



LEFT, SOLAR PANELS. BELOW, ECO-FRIENDLY GREEN ROOFING.



Sustaining the Momentum

The Search for Sustainable Roofing Solutions

by Brian Lambert, marketing manager, The Garland Company

(Editor's Note: Brian Lambert, marketing manager for The Garland Company, Inc., has been active in industry initiatives promoting green roofing and other sustainable design solutions since 1996. He serves on the board of directors for the Toronto-based Green Roofs for Healthy Cities Coalition and frequently promotes sustainable design as a guest lecturer to professional organizations in the U.S. and Canada. Lambert may be reached at (800) 762-8225.)

The Green Revolution

To paraphrase the Rocky Mountain Institute, from *Primer on Sustainable Building Design*: Sustainability is not a style... it is nothing less than a revolution in how we design, construct, and operate buildings. In roofing, sustainability can be accomplished in any of five ways:

- ☛ Through the use of recycled materials (i.e., materials that are being reused).
- ☛ Through the use of materials that are, in themselves, recyclable (i.e., materials that can be reused in the future).
- ☛ Through extended service life.
- ☛ By promoting the more efficient use of energy and other natural resources.
- ☛ By actually renewing our natural resources.

Some of today's sustainable roofing solutions perform only one of these objectives; others perform several. Today's most popular sustainable roofing solutions include: cool, highly reflective roofing; metal roofing; modified bitumen membranes that incorporate post-consumer recycled materials; adhesives and other roofing materials and products that eliminate or reduce hazardous fumes; photovoltaic panel systems; and green roofing.

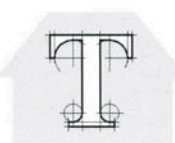
In their efforts to promote sustainable design, government and industry groups are rapidly evolving methods of applying uniform standards of measurement to certify performance. The two standards most often used to evaluate sustainable roofing solutions are:

- ☛ The Leadership in Energy and Environmental Design (LEED) Green Building Rating System™, a voluntary, consensus-building national standard that was initiated by the U.S. Green Building Council (USGBC).
- ☛ Energy Star®, a collaboration between the U.S. Department of Energy, the U.S. Environmental Protection Agency, and private industry.

Reflective Solutions

According to the Environmental Protection Agency (EPA) website, buildings with white roofs that reflect ultraviolet rays typically require 40% less energy for cooling. Add to that the fact that a highly reflective roof resists ultraviolet degradation, and the sustainability factor is even higher.

Energy Star certification is an accurate indication of a roof's ability to reduce fossil-fuel usage. When products that comply with this performance standard are used in



he ability to endure, to keep on going, is at the heart of sustainable design. When applied to

buildings, sustainable design refers to product solutions that can conserve, recycle, and even help renew natural resources over time. Many products that accomplish that goal are here already, and new ones are being introduced every day.

For a design community faced with the rapid proliferation of new products and evolving performance standards, today's challenge is maintaining the momentum for design solutions enriched by sustainable design concepts.

urban areas, peak-cooling demand can be reduced by up to 15%. It's no wonder that states like California are creating incentive programs to promote the use of Energy Star roofing solutions.

The rapid development of new Energy Star-approved roofing products is making it possible for architects and designers to choose, from a variety of reflective solutions, a roof that will retain the integrity of their original design concept. Knowing that some of these products have been demonstrating their ability to resist UV-related failures, for 20 years or longer, is an added incentive for specifying a product that can dramatically reduce a client's energy costs.

Roof reflectivity can be achieved in a variety of ways. One of the most lasting methods is the application of a highly reflective topcoat or mineral surfacing. Although Energy Star solutions are available for all types of roofing, their energy payback benefits are particularly significant when they are installed on single-story, air-conditioned buildings with large roof surfaces and older buildings with insufficient insulation.

Metal Solutions

Metal roofing solutions are perhaps the fastest-growing segment of the sustainable roofing market. Their sustainability derives from the fact that typically as much as 100% of their material components are recyclable. In other words, when the day comes that your client has to tear off the old roof and put up a new one, virtually the entire roof can be reused to create new metal products.

In addition, many of today's metal systems have long track records for lasting performance. A copper roof that has protected a cathedral for over a century is sustainable - not only by virtue of its recyclability. It is sustainable because it keeps on going year after year after year.

Metal roofs also eliminate the fume and kettle concerns associated with some types of roofing, for easy and eco-friendly installation. And, with so many manufacturers introducing new products, finishes, colors, profiles, and textures, today's recyclable metal roofing is offering architects and

designers a diversity of aesthetic features to support a wide spectrum of design concepts.

Recycled-Material Solutions

Yet another category of sustainable roofing is roofing that reuses materials that might otherwise be overflowing our landfills. For example, some built-up, multi-ply modified-bitumen roofing systems replace conventional filler with post-consumer crumb rubber from recycled tires. With over 250 million tires discarded yearly in the U.S., our landfills are rapidly running out of space. In addition, discarded tires create several health and environmental hazards, including the potential for mosquito infestation, water contamination, and fires emitting hazardous fumes.

In the roofing industry, innovative manufacturers are also helping to reduce landfill problems by using recycled plastics or rubbers to create roofing that simulates the look and feel of natural slate. Manufacturing new products out of recycled materials is

becoming increasingly common with other building components, such as carpeting, as well.

