

GREENGRID MODULAR GREEN ROOF SYSTEM



GREEN ROOFS

Green roofs are not a new phenomenon. Due to their excellent insulation, storm water retention and environmental properties, these roofs have been a standard construction practice in many countries for some years. Traditionally, these systems are constructed in layers consisting of the waterproofing membrane, root barrier, moisture mat, filtration layer, growing media and finally, the plants.

This is often a complex, time-consuming installation with multiple deliveries and frequently the plants can take time to settle and mature.



THE GREENGRID MODULAR GREEN ROOF SYSTEM

Simplicity in design and flexibility are the hallmarks of the GreenGrid® Modular Green Roof System. GreenGrid offers distinct advantages over the more complex systems with its straight-forward design, pre-planted modules and movable modular features. Most commonly, GreenGrid is installed by the roofing contractor who installed the waterproofing, however its simplistic nature means that green roofs can now be installed by almost anyone.

The system was designed by engineering, roofing and horticultural experts to produce an efficient, integrated green roof product. GreenGrid offers a design that arrives at your site pre-planted and ready for installation. The modules can be hoisted to the roof and quickly installed onto the waterproofed surface, which should be checked for adequate structural capacity. When time on-site and the associated costs are of paramount importance, GreenGrid ensures that these are kept to a minimum.



GREEN ROOF TYPES

Extensive

The most commonly used type of roof in the UK is the extensive green roof. Chosen because of its minimal amount of maintenance and often the least expensive, sedum is generally the plant used in the majority of installations.

Sedum is a succulent plant which means that it retains moisture. In situations where the roof area is not easily accessible, this attribute allows the plant to be reasonably self-sufficient, as in the UK climate, it should only require watering at times of drought. These roofs are generally not trafficked.

GreenGrid modules provide an established planted appearance which provide an instant green roof effect.



Semi-Extensive

A semi-extensive roof may comprise some sedum, but perhaps the addition of wildflowers or grasses. To add additional interest. Some additional maintenance work may be required, depending upon the plant choice.

Intensive

Where a more formal garden appearance is required, the specification would be for intensive planting. The 200mm deep GreenGrid modules allow small shrubs, perennials, herbs and bulbs to be planted, while still providing the benefits associated with a modular system .



Biodiverse / Brown Roof

Biodiverse or brown roofs have become more prominent as the demands for more environmental issues increase. This type of roof is not chosen for its appearance, but to encourage wildlife (biodiversity), birds, insects etc to the locality. Often it replaces land that has been removed for building purposes, or simply to meet an environmental desire. The substrate is a mixture of building rubble, crushed brick and concrete, soil or sand and often additional items such as logs and piles of stones are added to provide additional habitat.

