

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN  
SCHOOL OF ART AND DESIGN + KRANNERT ART MUSUEM

*Student Sustainability Committee* | **GreenLink Proposal** | November 14, 2008

Application Information

Project Lead

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Professor, Interim Director  
School of Art + Design

Secondary

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Director, A+D Facilities  
School of Art + Design

Participants: Nan Goggin, Interim Director, A+D; Alan Mette, Associate Director, A+D; David Akins, Facilities Director, A+D; Kathleen Harleman, Director of KAM, Walter Wilson, Design and Installation Specialist, KAM; William Bullock, Professor of Industrial Design; Eric Benson, Assistant Professor of Graphic Design, Student Coordinator and 20 Art + Design undergraduate students.

I. Project Description | title . **GreenLink Proposal**  
Greening the Link Gallery roof and providing a rainwater collection system for the roof and two gardens.

Goals:

- a. Make visible the concerns and interests of FAA students and faculty in working collaboratively on "greening the art campus".
- b. Implement a student-designed green roof above the Link Gallery, which is a space primarily used by students as exhibition space, and as a gathering and study area.
- c. Lower the heating and cooling costs for the Link space connecting the Krannert Art Museum and the School of Art + Design.
- d. Collect and store rainwater using some existing architecture to facilitate the watering of the roof and two gardens located on either side of the Link Gallery.

Definition of sustainability + relationship to project:

1. Meets the needs of the present without compromising future generations.
2. of, relating to, or being a method of harvesting or using a resource so that the resource is not depleted or permanently damaged.
3. of or relating to a lifestyle involving the use of sustainable methods.

GreenLink is collaborative project that was first brought to my attention by two graduating seniors. Since that time, the Krannert Art Museum and the School of Art + Design have been working together with a student group headed by Eric Benson, Assistant Professor of Graphic Design, to work on ideas to make our two buildings green.

The GreenLink will be a green roof covering the Link Gallery, a glassed-in exhibition space connecting the Krannert Art Museum to the Art + Design building. The project will be student-driven as to designing and sustaining the green roof. The project includes a rainwater collection system to sustain the green roof as well as two existing gardens located on either side of the Link Gallery. The rainwater collection system will allow us to harvest a natural resource and use it effectively, thereby cutting our current water use. The green roof will passively help cool the glassed space in the summer and help insulate the roof in the winter, and will be a visible outcome of the student sustainability funds.

Longevity and/or permanence of project results on campus:

The anticipated minimum lifespan of the project is 20 years. The GreenGrid system carries a 20-year warranty, and with continued maintenance and periodic component replacement (funded by Art + Design), the project should be able to continue indefinitely.

Location:

The garden will be located on the roof of the Link Gallery. It is the connecting gallery space between the Krannert Art Museum and the School of Art + Design. The Krannert is two stories tall, A+D is three stories tall and the Link Gallery is one story. This location is significant because it symbolically and physically links our two units. It is primarily used as a space for students to exhibit work, but also serves as a social gathering space for student, campus, and community functions. In addition, the Link Gallery's shared entrance w/ the museum means that the green roof will be visible to the museum's many visitors, including local schoolchildren on class field trips. The roof of the Link can be easily viewed from many buildings on campus. Its highly visible location would serve as an ideal means of promoting the work by the Student Sustainability Committee.

## II. Budget + Fundraising

Detailed Budget:

Initial Costs: covered by the School of Art + Design and Krannert Art Museum. Original construction drawings rate the roof load at 25 pounds per square foot, which will support the wet weight of the green roof product. If the project receives preliminary approval, Art + Design will fund an analysis of the Link Gallery's roof structure.

1. Replacing existing Link Gallery roof surface | cost: \$51,900.00

The current roof provides sound structural base for the green roof

Vendor: University of Illinois Facilities and Services

2. Install modular green roof panels on the Link Roof | cost: \$17,160.00

360 - 2ft. x 2ft. GreenGrid panels = 1,440 square feet

vendor: Weston Solutions

3. Install rainwater collection system | cost: \$20,876.00

Under the Link Gallery is a lower level that is partially above and below ground level. This space once held the air conditioning unit and water softener for the Krannert Art Museum and School of Art + Design. This space is ideal to hold the proposed rainwater collection system because of its partial above-ground exposure, and its availability to the two land gardens and the proposed roof garden.

- a. Remove defunct water softener from Link basement to free 100 square feet of space for the rainwater tank

- b. Purchase and install 535 gallon (48" x 78") rainwater tank

- c. Tie new tank into existing roof drain pipe in Link basement
  - d. Install small pump and water supply lines from tank to garden
- vendor: East Central Construction/Extreme Mechanical

4. Replace second floor window in A+D with hinged unit | cost: \$1,975.00  
 Provides access to Link roof from the A+D building's second floor to install and maintain the green roof.  
 Vendor: Bacon and Van Buskirk

Full Project Cost: \$91,911.00

If the student clean energy committee does not fund the full requested amount, will the project be able to move forward?

We have been pushing forward in the hopes of working with this group. We have done substantial preliminary work to insure its success, in terms of needed materials, timetable, and legal and safety concerns. Current budget limitations at Art + Design would not allow us to pursue this project without the energy committee's funding.

## 2. Fundraising

The School of Art + Design and the Krannert Art Museum will fund the window unit to give access to the Link roof, in addition to any incidental costs that will arise as the project progresses. It is hoped that Facilities and Services will fund all or part of the roof replacement as part of the deferred maintenance program. The Graphic Design program will provide signage and marketing materials for the project. The GreenGrid system is a do-it-yourself product, so the assembly and installation will require a substantial amount of 'sweat equity' on the part of the student group, staff, and faculty. The existing garden that will benefit from the rainwater collection system was planted and maintained by Art + Design faculty and staff, and was funded through a memorial fundraising campaign that was launched in 2006 and ongoing employee donations of plants, labor, and materials.

