTIONS | | | |
|---|---------------------------------|--|--|
| * Laminations are to be fully connected to provide uniform transfer of loads to a | all members | | |
| DEFLECTIONS Center Live Load 0.13 IN L/881 Dead Load 0.07 in Tatel Load 0.20 IN L/572 | LOADING DIAGRAM | | |
| Iolal Load U.20 IN L/578 | | | |
| Live Load Defiection Criteria: L/360 Total Load Defiection Criteria: L/240 | | | |
| REACTIONS A B Live Load 927 lb 848 lb Dead Load 485 lb 446 lb Total Load 1412 lb 1294 lb Bearing Length 1.11 in 1.01 in | TR1 TR2 | | |
| BEAM DATA Center | | | |
| Span Length9.67ftUnbraced Length-Top0ft | 9.67 ftB | | |
| Unbraced Length-Bottom 9.67 ft | | | |
| Live Load Duration Factor 1.00 | | | |
| | UNIFORM LOADS Center | | |
| MATERIAL PROPERTIES | Uniform Live Load 0 plf | | |
| #2 - Spruce-Pine-Fir Base Values Adjusted | Uniform Dead Load U pir | | |
| $\frac{\text{Dase values}}{\text{Rending Stress}} = \frac{\text{Aujusted}}{\text{Point Stress}}$ | Total Uniform Load 5 plf | | |
| Cd=1 00 CF=1 10 | | | |
| Shear Stress: Fv = 135 psi Fv' = 135 psi | TRAPEZOIDAL LOADS - CENTER SPAN | | |
| Cd=1.00 | Load Number <u>One Iwo</u> | | |
| Modulus of Elasticity: E = 1400 ksi E' = 1400 ksi | Left Dead Load 98 plf 81 plf | | |
| Comp. \perp to Grain: Fc - \perp = 425 psi Fc - \perp = 425 psi | Right Live Load 197 plf 163 plf | | |
| | Right Dead Load 98 plf 81 plf | | |
| Controlling Moment: 3322 ft-lb | Load Start 0 ft 5.83 ft | | |
| 4.74 Ft from left support of span 2 (Center Span) | Load End 5.83 ft 9.67 ft | | |
| Created by combining all dead loads and live loads on span(s) 2 | Load Length 5.83 ft 3.84 ft | | |
| Controlling Shear: 1412 lb | | | |
| At lett support of span 2 (Center Span) | | | |
| Greated by combining all dead loads and live loads on span(s) 2 | | | |

| Comparisons with required sections: | <u>Req'd</u> | Provided |
|-------------------------------------|--------------|-----------------|
| Section Modulus: | 41.41 in3 | 42.78 in3 |
| Area (Shear): | 15.69 in2 | 27.75 in2 |
| Moment of Inertia (deflection): | 82.17 in4 | 197.86 in4 |
| Moment: | 3322 ft-lb | 3431 ft-lb |
| Shear: | 1412 lb | 2498 lb |

Location: FL1- beam at master entry Multi-Loaded Multi-Span Beam [2015 International Building Code(2015 NDS)] (3) 1.5 IN x 9.25 IN x 5.0 FT #2 - Spruce-Pine-Fir - Dry Use Section Adequate By: 35.8% Controlling Factor: Shear



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| CAUTIONS * Laminations are to be fully connected to provide uniform transfer of loads to all members | | | |
|---|---|--|--|
| DEFLECTIONSCenterLive Load0.03IN L/2152Dead Load0.01inTotal Load0.04IN L/1607Live Load Deflection Criteria: L/360Total Load Deflection Criteria: L/240 | LOADING DIAGRAM | | |
| REACTIONS A B Live Load 2060 lb 2060 lb Dead Load 699 lb 699 lb Total Load 2759 lb 2759 lb Bearing Length 1.44 in 1.44 in | TR2 TR1 | | |
| BEAM DATACenterSpan Length5Unbraced Length-Top0Unbraced Length-Bottom5ftLive Load Duration Factor1.00 | A 5 ft B | | |
| Notch Depth 0.00 MATERIAL PROPERTIES #2 - Spruce-Pine-Fir Bending Stress: Fb = 875 psi Fb' = 1107 psi | UNIFORM LOADSCenterUniform Live Load0plfUniform Dead Load0plfBeam Self Weight8plfTotal Uniform Load8plf | | |
| $Cd=1.00 \ CF=1.10 \ Cr=1.15$ Shear Stress: $Fv = 135 \ psi \ Cd=1.00$ Modulus of Elasticity: $E = 1400 \ ksi \ E' = 1400 \ ksi$ Comp. \perp to Grain: $Fc - \perp = 425 \ psi \ Fc - \perp' = 425 \ psi$ | TRAPEZOIDAL LOADS - CENTER SPAN Load Number One Two Left Live Load 557 plf 267 plf Left Dead Load 139 plf 133 plf Right Live Load 557 plf 267 plf | | |
| Controlling Moment:3449 ft-lb2.5 Ft from left support of span 2 (Center Span)Created by combining all dead loads and live loads on span(s) 2Controlling Shear:2759 lbAt left support of span 2 (Center Span)Created by combining all dead loads and live loads on span(s) 2 | Right Dead Load139 plf133 plfLoad Start0 ft0 ftLoad End5 ft5 ftLoad Length5 ft5 ft | | |