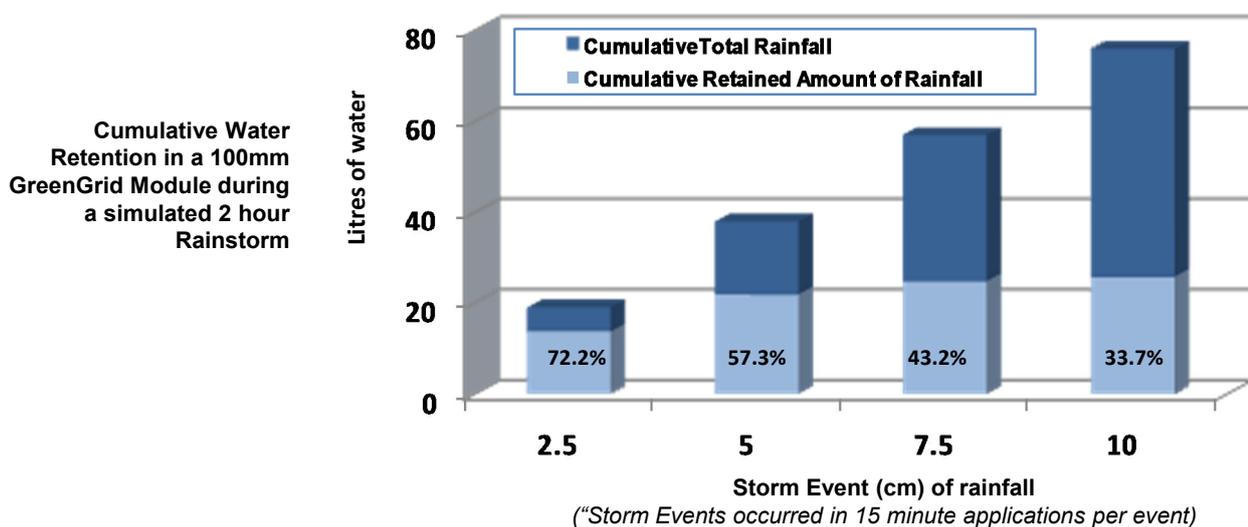
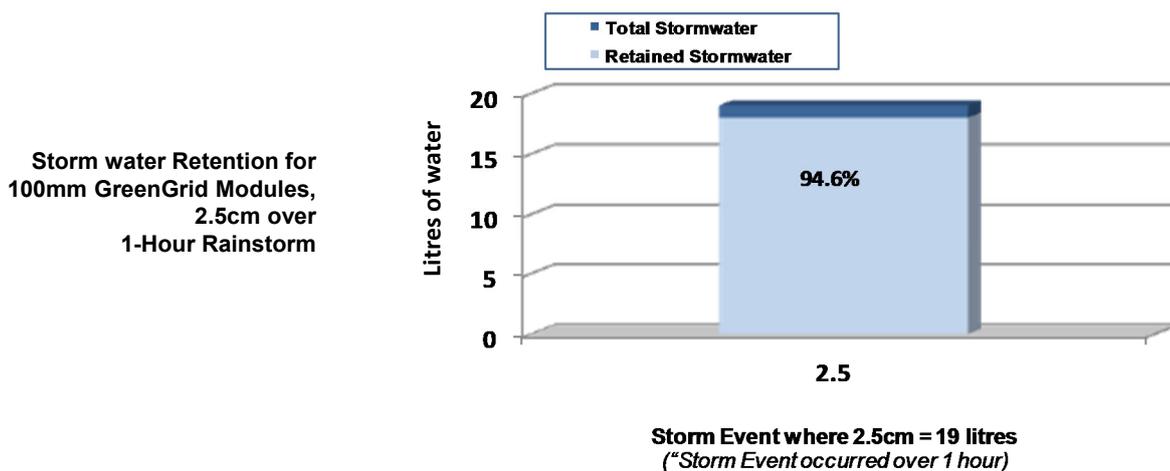
ENVIRONMENTAL BENEFITS

Reduced Energy Costs

To show how the weather can affect building conditions, if the outside air temperature were to reach 35°C, traditional black roof surface temperatures could be as high as 80°C. The heat load of a roof impacts the amount of energy necessary to cool the building to the desired temperature. Although the insulation on the building will account for the greatest degree of protection, due to its insulating properties, GreenGrid green roofs can significantly reduce the heat load of the roof in warmer conditions.

Storm Water Management

The increasing amounts of rainfall over the years have shown that often drainage systems are unable to cope, resulting in floods. Green roofs help alleviate storm-water runoff through retention and detention of rainfall and water runoff from the roof area.



ENVIRONMENTAL BENEFITS

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 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, and the plants on green roofs transpire, thereby cooling the atmosphere around them.

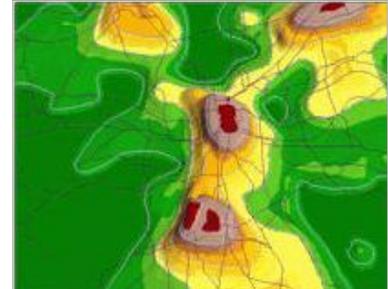


Figure showing heat accumulation in city areas

Sound Insulation

The growth media, plants and layers of air trapped 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 for every 75mm of soil media.