## III. Project Timetable

- fall 08: feasibility, planning stage, proposal
- spring 09: rebuild surface of roof, install watering system
- summer 09: purchase green roof materials; plant
- fall 09: promotion, maintenance, class project : ARTD 299/499 sustainability

## IV. Energy, Environment, Social and Economic Impact

### Environmental Impact:

At an estimated garden hose flow rate of 5 gallons/minute, 30 annual waterings of 20 minutes each will result in a tap water savings of 3,000 gallons/year. It may be possible to expand the collection and distribution capacity of the system to provide water for other landscaping nearby.

#### Economic Impact:

While we do not predict a significant economic impact on the campus, it is anticipated that the added insulation provided by the green roof will help to alleviate temperature control challenges in the Link Gallery, without need to expand cooling system capacity. It is hoped that the enhanced insulation will reduce the burden on the current central air system, which is long past its expected lifespan.

#### Social Impact:

This area is where we anticipate the most benefit from this project. It is hoped that this will serve as an example of what can be accomplished at a grass roots level to help improve the campus's environmental awareness. Student involvement and visibility should help to generate excitement and lead to more projects of this type.

### V. Outreach and Education

#### 1. Campus Impact/Presence:

The College of Fine and Applied Arts has made it one of their mission points for the upcoming year to be the "greenest unit on campus." The students from the School of Art + Design particularly want to participate in making the arts green. The Link roof is a very visible location for such a project.

#### 2. Creativity/Promotional Materials:

The student group working on this project will be working in tandem with the College's sustainability group to create signage, images, and information for the community on the efforts by the college. At one meeting, the students expressed interest in creating award stickers for the Student Sustainability Committee to distribute to projects that it funds. These students have also begun a website that they want to connect to the school's website to disseminate information.

#### 3. Education:

The GreenLink roof will cover one of the main student exhibition spaces for Fine and Applied Arts. There are approximately twelve exhibitions a year in the Link Gallery. The school alone has over 650 students that work in the building as well as approximately 1000 other students who take classes or participate at the events in the space. This is in addition to parents and prospective students who tour the buildings, community members and schoolchildren who visit the museum, and the parents and schoolchildren who participate in the School's Saturday art classes.

The GreenLink requires student participation in the planning, implementation and management of the garden as well as its care and the watering of the other two land gardens. The School has leveraged its curriculum to involve students in sustainability, specifically, ARTD299 and ARTD499, which have sections on the topic of sustainability. These courses are being taught by the Industrial Design program, with Professor William Bullock and Eric Benson spearheading this curriculum. It is primarily through these courses that students have become involved in the GreenLink initiative, under Professor Benson's guidance.

GreenLink will be one of the most visible elements encountered by prospective students, family members, or visitors coming to the school or museum. Its impact with its location across from the law building and near the ARC, Memorial Stadium, and the "Six Pack" residence halls makes it a prominent symbol for how older buildings can become greener. It makes visible the committee's commitment, as well as our own, to sustainability, it will attract students to our school, facilities, and campus, and it will serve as a model for how sustainability and public engagement can complement one another.

#### 4. Likelihood for Success:

The School of Art + Design is in the midst of a multiyear facilities modernization process. We have completed a large move and upgrade of studios and classrooms to Flagg Hall, classroom technology upgrades, 3D output laboratory installation, and a computer laboratory and digital printing expansion. A substantial darkroom reconfiguration and renovation project is due to be completed for Fall 2009. The garden that will be watered by the rainwater system has been a great success. We consider this project to be a part of our continuing efforts to improve the student experience, and are quite certain that it will succeed.

#### Attachments:

- a. Roof resurface quote
- b. Rainwater collection system quote
- c. Window replacement quote
- d. GreenGrid pricing
- e. GreenGrid product information



**Facilities and Services  
Maintenance Division**

DATE: 11-13-08

**MAINTENANCE FIXED COST ESTIMATE**

To: Chris Bonner, Office phone #: \_\_\_\_\_, Office Fax #: 4-7688

From: Randy Hitchins \_\_\_\_\_, Office phone #: 333-6238

Building: Art & Design, Subject: Re-Roof of roof section over room 150 gallery

Based on your authorization, Facilities & Services, Maintenance Division has proceeded to develop the following scope of work.

**Scope of Work:**

- 1 remove the present roof and metal edge/fascia
- 2 Install 2-ply asphalt vapor barrier to existing concrete deck

- 3 Install 1- layer of 1" ISO insulation in hot asphalt
  - 4 Install 1-layer of High Density wood fiber insulation
  - 5 Install Fully Adhered EPDM( Rubber) roof
  - 6 Fabricate and install new Aluminum metal edge/fascia
  - 7 Material quotes good for 40 day from date of 11-13-08
- Labor quoted good for until July 1 of 2009

COPY

**Fixed Cost Estimate: \$ \$51,900**

This fixed cost estimate only includes work as outlined in the scope of work statement. Facilities & Services, Maintenance Division will not proceed with any work beyond the work defined. If changes are required, a signed change in scope is required to identify additional work and estimated cost with the appropriate authorization. The fixed cost estimate is valid for 30 calendar days.

**Authorization:**       Accept       Decline       Revise

If accepted, I agree with the scope of work and fixed cost estimate as presented. I also confirm that I did not solicit bids from outside contractors for this work.

