

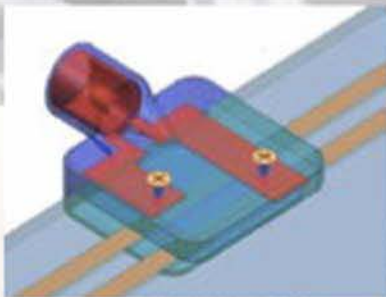
System Mock Up



A system mock up was built on the roof of the College Architecture's Research and Demonstration Facility (RDF). This mock up will allow for data collection to better monitor roof conditions and establish a cost analysis and feasibility of the system implementation.

Electrical Connection Method

Plug and play connection method is designed to allow for connections to be made on the roof, or at a factory prior to installation. The connection can be positioned in a variety of locations on the panel. This helps to minimize wire-runs on the roof, providing a safer working environment, and lowering current loss incurred by long wire runs.



Mechanical Panel Connection

Early concepts for mechanical connection of solar panel to the PVC roof membrane. This connection method would be used were an adhesive is not an option, or in certain retro fit situations. Profile serves as a means to secure panels to membrane while also serving as a protective casing for wire runs.



Research Topic:

Building Integrated Photovoltaic Roof Membrane

This research is focused on the development of an integrated roof membrane and photovoltaic solar panel system. The goal is to have a final product that can be installed as a typical low-slope roof membrane, yet function as a solar array.

The objective is to bond flexible amorphous solar panels to a polyvinyl chloride membrane, and distribute this system as one combined product. By combining these two products into one, the overall installed cost of the system is greatly reduced.

The other aspect of the system is a plug and play connection method that allows for easy electrical connections, thus minimizing the need for specialized high cost electricians. Utilizing the plug and play connection method with a modular system design allows for the system to be easily customized for different PV array sizes without the need for specialized system designers. This cuts down installation cost and lead time.

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Ross came to Virginia Tech with a background in fine arts and architecture to study Industrial Design. Upon starting at Tech he has been very active in the DOE Solar Decathlon project, and other alternative energy projects. He is now pursuing a marketing research degree.