

## Snow Impacts with clawFR® and clawFRplus™

### BACKGROUND

Engineers rely on ASCE 7 (Minimum Design Loads for Buildings and Other Structures) for the application of snow on structures. However, ASCE 7 is silent on how snow loads are to be applied on low profile flat roof solar arrays. Our partners have asked us about how flat roof solar arrays built using our clawFR and clawFRplus products may affect snow drifts in and around the arrays and if these drifts affect PV power performance.

### SNOW LOADS AND DRIFTING

clawFR and clawFRplus have a relatively low profile with maximum rooftop standoff heights (north edge of modules) of about 10 inches or less for the 5-degree systems and about 14 inches or less for the 10-degree systems. Because typical flat roof snow load depths can exceed these heights, the PV system will not negatively impact rooftop snow loads or rooftop drifting like a taller racking system could. For shallow rooftop snow depths (less than about 12 inches, refer to Figure 1 and Picture 1) small drifts up to approximately the same depth as the system height may develop between array rows. In this case, roof live loads will normally control over the snow loads. For deeper rooftop snow levels (Figure 2 and Picture 2), our systems will be blanketed by the snow depth. Thus, the maximum snow load on a roof with our systems will be similar to the uniform flat roof snow loads required by ASCE 7 (Figure 3).

Nonetheless, care should be taken not to place racking systems and modules near areas that can see large snow drifts such as adjacent to tall parapets, windscreens, roof projections, and the like. Buildings with features that will cause drifted snow should have a drifted snow load plan prepared so that modules can be positioned to avoid these areas of high load.

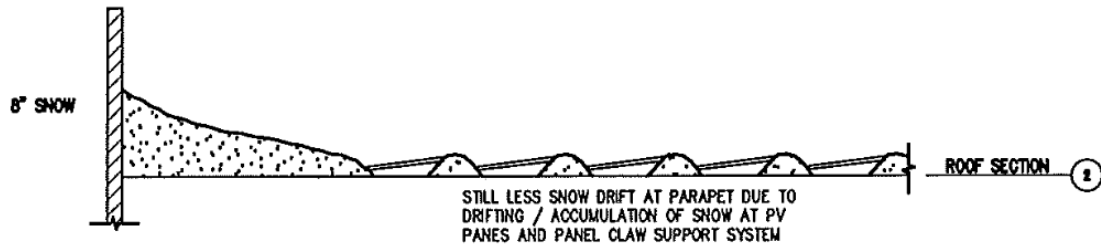


Figure 1 – Predicted Small Depth Snow with Solar Array

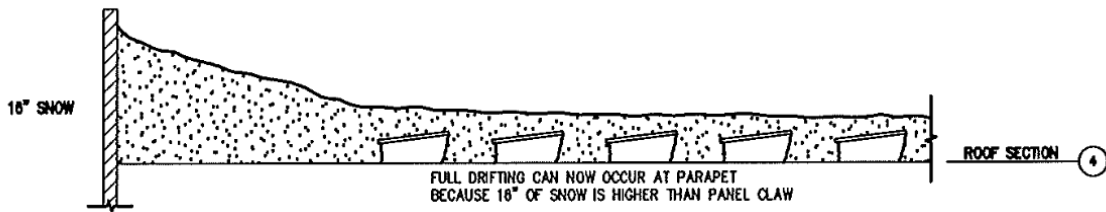


Figure 2 – Predicted Blanketed Snow with Solar Array



Picture 1 – Small Depth Snow with Solar Array



Picture 2 – Blanketed Solar Array

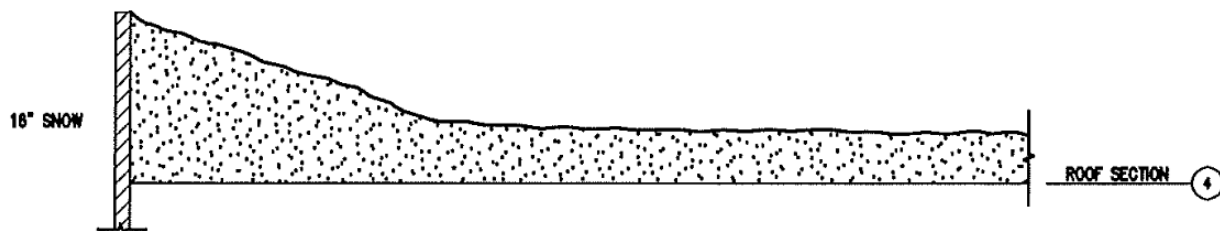


Figure 3 – ASCE 7 Snow without Solar Array

## POTENTIAL EFFECTS ON POWER PERFORMANCE

Snow accumulation in between array rows may cause limited shading on modules under certain conditions (See Picture 3). Resulting production losses can increase with tighter row spacing. PanelClaw believes the higher power density of tighter row spacing designs likely offsets this difference in summer months.



Picture 3 – Limited Snow Shading

### **ABOUT PANELCLAW:**

PanelClaw is a global expert focusing primarily on flat roof PV structures. The company is headquartered north of Boston, Massachusetts and has gigawatts of experience designing and engineering flat roof structures in over 30 countries around the world. For more information, contact [sales@panelclaw.com](mailto:sales@panelclaw.com)