Department Authorization \_\_\_\_\_ Date: \_\_\_\_\_

CHAMPS Account #: \_\_\_\_\_

BANNER C-FOAPAL: C: \_\_\_\_\_ F: \_\_\_\_\_ O: \_\_\_\_\_ A: \_\_\_\_\_ P: \_\_\_\_\_ A: \_\_\_\_\_ L: \_\_\_\_\_

Fax completed form to: \_\_\_\_\_ Linda Ogden \_\_\_\_\_ at Fax: 244-6391 \_\_\_\_\_

**Facilities & Services Office Use Only**

(To be filled out **AFTER** Customer Returns form)

To	Work Order	Step	Account	Hours	Amount
<b>Total Fixed Cost Estimate</b>					

Service Office send copies to:  
Maintenance Division  
Mike Alsip-F&S

# **EAST CENTRAL** **CONSTRUCTION, INC.**

404 West Clark Street Champaign, IL 61820

Phone 217-352-8600 Fax 217-359-5456

E-mail : ecentral@shout.net

Chris Bonner  
Art & Design  
Uofl Urbana Champaign

November 12, 2008

## **RE: Water Reclamation System for Garden Area**

East Central Construction proposes to furnish the necessary materials, contractor equipment, labor and supervision required to install a new Garden Reclamation Water System. Work to include the following:

### **SCOPE**

Demo electrical as needed, provide power and conduit disconnect and 120 duplex receptacle located by Chris Bonner.  
Demo existing 3 water softener tanks and associated piping as discussed at site visit  
Install new poly storm water reservoir  
Install new poly storm water reservoir pump package  
Install new sillcock and line

### **EXCLUSIONS**

No abatement is included in this bid  
No painting  
No insulation  
No concrete or concrete demo work  
Demo limited to the above three tanks only.

**COPY**

Price is good for thirty (30) days from above date

**TOTAL COST FOR THIS WORK ..... \$20,876.00**

Thank you for the opportunity to price this work.  
Steve Stoerger  
East Central Construction

# BACON & VAN BUSKIRK

EST 1937

GLASS

MIRRORS

WINDOWS

DOORS

PO Box 712 CHAMPAIGN, IL 61824-0712 PH2173566471 FAX2173527267  
WWW.BVBGLASS.COM

Date: August 4, 2008

Estimate No. 080408 - KH1

Quoted To: UIUC - School of Art & Design  
144 Art and Design Building MC-590  
408 East Peabody Drive  
Champaign, IL 61820

Attn: Chris A. Bonner, Jr. / Assistant Facility Manager

Phone: 217-244-7761

Fax: 217-244-7688

Job: Replacement Vent

As per your request, we propose to furnish and install the following material:

1each In-swing Aluminum Casement window (Boyd Aluminum Manufacturing Series 2400)  
Clear Anodized Finish to match existing aluminum framing  
Glazed with 1/2" Tempered Glass  
90 Degree open limit stop  
Custodial cam lock

COPY

Window to be glazed within existing aluminum framing.

Approximate lead time is 4 to 6 weeks from receipt of signed contract or purchase order.

**For the sum of \$1,975.00 ( One Thousand Nine Hundred Seventy-five)Dollars.**

The proposal is subject to the following conditions:

1. We do not clean any glass or metal. 2. If we reuse &/or handle Owner's glass, any damage to the Owner's glass is at the Owners risk of breakage and at their expense. 3. We do not replace breakage or damaged glass caused directly or indirectly by anyone other than our own employees. 4. Work to be executed as promptly as possible upon award, subject to delays occasioned by strikes, lock-outs, fires, carriers, and other causes beyond our control. 5. Subject to revisions if not accepted within 30 days of the date of issue. 6. We reserve the right to correct any clerical errors prior to acceptance. 7. We are not responsible for Mold, mildew, or pollution-related building problems. 8. All overdue invoices and pay requests will be charged an additional monthly service fee of 1-1/2% if payment is not received within 30 days. This is an annual rate of 18%

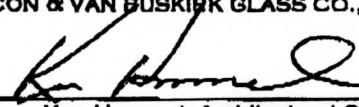
We solicit your early acceptance of this proposal in which event we promise to give the work our most careful attention.

Sincerely,

BACON & VAN BUSKIRK GLASS CO., INC.

Date Accepted: \_\_\_\_\_

By

  
Ken Hummel, Architectural Sales Mgr

Accepted By: \_\_\_\_\_





## Price List – Summer 2008

Contact us at:  
Phone: 847-918-4121  
Fax: 847-918-4055  
e-mail: DIY@GreenGridRoofs.com

### Material Pricing

Pricing per module with 9-plants per module	
Plant palette options	Price per module
Classic Sedum Mix ( <i>min. order of 12 modules</i> )	\$ 45.78
Yellow Submarine ( <i>min. order of 12 modules</i> )	\$ 45.78
Fire & Ice ( <i>min. order of 12 modules</i> )	\$ 45.78
The Blues ( <i>min. order of 12 modules</i> )	\$ 45.78

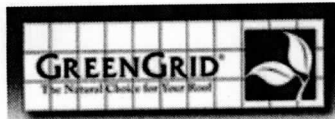
Pricing per module without plants (plants to be supplied by others)	
Module/Mix/Root Barrier Only ( <i>min. order of 12 modules</i> )	\$ 36.25

### Shipping and Handling Prices

Shipping	
Chicagoland Area	\$ 325.00 (for every 300 modules)
All other Areas	Call for Quote

#### Please Note:

- 1) Each module takes up a 4-square foot area
- 2) Buyers must order the minimum number of modules specified.
- 3) All orders must be pre-paid.
- 4) Order lead time is 2 to 3 weeks from receipt of payment. Acceptable methods of payment are check, money order, or Visa/Mastercard/Discover
- 5) Material and shipping costs are subject to change
- 6) Customer self pickup is not available
- 7) Plant substitutions may occur based on availability.



