

Client Name: PowerHome Solar  
 PFE Project Number: 204137  
 Client Project Number: 15519GREE  
 Project: Green Residence  
 Address: 15519 Piedmont Street  
 Detroit, MI 48223  
 Description: Mounting Plane 2  
 Calculations By: ADL  
 Date: September 20, 2020

### Roof Construction

2x6 Rafters at 16" on center

A=	8.25 in <sup>2</sup>
Ix=	20.8 in <sup>4</sup>
Sx=	7.56 in <sup>3</sup>
Wood Species=	Doug-Fir Larch #2
Fb=	900 psi
Fv=	180 psi
E=	1600000 psi
Roof Slope=	30 °
Rafter Span=	13.86 ft
Ceiling Attached to Rafters?:	No

### Design Criteria

Ground Snow (P <sub>g</sub> ):	20 psf
Design Wind Speed:	115 mph
Live Load:	20 psf
Dead Load:	4.7 psf
PV Modules:	3.46 psf

### Wind Calculations

Directionality Factor (K <sub>d</sub> ):	0.85
Topographic Factor (K <sub>zt</sub> ):	1
Velocity Pressure Exposure Coefficient (K <sub>z</sub> ):	0.7
Importance Factor (I):	1
Velocity Pressure (q <sub>z</sub> ):	20.14 psf
Tributary Square Footage on Component:	10.83 ft <sup>2</sup>
Component Roof Pressures:	21.69 / -27.66 psf

### Snow Load Calculations

Exposure Factor (C <sub>e</sub> ):	1
Thermal Factor (C <sub>t</sub> ):	1
Importance Factor (I):	1
Flat Roof Snow Loads (P <sub>f</sub> ):	14 psf
Roof Slope Factor (C <sub>s</sub> ):	1
Sloped Snow Loads (P <sub>s</sub> ):	14 psf
Unbalanced Snow Load:	20 psf