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## **Sustainable roofing systems: Helping the environment and your bottom line**

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A lot has been written about sustainable building systems, but can making environmentally-correct decisions save money too? When it comes to roofing systems the answer is an unqualified yes.

A case in point is three well-known Pittsburgh-area department stores: Between the ages of 17 and 22, the stores' old loose-laid EPDM rubber roofs were experiencing shrinkage, seam and flashing problems. It was time for N.H. based roofing consultants Advanced Roof Management (ARM) to swap out the old roofs for a new, more energy-efficient solution.

"The buildings had multiple levels with different types of roofs. We were dealing with a steel deck, polyisocyanurate insulation and then an EPDM membrane with stone ballast," said Steve Burns, president of ARM. "The conventional thinking would be to just remove the entire assembly down to the deck and use new insulation, but, I look to just do a membrane replacement whenever feasible. In this day of increasing costs of roofing in general, there's a bigger emphasis on trying to recycle as much as possible."

And that's what ARM did. Pulling off the old EPDM roofs, they were able to salvage the existing insulation by putting down a ¼-inch Dens Deck recovery board to act as a substrate for the new energy-efficient roof.

"We not only saved the client an enormous amount of money, but we also saved 90,000 s/f of insulation from going into the dump," said Burns.

The International Council for Research and Innovation in Building and Construction (CIB) and the International Union of Laboratories and Experts in Construction Materials, Systems and Structures (RILEM) recognize sustainable roofing as a goal and have therefore defined its practice. According to CIB and RILEM, a sustainable roof system is "designed, constructed, maintained, rehabilitated and demolished with an emphasis throughout its life cycle on using natural resources efficiently and preserving the global environment."

A life-cycle look at an energy-efficient roof system begins with the membrane's manufacturing, and continues throughout its maintenance, performance and disposal.

### Materials Manufacturing

Because of its relative light weight, low mass and long service life, vinyl membrane has a low life cycle impact compared to alternative roofing systems. It uses relatively less raw materials and energy in its manufacturing and helps the building owner save money in cooling costs over its service life.

One of the most energy-efficient features of a vinyl membrane is its white-reflective color, an attribute that has earned it the U.S. EPA's Energy-Star label.

Eric Silver, regional facilities manager for Toys' R' Us, has re-roofed over 100 of his stores with

white-reflective vinyl membranes since 2001. "I have no doubt that there's an energy cost savings because of the roof reflectivity; it's a factor that we really enjoy," said Silver.

### Roof Maintenance

Maintenance costs are an important component of the life-cycle analysis of roofing systems. Vinyl membranes with their hot-air welded seams and long life require relatively little in the way of maintenance. Silver agrees.

Ron Brown, director of preconstruction services for Federated Department Stores, maintains the 400 Bloomingdale's and Macy's retail establishments nation-wide. He often specifies a Sarnafil 60-mil, fully-adhered membrane for the same reason.

"We have used [a Sarnafil vinyl membrane] because it's easy to maintain," said Brown. "This has allowed us to focus our attention elsewhere and not have to worry about the roof."

### Peak Performance

Houston, Texas' Toys' R'Us' was experiencing habitual roof leaks to the point where they had to use their in-stock children's pools to catch the drips.

Toys' R' Us' chose Sarnafil's S-327, 48-mil mechanically-attached vinyl white-reflective membrane, a selection that Silver says will pay the franchise back for years to come.

Specifiers looking for an energy-efficient roof membrane need to make a complete life-cycle analysis that considers the anticipated service life of the system and its scheduled maintenance, disposal and life-long energy costs.

"The advantage of a roof like Sarnafil is longevity, it allows a building owner to apply its cash flow elsewhere, without running the risk of having to fund a replacement roof at the end of 10 years." said Brown.

### Circle of Life

Even after decades of performance, when an energy-efficient membrane has seen its final moments, it still gives back.

Vinyl membranes can be recycled at the end of their useful life, either back into new roofing membranes or other types of products.

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