



## Echo™ Solar System Creates A Superior Roofing System

**Echo™** is installed using standard roofing practices to create a superior double roof system. The primary means of weatherproofing and fire resistance is achieved on the roof deck via a high quality underlayment covered with a metal roofing product. A second layer of protection is created by the solar array which is utilized for water-shedding. During installation or in the case of module breakage, the weatherproofing under the solar array is not effected by exposure to the elements. This paper summarizes the details around the creation of the double roof.

### Superior underlayment system

A full weatherproof underlayment system is installed underneath the solar array to create the primary weather barrier. First, the roof deck is covered with a PolyGlass MTS underlayment. This self-seals around the mounting hardware penetrations and forms a weather barrier superior to traditional felt underlayments. Over this a 28 or 30 gauge Galvalume skin is installed in overlapping layers, or alternately a 28 or 30 gauge metal pan system. This creates a metal-type roof underneath the solar system with a 50 year expected life and a superior fire rating.

### Minimally penetrating mounting system

To secure the mounting system a pair of structural aluminum runners is attached laterally across the roof. These structural runners are similar to tile battens in function but superior in performance:

Far fewer penetrations:	Typically spaced 6' to 9' apart on the roof  Typical <b>Echo</b> solar system contains 18 – 24 roof penetrations compared to 100's of roof penetrations created by tile attachment
More secure penetrations:	Lagged directly into trusses as opposed to roof decking for secure attachment and better leak protection
Better water protection:	Structural runners are designed to reduce the potential for water 'ponding' and direct water down the roof

### Solar array utilized for additional protection

An additional layer of protection for the roof is created by the solar array itself. While the lags that secure the mounting system to the roof are themselves weatherproof when exposed to the elements, they are fully concealed beneath the solar array. This seamless array is created by the front face of the CleanLine™ mounting system.

Finally, the entire solar array is flashed and counter-flashed into the roof to ensure the highest degree of water protection. The CleanLine mounting system incorporates a flashing / counter-flashing detail on the perimeter, identical in concept to a skylight, that integrates the array into the adjacent roof. The flashing detail includes a toe flashing, a drip edge, and side covers to ensure the highest level of protection.