The PREMIER Green Roof System

CONTACT US | SITE MAP | SEARCH

GreenGrid® System

Advantages

Projects

Specifications

Green Buildings

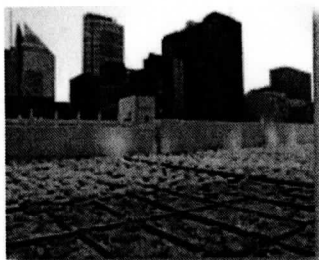
About Us

Events

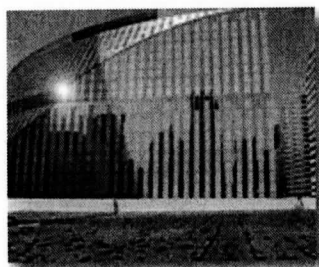
## Benefits

### Green Roof Benefits

#### Reduced Energy Costs



When the outside air temperature reaches 80°F, surface temperatures of traditional black rooftops can be as high as 180°F. Rooftop heat loads affect the amount of energy necessary to cool buildings to desired temperatures. Because of their insulating properties, GreenGrid® green roofs have consistently and significantly reduced rooftop heat loads in warm seasons, even more so than reflective white roof membranes.



Because of its insulating properties, GreenGrid® green roofs have greatly affected interior building temperatures, reducing the amount of energy needed to heat and cool buildings effectively. Green roofs have been shown to reduce heating and cooling costs from 25% to 50% for the floor directly below the roof. They can also significantly slow a building's heat gain and loss. Roof temperatures under the GreenGrid® modules are significantly cooler than their counterpart blacktop and reflective white membrane roofs.

As a result, the HVAC systems of buildings equipped with GreenGrid® roofs operate more efficiently, translating in lower energy costs for the building owner.

For those who wish to see raw live temperature data, just click on the link below to enter the site and follow the instructions.

[Click here to register for DataLink](#)

#### Green Roof Benefits

- Reduced Energy Costs
- Reduced Urban "Heat Island" Effect
- Sound Insulation
- Extended Roof Life
- Aesthetics
- Stormwater Management
- Government Incentives

#### Related Content

- [GreenGrid® Advantages](#)
- [GreenGrid® Temperature Data](#)

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an employee-owned company

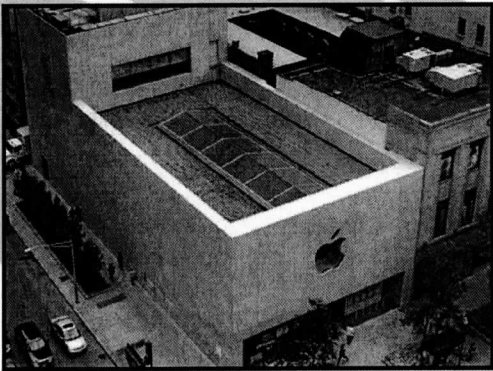
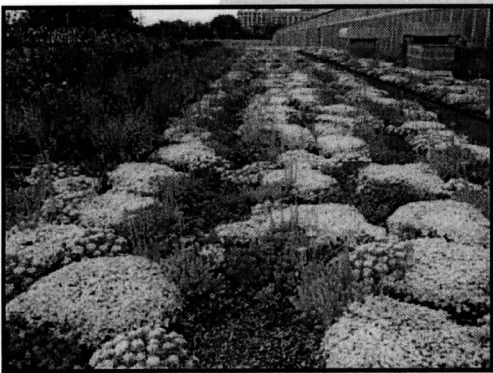
**GREENGRID®**  
The Natural Choice for Your Roof



# The PREMIER Green Roof System

## The GreenGrid® Green Roof System

offers distinct advantages over more complex systems with its simplicity in design, pre-planted modules, and movable modular features.



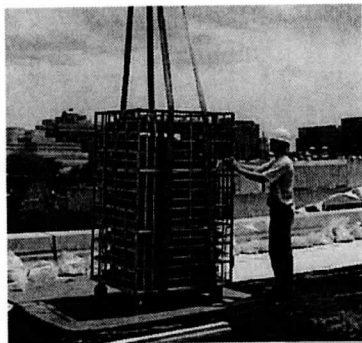
**WESTON**  
SOLUTIONS

[www.greengridroofs.com](http://www.greengridroofs.com)

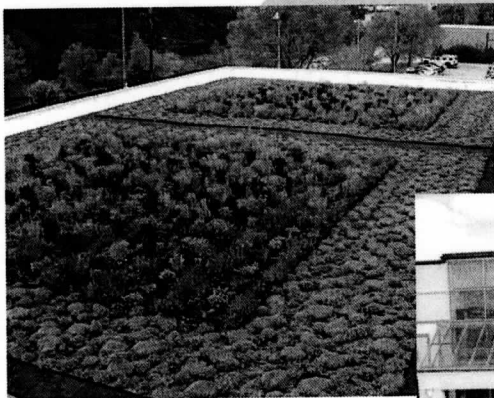
# Introducing the GreenGrid® Modular Green Roof System

**S**implicity in design and flexibility are the hallmarks of the GreenGrid® System. The system was designed by engineering, roofing, and horticultural experts to produce an efficient, integrated green roof product. GreenGrid® offers a modular design that arrives at your site pre-planted and ready for installation. The modules contain 100% recycled plastics, and the components can be hoisted to the roof via elevator, forklift, or crane, and quickly installed in accordance with the design. The modules can be placed directly on the roof membrane or on any other surface with adequate structural capacity.

