

GREENGRID™

The Natural Choice for Your Roof

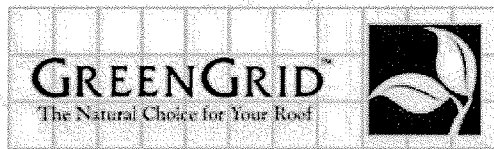


Specifications Summary

ELEMENT

DESCRIPTION

Module size	Standard - 2 ft. x 4 ft. 2 ft. x 2 ft. x 2.5 in. 2 ft. x 2 ft. x 4 in. Specialty modules vary in dimensions
Depth of modules (three depths)	2.5 in., 4 in., and 8 in. (nominal)
Weight of planted modules (fully saturated)	2 in. depth - Approx. 10 lb. per sq. ft. 4 in. depth - Approx. 15 lb. per sq. ft. 8 in. depth - Approx. 28 lb. per sq. ft.
Module material	60% post-industrial recycled HDPE - 150 mil. 2.5 and 4 in. - 175 mil. 8 in.
Module drainage clearance above roof	0.5 in.
Color of modules	Black
Paver size	Length - 2 ft., width - 2 ft., depth - 1.75 in.
Paver material	100% recycled rubber
Paver colors	Forest green, charcoal, and brick red
Paver weight	7.5 lbs./sq. ft.
Drainage/root resistance medium	Spunbonded polypropylene geotextile
Soil media	Proprietary mixture consisting of organic and inorganic material.
Acceptable underlying materials	Roof membrane or any other roofing materials. Modules can be placed directly on membrane or other roof materials.
Drip irrigation system	Black polystyrene tubing. Typically not required for 4 in. depth modules. May be required for 8 in. depth modules, depending on climate and plant selection.
Water feature	Mule-Hide® 60 mil. membrane
Water feature weight	41.6 lb./sq. ft. for 8 in. water feature
Edge treatments	Wood, recycled composite wood, aluminum, or other specialty materials (in various colors and designs)
Plants	Perennials, grasses, or shrubs specifically selected for climate, hardiness zone, color, and size.



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Frequently Asked Questions

Weston Solutions, Inc. (WESTON®), a leading environmental and infrastructure redevelopment firm, and ABC Supply Company, Inc. (ABC Supply), the largest U.S. roofing supplier, developed the GreenGrid™ System to boost your building's environmental and economic performance. Learn more about green roofs and how the GreenGrid™ System is revolutionizing the roofing industry with its flexible, modular design.

What is a "green roof"?

At its most basic, a green roof is a roof substantially covered with vegetation. Green roofs improve the energy performance of buildings, reduce stormwater runoff and contribute to a healthier environment. Since the 1970's, green roofs have increasingly become part of the European landscape, where there are over 100 million sq. ft. of planted roofs today. However, many of these European systems can be complex, time-consuming and expensive to install. Faced with soaring and unpredictable energy costs and the desire for higher performance buildings, more U.S. building owners are opting for green roof technology.

What is the GreenGrid™ System?

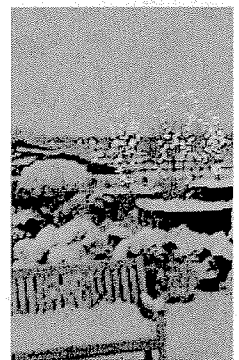
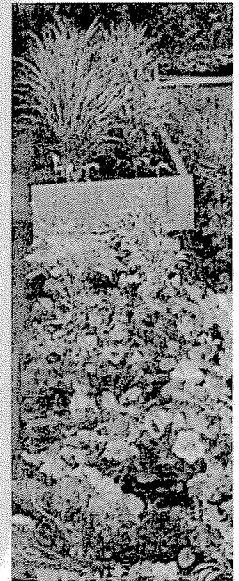
The GreenGrid™ System is a new green roof technology that offers a flexible, modular design. Simplicity of design and flexibility are the hallmarks of the system. The system is geared toward the needs and requirements of industrial, commercial and government facilities, offering a sleek, flexible, and cleverly simple design. GreenGrid™ modules arrive at your worksite planted and ready for installation. These interlocking modules are composed of recycled plastics. The system can be brought to the roof via heavy equipment or elevator and installed in a matter of days. The modules can be placed directly on the roofing membrane or on any other surface, provided the structural capacity is present.