Extended Roof Life

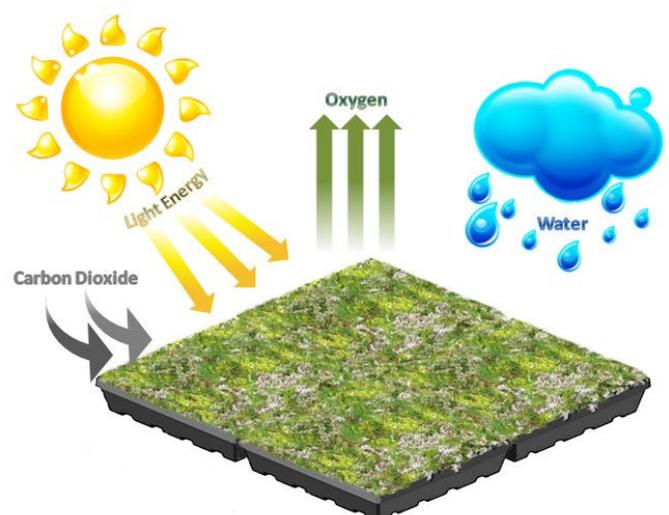
GreenGrid green roofs can protect roof membranes from ultraviolet radiation, extreme temperature fluctuations and puncture or other physical damage. Even existing older roofs will increase their longevity with the protection of a GreenGrid roof. When the older waterproofing eventually fails, GreenGrid can be removed and replaced once the waterproofing is renewed.

Improved Air Quality

Plants will naturally improve the air quality by using excess carbon dioxide to produce oxygen, absorbing noxious gasses and trapping and filtering airborne particles.

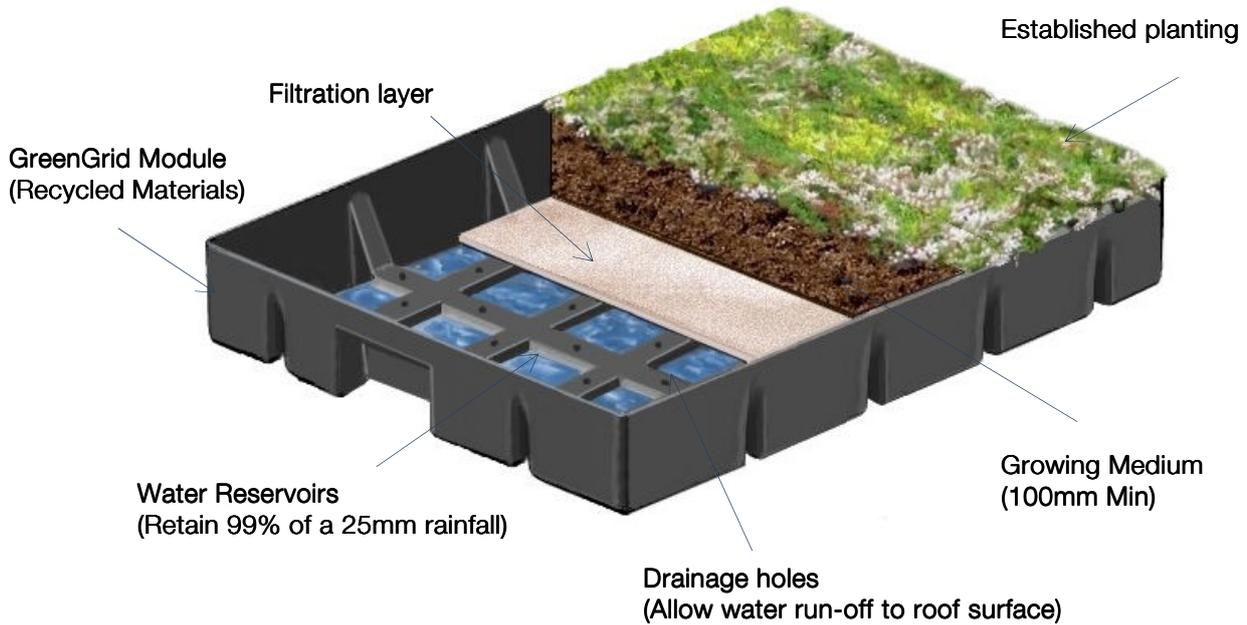
Creation of added value and aesthetics

While it is clear that green roofs provide strong environmental and biodiverse benefits, it is also simply the case that they can provide an oasis of green in an urban environment.