GreenGrid® Green Roof System modules are lightweight compared to many other green roof systems. The Ultra-Extensive (2.5-inch depth) modules weigh approximately 11-13 pounds per square foot (wet). The Extensive (4-inch depth) modules weigh approximately 18-22 pounds per square foot (wet). Both Ultra-Extensive and Extensive modules support highly drought-resistant ground covers that can thrive in a non-irrigated (climate dependent), rooftop environment in the project location. The Intensive (8-inch depth) modules—supporting a large variety of variety of grasses, perennials, and/or



groundcovers that can thrive in an irrigated or non-irrigated, rooftop environment in the project location—weigh approximately 35 pounds per square foot (wet) and up, depending on plant selection and growth media. They can be easily arranged or rearranged to suit the needs and desires of the client. Most important, roof maintenance and repair is simple—modules can just be moved should roof repair/maintenance be required, then put back in place.



## About Green Roofs



Green roofs are not a new phenomenon. Due to their excellent insulation and stormwater retention properties, these roofs have been a standard construction practice in many countries for years. Since the 1970s, green roofs increasingly have become part of the landscape in Europe, where there are over 100 million square feet of planted roofs today. Due to the complexity of some of these systems, green roofs have been somewhat slow to catch on in North America. These “European” systems are constructed in layers, starting with a waterproof membrane and drainage layer, then insulation, root barriers, soil layers, and a wind erosion blanket are put in place. The landscape is then installed, which can take considerable time to mature.

**The GreenGrid® System offers distinct advantages over these complex systems with its straightforward design, pre-planted modules, and movable modular features.**

## System Options

### Ultra-Extensive Modules

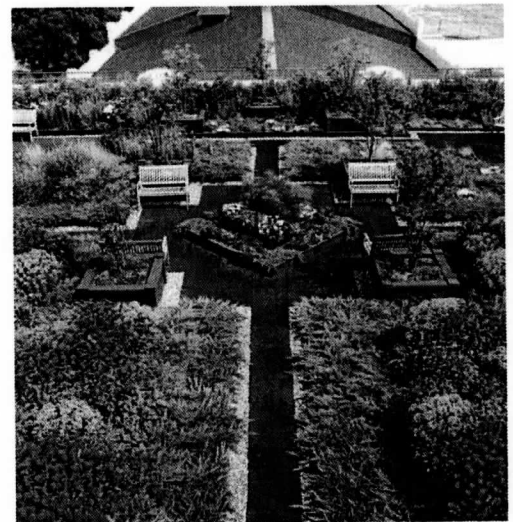
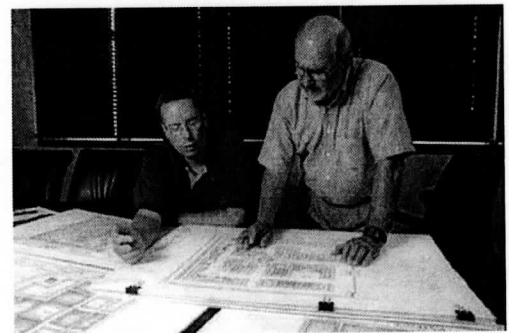
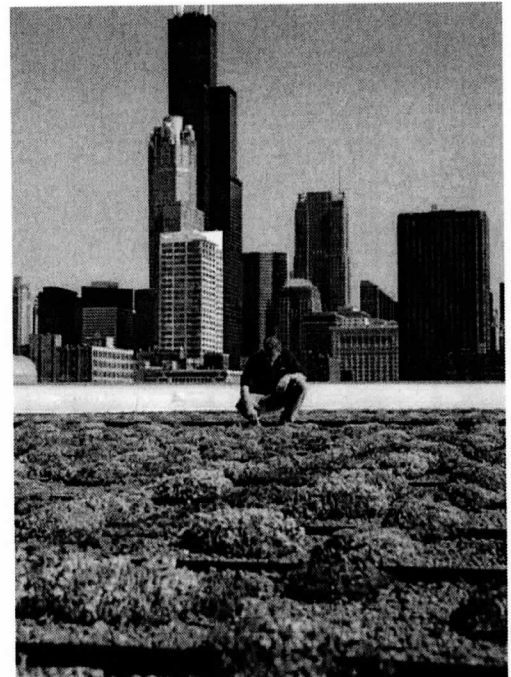
The 2.5-inch Ultra-Extensive GreenGrid® System is an extremely lightweight green roof system of modules, composed of 2.5 inches of growth media and drought-tolerant vegetation. This functional green roof system is generally designed to require minimal irrigation and maintenance. The 2.5-inch green roof system is appropriate for small applications with limited structural capacity. The approximate weight of a wet 2.5-inch GreenGrid® ultra-extensive green roof system is 11–13 pounds per square foot, which is similar to the weight of gravel ballast placed on many conventional roofs.

### Extensive Modules

The 4-inch Extensive GreenGrid® System is a lightweight green roof modular system composed of a 4-inch layer of growth media and highly drought-tolerant vegetation that is composed of ground covers that can thrive in a non-irrigated (climate dependent), rooftop environment in the project location. Like the ultra-extensive modules, this highly functional green roof system is generally designed to require minimal irrigation and maintenance. The approximate weight of a wet 4-inch GreenGrid® extensive green roof system is 18-22 pounds per square foot.

