

Energy Efficient Reroofing

It is important to understand that when retrofitting over existing sloped metal, the Roof Hugger sub-purlin will create an air-space cavity between the old and new roofs. This air-space presents several options to the contractor and building owner. Simply stated, the space can be used to improve the building inhabitant's comfort and environment as well as provide significant energy saving benefits. Consider the following before finalizing your re-roofing plans.

Insulated Systems

Metal building construction over the years has historically used low R-value insulation between the existing purlins and metal roofing. Typical values of R-4 to R-10 have been used in the past. Because of this, these buildings may be ineffective in reducing heat gain through the roof assembly in the summer as well as heat



loss during the winter months. Adding insulation between the old and new roofs is a cost-effective measure to decrease the building's energy consumption while paving the way to return the additional investment in a relative short time frame.

The thickness of the insulation may vary dependent on building code requirements, such

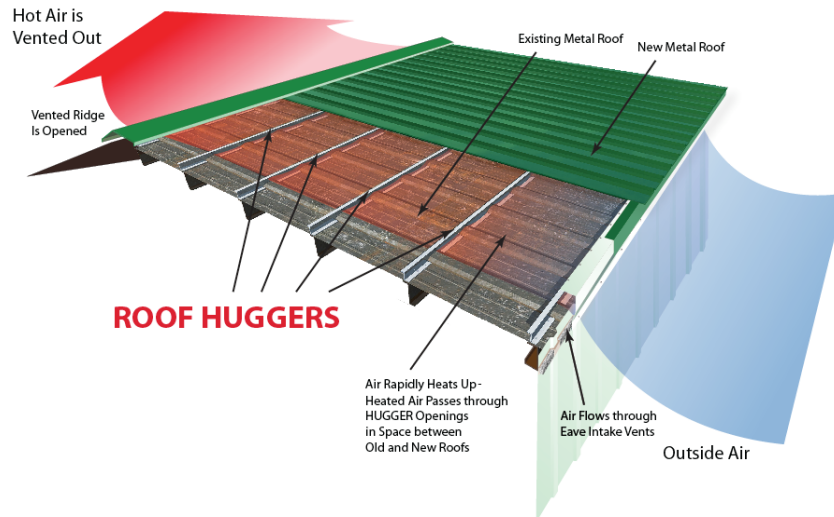
as the ASHRAE 90.1-Model Energy Code recommended by the Federal Energy Policy of 2005. If this code is adopted in your local area, then it will require a minimum R-Value between R-19 and R-26 for metal building type roof systems. For conventional construction, the R-Value minimum is R-30 to R-38 depending on what version of the code has been adopted. If the code is required, what this means is insulation will need to be added between the two roofs. That total R-value required will include whatever insulation R-value is existing plus the difference in new insulation. The depth of the air-space, or Hugger height, will have to accommodate the new insulation. It is very easy to increase the depth of the Hugger to permit thicker insulation without adding major cost to the project.

Actual project case studies have illustrated up to 25% reduction in energy fuel source consumption for heated and air-conditioned buildings.

Ventilated Systems

If the building that is being retrofitted is not thermally controlled, then adding insulation may not be of benefit. However, if this is the case, then the air-space should be ventilated to help in preventing condensation at the underside of the new metal roof. This is easily accomplished using economical ventilation products at the low eave and high point (ridge, high eave, etc.) of the roof. When ventilated, the air in the cavity becomes a radiant barrier that reduces heat gain/loss. This roofing technology is known throughout the roofing industry as Above Sheathing Ventilation or

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“ASV”. It has been used for decades for stone-coated and tile roofs and is considered a standard installation.

Please note that this assembly is very beneficial as well for buildings that are thermally controlled. Case studies for these systems have illustrated nearly 21% decrease in energy consumption. In warmer climates, this system is very effective in improving the building’s interior environment. This is especially true for buildings that have working occupants such as manufacturing and warehousing and it is effective as well in livestock confinement facilities. So, whether the building is thermally controlled or not, the building’s internal processes and operations may be such that ventilating the air-space is a wise decision. However, there is an application that is the best of both worlds, especially for buildings that are thermally controlled.

