GLASS SYSTEMS: PHOTOVOLTAIC GLAZING

Building Integrated Photovoltaics (BIPV) are increasingly being specified by architects and owners interested in energy efficient and environmentally friendly design. Super Sky Products has completed hundreds of photovoltaic installations. Our expertise in designing, fabricating, and installing complete photovoltaic systems provides architects and contractors with single source responsibility for all aspects of the BIPV system. This single source responsibility eliminates the confusion and lack of coordination that can occur on a relatively new building component such as this.

To assist in planning your BIPV installation, please keep in mind the following:

1. Preliminary Design: It is important for the design of the BIPV system to be extensively researched, detailed, and specified so that nothing slips through the cracks or that proper coordination between trades is overlooked.

2. Aesthetic Design: The first concern is how the BIPV skylight will be integrated into the overall building design. Will it be an entrance canopy, an atrium skylight, or a sunshade? The design possibilities are almost as limitless as a standard skylight, although it will help keep the cost down if mainly rectangular PV modules are used.

3. Geometry: Virtually any geometry is possible, although curved glass surfaces are not possible at this time. However, segmented vaults can approximate curved surfaces.

4. Locations and Orientation: Ideally, the BIPV system should face the south, southeast, or southwest. It should slope about 30 degrees off horizontal, and most importantly, it should NOT be shaded by other buildings or building elements.

5. Structural Design: Design of the supporting aluminum framework, proper glazing techniques, and details must be used to properly support and protect the PV modules, and provide a watertight system. Since the BIPV system is the building envelope, it must be designed with as much attention to detail as any other skylight or curtainwall project. The PV components are important, but it is critical that the system be leak- free for many years to come, and will provide the proper thermal performance as required by the building mechanical systems.

6. Power Output: the size of the PV array, along with the type of PV module, determines how much power is generated. Typically, a crystalline PV system will generate about 10 watts per sq ft. and a thin film system will generate 4 watts per sq ft. Usually, on a commercial building, the PV system will generate only a portion of the buildings electrical needs, so connection to the electrical grid is recommended. The local power company should be contacted for questions about grid connections, and 'net-metering" where excess power generated by the PV system will be credited against the owners electric bill. On residential systems, it is possible to incorporate enough modules to generate enough power to meet the house's energy requirements for the entire year. However, grid connection is still recommended, otherwise large battery storage systems are needed.

7. PV Modules: Crystalline and Thin Film modules are available in custom sizes and patterns, but some limitations apply in terms of glass size and thickness. Insulated glass units are also available, but careful consultation with the manufacturer should be done in the preliminary design stage to assure the desired output, light transmission, thermal performance, and appearance is achieved. Crystalline modules have a distinct grid pattern because the individual crystalline 'cells' are linked together in a checkerboard pattern with the spaces between the cells varying to allow for different amounts of light transmission.

8. PV System Electrical Design: Care must be taken in designing the PV system; in particular the wiring layout and interface with the building electrical. Decisions need to be made concerning the type of system: whether it is grid connected, with or without battery back-up, and that the proper BOS (Balance of System) components are specified.

9. BOS (Balance of System): BOS components include all necessary fittings, conduit, junction boxes, wiring, connectors, inventors, charge controllers, etc. that are required for a complete installation. Specifications and bills of materials must be carefully prepared, to insure the proper functioning of the system and integration with the building electrical system.

10. Coordination of Installation: The installation of a BIPV system involves several different trades that generally aren't used to working together. Sheet metal workers, glaziers, and electricians must all work on the same BIPV installation, in a coordinated fashion, for the project to be a success. With the proper preliminary wiring and installation details worked out, along with Super Sky's experience in the field, this process will be much more efficient.

11. Financial Incentives: Incentives for using photovoltaic systems are offered by both the federal government, and state governments. These include grants, low interest loans, special depreciation, tax credits, and net energy billing, or net metering. Each state has its own incentive programs.