What makes the GreenGrid™ System unique?

The GreenGrid™ System is the product of years of research and testing. Testing of the system's structural components and lightweight recycled plastic materials has been underway since 1997. The result is a complete green roof solution that is lightweight, flexible, easy-to-install and requires minimal maintenance. This is in contrast to many European versions of green roofs, which are often heavy and time consuming to install and maintain. Because it is modular in nature, a GreenGrid™ rooftop design can be easily adjusted and rearranged after installation to meet a change in stylistic preferences or planting schemes. *Most importantly, roof maintenance and repair is easily carried out with this system. Modules can simply be moved to address a maintenance issue, and then put back in place.*

What is the biggest economic advantage of implementing the GreenGrid™ System?

Energy savings. A recent study by WESTON estimates that greening the rooftops of all city buildings in Chicago would result in nearly \$100 million of annual energy savings. Peak demand would be cut by 720 megawatts – the equivalent of several coal-fired generating units or one small nuclear power plant. Another tangible payoff from a green roof system is the increased longevity of the roof membrane. It has been proven that green roofs protect the exterior roof membrane against ultra-violet radiation, extreme temperature fluctuations, puncture or other physical damage. Green roofs can increase the life expectancy of the membrane up to the life of the building. This diminishes the need for costly roof



replacements and maintenance, resulting in tangible savings for the building's owners.

How much does the system weigh?

The GreenGrid™ System is remarkably lightweight, particularly when compared with existing green roof technologies. The 2-in. depth modules have a saturated weight of approximately 10 lbs. per sq. ft., the 4-in. depth modules have a fully saturated weight of approximately 15 lbs. per sq. ft., while the 8-in. depth modules have a wet weight of approximately 28 lbs. per sq. ft.

**Should the GreenGrid™ System be irrigated?**

Normal water usage will depend on geographic area, climate, rainfall, plant selection and other factors. Plants can be selected to withstand drought conditions. However, an irrigation system is an available option. The GreenGrid™ System requires approximately 1 gallon for complete irrigation of 4-in. modules, and approximately 2 gallons for 8-in. modules.

What plant selection options are available with the GreenGrid™ System?

Plants are one of the most vital components of a green roof. In other green roof systems, plants are set in after the roof system is in place, a very labor intensive process. With the GreenGrid™ System, the modules are pre-planted with plants of the color and type selected by clients. The 4-in. depth modules (extensive systems) will support grasses, sedums and wildflowers, while the 8-in. modules (intensive) will support a variety of larger ornamental plants. Plants are placed in the modules at the nursery and cared for until they are shipped to the green roof site for installation. A preset "palette" of plants, developed by staff horticulturists, is available to allow customers to select plant varieties according to plant hardiness zone, size and color.

What is the urban "heat-island" effect?

Urban areas are significantly warmer and produce more harmful ozone than surrounding suburban areas due to the prevalence of heat absorbing buildings, dark surfaced pavements, and hot air vented through cooling systems. The envelope of hot air that hovers over cities due to heat reflective materials and the lack of vegetation is known as the urban "heat island" effect. It is the aggregate of all the heat absorbed and generated by buildings, roads, vehicles, HVAC systems, etc., and can result in cities being as much as 7 to 10 degrees warmer than their suburban and rural counterparts. These urban areas are incubators for smog or "ozone". The heat rising from the concentrations of asphalt and black top roofs can actually disrupt weather patterns within the city, producing droughts and compressing weather fronts. This results in abnormal and dangerous weather anomalies, such as increased electrical storms within the city and surrounding areas.

What role can the GreenGrid™ System play in reducing the heat island effect?

Since heat naturally rises, uncovered rooftops are a haven for heat absorption and high temperatures. Green roofs insulate and shade buildings, which in turn reduces the heat island effect. Plants transpire moisture, making the air above them considerably cooler. By implementing a green roof system, the compounded benefit of eliminating the heat generated by a non-vegetated rooftop, while subsequently cooling the surrounding air, is achieved. According to the Lawrence Berkeley National Laboratory (LBNL), reducing the ambient temperature in a city by three degrees has the equivalent air quality impact of converting all of the city's cars to electric power. Computer modeling conducted by LBNL scientists indicates that widespread heat-reduction measures, such as planting rooftop vegetation, could easily lower a city's temperature by five degrees.

