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## **How have the green movement and the need for energy savings affected commercial roofing?**

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Our business is always evolving as we strive to meet the increased needs of building owners. We always had the basic mission to keep the elements out. The next requirement added, years ago now, was the need to also keep energy in, to save on heating and cooling costs. This involved newer types of insulations and increased thicknesses. Following that was the need to keep energy out, achieved through highly reflective roofing materials utilized to reduce HVAC loads during the hot summer months.

Each of these changes created new concerns as to adhesives, fire ratings, wind uplift issues, and other factors important to overall building integrity.

Current trends are to begin to use the roof as a collection device, to collect both water and/or to collect energy.

Storm water runoff / rain water collection is becoming a priority for many building owners, as most municipalities will not allow any new water runoff to leave your property. This can result in expensive retention ponds that take up large portions of your property, or may need to be built under parking lots. Some of this expense can be mitigated by roof gardens which catch and retain rainfall. Roof gardens can also add insulating value to the building, reduce the 'heat island' effect of a black roof, and be visually attractive. There are numerous types of roof gardens which range from modular pre-planted grids to systems capable of sustaining large plantings and trees.

The other collection concept is to collect solar energy, traditionally with water circulating through roof mounted solar panels, or now with the newest type of photo voltaic panels. PV panels convert sunlight directly into electricity. PV panels can be mounted onto frames that sit on or through the roof, or in some cases can be incorporated directly into the roof membrane itself. In some communities tax rebates and other credits can be earned from investing in these technologies. The website <http://www.dsireusa.org> can offer more information on these credits.

The future holds Building Integrated Photo Voltaics (BIPV) where many if not most building surfaces could contain PV collectors. Imagine, the entire exterior of your building may one day generate electricity for you.

Another facet that is attracting attention is delighting, which essentially is adding energy efficient skylights into an existing or new roof, at certain intervals. Not only is energy cost reduced with less electricity required for interior lighting, but some studies have shown that delighting increases worker productivity. In certain areas schools are being mandated to consider delighting when doing building renovations or new construction.

How has all of this affected our basic mission of keeping the elements out? Each of these new requirements has added new stress to the roof. Added insulation subjected the waterproofing roof membrane to substantially more thermal shock than was the case decades ago when substantial

amounts of heat were lost through the roof, but at the same time the roof was not subjected to as many freeze / thaw cycles.

Roof gardens result in a roof that is inaccessible for inspection and repair, is always wet, and is subjected to root growth. Newest designs for these installations include tapered insulation under the waterproofing membrane, thicker and fully adhered membrane, and double stripping of all seams. This adds to the initial cost but should reduce the total life cycle cost. Still, how will we be able to maintain watertight integrity at a reasonable cost in years to come? The roofing contractor should be tasked with the overall design and installation of the entire system, including plantings if he is expected to take responsibility for leaks. But what happens with future maintenance, fertilization, and replacement of dead plantings in future years?

Solar panels and photo voltaic collection systems require a huge number of roof penetrations for their installation. Foot traffic on the roof will increase for maintenance and repair of these systems. Additionally if you are considering adding these systems to an existing roof you should seriously consider that roof's age as reroofing costs will increase significantly once these systems are in place. In fact it appears that the expected life of a commercial roof is about the same as the expected life of a PV system, so perhaps both should be installed at the same time.

We feel that all of this highlights the need to only consider roofing contractors that can demonstrate that they have a wealth of experience, knowledge and reputation. There is certainly no shortage of roofing contractors out there; and with proper homework you should be able to find a select few that can accommodate your roofing needs today and into the future.

Steve Chaffee is the third generation owner of Chaffee Industrial Roofing, headquartered in East Providence, R.I., which installs and services roofs on industrial and commercial buildings throughout New England and is celebrating 100 years in business. For more information visit [www.chaffeerofing.com](http://www.chaffeerofing.com).

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