

1.5 IN x 5.5 IN x 16.5 FT (15 + 1.5) @ 24 O.C.
 #2 - Douglas-Fir-Larch - Dry Use
 1.5 x 7.25 Solid Sawn Lumber with minimum Ft = 575
Section Inadequate By: 311.0%
 Controlling Factor: Moment

DEFLECTIONS	Center	Right
Live Load	1.49 IN L/122	-0.40 IN 2L/90
Dead Load	0.90 in	-0.24 in
Total Load	2.39 IN L/76	-0.65 IN 2L/56
Live Load Deflection Criteria: L/240 Total Load Deflection Criteria: L/180		

RAFTER REACTIONS	LOADS	REACTIONS
Lower Live Load @ B	412 plf	825 lb
Lower Dead Load @ B	250 plf	500 lb
Lower Total Load @ B	662 plf	1325 lb
Collar Tie Tension		4108 lb

RAFTER SUPPORT DATA	B
Bearing Length	1.41 in

RAFTER DATA	Interior	Eave
Span Length	15 ft	1.5 ft
Unbraced Length-Bottom	0 ft	0 ft
Rafter Pitch	1.63	:12
Collar Tie Location	2.19 ft	
Roof Duration Factor	1.15	
Peak Notch Depth	0.00	
Base Notch Depth	0.00	

RAFTER LOADING
Uniform Floor Loading
Roof Live Load: LL = 25 psf
Roof Dead Load: DL = 15 psf
Slope Adjusted Spans And Loads
Interior Span: L-adj = 15.14 ft
Eave Span: L-Eave-adj = 1.51 ft
Rafter Live Load: wL-adj = 49 plf
Eave Live Load: wL-Eave-adj = 49 plf
Rafter Dead Load: wD-adj = 30 plf
Rafter Total Load: wT-adj = 79 plf
Eave Total Load: wT-Eave-adj = 79 plf

MATERIAL PROPERTIES

	Base Values	Adjusted
Bending Stress:	Fb = 900 psi <i>Cd=1.15 Cl=0.55 CF=1.30</i>	Fb' = 744 psi
Shear Stress:	Fv = 180 psi <i>Cd=1.15</i>	Fv' = 207 psi
Modulus of Elasticity:	E = 1600 ksi	E' = 1600 ksi
Min. Mod. of Elasticity:	E_min = 580 ksi	E_min' = 580 ksi
Comp. \perp to Grain:	Fc \perp = 625 psi	Fc \perp = 625 psi

Controlling Moment: -1928 ft-lb
 6.897 Ft from left support of span 2 (Center Span)
 Created by combining all dead loads and live loads on span(s) 2
Controlling Shear: -645 lb
 14.864 Ft from left support of span 2 (Center Span)
 Created by combining all dead loads and live loads on span(s) 2, 3

Comparisons with required sections:	Req'd	Provided
Section Modulus:	31.09 in3	7.56 in3
Area (Shear):	4.68 in2	8.25 in2
Moment of Inertia (deflection):	66.56 in4	20.8 in4
Moment:	-1928 ft-lb	469 ft-lb
Shear:	-645 lb	1139 lb

<u>COLLAR TIE DESIGN</u>		
1.5 x 7.25 Solid Sawn Lumber with minimum Ft = 575		
	<u>Base Values</u>	<u>Adjusted</u>
Tension Parallel to Grain	Ft = 575 psi	Ft' = 992 psi
	<i>Cd=1.15 Cf=0.00</i>	
Collar Tie Location	2.19 ft	
Collar Tie Tension	4108 lb	
Collar Tie Capacity	10787 lb	
Nailing Required @ Both Ends		
16d Common	26 Nails	
16d Sinker	31 Nails	
16d Box	35 Nails	

LOADING DIAGRAM

