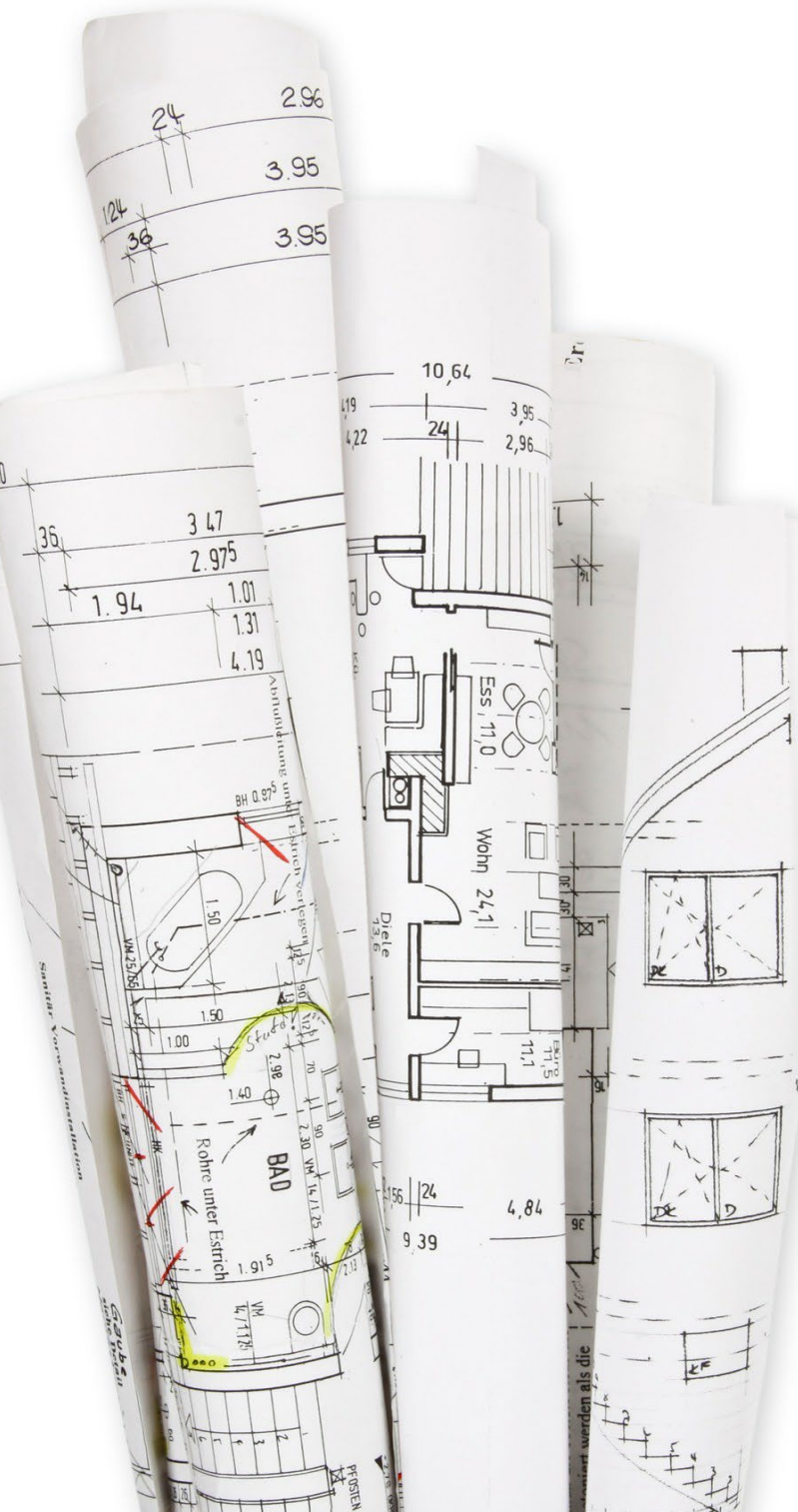


BUILDING BLOCKS

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Advising Project Owners on the Pros & Cons of Green Roofs

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Design professionals should inform their clients of both the benefits and the negative aspects before they decide to design and install a green roof. A green roof, also known as a living roof, is a roof that is covered in whole or in part in vegetation. It offers a number of benefits, but there are contrary attributes that much be considered when an architect or engineer advises their client to invest in a green roof.

IN THIS ISSUE:

FEATURED ARTICLE
SOCIAL MEDIA
MEET OUR PEOPLE

Green roofs and their modern equivalents were initially pioneered in Germany in the 1980's and 1990's, before their use spread to Switzerland, Scandinavia, and Britain. Advanced materials and emerging design and installation techniques coupled with mandates and incentives moved the use of green roofs into the mainstream European market.

In the US, green roofs are becoming more common, especially on projects that are seeking an environmentally sustainable design solution. Not every climate and region are best suited for a green roof, however. For example, the prairie grasses depend on fire to maintain ecosystem stability and diversity. One benefit of fire in this community is the elimination of invasive plants, thereby helping to shape and maintain the prairie. However, utilizing indigenous grasses in the prairies for a green roof must be carefully considered. The roof catching on fire could be a dangerous design decision.



Nonetheless, either by design or by default, some buildings may best be served on having a “green” roof.

SHOULD AN ARCHITECT/ENGINEER ADVISE THEIR CLIENT TO INSTALL A GREEN ROOF? — THE PROS:

Increased Lifespan of the Roof

A green roof can shield a rooftop which is continually under attack from the environment, such as wind and rain, ultraviolet light and fluctuating temperatures.