| Comparisons with required sections: | <u>Req'd</u> | Provided |
|-------------------------------------|--------------|------------|
| Section Modulus: | 37.39 in3 | 64.17 in3 |
| Area (Shear): | 30.65 in2 | 41.63 in2 |
| Moment of Inertia (deflection): | 49.65 in4 | 296.79 in4 |
| Moment: | 3449 ft-lb | 5919 ft-lb |
| Shear: | 2759 lb | 3746 lb |
| | | |

Location: FL1- Header at Breakfast rooom door Multi-Loaded Multi-Span Beam [2015 International Building Code(2015 NDS)] (2) 1.5 IN x 9.25 IN x 6.0 FT #2 - Southern Pine - Dry Use Section Adequate By: 23.4% Controlling Factor: Moment



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| CAUTIONS * Laminations are to be fully connected to provide uniform transfer of loads to a | II members |
|---|---|
| DEFLECTIONSCenterLive Load0.04IN L/1949Dead Load0.02inTotal Load0.05IN L/1332Live Load Deflection Criteria: L/360Total Load Deflection Criteria: L/240 | LOADING DIAGRAM |
| REACTIONS A B Live Load 1053 lb 1053 lb Dead Load 488 lb 488 lb Total Load 1541 lb 1541 lb Bearing Length 0.91 in 0.91 in | TR1 |
| BEAM DATACenterSpan Length6 ftUnbraced Length-Top0 ftUnbraced Length-Bottom6 ftLive Load Duration Factor1.00 | A 6 ft B |
| Notch Depth 0.00 MATERIAL PROPERTIES #2 - Southern Pine #2 - Southern Pine Base Values Bending Stress: Fb = 800 psi Fb = 800 psi Fb' = 800 psi | UNIFORM LOADSCenterUniform Live Load0plfUniform Dead Load0plfBeam Self Weight7plfTotal Uniform Load7plf |
| $Cd=1.00 \ CF=1.00$ Shear Stress: $Fv = 175 \ psi \ Cd=1.00$ Modulus of Elasticity: $E = 1400 \ ksi \ E' = 1400 \ ksi$ Comp. \perp to Grain: $Fc - \perp = 565 \ psi \ Fc - \perp' = 565 \ psi$ | TRAPEZOIDAL LOADS - CENTER SPANLoad NumberOneLeft Live Load351 plfLeft Dead Load156 plfRight Live Load351 plf |
| Controlling Moment:2311 ft-lb3.0 Ft from left support of span 2 (Center Span)Created by combining all dead loads and live loads on span(s) 2Controlling Shear:1541 lbAt left support of span 2 (Center Span) | Right Dead Load 156 plf Load Start 0 ft Load End 6 ft Load Length 6 ft * Load obtained from Load Tracker. See Summary Report for details. |

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

| Comparisons with required sections: | <u>Req'd</u> | Provided |
|-------------------------------------|--------------|------------|
| Section Modulus: | 34.67 in3 | 42.78 in3 |
| Area (Shear): | 13.21 in2 | 27.75 in2 |
| Moment of Inertia (deflection): | 36.55 in4 | 197.86 in4 |
| Moment: | 2311 ft-lb | 2852 ft-lb |
| Shear: | 1541 lb | 3238 lb |



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Location: FL1- Beam at stairs in garage Multi-Loaded Multi-Span Beam [2015 International Building Code(2015 NDS)] (2) 1.75 IN x 9.25 IN x 11.67 FT Versa-Lam 2800 Fb DF - Boise Cascade Section Adequate By: 68.1% Controlling Factor: Deflection