How will the GreenGrid™ System help my building in terms of energy efficiency and insulation?

Due to their superior insulating properties, green roofs have consistently been proven to reduce heating and cooling costs by up to 25 and 50%, respectively, for the floor directly below the roof. They also significantly slow a building's heat gain and loss. When outside air temperatures reach a level of 95° F., rooftop surface temperatures can be as high as 175° F. These temperatures impact not only the temperature within the building, but also the amount of energy necessary to heat and cool the building to the desired temperature.

Plants transform heat and soil moisture into humidity, naturally cooling the building. Conversely, in a cool climate, the green roof provides added insulation against heat loss through the building's roof. [Click here for more temperature information.](#)

What can the GreenGrid™ System do to help reduce stormwater runoff?

Rainfall on forested and undeveloped land is almost entirely redistributed through its natural cycle into the atmosphere, water bodies, and aquifers. However, in metropolitan areas, buildings and streets dominate the landscape, preventing rainwater from following a natural distribution. In urban areas, a startling 75% of rainwater can become surface runoff, often carrying contamination and pollution. This water flows untreated into water bodies and open water sources. Green roofs help alleviate this problem through absorption and recycling of rainwater. The GreenGrid™ System can absorb up to 99% of a 1-in. rainfall. Runoff potential is reduced, lessening the risk of flooding and sewer overflows. By slowly percolating through the GreenGrid™ soil media, roof runoff occurs several hours after peak flows, providing additional time for sewer systems to handle other uncontrolled runoff. [Click here for more stormwater information.](#)

What can a green roof system do for sound insulation?

The soil, plants, and layers of trapped air in a green roof system serve as excellent sound insulators. Tests have shown that green roofs can reduce indoor sound by as much as 40 decibels, providing particular benefit to buildings in noise impacted areas, such as those close to airports or industry.

Who is the GreenGrid™ System intended for?

The GreenGrid™ System is ideal for organizations that wish to make the most of building space and reap the greatest economic benefits from a high-performance green roof. The System is compatible with any flat, non-pitched roof. It is suited for industrial, commercial, and government facilities, large one-story buildings, hotels, condominiums, and a variety of other structures to help owners reduce operating costs through an energy-efficient roofing system.

Are there tax incentives available for green roofs?

Yes. As energy demands continue to threaten power supplies and smog maintains its stranglehold on cities, more and more cities and states are encouraging the use of green building technologies and, in particular, green roof systems. For example, the city of Portland, OR, is leading an aggressive regional program providing financial, technical and educational incentives to those willing to participate in its green roof initiative. Other states such as Washington, Illinois, New York, California and Maryland have also implemented incentive structures, including tax credits and avoidance of fees assessed for impervious surface cover. Both Massachusetts and Pennsylvania currently have pending legislation to establish incentives for green building structures. Check with your state department of environment to learn more about green roof incentives in your area.

Who is behind the GreenGrid™ System?

ABC Supply and WESTON developed the unique GreenGrid™ roofing system to boost your building's economic and environmental performance. ABC Supply is the largest wholesale distributor of roofing and siding materials, tools, and supplies in the United States. Weston Solutions, Inc. is a leading environment and redevelopment firm, delivering comprehensive solutions to complex problems for industry and government worldwide.

Can the GreenGrid™ be used for non-roof applications?

Yes. It has been installed in plazas, median strips, and indoors. Again, modules are planted at the nursery then brought to the site and put in place. The interchangeability of the modules allows newly planted modules to be brought to the site to reflect seasons or other desires of the client. The changeout of the modules is efficient and, in instances where perennials are used, out-of-season modules can be stored at the nursery then returned for their "next season." This avoids the costly purchase of plants every season. [Example in PDF format.](#)

I'm interested in installing a GreenGrid™ System. What should I do?