Basic Photosynthesis

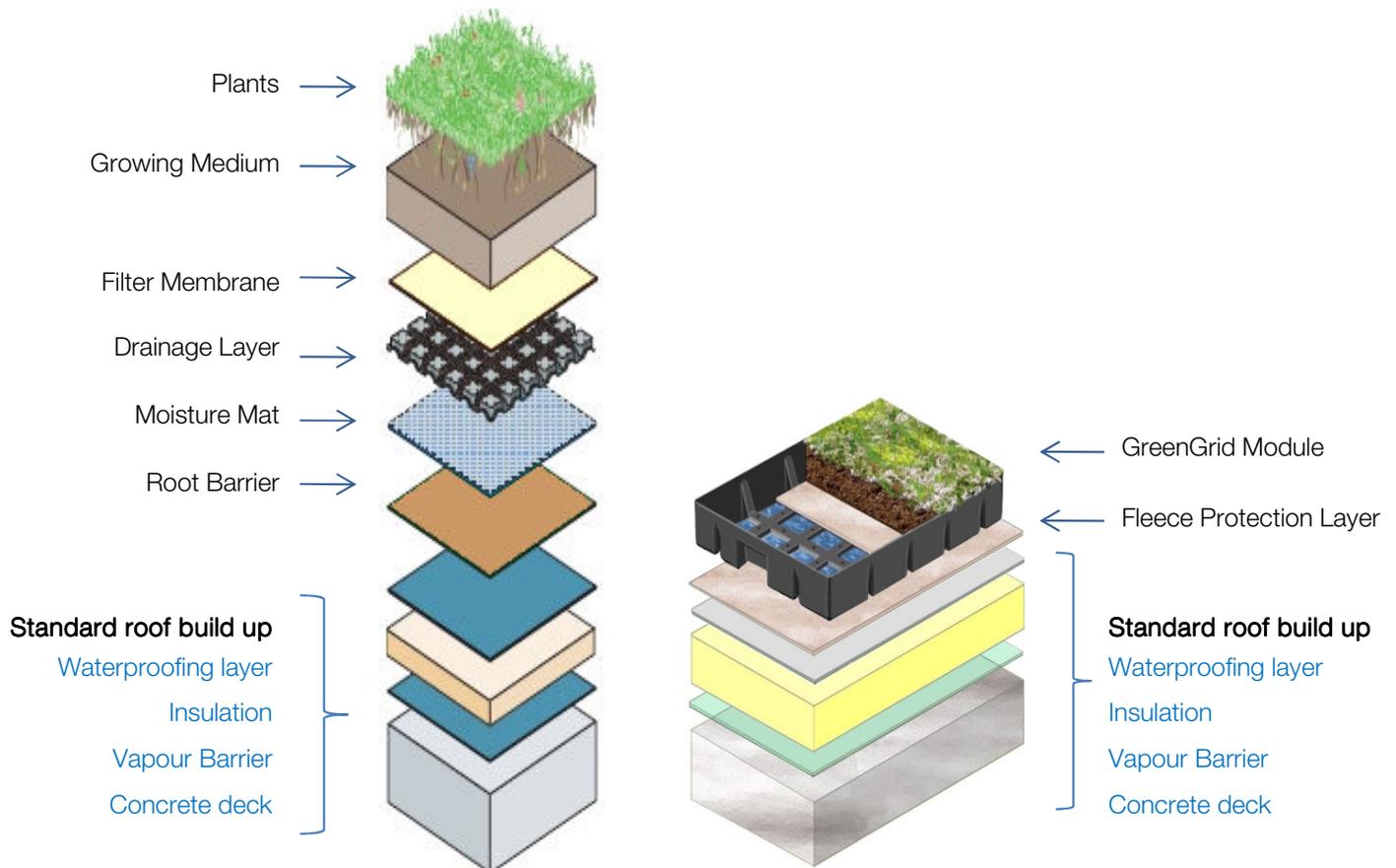
GREENGRID INFORMATION



Module Dimensions: 600mm (L) x 470mm (W) x 100mm (D)

