



6/18/2025

Freedom Forever LLC
43445 Buisiness Park Dr., Suite 110
Temecula, CA 92590

Job Number: 559074
Project Name: Theresa McNulty
Project Address: 110 Denali Dr , Angier, NC

Design Criteria:

Applicable Code = ASCE 7-16
Design Wind Speed = 130 mph (3 Second Gust)
Exposure Category = B
Ground Snow Load = 15 psf
Module Type = JA Solar: JAM54S31-405/MR
Module Quantity = 19
Seismic Design Cat= A
Roof Snow Load= 11.55 psf

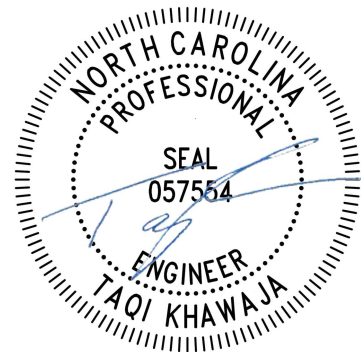
To whom it may concern,

The above mentioned residential rooftop solar project has been designed to the specifications shown above. The team at Freedom Forever LLC has visited the site to observe the roof and its framing as well as gather other required information for the project. During this observation they did not see any signs of damage or distress to the roof structure which would preclude solar from being installed. Based on that review and the information provided, the calculations on the following pages were completed to determine the adequacy of the roof framing as well as the allowable attachment spacing for the PV panels. The calculations show that the roof can support the proposed PV system without structural modifications.

| | | | | | | | | | | |
|-----------------|---------------------------|---------------------------|---|---|---|---|---|---|---|----|
| Mounting Plane | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Roof Type | Comp Shingle | Comp Shingle | | | | | | | | |
| Framing Type | Truss | Truss | | | | | | | | |
| Framing Size | 2x6 @ 24 | 2x6 @ 24 | | | | | | | | |
| Upgrade Size | NA | NA | | | | | | | | |
| Attachment Type | SnapNRack RL Universal | SnapNRack RL Universal | | | | | | | | |
| Lag Count | 1 | 1 | | | | | | | | |
| Embedment Depth | 2.5 | 2.5 | | | | | | | | |

Sincerely,

Taqi Khawaja, PE
Freedom Forever LLC



Digitally Signed by: Taqi Khawaja, PE
Digitally Signed on: 06/18/2025

[illegible]

Down Force

| Mounting Plane | 1 | | 2 | | 3 | | 4 | | 5 | |
|-----------------|------|------|------|------|----|----|----|----|----|----|
| Module Location | EM | IM | EM | IM | EM | IM | EM | IM | EM | IM |
| D+S (psf) | 9.54 | 9.54 | 9.54 | 9.54 | | | | | | |
| D+06W (psf) | 8.62 | 6.64 | 8.62 | 6.64 | | | | | | |

| Mounting Plane | 6 | | 7 | | 8 | | 9 | | 10 | |
|-----------------|----|----|----|----|----|----|----|----|----|----|
| Module Location | EM | IM | EM | IM | EM | IM | EM | IM | EM | IM |
| D+S (psf) | | | | | | | | | | |
| D+06W (psf) | | | | | | | | | | |

Lateral Parallel to Roof

| Mounting Plane | 1 | 2 | 3 | 4 | 5 |
|----------------|------|------|---|---|---|
| D+S (psf) | 4.65 | 4.65 | | | |

| Mounting Plane | 6 | 7 | 8 | 9 | 10 |
|----------------|---|---|---|---|----|
| D+S (psf) | | | | | |

Framing Check

Lumber Species: DF

PV Load = 3 psf

| Mounting Plane | 1 | 2 | 3 | 4 | 5 |
|----------------------|-------|-------|---|---|---|
| Framing Type | Truss | Truss | | | |
| Framing Size | 2x6 | 2x6 | | | |
| Framing Spacing (in) | 24 | 24 | | | |
| Span (ft) | 7 | 7 | | | |
| Moment (lb-ft) | 203 | 203 | | | |
| Shear (lbs) | 116 | 116 | | | |
| % Stressed | 21% | 21% | | | |
| Upgrade Size | NA | NA | | | |
| New % Stressed | NA | NA | | | |

| Mounting Plane | 6 | 7 | 8 | 9 | 10 |
|----------------------|---|---|---|---|----|
| Framing Type | | | | | |
| Framing Size | | | | | |
| Framing Spacing (in) | | | | | |
| Span (ft) | | | | | |
| Moment (lb-ft) | | | | | |
| Shear (lbs) | | | | | |
| % Stressed | | | | | |
| Upgrade Size | | | | | |
| New % Stressed | | | | | |



Array Attachment Spacing

Module = JA Solar: JAM54S31-405/MR

| Mounting Plane | 1 | 2 | 3 | 4 | 5 |
|--------------------------|---------------------------|---------------------------|---|---|---|
| Roofing Material | Comp Shingle | Comp Shingle | | | |
| Attachment Type | SnapNRack RL Universal | SnapNRack RL Universal | | | |
| Lag Count Per Attachment | 1 | 1 | | | |
| Min Lag Embedment (in) | 2.5 | 2.5 | | | |
| Landscape | 72 | 72 | | | |
| Portrait | 72 | 72 | | | |

| Mounting Plane | 6 | 7 | 8 | 9 | 10 |
|--------------------------|---|---|---|---|----|
| Roofing Material | | | | | |
| Attachment Type | | | | | |
| Lag Count Per Attachment | | | | | |
| Min Lag Embedment (in) | | | | | |
| Landscape | | | | | |
| Portrait | | | | | |