

## Member Calculations

### Bending

$M_d$ :	685.48 ft*lb		
$f_b$ :	1087.7 psi		
Load Duration Factor ( $C_d$ ):	1.15		
Stability Factor ( $C_L$ ):	1		
Wet Service Factor ( $C_M$ ):	1		
Temperature Factor ( $C_T$ ):	1		
Size Factor ( $C_F$ ):	1.3		
Flat Use Factor ( $C_{fu}$ ):	1		
Incising Factor ( $C_i$ ):	1		
Repetitive Member Factor ( $C_r$ ):	1.15		
$F_b$ :	900 psi		
$F'_b$ :	1547.33 psi	<b>1087.7 ≤ 1547.33 OK in Bending</b>	

### Shear

$V_d$ :	228.38 lb		
$f_v$ :	41.52 psi		
Load Duration Factor ( $C_d$ ):	1.15		
Wet Service Factor ( $C_M$ ):	1		
Temperature Factor ( $C_T$ ):	1		
Size Factor ( $C_F$ ):	1.3		
Flat Use Factor ( $C_{fu}$ ):	1		
Incising Factor ( $C_i$ ):	1		
$F_v$ :	180 psi		
$F'_v$ :	207 psi	<b>41.52 ≤ 207</b>	<b>OK in Shear</b>

### Deflection

Live Load Deflection ( $\Delta_L$ ):	0.37 in	<b>L/385</b>	<b>OK in Live Load Deflection</b>
Total Load Deflection ( $\Delta_T$ ):	0.53 in	<b>L/270</b>	<b>OK in Total Load Deflection</b>

### Uplift Calculation

Tributary Square Footage on Component:	10.83 ft <sup>2</sup>
Uplift Pressure:	-27.66 psf
Uplift per Lag:	-299.64 lbs
Lag Screw Diameter:	5/16 in
Allowable Withdrawal per Inch:	490.99 lbs/in
Minimal Screw Penetration:	0.61 in

**Install 5/16" diameter lag screws @ 48 on center with minimum penetration of 2" into rafter.**