Green Roof Build Up - Traditional System

Green Roof Build Up - GreenGrid



GREENGRID ADVANTAGES

GreenGrid Advantages	GreenGrid Benefits	Traditional Green Roof Systems
Simple to install	No specialist installation knowledge required	Roofing contractor may have to subcontract out 'green' works
Fast installation	Reduced time on site Reduced labour costs	Often complicated and time consuming
Project Management	Contractor is in control over installation	Following trades can damage waterproofing
Simple logistics	Multiple components combined in one unit, hoisted directly to the roof	Multiple components may require multiple deliveries and sequential logistical control
Facilities Management	Waterproofing can be accessed for maintenance or even renewal with no loss of green roof	Difficult to access roof surface for maintenance or leaks. Layers require to be cut through and plants are disturbed
Quality Control	Established planting means reduced risk of plant failure and reduced maintenance once on site	Use seeds, plug plants or sedum mat. Results can be patchy and may take some time to mature. Greater risk of plant failure.



PROJECT REFERENCES

GREENGRID PROJECT REFERENCES

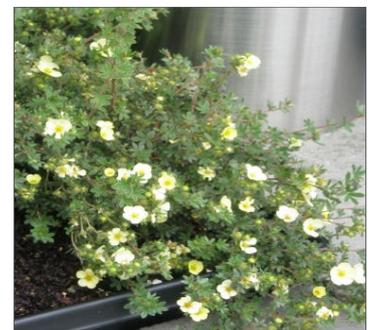
Marks & Spencer HQ, London

Plan A is Marks and Spencer's five-year 100-point 'eco' plan to tackle some of the biggest challenges facing our world.

The launch of Plan A took place at M&S' Headquarters in Waterside House in London in March 2007. Starting with their very own offices, M&S chose the GreenGrid Modular Green Roof System as an ideal way to declare themselves 'green'.

With only 48 hours notice, GreenGrid modules were installed on various roof levels of the building. Due to its waterside location, access to the roof areas may have caused a problem for other green roof systems – not so with GreenGrid. The modules were taken to the roof area by means of the goods elevator, through the staff restaurant and out onto the required area. Installation took place out with normal working hours, which mean that on arrival at work the following morning, the staff were greeted with the sight of a beautiful green roof.

From what was previously an uninspiring and bland area, is now a stunning environmental location for the staff to enjoy. Through careful plant selection, all manner of birds, butterflies and bees are also attracted to the surrounding inner city area.



*This is not just a green roof –
this is a GreenGrid Green Roof*

YOUR M&S



GREENGRID PROJECT REFERENCES

Marks & Spencer, Bournemouth Store



Plan A is Marks and Spencer's five-year 100-point 'eco' plan to tackle some of the biggest challenges facing our world.

Among the many environmental improvements made in their daily practices and through their products, they also took their 'eco' plan to new heights by installing GreenGrid Modular Green Roof System on some of their stores and also on various roofs on their Head Office in London.

This particular project illustrates their Flagship Environmental store in Bournemouth where the GreenGrid installation took place in October 2007. The pictures shown were taken in Spring 2008 and show the beautifully lush sedum planting interspersed with wildflowers.

Where traditional green roof systems may require some monitoring after installation to ensure their survival, GreenGrid plants are well established in the modules before being laid on to the roof.



This is not just a green roof – this is a GreenGrid Green Roof



YOUR M&S

Client: Marks & Spencer
Contractor: Braedale Roofing Ltd

GREENGRID PROJECT REFERENCES

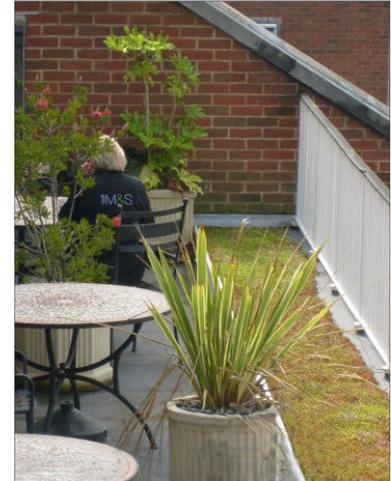
Marks & Spencer, Cwmbran Store

Plan A is Marks and Spencer's five-year 100-point 'eco' plan to tackle some of the biggest challenges facing our world. Among the many environmental improvements made in their daily practices and through their products, they also took their 'eco' plan to new heights by installing GreenGrid Modular Green Roof System on some of their stores and also on various roofs on their Head Office in London.