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| CAUTIONS * Laminations are to be fully connected to provide uniform transfer of loads to a | Il members |
|---|---|
| DEFLECTIONSCenterLive Load0.23IN L/605Dead Load0.07inTotal Load0.30IN L/469Live Load Deflection Criteria: L/360Total Load Deflection Criteria: L/240 | LOADING DIAGRAM |
| REACTIONS A B Live Load 1406 lb 1615 lb Dead Load 409 lb 463 lb Total Load 1815 lb 2078 lb Bearing Length 0.69 in 0.79 in | TR1 |
| BEAM DATACenterSpan Length11.67Unbraced Length-Top0Unbraced Length-Bottom11.67Live Load Duration Factor1.00 | A 11.67 ft B |
| Notch Depth 0.00 MATERIAL PROPERTIES Versa-Lam 2800 Fb DF - Boise Cascade Base Values Adjusted Bending Stress: Fb = 2800 psi Fb' = 2882 psi | UNIFORM LOADSCenterUniform Live Load0plfUniform Dead Load0plfBeam Self Weight9plfTotal Uniform Load9plf |
| $Cd=1.00 \ CF=1.03$ Shear Stress: $Fv = 285 \ psi$ $Fv = 285 \ psi$ $Cd=1.00$ Modulus of Elasticity: $E = 2000 \ ksi$ $Comp. \perp$ to Grain: $Fc - \perp = 750 \ psi$ | TRAPEZOIDAL LOADS - CENTER SPAN Load Number One Two Left Live Load 227 plf 73 plf Left Dead Load 57 plf 19 plf Right Live Load 227 plf 73 plf Dight Live Load 57 plf 19 plf Right Live Load 57 plf 10 plf |
| Controlling Moment:5609 ft-lb6.19 Ft from left support of span 2 (Center Span)Created by combining all dead loads and live loads on span(s) 2Controlling Shear:-2078 lb12.0 Ft from left support of span 2 (Center Span)Created by combining all dead loads and live loads on span(s) 2 | Load Start 0 ft 6.58 ft Load End 11.67 ft 11.67 ft Load Length 11.67 ft 5.09 ft |

| Comparisons with required sections: | <u>Req'd</u> | Provided |
|-------------------------------------|--------------|-----------------|
| Section Modulus: | 23.35 in3 | 49.91 in3 |
| Area (Shear): | 10.94 in2 | 32.38 in2 |
| Moment of Inertia (deflection): | 137.36 in4 | 230.84 in4 |
| Moment: | 5609 ft-lb | 11988 ft-lb |
| Shear: | -2078 lb | 6151 lb |
| | | |

Moment:

Shear:

Location: FI1- Beam between garages Multi-Loaded Multi-Span Beam [2015 International Building Code(2015 NDS)] (2) 1.5 IN x 9.25 IN x 3.67 FT #2 - Southern Pine - Dry Use Section Adequate By: 36.1% Controlling Factor: Shear



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| CAUTIONS * Laminations are to be fully connected to provide uniform transfer of leads to all members | | | |
|---|--|--|--|
| DEELECTIONS Contor | | | |
| <u>DEFLECTIONS</u> <u>Center</u> | | | |
| | | | |
| Total Load 0.01 IN L /0700 | | | |
| Ive Load Deflection Criteria: 1/360 Total Load Deflection Criteria: 1/240 | | | |
| Live Load Defiection Chteria. L/300 Total Load Defiection Chteria. L/240 | | | |
| REACTIONS A B | 1 | | |
| Live Load 332 lb 1797 lb | | | |
| Dead Load 162 lb 582 lb | | | |
| Total Load 494 lb 2379 lb | | | |
| Bearing Length 0.29 in 1.40 in | TR1 | | |
| BEAM DATA Center | | | |
| Span Length 3.67 ft | | | |
| Unbraced Length-Top 0 ft | A 3.67 ft B | | |
| Unbraced Length-Bottom 3.67 ft | | | |
| Live Load Duration Factor 1.00 | | | |
| Notch Depth 0.00 | UNIFORM LOADS Center | | |
| MATERIAL PROPERTIES | Uniform Live Load 0 plf | | |
| #2 - Southern Pine | Uniform Dead Load 0 plf | | |
| Base Values Adjusted | Beam Self Weight 7 plf | | |
| Bending Stress: Fb = 800 psi Fb' = 800 psi | Total Uniform Load 7 plf | | |
| Cd=1.00 CF=1.00 | | | |
| Shear Stress: Fv = 175 psi Fv' = 175 psi | POINT LUADS - CENTER SPAN | | |
| Cd=1.00 | Load Number One | | |
| Modulus of Elasticity: E = 1400 ksi E' = 1400 ksi | | | |
| Comp. \perp to Grain: Fc - \perp = 565 psi Fc - \perp = 565 psi | Leastien 2.5 ft | | |
| | Location 3.5 it | | |
| Controlling Moment: 563 ft-lb | Load obtained from Load Tracker. See Summary Report for details. | | |
| 2.28 Ft from left support of span 2 (Center Span) | TRAPEZOIDAL LOADS - CENTER SPAN | | |
| Created by combining all dead loads and live loads on span(s) 2 | Load Number <u>One</u> | | |
| Controlling Shear: -2379 lb | Left Live Load 140 plf | | |
| 4.0 Ft from left support of span 2 (Center Span) | Left Dead Load 70 plf | | |
| Created by combining all dead loads and live loads on span(s) 2 | Right Live Load 140 plf | | |
| - • • • • | Right Dead Load 70 plf | | |
| Comparisons with required sections: Req'd Provided | Load Start 0 ft | | |
| Section Modulus: 8.44 in3 42.78 in3 | Load End 3.67 ft | | |
| Area (Shear): 20.39 in2 27.75 in2 | Load Length 3.67 ft | | |
| Moment of Inertia (deflection): 5.68 in4 197.86 in4 | | | |

563 ft-lb

-2379 lb

2852 ft-lb