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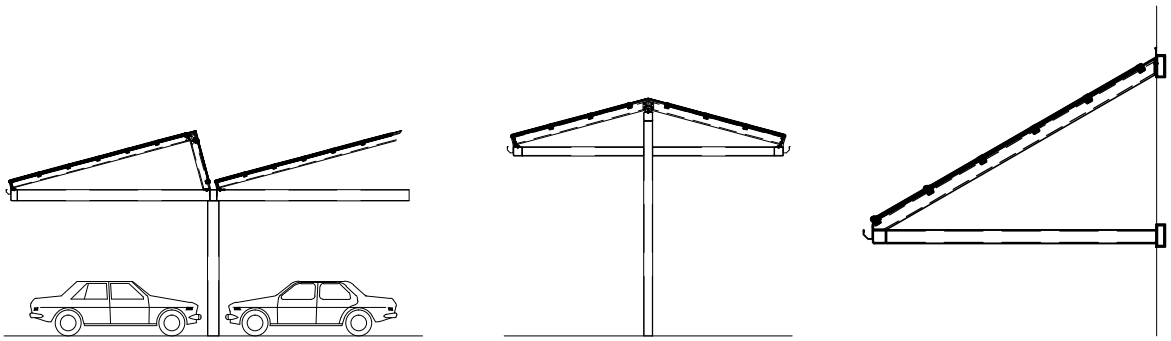
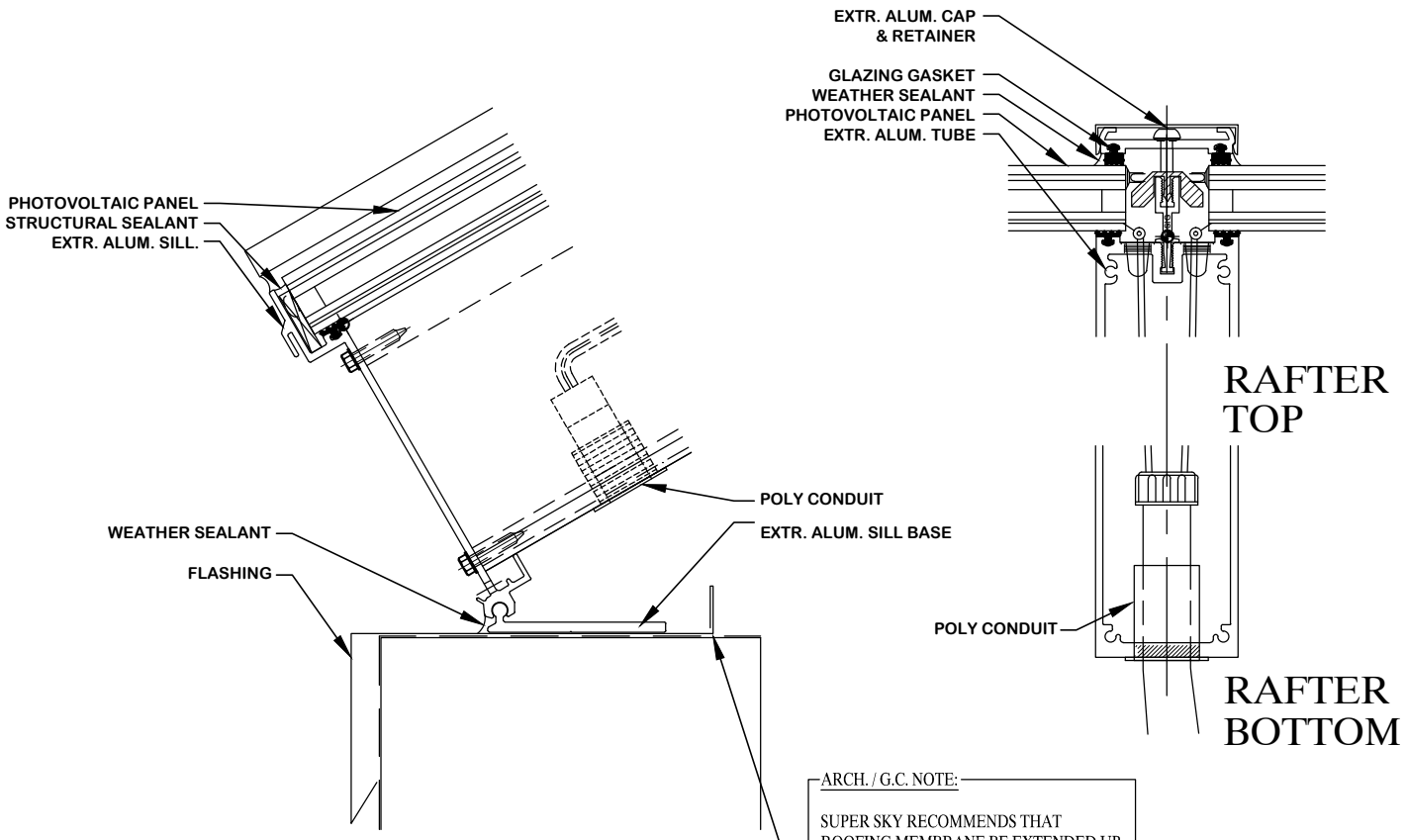
Super Sky has the resources to completely design, engineer, fabricate and install your photovoltaic skylight system. We have considerable experience in BIPV (Building Integrated Photovoltaic Systems), as well as entrance canopies, shade parking, covered walkways, and transit canopies.





1 PV-3 SILL

SCALE: 3" = 1'-0"

ARCH. / G.C. NOTE:

SUPER SKY RECOMMENDS THAT ROOFING MEMBRANE BE EXTENDED UP AND OVER THE CURB AS SHOWN; TO PROVIDE SEPARATION BETWEEN THE DISSIMILAR MATERIALS AS WELL AS PROVIDING AN ADDITIONAL BARRIER AGAINST WATER PENETRATION.

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