### Intensive Modules

The 8-inch Intensive GreenGrid® System is designed for more elaborate roof landscapes. These rooftop gardens are typically designed to be accessible for leisurely enjoyment and therefore must have the proper structural capacity for live loads. The 8-inch depth system allows for a larger selection of plants, including grasses, perennials, natives, and/or groundcovers. The addition of paver pathways, terraces, edge treatments, and other architectural features result in beautiful and dramatic new usable spaces. Depending on the plant selection, drip irrigation systems and maintenance may be necessary, just as they would be for a traditional garden. Although a more refined application, the ecological benefits of Intensive green roofs are wide-ranging due to the utilization of larger and greater plant species diversity. The average weight of a wet 8-inch GreenGrid® intensive green roof system starts around 35 pounds per square foot, and may be higher depending on plant selection and growth media.



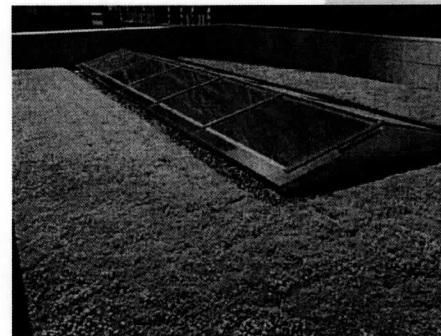
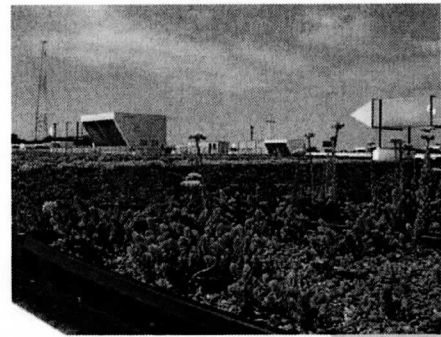
# The Advantages a GreenGrid® System Brings to Your Building

**Easy Roof Maintenance and Repair:** Since the GreenGrid® system is modular, roof surfaces are always accessible for maintenance and repair. “No matter the type or age of a roof, eventually it will leak. The question is, when,” said Larry Flynn, Senior Editor, *Building Design & Construction*<sup>1</sup>. When the roof requires maintenance or repair, the GreenGrid® modules are simply removed and then put back in place when repair is complete, without disturbing growing media or plants.

**Engineered, Integrated System:** All components of the GreenGrid® Green Roof System are designed and engineered to work together. This results in installation efficiencies, thereby lowering costs, and assures an integrated design.

**Lightweight for Existing/New Roofs:** The GreenGrid® system can be installed on any roof in good condition where structural capacity is present. The choice of lightweight modules make a green roof feasible for almost any building, without requiring upgrades to its structural capacity.

**Pre-Planted and/or Pre-Grown System:** The GreenGrid® modules are planted in advance at the nursery. This means modules arrive at the job site already planted and ready for installation. This feature helps reduce costs associated with labor and helps reduce installation time. Plants can also be grown at the nursery in advance of shipment to the project site.



The table below presents additional GreenGrid® advantages.

GreenGrid® Advantages	GreenGrid® Green Roof System Solution	Traditional (Built-in-Place) Systems
<b>Easy Roof Maintenance &amp; Repair</b>	Modules can easily be moved then put back in place without disturbing growing media or plantings	Layers need to be cut and rolled back until repair location found; plants and layers damaged
<b>Competitive Installed Cost</b>	Competitive installed cost versus leading built-in-place systems	New roof surface plus mat, drainage, root barrier, moisture retention layers often costly
<b>Quick Installation</b>	Delivered pre-planted, ready to set in place; reduced downtime due to inclement weather	Multi-layer, built-in-place, vegetation planted at job site, time-consuming
<b>Pre-planted</b>	Pre-planted at the nursery; speeds installation time and reduces labor costs	Planted on site; increases labor costs
<b>Lightweight for Existing/ New Roofs</b>	Lightweight—installs on any existing roof surface in good condition and with structural capacity	Systems often heavy; roof surface replacement often required despite condition
<b>Easy Rooftop Placement</b>	All modular system components quickly put in place on roof in accordance with design	Components delivered to rooftop by multiple sources can present scheduling difficulties
<b>LEED® Recycling Credits</b>	All GreenGrid® modules contain 100% recycled material, contributing to LEED® recycling credits	Components generally do not contain recycled material
<b>Built-In Water Retention</b>	Module design provides built-in water retention	Water retention layers must be added
<b>Easy System Alteration/Additions</b>	Option of installing green roof in sections offers opportunity for future add-ons	Often difficult and expensive to change/add-on due to edge design requirements
<b>Alliances</b>	Wrap-around or full-system warranties are available as part of a Mule-Hide or Carlisle GreenGrid® Roof	Limited Warranty – Removal and re-installation of plants/vegetation generally not included

<sup>1</sup> *Building Design & Construction*, 1 Sept. 2003, vol. 44, no. 9, p. 66

**Reduced Energy Costs:** When the outside air temperature reaches 95° F, traditional black rooftop surface temperatures can be as high as 175° F. The heat load of a roof impacts the amount of energy necessary to cool the building to the desired temperature. Due to its insulating properties, GreenGrid® green roofs can significantly reduce the heat load of the roof in warm seasons.