The environmental store at Cwmbran was M&S' third project using the GreenGrid Modular Green Roof System. GreenGrid is ideal for clients such as M&S, as its flexibility allows it to fit around the fluctuating budgets of the retail industry. The modules can be used on both new build projects and on existing stores and can be purchased according to budget. For M&S, with hundreds of stores throughout the UK, this means that any time in the future, additional modules can be purchased to cover part, or all, of individual stores.



It was important for the client to meet the environmental criteria which they had set themselves, whilst still having a low maintenance and visually appealing appearance. The specification decided upon was a sedum roof interspersed with wildflower planting.



The six varieties of sedum used will continue to provide a colourful carpet year after year and the wildflowers will self seed to provide additional interest and a source of interest to local birds and insects.



*This is not just a green roof –
this is a GreenGrid Green Roof*

YOUR M&S

Client: Marks & Spencer
Contractor: Single Ply Services Ltd

GREENGRID PROJECT REFERENCES

Schools



The Building Schools for the Future programme (BSF) is the largest ever schools investment programme and it is no surprise that green roofs feature prominently in the design criteria as an effective and aesthetic means of contributing to the necessary environmental requirements.

As with most of the environmental features incorporated into the school buildings, these may often be a topic for discussion in the classroom, however actual experience would be difficult to facilitate. While many green roof systems would appear to tick the environmental boxes, only GreenGrid can also provide additional creativity in the classroom. Whereas the green roof would normally be off-limits, additional modules can be provided at ground level, which can be taken into the classroom, allowing the children to have hands-on experience with the plants and biodiversity. All of which could contribute to an EcoSchools initiative.

As well as the more common sedum planting, wildflowers, grasses, bulbs and herbs are only a small part of the wide range of planting options which can also be incorporated into the modules.

Of course, GreenGrid still provides all the benefits of flexibility, speed of installation, ease of use and finished appearance for which it is widely recommended. The innovative modular design is pre-planted in our nurseries, where the plants are tended for until required. The plants never leave the modules, which ensures a strong growing system and a beautiful finish. Each module contains all the layers required on a normal built up green roof combined in one convenient unit.

All that is required is for the modules to be hoisted to the roof and laid on the surface – simple as A, B, C.



Project: Northbury School, Essex
Architect: Greenhill Jenner Architects
Main Contractor: Neillcote Construction



John Fernley School, Melton Mowbray
Architect: White Design
Main Contractor: Wilmott Dixon



Bowbridge Primary School, Newark
Architect: Nottinghamshire County Council
Main Contractor: Kier Marriott



Blackpool Primary, Blackpool
Architect: Aedas Architects
Main Contractor: Parkinson Ltd

GREENGRID PROJECT REFERENCES

Tigh-Na-Mara

A remote location on a wild Scottish coastline, along some very narrow and winding roads posed no logistical problems for the installation of a GreenGrid Modular Green Roof. Every single module is complete with its own water reservoirs, drainage system, root protection and established planting which means that these compact self-contained green roof units are easy to transport and install, often delivered in just one vehicle.

Even taking into account the exposed location of Tigh-Na-Mara (House by the Sea) the owner was able to have a green roof installed in Winter.



Since the sedum plants are grown and established directly into the modules, the plants are never disturbed, which means that no actual planting is required on site and installation is not restricted to within the growing season. The established modules are simply placed onto the waterproofed roof surface and immediately you have a beautiful green roof, no matter the time of year.



The project was a first-time GreenGrid installation for the roofing contractor, who had previously only worked with the more traditional layered green roof systems. Requiring no specialist training or plant knowledge, they followed the supplied module layout for the roof and were greatly impressed with the speed and simplicity of the installation.

