

“Sustainability & Roofing”

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Why Roofing Matters

Many people are unaware of the important role roofing plays in the question of sustainable urban environments.

Did you know?

- *Dark conventional black/ asphalt & tar roofing contributes to the problem of “urban heat islands” (UHI).*

This is a growing phenomenon in cities where temperatures do not cool down at night as compared with rural areas nearby. A major factor in UHI is heat-absorbing black roads and roofs. UHI not only impacts quality of life, it **contributes to smog and poor air quality.**

- *Black roofing increases energy consumption in the warmer months.*

Heat-absorbing roofing materials like gravel and tar/asphalt, as well as black EPDM, can have a dramatic impact on the temperature of a building’s interior during the warmer months. This increases the usage of air-conditioning systems, which **impacts a business’s bottom line.**

- *One hundred billion pounds of old roofing material – 10% of all contributions – are added to landfills annually.*

Old roofing that is not recycled or recyclable, as well as poorly installed or unmaintained roofing, contributes significantly to the landfill problem.



Cool Roofs

White is the new *Green!*

Cool Roofs are typically made of white thermoplastic PVC, TPO or KEE. (Occasionally a white coating is applied to a black roof.) These roofs are highly-reflective, single-ply membranes that, when properly installed, create efficient, long-lasting roofing systems. They can often be installed right over an old asphalt/tar roof or other membrane. When purchased from trusted manufacturers and installed well, they can reduce your energy consumption and maintenance costs, while providing a high-performance roofing system.

Benefits include:

- **PVC is made from abundant natural resources.** The primary material in PVC is salt, which is 40-60% of its makeup. The form of petroleum used is abundant natural gas.
- **Reduced energy use = cost savings.** The SRI (Solar Reflectance Index) for white membranes is high, meaning these products reflect the sun's rays, as opposed to absorbing the sun's heat like other roofing materials do. This helps keep building interiors cooler and can lead to significantly reduced air-conditioning usage during the warmer months.
- **Energy Star Qualified, plus points toward LEED Certification.** These roofs are Energy Star qualified, and each can help a building qualify for LEED points needed for certification in the areas of energy savings, recyclability, and urban heat island reduction.
- **Long life span.** When properly installed and maintained, TPO lasts 20 years on average, while PVC and KEE roofing lasts 25 years and longer (some have lasted 50 years.) Today's built-up tar-and-gravel roofs do not usually last as long (they average between 10-20 years.) Long-lasting roofs save on roof-replacement costs for businesses and lessen the impact on landfills.
- **High recyclability.** PVC is very recyclable and can be shredded and re-used in the production of new membrane. Clark's Quality Roofing works with Sika's Sarnafil® membrane, a manufacturer committed to keeping vinyl rooftops out of landfills. Sika offers a cost-neutral recycling program for contractors designed to "keep waste – perhaps mountains of used roofing vinyl – from overburdened landfills."
- **Low Carbon Foot Print.** The impact to the environment in producing high-quality PVC membrane is quickly offset by the heat reflection and recyclability into new PVC membrane. There is no better roofing alternative in terms of impact to the environment.

Solar Roofs

Turn your depreciating roof space into an *energy/revenue* generating asset



A solar roofing system – white thermoplastic roofing membrane combined with solar panels -- is the next step towards sustainability, and lets you harness the power of the sun. It can reduce your energy consumption costs and your reliance on the utility grid, while providing a high-performance roofing system. Additionally, the potential exists for generating revenue by selling power back to energy providers.

All the benefits of a white roofing system (when used) apply to solar roofs.

Additional benefits of the combination include:

- **White membrane increases solar module efficiency.** When combined with direct and diffuse sunlight, the reflected sunlight from the white membrane helps to keep the solar modules cool, which contributes to the efficiency of the solar modules themselves.
- **Increased energy yield with some solar technologies.** When used with bi-facial or cylindrical solar panels, the reflective properties of white membrane roofing have been shown to increase energy output as much as 30%.
- **Long-lasting/low-maintenance roofing system.** Solar modules can last more than 25 years, necessitating a long-lasting, "solar ready" roofing system. PVC, TPO and KEE membrane roofing systems are lightweight, long-lasting, and require minimal maintenance – key characteristics for any solar roof system.
- **Generous state and federal tax Incentives.** A profitable company can benefit significantly from the tax credits often available at the federal and state level for installing solar.

Living Roofs

Your next roof can be both an *inspiring* contribution to your community, as well as a cost savings to your bottom line.



Living or vegetated roofs are one of the most exciting developments in sustainable building design. Sometimes called “eco roofs,” or “green roofs,” they offer a number of sustainable advantages for an otherwise empty, unused space.

Each business is special. Your building should be, too.

Depending on a variety of factors and other application-driven requirements, living roofs can be planted with herbs, grasses, flowers, even trees, in an exciting variety of colors, textures, scents and heights.