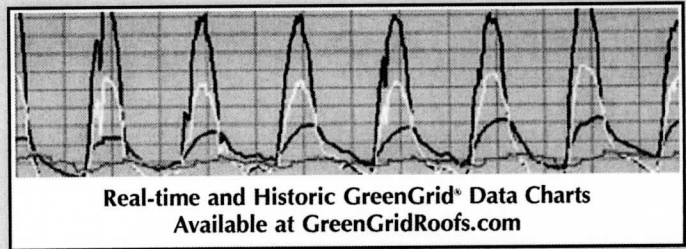
**Reduced Urban Heat Island Effect:** The urban heat island effect occurs in most of the large cities of the world and has actually been shown to change weather patterns in some. Roads and building rooftops absorb a significant amount of heat during the day, which in turn is radiated back into the atmosphere, causing further warming. GreenGrid® green roofs help insulate and shade buildings. Plus, the plants on green roofs transpire, cooling the atmosphere around them.

**Stormwater Management:** Green roofs help alleviate stormwater runoff through retention and detention of rainfall and detention of runoff from roofs. This benefit can cut costs associated with required municipal on-site stormwater retention.

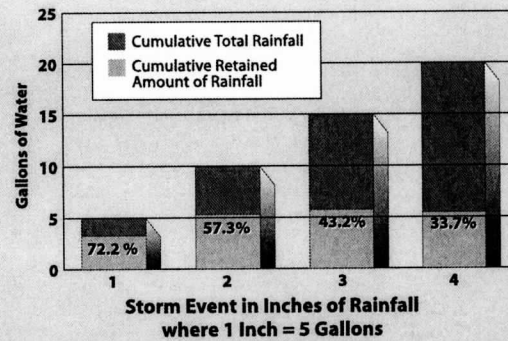
**Sound Insulation:** The growth media, plants, and layers of trapped air in a green roof system serve as excellent sound insulators. Tests have shown that green roofs can reduce the indoor noise pollution from outdoor contributors by as much as 10 decibels per every 3 inches of soil media.

**Extended Roof Life:** GreenGrid® green roofs can protect roof membranes from ultraviolet radiation, extreme temperature fluctuations, and puncture or other physical damage.

**Creation of Added Value and Aesthetics:** Green roofs can provide an oasis of green in the urban environment by creating visually pleasing vistas, serene rooftop gardens, and functional gathering areas.

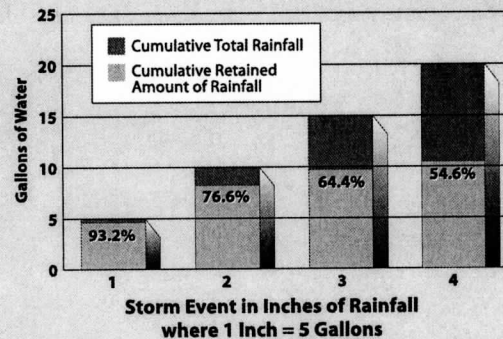


**Cumulative Water Retention in a 4-Inch GreenGrid® Module During a Simulated 2-Hour Rainstorm**



(\*Storm Events\* occurred in 15-minute applications per event)

**Cumulative Water Retention in an 8-Inch GreenGrid® Module During a Simulated 2-Hour Rainstorm**



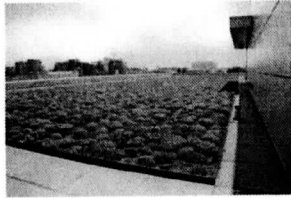
(\*Storm Events\* occurred in 15-minute applications per event)

## GreenGrid® Projects



### APPLE COMPUTER STORE - NORTH MICHIGAN AVENUE

**Client:** Apple Computer, Inc.  
**Location:** 679 N. Michigan Ave., Chicago, IL  
**GreenGrid® Size:** 2,400 Square Feet  
**Installation Contractor:** WESTON  
**Landscape Design:** Douglas Hoerr Landscape Architecture  
**Rooftop System:** Extensive  
**Status:** Completed Summer 2003



### AMERICAN RED CROSS OF GREATER CHICAGO - RAUNER CENTER

**Client:** American Red Cross of Greater Chicago  
**Location:** 2200 W. Harrison St., Chicago, IL  
**GreenGrid® Size:** 2,800 Square Feet  
**Installation Contractor:** WESTON  
**Landscape Design:** Douglas Hoerr Landscape Architecture  
**Rooftop System:** Extensive  
**Status:** Completed Summer 2004



### MILWAUKEE HOUSING AUTHORITY - HIGHLAND GARDENS

**Client:** Milwaukee Housing Authority  
**Location:** 1818 W. Juneau Ave., Milwaukee, WI  
**GreenGrid® Size:** 20,032 Square Feet  
**Installation Contractor:** WESTON  
**Landscape Design:** WESTON  
**Rooftop System:** Extensive  
**Status:** Completed Fall 2004



### UWM GREAT LAKES WATER INSTITUTE

**Client:** University of Wisconsin-Milwaukee – Great Lakes Water Institute  
**Location:** 600 E. Greenfield Ave., Milwaukee, WI  
**GreenGrid® Size:** 6,480 Square Feet  
**Installation Contractor:** WESTON  
**Landscape Design:** WESTON  
**Rooftop System:** Extensive/Intensive  
**Status:** Completed Summer 2003



### U.S. EPA REGION 8 HEADQUARTERS

**Client:** U.S. Environmental Protection Agency  
**Location:** 1595 Wynkoop St., Denver, CO  
**GreenGrid® Size:** 19,396 Square Feet  
**Installation Contractor:** WESTON  
**Landscape Design:** WESTON  
**Rooftop System:** Extensive  
**Status:** Completed Fall 2006