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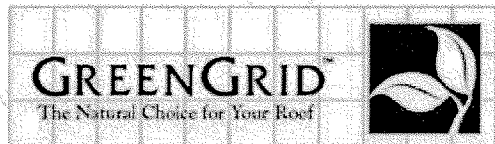
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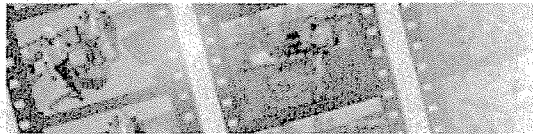
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The Innovative GreenGrid™ System

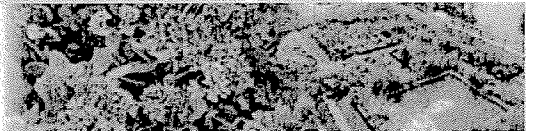


New GreenGrid™ Videos Available

[Click to view digital video clips of the GreenGrid™ System](#)

New GreenGrid™ Photos Available

[Click to view new photographs of the GreenGrid™ System](#)



ABC Supply Company, Inc. (ABC Supply), and Weston Solutions, Inc. (WESTON®), developed the unique GreenGrid™ roofing system to boost your building's environmental and economic performance. ABC Supply is the largest wholesale distributor of roofing and siding materials, tools, and supplies in the United States. WESTON is an established provider of infrastructure redevelopment services worldwide, with an emphasis on creating lasting economic solutions for its clients.

Simplicity of design and flexibility are the hallmarks of the GreenGrid™ roof system. The system was designed by engineering, roofing and horticultural experts, and is the product of years of research and testing. Testing of the system's structural components and lightweight recycled plastic materials has been underway since 1997. The result is a complete green roof solution that is easy-to-install and maintain.

This flexible roof system is ideal for both new and existing industrial, commercial and government facilities that want to improve their energy and stormwater discharge performance and contribute to a healthier environment. These visually appealing roofs are dramatically cooler in the summer and warmer in the winter.

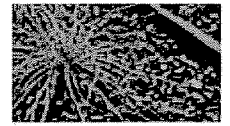
The GreenGrid™ System offers a lightweight, modular design that arrives at your building planted and ready for installation. The system can be brought to the roof via heavy equipment or elevator and installed in a matter of days. The modules, composed of recycled plastics, can be placed directly on the existing roofing membrane or any other surface, provided the structural capacity is present. The GreenGrid™ can also be installed at grade in locations where owners desire a simple, flexible greening system.

Because it is modular in nature, a GreenGrid™ rooftop design can be easily adjusted and rearranged after installation to meet a change in stylistic preferences or planting schemes. Most importantly, roof maintenance and repair is easily carried out with the GreenGrid™ System. Modules can simply be moved to address a maintenance issue, and then put back in place.

The modules come in three different depths. The 2-in. depth modules will support sedums and weigh approximately 10 lbs. per sq. ft. (wet). The 4-in. depth modules will support grasses and wildflowers and weigh approximately 15 lbs. per sq. ft. (wet). The 6-



grasses, sedums and wildflowers, and weigh approximately 15 lbs. per sq. ft. (wet). The 8-in. depth modules will support a large variety of ornamental perennials and shrubs, and weigh approximately 28 lbs. per sq. ft. (wet). The modules are available in square, rectangular and various custom shapes.



Plants are placed in the modules at the nursery and cared for until they are shipped to the green roof site for installation. Preset "palettes" of plants, developed by staff horticulturists, are available to allow customers to select plant varieties according to plant hardiness zone, size and color.

Due to the planning and design of the GreenGrid™ System, it offers significant benefits over traditional green roofs as summarized in the table below.

Traditional Systems	GreenGrid™ Systems
Systems often heavy	Modules very light
Installation time-consuming/expensive	Installation can be quickly accomplished
Irrigation systems obtrusive, problematic, designed roof by roof	Simple, pre-installed irrigation system
Roof repair extremely difficult	Modules can simply be moved
No "complete" system available	All components of GreenGrid™ engineered and available
Roof surface replacement required	GreenGrid™ can go on any roof surface in good condition
Systems are often expensive	GreenGrid™ competitively priced
Systems often contain PVC in components	All GreenGrid™ modules and pavers made from recycled materials
Roof requires about 2 years to be "green"	Instant green roof since system comes preplanted

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