Ventilated and Insulated Systems

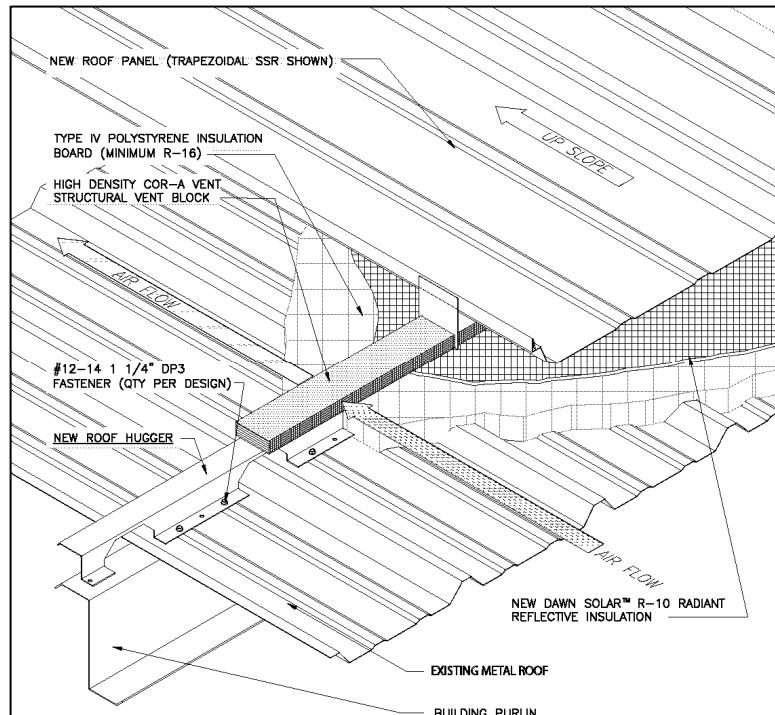
It is possible to incorporate both new insulation and ventilation in the cavity between the old

and new roofs. In fact, building envelope industry experts claim this is the best assembly to reduce heat gain/loss in a roof system. To accomplish this, the thickness of insulation is determined as mentioned before based on desired thermal resistance or code requirements and the Hugger sub-purlins are then manufactured approximately two inches taller to permit air-flow above the insulation.

This application however, requires a new roof that has available air-flow at the immediate underside through trapezoidal shape major ribs or stand-off clips that allow the panel to rest above the Hugger. Vertical rib panels with flat pans will not satisfy this application unless they have a stand-off clip. Another very cost effective technique can be used by installing a high density structural Cor-A-Vent block/strip (see detail on next page) atop the Huggers for systems using new standing seam metal roofs with minimum 1” stand-off clips. It is important to note that the type of insulation can be rigid board or fiberglass. Of course, rigid board type insulation will achieve a greater R-value per 1” of thickness than fiberglass. Hence, the overall height of the assembly would not be as great. In the detail on the next page, polystyrene insulation board plus a reflective radiant insulation has been installed above the existing roof. This assembly alone achieves an R-26 thermal resistance value without including the existing insulation below the original roof panels. You may note that this assembly can be

used very effectively for a newly built metal building as well. There are a lot of advantages by utilizing this type of system in a new building. The energy code minimum R-value or greater is achieved plus the building owner achieves a very clean appearance at the underneath side of the roof, which in addition enhances lighting the building. In a new building, a 26 to 29 gauge metal sub-deck is installed directly over the new building purlins. This is an added benefit because the metal sub-deck provides diaphragm bracing resistance in the building's purlin system that decreases the building manufacturer's bracing requirements. This assembly is ideal for buildings where the underneath of the roof is not hidden such as gymnasiums, natatoriums, assembly halls and sports or livestock arenas, etc.

For more information on any of these roof technologies, please contact Roof Hugger or consult with your building or metal roofing manufacturer.



Some additional benefits to this type of roof assembly is any ventilated roof system that has the air-space above the insulation protected by a radiant barrier can be considered a "Cold-roof" application. These systems are very effective in the northern climates where snowfall and cold temperatures prevail. With an air-space that is subject to being heated by the sun's radiant heat through a metal roof, the result will lead to reduced ice-damming at the roof's exterior side and moisture build-up beneath the roof's surface. This technology has been used for many years throughout the U.S. provided by a multitude of assembly types.