### HASTINGS KEITH FEDERAL OFFICE BUILDING

**Building Owner:** United States General Services Administration  
**Client:** J & J Contractors, Inc.  
**Location:** Hastings Keith Federal Office Building, 56 North 6th St., New Bedford, MA  
**GreenGrid® Size:** 3,400 Square Feet  
**Installation Contractor:** WESTON and J & J Contractors, Inc.  
**Landscape Design:** Oak Point Associates  
**Rooftop System:** Extensive  
**Status:** Completed Spring 2004





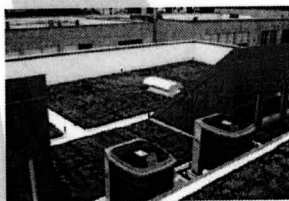
### **KOHL'S RETAIL STORE**

**Client:** Kohl's Illinois, Inc.  
**Location:** 2140 N. Elston Ave., Chicago, IL  
**GreenGrid® Size:** 32,500 Square Feet  
**Installation Contractor:** WESTON  
**Landscape Design:** WESTON  
**Rooftop System:** Extensive  
**Status:** Completed Spring 2005



### **BARBER PARK GREEN BUILDING**

**Client:** Ada County Parks & Recreation  
**Location:** 4049 S. Eckert Rd., Boise, ID  
**GreenGrid® Size:** 3,660 Square Feet  
**Installation Contractor:** WESTON  
**Landscape Design:** WESTON  
**Rooftop System:** Ultra-Extensive  
**Status:** Completed Summer 2005



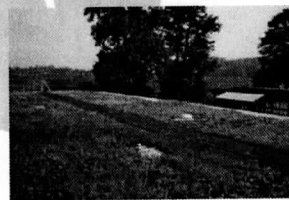
### **HOLY REDEEMER CATHOLIC CHURCH**

**Client:** Holy Redeemer Catholic Church  
**Location:** 25 N. Rosa Parks Way, Portland, OR  
**GreenGrid® Size:** 4,464 Square Feet  
**Installation Contractor:** WESTON  
**Landscape Design:** WESTON  
**Rooftop System:** Extensive  
**Status:** Completed Summer 2005



### **IKEA STORE**

**Client:** IKEA US  
**Location:** 1 Ikea Way, Stoughton, MA  
**GreenGrid® Size:** 21,376 Square Feet  
**Installation Contractor:** WESTON  
**Landscape Design:** WESTON  
**Rooftop System:** Extensive  
**Status:** Completed Summer 2005



### **CENTER FOR URBAN ECOLOGY**

**Client:** National Parks Service  
**Location:** 4598 MacArthur Blvd., Washington, DC  
**GreenGrid® Size:** 6,500 Square Feet  
**Installation Contractor:** WESTON/Platinum One Contracting  
**Landscape Design:** U.S. Department of the Interior  
**Rooftop System:** Extensive  
**Status:** Completed Summer 2004



### **SUSTAINABLE SOUTH BRONX**

**Client:** Sustainable South Bronx  
**Location:** 890 Garrison Ave., Bronx, NY  
**GreenGrid® Size:** 1,052 Square Feet  
**Installation Contractor:** WESTON/Corporate Contractors, Inc.  
**Landscape Design:** WESTON  
**Rooftop System:** Intensive/Extensive  
**Status:** Completed Summer 2005

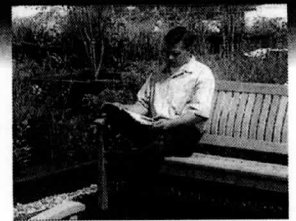


### **NATTY BOH BREWERY REDEVELOPMENT**

**Client:** Natty Boh Brewery  
**Location:** 3600 O'Donnell St., Baltimore, MD  
**GreenGrid® Size:** 12,000 Square Feet  
**Installation Contractor:** WESTON  
**Landscape Design:** Cho Benn Holback & Associates  
**Rooftop System:** Extensive  
**Status:** Completed Fall 2005

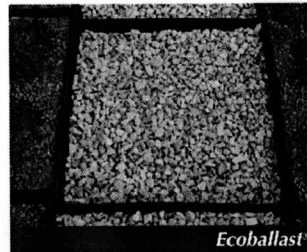
## Optional Features

Additional features are available to enhance the benefits and aesthetic appeal of your green roof. Whether your goal is to create a pleasing and enjoyable space, or optimize the beneficial use of your building's roof space, there are many options available to make the most of your GreenGrid® Green Roof System.

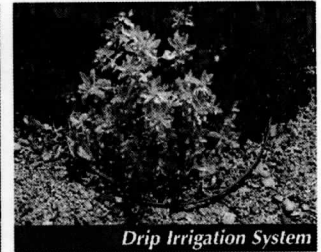


### Beneficial Enhancements

- Ecoblast®—These modules can be added to augment stormwater retention.
- Drip Irrigation Systems—Some configurations may require the installation of a drip irrigation system, due to climate and/or plant selection.



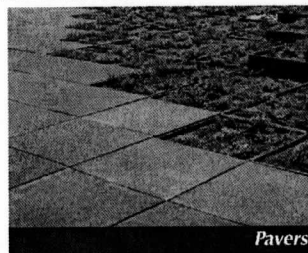
Ecoblast®



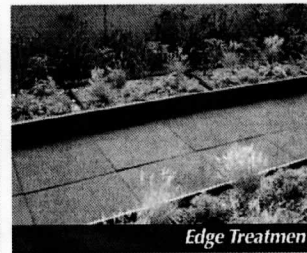
Drip Irrigation System

### Aesthetic Enhancements

- Pavers
- Edge Treatment
- Outdoor Furniture and Planter Boxes



Pavers



Edge Treatment



Outdoor Furniture & Planter Boxes



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