Add patios and walkways, and the space that would have been ignored (except by your maintenance technicians) can become a useable area that can add to the enjoyment of your tenants and community. Today it’s clear -- vegetated roofs offer many social, environmental and economic benefits.

Benefits include:

- **High-performance turf trays simplify installation and maintenance.** Significant advancements in Living Roof technology have been made in the last 10 years. Today, turf is planted in trays that are installed in movable sections, making installation and on-going maintenance much easier.
- **The reduction of water pollution.** Rain is absorbed and used by productive vegetation, which in turn reduces the stress on urban sewer systems and decreases storm run-off and related pollution of natural waterways.
- **A savings in energy costs.** The insulating qualities of living roofs mean reduced energy usage for heating and cooling, which translates into lower energy costs for building owners.
- **Improved air quality.** The temperatures for living roofs are lower than conventional roofs, which translates into less smog from the “urban heat island” effect. In addition, the oxygen-producing vegetation can have a positive impact on air quality.

- **Reduced noise pollution in building interiors.** Studies show noise levels in a building can be reduced by as much as 40 decibels.
- **The maximizing of your investment.** The turf moderates temperature swings that cause a roof system to expand and contract. In addition, it offers protection from everyday wear and tear from the elements and other influences. For these reasons, living roofs can last longer than conventional roofs.
- **Enhanced quality of life for your tenants, employees, and community.** Studies have proven the value of urban green spaces. They help enhance people's mental and psychological health, they offer a sense of place and community, and they soften the urban landscape.

And finally --

- **Powerful branding that will connect with employees, your community, and your industry.** A living roof will distinguish a building and a business from its competitors. Living roofs, especially those that have walkways and patios and can be enjoyed, inspire people, which can lead to unique publicity and brand awareness.

Proper Roof Installation & Maintenance

“An ounce of prevention is worth a pound of cure” is true of many things, including sustainable roofing.

The issue of sustainability is a complex one, and as with most complex issues, there are no magic answers or products. Within the general roofing types discussed here, there are many variables, and an experienced roofing consultant needs to consider many factors – from product manufacturing differences, to environmental conditions which impact a product’s performance, to building and business requirements – when making a recommendation.

However, despite the complexity, there are two simple guidelines that all building owners can apply – no matter what type of roof they have -- that go a long way towards sustainability:

1. have their new roof installed by experienced technicians, and
2. conduct proper maintenance and repairs on their existing roof.

While less glamorous than other options discussed, these are two of the most practical, cost-effective, and *eco-friendly* steps a business can take for these reasons:

- **Poorly installed roofs lead to more leaks and more prematurely replaced roofs.** Even the best products must be installed by qualified technicians to achieve their goal of being sustainable. Factors such as weather/temperature, existing surfaces, roof components (like HVAC units), architectural design, and many other details must be planned for to achieve successful results.
- **Proper roof installation and maintenance reduces stress on landfills.** Small repairs made every year can extend a roof for several years. This keeps more roofing material out of the landfills.
- **Cost + energy for repairs is less than for new installation.** Sending roofing crews to tear off and haul away old roofing, plus install new roofing requires a significant expenditure in energy. Quality roofing materials are expensive, as is installation by experienced crews. Overall cost-wise, a roof is the most expensive part of a building.
- **The roof is the most expensive component of a building and the critical.** More so than any other component of a building, the roof’s integrity protects all the rest of a building’s components and assets. It is the most litigious aspect of a building, because of its complexity. More than 40% of all roof failures is due to poor installation.

Case Study:

The Salt Palace Convention Center

Clark's Quality Roofing worked with contractors, including Bella Energy, on a solar power project for The Salt Palace Convention Center in Salt Lake City, UT. The Salt Palace Convention Center consists of 515,000 square feet of exhibit space, 66 meeting rooms, and 165,000 square feet of meeting space. This is the largest solar project on the Rocky Mountain Power energy grid, producing 1.65 megawatts. It is also one of the largest projects in the United States.

More than a half million square feet of black roofing had to be removed and replaced in preparation for the solar installation. CQR had to organize multiple crews to meet deadlines and operate in a way that did not disrupt the event schedule for the convention center. They had only ten weeks to remove the old black roof and replace with 600,000 square feet of white TPO membrane manufactured by Carlisle, plus heat-blocking insulation. Once the roof was in place, CQR installed 26 semi-truck loads of solar panels, beams, and other hardware.

The Salt Palace Convention Center re-roofing and solar installation project was successfully completed on time and under budget, with the desired results, look, quality workmanship, and innovative solutions for which Clark's Quality Roofing is known. The array required more than 14,000 man hours. There were zero change orders, zero OSHA violations, and zero injuries

In addition to energy production, significantly cooler temperatures were measured one year later

In 2010 while the black roofing was still in place, a digital thermometer was installed to measure the air temperature just above the roofing.