Client: Private Dwelling
Architect: Stewart Associates
Contractor: Glenville Ltd

GREENGRID PROJECT REFERENCES

Portavadie Marina

SealEco's GreenGrid green roof modules were specified again for the second phase of the £45M marina development at Portavadie on the shores of Loch Fyne on the Cowal Peninsula.

Formerly an MoD oil rig construction yard which had lain derelict since the early 1980's, the new luxury five-star rated marina, restaurant, retail and residential development was constructed using high specification materials designed for low energy use and low maintenance. The chic steel, glass, and reclaimed natural stone buildings take maximum advantage of the stunning scenery and sedum roofs were incorporated into the design to complement the surrounding environment.



Architects Stewart Associates had originally specified GreenGrid for an exclusive romantic Couple's Hideaway, Tighnamara, as part of the initial development of the Marina development four years previously. Delighted with the appearance, installation and ongoing performance from the initial project, Stewart Associates insisted on using the GreenGrid system again for the following phases of the much larger accommodation complex comprising new studio apartments and lodges overlooking the marina.



Commenting on their continued preference for using GreenGrid, Keith Geddes of Stewart Associates says, "It's all to do with the quality of the finished product and the simplicity and ease of installation. Why use a multiple layered system, when it's all self-contained in one engineered module? Using the GreenGrid system just makes sense".

The installing contractor, Green Roof UK's Managing Director, Scott Deans added, "As a pioneer of intensive and extensive green roofs we have had the opportunity to install many varied systems. With GreenGrid, the sedums are selected and pre-cultivated within the modular trays which, when transported to site resulted in a quick and simple installation process providing a highly effective extensive green roof covering."

Architect: Stewart Associates
Contractor: Green Roof UK Ltd

GREENGRID PROJECT REFERENCES

South Cheshire College

The new £74 million South Cheshire College building which opens its doors in September 2010, is set to be unveiled as the most advanced and finest education building in the country. Designed by Jefferson Sheard Architects, with BAM leading the construction, the semi-circular three storey carbon neutral building has a number of sustainability factors incorporated into the design.

An important part of this design were two 'green' roof areas – one sedum and one brown/biodiverse. The location of the roof areas, however, and access to them, meant that deliveries of materials would be extremely difficult. A normal green or biodiverse roof would require the movement of multiple loads of bulky materials to accommodate the various built up layers. With GreenGrid however, the specified brown roof substrate was already placed in the GreenGrid modules prior to delivery, which meant that all that was required on site was to hoist the modules to the roof and lay them onto the roof surface, resulting in greatly reduced installation times. Although a brown roof provides many environmental benefits, the sheer amount of crushed rubble, soil etc could provide major headaches if access to the roof surface was required in the future. By utilising GreenGrid, this rubble is contained and manageable.



The installing roofing contractor, Advanced Roofing of Ilkeston, knew that they could overcome the difficulties of access with GreenGrid. Gordon Harris commented, "GreenGrid proved to be entirely suitable for this project due to the ease of installation and delivery to the roof in an area that would have been difficult to service by traditional means".

The existing College is rated the best in the country, after an outstanding 2004 Ofsted inspection, and as well as gaining Beacon Status it is also rated as one of the 100 Best Companies to Work For in a Sunday Times survey in 2009. With a GreenGrid roof overhead on the stunning new educational facility, the building should receive even more 'top marks'.

Client: South Cheshire College
Architect: Jefferson Sheard Architects
Contractor: Advanced Roofing Ltd

GREENGRID PROJECT REFERENCES

Bowood Manor

Bowood Manor located in Wiltshire, home to the 9th Marquis and Marchioness of Lansdowne recently added a luxury hotel and spa in the vast grounds belonging to the original Robert Adam designed 18th Century building.



A stunning new atrium fills the centre of the spa roof which is surrounded by flat roofs. With the roofs clearly visible from the upper floors of the hotel and from the sweeping driveway, the Marquis was looking for something which would do justice to the surrounding parkland designed by 'Capability' Brown and a GreenGrid Modular Green Roof was chosen to harmonise with the gardens which are considered to be one of Wiltshire's hidden treasures.