Increasing Thermal Retainage

Heat loss in winter and high temperatures in the summer months is offset by a green roof. Plants absorb the sun's energy and therefore reduce the temperature of the roof in the summer and aiding thermal efficiency in the colder winter by locking heat inside.



Acoustical Insulation

An interesting design solution for a music and recording studio on a college campus is the green roof on The Kohl Building/Clonick Hall, Oberlin College, Ohio. Under the flight path of neighboring Cleveland Hopkins International Airport, jet aircraft taking off would interfere with the students' and faculty's work. However, the green roof in combination with traditional sound attention materials provided the necessary acoustical attenuation.

Home to jazz studies as well as programs in composition, musicology, and music theory, the building opened in 2010. It also houses the superior recording studios as well as the conservatory library's Special Collections, which has the largest privately held collection of jazz recordings in the United States. Earning a LEED Gold designation from the U.S. Green Building Council, including a green roof, the Kohl Building is a cornerstone of Oberlin's commitment to environmentally sustainable building practices.

<https://www.oberlin.edu/kohl-building>

Accommodating Environmental Rating Systems

There are at least twelve green building rating systems that support the design and installation of green roofs. These rating systems confer certain advantages for the building owner, including—**LEED, WELL Fitwel Green Globes BREEAM DGNB Green Star BCA Green Mark Scheme BEAM PLUS CASBEE GORD** and **Miljöbyggnad**.



It should be noted, however, a design professional should not guarantee or warranty that their green roof design will meet a certain level of a green building rating system. The following disclaimer could be utilized in the agreement between the design professional and their client (the building owner).

The Owner may establish a goal that the Project may achieve a certain level of sustainable certification for a specific rating system. However, the aspects and procedures of the selected rating system are outside the control of the Design Professional, and may not uniformly implemented and subject to change at any time. The Owner acknowledges that in pursuing its sustainable goal it will require input and effort from third parties that are also outside the control of the Design Professional. As a result, the Design Professional cannot guarantee or warrant that the Owner's goal will meet the actual level of certification desired.

Supporting Nature Preservation

Green roofs attract wildlife such as insects and birds for an environmentally friendly habitat.

Controlling Water Runoff

Flooding from excess rainfall is absorbed by a green roof.

Aiding Air Quality

Especially in urban areas, a green roof helps to improve the overall air quality, absorbing environmental pollutants.

<https://www.greenroofers.co.uk/green-roofing-guides/advantages-disadvantages-green-roofs/>

SHOULD AN ARCHITECT/ENGINEER ADVISE THEIR CLIENT TO HAVE A GREEN ROOF? — THE CONS:

Cost of a Green Roof

There will be extra design considerations involving increased design fees. And a green roof will be more expensive to install than a traditional roof, such as the need for a waterproof membrane that must seal out moisture from the interior spaces. In addition, the underlying structure will have to be strengthened to accommodate the extra loads of soil, vegetation and water retained in the green roof.

Root Growth Penetrating the Waterproof Membrane

Leaks in the waterproof membranes due to root growth or temperature fluctuations may expose the underlying roof structure to damage or corrosion. Drainage systems may become blocked by roots, soil and vegetation.

Maintenance Considerations

Maintaining a green roof will take extra care by making sure water and weed control must be considered.

<https://www.greenroofers.co.uk/green-roofing-guides/advantages-disadvantages-green-roofs/>

CONCLUSION:

There are two types of green roofs.

Intensive green roofs are the most complex type of green roof as they require similar maintenance to a garden. The soil layer is typically much thicker and can support a variety of plants such as trees, shrubs and flowers.

Extensive green roofs are much more common, as their maintenance is much lower. The soil layer is also thinner as grasses will be used to cover the roof instead of larger shrubs.

On balance, the choice of selecting a green roof over traditional designs outweighs its disadvantages. At the same time, an architect or engineer must become very familiar with the design considerations. And experience in designing this type roofing system helps, learning from past projects for future clients and projects.

About the Author of this Risk Management Building Block Article

As a risk manager for the last 18 years for the design profession, Eric has experience in professional liability insurance and claims, architecture, engineering, land use, law, and a unique background in the construction industry. Prior to risk management, he has 25 years of experience in the practice of architecture/engineering, and as an adjunct professor teaching professional practice courses at the undergraduate and graduate levels for the last 35 years at Kent State University's College of Architecture & Environmental Design.

As a Fellow of the American Institute of Architects and AIA National Ethics Council 2021 Chair, he has demonstrated his impact on architectural profession. He has presented numerous loss prevention and continuing educational programs to design professionals since 2000 on topics of ethics, contracts, and professional practice in various venues across the United States and Canada. He is a former member and chair of his city's Board of Zoning & Building Appeals for 24 years, and is a licensed architect, attorney, and property & casualty insurance professional.

His educational background includes a JD from Southwestern University School of Law, Los Angeles; Master of Science in Architecture from University of Cincinnati; and BA in psychology/architecture from Miami University, Oxford, Ohio.

The above comments are based upon DesignPro Insurance Group's experience with Risk Management Loss Prevention activities and should not be construed to represent a determination of legal issues but are offered for general guidance with respect to your own risk management and loss prevention. The above comments do not replace your need for you to rely on your counsel for advice and a legal review, since every project and circumstance differs from every other set of facts.

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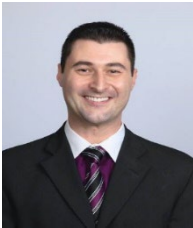
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