- 2010 – Before the white TPO installation in 2010, the average high summer daytime temperature of the old black roof was 180 degrees.
- 2011 – One year later in 2011 after the white membrane was installed, temperatures measured 107 degrees.

The white reflective TPO membrane **reduced** the average temperature of the roof in one of the hottest months of the summer by **73 degrees**. CQR installed insulation in addition to the TPO to further shield the interior from the heat of the roof.

About Clark's Quality Roofing

Sustainability starts with quality, and “quality” is our middle name.

A roof is not only a major investment: when it comes to protecting your assets, it is a critical. Clark's Quality Roofing has been innovating practical solutions to roofing needs for more than 30 years. We helped pioneer installation techniques of single-ply roofing systems. And, while the industry is always changing, we only recommend products which we have seen perform well consistently over time. We're experienced installers of white cool roofs, as well as solar and living roofs. In addition, we offer Roof Care services to property managers to help them extend their roofing investments through proper repairs and maintenance, as well as assist them in developing a strategic business and capital expenditure plan for roof replacements.

For a Free Roofing Consultation and/or Energy Savings Building Envelope Calculations Report –

Please call Hilary Clark at [1-888-266-3575](tel:1-888-266-3575)

Fix the Leak and Extend the Roof's Life

CQR is also available to consult on any commercial or residential roof problem or leak. Most roofing companies do not have the expertise needed to properly identify and resolve the source of the leak, which is why many leaks are “fixed” repeatedly until the owner gives up and replaces the roof. Often a roof leak can be traced back to other system failures – HVAC systems, skylights, chimneys, and other areas.

CQR has experts that will track down and resolve the leak problem using a methodical 6-step process. We can also provide on-going maintenance that will extend the life of your current roof in a cost-effective way.



**24 HR Emergency
Roof Leak Repair
[1-888-266-3575](tel:1-888-266-3575)**

CQR Awards & Memberships

Clark's Quality Roofing serves 11 western states, and has been involved in projects of all sizes in almost every state in the nation. CQR president Carl Clark was a major contributor to the National Roofing Contractor's Association's 6-volume Roofing Manual, which has become the "bible" to the construction and roofing industry.

CQR has been recognized by customers and industry leaders for providing expert workmanship, knowledge, and problem-solving:

- 2014 & 2006 – National Roofing Contractor's Gold Circle Award Winner
- 2004, 2005, 2006 – Sarnafil's Century Award Winner
- 2001 & 2003 – Sarnafil "Project of The Year" Award
- Accredited by the Better Business Bureau
- RoofConnect's chosen contractor for the state of Utah

We are members of the following organizations:

- Member of the National Roofing Contractors Association
- Member of the Western States Roofing Contractors Association
- Member of The Utah Roofing Contractors Association
- Member of the American Subcontractors Association of Utah
- Member of BOMA (Building Owners and Managers Association International)
- Member of the Salt Lake County Business Alliance
- Member of the Salt Lake Chamber of Commerce

References:

“Cool Roofs Myths Busted “

<http://usa.sarnafil.sika.com/en/group/roofing-sustainability/cool-roof-myths.html>

Evidence of Cool Roof’s effectiveness in thermal Image of RC Willey Intermountain Distribution Center taken by NASA’s Remote Sensing Jet –

ReflecTech Energy Savings Using Radiant Barrier Technology -

<http://www.videcomp.com/reflectech/sarnafil.html>

Reprint: Professional Roofing – October 2013b – “Still Cool After All These Years: White Reflective Roofs Stand Up to Scientific Scrutiny”

http://usa.sarnafil.sika.com/downloads/repository/submittal/literatures/Cool_Roofs_Graveline_Pro_Roofing_10_13_reprint_pg_view.pdf

Buildings.com “Roof Reflectivity, Good Design, and Decades of Cool”

<http://www.buildings.com/article-details/articleid/3742/title/roof-reflectivity-good-design-and-decades-of-cool.aspx>

Reducing Urban Heat Islands: Compendium of Strategies – Cool Roofs

<http://www.epa.gov/heatislands/resources/pdf/CoolRoofsCompendium.pdf>

Living Roofs Inc.

<http://www.livingroofsinc.com/why-green-roofs/>

U.S. Green Building Council

www.usgbc.org.

DDC Cool & Green Roofing Manual

http://www.nyc.gov/html/ddc/downloads/pdf/cool_green_roof_man.pdf

enerGy “Solar Power on the Salt Palace” –

http://www.altenerg.com/back_issues/janfeb2013-story1.htm

Videos

Sika Sarnafil Recycling Program - <https://www.youtube.com/watch?v=t8J1gA1UkJ8>

PVC Recycling Process Explained - https://www.youtube.com/watch?v=xNNnP86N_kE