Low-Fume Solutions

In the maintenance and restoration arena, more products are being introduced each year that promote a healthy ecology by eliminating or reducing hazardous fumes. Some BUR roofing can be applied "cold," for eco-friendly installation. Cold adhesives allow multiple layers of built-up roofing to be applied without hot kettles or torches. These adhesives are VOC-compliant and significantly reduce odor.

There are also new adhesives available for hot-applied systems that can reduce volatile emissions by as much as 50%, while maintaining all the self-healing, elongation, and performance properties of hot asphalts. Another innovation in this area is the fume-recapturing kettle, which significantly reduces the environmental and health impact of hot-application processes.

(Continued on Page 38)

The Executive Masters Program

Earn your Master's degree in architecture
in less than a year, concurrent with your professional work.

1249 F Street, San Diego, California • newschoolarch.edu
619.235.4100 ext.125

NEWSCHOOL
of ARCHITECTURE
& DESIGN

A program designed for registered architects wishing to earn a NAAB accredited degree.

Circle #66 on Reader Service Card

Sustaining the Momentum

(Continued from Page 37)

Photovoltaic Solutions

Building-integrated photovoltaic (BIPV) materials integrate photovoltaic panels into a building to create power from the sun. The power is generated in the form of DC current that can be used directly or converted into AC current for future use. Many photovoltaic building solutions are available, offering architects and designers a wide variety of distinctive design solutions. Some solutions enable architects to make BIPV part of a building's original design, but retrofit BIPV materials are also available.

Roof-mounted systems have the distinctive advantage of using the expansive and frequently under-utilized roof surface for placement. Whether integrated into the original building design, or added later as an accessory, roof-mounted photovoltaic systems should be looked at as an integral part of a roofing solution.

BIPV solutions increase building sustainability in at least two ways. First, by creating new power from a renewable energy source, thereby reducing peak energy loads and reducing energy costs. Secondly, they are likely to last 25 years or even longer. Recognizing the community value of such solutions, many green pricing programs are available to help offset the costs of investing in BIPV solutions.

Green Roofing

Arguably the most exciting development in sustainable building design is green roofing. Although new green roofing products are being introduced more frequently than ever before, the best designs are integrated solutions that combine a high-performance waterproofing layer; a root-resistant compound; a drainage system that draws away excess moisture; a filter that prevents drain-system clogging; a specially formulated lightweight soil; and a surface layer of plant life.

Aesthetically, green roofing opens up an entire new world of design options to architects and other design professionals. Depending on load capabilities and other application-driven requirements, green roofs can be planted with herbs, grasses, flowers, even trees, in an exciting variety of colors, textures, scents, and heights. Patios and walkways can become a usable part of the roof environment.

Aside from the obvious aesthetic and psychosocial advantages in applications such as nursing homes, day-care centers, healthcare facilities, and office parks, green roofs offer tremendous sustainability benefits: reduced energy costs in hot urban environments; the ability to reduce storm water run-off, reducing stress on urban sewer systems and decreasing run-off-related pollution of natural waterways; dust reduction; air quality improvement; and noise pollution reduction.

In addition to the inherent recyclability of natural plant materials, some green roof systems use recycled materials in their underlying membranes for added sustainability. Green roofing is also compatible with many of the other eco-friendly solutions discussed in this article.

Lasting Solutions

Perhaps the single most critical contribution to sustainability is extended life. Today, many roofing solutions are designed to last 15 or 20 years, some, 30 years and longer. The longer a roof can be kept in use, the more it contributes to the overall sustainability of the building by prolonging the impact of eventual tear-off.


Measuring Sustainability

The USGBC LEED certification is making it easy for architects and building owners to assess objectively the sustainability of an entire building over its life cycle. LEED uses a point-rating system to evaluate various factors that contribute to a building's overall environmental performance. These include: the sustainability of the building site; water efficiency; energy use and atmospheric quality; the eco-friendliness of various materials and resources; indoor environmental quality; and innovations in the design process.



Architects and designers can sustain the momentum for building solutions that keep on going by investigating exciting new roofing technologies that promote sustainable design.



RC 2000 Roof Rubbercoating




WE SELL
ENERGY STAR



Versatile Inland Rubbercoatings provide waterproofing, energy savings and corrosion protection on interior & exterior roofs and walls.

- **Thermally Efficient** RC 2000 is highly reflective, providing dramatic summer surface temperature reductions.
- **Superb Adhesion** RC 2000's superior chemistry provides excellent adhesion, even over tight rust.
- **Seals and Waterproofs** RC 2000 features 1,500 lbs. tensile strength with 500% elongation and low permeability.
- **Extended Application Season** Work can be performed even during colder winter months and RC 2000 is impervious to rainfall after only a minimal drying time.
- **Fire Resistant** RC 2000 features a Class A fire rating.
- **Weatherability** RC 2000 Rubbercoating has excellent long-term weather resistance.

1-800-456-8467
E-MAIL: info@inlandcoatings.com
WEB: www.inlandcoatings.com
P.O. Box 247, Adel, IA 50003 Phone: 515-993-4251 FAX: 515-993-4324



**INLAND
COATINGS**
CORPORATION

Circle #65 on Reader Service Card