Installed by Single Ply Roofing Services Ltd, the sedum roof instantly provided such a stunning appearance it inspired a poetic Lord Lansdowne to enthuse, "The service provided by SealEco has been outstanding. In the Spring, the sedum flowers are a vivid yellow and white, almost fluorescent, evolving into gentle shades of green until, in late Autumn the plants put on their soft brown winter overcoats! Sedum plants make flat roofs attractive, like jewellery makes women beautiful!"

From an installation point of view, Single Ply Services comment, "Placing of the modules is extremely quick, far quicker than traditional and the possibility of damaging the membrane is greatly reduced. It is so easy to set out and lay. If asked, we would recommend the system to other roofing contractors."



Client: Marquis of Lansdowne
Architect: Purcell Miller Tritton
Contractor: Single Ply Services Ltd

GREENGRID PROJECT REFERENCES

National Magazines

National Magazines in London are now the proud owners of the first retrofit green roof in the West End of London. The National Magazine Company is one of the foremost luxury consumer magazine publishers in the UK, producing 20 magazines and reaching 14.8 million adults every year. They publish some of the most admired and well established magazines in the UK including *Good Housekeeping*, *Country Living*, *Harper's Bazaar*, *Esquire* and *Cosmopolitan*.

'NatMag' had been working with Dusty Gedge, the country's leading green roof campaigner, to find a suitable system for their roof area. As one of 15 'London Leaders', Dusty had taken on board this project as part of his London Pledge to have three corporate bodies retrofit green roofs in the Central Core of London to adapt the city for Climate Change.

With ecology and attracting biodiversity to the surroundings at the forefront of the specification, the GreenGrid modules were supplied with bespoke planting for a wildflower meadow roof.



Kitty Corrigan, Deputy Editor of 'NatMag' said, " We were very impressed with the installation speed, simplicity and practicality of GreenGrid and are delighted with our beautiful wildflower meadow roof, which is attracting great numbers of birds, bees and butterflies. It is a talking point here in the centre of London, and in keeping with the Mayor's pledge to make the city greener.

So impressed were NatMag with GreenGrid, that they ran a national competition through their Country Living Magazine for their readers to win their own wildflower roof. The lucky winner had his roof installed by Advanced Roofing Ltd in November 2009, watched by envious neighbours, and is looking forward to enjoying his beautiful wildflower roof in the summer.

Client: The National Magazine Company
Location: London

GREENGRID PROJECT REFERENCES

Irene Kennedy Centre, Wirral Ark



Designed by Denovo Design Architects and built by Wirral Construction Company, JFW Construction, the Irene Kennedy Centre at the Wirral Ark has been awarded a Gold International Environmental Best Practice Award for its contribution to the environment. This honour represents a hat-trick for Denovo Design who have secured 3 Green Apple Environmental Awards for their work since June.

In addition to a prestigious Gold, the awards for the Centre just keep on coming in. To date, this project has also been awarded a Silver International Award for the Build Environment and Architectural Heritage.

The scheme incorporates a number of environmental features, however the GreenGrid Modular Green Roof is considered to be the jewel in the crown. In addition to providing the already familiar benefits of being easy to install and supplying an instant established appearance, GreenGrid was particularly specified as it offers the client flexibility for the future, should plans to extend the building upwards be implemented. As all the multiple layers of a traditional built up green roof are contained in each module, it is a simple exercise to lift the GreenGrid modules and set them aside to be replaced when the additional levels have been built.

Referring to the multiple awards received, Anne O'Marah, CEO of the Ark said, "Its is in no small part the vision of Frank Olchowski from Denovo Design, particularly the wonderful addition of our "green" roof - a great talking point amongst staff, clients and visitors. As an organisation we are keen to protect our planet and recycle, reuse and turn off as much as we can. This roof is a continuation of this policy"

Client: The Wirral Ark
Architect: Denovo Design



SealEco Ltd

77 Canyon Road
Excelsior Park
Wishaw, Lanarkshire ML2 0EG, UK

Tel: 01698 802250
Fax: 01698 802251
Email: info.uk@sealeco.com
Web: www.sealeco.com